

User's Guide to The Trumpet

Version 2.01

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Before you start

Before installing “The Trumpet”, please read very carefully the items below:

System requirements

The Trumpet provides unprecedented realism and expressiveness. However, it’s a demanding software in terms of CPU load. The instrument has been developed and thoroughly tested on a PC with IntelCore2 6600 & 2.40 GHz, 2GB RAM, Windows XP, 2 SATA drives, and a 24 bit audio card with low latency (<7 msec) Asio drivers. Under these conditions, the CPU load was approximately 5-10 %, and five to seven different trumpets could concurrently run as Cubase VST plugins. On the Mac, similar excellent results have been obtained with Mac Pro Quad Core 3 GHz, 8GB RAM, Mac OS 10.5.2, and Power Mac G5, 2 x 1 GHz, 3,5 GB RAM, OS 10.4.9.

Less powerful systems may also prove satisfactory, but may require larger buffer sizes and higher latencies, and the number of active instruments may be limited to one.

Note: this may not represent a real problem though. Using the freeze feature or, what is more recommended, bouncing the single MIDI tracks to audio is a useful remedy. Do it before struggling against 3, 5 or 7 simultaneous trumpet MIDI tracks and work on the audio level instead. After all, even when working with a real musician, you need to preserve his performance on unalterable audio tracks anyway.

More detailed information on the configurations tested so far will be found in the Appendix 2, and on our website, under “benchmarks”.

Conversely, the overall memory load is less of a problem, remaining below two hundred MB for the entire instrument, Player included, due to DFD (disk streaming) use. Required RAM is more dependent on the concurrent applications (multiple tracks etc) ranges from one GB (for standalone use) to two GB or more (for complex multitrack arrangements using multiple plugins).

Soundcard. A good quality audio hardware with suitable low latency drivers (**Asio for the PC**) is required. Buffer size should be kept to 256 (recommended) or 512 samples (higher latency, but less CPU load).

Midi interface. A MIDI interface will be required if using a MIDI keyboard, another MIDI controller or an external sequencer, unless the connection is made via USB.

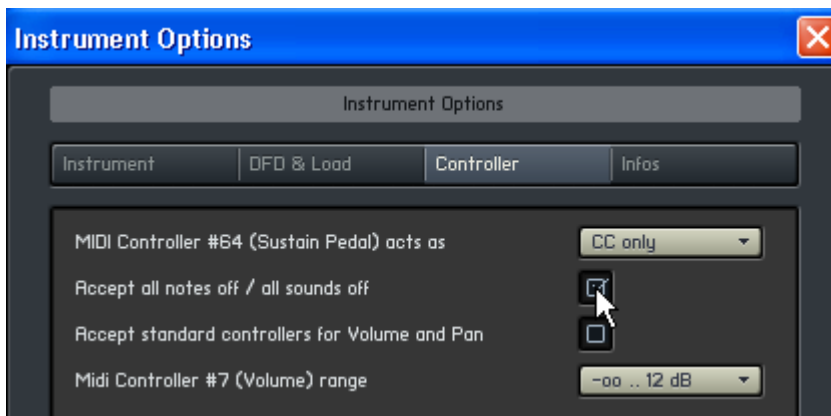
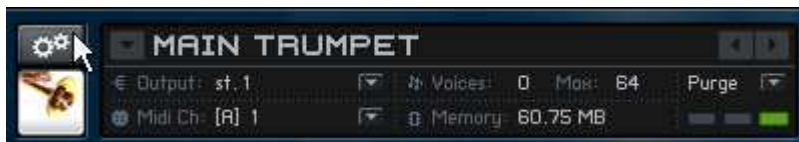
Keyboard. A five-octave midi keyboard, mappable from C1 to C6, with pitchwheel, modwheel, and an expression pedal (or breath controller) constitute the absolute minimum requirements for real time playing. Keyboards with several mappable physical midi controllers are recommended for full exploitation of the expressiveness of the instrument.

Note: Please note that CC11 is absolutely necessary for proper functioning of the instrument. If CC11 is not connected, a warning message will be displayed. It will disappear upon receiving any CC11 data, showing that the instrument is now properly working.

Sequencer. If real time playing is not contemplated (you will miss a great fun though), using a sequencer may obviate the need for several physical midi controllers, while maintaining full control of the instrument's expressiveness. "The Trumpet" has been thoroughly tested under several sequencers, including Cubase, Ableton Live, Digital Performer, Logic and Sonar.

Tip: Logic users, by deactivating the trumpet track will dramatically reduce the CPU load, and greatly improve the overall performance. Running the Player (instead of the Sampler) is also recommended.

Tip: Sonar users might experience hanging notes upon stopping the playback. This is due to the fact that Sonar sends an "All-Notes-Off" command when the Stop button is pressed. The problem can be easily solved by checking the box "Accept all notes off/ all sounds off" under "Instrument Options -> Controller", as shown below.



Kontakt 2 Player. “The Trumpet” has been developed and is distributed as a Kontakt 2 Player Virtual Instrument. The Player (vers. 2.2.4.001) is included, and no additional software is required to play the instrument. Stand-alone mode, as well as plugin formats VST, DXi, RTAS and AU are supported. For further details, please refer to the Player Manual.

Kontakt 2 Sampler. The instruments can be also loaded and played in Kontakt 2 (vers. 2.2.4.001 or higher), yielding virtually identical performances. Please note, however, that it cannot be opened or modified, and no access to the samples or impulse responses is provided.

Kontakt 3 Sampler. K3 is not fully compatible with K2 programming, and you should not therefore attempt to load the standard instruments into this platform. Accordingly, we developed special versions of the instruments, which can be found under “/The Trumpet/Instruments/Kontakt3 only/.....[for K3 only] . These can be safely loaded and played in K3 (vers. 3.0.2.004 or higher), yielding very similar, if not identical performances.

Tip: If you have Kontakt 3 installed on your system, please do not open any nki file (instrument) double-clicking on it, if it is not “for K3 only”. If you do this, the instrument will be automatically opened in Kontakt 3, resulting in a compromised performance.

Installation. Please read carefully and follow the instructions found in the Installation Manual.

Note: If you already have the Kontakt 2 Player on your system, you may choose not to reinstall it along with “The Trumpet” library. In that case, perform a Custom Install, then follow the instructions, and uncheck the unwanted items. Make sure, however, that the installed Player is vers. 2.2.4.001 or higher.

Technical Support will be directly provided by Native Instruments:

<http://www.native-instruments.com/support.info>

Introduction

Another Trumpet?

Well, not just another trumpet, but probably the most expressive virtual instrument made so far.

The real trumpet is one of the most versatile, dynamic, flexible and expressive musical instruments. It covers an incredibly wide range of sounds and moods. Whether a soft ballad or a powerful fanfare, a pop song or a huge orchestral arrangement - the trumpet is an indispensable instrument in a vast majority of musical styles.

However, it's extremely difficult to emulate - a true challenge for developers of virtual instruments. That's why we chose it...

Our virtual instrument uses recorded samples of real trumpets as base material. This proved to be the best choice to preserve the timbral characteristics of the original instrument. We used, of course, state-of-the-art recording technique and experienced, careful microphone placement. But we went beyond. All sounds were recorded in an anechoic chamber. To our knowledge, this is actually the first sample-based anechoic virtual instrument.

Why anechoic ? The purpose of anechoic recording was threefold: 1) avoid "contamination" of the pure trumpet sounds with the uncontrolled resonances of a particular ambience, 2) allow artifact-free "harmonic alignment" processing, 3) provide clean articulations and phrases as a database to build the "adaptive model". (see below).

What we finally obtained is, far from the "dead" sound that some might expect, a pure, homogeneous timbre without coloration.

This will set you free of adding just the most suitable acoustic environment, without incurring multiple-ambience issues. This can be carried out within the same Kontant Player, which provides a high quality convolution reverb. See Appendix 1 for details.

The Instruments

The Trumpet package includes several instruments belonging to the same family:

Three B \flat Trumpets

Along with the main, solo B \flat trumpet (“Main Trumpet”) you will find 2 other ones – named “Trumpet 2” and “Trumpet 3”, sounding slightly different, and suitable for being used in trumpet sections (what shouldn’t mean that your arrangements need to be limited to 3 voices only).

Flügelhorn

Similar to the trumpet, but with a wider, conical bore, the Flügelhorn provides a darker and much softer tone. Its beautiful, warm sound is mainly used in jazz or in brass bands, as well as in popular music.

German Trumpet

This more “massive” type of trumpet uses rotary valves and sounds less “penetrating” than the jazz trumpet. It possesses a larger volume of tone which may better blend with other instruments. It’s mainly used in classical music.

Cornet

Similar to the trumpet, but more compact in shape. It sounds a bit warmer and mellow. Its agility makes the Cornet particularly suitable for melodic passages. It is mostly used in brass-, but also in jazz bands.

Piccolo Trumpet

Also known as “Bach trumpet”, it represents the smallest instrument of the trumpet family. Its tubing, which is only one-half the length of the “normal” trumpet, as well as other construction details, make this instrument more advantageous for playing in the highest register – not only in Baroque music. Piccolo Trumpet sounds “smaller” and brighter than the B \flat trumpet.

All these instruments are now at your fingertips... You can really PLAY them – shaping the sound like a real trumpet player does. But please, read the manual first and learn more about how to do it in the best way. It is easy and intuitive but, like every music instrument, “The Trumpet” needs some practice and experience. You will certainly learn it very quickly! The demonstrations we prepared show how realistic our trumpet sounds. If you want to learn more about how this has been achieved, please visit our homepage and download the demos we prepared for you as MIDI files.

www.samplemodeling.com

The Mutes

Mutes are devices affecting the timbre and/or volume of an instrument. The trumpet – like other brass instruments – uses a wide range of mutes; the most common are Harmon (with or without stem), Straight, Cup and Bucket. They are mostly cone-shaped and are inserted into the bell or simply held or clipped outside the bell. Depending on the shape or material (metal, wood, plastic) they may significantly vary the sound of the trumpet. The most common mutes are:

Straight - commonly used, cone-shaped, hollow mute – provides more metallic and „nasal“ sound. It is available for all the brass instruments.

The **Cup** mute, which is similar to the Straight, decreases high and low frequencies providing a rounder, more „muffled“ sound.

The bulbous, hollow **Harmon** mute provides the very characteristic „Miles Davis sound“. It completely blocks the air output forcing it to pass the hole in the middle of the mute, providing a very bright, „buzzy“ sound, frequently used in Jazz. Harmon can be combined with the stem, which is a short metal pipe with a funnel-like end, fitted into the hole of the Harmon mute.

The **Bucket** mute uses some soft materials which remove the high frequencies providing a much softer, darker sound.

The **Plunger** – which, indeed, is very similar to an unused toilet plunger – is kept by the player in one hand and manipulated in front of the bell. By closing and opening it, the typical “wah-wah” effect – even imitating the human voice - can be obtained.

All these mutes are available for use with our B \flat trumpets. We used sophisticated technologies to capture the “fingerprints” of each mute, which were ultimately coded into a suitable impulse response. The latter can be loaded in a fraction of a second from a drop down menu of the graphical interface, or via MIDI (**NEW !**), using CC100 (see page 14).

The Graphical Interface

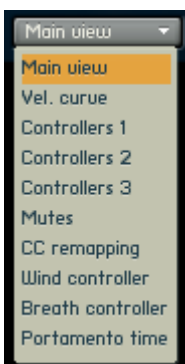


This is how the instrument looks upon loading. A warning message appears, reminding you that: **CC11 (Expression) is absolutely necessary for proper functioning of the instrument.**

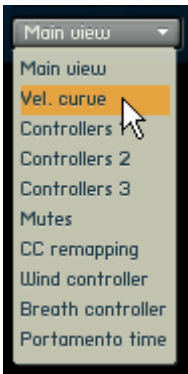


Upon receiving CC11 (from your keyboard or other midi sources, such as a sequencer), the warning disappears, and the instrument is fully functional. The grey button in the lower right corner opens a drop down menu.

You may choose among several options:



NEW !



Velocity Curve Mapping

It is well known that midi keyboards have different and uneven velocity response, and this may heavily influence the performance of a virtual instrument. To obviate this problem, the instrument includes automatic detection of any velocity inhomogeneities or non-linearity emitted by the keyboard, and provides automatic remapping to any desired curve.

If “Vel. curve” is selected in the drop down menu, the velocity mapping GUI will be displayed:



As a default, velocity mapping is disabled.

Velocity mapping is activated by clicking on the “Mapping” button until it turns yellow.



Now, the relationship between in (X axis) and out (Y axis) velocity values is represented by the upper graph. A straight line, from bottom left to top right means linear mapping. The graph can be directly edited with your mouse, so that you can program any velocity response you need.

To compensate for a nonlinear behaviour of your keyboard, an automatic calibration procedure is provided.

Just click on “Calibration”, and the GUI will appear like this:



Now what you have to do is to hit any key at random velocity, trying to cover the whole velocity range. Each new output velocity will appear as a new bar in the lower panel. The overall velocity curve output of your keyboard will progressively be updated in the upper panel.



The response of a nonlinear keyboard.

After you're finished with the automatic mapping procedure, i.e. when you notice, that no new velocity bar appears anymore, disable “Calibration” by clicking on it until it turns grey. Since now, compensation for nonlinearity of note-on velocities will be carried out if “Mapping” is active (i.e. yellow). You may also correct the compensated curve with your mouse. Please note that all changes will be maintained upon reloading the instrument.

Controller Knobs



NEW !

All the controllers needed for proper functioning of the instrument are mapped to virtual knobs in three GUI panels, which can be activated by a drop down menu. The function of each controller is indicated by the associated label. The virtual knobs permit to monitor the incoming midi data, but can also be used to directly control the instrument. This allows users of keyboards without physical MIDI controllers or knobs, to explore the expressive capabilities of The Trumpet.

Please note that, for realistic and expressive playing, the controller knobs cannot substitute the essential controllers, such as CC11, modwheel (C1) and pitchbend, which must be provided by your keyboard or sequencer.



NEW !

The three “Controllers” GUIs, show each MIDI-controlled function, the associated CC number and its current value. Each knob is bidirectionally mapped to its CC. This means that you may set each CC by moving the associated knob. Conversely, any incoming MIDI CC will be mirrored by the corresponding knob, and its current value will be shown on the display panel.

The Controllers and their function.

PB (pitchwheel) : linearly mapped to one semitone to about 85% of the full scale (+/- 7095). Above this value, linearly mapped to two semitones at full scale (+/- 8192).

CC1 – (modwheel) : **vibrato - shake intensity**. Vibrato intensity increases linearly for CC1 values between 0 and 96. Above 96, vibrato converts into a full step shake. Shake intensity linearly increases with CC1.

NEW !

CC5 : portamento time. By default, the duration of portamento is controlled by the velocity of the overlapped note. Under some circumstances, it may be preferable to control the duration of portamento with a dedicated CC. This is particularly true when using a Wind Controller, where the velocity of the overlapped note basically corresponds to the current dynamics. Lower dynamics unavoidably yield long portamentos and vice versa. By activating “Portamento time” in the drop down menu you will open a dedicated window. The two knobs show how the duration of portamento is currently controlled. Default is 100% by velocity, as already stated. By acting on the knobs, you may set the relative weight of velocity vs. CC5 for controlling portamento time.



CC11: expression. Controls continuous transition across the **dynamics**, from ppp to fff, free from phasing artifacts, due to our proprietary Harmonic Alignment Technology. An expression pedal, or a breath controller, routed to C11, are highly recommended for the most realistic realtime playing.

CC19: vibrato rate. The frequency range is approximately 2.5 – 8 Hz. Default = 50.

CC20: default note-on **pitch-modulation depth**. Reproduces the typical slight pitch modulation of the real attacks. May vary from none (more precise initial intonation) to slightly excessive. Default = 100.

CC21: growl intensity. High frequency flutter may be added by directly acting on this controller, to produce a “growly, dirty” sound. Default = 0. Optimal values are low. Values above 40 may lead to unrealistic results.

CC22: on-transition flutter intensity. Bursts of high frequency flutter are automatically generated on transitions, reproducing the behaviour of the real instrument. CC22 controls the overall intensity of this flutter. The useful range is 70 to 110 (slightly excessive). Default = 95.

CC23: frullato intensity. Medium frequency flutter-tongue may be added by directly acting on this controller, to produce a frullato (flutter-tongue) effect. Default = 0. Optimal values are low to medium. Values above 70 may lead to unrealistic results.

NEW !

CC24 : dynamic pitch modulation. In the real instrument, the current pitch is modulated by transient changes of the dynamics. The Trumpet exactly reproduces this behaviour. In version 2.01, the intensity of this pitch response can be varied with CC24, to better cope with different styles. For example, barock music generally exhibits less fluctuations, and the overall pitch tends to be more steady. You may reproduce this behaviour by decreasing CC24 somewhat from the default value of 64. Conversely, a “funny trumpet”, mimicking the behaviour of a beginner, can be obtained by increasing CC24 to very high values.

Tip: Higher settings of CC24 may also allow BC players to perform a realistic vibrato by simply modulating the air flow.

CC25: dynamics linked to velocity. The dynamic is normally controlled by CC11 only. CC25 allows to link the initial dynamics to note-on velocity. This allows fast sforzato-crescendo effects, often too difficult to create with the expression pedal CC11. If the value of CC25 is different from zero, the dynamic time course will follow a ramp, connecting the note-on velocity to the current CC11 value. If the former is higher than the latter, a sforzato effect is obtained. In the opposite case, one gets a crescendo effect. The overall dynamic excursion is proportional to CC25. It varies from zero (no dependence on velocity) to 127 (initial dynamic determined only by velocity). Default = 0.

CC26: default note-on **pitch-modulation duration**. Default = 94.

CC27: default note-off **release duration**. Default = 10. (for fast releases)

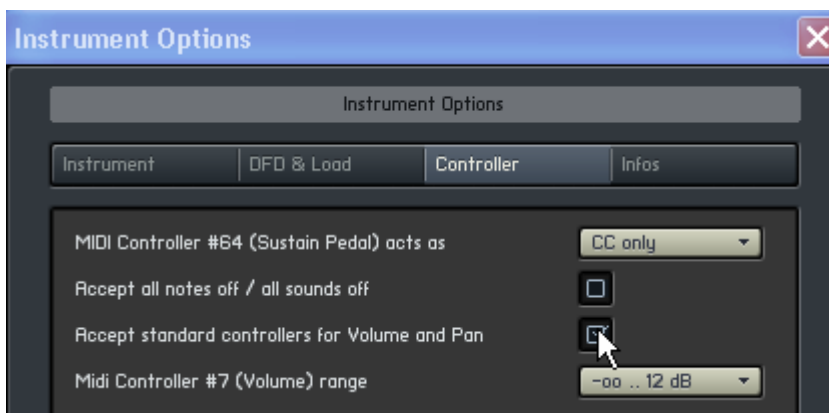
Note: CC26 and CC27 also allow to modify the relative duration of each keyswitch. (See “Performance Keyswitches” below).

NEW !

CC100: MIDI-loadable mutes. Loaded mutes are: “None” (default) (for CC100 between 0 and 21), “Straight (22-42)”, “Cup” (43-63), “Bucket” (64-85), “Harmon” (86-106), “Harmon + stem” (107-127).

Volume control by CC7

Tip: If you wish to control the instrument volume by CC7, don't forget to enable this function by checking the box "Accept standard controllers for Volume and Pan", under "Instrument Options -> Controller", as shown below.





The Mutes

The mutes are selected on the drop down menu from the upper button.

You may choose among “Straight”, “Cup”, “Bucket”, Harmon” and “Harmon + Stem”.

Please note that the actual activation of the mute will occur on the first detached note (i.e. the note which is separated from the preceding one), in order to preserve the continuity of a phrase. To disable the mute and restore the “normal” sound please select “None” on the Mutes menu. The “unmuted” sound will occur on the first detached note.

NEW !

Version 2.01 allows to load the mutes also via midi. This is particularly useful when working with a sequencer. CC100 is used for this purpose. Loaded mutes are “None” (CC100 between 0 and 21), “Straight (22-42)”, “Cup” (43-63), “Bucket” (64-85), “Harmon” (86-106), “Harmon + stem” (107-127).

Tip: Unlike the other mutes, the Plunger does not appear in the GUI menu but is activated by pressing (and holding) the Key Switch A#1. In this mode, CC11 controls directly the “wah-wah” effect. For more details see “Playing techniques” below.

CC Remapping



Default Settings

NEW !

Version 1.01 only allowed to remap CC11, allowing those users with keyboards outputting only CC7 (volume), or those using a Breath or Wind Controller (CC2), to control the Dynamics.

Version 2.01 allows to remap all most important controllers, such as Dynamics, Vibrato Intensity, Vibrato Rate, Dynamic Pitch and Portamento Time.



NEW !

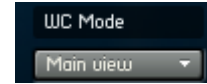
Wind controller Mode

This option opens the WindController panel

By clicking on “Use Windcontroller” button, you will activate the universal Windcontroller mode.



The selected mode will appear on the main view GUI



WC mode automatically maps the Dynamics to CC2, and gives complete (100%) control of Portamento Time (see below) to CC5.

In Keyboard mode, the duration of portamento is determined by the velocity of the overlapped note. Since note-on velocities output by Windcontrollers generally reflect the current CC2 value, portamento time becomes a function of the current Dynamics. This is undesirable, since, for example, playing pp will always lead to long portamento and vice versa. Linking portamento time to a separate controller, such as CC5, permits to overcome this limitation. The duration of portamento can now be controlled with any suitable physical controller mapped to CC5. If no controller is available, one might anyway set CC5 to a suitable value by directly acting with the mouse on the appropriate knob in controllers1 panel.

A mixed-mode behaviour is also possible, partially linking the duration of portamento to both dynamics (velocity) and CC5, allowing even greater flexibility and expressiveness.

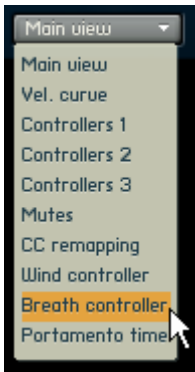


A pitch sensitivity knob is provided to compensate differences among different brands. For example, the Pitchbend output of the Yamaha WC5 is smaller, and cannot easily cover the standard two-semitone range. This can be fixed by setting Pitch Sensitivity to a higher (200%) value.



The default setting (100%) should be generally adequate for Akai devices.

WC mode is deactivated by clicking on the yellow button. Dynamics control will be automatically remapped to CC11.



NEW !

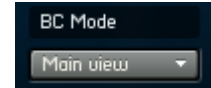
Breath controller Mode

This option opens the Breathcontrol panel

By clicking on “Use Breathcontroller” button, you will activate the Breathcontroller mode.



The selected mode will appear on the main view GUI

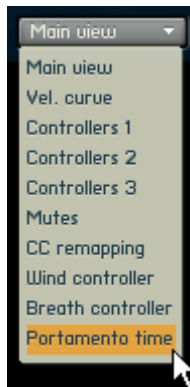


BC mode automatically maps the Dynamics to CC2.

In addition, it's the BC which actually triggers note-on & off when overcoming or going below a certain threshold. As with the real instrument, the pressed key only determines the note which will be played.

NOTE: This does not apply to legato notes, where legato/portamento duration is determined, as usual, by the velocity of the overlapped notes.

BC mode is deactivated by clicking on the yellow button. Dynamics control will be automatically remapped to CC11.



NEW !

Portamento Time

This option opens the Portamento Time panel.



In Keyboard (default) mode, the duration of portamento is determined by the velocity of the overlapped note. While this represents a very convenient approach to portamento control, there might be cases where linking portamento time to a separate controller (such as CC5) would be preferable. By setting the right knob to 100%, the duration of portamento could be linked to any physical controller mapped to CC5.

A mixed-mode behaviour is also possible, partially linking the duration of portamento to both velocity and CC5, allowing even greater flexibility and expressiveness.

In this example, portamento time is determined 30% by the velocity of the overlapped note, and 70% by CC5.



Playing Techniques

Despite its structural complexity, this instrument is very intuitive and easy to play.

The Trumpet does not use pre-recorded articulations, and shaping the sound is the task of the player, carried out by proper use of a few midi controllers. However, extensive use of advanced Artificial Intelligence (AI) techniques greatly facilitates this task.

Our revolutionary “Adaptive Model” approach acts by minimizing the differences with the real instrument, whatever articulation or phrase you play. You can therefore concentrate on creating music, rather than mastering complex sample bank management.

Nevertheless, thorough knowledge of the controllers and the keyswitches, and some practice... are certainly needed to get virtuoso effects.

Before starting to play, please make sure your expression pedal (or breath controller) is connected to the keyboard and properly mapped to CC11.

Playing range

Active notes of the First Trumpet are in the range E2 – G5. D#2 and G#5 are silent notes, useful for portamenti & falls “to nowhere”.

C1 to D2 are reserved for the performance keyswitches.

The range of the other instruments is:

Flügelhorn: E2 – C5

Second and Third Trumpet: E2 – F5

Cornet: E2 – C5

German Trumpet: E2 – C5

Piccolo Trumpet: G#2 – G5

Basic playing techniques

Detached notes. Detached (non legato), is a note separated from the previous one by some amount of time. They consist of an attack, a sustain, and a release phase.

The type of the attack depends on the interaction between note-on velocity and CC11. For a given dynamics (between pp and ff), determined by the CC11, you can vary between softer attacks (low velocity), “normal” attacks (medium velocity, up to 89) and more accented attacks (velocity between 90 and 127. The higher the velocity, the more “punchy” the attack. The pitch-modulation depth of the attack and its duration – which creates a characteristic timbral richness - can be varied with CC20 and CC26, respectively.

The dynamics of the sustain phase is entirely under control of CC11. You may continuously morph from pp to ff by acting on your expression pedal or breath controller.

A natural release curve is performed on note-off. The duration of the default release can be varied with CC27. The default setting of 10 corresponds to a very short decay.

Please refer to the “Controllers” section above for more details.

Legato/Portamento notes. “Legato” means “bound together”: legato notes are not separated, but rather connected to the previous note by some form of transition. The transition time (and type) between subsequent notes represents one of the most important elements of expression. If it’s short, it is usually named legato. If it exceeds a certain time, the transition may “carry” from one note to another by a slide, which is called “portamento”. On a real trumpet, this can be achieved by skilled control of the lip tension, or by “switching” the tube length with the valves.

To get a legato or portamento on our virtual trumpet is indeed very easy. You only need to overlap subsequent notes with the appropriate velocity. The duration of legato/portamento ranges from 20 msec to about 1 sec., dependent on the velocity of the overlapped note and on the played interval. Normal legato is obtained with velocities ranging from 70 to 90. Lower velocities lead to a portamento effect. Portamento may be interrupted by overlapping a new note. This leads to the very realistic effect of a split portamento, especially if a wide interval is played in an arpeggio-like fashion.

Please note: very low velocities (below 10), which are necessary for longer portamentos, might be difficult to play on some keyboards, so the proper calibration of the velocity response of your keyboard may be very helpful. Under these circumstances we strongly recommend using our velocity remapping tool. Please refer to the Menu description above to learn more how to apply it.

Half-valve sound. To perform legato/portamento on a real trumpet, the player frequently applies the so-called “half-valve” – technique. By pressing the valves only about half way down the tone “collapses”, providing a characteristic “squeezed” sound. During this very unstable status of the instrument the player is able to perform within some limits a nearly continuous glissando. In our virtual trumpet, the half valve sound is automatically activated if low velocity is applied. Please note that, in order to maintain realism, larger portamento intervals shouldn’t be played entirely with the half valve sound; instead, some intermediate, fixed notes should be inserted. This might be sometimes quite difficult in the realtime – for that reason some keyswitches have been programmed to perform ready-to use “split portamento” transitions. Please refer to the keyswitch section for more details.

Vibrato. An extremely important element of musical expression. The vibrato of a real trumpet has a very complex “anatomy” which can be described as a modulation of pitch, intensity and timbre. Vibrato intensity and frequency are basically unsteady, depending on various factors, such as lip or hand pressure. Our virtual trumpet reproduces a realistic vibrato by simultaneously acting on those very parameters. Vibrato intensity is controlled by the ModWheel (CC1), vibrato rate by CC19 (available also on the instrument GUI). Advanced AI techniques are used to recreate vibrato unsteadiness.

Vibrato-like endings. If you analyse any real trumpet phrase, you will notice that many notes have a brief, tasteful kind of vibrato at the very end. This vibrato is mostly just a single oscillation (one period) long, and adds a very typical expression to the sound. This articulation, nearly impossible to perform by the interaction of the main controllers, can be easily obtained by a simple touch on a keyswitch. Keyswitch F1 provides a more brief type of short vibrato, which also can be used again and again as “on-the fly – vibrato” at any point in the middle of a phrase. Keyswitch F#1 triggers a more definite, stronger pronounced end-vibrato. Keyswitch A1 can also be used. If pressed before note-off, it adds the same type of effect on the release of the note. Since the intensity

(via KS velocity) and duration are entirely under your control, these keyswitches are one of the most important articulation tools, allowing incredible realism to be easily achieved.

Trills / shakes & ornamentations. Realistic trills, ornamentations and shakes can be obtained by simply playing them on a keyboard. However, a very helpful retrigger feature greatly facilitates this task: upon release of an overlapped note, the previous note will be played again (retriggered) if the key is still held down. So in order to play a trill, keep the initial note pressed while pressing and releasing the other note. Try different velocities, which noticeably determine the character of the trill/shake. This technique works also in more complex ornamentations using two or more overlapping notes. Typical trumpet shakes can be played either using the technique described above, or raising the ModWheel (CC1) to 110-127. In this latter case, a very realistic vibrato-to-shake transition will be obtained.

Falls. Falls are descending glissandos going to nowhere, i.e. they just fade out and do not stop on a particular note. If performed using only the half-valve sound, which is more suitable for longer falls, they sound smoother and softer. If a “punchy” or “sloppy” fall is needed, a series of notes (usually in fortissimo) is played – either chromatic, or using any other – e.g. harmonic - series of notes. These articulations may be directly executed on the keyboard by skillful players. However, and more conveniently, the same effect will be obtained by using dedicated keyswitches. For more details please refer to the “Performance Keyswitches” below.

Pitchbend. Under certain circumstances a real trumpet is capable of playing continuous, glissando-like pitch change. This is either possible using the half-valve technique described above, or – within limited intervals and mostly in higher register – applying a skilled control of lip pressure. With our virtual trumpet one may achieve a very similar effect by simply using the Pitch Bend, which performs a continuous pitch glide within a realistic interval, accompanied by some timbral interaction typical of a real trumpet.

Flutter & Flutter-tongue. This playing technique provides a characteristic “dirty” sound, which is a result of a high-medium frequency modulation of the sound. The most common is the flutter-tongue (frullato): while playing a note, the trumpet player flutters his tongue making the typical “Frrrrr” - sound. “The Trumpet” uses 2 controllers to obtain flutter and frullato effects: CC21 and CC23, where CC21 uses higher modulating frequency. To differentiate the results, they can be used separately or mixed in different proportions. Please avoid excessive settings which may produce excessive, unrealistic results.

Playing 3 or more trumpets in unison. The trumpet 2 and 3 differ slightly from each other, and from the main trumpet, as far as the timbre, time response and articulations are concerned. So, even if played at unison from the same keyboard, they will sound very realistic. However, by all means, try to play them individually, applying slightly different pitch, pitch bending, portamento, vibrato depth and frequency, etc. Those small differences in sound and articulations are essential for a natural section sound. Please note that even real trumpets, if played in a very similar, “perfect” manner, may produce some phasing-like sound, spoiling the richness in timbre.

The Performance Keyswitches

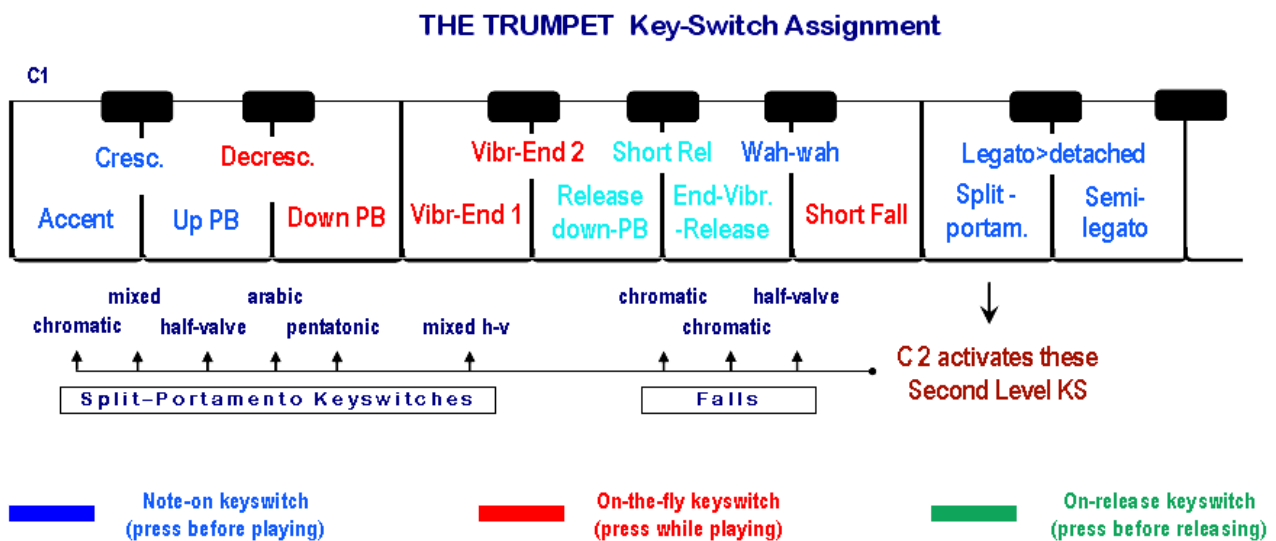
Basic concepts

The keyswitches (KS) are conceived to ease the task of shaping complex articulations or phrases which are impossible or too difficult to perform with the usual interaction of the expression pedal, pitchbend and modwheel.

For example, sforzato, crescendo, sforzato-crescendo, on-the-fly modulation and different types of release, can be obtained by a simple touch on one of the modulating keyswitches.

Non-modulating keyswitches perform several specific tasks, such as wah-wah effects, automated split portamentos and other typical phrases, such as falls or semi-legato.

The reserved keyswitch range is C1 – D2.



Four types of modulating KS are available:

- 1) Note-on KS. (C1-D1). When held down, these KS will affect the next detached note(s).
- 2) Legato/portamento KS (C#1). Similar to 1), but affecting also overlapped (legato) note(s).
- 3) On-the-fly KS (D#1- F#1). They affect the note which is being played, with characteristic modulation patterns.
- 4) Note-off KS. (G1 – A1). They affect the subsequent released note(s).

Five types of non-modulating KS are also available:

- 1) Wah-wah effect (A#1)
- 2) Default fall(B1)
- 3) Modeled split portamento and falls (C2)
- 4) Legato > detached conversion (C#2)
- 5) Legato > semi-legato conversion (D2)

Note-on, legato/portamento, on-the-fly and release KS do not produce repetitive, stereotypical patterns, as a presampled articulation would do. Rather, they act by modulating the note so that the current dynamics, pitch and evolution are preserved. This ensures that a virtually infinite series of nuances can be elicited by pressing a single KS.

The *intensity* of the effect carried out by a modulating keyswitch is linked to the KS note-on velocity (from none to slightly excessive, for special effects).

The *duration* of the modulating KS articulation has a default value of 64, which is generally most appropriate. It can, however, be varied by holding down just the selected KS while setting CC26 (for note-on) or 27 (for release) to the desired value.

Note-on and legato/portamento keyswitches

C1: *Sforzato*. This KS imparts a accent to the next detached note(s).

C#1: *Crescendo*. This KS imparts a fast crescendo pattern to the next detached and legato note(s).

D1: *Upward pitchbend*. This KS applies an upward pitchbend to the next detached note(s).

On-the-fly keyswitches

D#1: *Decrescendo*. This KS imparts a fast decrescendo pattern to the note which is being played.

E1: *Downward pitchbend*. This KS imparts a downward pitchbend to the note which is being played.

F1: *Vibrato-like ending #1*. This KS imparts a characteristic vibrato-like pattern to the note which is being played.

F#1: *Vibrato-like ending #2*. This KS imparts a characteristic, shorter and more “definitive” vibrato-like pattern to the note which is being played.

Note-off keyswitches

G1: *Release pattern #1.* This KS imparts a characteristic, rich release pattern to the next note-off.

G#1: *Release pattern #2.* This KS imparts a very short release pattern to the next note-off. Very suitable for fast sequences.

A1: *Release pattern #3.* This KS imparts a characteristic, vibrato-like ending release pattern to the next note-off.

Tip: note-on, on-the-fly and note-off KS may be simultaneously activated for multiple modulations. For example, by holding down C#1 and pressing on-the-fly D#1 one can obtain a crescendo-decrescendo dynamic pattern. By simultaneously holding down C1 and A1, one can obtain a sforzato pattern with vibrato-like ending on each next staccato note.

Note: CC26 also allow to modify the relative duration of each note-on and on-the-fly keyswitch. To perform this, you need to set the controller while holding down the keyswitch. Similarly, CC27 will allow to modify the relative duration of each release keyswitch. A message on the lower bar will report the new value. Please note that this new value will be stored, replacing the default. By pressing a keyswitch, the associated value will be displayed on CC26 and CC27 GUI knobs.

Non-modulating keyswitches

A#1: *Wah-wah effect.* This KS reproduces the wah-wah effect of the plunger. This effect is directly controlled by CC11. Two different plunger types (unused and used, presumably) are activated on the basis of the KS velocity. Activation/deactivation of the wah-wah actually takes place on the next detached note, to preserve the integrity of the phrase.

B1: *Short fall.* This KS reproduces a typical short fall from the currently played note. This obviates the necessity of playing a very quick scale with staccato notes to get the same effect. The fall starts upon pressing the KS. The duration of the fall is determined by the KS velocity. The fall can be interrupted, before its natural end, by releasing the KS, or by playing a new note while the fall is still sounding.

C2: *Automated split portamento.* This KS modifies the normal portamento pattern into a harmonically based, split portamento, very typical for a trumpet. This obviates the necessity of playing a very complex arpeggio with staccato notes, instead of just overlapping the start and destination notes. The overall portamento duration is similar to that of a normal portamento, and is therefore determined by the velocity of the overlapped note, and by the played interval.

Note: C2, pressed along with another KS, such as C1 to A#1, will activate non-default, different types of split portamento and falls:

C2 + C1 : chromatic split portamento
C2 + C#1: semi-chromatic split portamento
C2 + D1 : half valve split portamento
C2 + D#1: arabic scale split portamento
C2 + E1 : pentatonic scale split portamento
C2 + F1 : mixed mode half-valve split portamento
C2 + F#1: doit, or “upward fall” (NEW !)
C2 + G1: “upward half-valve fall” (NEW !)
C2 + A#1: half-valve fall
C2 + A1 : chromatic fall
C2 + G#1: chromatic long fall

C#2: Automated legato>detached conversion. When playing fast, it proves at times very difficult to avoid overlapping notes when a staccato sequence is instead desired. This KS converts overlapped notes into staccato (with normal attacks & sustains).

D2: Automated legato>semi-legato conversion. This KS is very much alike C#2, converting legato notes to semi-legato, an articulation which sounds between staccato and legato, with a strong reattack.

Note: semi-legato is also automatically generated when two non-legato notes are very close to each other, i.e. when the time interval between the release of the first note and the subsequent note-on is less than 35 msec. This avoids the overlap of the release of the first note with the subsequent attack, which would otherwise lead to unrealistic results.

Appendix 1

Using the Convolution Reverb

Both Kontakt Player and Sampler have a built-in convolution reverb. It is capable of recreating a reverb of real acoustic environment previously sampled and stored as an IR (Impulse Response). Even if you do not own the K2 Sampler, you can apply this high quality reverb to any patch using the Player included in this library. Open the output section of the Player and insert the Convolution into the Aux channel. Click on “Conf” and make sure that the output of the Aux channel is routed to the main output. Open the convolution unit (double-clicking on the insert) and drag-and-drop an Impulse Response into its editor window. You will find a small library of the IRs in the Player folder (Kontakt Player 2 > Presents > Impulses). Move the slider “DRV” to zero to eliminate the direct (dry) signal.



To control the amount of reverb, open the AUX Sends of the appropriate instrument clicking on the small button “AUX” at the right margin of the instrument GUI (or first on “+”, if no “AUX” button is seen) and move the slider “aux 1”.



For more details refer to the Kontakt Player Guide.

Appendix 2

Tested Systems

“The Trumpet” was initially tested on the following systems:

Mac:

Mac Pro Quad Core 3 GHz, 8GB RAM, Mac OS 10.5.2,
Sequencer: Logic 8.01 and Ableton Live 7.02
Audio hardware: MOTU 2408mk3

Power Mac G4 (MDD) dual 1GHz, 1.75GB RAM, Mac OS 10.4.11
Sequencer: Cubase 4.1.2, Cubase 4.0.3, Cubase SX 3.1.1, Digital Performer 5.1.2
Audio hardware: MOTU 2408mk3

Mac Pro G5 single cpu, 1.6Ghz, 2 GB RAM, MacOSX 10.4.11,
Sequencer: Cubase SE 3.03
Audio Hardware: Core Audio, DSP driver

Mac Mini Core 2 Duo 2GHz, 2GB RAM, Mac OSX 10.5.1
Sequencer: Logic 8.1
Audio hardware: Core Audio, Edirol UA-1D; Tascam US-428

Power Mac G5, 2 x 2 GHz, 3,5 GB RAM, OS 10.4.9
Sequencer: Logic Pro 7.2.3
Audio Hardware: RME Fireface 800

Windows:

IntelCore2 6600 & 2.40 Ghz, 2 GB RAM, Win XP
Sequencer: Cubase SX3
Audio Hardware: Creative Audigy, M-Audio Fast Track Pro

Core 2 Duo, 3 GHz, 3 GB RAM, Win XP
Sequencer: Cubase 4.1
Audio Hardware: RME Fireface 800

Core 2 Duo, 1,8 GHz, 2 GB RAM, Win XP
Sequencer: Cubase 4.1
Audio Hardware: Terratec EWX 24/96, Edirol DA2496

AMD Athlon 64 X2 Dual Core 3800+, 2 GHz, 1 GB RAM, Win XP
Sequencer: Cubase SE 3.03
Audio Hardware: Digidesign Mbox

Mac Mini Core 2 Duo 2GHz, 2GB RAM, Windows XP Home SP2
Sequencer: Cubase 4.1, SE 3.03
Audio hardware: Edirol UA-1D; Tascam US-428

Intel "D" duo, 3 GHz, 2 GB RAM, Win XP
Sequencer: Cubase 4.1
Audio Hardware: RME Fireface 800

AMD Opteron 275, 2 x dual core 2,2 GHz, 2 GB RAM, Win XP
Sequencer: Cubase SX 3
Audio Hardware: Scope

AMD Opteron 270, 2 x dual core 2 GHz, 2 GB RAM, Win XP
Sequencer: Cubase 4.01
Audio Hardware: Echo Audio, Layla (PCI)

Core 2 Duo E6600, 2 GB RAM, Win XP
Sequencer: Sonar 7.0.3, Producer Edition
Audio Hardware: E-MU 1820M

An updated list will be eventually made available on our website:
<http://www.samplemodeling.com/en/benchmarks.php>

Please note that all the above is reported for informative purposes only, and cannot be taken as a guarantee, since even identical systems may under certain circumstances behave differently.