Dorico Articulate Map for Articulate Presets

Unprecedented playback using the entire VSL

User manual

2nd Edition

Introduction

What is the Dorico Articulate Map?

There probably was never a more detailed playback of orchestral score in a notation software and at the same time a more convenient way to tap the full potential of the *Vienna Symphonic Library (VSL)* —the world's largest orchestral sample database. The *Dorico Articulate Map* integrates *Articulate Presets*, which provide instant access to most of the VSL, right into Dorico and automatically plays your score with striking realism, taking advantage of the wealth of articulations included in the VSL via Dorico's powerful *Expression Map* feature.

A Dorico Expression Map is a set of *Expression Definitions*, that allows Dorico to access the articulations and playing techniques included in an orchestral sample library. This way Dorico provides an instant and automatic playback of your score. Due to the Expression Map you generally don't have to care about the entire sample library implementation, but can just write your score using standard notation symbols and it plays as expected. An articulation definition can include several different score elements specifying the particular articulation—either symbols like  (staccato) or text specifications like 

(muted)—that you insert in your score and that together determine the particular version of a playing technique (e.g. muted staccato) a given note will play. Dorico then automatically sends all required Midi events to select the corresponding articulation in a virtual instrument immediately before the note is played.

With many dozens of used score elements (symbols and text specifications)—many of them purposely created to access the entire VSL—and nearly 1000 individual Expression definitions, the Articulate Map is probably the most detailed Dorico Expression Map ever created. And in addition it even allows you to continuously control the nuances of many articulations by additional Continuous Controllers (CC) via Articulate Presets's signature *3D-control*. This unique feature fully takes advantage of Dorico's advanced Midi capabilities, which are unmatched by any other notation software. By blending the various recorded sounds within the VSL, it allows you to control various musical aspects continuously, including e.g. vibrato intensity, attack behavior, section size, mute strength or bowing position! The Articulate Map even gives you the freedom to decide anywhere in the score via a simple direction if Dorico should play back everything automatically in *Composer Mode,* or if you want to shape the performance in detail in *Conductor Mode*, which takes full advantage of the powerful 3D-control and gives you full control over the playback your music.

The integration of the VSL into Dorico, based on Articulate Presets and the Articulate Map is completely seamless and there is generally nothing to set up. After installation you can simply select your orchestra, write your score, and will get the probably most detailed playback possible to date. This fully works even with the *free* Dorico SE version. I.e. if you are e.g. a user of the VSL Symphonic Cube, you can fully check it out using the *free* Articulate Presets demo. It includes the full Articulate Preset for Flute 2, while there is even a demo score "Cygnus the Swan" for solo flute included in Dorico SE that impressively demonstrates the score playback without any further editing or modifications (the few glitches, e.g. grace notes, stem from the score and not the Articulate Map).

Requirements and Setup

What you need, and need to do, to get started

Requirements

The Articulate Map requires Dorico 3.5, but is compatible with all Dorico editions: *Pro*, *Elements* and *SE*. To reach a new level in the quality of the playback of your score you will need the *Vienna Instruments pro* (VI pro) player, the appropriate *Vienna Instruments library* (or several of them) for the music you want to play back, the *Articulate Presets* for the corresponding library, that the Articulate Map relies on, and ideally also a *MIRx venue* that automatically and very realistically simulates the placement and reverberation of all instruments (which are recorded completely dry for maximum flexibility) in a venue directly within Vienna Instruments pro.

The “gold standard” is the *Symphonic Cube* which includes all instruments of even a large, extended orchestra, as well as smaller sections from a chamber orchestra down to a string quartet (see the VSL homepage for details). It is available in two different versions *standard* and *full* and you can also purchase individual parts if you do not need everything included. The standard library includes the basic articulations, whereas the full library includes in addition to more variations and many specialized articulations e.g. also vibrato variations or the unique "performance trill” which allows you to play any fast figures extremely realistically.

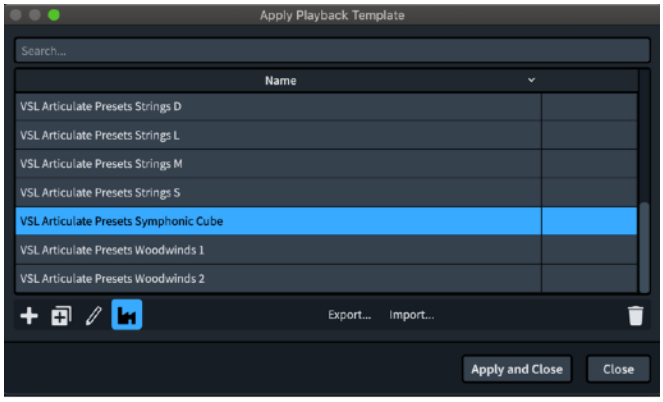
In addition the VSL offers several other dedicated libraries that are supported by Articulate Presets and the Dorico Articulate Map. There are the unique *Dimension Strings* and *Dimension Brass* libraries, which increase the realism even more, since they recorded each player in a section individually and can automatically mix the recordings of all players at different positions within a venue (using MIRx). Thereby they give you, in combination with the unique harmonize feature in VI pro, even far more detailed control, in particular when it comes to divisi. Finally there are the *Appassionata Strings* which present a very large romantic string section, *Chamber Strings 2 and Solo Strings 2*, adding con sordino playing techniques, as well as *Violin 2* and *Cello 2*, that are not included in the Symphonic Cube. There are Articulate Presets for all these libraries and all of them are fully compatible with the Articulate Map giving you a huge collection of instruments and articulations for your score playback. Due to the universal layout of Articulate Presets, the universal Articulate Map provides the best available playback with the included set of articulations for both the standard and full version of the library.

Finally, there are many *MIRx venues* (ranging from recording studios to concert halls and a church) and a huge advantage of the VSL is that you can conveniently select the different venues by a simple click and the entire orchestra automatically “moves to the new venue”—completely changing the resulting sound. Compared to other libraries, that are recorded in a fixed, idealized studio, this gives you the chance to hear how your score will sound when it is actually performed in a realistic venue.

Setup

There is a single, universal Dorico Expression Map for all chromatic Articulate Presets, which works both for standard and full libraries. You typically don't even have to deal with the Articulate Map itself since there are dedicated *Playback Templates* (including the required "*Endpoints"*) that let Dorico automatically access all instruments in your VSL libraries. I.e. once installed, when you add a new instrument to your project or open an existing score, everything should work automatically!

A Playback Template stores all settings how the various playing techniques of instruments in Dorico are played back. For the full Symphonic Cube or the Basic Orchestra package (for standard VSL libraries) there are already complete Playback Templates *VSL Articulate Presets Symphonic Cube* and *VSL Articulate Presets Basic Orchestra* that cover an entire orchestra. For other full libraries, e.g. Dimension Strings, there are Playback Templates that cover the included instruments and use the Halion Symphonic Orchestra for the rest. If you use the Articulate Presets for several VSL libraries you can very easily combine them to create custom Playback Templates as described below—e.g. combining Dimension Strings with winds and percussion from the Symphonic Cube.



To install the Playback Template(s) for the Articulate Presets covering your VSL libraries, simply copy them to your *Dorico* folder. Then in Dorico select *Playback Templates …* from the *Play* menu. Press the *Import …* button at the bottom of the window, then locate the corresponding Playback Template for your library in the file dialog and press the *Open* button. It is then saved as part of your standard Dorico library and will be available in each project. You can then select an imported Playback Template and activate it by pressing the *Apply and Close* button. Moreover you can set e.g. the Symphonic Cube as *Default playback template* in the Play section of the Preferences, so that it is automatically used for every new score. Finally you will have to set the *Default Preload* buffer, specifying how much of the samples is loaded into Ram (see the VSL or Articulate Presets manual), in the settings of Vienna Instruments Pro You can access a VI pro instance in Play mode by pressing the  button, next to a VSL-based instrument, added to your score. Now you can access your entire VSL library conveniently within Dorico. Enjoy!

Important: Due to the improved realism and extensive content of the VSL (up to over 500GB vs. only 8GB of sample data for the included Halion Symphonic Orchestra) it naturally uses more Ram and CPU resources. You will generally need a Solid State Disk (SSD) for sample streaming to handle this. With a fast SSD you can set the Default Preload buffer to a low value (4096 or lower), in which case you should be able to run an entire Symphonic Cube based orchestra on a single computer (with ≥16GB of Ram). However, If you set the Default Preload too high and/or do not have sufficient Ram, you can easily overload Dorico with a huge score including dozens of instruments, which could crash your system. Therefore, please slowly check out how much your system can handle.

Similarly, the detailed control features require more computing power. This should not be a problem with a fast computer, but dynamic transitions (obtained via hairpins) are realized via Velocity X-fade in VI pro, which uses around 3-5 times more voices. For convenience it is standardly activated. Yet, should your realize performance issues since your system is less powerful, you can standardly deactivate it by changing the CC28 value in the first *Init* entry of the Articulate Map from 127 to 0 and saving the Playback Template you use under a new name, as well as activating it. Where needed in the score you can then easily activate it via CC28 or dedicated control score symbols.

The standard Dorico templates instantiate VI pro directly in Dorico, which presents the most convenient option. Since VI pro is a VST2 plugin, you might have to "white-list" VI pro in case you have not used it previously in Dorico. To do this, select *Preferences …* from the *Dorico* menu and then the *VST Plug-ins* tab. If VI pro is listed on the right side, select it and press the "<" button to allow it to be used in Dorico. Many Plug-Ins (including e.g. the VSL Synchron Player) are VST2 versions, but they work without problems in Dorico. In case your working style involves *Vienna Ensemble (VE)*, or its *pro* version (e.g. in combination with *MIR pro*) please assign the corresponding Dorico instruments to your Articulate Presets based VSL template in VE (pro) in Play mode by assigning the Articulate Map in the Endpoint Setup window. You can then create a custom Playback Template tailored towards your particular VE template. Please see Dorico's manual for details.

Features of the Articulate Map

How to integrate the VSL into Dorico

Standardly Dorico plays back your score with the Halion Symphonic Orchestra, which offers the standard orchestral instruments with ups to 10 different recorded playing techniques and is based on 8GB of sample data in total. The Articulate Map for Dorico allows you to conveniently use the renowned Vienna Symphonic Library (VSL) for playback instead, which covers basically every instrument that appears in an orchestral context, many even in different section sizes, with up to nearly 100 individually recorded articulations per instrument. It contains pristine recordings of all common playing techniques (legato, staccato, …) and even in various playing styles (con sordino, sul ponticello, sul tasto, …).

The Articulate Map is based on Articulate Presets which turn the VSL into an instrument and provide instant access to all sounds. Moreover they are consistent across the entire orchestra and give you unprecedented control over the nuances of the performance via the unique *3D-control,* that allows you e.g. to control the attack strength, the vibrato intensity and the section size of an instrument continuously. The VSL libraries supported by Articulate Presets and the Articulate Map include over 500GB of sample data, significantly increasing the realism that could be obtained in Dorico so far. There is a universal Articulate Map for all chromatic Articulate Presets that uses this huge sound content via nearly 1000 individual Expression definitions. For instance for normal notes, depending on the note length, the Articulate Map automatically selects one out of five different recorded articulations (sustained, long portato, medium portato, short portato and short portato with a harder

attack due to a bit of staccato mixed in) to get the playback as close to a real performance as possible.

Dorico allows you to specify various different score elements simultaneously (e.g. both 

and legato—marked by standard slurs ) and the Articulate map selects for each combination the appropriate sound within the VSL. For convenience all implemented combinations of score symbols and text specifications are shown in tables II-V in the appendix. The VSL contains a large set of standard articulations that all of the instruments include. The structure of Articulate Presets is fully consistent across the entire orchestra and the universal Articulate Map drives all Articulate Presets for both standard and full VSL libraries. Due to this consistency you can (aside from agility and range differences) generally use a given part of your score (i.e. the notes with the corresponding score elements) with any chromatic orchestral instrument and it should play back correctly!

Score symbols and text specifications in Dorico can be either *attributes* that affect only a single note or *directions* that affect all following notes until another converse direction is specified. The Articulate Map uses both attributes and directions. Most score elements are attributes that affect a particular note. However, those that switch between different playing styles like con sordino or non vibrato, are generally implemented via directions, that you have to specify only once before the corresponding movement or group of notes, see table II. Attributes can likewise be applied to groups of objects. In this case the attribute is only displayed once but there is a range specifier that shows up to where it is applies.

Composer versus Conductor mode

The Articulate Map even offers two different modes: *Composer* and *Conductor Mode*. Composer Mode is the standard mode in which the score is fully automatically played back. I.e. you take the role of the composer and only have to provide the score, but do not have to care about the actual playback of the score, beyond the standard directions in the score a composer would give. Even in Composer Mode you can nevertheless fully control the section size (CC20), e.g. to realize realistic divisi as discussed in detail below, the dynamics (CC1), or any other standard VI controller.

In contrast in Conductor mode you can in addition even take the role of the conductor (or an individual player) and can specify in detail how the score is played—all the way down to subtle nuances. This is done by additional control instructions that determine the particular execution of the score. Conductor Mode is selected by the direction  from the *Common* panel of the *Playing Techniques Toolbox* and is active until you specify the direction  from the Common panel, which returns back to the standard Composer mode.

In Composer Mode Dorico chooses for articulations with different recorded versions automatically a particular one and sends all required controllers to select it (i.e. it fully fixes the position of Articulate Presets matrices in VI pro). In Conductor Mode you can dial the relevant controllers (CC2 and CC3) yourself and thereby get full control of all the detailed recordings in the VSL. Beyond this, in Conductor Mode Articulate Presets even allow you to continuously control the nuances of the performance in Dorico's Automation Lane via their unique 3D-control, described in detail below.

Important: During passages where Composer mode is active for a particular stave there should not be CC2 or CC3 data in the Automation Lane for the corresponding stave.

Supplementary score symbols

The VSL includes many recorded dynamic transitions and phrases (trills, runs, fast repetitions, …) that can further increase the realism of the playback of your score. Yet, they naturally only work well if a passage in your score matches the recorded sound, and therefore require more care. Arbitrary dynamic transitions can generally also be very convincingly realized using Vienna Instruments pro's velocity X-fade feature and for many phrases the VSL even includes flexible dedicated patches (performance trill, slurred legato, …) that allow to obtain a realistic playback of any variation of such phrases. Therefore, for maximum flexibility the recorded dynamics and phrases are standardly not used in the playback of your score. This way you can e.g. fully use the comprehensive implementation of dynamic transitions, trills, arpeggios, … right in Dorico .

However, the recorded sounds can add that final bit of realism, and therefore the Articulate Map also gives you access to them in case you choose to use them. To this end, the Articulate Map includes in addition to the standard score symbols and directions many supplementary control score symbols that you can use to access the recorded dynamics and phrases, as well as those realized via the Automated Playback and Pattern (APP) sequencer included in VI pro, in order to control the playback of the score in even more detail. They have been specifically created to quickly access these sounds and at the same time give you a clear and appealing display. These symbols are exclusively meant to control the playback and you can easily hide them if you want, so that they do not show up in the actual score. A complete list of all playing techniques you can access this way and the necessary combinations of score symbols are given in the extensive table IV.

Phrases typically offer several different versions and in Composer Mode Dorico choses a particular one. However, in Conductor Mode you can access all of them with the two controllers CC2 (Vertical) and CC3 (Horizontal) and Table IV lists which versions they select. These allow you to access all particular versions, e.g. different lengths for dynamic transitions or different keys for phrases—see the Articulate Presets manual for more details.

Divisi control symbols

For a convenient control of the section size and a simple realization of divisi, the Articulate Map contains five additional control symbols. These are taken from the *Choral* panel of the playing techniques toolbox, which are not used for orchestral instruments. They are implemented as Add-On Switches in Dorico, so that they are always active and can be used with any playing technique offering section control. They are realized via Articulate Presets powerful Section Controller (CC20) and merely send the following fixed values of this (generally continuous) controller:

-  ("mouth wide open") : 0 (Dimension: full section)
-  ("mouth open") : 32
-  ("mouth slightly open") : 63 (Dimension: group)
-  ("mouth purged") : 98 (Dimension: desk)
-  ("mouth closed") : 127 (Dimension: player)

These control symbols can easily be hidden so that they do not appear at all in the printed score.

In all VSL Dimension Libraries gives you the full section, yields around 3/4 of the section, a group (i.e. half the section), a desk (in case of the Dimension Strings), and a single player. In addition, the combinations of symbols , , respectively , , , , even allow you to access the two different groups, respectively up to four individual desks/players. For standard VSL ensemble instruments gives you the large and the smaller section, which generally works fine for divisi, but you can surely choose an intermediate value. Instead for VSL solo instruments gives you the solo version instead and a small instrument section. However, there are also inverted versions of the presets (prefix “i”) that allow you to have a universal effect of divisi symbols across the orchestra—always decreasing the section size as you go from to . In case of the Expressive Vibrato, Mute or Tune articulations (see below or the Articulate Presets manual for details) these control symbols give you easy access to the corresponding five fixed vibrato intensities, mute strengths or detuning intensities instead.

Dynamic transitions and velocity X-fade

Dorico offers very flexible ways to notate nearly any possible dynamic transition via standard notation symbols (hairpins, …). The Articulate Map uses the “velocity X-fade" feature in Vienna Instruments pro to ensure that they automatically play back correctly. The velocity X-fade is realized by blending adjacent dynamic layers. This way not just the volume but also the sound character of the corresponding instrument changes continuously. This works particularly well for instrument sections. Since VSL instruments typically include 4-6 velocity layers for sustained sounds and typically 2 for legato, these transitions are generally quite smooth and realistic.

For convenience velocity X-fade is standardly activated, so everything works automatically. However, as discussed before, when velocity X-fade is activated all layers are always active and use up the corresponding number of voices, which will tax your system significantly more. Usually, this should not be a problem, but in case your system is less powerful or for very large scores you could standardly deactivate velocity X-fade. This is done by changing CC28 in the first *Init* entry in the Articulate Map from 127 to 0.

Even if standardly deactivated, velocity X-fade be can activated whenever you need it either by setting CC28 in the control lane to a value of 127, or even more conveniently by dedicated control symbols from the Choral panel. The symbol activates velocity X-Fade and ends it. This way your system is only taxed more for those instruments and those passages where this is actually needed. You can also temporarily deactivate velocity X-fade when you are not happy with the result in solo passages, and e.g. use the recorded dynamics, as discussed below.

3D-control

Maybe the most powerful feature of Articulate Presets, is that they do not merely give you access to a few fixed sampled versions, but with their signature 3D-control they let you control up to 3 musical parameters continuously—e.g. attack strength, vibrato intensity and section size—just like a virtuous player can do when playing an acoustic instrument. To access these gradual nuances Articulate Presets automatically blends all available sampled versions to give you a smooth and natural transition in this 3D sound space. Which musical aspects can be controlled depends on the particular articulation and they are listed in Table VI, see also the Articulate Presets Manual for more details.

In contrast to other dedicated Notation software, Dorico offers the advanced Midi functionality to conveniently take advantage of this sophisticated and very musical feature. In *Play* mode you can use the *Automation Lane* to add Continuous Controllers (CC) that are sent to control the playback in more detail. For each of them you can draw a curve that determines how the corresponding musical aspect changes with time. In Articulate Presets the 3 musical aspects (“dimensions") of 3D-control are controlled by the *Vertical Controller* (CC2), the *Horizontal Controller* (CC3) and the *Section Controller* (CC20). In addition the *Velocity X-fade* controller (CC1) realistically controls the dynamics and you can adjust it in any way you like to improve the playback by subtle dynamic transitions an instrumentalist naturally performs, even though they are not explicitly notated in the score.

As the name suggests the Section Controller (CC20) controls in most cases the section size. This is extremely useful for divisi since dialing this controller you can gradually change the size of the instrument section playing this part. In most standard VSL libraries you can, in addition to the fixed values discussed above, continuously blend between a solo instrument and a small section, or two different section sizes respectively. This can give a rather realistic impression of changing the size of the instrument section. For the Dimension libraries you have even far more detailed control and can conveniently dial the different number of players with the Section Controller. In contrast to using the divisi control symbols, using the 3D control in the Automation Lane, you even get manual access to every recorded player/desk or group with the Section Controller, see the Articulate Presets Manual for details on which controller ranges you have to choose in each case.

For natural and legato playing techniques in both normal and muted playing style, there are alternative versions listed in Table III where the Section Controller (CC20) continuously controls vibrato instead. This feature is based on the so called expressive vibrato (xVib) matrices of Articulate Presets, accessed in Dorico by the symbol esp. vib.. They allow you to draw gradual vibrato transitions in real time while a note is playing in the Automation Lane. At the same time you can control the dynamics via CC1 which gives you detailed control to shape the playback of long notes. Both CC1 and CC20 can be controlled continuously even in Composer mode. Similarly, for individual solo players within the Dimension Strings libraries CC3 continuously controls the vibrato and in the Dimension Brass libraries (both solo and ensemble) it continuously controls the muting.

The musical aspects the Vertical and Horizontal Controller control depend on the particular playing technique. For instance for the sul ponticello playing style you can for the various articulations continuously control the *bowing position* and gradually crossfade from sul ponticello playing, bowing on the bridge, to normal playing, bowing somewhere in the middle, to sul tasto playing, bowing on the fingerboard. Analogously for harmonics articulations you can control the *harmonic content*, blending normal and artificial harmonics version, and for muted articulations you can control the *mute strength*, blending muted and normal versions. The Vertical and Horizontal controllers are only controllable in Conductor mode, whereas in Composer mode they are automatically sent before each note. The “half-muted” and “half-harmonics” playing techniques that are available in Composer mode, see Table II in the appendix, are just two particular positions in this continuous transition you can access in Conductor mode. A complete list of what you can control with these two controllers is shown for various playing techniques in Table VI.

In Conductor mode generally only the corresponding program change message is sent to VI pro and you can specify the additional continuous controllers yourself to access every cell in the 2D matrix space and quasi-continuously crossfade the sampled versions—in combination with the (always

active) Section controller—in a 3D sound space. Please see the *Articulate Presets Manual* for details. To do this you have to send the corresponding Vertical (CC2) and Horizontal Controller (CC3) values before the respective note, while any changes you make while a given note is playing have no effect on this note. This makes sense for musical aspects like bowing position or muting that are generally not adjusted during the course of a given note. Moreover, when you switch to a different articulation, you will have to specify the appropriate controller value again.

With all these different musical aspects (see Table VI) freely controllable you can shape the nuances of the playback of your score in as much detail as you want and obtain extremely detailed and realistic results, that were so far simply impossible with notation software. Yet, these enhancements are optional and you already get a convincing playback without them. i.e. you have complete freedom to shape the playback of your score in as much detail as you want.

Implementation of particular articulations and playing techniques

Dorico distinguishes between *articulations* and *playing techniques*, while in the VSL and in this manual these terms are often used interchangeably. The articulations in Dorico control force (i.e.attack), duration (e.g. staccato) and stress. As marked in Table III, accents  result for many playing techniques not just in an increase of the velocity, but also in a change of the sound (realized by Articulate Presets 3D control). Marcato  yields an even more pronounced velocity effect and, where available, uses the dedicated marcato samples. While staccato  and staccatissimo  are played by the respective samples, tenuto  is played by VSL's dedicated repetition samples and automatically selects the appropriate version depending on the speed, or the corresponding staccato repetitions for staccato-tenuto  . Similarly any occurrence of these symbols in combination with slurs  yields automatically an appropriate playback in terms of either the performance trill or particular repetition samples. Articulations of stress are not used in the Articulate Map so far due to the lack of corresponding distinct recordings in the VSL. I.e. you can use them in the score, but they won't have an impact on the playback.

As discussed, the Articulate Map gives you access to the various playing techniques included in the VSL, as shown in the extensive Tables II-IV. Table III lists those playing techniques that are automatically played in response to standard notation symbols and directions. Table II lists general playing styles (like con sordino) that each offer various different playing techniques which are marked in tables III & IV. These general playing styles are all directions and affect all following notes. Table IV lists additional playing techniques included in the VSL, like recorded dynamics or phrases, that can be accessed by supplementary (control) score symbols, as had been discussed above.

For particular playing techniques their implementation is discussed in more detail in the following:

Legato and portamento/glissando

The legato articulation is automatically chosen by Dorico whenever slurs appear in your score, which are entered by the symbol  . The Articulate Map uses for legato the universal matrix that includes the VSL performance trill at very fast playing speed. This is done since Dorico also chooses the legato articulation for playing back trills, and moreover this way any fast figures in your score will automatically sound realistic. In case of fast runs the *slurred legato* can give an even slightly more realistic result and you can force it with the additional control attribute from the

Strings panel. The *portamento* (for strings) and *glissando* (for brass) can add realism to slower legato lines, which you can also obtain with the additional control attribute  , as shown in table III. The notated portamento or glissando lines in Dorico (straight or zigzag lines) in contrast play chromatic transitions. Therefore, at this point they unfortunately cannot be used to obtain the desired continuous transition for string and brass instruments.

Recorded dynamic transitions

Due to the dynamic X-fading used for standard dynamic transitions, discussed before, it could in very exposed solo passages happen that you can sound out two instruments playing, which would not be desired. The VSL also includes various recorded transitions that can be used in this case. These are less flexible, but can in general further increase the realism if the desired transition has been recorded. The Articulate Map allows you to conveniently access these as well. They are not obtained by the standard dynamics symbols (hairpins), but instead by the supplementary attributes  ,  ,  and  (or the corresponding version specifying in addition the dynamic strength) in the Common panel of the Attributes Toolbox (which can be hidden in the score). In the VSL dynamic transitions are recorded in different lengths and in Composer Mode the Articulate Map tries to automatically pick the appropriate one depending on the length of the note—while in Conductor Mode all are available. By temporarily turning off velocity X-fade via  (and afterwards on again by ) ordinary hairpins in the score have no effect on the playback, but (static) dynamic symbols like  still control the velocity and access the different velocity layers of medium and light dynamics.

Harmonics

Since Dorico at this point does not seem to support the playback of the VSL natural harmonics, which are mapped in a complicated way, and the VSL does not include recorded natural harmonics in most string libraries anyway, the Articulate Map always plays notes specified by the (natural) harmonics symbol  by recorded artificial harmonics. They are typically available in normal and staccato versions, while the Dimension Strings also include a tremolo version. The Articulate Map even includes half harmonics  , which give a nice mix of the fundamental note and the harmonic.

Basic percussion

Like all chromatic instruments, most Pitched Percussion is fully implemented via the universal Articulate Map. In addition the Unpitched Percussion instruments most commonly used in an orchestral context (Concert Toms, Snare Drum, Bass Drum, Tambourine, Suspended Cymbals, Piatti, Tam-tam, Triangle, Rails, Whip, Hammer) are also conveniently implemented. There is a dedicated Dorico *VSL Percussion Map* that makes all these instruments conveniently accessible based on the score symbols shown in Table V. It is based on the dedicated drum kit (“Drums+Perc_set_dry”) included in the Processed Percussion section of the Percussion library which includes the standardly used playing techniques. Some of the included instruments are not implemented in Dorico and therefore replacement instruments had to be used: “Crash Cymbal” in Dorico yields the VSL Piatti, “Jam Blocks” yields the Rails, and “Anvil” yields the Hammer.

In addition the universal Articulate Map even allows you to access the extensive content of the VSL percussion library in the rare case that you need a more special instrument or playing technique, as discussed below.

Using the Articulate Map

Turning a score into a performance …

General handling

For standard scores you do not have to do anything to use the Articulate Map—just write your score and you should automatically get a very realistic playback that offers significantly more detail than Dorico's standard *Halion Symphonic Orchestra*. In particular, all standard playing techniques are automatically correctly handled and the appendix gives you a complete overview of the implemented combinations of score elements and the resulting VSL articulation. Table I shows the implemented instruments and Table II the general score elements that select whole classes of playing styles. They are implemented for various different articulations marked in Table III and obtained by simply adding the corresponding score elements. When adding them to a note or a set of notes (either attributes or directions), the order of the individual score elements shown in the tables below is irrelevant.

All basic articulations (normal, legato, staccato, tenuto (played by repetition samples), tremolo/fluttertongue, fortepiano, sforzato) are available for every single chromatic instrument or instrument section included in the VSL. An accent > can be added to all articulations, but whereas this generally merely increases the volume, for the articulations marked in Table III in the appendix also the sound changes. Moreover, other playing techniques like dynamics, trills, … are automatically correctly generated for all instruments by Dorico and are played by the appropriate articulation in the VSL. However, not all more specialized recorded articulations are available for every instrument and not in every playing style indicated (e.g. woodwinds don't have muted articulations). See Table III of the Articulate Presets Manual or the corresponding VSL library manual for details. Should your score include very special playing techniques that are not even included in the extensive VSL, they will typically be played back as normal notes ("natural" playing).

The fact that there is only a single Dorico Expression Map for all Articulate Presets makes it possible that the same musical line in your score can easily be played by different instruments. I.e. you can easily move or copy the corresponding notes (with the associated playing techniques) to a different stave. Taking into account the different ranges and the different agility of the instruments, it should play correctly as far as the corresponding articulations are available for the other instrument.

Standardly the Articulate Map automatically selects the appropriate version of ordinary notes ("natural playing", i.e. without specifying additional score symbols) based on the note length. Analogously appropriate shorter notes are selected by specifying the additional symbols détaché (for strings) and portato (for winds). In addition, for complete control, you also have the chance to select all different versions individually by dedicated directions if you prefer a different sound for a particular (set of) note(s). Long, sustained notes are obtained by sus. and the various shorter notes can be individually accessed using the dét. long, dét. short, respectively por. long, por. med. and por. short directions, see Table III. You can view these additional symbols as mere control symbols that can easily be hidden in the score.

Divisi made easy

Realizing divisi couldn't be any simpler than by using Articulate Presets and the Articulate Map. As discussed before, the Articulate Map implements self-explanatory section control score symbols from the *Choral* panel of the Playing Techniques Toolbox, namely simply rectangles of different sizes that directly reflect the size to the instrument section that plays the following notes.

In all VSL Dimension Libraries  gives you the full section,  yields around 3/4 of the section,  a group (i.e. half the section),  a desk (in case of the Dimension Strings), and  a single player. All of these even offer *auto-divisi* so that the different voices are automatically distributed between the different players, desks or groups: e.g. if your score involves a 4-voice chord (or 4 different lines) and you choose that each voice is played by 2-player desks with auto divisi via  , the 4 voices are automatically distributed among the 4 different desks! I.e. you can conveniently have all players on a single stave, like in a full score, and merely insert the corresponding control symbol to guarantee that the different notes are played by fewer players in divisi passages. Therefore, all standard divisi cases are realistically played back by simply inserting the appropriate divisi control symbols for a given instrument section, wherever its score becomes polyphonic (or you want to reduce the size). At the same time it gives you e.g. for strings complete flexibility to choose if you instead want all players to play double (triple or quadruple) stops by keeping the full or a larger section playing. For utmost realism you can in the latter case slightly displace the different notes of the chord in Dorico's Play mode. In all cases the different voices are automatically distributed among the different groups, desks or players, without any need to use the Articulation Lane (see below) or different staves. However, you can surely also access all individual ("Solo") players on different staves if you want to.

Automation lanes and 3D-control

As already discussed, the Articulate Map gives you extensive additional possibilities to improve and shape the playback in even more detail without altering the score itself. You can think of this as the various very different ways the conductor as well as the individual instrumentalists can shape the playback of the same score written by a composer.

This is done by adding the corresponding controller data in the *Dynamics Lane* or *Automation Lane* of a particular track, which is displayed by pressing the corresponding symbols  or  in the track parameters to the left. In case of the Automation Lane you can select the corresponding Midi controller (CC2, 3, 4 or 20, see below) on the left. Only one of the different controllers is displayed at a time in the Automation Lane, but all controller lanes are active, even when they are no displayed. In all cases you can then draw controller data by selecting the *Draw tool*  or the *Line tool*  from the *Play toolbox*, or edit already present data, see the Dorico manual for more details.

As for most sample libraries, the Articulate Map allows you to continuously shape the dynamics to realize subtle dynamic changes a player naturally introduces while playing a note even when there are no explicit dynamic transitions marked in the score. This is done in the *Dynamics Lane* which can be shown simultaneously to the Automation Lane via the symbol  (or alternatively in the Automation Lane by selecting CC1). In case there are dynamic markings in your score there will already by control data in the dynamics lane and you can alter and extend it as you like to make the playback more realistic. This is realized via the Velocity X-fade feature in Articulate Presets and Dorico sends the appropriate controller CC1 to alter the dynamics.

Whereas for Dimension libraries all distinct cases can be accessed by the convenient section control symbols discussed above, which send discrete values of the Section Controller, for other instruments that offer continuous section control you can continuously dial the size of the instrument section via CC20 in the Automation Lane. This works both in Composer and Conductor mode. It allows you control the section size in more detail than with the section control symbols and in principle even allows to realize continuous transitions. Please see the Articulate Presets manual.

The Articulate Map implements two alternative modes, see Table II. The standard *Composer mode* gives you completely automatic playback of your score without requiring any other Midi events than the notes, while the *Conductor mode* allows you to control the nuances of the performance by additional controllers using Articulate Presets's unique 3D control. This gives you complete flexibility to shape the sound to the level of detail you want. E.g. you could standardly use the convenient Composer mode and switch to Conductor mode whenever you want to control a certain set of notes in detail with full 3D control. To do this in a particular part of your score, you first have to activate Conductor mode by the dedicated control symbol  available in the Common panel. Then you have access to the additional two continuous controllers CC2 & CC3 in the Automation Lane and (in combination with the Section Controller) can alter the playback in a 3D sound space. The control symbol  takes you back to Composer mode again, where the CC2 & CC3 are fixed. Table VI shows for all playing techniques, which sound aspects can be controlled.

Recorded and Dorico-generated phrases

This section describes how the various available phrases can be accessed. These are either recorded, realized within the APP sequencer in VI pro, or generated directly in Dorico.

Sampled and APP sequencer phrases

Many articulations include several sampled versions (e.g. runs), that are in Articulate Presets accessed by the matrix controllers (Vertical (CC2) and Horizontal (CC3)), as shown in Table IV. In Composer mode only a particular case is automatically selected, while all individual versions are available in Conductor mode and require you to explicitly send the controller values to select the desired version (e.g. a minor run in G#) in addition to the notes. For some other recorded techniques, like dynamics, the Articulate Map also tries to choose the appropriate version (e.g. a 3s diminuendo) in Composer mode depending on the note length. In principle the A/B switch (CC4) likewise has to be sent in Conductor mode, but in most cases, there are separate symbols for the two different versions (e.g. for up and downward runs), and the A/B controller is automatically sent.

Measured tremolos

Whereas unmeasured tremolos (with three tremolo bars from the Repeat Structures panel) are played with the recorded VSL tremolo, Dorico automatically plays back measured tremolos (one tremolo bar = eighth notes and two tremolo bars = sixteenth notes). Standardly they are played by the "natural" articulation which generally does not have enough round robins making the playback unnatural. Therefore, it is better to play them using one of the dedicated repetition patches, which are used when the  symbol is specified. Due to a small bug in Dorico 3.5, the general version, which choses the appropriate sound based on the note length does not work well, but any other combination ( ,  , …) works fine and yields a natural playback of measured tremolos. You can hide the additional symbol(s) in this case, so that they do not appear in the

printed score. Recorded fast measured tremolos (called “fast repetitions” in the VSL) are instead played with the tremolo symbol with three bars plus the symbol fast, see Table IV.

Trills

For maximum flexibility trills, accessed by the symbol *tr* from the *Ornaments* panel, are played with the dedicated performance trill articulation, which is available for most instruments in the VSL. This way you can shape the trill interval as well as many other aspects using the flexible features in Dorico via the *Properties Panel*. In addition the sampled trills included in the VSL are accessible by additional trill symbols with interval specifications, and in Conductor mode different versions can be selected with the Vertical and Horizontal controller, see the Articulate Presets manual for details.

Score Representation

In the score all standard musical symbols, using the attributes and directions in tables I-II in the appendix, are automatically properly played back. This gives you a clear, musical overview what is played by the corresponding note. To further improve the score, you can add any other symbols, not used in the Articulate Map and it generally won’t have an impact on the playback. As discussed before there are additional control symbols that you can use to improve the playback and you can easily hide them (or any of the standard symbols, other than articulation symbols) from being displayed in order to improve the final (“printed”) score. This holds e.g. for the small dynamics symbols, in case you want to replace them in the final score by proper dynamics symbols (hairpins).

For recorded and sequenced phrases and dynamics clear score symbols are used, that have been dedicatedly defined in Dorico that you can easily add to your score and that give you an instant overview. At the same time they provide a pleasant and clear score representation based on musical terms instead of technical aspects related to the particular sample library implementation. Whereas most of them follow standard musical notation (e.g. trills) for other recorded phrases (runs, arpeggios, …), that are usually fully notated in the score, self-explanatory score symbols, given in table III in the appendix, are introduced that are added to the base note of the phrase.

In case you want to use either a recorded phrase (runs, arpeggios, fast repetitions, …), or one that is realized with the APP sequencer in Vienna Instruments pro, only a single note is required to play the entire phrase. However, many phrases are typically explicitly notated in the score by the corresponding range of individual notes. To get both the full notation and a realistic playback, you will have to activate *Suppress playback* in the *Common* tab of the *Properties Panel* for all but the first (root) note of the phrase, so that they are not played back. Then you have to extend the length of the root note in Play mode and add the control symbol(s) (shown in Table III c) to play the appropriate phrase. Finally you can activate *Hidden* in the *Playing Techniques* tab of the *Properties Panel* for all supplementary control symbols, so that they are no shown in the score.

In many cases there are alternative score elements in addition to those listed in the tables I-III in the appendix, that have exactly the same effect. E.g. instead of con sord. you can just as well choose mute, with mute or +. You can check which alternatives are available by hovering over the playing techniques in the Toolbox with the mouse. Whenever two of them show the same playback technique name in parenthesis, e.g. for all the muting score elements just mentioned “pt.muted”, they have the same effect and can be used interchangeably. This guarantees that a score is properly played back even if it uses different naming conventions than in the tables in the appendix.

Extended Percussion

As discussed above the Articulate Percussion Map gives you convenient access to the percussion instruments and playing techniques that are commonly used in an orchestral context, as listed in Table V in the appendix.

However, in the rare cases that you need a more special unpitched percussion instrument or playing technique, the Dorico implementation also supports this. In addition to the Articulate Percussion Map, there are dedicated Dorico Instruments for the various Combi presets included in Articulate Presets (Drums, Cymbals & Gongs, Percussion, Bells, Mallets - see table V in the Articulate Presets Manual), that give you access to basically all instruments and playing techniques included in the extensive VSL Percussion library! Since Dorico does not allow to define Custom Instruments, yet, they are accessed in Dorico by replacement instruments taken from the Keyboard section, that are generally not used in an orchestral context:

- *Accordion* = Drums Combi
- *Bandoneon* = Percussion Combi
- *Electric Piano* = Bells Combi
- *Honky-Tonk Piano* = Mallets Combi
- *Keyboard* = Cymbals and Gongs Combi

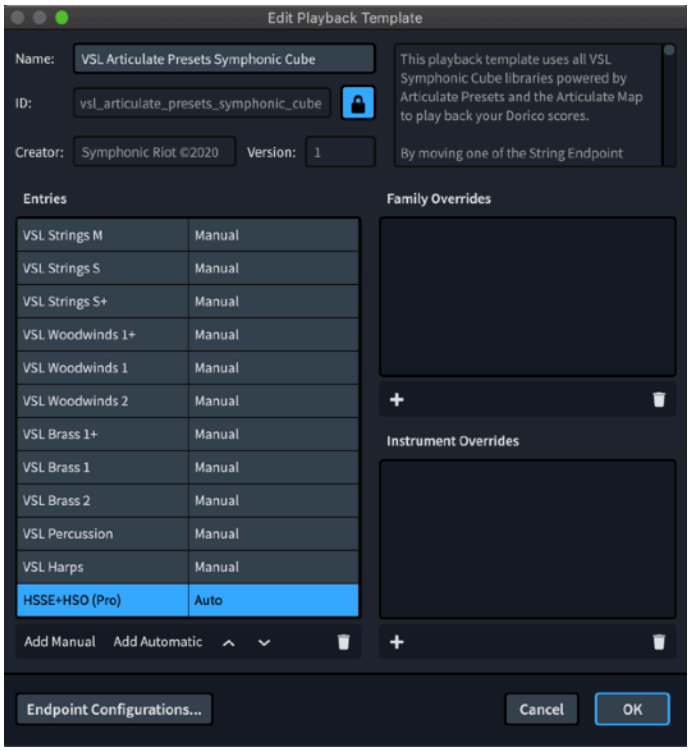
All of these use the standard Articulate Map and you can access them in Composer Mode using the standard symbols listed in tables I-III, corresponding to the appropriate program change number (listed in the columns) the desired sound has in the corresponding Combi instrument (listed in the Articulate Presets manual). These percussion instruments are typically mapped out across the keyboard as shown in each case in the manual of the VSL Percussion library and you will have to insert a note of the appropriate pitch to access the particular playing technique of the corresponding percussion instrument.

Since all this is rather indirect an example should help: Say you want to get a fast muted rim hit of a 16” Crash Cymbal played with a rod. The latter is included in the Cymbals and Gongs Combi and correspondingly you have to add the *Keyboard* to your project. According to table Vc in the Articulate Presets manual the 16” Crash Cymbal played with a rod is program 35, according to table III in the Articulate Presets manual the corresponding articulation is *sul ponticello repetitions legato*, and finally according to table IIa below in the appendix this program is accessed in Dorico by the score directions sul pont., rep. and legato. Finally, according to the VSL Percussion manual (p. 75) you have to add a D3 note to get the fast muted rim hit.

For such rarely used percussion instruments the score of the corresponding auxiliary Combi instruments will obviously not look nice at all, but this does not matter since this track is intended only for playback and you should not add it to your score. Instead you can in addition add a properly formatted percussion track based on the corresponding instrument in the score, that does not play back anything, but gives you the correct score layout.

Playback Templates and their customization

The included Playback Templates completely set up Dorico to use the VSL for playback. E.g. if you use the full Symphonic Cube, by installing the respective Playback Template *VSL Articulate Presets Symphonic Cube* everything should work out of the box. In many cases both Solo and Section instruments are available in Dorico, which are distinguish by names in singular respectively plural in Table I. In some cases auxiliary Dorico instruments had to be chosen since the corresponding instrument was not or not exactly available. In these cases the respective VSL instrument is given in square brackets. Instruments marked by a star merely have different MIR position and equalizer settings compared to the standard instruments. In case of the Dimension libraries you can either use the convenient Sections with VSLs Humanize feature and full auto-divisi as discussed above, or include the different players as individual Solo Players into your score to shape the sound in even more detail.



Yet, if you use various VSL libraries or libraries from other developers you might have to create a custom Playback Template for your particular combination of libraries. A Playback Template consists of *Endpoint Configurations* or other Playback Templates. Generally there are Endpoint Configurations for each Articulate Presets package or VSL library. The currently available Endpoint Configurations and the implemented instruments, you can use in Dorico, are shown in the Table I in the Appendix.

To create a custom Playback Template you can create a new or copy an existing template to edit it by pressing the pencil button. In the list simply remove and add libraries so that the list reflects the VSL libraries you use. E.g. if you purchased several individual Articulate Presets packages you should combine them into a single Playback Template. Dorico uses a given instrument from the Endpoint Configuration it is first defined in, so it can be necessary to reorder them. The Playback template should include all the Endpoint Configurations for libraries you actually use but no others so that Dorico can use the standard Halion Symphonic Orchestra version (included as the last entry) in this case.

If you have several orchestral libraries you can easily mix and match them, by including the corresponding Endpoint Configurations. Often the same instruments are covered by several Endpoint Configurations. You can create separate templates and then choose the one you want—e.g. in the VSL there are several string sections: Strings S, M, L and D. In case of the Strings S there are two Endpoint Configurations (S and S+), where the first uses merely different MIRx settings and EQs for the second violin, whereas the latter includes the dedicated VSL Single Instrument libraries Violin 2 and Cello 2 as second instruments. Simply move the appropriate one to the top position.

Appendix

All the details … just in case

Table I lists the Dorico Instruments that implement the various VSL Articulate Presets as well as the Endpoint Configurations that contain them. Names in singular denote solo instruments and names in plural section instruments. The instruments marked by a star are not based on distinct samples but merely use different MIRx placement and settings.

Table I: Implemented Endpoints and Instruments (solo: singular, section: plural, *: alternate MIR)

Endpoint Configuration	Supported VSL Libraries	Implemented Dorico Instruments [VSL instrument]
VSL Strings S	Solo Strings I & II, Chamber Strings I & II	Violin 1, Violin 2*, Viola, Violoncello, Contrabass; Violins 1, Violins 2*, Violas, Violoncellos, Contrabasses
VSL Strings M	Orchestral Strings I & II, Chamber Strings I & II	Violins 1, Violins 2*, Violas, Violoncellos, Contrabasses
VSL Strings L	Appassionata Strings I & II, Orchestral Strings I & II	Violins 1, Violins 2*, Violas, Violoncellos, Contrabasses
VSL Strings D	Dimension Strings I - III	Violins 1, Violins 2*, Violas, Violoncellos, Contrabasses; Violin 1-8 & 9-16*, Viola 1-6, Violoncello 1-6, Contrabass 1-4
VSL Woodwinds 1	Woodwinds I	Flute, Oboe [French], Clarinet (Bb), Bassoon; Flutes, Oboes [Viennese], Clarinets (Bb), Bassoons; Flute 2*, Oboe 2* [French], Clarinet (Bb) 2*, Bassoon 2*
VSL Woodwinds 2	Woodwinds II	Piccolo, Flute [Second], Alto Flute, Oboe [Viennese], English Horn [French], English Horn 2 [Viennese], Clarinet (Eb), Bass Clarinet, Contrabassoon; Treble Flute [Second], Baritone Oboe [Viennese]
VSL Brass 1	Brass I	Trumpet (C), Horn (F) [Viennese], Trombone, Tuba, Trumpets (C), Horns (F) [Viennese], Trombones, Trumpet (C) 2&3*, Horn (F) 2-4* [Viennese], Trombone 2*,
VSL Brass 2	Brass II	Piccolo Trumpet (Bb), Bass Trumpet (Bb), Horn (F) [Triple], Horns (F) [Epic], Wagner Tuba, Bass Trombone, Contrabass Trombone, Cimbasso, Contrabass Tuba; Horn (F) 2* [Triple], Bass Trombone 2*; Tenor Horn [Triple], Tenor Horns [Epic]
VSL Brass D	Dimension Brass I & II	Trumpets (Bb), Horns (F), Trombones, Tubas [Low Brass Ensemble], Wagner Tubas; Trumpet (Bb) 1-4, Horn (F) 1-4, Trombone 1-6, Bass Trombone, Tuba, Wagner Tuba 1-4
VSL Percussion	Percussion	Toms, Floor toms, Snare Drum, Bass Drum, Tambourine, Suspended Cymbal, Crash Cymbal [Piatti], Tam-tam, Triangle, Jam Blocks [Rails], Whip, Anvil [Hammer]; Timpani, Celeste, Glockenspiel, Marimba, Vibraphone, Xylophone; Accordion [Drums], Bandoneon [Percussion], Electric Piano [Bells], Honky-Tonk Piano [Mallets], Keyboard [Cymbals & Gongs]
VSL Harps	Harps	Harp, Harp 2

Table II: General playing styles

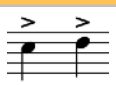
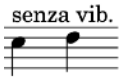
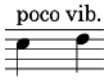
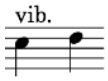
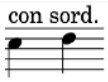
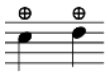
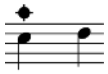
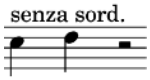
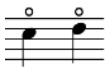
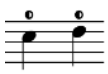
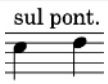
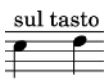
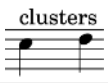
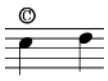
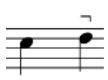
Score	Score elements		Type	VSL Articulation
	>	+ additional score elements	attribute	accent (sound change for all articulations marked under A)
	senza vib.	+ additional score elements	direction	no vibrato (available for all articulations marked under V)
	poco vib.	+ additional score elements	direction	light vibrato (available for all articulations marked under V)
	vib.	+ additional score elements	direction	vibrato (standard case when no specification is given)
	con sord.	+ additional score elements	direction	muted/con sordino (available for all articulations marked under M)
	⊕	+ additional score elements	direction	half-muted (available for all articulations marked under M)
	✦	+ additional score elements	direction	harmon mute (trombone only, available for all articulations marked under M)
	senza sord.	+ additional score elements	direction	unmuted (standard case when no specification is given)
	○	+ additional score elements	direction	artificial harmonics / flageolet (available for all articulations marked under H)
	◦	+ additional score elements	direction	half-harmonics (available for all articulations marked under H)
	sul pont.	+ additional score elements	direction	sul ponticello (available for all string articulations marked under SP)
	sul tasto	+ additional score elements	direction	sul tasto (available for all string articulations marked under ST)
	clusters	+ additional score elements	direction	clusters (available for articulations marked under C)
	©	+ additional score elements	direction	Conductor mode (available for all articulations marked under ©)
	¬	+ additional score elements	direction	Composer mode (ends © - standard case when no specification is given)

Table II lists the various general playing styles, in which many articulations in tables III and IV are available, as explicitly indicated there. They are accessed by adding the additional score elements.

The extensive table III lists all combinations of standard score elements for which the Articulate Map provides a dedicated automatic playback in terms of VSL sounds. The first column shows the score representation, the following columns show the symbols and text specifications you have to select from the toolbox to obtain it. The precise order/placement is irrelevant for the playback. The following narrow columns indicate either by a number or a mere cross which of the playing techniques are available for the additional playing styles given in table I. Where a number is given the corresponding combination of score elements is also available in Conductor mode, and the number represents the program change message of the called Articulate Presets matrix. The last column finally shows the VSL articulation that is played.

Table III (a): General playing techniques

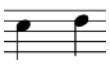
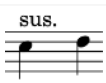
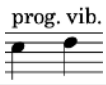
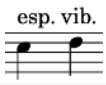
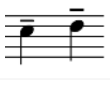
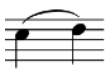
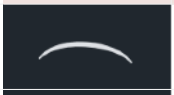
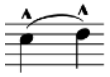
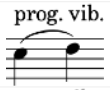
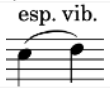
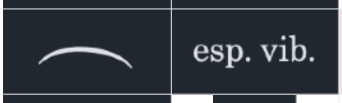
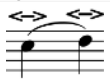
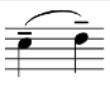
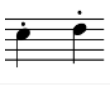
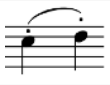
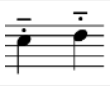
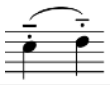
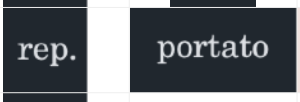
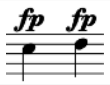
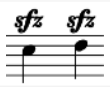
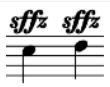
Score	Score elements	©	M	SP	ST	H	C	V	A	Note Length	VSL Articulation
	(“natural” playing)	1	73+	61	x	70+ (68)	68	x	x	Very Long	sustained
		3						x	x	Long	long portato / sustained fast
		5	77					x	x	Medium	medium portato / long detache
		6	78						x	≤ Short	short portato / short detache
		1	73					x	x		sustained
		2	74								sustained progressive vibrato
		4	76								sustained expressive vibrato (xVib) / mute / tune
	 (or  …)	1	73	61	x	70			x	≥ Long	sustained
		36	92	35	x	33			x	Med., Short	legato repetitions (speed c.)
		x	94						x	Very Short	portato repetitions (speed c.)
		24	85		68		66		x		interval legato & perf. trill (speed controlled)
		15	87								interval marcato (speed controlled)
		14	86								legato progressive vibrato
		16	88								legato expressive vibrato / mute / tune (speed cont.)
		19									legato time-stretched
		25	92	35	x	33			x		legato repetitions (speed controlled)
		8	80+	63	x	71+ (67)	69		x		staccato
		18	90								performance trill
		29	96				67				staccato repetitions (speed controlled)
		27	94				72		x		portato repetitions (speed controlled)
		49	75				62	x	x		fortepiano (chosen from Combined Dynamics)
		51	x	64	x		70	x	x		sforzato
		53	x					x			sforzatissimo

Table III (b): String playing techniques

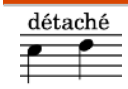
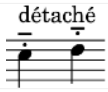
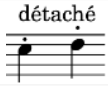
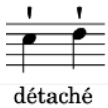
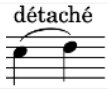
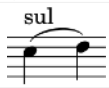
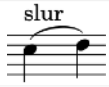
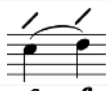
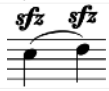
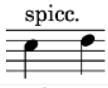
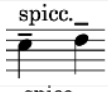
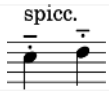
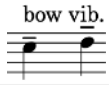
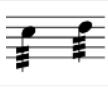
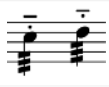
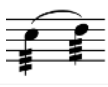
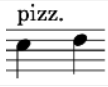
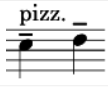
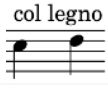
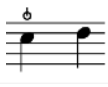
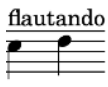
Score	Score elements		©	M	SP	ST	H	V	A	Note Length	VSL Articulation
	détaché	(direction, ended by ord.)	5 6	77 78	62	x		x	x	≥ Medium ≤ Short	long detache short detache
	dét. long		5	77				x	x		long detache
	dét. short		6	78					x		short detache
			9								short staccato
		détaché	23								interval detache
		sul	22								interval legato sul (forcing a particular string)
		slur	13	x							interval legato slurred (speed controlled)
			21	x		x					interval portamento
		sfz	20								legato sforzato / zigane / espressivo / tune
	spicc.	(direction, ended by ord.)	17	89					x		interval spiccato (speed controlled)
	rep.	spicc.	30	95		31			x		spiccato repetitions
	rep.	martelé	31								harsh repetitions
	rep.	bow vib.	26								bow vibrato repetitions
			12	84	65	x	72		x		tremolo
		slow	11			67	x				tremolo slow
			23								interval tremolo
	pizz.	(direction, ended by ord.)	10	82						≤ Medium, ≥ Long	pizzicato, pizzicato slow
	rep.	pizz.	28								pizzicato repetitions (speed controlled)
	col legno		x							≤ Medium, ≥ Long	col legno, col legno slow
			x								snap pizzicato
	flautando		68						x		flautando

Table III (c): Wind & Percussion playing techniques

Score	Score elements	©	M	C	V	A	Note Length	VSL Articulation
détaché	por. long	3	62		x	x		long portato
détaché	por. med.	5	77	65	x	x		medium portato
détaché	por. short	6	78			x		short portato
sus.	sus.	22						legato sustained
	♪	20						legato grace / tune
		7						marcato / blared / tune
flt.	flt.	12	84	63				fluttertongue
flt.	flt.	x	x					fluttertongue
		12				x		roll
		21	x					interval glissando
		63						sustained with fall release
		68						interval legato with fall release
		70						marcato with fall release
		69						interval marcato with fall release
rip	rip	72						rip
rip	rip	x						rip with fall release
p.d.l.t.	p.d.l.t.	61						pres de la table
		72						damped

Table IVa-c lists the additional recorded and sequenced phrases and tables IVd&e dynamics. For sounds with many variations all of them are accessible in Conductor mode.

Table IV (a): Supplementary control symbols to access ornaments and runs

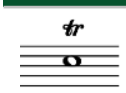
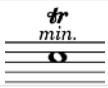
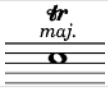
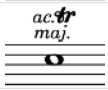
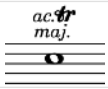
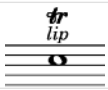
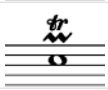
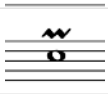
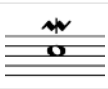
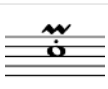
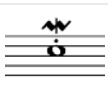
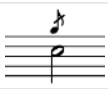
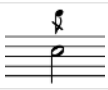
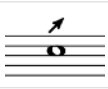
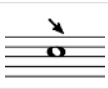
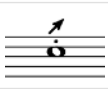
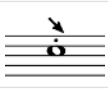
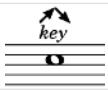
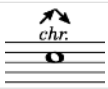
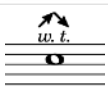
Score	Symbols	Vertical	Horizontal	©	M	SP	ST	H	V	VSL Articulation
										Dorico generated trills (played by performance trill)
		min | maj 2.| min | maj 3.	std.| baroque/ slow | fast	37	91					recorded half tone trill
				x	x					recorded whole tone trill
				38						trills minor 2. accelerando
				x						trills major 2. accelerando
				66						lip trill
		sequencer pattern		101	108					sequencer trills
		version 1-6		40						mordents up
		version 1-6		40						mordents down
		version 1-6		63						mordents staccato up
		version 1-6		63						mordents staccato down
		interval: 2.| …| oct.	std. | zigane	39						grace notes upwards
		interval: 2.| …| oct.	std. | zigane	39						grace notes downwards
		maj.| min.| chr.| w.t.	key: C | … | B	42						recorded runs legato upwards
		maj.| min.| chr.| w.t.	key: C | … | B	42						recorded runs legato downwards
		maj.| min.| chr.| w.t.	key: C | … | B	43						recorded runs fast/spiccato upwards
		maj.| min.| chr.| w.t.	key: C | … | B	43						recorded runs fast/spiccato downwards
		sequencer pattern		102	103					sequencer runs & phrases key
		sequencer pattern		104	105					sequencer runs & phrases whole tone
		sequencer pattern		106	107					sequencer runs & phrase chromatic

Table IV (b): Control symbols to access repetitions and glissandi

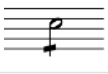
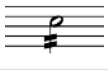
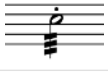
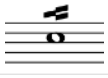
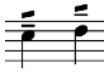
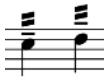
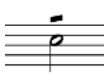
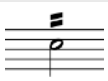
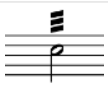
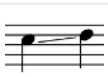
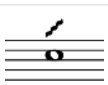
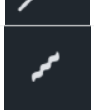
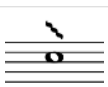
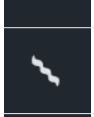
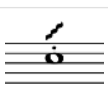
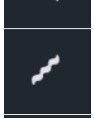
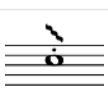
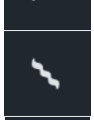
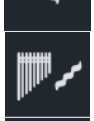
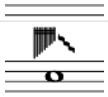
Score	Symbols		Vertical	Horizontal	©	M	VSL Articulation
							Dorico generated measured tremolo eighth
							Dorico generated measured tremolo sixteenth
		fast			41	93	recorded fast repetitions (fast measured tremolo)
			sequencer pattern		97	98	sequencer repetitions
	rep.				32		upbeats 1 repetitions
	rep.				34		upbeats 2 repetitions
			tempo		48	66	upbeats 1
			tempo				upbeats 2
			tempo				upbeats 3
							Dorico generated chromatic glissandi
			interval: 2.| …| oct.	—	44		glissandi upwards
			interval: 2.| …| oct.	—	44		glissandi downwards
		fast	interval: 2.| …| oct.	—	45		glissandi fast upwards
		fast	interval: 2.| …| oct.	—	45		glissandi fast downwards
		slow	7. maj. | min. | 6. | 5. | 4. maj. | min.| dim.	key: C | … | B	67		harp glissandi slow upwards
		slow	7. maj. | min. | 6. | 5. | 4. maj. | min.| dim.	key: C | … | B	67		harp glissandi slow downwards
			7. maj. | min. | 6. | 5. | 4. maj. | min.| dim.	key: C | … | B	68		harp glissandi medium upwards
			7. maj. | min. | 6. | 5. | 4. maj. | min.| dim.	key: C | … | B	68		harp glissandi medium downwards
		fast	7. maj. | min. | 6. | 5. | 4. maj. | min.| dim.	key: C | … | B	69		harp glissandi fast upwards
		fast	7. maj. | min. | 6. | 5. | 4. maj. | min.| dim.	key: C | … | B	69		harp glissandi fast downwards

Table IV (c): Control symbols to access arpeggios

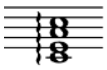
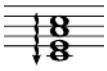
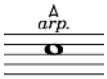
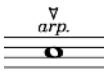
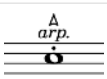
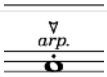
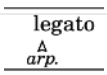
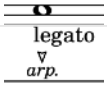
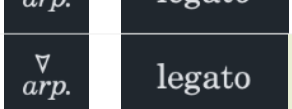
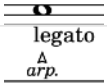
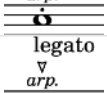
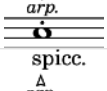
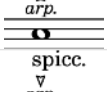
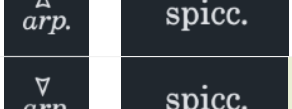
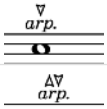
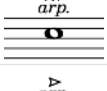
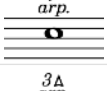
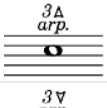
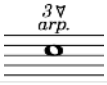
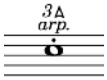
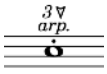
Score	Symbols	Vertical	Horizontal	©	M	VSL Articulation
						Dorico generated arpeggios upwards
						Dorico generated arpeggios downwards
		maj.| min.| dim.| aug.	key: C | … | B	46		recorded arpeggios upwards
		maj.| min.| dim.| aug.	key: C | … | B	46		recorded arpeggios downwards
		maj.| min.| dim.| aug.	key: C | … | B	47		recorded arpeggios staccato/fast upwards
		maj.| min.| dim.| aug.	key: C | … | B	47		recorded arpeggios staccato/fast downwards
		maj.| min.| dim.| aug.	key: C | … | B	64		recorded arpeggios legato upwards
		maj.| min.| dim.| aug.	key: C | … | B	64		recorded arpeggios legato downwards
		maj.| min.| dim.| aug.	key: C | … | B	65		recorded arpeggios legato upwards fast
		maj.| min.| dim.| aug.	key: C | … | B	65		recorded arpeggios legato downwards fast
						string arpeggios upwards
						string arpeggios downwards
		sequencer pattern	—	46	47	sequencer arpeggios
		maj.| min.| dim.| aug.	key: C | … | B	63		arpeggios straight / chords
		maj.| min.| dim.| aug.	key: C | … | B	65		3-note harp arpeggios upwards
		maj.| min.| dim.| aug.	key: C | … | B	65		3-note harp arpeggios downwards
		maj.| min.| dim.| aug.	key: C | … | B	66		3-note harp arpeggios fast upwards
		maj.| min.| dim.| aug.	key: C | … | B	66		3-note harp arpeggios fast downwards
		maj.| min.| dim.| aug.	key: C | … | B	64		3-note harp arpeggios straight

Table V shows the instruments as well as the score symbols for the playing techniques implemented in the Articulate Percussion Map.

Table IV (d): Control symbols to access dynamics

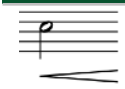
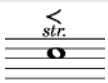
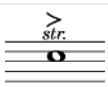
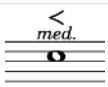
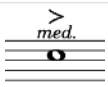
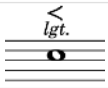
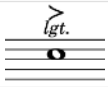
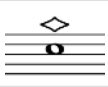
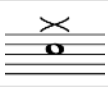
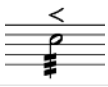
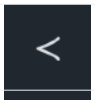
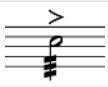
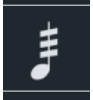
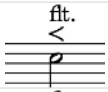
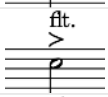
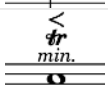
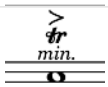
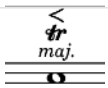
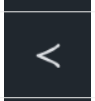
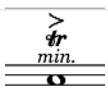
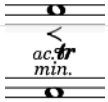
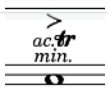
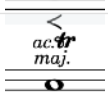
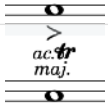
Score	Score elements		©	M	SP	ST	C	V	Note Length	VSL Articulation
		…							activation needed (see text)	Dorico generated dynamics (played by velocity X-fade)
			56	81	62		71	x	Very Long, Long, ≤ Medium	strong crescendo 4s, 2s, 1s
			56	81	62		71	x	Very Long, Long, ≤ Medium	strong diminuendo 4s, 2s, 1s
			58	83				x	Very Long, Long, ≤ Medium	medium crescendo 4s, 2s, 1s
			58	83				x	Very Long, Long, ≤ Medium	medium diminuendo 4s, 2s, 1s
			60					x	Very Long, Long, ≤ Medium	light crescendo 4s, 2s, 1s
			60					x	Very Long, Long, ≤ Medium	light diminuendo 4s, 2s, 1s
			54	79				x	Very Long, Long, ≤ Medium	crescendo-diminuendo 4s, 2s, 1s
			55						Very Long, Long, ≤ Medium	diminuendo-crescendo 4s, 2s, 1s
			59						≥ Long, ≤ Medium	tremolo crescendo 3s, 1.5s
			59						≥ Long, ≤ Medium	tremolo crescendo 3s, 1.5s
			59	64						fluttertongue crescendo
			59	64						fluttertongue diminuendo
			50	67						trills minor 2. crescendo
			50	67						trills minor 2. diminuendo
			x	x						trills major 2. crescendo
			x	x						trills major 2. diminuendo
			52							accelerando trills minor 2. crescendo
			52							accelerando trills minor 2. diminuendo
			x							accelerando trills major 2. crescendo
			x							accelerando trills major 2. diminuendo

Table IV (e): Control symbols to access repetition dynamics

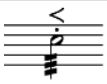
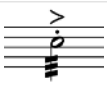
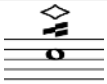
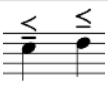
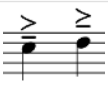
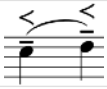
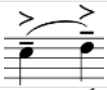
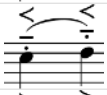
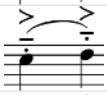
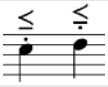
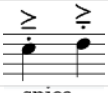
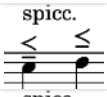
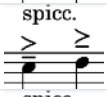
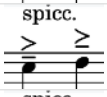
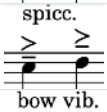
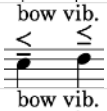
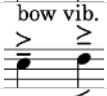
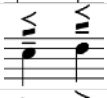
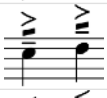
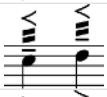
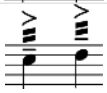
Score	Score elements			Vertical	©	M	SP	Note Length	VSL Articulation
		fast	<		57	65			fast repetitions crescendo
		fast	>		57	65			fast repetitions diminuendo
				sequencer pattern	99	100			sequencer repetitions dynamics
	rep.	<			x	x	x	≥ Long, ≤ Medium	legato portato repetitions crescendo
	rep.	>			x	x	x	≥ Long, ≤ Medium	legato portato repetitions crescendo
	rep.		<		x	x	x		legato repetitions crescendo
	rep.		>		x	x	x		legato repetitions diminuendo
	rep.		<		x	x			portato repetitions crescendo
	rep.		>		x	x			portato repetitions diminuendo
	rep.	•	<		x	x			staccato repetitions crescendo
	rep.	•	>		x	x			staccato repetitions diminuendo
	rep.	spicc.	<		x	x			spiccato repetitions crescendo
	rep.	spicc.	>		x	x			spiccato repetitions diminuendo
	rep.	martelé	<		x				harsh repetitions crescendo
	rep.	martelé	>		x				harsh repetitions diminuendo
	rep.	bow vib.	<		x				bow-vibrato repetitions crescendo
	rep.	bow vib.	>		x				bow-vibrato repetitions diminuendo
	rep.		<		x				upbeats 1 repetitions crescendo
	rep.		>		x				upbeats 1 repetitions diminuendo
	rep.		<		x				upbeats 2 repetitions crescendo
	rep.		>		x				upbeats 2 repetitions diminuendo

Table V: Unpitched percussion instruments and playing techniques

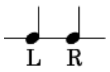
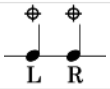
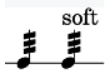
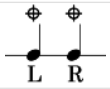
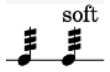
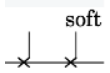
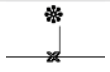
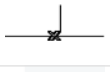
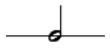
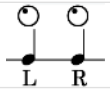
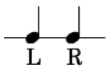
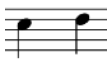
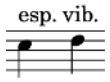
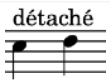
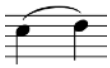
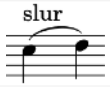
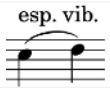
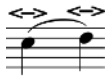
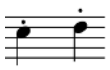
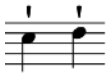
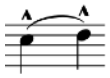
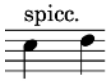
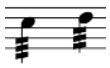
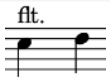
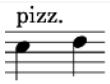
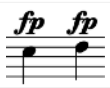
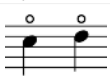
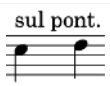
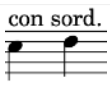
Instrument	Score	Symbols					VSL Articulation
Floor Tom & Toms 1-4		L	(or natural)	/		R	hit left / right hand
Snare Drum		L	(or natural)	/		R	hit left / right hand
							roll
Bass Drum		L	(or natural)	/		R	hit left / right hand
		L	/	R	+		hit left / right hand damped
			/		+	soft	roll hard / soft
Tambourine		L	(or natural)	/		R	hit open variation 1 / 2
		L	/	R	+		hit muted variation 1 / 2
			/		+	soft	normal / thumb tremolo
Suspended Cymbal		(natural)		/		soft	hit hard / soft mallet
							hit stick
			/		+	soft	tremolo hard / soft mallet
Crash Cymbal (Piatti)		(natural)					hit normal
			/		+	fast	hit damped slow / fast
Tam-tam		(natural)					hit
Triangle		L	(or natural)	/		R	hit side variation 1 / 2
		L	/	R	&		hit above variation 1 / 2
							tremolo
(Jam Blocks=) Rails 1-4		L	(or natural)	/		R	hit left / right hand
Whip		L	(or natural)	/		R	variation 1 / 2
(Anvil=) Hammer		L	(or natural)	/		R	hit wood block / board

Table VI finally shows for selected playing techniques that offer 3D-control the effect of the controllers in Conductor mode, please see the Articulate Presets Manual for more details.

Table VI: 3D control

Score	VSL Articulation	Vertical (CC2)	Horizontal (CC3)	Section (CC20)
	normal (“natural playing”)	attack behavior (sus. <> long portato <> marcato)	vibrato intensity (strong <> light <> no vibrato)	section size (solo <> section, …)
	normal expressive vibrato	attack behavior (sustained <> long portato)	—	vibrato (no vib. <> vibrato)
	detache	attack behavior (long < short detache)	(vibrato intensity)	section size (solo <> section, …)
	interval legato (uni.) (speed controlled)	<> marcato <> spiccato / <> marcato	—	section size (solo <> section, …)
	interval legato slur (speed controlled)	<> slurred <> portamento / <> grace / <> glissando	—	section size (solo <> section, …)
	interval legato expressive vibrato	<> slurred <> portamento / <> grace / <> glissando	—	vibrato (no vib. <> vibrato)
	interval legato time-stretched	<> slurred <> portamento / <> grace	time interval (requires activation and disk space - see AT manual)	section size (solo <> section, …)
	staccato	attack behavior (long < short staccato)	—	section size (solo <> section, …)
	(short) staccato	<> sustained	—	section size (solo <> section, …)
	interval marcato (speed controlled)	attack	—	section size (solo <> section, …)
	interval spiccato (speed controlled)	attack behavior (<> harsh, …)	—	section size (solo <> section, …)
	tremolo	attack behavior	tremolo intensity (tremolo <> normal)	section size (solo <> section, …)
	fluttertongue	—	fluttertongue intensity (fluttertongue <> normal)	section size (solo <> section, …)
	pizzicato	<> col legno <> snap (Bartok) pizzicato	<> slow/secco	section size (solo <> section, …)
	fortepiano	<> sforzato <> sforzatissimo	vibrato intensity	section size (solo <> section, …)
	artificial harmonics articulations	as corresponding articulations above	harmonic content (harmonics <> normal)	section size (solo <> section, …)
	sul ponticello articulations	as corresponding articulations above	bowing position (sul pon. <> normal <> sul tasto)	section size (solo <> section, …)
	con sordino/muted articulations	as corresponding articulations above	mute strength (muted <> normal)	section size (solo <> section, …)