User's Guide

For the

Wind Instrument Performance Suite

Kontakt 4/5

V1.0

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Please Read This

WIPS requires custom graphics and other *resources* to function properly. **Therefore, it is very important that you follow the Installation Steps given on page 5 before attempting to use these scripts.** If you do not properly follow these installation instructions, WIPS control panels will not display properly and the scripts will not function correctly.

WIPS consists of a trio of scripts distributed as .nkp files named **WIPSV1xx-Art, WIPSV1xx-Leg,** and **WIPSV1xx-Vib**** These scripts need to be installed in adjacent script slots in the following order: **Art, Leg, Vib**. The Vibrato script is *optional* but **the Legato and Articulation scripts must always be used as a pair** and must always be located in two adjacent slots. The Vibrato script ***cannot*** be used by itself and when it ***is*** used, both the Art and Leg scripts must immediately precede it.

In addition to the three primary ***instrument*** scripts, a ***multiscript*** file named **PCMapper.nkp** is also included in the NKP Files folder. This multi-script is provided in case you want to use MIDI Program Change commands to select articulations. PCMapper will allow you to convert MIDI Program Change commands to ordinary MIDI CC messages which can then be used by the WIPS-Art script to control articulation selection. If you do not want to use MIDI Program Change commands to select WIPS articulations, you will not need to use this multiscript.

** **V1xx in the file names stands for the current version number such as V103.**

NOTE: There must be at least one playable articulation before you can begin to explore WIPS. Therefore, the Articulation Script is initially configured with Articulation #1 set up as a simple, one-group articulation (enabling only Group 1). However, this initial articulation setup may or may not be very useful for further exploration of WIPS. Therefore, it is recommended that you first take the time to use the Setup mode of the Art script to create at least one useful articulation before attempting to explore WIPS musically. Building simple articulations with the Art Script is very easy and fast so don't attempt to avoid this step if you want a good exploration experience.

Installation Steps

1. Copy the 3 instrument-scripts WIPSV1xx-Art.nkp WIPSV1xx-Leg.nkp, and WIPSV1xx-Vib.nkp (from the NKP folder), to some convenient location under your local **scripts** folder. For example, In Windows, you might put these files in:

... mydocs/Native Instruments/Kontakt 4/presets/scripts/performance.

2. If you want to use MIDI Program Change messages to select articulations, copy the **PCMappe**r script to your local **multi-scripts** folder so it will be available for loading later. In Windows, you might put this file in:

... mydocs/Native Instruments/Kontakt 4/presets/multiscripts/utilities.

3. From the **WIPS_Resources** folder, copy the **.nkr** file named **WIPSV1xx.nkr** to any convenient location on your hard drive. Also copy the **Data** folder and its contents to the same location (alongside the .nkr file you just copied). It is not necessary to copy the **Resources** folder or its contents. All the custom graphics needed by WIPS is already packed into the .nkr file itself. **However, see section 5.2 for conditions under which you may need the files provided in the Resources folder.**

4. Load one of your instruments and prepare it by first deleting any scripts it may be using. Generally, you should also deactivate any group-start programming because it will interfere with proper operation of the Articulation script. **PLEASE NOTE: If you intend to use another script along with the WIPS scripts, please refer to Section 5.0 for important information about compatibility with other scripts and how to resolve resource conflicts.**

5. Under Instrument Options, use the Browse button to point the **resource container** field to the **WIPSV1xx.nkr** file which you copied in Step 3 (with the **Data** folder alongside it). Now, save this modified version of your test instrument under a new name so as to preserve your original instrument. This instrument will now have access to both the custom graphics and the fast-trig support file required for proper operation of WIPS. **NOTE: If you do not properly implement this step, the control panels will appear as a useless, scrambled arrangement of controls and WIPS will not function correctly**.

6. Reload the new instrument, open the script editor and select the slot you want to use for the **Art** script. Use Kontakt's Preset button in the upper left corner to first load the Factory**, '- Empty -**' script (to clear out any leftover persistent variables which could be in conflict). Then use the **Preset** button again to load the **WIPSV1xx-Art.nkp** file that you copied to your local presets folder in step one.

NOTE: Loading the '– Empty –' script before loading the desired .nkp is an important step that should always be followed whenever installing any script (not just WIPS) into an instrument which may have previously used other scripts in the same slot. If you neglect to do this, you could experience strange and elusive problems due to 'leftover' persistence variables with duplicate names.

7. Select the next script slot for the Legato Script and first load the '- **Empty** -' script followed by loading the **WIPSV1xx-Leg. nkp** file. Then, select the next script slot for the Vibrato Script, using the Preset button to first load the '- Empty –' script and then the **WIPSV1xx-Vib.nkp** file.

8. If they aren't currently visible, turn on Kontakt's **keyboard** display so you will be able to view key-switches, instrument range, etc. Also turn on the **Info** pane so you can see control help/tips when you hover your mouse over the controls. Lastly, select the 'performance view' and then resave the instrument.

9. Repeat steps 4 through 8 for each instrument you want to use with WIPS.

10. Finally, please read and heed the material on the next page about Further Instrument Preparation.

Further Instrument Preparation

While WIPS can provide a lot of very useful support for your virtual wind instruments, it doesn't do everything. Much of what is needed to construct a very playable virtual wind instrument must be done within Kontakt by you. As a starting point I suggest that you read the included pdf titled **Virtual Wind Instrument Design Guidelines** (hereafter referred to as the **VWI**). This guide discusses a lot of very pertinent concepts and contains a number of references to other documents that you may find very useful. In particular, please be sure to read **section 7.0** of the VWI to get a quick overview of how WIPS fits into the big picture.

WIPS provides all 3 performance control modes (discussed in the VWI) which can be selected easily from the Articulation script: These performance modes are:

1. Keyboard Only
2. Keyboard + Breath Controller (or other dynamics controller such as an Expression pedal)
3. Standalone Wind Controller

In order to use modes 2 and 3, your *instrument* must be configured so that the BC or WC (or other dynamics controller) properly controls volume dynamics within K4/5. If your instrument uses traditional velocity layers you should reconfigure the instrument for either AET Morphing or Volume-Layer Crossfading to be controlled by your selected dynamics controller. Generally, you won't want velocity to control volume (especially in modes 2 or 3). Again, please read the VWI for more info on these topics because WIPS is written to conform to the ideas outlined in the VWI Guide. You will especially want to read **section 5.2** (of the VWI Guide) regarding volume layers and dynamics control.

You may also benefit from reading the included AET tutorials titled **Using Kontakt's AET Filter** Parts 1 and 2.* You may also want to get hold of David Carpenter's advanced tutorials on setting up virtual wind instruments in Kontakt if and when they become available.

* Note: At the time this guide was written, Part 2 of the AET Filter Guide is still in a very rough, and incomplete state. This document is being written by David Carpenter and he is unable to estimate a target completion date at this point.

Acknowledgements

I want to take this opportunity to thank everyone in the Kontakt community who played some part in the development of these scripts especially the beta test crew for uncovering a number of 'unintended features' ☺. Many offered useful ideas and suggestions along the way and many others offered encouragement.

I especially want to thank **Rob Horvath** for all his efforts during the beta phase. Rob not only uncovered a number of my errors but he also made many valuable feature suggestions that greatly enhanced the final version of the scripts. Rob also discovered a Kontakt problem (related to pitch modulation) and then even came up with a nice 'work-around' for it (see 'The Rob Horvath Maneuver' in Section 6.0). And, last but not least, Rob designed all of the 'Built-In' legato/vibrato presets and contributed some very nice audio clips to showcase WIPS in action.

I also want to thank **David Carpenter** for revitalizing my interest in using the AET filter which then led to the **AET Velocity Morph** option added to WIPS. And, as always, many thanks to Nils Liberg for developing and sharing his **KScript Editor** with us. Without a tool like the KSE, writing an ambitious set of scripts like WIPS would be an almost nightmarish task.

Finally, my thanks to all of you on the VI Forum who have posted so many kind remarks and encouraging thoughts. I also appreciate the many emails and PMs expressing your concern for my health situation and of course I especially appreciate your prayers on my behalf. I'm sure that, in no small way, they are responsible for my still being around to make this small contribution to the Kontakt community. I sincerely hope that many of you will find these scripts to be a useful addition to your toolbox.

Rejoice in the Lord always,

Bob

1.0 WIPS Overview

The **W**ind **I**nstrument **P**erformance **S**uite, **WIPS**, is a trio of Kontakt Scripts (over 8000 lines of compiled code) designed to work together harmoniously to provide some of the most important functions needed to support Virtual Wind Instruments. While WIPS has its ancestry in SIPS, it is nevertheless a totally fresh scripting effort that benefits from many of the KSP enhancements added since the days of Kontakt 2.2. In addition, the design of WIPS takes advantage of several additional years of hindsight gained in using SIPS and in thinking about the special requirements for realistic wind instrument synthesis.

WIPS includes a very powerful and flexible articulation and variation control system with very musical-sounding legato, portamento, and vibrato effects. WIPS also supports the 3 major methods of virtual wind instrument control with **Keyboard Only**, **Keyboard + Breath Control**, and, **Standalone Wind Controller** modes. Mode 2 also supports **Keyboard + Expression Pedal** for those who don't yet have a breath control setup. All 3 modes are designed to provide the special control characteristics that are most needed by virtual wind instruments. However, many of WIPS special features depend on the availability of a keyboard. For example, key switching, re-triggering, hold pedal functions, etc. If you have no keyboard in your Wind Controller setup, many of these keyboard-dependent features will not be useable.

WIPS articulations are made up of complex combinations of Kontakt Instrument Groups and each articulation can contain up to 16 'natural' (ie sampled) variations as well as synthesized variations (using the Theo Krueger Technique, TKT) that can be sequenced in a round-robin or random fashion. Each variation can control as many as 6 normal and 6 release groups to support all manner of volume-layer blending, mod-wheel crossfading, etc. In addition, special support is included to optimize the performance of the AET filter in the velocity morph mode. And, unlike SIPS, WIPS handles all articulation control without the need to alter group-start programming (which has been a troublesome area in the past and then became unusable with the introduction of K4).

Up to 100 complex articulations can be defined and 'called up' in real time by means of MIDI Controller messages and/or key switches. Key switches can be freely assigned to any articulation individually or in pairs anywhere on the keyboard. This allows for all manner of linear or bank/art key configurations. Key switches can be defined as latching or non-latching in any combination. A dedicated set of variation parameters (such as triggering mode, sequencing mode, etc) are saved and recalled with each articulation rather than being set globally. In addition, the articulation script can associate specific panel setups with any articulation so that legato/vibrato parameters can be changed 'on the fly' as articulations are recalled.

The improved solo-mode logic used in WIPS also supports a retrigger option for performing realistic trills, trumpet shakes, etc. The 'hold/ghost' pedal function makes it possible to perform legato-connected repeat notes and such things as starting a legato phrase with a legato attack (and bending from any desired imaginary note). Any pair of notes in a legato phrase can easily be connected with a smooth, formant-corrected glide allowing all manner of portamento effects such as emulating a slide trombone glissando. Both legato bending and glide time contours can be adjusted for different shapes including exponential and S-shaped. In addition, bends and glides now have a separate set of parameter settings for both up and down intervals to allow for more realistic emulation of real instruments.

Small random variations of all the key legato/vibrato parameters can be programmed for more realistic humanization of the effect and all legato, glide and vibrato parameters can be CC controlled during performance using Kontakt's automation facility (extended to allow the use of **Channel Aftertouch**, **Pitch Wheel** and/or played **Velocity**). The Articulation script includes a powerful meta-function facility that extends the power of keyswitches to control various function buttons or to recall Legato/Vibrato parameter sets during performance. In addition, the Vibrato script has a nice new feature called **Key-Paced Vibrato**. This option allows you to actually 'play' the Vibrato cycle by cycle from your keyboard.

2.0 WIPS Articulation Script

This script has two major *modes* of operation named **Play** and **Setup**. **Play** is the normal mode used during performance while the **Setup** mode is used to build and edit articulations. The operating mode of the script is chosen with the corresponding radio button in the upper-right corner of the control panel.

Up to 100 complex articulations can be built and later recalled via key switches or MIDI Controller messages. Each articulation has its own set of parameters for controlling all key operating modes including Legato/Vibrato panel settings.

During performance, besides articulation control, the **Articulation Script**, provides a number of vital functions such as Note-stream Normalization, Variation Sequencing, Controller Mapping, etc. The Articulation Script is tightly integrated with the **Legato Script** and neither can function without the other.

2.1 Common Controls

While the **Play** and **Setup** modes of the Articulation Script have separate control panels, there are three functions that are common to both panels. The controls for these functions are located in the upper right corner of either panel as depicted in **Figure 2-1** (shown with the **Play** mode active).

Figure 2-1

2.1.1 Mode Select

This pair of radio buttons can be used at any time to change the current mode of the Articulation Script. However, if you are in the **Setup** mode and you have **deleted** all articulations, you will not be able to switch to the **Play** mode until you build at least one articulation. Initially, the script is configured with Articulation #1 pre-built to simply enable group 1 of your instrument. This may or may not be a very useable articulation, but it *will* allow you to explore the **Play** mode prior to building any articulations of your own.

2.1.2 Setting Instrument Range

It is important when setting up a new instrument that you tell WIPS what the playable range of the instrument will be. Until you do this, **you will not be able to assign any key switches** for your articulations. Key switches can only be set 'outside' of the Instrument Range (IR) which defaults to the full MIDI note range initially. In addition, WIPS uses the IR to determine the TKT shift limits it can use without overrun.

To set the IR, simply click on the **Instrument Range** button and then play the lowest and highest notes used by the instrument. You can play these notes in either order (or at once) on your MIDI keyboard or by clicking your mouse on Kontakt's displayed keyboard. Once you have set the instrument's range, WIPS will highlight it on the keyboard display using **cyan-tinted** keys. Later, when key switches are assigned, they will be tinted either Red, Green, or Yellow (see section 2.3.10). You can change the IR at any time in the future but you will first have to move any previously defined key switches that might be in the new range.

2.1.3 Setting Preferences

Clicking the **Preferences** button will open a dialog box with a number of checkboxes that you can either check or uncheck as may be most appropriate for your instrument and/or modus operandi.

(1)	Program Change Offset	See section 2.2.3 (Last paragraph)
(2)	Retrigger Velocity Mode	See section 2.2.4 (Last paragraph)
(3)	Reset Random Generator	See section 2.3.7 (Paragraph 4)
(4)	Disable TKT for Glider	See section 3.2.4 (Last paragraph)
(5)	Activate Mute/Ghost Option	See section 3.5 (Paragraphs 5 & 6)
(6)	Allow ArtCC to Recall Meta Articulations	See section 2.2.3 (Paragraph 3)

2.2 Play Mode

Besides the common control buttons, the **Play** mode control panel has two major sections. The **Articulation Status Display** which will be discussed in section 2.2.1 and the **Performance Settings** group which will be discussed in sections 2.2.2 through 2.2.6.

2.2.1 Articulation Status Display

The Articulation Status Display is shown in Figure 2-2. Articulation changes that you make do not take effect musically until the next note played. This allows you to recall your next needed articulation while still sustaining the prior note and without affecting the sustained note (or its associated release sample group). Incidentally, with few exceptions, **most parameters that you change in WIPS do not take their musical effect until the next note played**. While there are some exceptions to this rule (that were made in order to provide the most useful musical result), when such is the case it will be specifically pointed out.

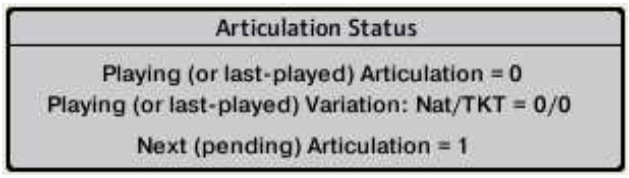

Figure 2-2

The first two lines of the **Articulation Status** display always show the currently sounding articulation and variation (or if there are no notes currently sounding, the last-sounding articulation/variation). The last line of the display shows the articulation that *will be* used for the ***next note*** to be played. As soon as you play a new note, the first two lines will then also show this 'Next' (pending) Articulation as the active or Playing Articulation.

The second line displays both the Natural and the TKT variations selected by the articulation's variation sequencer. If the active articulation has no variations or, if the variation triggering mode hasn't been satisfied, this display will simply show **0/0**. A variation of zero (either natural or TKT) means the primary sound itself is playing (i.e. 'no variation').

2.2.2 Performance Controller Mode

The performance controller mode is selected with a trio of radio buttons in the upper left side of the **Performance Settings** box as shown in Figure 2-3. The available modes are **Keys Only** or **Keys + Breath**, or **Wind Controller**. The purpose of these buttons is to control how WIPS processes the input note stream to condition it for the Legato Script. The Legato Script operates in a 'solo mode' where only one note at a time is allowed to sound but, the legato or glide effect is triggered when two notes are played overlapping each other.

Figure 2-3

The objective of each mode is to 'normalize' the output note stream to a common format, suitable as input for the Legato Script. This common format is the same as that produced by a typical Wind Controller such as an EWI (see section 4.4 of the VWI). Therefore, when the **Wind Controller** mode is selected, essentially no note-stream processing is performed by the Articulation Script. The **Keys Only** mode on the other hand is designed to condition the possibly-polyphonic output of a normal MIDI keyboard to provide a solo-mode output note stream with a format similar to that provided by a Wind Controller.

The **Keys+Breath** mode, in addition to providing the solo-mode conditioning, is also integrated with the dynamics controller in the following way. In order for a note-on condition to be generated, there must be both a key down *and* the dynamics controller must be above zero. For example, if the default BC is used as a dynamics controller, there must be both BC pressure *and* a key down condition in order to generate a note-on for the Legato Script. So for **note-on**, the keyboard and the dynamics controller are in an **AND** relationship. On the other hand, a note-off condition occurs on either key up *or* when the dynamics controller drops to zero (off). So for **note-off**, the keyboard and the dynamics controller are in an **OR** relationship.

However, it is important to realize that apart from using the dynamics controller to control the note-on/note-off logic, **WIPS in no way participates in the volume-control processes of the dynamics controller**. That you must handle in Kontakt itself (see section 5.2 of the VWI).

2.2.3 Performance CC Assignments

Directly under the Performance Controller Mode buttons are three CC assignment buttons for the **Hold Pedal**, **Breath/Dynamics**, and **Articulation Control** as shown in Figure 2-4. The default assignment for the **Hold CC** is 64 however, you can reassign this to any MIDI CC of your choosing (including none if you don't want to use the hold function). The function of the Hold Pedal will be discussed with the Legato Script (see section 3.5).

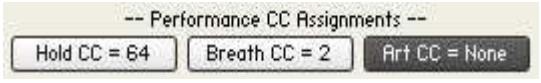

Figure 2-4

The default assignment for the **Breath CC** is 2. However, you can assign dynamics control to any MIDI CC of your choosing such as the Mod Wheel or an Expression Pedal. However, it needs to be emphasized again that this assignment is used by WIPS **only in the Keys+Breath** mode and then only to participate in the note-on/note-off logic. It is up to you to determine how the assigned dynamics controller is used to control volume within Kontakt itself.

The **Art CC** assignment menu can be used to assign any MIDI CC to recall articulations during performance. Usually, you will want to assign key switches to recall articulations that you create. However, you can also recall any articulation from 1 to 100 by means of any MIDI controller assigned as the **Art CC**. If a CC is assigned, when that CC is received with a value between 1 and 100, the corresponding articulation will be recalled (queued for the next note to be played). Normally, the ArtCC is only used to recall normal articulations. However, if you want to also recall meta articulations (see section 2.3.9) with the ArtCC, you can do so by enabling the preference option named **Allow ArtCC to recall meta articulations**.

With this optional method of articulation selection, you can easily design any kind of control mechanism you might want to use for selecting articulations. For example, for live performance situations with an EWI, you might want to rig some kind of footswitch control for selecting various articulations. You could easily do that by writing a simple front-end script that converts pedal-board signals to a MIDI CC message. Alternatively, you can use MIDI program change messages to directly select articulations by using a simple multiscript that converts program change messages to a standard CC message. The **PCMapper.nkp** multiscript distributed with WIPS can be used for this purpose.

Finally, it should be clarified that MIDI CC messages can contain data values between 0 and 127 but WIPS articulations are numbered from 1 to 100. If you send the assigned CC with a value of zero (or a value between 101 and 127), it will simply be ignored by WIPS. However, if the first option in the **Instrument Preferences** dialog is checked (see section 2.1.3), the CC value will be incremented by one before performing articulation selection. Therefore, with this option enabled, articulations from 1 to 100 will be selected with MIDI CC values from 0 to 99. This can be convenient if you are using the PCMapper multiscript and sending MIDI Program Change messages from a keyboard that displays patch numbers from 1 to 128 when it actually transmits 0 to 127.

2.2.4 Retrigger Option

The **Retrigger/Trill Option** can be turned On or Off with the pair of radio buttons in the upper right corner of the Performance Settings box. With this option On (as shown in Figure 2-5), if you play a legato phrase and continue to hold down the keys for the preceding notes, when you lift the last key played, it will retrigger the prior note. Lifting that key will also retrigger the prior note played, etc. This is a very convenient way to play more realistic-sounding trills, trumpet shakes, etc. **Note: If you are using a Hold pedal, you must release it before you lift the retrigger key or it will continue to sustain (**see section 3.5**).**

Figure 2-5

When a prior note is retriggered this way, you have two global choices as to what velocity the retriggered note will be played with. This velocity option is controlled by the 2nd checkbox in the **Instrument Preferences** dialog (section 2.1.3). If *unchecked*, the retriggered note velocity will be made the same as that of the retrigger key (the one being lifted) whereas, if this preference box is *checked*, the retriggered note will be re-played with its original, played velocity.

2.2.5 Variation Trigger Override

Variation triggering itself will be explained in section 2.3.7. However, each articulation can be defined to have a number of natural and/or TKT variations which will be sequenced either in round-robin or random order. Moreover, you can also specify the conditions under which the variation sequence will advance or reset. The various options available to advance the variation sequencer are referred to as the triggering condition. For example, an articulation can be programmed to trigger an advance to the next variation only when the last two notes played are the same (anti machine-gun mode).

Normally, when an articulation is recalled, its pre-programmed triggering rules govern when and how its variations are triggered during performance. However, the programmed trigger conditions can be **overridden** by using the trio of radio buttons labeled **As Set**, **Always**, and **Never** as shown in Figure 2-6.

Figure 2-6

With the default **As Set** button down, variation triggering is handled normally as programmed with the articulation. With the **Always** button down, every note played will trigger the variation sequencer advance (regardless of what is specified with the articulation programming). And, with the **Never** button down, the variation sequencer will **not** advance under any condition (regardless of how the articulation has been programmed).

These override buttons can be very useful since they can be controlled by key switches and therefore you can countermand the programmed variation sequencing whenever you would like for best musical effect. For example, suppose you have programmed an articulation to use TKT variations only to avoid the machine-gun effect (by triggering variations only on note repeat). But then, you encounter some musical passage that would greatly benefit from using a variation here or there that wouldn't ordinarily be triggered by any notes in the passage. By assigning the override buttons to key switches, you can effectively use key switches to force a TKT or natural variation to play (or not play) precisely where you want this to occur.

2.2.6 Special Controller Mapping

The Legato and Vibrato scripts have a lot of parameters set by knobs and sliders that you may want to vary in real time during performance. All WIPS knobs and sliders can be CC controlled using Kontakt's automation system. However, this system is limited to using only the standard CCs and there are times when you may want to use one or more of the *special* MIDI controllers to control a knob or slider. For this purpose, WIPS provides a set of four mapping menus located in the bottom row of the Performance Settings box as shown in Figure 2-7. For example, if you want to control a Vibrato panel knob with Aftertouch, you could use Kontakt's automation facility to assign some CC, say CC100, to control the vibrato knob. Then, use the **AT CC** menu to assign AT to CC100. When you do that, channel aftertouch messages (from 0 to 127) will be mapped to CC100 messages (from 0 to 127) allowing you to indirectly control the Vibrato panel knob with Aftertouch.

Figure 2-7

The **Vel CC** menu can be used to map played Velocity to any standard CC. And the **PW+ CC** and **PW- CC** menus can be used to map either side of the Pitch Wheel. **PW+** will map positive Pitch Wheel values and **PW-** maps negative Pitch Wheel values to a standard CC (from 0 to 127). If you assign the same CC to both **PW**+ and **PW-**, it will run from 0 to 127 for either positive or negative Pitch Wheel movement.

As a special usage case of Velocity mapping, if your instrument uses the AET filter in its Velocity Morph mode, you can use WIPS special AET option (see section 2.3.7) to force all played velocities to 127. However, if you do that and you would still like to use Velocity to control other things in your instrument, you can use the Velocity map menu to accomplish this. Simply edit your instrument to use any standard CC in place of where you would have used velocity control. Then, assign that same CC to the Velocity mapper and WIPS will send the originally-played velocity (**before** it forces the velocity to 127) via the assigned CC proxy. Please see section 4.4 of the AET User Guide included in the Docs folder with WIPS.

2.3 Setup Mode

Besides the set of buttons in the upper right corner common to both the Play and Setup modes, the **Setup** mode control panel contains a number of control groupings, displays, and popup dialog boxes. The **Setup** panel gives you access to everything you will need to create, view, edit, and audition articulations and their associated parameters.

2.3.1 Overview

WIPS articulations at their core are about instrument group and parameter control. The simplest form of an articulation consists of a single Kontakt group which is enabled whenever the articulation is selected. The next step up would be a pair of groups, one normal and one release group. When such an articulation is recalled, the release group is triggered at the end of any detached note or at the end of a legato phrase.

If you have several sampled variations of the same sound, each in their own group, you can assign the variation groups as *natural* variations of the same articulation. The first normal/release groups assigned to an articulation are considered to be in Variation 0. However, you can also assign up to 15 more variations numbered from 1 to 15. These additional variations can be sequenced in either round-robin or random order and with various optional triggering conditions specified (such as only when two notes in a row are the same). In addition to natural variations, WIPS can synthesize variations for you with up to 6 TKT variations that can be used alone or in conjunction with natural variations. Variation sequencing and triggering options are very flexible and each articulation has its own set of such parameters that will be established whenever the articulation is recalled.

For situations in which you want two or more groups to sound when a key is played, you can assign up to 6 normal and 6 release groups to each variation of an articulation. This can be used to provide a layered sound or can be a convenient way to implement volume-layer crossfading schemes. In addition to group and variation control, WIPS articulations can also be associated with specific User Presets for the Legato and/or Vibrato scripts. Thus it is possible for an articulation to also establish a custom set of parameters for the Legato and/or Vibrato Scripts when the articulation is recalled.

WIPS articulations can be recalled with CC messages or with a very flexible and easy-to-use key-switch facility. Any articulation can be associated with either one or two keys (outside of the normal instrument range). This allows you to use either linear or bank/art key switch configurations in any combination. Key switches can be defined as either latching or non-latching (momentary) in any combination desired. Meta Articulations can also be built that can issue various kinds of useful commands such as changing a mode button or requesting a User Preset change. Such Meta Articulations can also be recalled with a key switch and thus will allow you to do things like change from Legato to Glider mode with a simple key-switch command.

You can also use a key-switch-driven Meta function to pace the Vibrato script when using its **Ksw-Paced Vibrato** mode (see section 4.3.2). This provides a very functional alternative to using aftertouch pacing if your keyboard has no aftertouch capability.

2.3.2 Selecting An Articulation

To view or edit the various parameters of an existing articulation or to audition any variation of an articulation or to create an articulation from scratch, you have to first **select** the articulation. In the top center of the control panel you will find 3 value edit boxes as shown in Figure 2-8. To select any articulation, use the leftmost edit box to enter the number of the desired articulation (from 1 to 100). Beneath the three edit boxes is a **viewbox** that displays the assigned groups as shown in Figure 2-9. All the normal groups assigned will be displayed in the left column while all the assigned release groups are displayed in the right column.

Figure 2-8

Figure 2-9

When you first select an articulation number, the groups displayed will be for **variation 0** which is indicated by the middle edit box (labeled **Natural Variation**). If additional groups have been assigned to higher variations, you can view these assignments by entering the desired variation number in the middle edit box. However, you will not be able to enter a variation number above the highest natural variation assigned so far. So, as an example, for the default Articulation #1 (assigned when you first load WIPS), there are no other natural variations defined so you will not be able to scroll the middle edit box to any number other than zero.

If TKT variations are enabled for the articulation (see **section 2.3.7**), you can select them for auditioning by using the 3rd edit box labeled **TKT Var**. As for natural variations, you will not be able to set this edit box any higher than the highest TKT variation number enabled.

2.3.3 Selecting Instrument Groups

At the bottom of the Setup control panel, you will find a listbox that displays all the groups within your instrument (16 at a time) in a scrollable window as shown in Figure 2-10. The process of building an articulation consists of selecting groups from your instrument to be assigned to the articulation you are building. To audition or add one or more groups to an articulation, you first need to select the group (or groups) in this **Instrument Group Listbox (IGL)**.

Figure 2-10

You can **select** any group (showing in the window) by clicking on its name. When the group is selected, a rectangular box will surround it as shown for the first group in Figure 2-10 Clicking on any *selected* group will *deselect* it again. You can also **Deselect All** groups with the red button at the bottom of the listbox. If the group you want isn't visible in the window, simply click the appropriate up or down arrow button on the right side of the listbox until the desired group appears in the window. If you have a lot of groups to scroll through, simply hold down the arrow button and the window will continue to scroll automatically (at an accelerating speed) until you release the arrow button.

Note that the number of groups currently selected (as well as the total number of groups contained in your instrument) is displayed above the window. This is especially convenient when you scroll some selected groups out of view (since selected groups remain selected even when they are not visible in the window).

2.3.4 Auditioning

Whenever the **Setup** panel is open, one of two audition modes will be active. The **Audition Mode** is determined by a pair of radio buttons located on the top-left side of the Setup panel as shown in Figure 2-11. In either audition mode, the Legato and Vibrato Scripts are effectively *bypassed* so they do not color the sound in any way that might be misleading. When the left **Art/Var** button is lit and you play a note, you will hear the currently selected articulation. Specifically, you will hear the selected Natural + TKT variation of the selected articulation. This audition mode can be very useful when you want to hear what some particular variation will sound like without any Legato or Vibrato effect added. On the other hand, when the **Groups** button is lit and you play a note, you will hear whatever instrument groups are currently selected in the **IGL** This mode can be very useful for previewing a group prior to assigning it to an articulation that you are building. In summary, you can listen to one or more groups by themselves or to any variation of any articulation.

Figure 2-11

2.3.5 Building an Articulation

Building an articulation is accomplished by first selecting the desired articulation number with the **Articulation** edit box. If the articulation is unassigned, the viewbox below it will show **Articulation Not In Use** in the normal column. However, if one or more assigned groups are displayed, you will either have to select a different (unassigned) articulation number or you will have to delete the existing articulation. All operations performed in assembling the group structure of an articulation are handled by the 5 buttons located to the left of the viewbox (Fig 2-9) as shown in Figure 2-12.

Figure 2-12

To add a **normal** group to an articulation, first select the articulation and the natural variation you wish to add the group to. Next, select the group (or groups) in the IGL and then click the top button labeled **+ Normal Group**. To add a release group to a variation, first select the release group in the IGL and then click the button labeled **+ Release Group**. Note that you cannot add any release groups until you have first assigned at least one normal group to the variation.

To add a new natural **variation**, select (in the IGL) the *normal* group or groups you want included in the new variation and then click the button labeled **+ New Variation**. After the new variation has been created with **+ New Variation**, you can of course add more normal or release groups to it using the **+ Normal Group** or **+ Release Group** buttons. Note that when you add a new variation, it will be positioned immediately after the variation displayed before clicking **+ New Variation**.

For example, if there are currently 3 natural variations defined (i.e. variations 0, 1, and 2), and you set the Natural Variation edit box to 1, when you click the **+ New Variation** button, the new variation will be inserted between the prior variations 1 and 2. Thus, the new variation will become #2 and the old #2 will become variation #3. Thus you have some measure of control of the ordering of the variations as you add new ones to the chain. However, you cannot just insert a new variation 0 in **front of** the existing variation 0 with a single operation because new inserted variations are always positioned **after** the selected variation (which can't go below zero). Similarly, you cannot **replace** variation 0 with a new one in a single operation but there are ways to accomplish these things with several steps.

To **replace variation 0**, you can first **insert** the new variation **after** variation 0 and then select the old variation 0 and delete it by pressing the **Delete Variation** button. When you select a variation and then delete it, all the higher variations will shift downward and be *renumbered* one lower than they were before the delete. To **insert a new variation in front of the existing variation 0**, first insert a copy of variation 0 after the existing variation 0. Then use the replace variation zero method outlined above. To **make a copy** of variation 0, first select the normal groups (in the IGL) and click **+ New Variation**. Next, select the release groups (in the IGL) and then click **+ Release Group**.

2.3.6 Articulation Options

There are a number of optional parameters that can be specified for each articulation and in addition, you can assign a unique key switch (or pair) to any articulation. These options are accessed via the **Articulation Options** buttons labeled **Art/Var Parameters** and **View/Edit Key Switch**. These buttons are located on the right-hand side of the **Setup** panel just above the **IGL** and shown in Figure 2-13. To use these buttons, **first select the articulation** with the Articulation Edit box and then click the appropriate button.

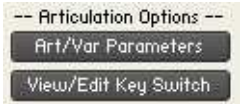

Figure 2-13

2.3.7 Setting Articulation Parameters

When you select an articulation and then click on the **Art/Var Parameters** button, you will see a dialog box like that shown in Figure 2-14. Whenever you create a new articulation, the default settings for these parameters are as depicted in Figure 2-14. The top line *caption* displays the articulation number that the parameters belong to.

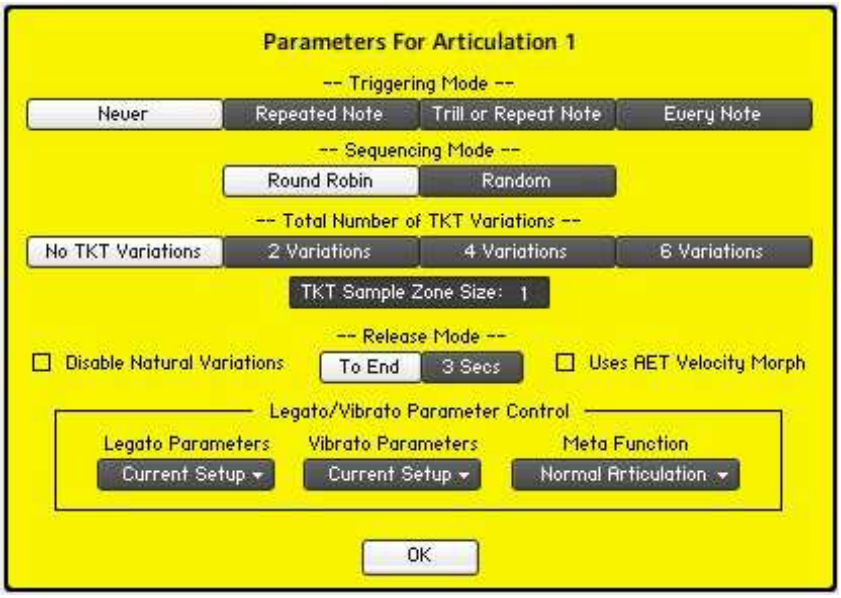

Figure 2-14

Under the caption is a set of four radio buttons that control the variation **Triggering Mode**. If your instrument has variations, (Natural, TKT or both), the triggering mode will determine under what conditions the variation sequencer will advance. If **Never** is lit, variations will never be triggered (other than when a manual override is used, see section 2.2.5). When **Repeated Note** is lit, the sequencer will advance only when the same note is played two or more times in a row. When **Trill or Repeat Note** is lit, the sequencer will advance when the current note matches either of the two prior notes. This can be used to prevent any kind of machine-gun effect due to a series of repeated notes or a series of alternating notes such as when trilling. When **Every Note** is lit, the variation sequencer advances for every note played.

Underneath the **Triggering Mode** buttons you will find a pair of radio buttons to control the **Sequencing Mode** as depicted in Figure 2-15. When **Round Robin** is selected, the sequencer steps through all variations (natural and/or TKT) in numerical order each time an advance is triggered. **Random** mode chooses variations from the pool randomly but, the same variation is never triggered twice in a row. This is often called a *random-no-repeat* mode. The variation sequence always resets to **0/0** whenever a new articulation is selected (in either Round-Robin or Random mode).

Figure 2-15

When using the Random mode, it is sometimes convenient for trouble shooting a problem to be able to repeat a *random* sequence. The **Instrument Preferences** dialog (section 2.1.3) has an option to reset the pseudo-random generator whenever a new articulation is recalled. If this option is checked, whenever you recall an articulation that uses a random sequencing mode, you can expect the **same** 'random' sequence to govern its performance. While this may sometimes be useful for test purposes, generally you will want to leave this preference option unchecked for best overall random behavior of the sequencer.

The next set of controls, shown in Figure 2-16, are for setting the number of TKT variations and the sample-zone *reach* used for each variation. For chromatically-sampled instruments the **TKT Sample Zone Size** should always be set to one. However, if you have an instrument that was sampled only once for every 2 or 3 notes, you may want to set this value higher so TKT variations will 'reach farther' to obtain a variation sample. Generally, set **Sample Zone Size** to the nominal number of semitones between each zone.

Figure 2-16

Next in the dialog box of Figure 2-14 are a pair of radio buttons and two checkboxes as shown in Figure 2-17. The radio buttons determine the release-sample triggering mechanism used for the articulation. When you choose **To End**, triggered release samples will play until the sample 'runs out'. This mode is appropriate for most release samples (which are are usually very short and not looped). However, some release samples *are* actually looped and rely on the envelope to decay them to silence. If such a release sample is triggered it will never stop and therefore will use up polyphony unnecessarily. For such situations, you can use the **3 Secs** option. With this button selected, release samples are triggered and allowed to run for three seconds and are then terminated. Of course if you have a release sample that is looped and sounds for *more* than 3 seconds, it will be cut off after 3 seconds.

Figure 2-17

The **Disable Natural Variations** checkbox (Figure 2-17) can be used to disable any natural variations that the articulation was created with. With this box checked, only TKT variations will be triggered (if they exist). Normally you won't need this checkbox because if you know in advance that you don't want any natural variations to sound you can simply edit the articulation by deleting the natural variations (or never include them in the first place). However, there might be some situations in which you want to keep the natural variations intact for the articulation but still not use them. If so, this option can be used to temporarily disable use of the natural variations. For example, you might use this to focus in on the TKT variations during setup and testing.

The **Uses AET Velocity Morph** checkbox is used to force all played velocities to 127 for instruments that use the **AET Filter** in its **Velocity Morph** mode. You can use this checkbox in conjunction with the Velocity Mapper as discussed in section 2.2.6 (as well as section 4.4 of the AET Guide).

2.3.8 Legato/Vibrato Parameter Control Group

At the bottom of the dialog box (Figure 2-14) you will find the **Legato/Vibrato Parameter Control** group shown in Figure 2-18. This section of the parameter dialog contains 3 drop-down menus. If you open the **Legato** or **Vibrato Parameters** menu you will see 16 choices. Besides **Current Setup** and **Bypass Script,** any of the **14 User Presets** can be selected..

Figure 2-18

If you select one of the User Presets, whenever this articulation is recalled it will also tell the Legato/Vibrato script to recall the specified User Preset for the next note played. Therefore, articulations can effectively control all the Legato/Vibrato parameters as well as enabling the specified groups. If you select **Current Setup**, when the articulation is recalled it will not change any of the Legato/Vibrato parameters from whatever they are currently set to (and as shown by Legato/Vibrato control panels). To illustrate how this works, it will be convenient to use a simple example.

While the following example primarily refers to recalling presets for the Legato script, the same behavior also applies to the Vibrato script. So you can recall Legato presets and/or Vibrato presets in any combination as you wish.

Now, suppose that you setup **Articulation 1** to recall **User Preset 1**, **Articulation 2** to recall **User Preset 2**, and **Articulation 3** to recall **Current Setup**. If you now recall **Articulation 1**, the next note played will set the Legato script controls to the settings you stored in **User Preset 1**. Now, if after you play a few notes, you recall **Articulation 2**, the next note played will set the Legato script controls to the settings you stored in **User Preset 2**. Finally, if you recall **Articulation 3**, the next note played will not change the Legato panel settings. So, if you haven't manually (or through automation) altered any legato controls since recalling **User Preset 2,** the legato controls will still be set the same as when **User Preset 2** was recalled.

However, if after recalling **Articulation 2**, you have made some manual or automation changes to the legato controls, these will also remain when you recall **Articulation 3**. Specifically, the controls will not revert to **User Preset 2** settings but rather what they have been changed to since then. Thus the meaning of **Current Setup** is always to make no changes to the current legato controls

Now, suppose that after recalling **Articulation 2**, no further manual or automation changes have been made to the legato controls. Then, when **Articulation 3** is recalled, the legato settings will remain those of **User Preset 2**. However, suppose that you now recall **Articulation 1**, play a few notes (but make no manual or automation changes) and then recall **Articulation 3**. In this situation, the legato controls will now remain those of **User Preset 1**. So the legato settings after recalling **Articulation 3** in the first case will be those of **User Preset 2** but in the second case they will be those of **User Preset 1**. While this may at first seem a bit confusing, simply remember that **Articulation 3** is programmed to leave the legato settings unchanged.

It now remains to explain the purpose of the **Bypass Script** option of the Legato/Vibrato Parameters menus. Sometimes it is desireable to use certain articulations with no legato (and/or vibrato effect) effect. Suppose for example, that we create **Articulation 4** and set the Legato Parameters menu to **Bypass Script**. When **Articulation 4** is recalled, the following notes will be played without any legato effect added. This bypass of the legato script will remain in effect until cancelled some way. Bypass cancellation occurs whenever you recall some other normal articulation (that itself doesn't invoke **Bypass Script**) or when you recall a meta articulation (to be discussed) using **Recall User Presets**.

It is also possible to bypass the legato/vibrato scripts via certain meta functions. One meta **function** available is **Recall User Presets** and if it also invokes **Bypass Script**, recalling such a meta articulation will have the same effect as recalling a normal articulation that invokes **Bypass Script**. However, if the meta function executed is **Recall User Presets** and it **does not** invoke **Bypass Script** (ie it invokes **Current Setup** or one of the **14 User Presets**), recalling this meta articulation will **cancel** any active bypass.

There is also a **Bypass Legato/Bypass Vibrato** button available on the script control panels (see sections 3.3.2 and 4.1.9). This button can be activated manually or, via a set of meta functions. However, please note that (unlike the preset bypass discussed above), **the panel button bypass will not be cancelled when an articulation is recalled**. Panel button bypass can only be cancelled by clicking the button again or by executing an appropriate meta function.

Meta articulations are established by choosing something other than the default **Normal Articulation** in the **Meta Function** menu shown on the right side of Figure 2-18. The **Meta Function** menu is shown open in Figure 2-19 on the next page. Selecting something from this menu (other than Normal Articulation) sets up a special kind of articulation called a **Meta Articulation**.

When meta articulations are recalled, the active articulation (for group control) is **unaffected**. Instead, a meta articulation executes a special operation called a **Meta Function**. Meta Functions are used primarily to control panel buttons but they can also be used to *recall* presets or to control vibrato pacing. The thing that makes meta articulations especially useful is that (like normal articulations) they can be recalled with key switches and optionally (see section 2.1.3) with the ArtCC. This means that you can essentially control panel buttons and such with key switches (or with the ArtCC) if desired.

Figure 2-19

2.3.9 Constructing Meta Articulations

Any articulation can easily be 'converted' to a meta articulation. Whenever you create a new articulation, the default setting of the **Meta Function** menu is **Normal Articulation**. However, if you choose any of the other Meta Functions from the list, the articulation will become a meta articulation. For example, let's say you select Art #5 from the **Setup** panel. If you open the **Art/Var Parameters** dialog and then select **Toggle Glider Sw** in the Meta Function menu it will convert Art #5 to a Meta Articulation. Let's further assume that you have assigned key-switch C2 to Art #5.

Now, in the **Play** mode let's say you are using Art #2 and you then press the C2 key. Since Art #5 is a meta articulation, **Art #2 will continue to remain the active articulation**. However, the **Toggle Glider Sw** function will be executed each time you press C2. This effectively 'ties' the C2 key to the Glider On/Off button in the Legato Script control panel. If you instead choose **Recall User Presets** for Art #5, when you press C2, the User Presets (determined by the settings of the first two menus in Figure 2-18) will be recalled for the Legato and Vibrato scripts and **will take effect for the next note played**. Therefore, C2 can be used to recall Legato and/or Vibrato User Presets without changing the active articulation.

While any articulation can be made into a meta articulation, if you want to create a meta articulation from scratch you will have to include at least one normal group in it (even though meta articulations perform no group control whatever). The reason for having to assign at least one normal group to a meta articulation is that you cannot set articulation parameters or assign a key switch to an 'empty' articulation. So, if you want to create a meta articulation from scratch, simply select an 'empty' articulation and assign Group 1 as a *normal* group. Then, open the **Art/Var Parameters** dialog and set the Meta Function as desired. Even though group 1 is assigned, it will not be enabled when this articulation is recalled. Also, please remember that if the meta articulation invokes the **Recall User Presets** meta function, you must also set the desired presets in the first two menus of Figure 2-18 so the meta function 'knows' *which* presets to recall.

Note that, other than assigning at least one normal group, no other Art/Var parameters need be set for meta articulations. When a meta articulation is recalled, it totally ignores any group assignments, variation control parameters, etc.. Meta articulations also ignore the first two menus in Figure 2-18 unless the meta function is set to **Recall User Presets**.

When **Recall User Presets** is the active meta function, the actual Legato/Vibrato parameter change doesn't occur until the next note played (this behavior is thus the same whether a normal articulation or a meta articulation *recalls* these presets). However, when any of the remaining, 'button pushing' meta functions are executed, the buttons will react immediately. But again, for the most part (like the buttons themselves), the *musical* effect will not occur until the next note played. Exceptions to this are the **Vibrato Pitch/Volume Phase** buttons and the **Vibrato Style** buttons which have an immediate effect on any currently playing note (see also section 2.3.11 for a discussion of.when key-switch action takes effect).

2.3.10 Key Switches

Once you have entered your instrument's actual keyboard range (see section 2.1.2), you can assign key switches anywhere outside of that range to recall your articulations. To assign a key switch, first select the articulation with the Edit box, then 'turn on' the **View/Edit KeySwitch** button (Figure 2-13). Now all you have to do is to press the desired key you want assigned to the selected articulation. When you first assign a key switch, it will be tinted Red to indicate that it is a normal latching key switch. If you want to assign key switches to other articulations, you can just leave the **View/Edit** button On and repeat the two-step process of first selecting an articulation and then pressing the key switch you want assigned to it.

While the **View/Edit KeySwitch** button is active, only the key assigned to the selected articulation is displayed. However, when the **View/Edit KeySwitch** button is **off** (or when in **Play** mode), **all** assigned key switches (for all articulations) will be displayed on Kontakt's keyboard. While the **View/Edit** switch is on, if you want to change an assigned key switch, simply press the new key and the old key will be replaced by the new one. If you want to change a key switch from **Latching** to **Non-Latching** (or vice versa), simply press the assigned key again. Every time you re-enter the same key switch (while **View/Edit** is active) the key switch mode will be toggled from latching to non-latching. This will be indicated by changing the key coloring from **Red (latching)** to **Green (non-latching)**. If you want to delete a key switch assignment, as opposed to replacing it, simply press any 3 keys at once to delete the former assignment without replacing it.

If you have a rather small number of articulations you want to recall via key switches, it will probably be most convenient to just assign a single key to each. However, if you have a large number of articulations, you may not have enough available keys to cover them all, especially with shorter keyboards. For such situations, you may want to set up some kind of bank-switch configuration based on using **key pairs**. You can assign a pair of key switches to an articulation just as easily as you do a single key. Simply select the articulation first with the Edit box, activate the **View/Edit Key Switch** button and then, instead of pressing a single key, press any two keys at once. They will both light up Red initially (latching mode). If you re-press the same *pair* of keys again, they will both turn Green (non-latching mode).

For articulations that you recall with a single key switch, each key can only be used once. However, the very same key can be used again multiple times as long as it's part of a unique *key pair* for each subsequent assignment. This re-use of available key switches makes it possible to control a larger number of articulations with a smaller number of key switches than would be the case with a simple linear (one switch per articulation) configuration. While key pairs are not as convenient or easy to keep track of, they can be a life saver when you need to cover more articulations than you have available keys.

Table 2-1 illustrates the basic idea by providing access to six articulations using only the 3 keys C1, D1, and E1. In general, by using a combination of single keys and key pairs, it is possible to access up to $\mathbf{(N^2 + N)/2}$ articulations with N keys. So, for example, if you have 13 keys available, you can access as many as 91 articulations (14 keys could cover 105 articulations)! However, it should be pointed out that using every last one of the combinations available with N keys, may not be very user friendly for trying to keep them all straight.

Art#	KeySwitch
1	C1
2	D1
3	E1
4	C1+D1
5	C1+E1
6	D1+E1

Table 2-1

A key-pair scheme that is lot more user friendly is based on the familiar bank switch idea. By dividing your N key switches into two equal parts, you use N/2 keys as ***bank*** keys and the remaining N/2 keys as ***art*** keys. For example if you have 13 keys available (say from C1 to C2), you could configure your key switch setup so that the 7 keys from C1 to F#1 function as **Bank** keys and the 6 keys from G1 to C2 function as **Art** keys. Then you assign articulations to C1+G1, C1+G#1, C1+A1, ... C1+C2. In all 6 articulations are thus assigned to the C1 bank. Similarly, the remaining 6 bank keys from C#1 to F#1 are each paired with the 6 art keys from G1 to C2.

Thus, you can assign 7x6=42 articulations to the **bank/art** pairs. Finally, you can still use all 13 keys individually to cover 13 more articulations for a grand total of 55 articulations. In general, using this scheme, you will be able to cover $\mathbf{N^2/4 + N}$ articulations with N keys. Not as many as when using all the pair combinations, but, it may be a lot easier to remember how your key switches relate to your articulations. When you are viewing individual articulation assignments, its just as easy to see which keys control it with pairs as it is with single keys. However, in **Play** mode (or in **Setup** when the View/Edit button is off) when all the key switch assignments are being displayed at once, the display can get a bit confusing at times.

This is especially true when a key is used multiple times for both latching and non-latching key switches. For example, suppose that Art #1 is assigned to a latching key switch pair C1+D1 and Art #2 is assigned to a non-latching key switch pair C1+E1. When these key switches are displayed, D1 will be tinted Red and E1 will be tinted Green. But, C1 is both Red *and* Green in function! To help you interpret the display when this situation occurs, WIPS tints all such dual-mode key switches Yellow (C1 would thus be tinted Yellow in the foregoing example). While the tri-color coding can help, it's just the 'nature of the beast' that when you use key pairs and dual-mode pairs are involved, things may get a bit tricky to keep straight when you are viewing the composite key switch display.

It should also be pointed out that key switches need not be assigned contiguously they can be positioned anywhere in any combination of singles and pairs. The only requirement is that they cannot be assigned within the defined Instrument Range (IR) that you previously set (see section 2.1.2). And, while you can redefine the IR anytime you wish, if you have already placed key switches within the new range you will first have to move them before you can redefine the IR.

Please note also when setting up a new instrument and *prior* to setting the IR for the first time, WIPS defaults the IR to the entire MIDI note range so **you will not be able to assign any key switches until you first set the IR**. You can always distinguish this situation because once you set the IR in WIPS, the key range is tinted **Cyan** whereas prior to setting the IR for the first time, Kontakt will display the zone range of the instrument with **Blue** tinting. Therefore, if you have forgotten whether or not you set the IR for WIPS, check the color of the keys. If the IR is tinted Blue, you *haven't* set it in WIPS yet. On the other hand, if the IR is tinted Cyan, it means you *have* set it in WIPS.

2.3.11 Key Switch Action

Key switches can be used to recall normal articulations or to execute meta functions (via recalling meta articulations). Generally, the musical effect of using a key-switch will not be effective until the next note played but there are some exceptions to this rule so you should be aware of just when the visual and/or musical action associated with a key-switch will occur.

When recalling a normal articulation, the 'pending' articulation index will appear immediately in the Articulation display for each script as the 'Next' (pending) articulation. However, the 'Active' articulation sounding will remain unchanged until you play (or retrigger) the next note. Similarly, if you recall an articulation which also recalls one of the Legato and/or Vibrato User Presets, the preset will not actually become effective until the next note you play. This same deferred action also applies to executing the Recall User Presets meta function.

All the panel button meta functions take immediate effect visually when the corresponding key-switch is pressed. However, the musical action for most of these key-switch-controlled panel buttons doesn't occur until the next note played. Exceptions to this are the Pitch/Volume Phase and Humanizing Style buttons on the Vibrato Script Control Panel. When these buttons are changed, their musical effect occurs immediately for the note currently sounding. Similarly, the **Ksw-Paced Vibrato** meta function also has an immediate effect on the vibrato rate/amount control as you tap the assigned key-switch (see section 4.3.2).

3.0 WIPS Legato Script

The Legato Script is all about note transitions. When only detached notes are played, the Legato Script will add no processing whatsoever. However, when two notes are played overlapping, the Legato Script will synthesize a very realistic-sounding legato transition or a portamento transition (depending on the state of the **Glider On/Off** button).

WIPS' Legato effect is produced with a combination of volume crossfading and pitch bending to provide realistic and very musical-sounding legato transitions similar to that of SIPS. However, while SIPS provided for a wide spectrum of instrument classes, WIPS has a narrower, more specialized focus. As a result, some of the controls used in SIPS are absent in WIPS (for example, separate Atk & Rls Fade controls). The controls that have been eliminated in WIPS were used in SIPS primarily to accommodate strings and other slow attack instruments. And, since WIPS is focused on wind instruments, these controls are unnecessary. However, WIPS has several new controls such as bend contouring and separate bend/glide settings for both Up and Down intervals. These enhancements may allow you to achieve even more realistic legato/glide effects than was possible with SIPS.

Some **Built-In Presets** are provided as starting points for setting up new instruments but you can also save up to **14 User Presets** with each instrument you craft. These User Presets can also be 'called up' from an articulation or with a meta function key switch if desired.

3.1 Legato Mode Controls

All the performance controls for the Legato Script are contained within the large gray area above the Preset menus. The left side of this performance area is devoted to Legato Controls while the right side is devoted to Glider Controls (discussed in section 3.2). The Legato Control section is shown in Figure 3-1.

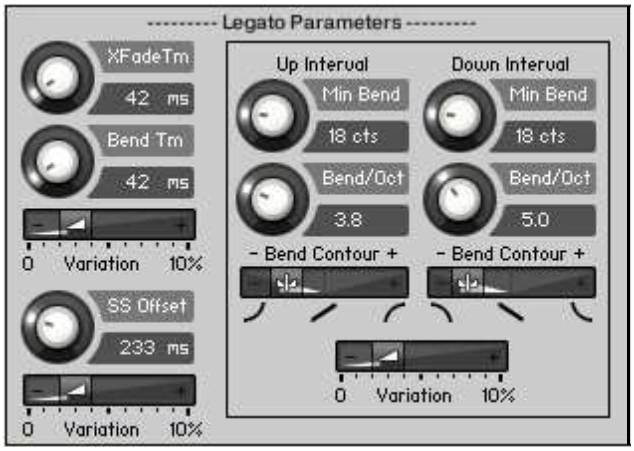

Figure 3-1

3.1.1 Sample Start Offset

All 'inside' notes of a legato phrase can be started late by an amount of time set with the **SS Offset** controls located in the lower left corner of the Legato Control section. Generally you will obtain a more realistic-sounding legato transition if you start the inside notes after their initial attack has passed. The SS Offset knob sets the nominal Offset time while the slider immediately underneath the knob is used to apply a small random variation in this Offset time. The slider sets the maximum allowed random deviation from the knob setting as a percentage of the knob's displayed value.

The **SS Offset** time can be set as long as 1000 msec, however if you are using **DFD** mode, each sample zone that will be sounded must have its S.Mod setting at least as high as the longest SS Offset time you intend to use. **In DFD mode, if you set SS Offset higher than the S.Mod setting, the sample will be played as though you had set SS Offset to zero.** So, if **S.Mod** is set for only 100 msec and you set the **SS Offset** knob to say 150 msec, the actual offset used will be zero. This behavior is of course preferable to earlier versions of Kontakt 4 (which would not even sound the note at all when the requested offset exceeded the S.Mod value) but it probably would have been better if NI would have just clamped the playback offset to the lesser of the requested SS Offset and S.Mod. Finally, please remember that S.Mod must be set in the Wave Editor and must be set for each sample zone involved. Fortunately, NI added a 'To all Selected Zones' utility command so you no longer have to edit each zone individually.

Please also note that S.Mod is not displayed in time units but rather in terms of samples. So, to set S.Mod for any given sample offset time period in msec, use the following formula.

S.Mod = S_R•Offset-Time where **Offset-Time** is in msec and S_R is the sample rate in KHz

For example, if you want to use an SS Offset as high as 500 msec and your sample rate is 44.1KHz, you need to set **S.Mod** to at least 44.1 x 500 = 22050 samples. Keep in mind however that S.Mod settings are unimportant if you are operating K4/5 in **Sampler** mode (setting S.Mod properly is only required when you operate in DFD mode). Note also that even if you intend to ultimately run in DFD mode, you may want to first run in Sampler mode in order to more easily determine by ear the maximum SS Offset settings you will require before you adjust all your zone's S.Mod values accordingly.

3.1.2 Crossfade and Bend Time

In synthesizing a legato transition between a pair of notes, WIPS crossfades the volume of the two notes and warps their tuning during the transition. For an Up interval, as the source note fades out toward silence, its pitch begins to rise toward the destination note. Simultaneously, the target note fades in from silence (with an initial tuning below its intonation center) and it bends upward in pitch toward its final correct pitch. The time interval over which this transition takes place is established by the three controls in the upper left corner of the Legato Control section as shown in Figure 3-2.

Figure 3-2

The knob labeled **XFadeTm** establishes the time interval over which the volume of the note pair will be crossfaded. To the time value set by this knob, the Variation slider adds a small random variation with a maximum deviation specified as a percentage of the XFadeTm knob's setting. For most wind instruments, a fairly short crossfade time of around 100 msec or less usually produces the most realistic effect.

The time over which pitch warping occurs is set by the **Bend Tm** knob. Most often, setting **XFadeTm** and **Bend Tm** to the same value will be most appropriate. However, there are certain special situations for which you may want to set these times differently. If you want to set these knobs to the same value, WIPS provides an easy way for you to accomplish it. If you hold down the Alternate key when you adjust XFadeTm, the setting of Bend Tm will automatically track with XFade Tm.

3.1.3 Bend Parameters

As explained previously, during a legato transition the pitch of the source and target notes is 'warped' and you can adjust the amount and shape for these transitional bends. The bend parameters are located in the box just to the right of the XFadeTm and Bend Tm knobs as shown in Figure 3-3. As you can see, there is an identical set of parameters for both Up and Down intervals. The **Min Bend** knob sets the amount of bend that will be made when the played interval is one semitone. For a convincing effect, generally you will want the amount of bending to increase as the interval played widens. The **Bend/Oct** knob sets the Min Bend ***factor*** that will be used when the played interval is one octave. When Bend/Oct is set to 1.0, the Min Bend setting will be used for all played intervals. At the other extreme, a Bend/Oct setting of 12.0 will result in Min Bend being increased by a factor that is directly proportional to the played interval. For example, if you play an interval of 5 semitones, the bend will be 5 times that set by Min Bend.

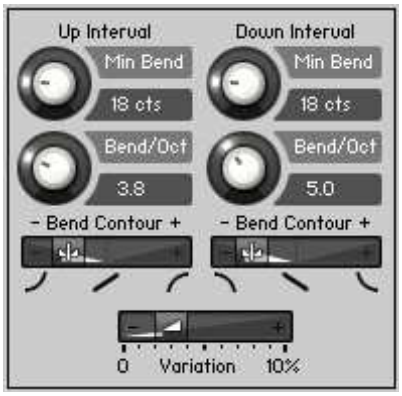

Figure 3-3

Underneath the Min Bend and Bend/Oct knobs you will find a Bend Contour slider. When this is set to the center position, the bend shape is essentially linear (the same as that used in SIPS). As you move the Bend Contour slider to the left, the bend shape will become more like a concave exponential as indicated by the graphics. Conversely, as you move the Bend Contour slider to the right, the bend will become more exponentially convex in shape. You can also hold down the Alternate Key (Windows) and then click on the slider. When you do this, the overall shape (either side of center) will become S or inverted S shaped as indicated by the graphics. You can return to the exponential shapes by simply holding down Shift and clicking on the slider.

Keep in mind that the legato transition time for most wind instruments is rather short so, as you experiment with using different contours, don't expect to hear very dramatic changes. The effect of these contours on the overall legato sound is very subtle. However, if you have a good ear, you will be able to notice the difference and using a non-linear contour for some of your presets may just add that little extra reality to the sound.

Oftentimes, you can use the same Min Bend and Bend/Oct settings for both up and down intervals but, for that extra touch of realism, you may want to use different Min Bend and Bend/Oct settings for **Up** versus **Down** intervals. Just as for the XFadeTm and Bend Tm knobs you can easily set the up/down controls to the same values by holding down the **Alternate key** when you adjust the **Up** controls. However, please note that this feature is not available with the Bend Contour sliders for Up/Down intervals. These sliders use the Alternate key for a different purpose (selecting the S shaped curves) so you must always set them individually.

Finally, at the bottom of the bend parameters box, you will find another **Variation** slider. Setting this to a non-zero position will apply a small random variation in both the Up and Down bend amounts for each legato transition.

3.2 Glider Mode Controls

In addition to providing very musical-sounding legato transitions, the Legato Script also has a Glider mode that will allow you to make very musical portamento transitions between any pair of notes. The Glider controls are on the right side of the control panel as shown in Figure 3-4.

Figure 3-4

3.2.1 Glider Mode On/Off

In the lower-right corner of Figure 3-4 is the **Glider On/Off** button. When this button is in its Off state, all notes played overlapping each other will be legato-connected as determined by the Legato controls already discussed in section 3.1. However, when the Glider On/Off button is in its On state and you play an overlapping interval, the source note will smoothly glide into the target note as controlled by the remaining Glide Parameters to be discussed next.

3.2.2 Sample Start Offset

In the bottom-left corner of Figure 3-4 you will see the sample-start offset knob labeled **SS Offset**. This setting serves the same purpose as the SS Offset knob for the legato controls (see section 3.1.1) but it can be set independently for the glider. However, please keep in mind that when you intend to run in DFD mode, you must set S.Mod high enough to cover the max setting of SS Offset that you intend to use for both the Legato and Glider functions.

3.2.3 Glide Speed and Contour

The speed of the glide is controlled by the **Glide Tm** and **Time/Oct** knobs. The contour used for the Glide is determined by the setting of the **Glide Contour** slider. The Glide Tm knob sets the total time it will take to glide from the source note to the target note when the played interval is one semitone. When playing portamento, one usually takes a little longer to glide over a large interval than when gliding over a small interval. The purpose of the Time/Oct knob is to set the factor by which the glide time will increase when playing a one octave glide compared to that of a one-semitone glide. These parameters are the counterpart of the Min Bend and Bend/Oct parameters for the Legato mode (see section 3.1.3).

As for Legato bend, you can shape the pitch versus time contour by using the slider labeled **Glide Contour** (just under the Time/Oct knobs). These sliders function in identical manner to those described in section 3.1.3 however, because glide times are usually much longer than legato crossfade time, the musical effect of the contour settings may be much more noticeable.

3.2.4 Formant Corrected Gliding

When you glide between a pair of notes, both end-point samples are used in order to reduce the 'chipmunk effect' which is caused by pitch shifting formants as well as pitch. However, if you glide between two widely-spaced notes, using only the two end-point samples, formants may not correct sufficiently over the entire glide. For example, if you are using the Glider to emulate a slide trombone glissando down and back up an interval of a fourth or so (say from B^b to F and back), if you merely play these two keys, only the B^b and F samples will contribute to the formant correction. However, if you instead play the individual notes chromatically from B^b down to F and then back up to B^b every sampled note between the Bb and F will contribute to the formant correction. Of course you will have to play this run in such a way that each successive pair of notes overlaps slightly in order to produce the glide effect (please see section 3.5 for a way to accomplish this easily).

Another good reason to play wide-interval glides this way is that it will be much easier to control the time profile in the desired way rather than trying to accomplish it with a fixed glide-time/contour setting (with or without cc automation control, see section 3.6). Usually, it is easier to just use a shorter glide time setting and play the in-between notes at the right time to achieve the overall desired time profile.

Finally, it should be mentioned that if you are using TKT variations, the formant quality of glides can be affected (because of the additional pitch stretching provided by the TKT machinery). To prevent that from happening, you can check the 4th Preference option (section 2.1.3). This option disallows any TKT stretching during a glide. You will probably want to check this option if you are using the TKT and gliding.

3.3 Other Controls

The remaining panel controls are located along the bottom row of the panel. The Legato Preset System will be discussed in section 3.4 and the remaining two items will be discussed in sections 3.3.1 and 3.3.2 next.

3.3.1 Articulation Display Box

Figure 3-5

The currently active articulation is displayed as a pair of numbers in the Red box located on the lower-left side of the Legato Script's control panel as shown in Figure 3-5. The first number displayed is the currently **'active'** articulation. The second number displayed is the **'next'** (or pending) articulation that will become active when you play the next note. When you first launch (or after you use the Articulation Setup mode), there will be no *active* articulation until you play the first note. This will be denoted by displaying the digit zero for the active articulation. For example, if you leave the setup mode with articulation #1 selected, the display box will show **0/1** until you play a note. The next note played will sound with articulation 1 so the display will then update to **1/1**.

3.3.2 Bypass Legato Button

If you want to bypass the legato 'effect', you should **not** use Kontakt's Bypass button. Proper operation of WIPS requires that all installed scripts remain active. However, you can easily disable the legato effect by simply depressing the red **Bypass Legato** button located in the lower-right corner of the control panel. When this button is 'lit' the legato effect is completely bypassed.

You can also disable the legato effect with a keyswitch by assigning a momentary key-switch to a meta articulation with the meta function set to **Bypass Legato On**. Then, when you depress and hold down the key-switch, the legato effect will be bypassed for the next and all subsequent notes played until you release the key-switch.

Please note that this button bypass differs from the preset bypass discussed in section 2.3.8 in that it will not be cancelled when any normal articulation is recalled. The button bypass can only be cancelled by manually clicking the button again or with an appropriate meta function.

Finally, it should be mentioned again that whenever the Articulation Script is in its Setup mode, the Legato script is automatically bypassed so that it will not 'color' what you audition as you build up various articulations. Also please note that when the legato script is disabled, only the legato/glider effect itself is bypassed. The control panel will still continue to respond to articulation and preset changes but the script will have no musical effect.

3.4 The Legato Preset System

The Legato Script contains a number of built-in presets that you can call up easily. There are also 14 User Presets that you can use to save panel setups and later recall. When any preset is recalled, all the panel knobs and sliders (discussed in sections 3.1 and 3.2) are immediately set to the values stored in the preset. When you need to construct a new instrument, you can use one of the Built-In presets as a reasonable starting point. However, each instrument library has its own 'character' so you will most likely end up 'fine-tuning' these presets to achieve your objective. When you finally have your panel set up the way you want it, there are two ways you can save your panel settings. One way is to simply resave the .nki so when you reload the instrument, it will put all the panel knobs and sliders just where you had them when you saved the instrument. However if you change any panel settings after loading the .nki, you will have to reload the instrument to get your custom panel back. Alternatively, you can save any panel setup to one of the User Presets (using the **Save Settings** menu) and then resave the instrument. Then, even if you change the control panel, you can just recall the User Preset to restore your custom setup (without having to reload the .nki).

User Presets also have another purpose that you may find very useful. Since User Presets can be called up with an articulation (or meta articulation, see section 2.3.9), you can employ User Presets to provide automatic Legato parameter control during performance. However, articulations *cannot* recall a built-in preset so, to accomplish that, you will first have to recall the built-in preset to the panel and then save it in one of the User Preset slots (which can then be recalled with an articulation).

3.4.1 Recalling Legato Presets

The Legato Preset system controls are located at the bottom of the Legato Script control panel in the yellow box as shown in Figure 3-6. The left-hand drop-down menu labeled **Recall Preset** can be used to recall any **Built-In** or **User Preset** by simply clicking on the desired preset name in the menu. Whenever you recall a preset, the name of that preset will appear on the menu's drop-down button. This tells you which preset is currently set up on the control panel. But if you then make any kind of change to the panel settings, the menu button will display **Current Setup**. This is to let you know that the current panel setup *may not* belong to any specific preset.

Figure 3-6

Please note however that this doesn't work in reverse. That is, if you set the controls manually to exactly the same settings as one of the presets, the menu will continue to display **Current Setup** (rather than the name of the preset you may have just duplicated). The name of a preset only displays after recalling it and until you change any settings. Also please note that the first and last menu items (labeled **Current Setup** and *** Bypassed ***) are **not** selectable by clicking on them.

3.4.2 Saving Legato Presets

If you want to save a custom Legato panel setup to one of the **User Presets**, all you need do is first set the panel controls as you want them and then open the right-hand drop-down menu labeled **Save Settings**. When you click on the destination User Preset number, a dialog will pop up asking if it's OK to overwrite whatever might currently be stored in that User Preset. If you want to continue with saving the panel, click **OK** or if you want instead to choose a different User Preset, click **Cancel**.

As discussed in sections 2.3.8 and 2.3.9, you can recall a user preset from an articulation (normal or meta). When an articulation requesting that a User Preset be recalled is activated, the next note played will recall the specified User Preset. However, if an articulation only specifies **Current Setup**, activating such an articulation will **not affect** the current panel setup. When a User Preset is recalled by an articulation, it will occur synchronously with when the **active** articulation number changes in the lower-left box of the Legato Panel.

3.4.3 Disabling Articulation Control

You can override articulation recall of Legato User Presets by turning Off the button labeled **Artic Control**. In order for articulation control of User Presets to be effective, this button must be On (its default state).

3.5 Using the Hold Pedal

Since WIPS operates strictly in a mono or solo mode, the sustain pedal doesn't function in the traditional way. With a polyphonic instrument, if you play a phrase with the pedal down, each note played will continue to sound (at least through its decay phase) until the pedal is released. With WIPS this is not desirable or even possible. Nevertheless, the sustain pedal (renamed **Hold Pedal**) provides several related effects that can be very useful.

In either of the Keyboard modes (Keys Only or Keys+Breath), depressing the Hold Pedal (provided you assigned one, see section 2.2.3) will sustain the currently-sounding note (even if you release the key) until another note is played. When the second note is played, the first note will then stop sounding but the 2nd note will be connected with a legato (or glide) action. If you keep the Hold Pedal down while you play a run, the notes will all be legato connected, regardless of whether you physically overlap the individual notes. Thus the Hold Pedal can be used to guarantee a legato (or glide) overlap of all the notes in a phrase and therefore provides an easy way to play something like a trombone glissando as discussed in section 3.2.4.

This behavior of the Hold Pedal also makes it possible to legato-connect two or more notes of the same pitch even in **Keys Only** mode. Ordinarily, a keyboard can't play two notes of the same pitch overlapped, so without using the Hold Pedal it would not be possible to perform this kind of legato phrase.

There is however one caution to keep in mind when using the Hold Pedal. If you are using the Retrigger feature to play a trill for example, you will need to release the Hold Pedal before you lift the retriggering key. If you don't, the prior note will **not** be retriggered because the meaning of Pedal down is to sustain the retriggering key's note even when the key is released. Either you want to hold the note or you want to retrigger the prior note but, you can't have it both ways. ☺

Finally, there is another optional way that the Hold Pedal can be used. Normally, when you start a legato phrase, the first note played begins with a normal attack and no bend-in. But, there can be situations for which you would like to begin a legato phrase with a legato attack. If you check the **Preference** option labeled **Activate Mute/Ghost Function of Hold Pedal**, when you depress and hold down the Hold Pedal during the silence between phrases, the first note played (for the next legato phrase) will be **muted**. And, the second note played (which will be the first audible note) will be legato-connected to the first 'silent' or 'ghost' note. This will allow you to begin a legato phrase with a legato attack and/or a bend-in from any imaginary 'ghost' note.

With this Preference option enabled, all other functions of the Hold Pedal remain intact so there is no functional loss in enabling this option. However, if you *never* want to begin a phrase with a legato attack and/or bend-in effect and you find this extra function of the Hold Pedal confusing or annoying, just leave this Preference option unchecked (which is its default setting for new installs).

3.6 Using Automation

All the legato and glide parameters can be CC controlled using Kontakt's automation facility. However, this Kontakt feature is limited to the standard CCs and it may be useful to control some of these parameters with Pitch Bend, Aftertouch, or Velocity. You can accomplish this by mapping these special controllers to a CC proxy using the Special Controller Mapping drop-down buttons at the bottom of the Art Script's Play Panel.

Suppose (for example) that you want to arrange it so when a phrase is played with mid to high velocities that the intervals will be legato-connected but when played with lower velocities, the intervals will be portamento-connected. Here's a way you could accomplish this. Assign some CC (CC30 for example) as a proxy for velocity and then use Kontakt's automation facility to assign CC30 to the **Glide On** button. To activate the glide mode for velocities **lower** than 20 or so, set the **From** value to about 60% and the **To** value to 0%. Now if you play with velocities above 20 the overlapping notes will be legato-connected whereas when you play velocities below 20 the notes will be portamento-connected.

Please note that if the Retrigger option is enabled and you set up velocity to control legato/ portamento mode (as in the above example), you need to know how velocity is determined for retriggered notes. There are two choices for determining the retrigger velocity. In the Preferences dialog (see section 2.1.3), you will find an option called '**Retriggered Note Uses Original Velocity'**. With this option checked, retriggered notes will be played with their original velocity whereas with this option unchecked, they inherit the velocity you used for the retriggering key (ie the key you are lifting to cause the retrigger). You may want to review section 2.2.4 and keep this in mind to achieve the intended legato or portamento behavior when using velocity for legato/glider switching.

You can also automate the Glider On/Off button with a momentary key-switch by defining a meta articulation and selecting **Glider On** as the meta function. For example, if you define C2 as such a non-latching (green-tinted) keyswitch, whenever you press and hold down C2, the next note played will be glide connected and when you release the C2 key, the next note played will be legato connected.

4.0 WIPS Vibrato Script

This script allows you to modulate both the pitch and volume level of any sustained note to provide a very realistic and natural-sounding vibrato effect. The WIPS Vibrato Script provides two major modes of operation with either **LFO** or **Key-Paced** rate control. For the more-traditional **LFO mode,** one of several 'Humanizing Styles' can be applied. These styles vary the LFO rate as well as the intensity of the pitch/volume modulation in a very realistic, human-like manner. However, for the ultimate in humanization, you can actually *'play'* the vibrato yourself using one of the special **Key-Paced** modes. In the **AT-Paced** mode, you can use your keyboard's mono aftertouch capability to pace the vibrato rate (cycle by cycle). The vibrato rate will follow the rate at which you modulate the aftertouch and the overall vibrato amount will vary with the overall aftertouch pressure you exert.

Alternatively, you can assign a key-switch to pace the vibrato. You can use this key somewhat like a tap-tempo button to control vibrato rate and the velocity of the taps can vary the overall vibrato amount. This **Ksw-Paced** mode can of course be used even if your keyboard has no aftertouch capability.

The Vibrato Script provides a number of **Built-In Presets** to use as starting points for setting up new instruments and, as with the Legato Script, you can save up to **14 User Presets** with each instrument you craft. These User Presets can also be 'called up' from an articulation or with a meta function key switch if desired but only User Presets and *not* built-in presets can be recalled this way. Just as for the Legato Script, to recall a built-in preset you will first need to save it to one of the User Presets. Also, as with the Legato Script, all key parameters and buttons are fully automatable and/or key-switch controllable.

4.1 Vibrato Script Control Panel

Most of the vibrato parameter controls are located within the gray rectangle in the upper left part of the control panel as depicted in Figure 4-1. To the right of this gray rectangle is the **Vibrato Amount** knob which is used to adjust the overall intensity of the applied vibrato effect. and is discussed in section 4.1.6. Beneath Vibrato Amount is a pair of knobs used to adjust vibrato onset delay in the LFO mode. These knobs will be discussed in section 4.1.7. The lower part of the control panel contains the active **Articulation** display, the **Preset Menus**, and the script **Disable** button which will be discussed in sections 4.1.8, 4.2, and 4.1.9 respectively.

Figure 4-1

4.1.1 Pitch Modulation Knob

This knob sets the maximum pitch modulation that will be applied when the Vibrato Amount knob is set to 100%. For example, if you set Vib Width to 30 cents and you then set Vibrato Amount to 60%, the pitch of a played note will swing by ±18 cents from its tonal center (0.6 x 30 = 18 cts).

4.1.2 Volume Modulation Knob

This knob sets the maximum volume modulation that will be applied when the Vibrato Amount knob is set to 100%. For example, if you set the 'Tremolo' knob to 6.5 dB, with Vibrato Amount set to 50% the played note will be modulated by ±3.25 dB from its nominal center volume.

4.1.3 Pitch/Volume Phase Buttons

These buttons determine the relative phase of the pitch and volume modulation. If the **–** button is selected, the volume will decrease as the pitch increases and the volume will increase as the pitch decreases. With the **+** button selected, the volume and pitch modulations will be generated in phase with each other. i.e. volume will increase as the pitch increases and vice versa.

4.1.4 Vibrato Rate Knob

This knob is used to set the vibrato speed (the nominal LFO rate). The LFO rate can be set from 1.0 Hz to 10.0 Hz. However, when this knob is turned below the 1.0 Hz rate position, (into the Red or Blue zones), the Vibrato Script is switched into its Key-Paced modes. The two Key-Paced modes will be discussed in section 4.3.

4.1.5 Humanizing Style Buttons

In the LFO mode, activating one of the three buttons to the right of the **Off** button, will apply some human-like variation to the vibrato parameters. The LFO **Rate** as well as the **Pitch** and **Volume** modulation intensities will be varied over time to simulate human imperfection and fatigue. Three different 'styles' of variation are provided by the buttons labeled **Tight, Moderate,** and **Loose**. With the **Off** button selected, no variation is applied.

4.1.6 Vibrato Amount Knob

This knob (shown in Figure 4-2) can be used to adjust the overall intensity of the Vibrato Effect. For example, let's suppose you have Pitch Modulation set to 50 cents, Volume Modulation set to 6.0 dB, and the Humanizing Buttons set to Off. If you now set the Vibrato Amount knob to 50%, the pitch will be modulated by ±25 cents and the volume will be modulated by ±3.0 dB. If you instead set the Vibrato Amount knob to 70%, pitch will be modulated by 35 cents and volume will be modulated by ±4.2 dB.

Figure 4-2

4.1.7 Vibrato Onset Delay Knobs

In the LFO mode, this pair of knobs located beneath the Vibrato Amount knob (and shown in Figure 4-3) can be used to set a delay time from when you first play a note until the vibrato begins. The knob labeled **Detached** sets the onset delay for detached notes or for the first note of a new legato phrase. The knob labeled **Legato** sets the onset delay for legato-connected or 'inside notes' of a legato phrase.

Figure 4-3

4.1.8 Articulation Display Box

The currently active articulation is displayed as a pair of numbers in the Red box located on the lower-left side of the Vibrato Script's control panel as shown in Figure 4-4. The first number displayed is the currently **'active'** articulation. The second number displayed is the **'next'** (or pending) articulation that will become active when you play the next note. When you first launch (or after you use the Articulation Setup mode), there will be no *active* articulation until you play the first note. This will be denoted by displaying the digit zero for the active articulation. For example, if you leave the setup mode with articulation #1 selected, the display box will show **0/1** until you play a note. The next note played will sound with articulation 1 so the display will update to **1/ 1**.

Figure 4-4

4.1.9 Bypass Vibrato Button

If you want to bypass the vibrato 'effect', you should **not** use Kontakt's Bypass button. Proper operation of WIPS requires that all installed scripts remain active. However, you can easily disable the vibrato effect by simply depressing the red **Bypass Vibrato** button located in the lower-right corner of the control panel. When this button is 'lit' the vibrato effect is completely bypassed.

You can also disable the vibrato effect with a keyswitch by assigning a momentary key-switch to a meta articulation with the meta function set to **Bypass Vibrato On**. Then, when you depress and hold down the key-switch, the vibrato effect will be bypassed for the next and all subsequent notes played until you release the key-switch.

Please note that this button bypass differs from the preset bypass discussed in section 2.3.8 in that it will not be cancelled when any normal articulation is recalled. The button bypass can only be cancelled by manually clicking the button again or with an appropriate meta function.

Finally, it should be mentioned again that whenever the Articulation Script is in its Setup mode, the Vibrato Script is automatically bypassed so that it will not 'color' what you audition as you build up various articulations. Also please note that when the vibrato script is bypassed, only the vibrato effect itself is bypassed. The control panel will still continue to respond to articulation and preset changes but the script will have no musical effect.

4.2 The Vibrato Preset System

The Vibrato Script contains a number of built-in presets that you can call up easily. There are also 14 User Presets that you can use to save panel setups and later recall. When any preset is recalled, all the panel controls (discussed in sections 4.1.1 through 4.1.7) are immediately set to the values stored in the preset. When you need to construct a new instrument, you can use one of the Built-In presets as a reasonable starting point. However, each instrument library has its own 'character' so you will most likely end up 'fine-tuning' these presets to achieve your objective. When you finally have your panel set up the way you want it, there are two ways you can save your panel settings. One way is to simply resave the .nki so when you reload the instrument, it will put all the panel knobs and sliders just where you had them when you saved the instrument. However if you change any panel settings after loading the .nki, you will have to reload the instrument to get your custom panel back. Alternatively, you can save any panel setup to one of the User Presets (using the **Save Settings** menu) and then resave the instrument. Then, even if you change the control panel, you can just recall the User Preset to restore your custom setup (without having to reload the .nki).

User Presets also have another purpose that you may find very useful. Since User Presets can be called up with an articulation or a keyswitch (via a meta articulation, see section 2.3.8 and 2.3.9), you can employ User Presets to provide automatic vibrato parameter control during performance.

4.2.1 Recalling Vibrato Presets

Figure 4-5

The Vibrato Preset system controls are located at the bottom of the Vibrato Script control panel in the yellow box as shown in Figure 4-5. The left-hand drop-down menu labeled **Recall Preset** can be used to recall any **Built-In** or **User Preset** by simply clicking on the desired preset name in the menu. Whenever you recall a preset, the name of that preset will appear on the menu's drop-down button. This tells you which preset is currently set up on the control panel. If you then make any kind of change to the panel settings, the menu button will display **Current Setup**. This is to let you know that the current panel setup *may not* belong to any specific preset.

Please note however that this does not work in reverse. If you set the controls manually to exactly the same settings as one of the presets, the menu will still display **Current Setup** rather than the name of the preset you may have just duplicated. The name of a preset only shows after recalling that preset (and until you change a panel setting). Also please note that the first and last menu items (labeled **Current Setup** and *** Bypassed ***) are **not** selectable by clicking on them.

4.2.2 Saving Vibrato Presets

If you want to save a custom Vibrato panel setup to one of the **User Presets**, all you need do is first set the panel controls as you want them and then open the right-hand drop-down menu labeled **Save Settings**. When you click on the destination User Preset number, a dialog will pop up asking if it's OK to overwrite whatever might currently be stored in that User Preset. If you want to continue with saving the panel, click **OK** or if you want instead to choose a different User Preset, click **Cancel**.

As discussed in sections 2.3.8 and 2.3.9, you can recall a preset from an articulation (normal or meta). When an articulation requesting that a User Preset be recalled is activated, the next note played will recall the specified User Preset. However, if an articulation only specifies **Current Setup**, activating such an articulation will **not affect** the current panel setup. When a User Preset is recalled by an articulation, it will occur synchronously with when the **active** articulation number changes in the lower-left box of the Legato Panel.

4.2.3 Disabling Articulation Control

Just as for the Legato script, you can override articulation recall of Vibrato User Presets by turning Off the button labeled **Artic Control**. In order for articulation control of User Presets to be effective, this button must be On (its default state).

4.3 Key-Paced Vibrato

The key-paced vibrato feature allows you to actually 'perform' the vibrato mechanically from your keyboard. You can control the rate of the vibrato (cycle by cycle) as well as the intensity of the modulation. This feature uses a phase-locked loop, PLL, to control the frequency of a sinusoidal oscillator so that it will follow the rate at which you tap a key switch or exert aftertouch pressure. The key-paced mode is activated by setting the Vibrato Rate knob below 1.0 Hz (into either the Red or Blue zones). In the Red zone, the **keyswitch-paced** mode will be activated and when in the Blue zone, the **aftertouch-paced** mode will be activated. When either of these modes are selected, the Rate Knob caption changes from **LFO Rate** to **Paced** and the value displayed will be either Ksw or AT respectively. Note also that when the Rate knob is set to one of the key-paced modes, the Humanizing Style buttons are replaced by a modulation intensity slider and the Onset delay knobs are grayed out to indicate that they have no effect in this mode.

4.3.1 Aftertouch Pacing

When you select the aftertouch-paced mode, the panel will appear as shown in Figure 4-6. The Pitch and Volume Modulation knobs still perform the same function as described in sections 4.1.1 and 4.1.2. The Phase buttons and the Vibrato Amount knob still perform the same functions as described in sections 4.1.3 and 4.1.6 respectively.

Figure 4-6

In this mode, the *rate* at which you exert and relax aftertouch pressure will determine the Vibrato Rate. When you first exert positive aftertouch pressure, the PLL will initiate the positive lobe of the sinusoidal modulator and when you relax the aftertouch pressure, the PLL will initiate the negative lobe. As long as you exert and relax at a rate between 1.0 Hz and 10.0 Hz (the capture range of the PLL), the sine wave that's generated will lock to the rate you are playing.

With the Velocity/Pressure Modulation slider set to zero, the intensity of the aftertouch will not affect the intensity of the vibrato. In other words, the rate at which you modulate the aftertouch will determine the vibrato rate but it doesn't matter how hard you press for each cycle. However, with the modulation slider set above zero, the *strength* of your aftertouch playing can be used to vary the Vibrato Amount. This allows you to control the vibrato intensity as well as the rate with the way you control aftertouch.

The degree to which you can comfortably control the vibrato intensity with aftertouch may depend on your particular keyboard. Keyboards seem to vary considerably in how easy or difficult it is to control things with aftertouch. Generally, synth action keyboards seem to be easier to use than piano action keyboards for something like vibrato pacing. If you can't seem to get this feature working in a comfortable way (or your keyboard doesn't have aftertouch capability) consider using the keyswitch-paced mode. The keyswitch-paced mode uses key velocity to control vibrato amount and it can provide excellent control (with a bit of practice of course). Even if you have reasonable aftertouch control, you should probably try the keyswitch-paced mode because you may actually find it more responsive and easier to use.

4.3.2 Keyswitch Pacing

To use the keyswitch-paced mode as shown in Figure 4-7, you must create a meta articulation (see section 2.3.9) with its meta function set to Key-Paced Vibrato. Then, assign a momentary (non-latching) keyswitch to this meta articulation (see section 2.3.10). This keyswitch can then be used to pace the vibrato rate.

Figure 4-7

In this mode, the rate at which you press and release the keyswitch will determine the Vibrato Rate. When you first press the key, the PLL will initiate the positive lobe of the sinusoidal modulator and when you release the key the PLL will initiate the negative lobe. As long as you press and release at a rate between 1.0 Hz and 10.0 Hz (the capture range of the PLL), the sine wave that's generated will lock to the rate you are 'playing'.

With the modulation slider set to zero, the keyswitch velocity will not affect the intensity of the vibrato. However, with the modulation slider set above zero, the velocity of the keyswitch 'playing' will be used to vary the Vibrato Amount. This allows you to control the vibrato intensity as well as the rate by how you 'play' the keyswitch.

4.4 Using Automation

All knob and slider vibrato parameters (as well as the Artic Control On/Off button) can be CC controlled using Kontakt's automation facility. However, this Kontakt feature is limited to the standard CCs and it could be useful to control some of these parameters with Pitch Bend, Aftertouch, or Velocity. You can accomplish this by mapping these special controllers to a CC proxy using the Special Controller Mapping menu buttons at the bottom of the Art Script's Play Panel. An example of using velocity mapping is described in section 3.6.

You can also automate the Phase or Style radio buttons by assigning a keyswitch via a meta articulation with the appropriate meta function assigned (see section 2.3.9 and 2.3.10) for how to set this up).

5.0 Using WIPS with other scripts

Cascading scripts from different authors often produces disappointing results because there are many incompatibility issues that can arise. Scripts that are not specifically designed to work together harmoniously have a rather low probability of being used in tandem. Back in the K2 days, it was very difficult to make scripts work together even when a concerted effort was made by both authors. However, since K4, the KSP now includes considerably more support for interscript communication and for resolving compatibility issues. Of course all these new features will do little good unless all script authors start to utilize them and adopt a consistent set of rules to play the game by. But, we are making some headway in this area.

The purpose of this section is to help you determine whether or not some other script, I'll refer to it as **Script X** or just X, is likely to be useable with WIPS. Besides the usual *functional* issues such as one script countermanding what the other is trying to do, there are now some 'new kids on the block'. WIPS employs custom graphics and if Script X also requires custom graphics, it may take additional effort on your part to cascade them successfully. Section 5.1 will discuss some of the functional issues you need to be aware of and section 5.2 will discuss the problems associated with custom graphics and what you can or can't do to resolve them.

5.1 Functional Issues

WIPS performs various kinds of **dynamic** tuning, so if Script X also performs **dynamic** tuning it is not likely to play well with WIPS. WIPS performs legato and glider effects based on the relative timing relationship between played notes so any script that diddles around with the relative timing of notes will probably not work well preceding WIPS. It may or may not work following WIPS.

One chronic problem in the pre-K4 days for any script that generates new notes (such as SIPS) is that such scripts couldn't easily preserve *static* micro-tuning effects introduced by a former script. However, with the expanded KSP instruction set now available, WIPS is able to preserve static microtuning. Therefore, WIPS may be able to function with certain kinds of *static* microtuning scripts placed ahead of WIPS in the script chain. For example, Dan Powell (Soniccouture) may soon be releasing a microtuning script that he calls the **Xenharmonium**. This script performs static note substitution and static microtuning and it has been tested for compatibility with WIPS.

WIPS also requires that the user tell it the Keyboard Range and Script X must not interfere with this process. If X also needs to know the keyboard range, there may be a conflict in cascading it with WIPS. However, WIPS communicates its keyboard range setting for use by other scripts so it is possible for Script X's author to accomodate this potential conflict. For example, the Xenharmonium also needs to know keyboard range but it's configured to *sense* when WIPS is present. When the Xenharmonium is running standalone, it requires users to enter the keyboard range. However, when WIPS is present, the Xenharmonium uses the keyboard range set in WIPS. If you are authoring a script that you want to be compatible with WIPS, please contact me about this.

WIPS also uses Kontakt's keyboard display to show instrument range and various key-switch information. Therefore, any script that also needs to use Kontakt's keyboard display will be in conflict with WIPS. While some of the foregoing information may be helpful in determining whether any given script will be compatible with WIPS, in the end you won't know for sure until you try to mate it with WIPS. Even then, there could be some subtle interference that won't be discovered initially.

5.2 Custom Graphics Issues

Besides cosmetic appearance, WIPS requires custom graphics to *function* properly. Therefore, if Script X also requires custom graphics, you may have to expend some additional effort getting things set up properly to support cascading Script X with WIPS.

In general, when scripts employ custom graphics, the actual graphics files must be located in one of several special locations that Kontakt is willing to look for them. Scripts access their graphics by including their file names in various KSP commands. **When an instrument is not pointed to a .nkr file** (see step 5 in section ii), Kontakt will only look for these file names in two specific locations. For example, under Windows, Kontakt 4 will first look for the file in the **User and System** areas using the following paths:

.... Mydocs/Native Instruments/Kontakt 4/pictures **and, if the file isn't found there:**

.... Program Files/Common Files//Native Instruments/Kontakt 4/pictures

However, when an instrument is pointed to a .nkr file, Kontakt will first look for the graphics files using the path:

... Resources/pictures

where it expects the **Resources** folder to be located alongside the .nkr file the instrument is pointed to. If Kontakt fails to find the file under the **Resources** folder (or there is no Resources folder alongside the .nkr file), it will then look for the file in the 'packed' resource container (the .nkr file) itself. However, and this is important, **if an instrument is pointed to a .nkr file, Kontakt will no longer look for graphics files in the User or System areas.** Another important point to keep in mind is that when the graphics are 'packed' into an .nkr, no sub-folders can be utilized. So, if a script uses one or more sub-folders to organize its graphics files, this same structure cannot be packed into an .nkr file.

With the forgoing in mind, we will now enumerate the possible configurations that Script X might be set up with and outline the steps you will need to take to cascade X with WIPS; while allowing both to still have access to their custom graphics. In the following scenarios, when we describe how Script X is configured, we are referring to how you found it already configured in some instrument and/or how the author instructs you to configure it (ie where you should put the graphics files, etc).

5.2.1 Configuration #1

For this scenario, Script X doesn't use an .nkr file. For such a situation the graphics files will be located (or X expects them to be located) in either the User or System area discussed in section 5.2). To use such a script with WIPS, follow the installation instructions given in section ii and then do the following.

Create a new folder named Resources alongside wherever you put the WIPSV1xx.nkr file and Data folder in step 3. Within the Resources folder, create a sub-folder named pictures. Then copy Script X's graphics files (together with any sub-folders they may require) to the pictures folder. WIPS will still be able to access its graphics from the packed .nkr file but Script X will also be able to access its graphics via the Resources/picture path.

5.2.2 Configuration #2

For this scenario, Script X provides all its graphics in a packed .nkr file and no **Resources** folder is actually provided or required. For such a situation, you will need to modify steps 3 and 5 given in **section ii**. For step 3, instead of copying the **WIPSV1xx.nkr** file and **Data** folder, copy the **Data** folder and the **Resources** folder from WIPS. Put these folders (with their contents) alongside Script X's .nkr file. For step 5, point the instrument to Script X's .nkr file instead of to WIPS' .nkr file. Now, Script X will be able to read its graphics from its packed .nkr file and WIPS will be able to read its graphics via the **Resources/pictures** path.

5.2.3 Configuration #3

For this scenario, Script X provides both a .nkr file and a **Resources** folder structure. There are several possible ways to handle this situation depending on certain details. One way to do it would be to copy the graphic files themselves (supplied in WIPS **Resources/picture** folder) to Script X's Resources/picture folder. Then point the instrument to Script X's .nkr file.

If Script X's **Resource/pictures** folder contains **all** of script X's graphics files, then you can copy WIPS graphics files to the same folder and **remake** the .nkr file yourself to pack both sets of graphics into a new .nkr file. You can then point the instrument to this new .nkr file and do away with the graphics files in **Resources/pictures**. Note that you can use this procedure only if Script X supplies **all** of its graphics files in unpacked form. If Script X has some of its graphics packed into the .nkr that aren't also available in uncompressed form (in the **Resources** folder), you won't be able to do it this way. However, the way described in the prior paragraph will still work because WIPS **does** provide all of its graphics files in uncompressed form (as well as in compressed form within the packed **WIPSV1xx.nkr** file).

5.2.4 Naming Conflicts

Another potential problem that could occur if Script X just happens to use one or more graphic files with identical names as WIPS (but for different images). To minimize this possibility, all graphics files used by WIPS have names that are prefixed with my initials. For example, **rdvCurves_ExpDn.png**.

6.0 The Rob Horvath Maneuver

There seems to be a rather strange problem with K4 and any script that might use the **change_tune** function in a while loop. Under certain conditions, K4 may produce a crackling noise, which goes away if you turn down the pitch modulation to zero. I have never personally heard this myself but Rob Horvath ran into it and reported it. According to Rob, this problem only seems to occur when the sample rate is set to 44.1KHz (and doesn't occur at 48KHz). Since Rob doesn't have K5, I have no information as to whether this problem has carried into K5, but it probably has.

After much testing and investigation, it has been determined that the problem resides with Kontakt rather than being any kind of scripting error producing it. Fortunately, Rob also came up with a nice 'duct-tape' solution for the problem which we named the **Rob Horvath Maneuver**, or **RHM** for short ☺. If you are using the Vibrato script (or any other script that invokes **change_tune** in a loop) and you've got good ears, you may hear a crackling sound and if you do, you will want to avail yourself of the **RHM**.

Basically, you need to assign both the Pitch Bender and an LFO as modulators of pitch in the Source module (for all instrument groups). The bender will usually be there already but if you have removed it, you will need to reinstall it. The intensity slider of the LFO should be set to zero and, if you don't want to actually use the pitch bender, you can set it to 0 also. In other words, you don't really need the *action* of these modulators -- just hooking them up is sufficient to squelch the crackling sound.