

# Dorico Articulate Map for Articulate Presets

*Unprecedented playback using the entire VSL*



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User manual

*5th Edition*

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# 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 *Switches*, that allows Dorico to access the sampled sounds included in an orchestral sample library that correspond to the various articulations and playing techniques in the score. This way Dorico provides an instant and automatic playback. 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. A switch definition can include several different score elements specifying a particular playing technique—either symbols like **•** (staccato) or text specifications like **con sord.** (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 sound 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 far over 1500 individual switches, the Articulate Map is likely the most detailed Dorico Expression Map ever created. And in addition it even allows you to continuously control the nuances of many playing techniques 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 complete 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 yourself using the *free* Articulate Presets demo.

# Requirements and Setup

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

### Requirements

The Articulate Map requires at least 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 appropriate *Vienna Instruments library* (or several of them) for the music you want to play back and the *Vienna Instruments pro* (VI pro) player that comes with it, the *Articulate Presets* for the corresponding library, that the Articulate Map relies on, and ideally also a *MIRx venue* that simulates the placement and reverberation of all instruments (recorded dry for full flexibility) in a venue.

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). There are 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 many specialized articulations, e.g. vibrato variations, the unique “performance trill” which allows you to play any fast figures extremely realistically, or the amazing new High Definition (HD) Shorts with 9 velocity layers!

In addition the VSL offers several other dedicated libraries that are supported by Articulate Presets and the Dorico Articulate Map. There are the vast *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 humanize 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. Finally, with the *Special Woodwinds* and *Brass* as well as *Clarinet* and *Bassoon 2*, *Trumpet Bb* (& *muted*) and *Flugelhorn* all contemporary orchestral instruments are covered by now. The Articulate Presets for all these libraries are fully compatible with the Articulate Map giving you a huge collection of instruments and playing techniques for your score playback. Due to the universal layout of Articulate Presets, the Articulate Map provides the best available playback with the included set of playing techniques 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 Vienna Instruments product line 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. Due to the new *Synchron Stage* MIRx venue, this approach is also fully compatible with the alternative VSL Synchron product line. Compared to the latter and most other libraries, that are recorded in a fixed, idealized studio, this flexibility to change the venue gives you the chance to hear how your score will sound when it is actually performed.

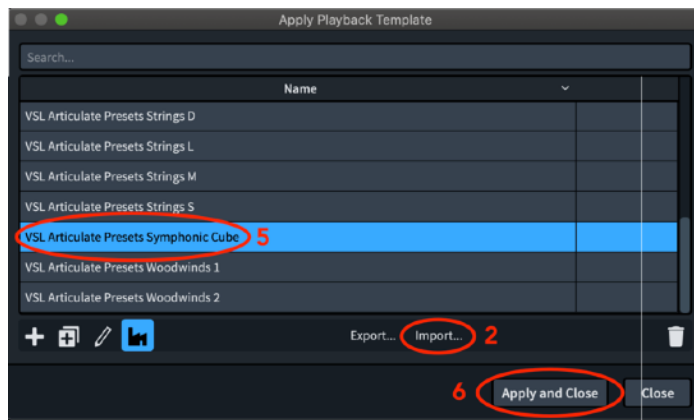
# Setup

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 Complete Package, Symphonic Cube and Basic Orchestra (for standard VSL libraries) there are already complete Playback Templates *VSL Articulate Presets Complete, ...* 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.

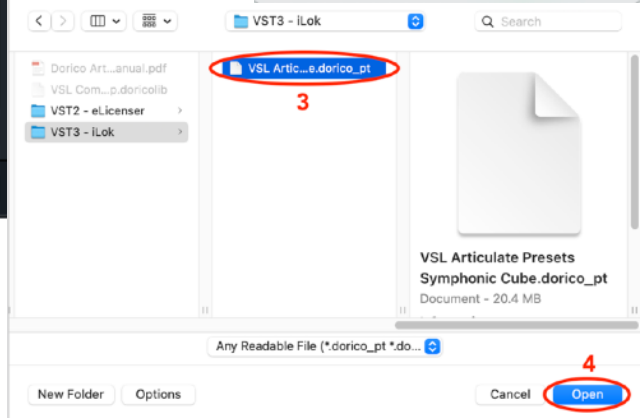
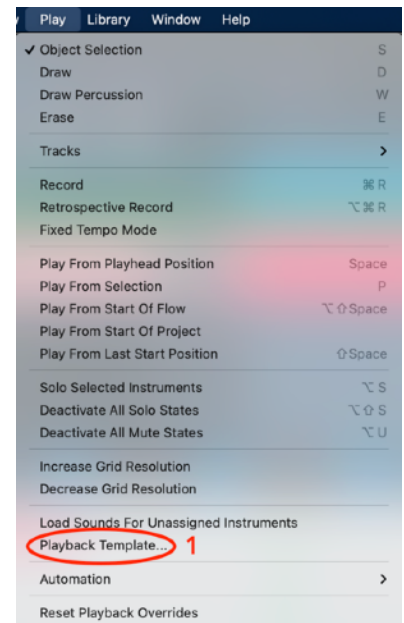
There are separate (VST2) eLicenser and (VST3) iLok versions of the Playback Templates (located in separate folders within the Dorico folder included in the Articulate Presets Package you downloaded) and you need to use the appropriate one for the VSL licensing scheme you use. To install the Playback Template(s) for the Articulate Presets covering your VSL libraries, perform the following steps:

1. in Dorico select *Playback Templates ...* from the *Play* menu, to open the Playback Template window
2. press the *Import ...* button at the bottom of the window



3. locate the corresponding Playback Template for your library on your hard disk within the package you downloaded

4. press the *Open* button



If you install Articulate Presets for several libraries please repeat steps 1-4 for each of them. All imported Playback Templates are then stored as part of your standard Dorico library and will be

available in each project in the Playback Templates window. You can move the original package (which also includes the documentation) anywhere on your hard disk as a reference and backup. If you only use the VSL in Dorico the Playback Template includes everything and is all you need, but if you want to use the VSL with other music software or in the Standalone Player please also install the Presets as discussed in the main Articulate Presets manual.

To use the Playback Template in a Dorico score:

5. locate the imported factory or combined custom Playback Template in the list in the Playback Template window

6. activate it by pressing the *Apply and Close* button

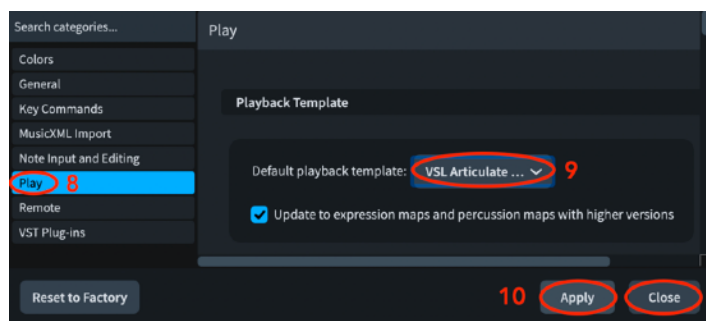
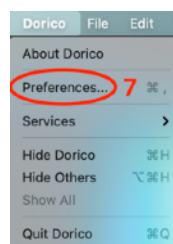
You will have to do this in each of your existing scores in order to use the VSL for the playback, but this is then saved with the score. Moreover you can set your Playback Template (e.g. for the Symphonic Cube) as *Default playback template* in the Play section of the Preferences, so that it is automatically used for every new score:


7. select *Preferences* from the Dorico menu

8. select the *Play* pane

9. select the desired Playback Template from the menu

10. press *Apply* and then *Close*



If you have not used the VSL before you will finally have to set the *Default Preload* buffer, specifying how much of the samples is loaded into memory (see the VSL or Articulate Presets manual for details), 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!

Several Playback Templates include alternative Endpoint Configurations (marked by a +) and you can select the appropriate one by moving it in the list of Endpoint Configurations in a Playback Template above the standard Endpoint Configuration (without the +).

- Strings S Solo+ / Section+: includes the sampled Violin 2 and Cello 2 as second instruments
- Woodwinds 1 Solo+: includes Flute 2 and Viennese Oboe (Woodwinds 2) as second instruments

- Brass 1 Solo+: includes the Triple Horn (from Brass 2) as second instrument
- Woodwinds S+: includes Clarinet 2 and Bassoon 2 as second instruments
- Brass S+: includes the Trumpet Bb as second instrument

If you want to use all recorded second wind instruments the order of Endpoint Configurations in the list should be S+, 1+, 2. Please see the corresponding section below for more details.

The new *Articulate Presets Complete Package* even includes Endpoint Configurations for the different instruments, marked by a “C”, that implement *all* available individually-recorded instruments included in both Dimension and non-Dimension VSL libraries. This gives you an unprecedented number of distinct players for a big orchestra, namely 10(+9) Violins, 7 Violas, 8 Cellos, 5 Basses, 6(+6) Horns, 6(+3) Trumpets, 7(+1) Trombones, 2(+1) Bass Trombones, 2 Tubas and 5 Wagner Tubas (where the numbers in parenthesis are further versions with distinct MIR positions). Similarly the above standard Endpoint Configurations implement 2(+1) Flutes, Oboes, Clarinets and Bassoons.

**Important:** Due to the improved realism and extensive content of the VSL (up to over 500GB vs. only 10GB 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  $\geq 16$ GB 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 you 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. In case your working style involves *Vienna Ensemble (VE)*, or its *pro* version (e.g. in combination with *MIR pro/3D*) 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. After saving the Endpoint Configuration, you can then create a custom Playback Template tailored towards your particular VE template. See Dorico’s manual for details.


If you still use the VST2/eLicenser version, 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.

# Basics 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 up to 10 different recorded playing techniques and is based on around 10GB 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 100 individually recorded playing techniques 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 a VSL sample library into an instrument and provide instant access to all sounds. Moreover they are fully consistent across the entire orchestra. 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 far over a thousand individual Expression definitions. For instance for normal notes, depending on the note length ( $\geq 1$ ,  $1/2$ ,  $1/4$ ,  $1/8$ ,  $\leq 1/16$ ), 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 (i.e. either musical symbols or text specifications) simultaneously (e.g. both **senza vib.** 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 playing techniques 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!

This section describes the basic features of the Articulate Map that allow you to play your scores using the extensive VSL libraries. Generally, you do not have to do anything else than to write your score, and it will play back fully automatically. Even in this case the Articulate Map offers you various convenient and powerful ways to vary the automatic playback, realize divisi, ... . In addition, the Articulate Map offers various more advanced features for more experienced users that allow them to shape the sound in even more detail and that are described in detail in the next section. E.g. they give you unprecedented control over the nuances of the performance based on the unique *3D-control* of Articulate Presets, which allows you e.g. to control the attack strength, the vibrato intensity and the section size of an instrument continuously.



## 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 playing techniques. Table I in the appendix, shows the implemented instruments and Table II the general score elements that select different playing styles. They are implemented for various different playing techniques marked in Table III and obtained by adding the corresponding score elements. When adding them to a note or a set of notes, the order of the individual score elements in the tables is irrelevant.

All basic playing techniques (natural, legato, staccato, tremolo/fluttertongue, repetitions, fortissimo, sforzato) are available for every single chromatic instrument or instrument section included in the VSL. This in particular guarantees that you can generally move or copy any range of notes (with the associated score symbols) from one staff to another staff and it should play back correctly. Other playing techniques like dynamics, trills, measured tremolos, ... are automatically correctly generated for all instruments by Dorico and are played by the appropriate playing technique in the VSL. However, not all more specialized recorded playing techniques 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).

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 and allows you to specify several of them simultaneously, e.g. **con sord.** and **senza vib.**. Yet, different length, muting, bowing, special playing technique or vibrato specifications, e.g. **senza vib.**, **poco vib.**, **vib.**, ... are mutually exclusive and one ends the previous one. In Dorico both attributes and directions can be applied to groups of consecutive notes by selecting them and choosing the attribute from the toolbox. In this case there is a range specifier that shows up to where they apply. Attributes are typically only displayed once but extend over the entire range, and even directions end without the need for another score symbol. This is often the most convenient way to use both attributes and directions.

Directions specifying general playing styles, like **con sord.** or **senza vib.** can apply to an entire score or movement. At this point Dorico requires that the precise combination of active score elements appears in the Expression Map, and if not the result is generally unpredictable. By explicitly defining all relevant combinations in the Articulate Map (e.g. vibrato variations for playing techniques, like staccato, even though there are no corresponding samples), we made sure that standard scores play back correctly, when certain directions are active for an entire score. In order to end one direction while keeping other directions active, where available you can use the directions listed in Table II: for instance muting is ended by **senza sord.**, sul ponticello & tasto by **ord. pos.**, the various vibrato variations by **ord. vib.** and special playing techniques by **ord. son.**. In contrast, the standard Dorico directions **ord.**, **nat.** or **arco** end all active directions and can be considered as a “full reset”.

Should you find that the playback does not work as expected for a more special playing technique, you might have to insert these before to end a problematic direction and restart it again afterwards.

In many cases there are alternative score elements, in addition to those listed in tables II & III 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 pointer. Whenever two of them show the same playback technique in parenthesis, e.g. for all the muting score elements “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 appendix.

## Implementation of particular articulations and playing techniques

Dorico distinguishes between *articulations* and *playing techniques*, while in the VSL 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 attack of the sound (realized by Articulate Presets 3D control). Marcato **▲** yields an even more pronounced effect and, where available, uses dedicated marcato or espressivo samples. While staccato **■** and staccatissimo **▮** are played by the respective samples, tenuto **▬** and staccato-tenuto **▣** are played by VSL's dedicated repetition samples and automatically select the appropriate version depending on the speed. 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.

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 is speed-controlled and includes the VSL performance trill at very fast playing speed. This is done since Dorico chooses the legato articulation for the playback of 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 more realistic result and you can enforce it with the additional control direction **slur** from the Strings panel. The sampled *portamento* (for strings) and *glissando* (for brass) can add realism to slower legato lines and it is obtained with the additional control attribute **▮** on the target note, 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 directly obtain the desired continuous transition for string and brass instruments.

### Dynamics


Dorico offers very flexible ways to notate nearly any possible dynamic transition via standard notation symbols (hairpins, ...) from the Dynamics panel. 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 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. Fortepiano and sforzato are automatically played by the dedicated VSL samples, while recorded sforzatissimo is only obtained by the similar but distinct symbol from the Playing Techniques panel.



### 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). For a realistic playback of measured tremolos it is advisable to use (a particular version of the) dedicated repetition samples, as described in the next subsection.

### Trills

Trills, accessed by the symbol  from the *Ornaments* panel, are for maximum flexibility played with the dedicated performance trill articulation, which is available for nearly all instruments in the VSL. This way you can shape the trill interval as well as many other aspects conveniently using the flexible features in Dorico via the *Properties Panel*. Other ornaments so far do not offer playback.





### 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  (or one of the other ways Dorico offers to notate harmonics) by recorded artificial harmonics. This symbol plays harmonics at the notated pitch. Harmonics are typically available in normal, staccato and repetition versions, while Dimension Strings also include tremolo. The Articulate Map even includes fake half harmonics , which give here a mix of partials 4 & 2 (i.e. 2 & 1 octaves above the fundamental). In addition you can also use Dorico's extensive implementation of harmonics via the Properties Panel to get the proper notation (e.g. of artificial harmonics in terms of stopped and touched notes), as well as other partials.

## Control score symbols

The Articulate Map fully automatically plays back your scores. However, in contrast to other Expression Maps it offers various *Control score symbols* to alter and improve the playback, that can easily be hidden in the score. Here we discuss general control symbols, while many more specific ones are discussed in the next section.



### HD Shorts

The (iLok) Articulate Presets for (full) Symphonic Cube libraries now include the brand-new High Definition (HD) Shorts: portato, staccato, spiccato/harsh; normal and muted with 9 velocity layers! (VSL Dimension libraries unfortunately do not offer the required samples to realize these great new sounds.) In Dorico you can conveniently select the HD shorts by the additional control direction  from the Common pane. This provides an alternative playback where the HD versions are used for short note lengths, and in case of the strings you will get an even more distinct playback since the unique HD spiccato is used for the shortest note lengths (important: due to limitations in VI pro this  mode does not work for Dimension Strings Section Players). After starting the HD mode with the control direction , it is active until ended by the control direction . The HD versions have

an impressive dynamic resolution and also a different sound character than the Standard Definition (SD) versions (used without the additional control direction **HD**). Nonetheless, they generally blend very well with them and therefore offer you an unprecedented flexibility to alter the playback.

The HD versions of short playing techniques even offer a second sampled alternative that can be obtained by overlapping notes in Dorico's Key Editor. I.e. whenever a previous note overlaps another note the alternative version is used for the second note and since these are short playing techniques extending a note generally does otherwise not affect the playback. (This does not work for staccato, since Dorico unfortunately always chooses natural notes when staccato notes overlap). In contrast to the SD versions, the HD versions do not offer automatic round robins, but, being built from repetition samples, they blend perfectly with the dedicated VSL repetition samples, discussed next, so that you can simply use these wherever notes are repeated.

## Repetitions

Standardly VSL (SD) playing techniques include two to four round robins. For even more realism when playing back many repeated notes (without the dreaded "machine gun effect") the VSL offers dedicated repetition samples with up to 9 repetitions. These are obtained by simply selecting a range of repeated notes and adding the control direction **rep.**. Just like for natural notes the Articulate Map automatically varies the playback of repetitions according to the note length. Moreover all these repetitions use speed control in VI pro (automatically selecting the appropriate one of up to three different sampled versions), for an extremely nuanced and realistic playback. There are many different sampled repetitions in the VSL and you can also directly select the particular version (**rep.** , **rep.** , ..., please see table III for details). Due to a bug Dorico cannot correctly determine the note length of measured tremolos discussed above, and you have to select the particular repetition version in this case.

## Length control symbols

Standardly, based on the note length, the Articulate Map selects the appropriate version of ordinary notes ("natural playing"), for all playing styles marked in table III below. You can enforce short notes by adding the control direction **détaché** (for both strings and winds). In addition, for full control, you also have the chance to select all different versions individually by dedicated control attributes 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 **dét. long**, **dét. short**, respectively **por. long**, **por. med.** and **por. short**, see Table III.

## Divisi made easy

Controlling the size of the instrument section and realizing divisi couldn't be any simpler than by using Articulate Presets and the Articulate Map. Standardly, the Articulate Presets of both the flexible Dimension libraries and of instruments that offer different section sizes allow you to control them by a dedicated Section Controller (adding/blending the different sampled versions).

The Articulate Map even implements standard divisi directions from the *Common* panel of the Playing Techniques Toolbox. For Dorico *Section Players* in VSL Dimension Libraries the direction **div. a 2** divides the section into two halves, so that notes are played by groups, while **div. a 3** or **div. a 4** divides it into 3 or 4 parts, so that notes are played by 2-player desks (strings) or individual

players (brass). These directions also give a similar effect for small sections in standard VSL libraries (that always also include a single player), like strings S or small wind sections. For large sections (that always also offer a smaller section) the direction **div.** yields the smaller section, which is generally perfect for divisi (e.g. for strings M, the Chamber instead of the Orchestral strings). For all other Dimension instruments or non-Dimension small sections **div.** provides a "complete divisi" so that each note is played by a single player (i.e. you rather have to use **div. a 2**, ... for standard divisi). In all these cases **unis.** returns to the full (or large) section. In contrast, for *Single Players* in non-Dimension VSL libraries the direction **tutti** gives the included small section (e.g. a 3-player woodwind ensemble), while **solo** returns back to the single player, please see table IIb in the appendix for details.

In the Dimension libraries, these directions even provide *auto-divisi* so that the different voices are automatically distributed among the players, desks or groups: e.g. if your Violin score involves a 4-voice chord (or 4 different lines) and you divide it up via the symbols **div. a 4**, the 4 voices are automatically distributed among the 4 different violin desks! I.e. you can conveniently have all players on a single stave, like in a full score, and merely insert the corresponding divisi directions 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 direction for a given instrument section, wherever its score becomes polyphonic (or you want to reduce the size). All this works fully automatically and does in particular not require Dorico's (manual) *Individual Voice Playback* mode, discussed in detail in the next chapter. 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 different staves or the Automation Lane (see below). However, you can surely also access all individual Dimension players as Single Players on different staves if you want to.

## 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 Percussion Map that makes all these instruments automatically accessible based on the score symbols shown in Table V. (It is based on the VSL drum kit ("Drums+Perc\_set\_dry") included in the Processed Percussion section of the Percussion library which includes standardly used playing techniques, but in the Dorico Playback templates everything is already set up.)

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 allows users in principle even to access the extensive content of the *entire* VSL percussion library in the rare case that a more special instrument or playing technique is needed. However, the implementation of this Extended Percussion is less intuitive and requires more effort so that it is only recommended for experienced users, as discussed in the next section.

# Advanced features of the Map






## *Turning a score into a performance ...*


This section describes the various advanced features of the Articulate Map. These are features that other Dorico implementations do not offer at all and they are not required to use the VSL to automatically play back your score. However, they allow more experienced users to adjust the playback in every detail, in order to further improve the realism and obtain results that were up to now only possible in a Digital Audio Workstation (DAW).

### Composer versus Conductor mode

The Articulate Map even offers two different modes (see table II): *Composer* and *Conductor Mode*. Composer Mode is the standard mode in which the score is fully automatically played back, as described in the previous section. 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. 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, which gives you complete flexibility to shape the sound to the level of detail you want. This is done by additional Continuous Controller (CC) instructions that determine the particular execution of the score. In contrast to other Notation software, Dorico offers the advanced Midi functionality to conveniently take advantage of this sophisticated and very musical feature.

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 cell in Articulate Presets matrices in VI pro, which is controlled by the *Vertical Controller* (CC2) and the *Horizontal Controller* (CC3). Even in Composer Mode you can nevertheless fully control the section size (CC20), e.g. to realize realistic divisi as discussed before, the dynamics via the Velocity X-fade controller (CC1), or any other standard VI controller, e.g. Humanize (CC27). In addition in Conductor Mode you can also dial the relevant matrix controllers (CC2 and CC3) yourself and thereby get full control of all the detailed recordings in the VSL. For instance you can select all lengths of sampled dynamic transitions or particular versions of recorded phrases. Beyond this, in Conductor Mode many Articulate Presets matrices even allow you to (quasi-)continuously control the nuances of the performance in Dorico's Key Editor via their unique 3D-control, as described in detail below.

Conductor Mode is activated by the direction  from the *Common* panel of the *Playing Techniques Toolbox* and is active until you specify the direction  from the *Common* panel (or / , which returns back to the standard Composer mode. In the Key Editor you can add Automation Lanes for Continuous Controllers (CC) that are sent to control the playback in more detail. You can add separate lanes choosing “add editor” and selecting the corresponding Articulate Presets Midi controller (CC2, 3, 4, 20), or any other VI pro controller, on the left. The configuration of your controllers can be stored and recalled so that you only have to set them up once. Then you can add the corresponding controller data in the various Automation Lanes 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. The resulting controller curve determines how the corresponding musical aspect changes from note to note—and in some cases even while a note is playing.

**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.

## 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 (quasi-)continuously—e.g. attack strength, vibrato intensity and section size—just like a virtuous player can do when playing an acoustic instrument. Please see the *Articulate Presets Manual* for details. To access these gradual nuances Articulate Presets automatically blend 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 playing technique and they are listed in Table VI, see also the Articulate Presets Manual for more details. The three 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 change it while a note is playing 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 very useful for divisi and 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 more detailed control and can conveniently dial the precise number of players. Although this can also be done via the Automation Lane, all available versions are even more conveniently accessed in this case with the section control symbols discussed below.

For natural and (where available) 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 . 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 Single Players within the Dimension Strings libraries CC3 continuously controls vibrato and in the Dimension Brass libraries (both Single and Section) it continuously controls muting.

The musical aspects the Vertical and Horizontal Controller control depend generally 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 partials 4 & 2), 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. For instance the **poco vib.**, **⊕** (half-muted) and **◉** (half-harmonics) playing techniques that are available in Composer mode, see Table II in the appendix, are just particular intermediate 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. 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 playing technique, 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 in as much detail as you want, 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 way you can 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. 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. I.e. you have complete freedom to shape the playback of your score in as much detail as you want.



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 either in the *Dynamics Lane* (or by directly selecting CC1). In case there are dynamic markings in your score there will already be 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. Moreover, for Dimension libraries the Humanize controller CC27 is very useful and you can set it e.g. at the beginning of each stave.

## Advanced section and string control

In addition to the standard divisi directions discussed above, the Articulate Map also implements self-explanatory section control symbols, namely simply shapes of different sizes that directly reflect the size to the instrument section that plays the following notes, that give you even more control over the size of the instrument section. These are taken from the *Choral* panel of the playing techniques toolbox (which are not used for orchestral instruments) and, like the divisi directions above, are implemented as Add-On Switches in Dorico, so that they can be used with any playing technique offering section control. For all Dorico Section Players, both in standard VSL or



Dimension Libraries,  gives you the full (or larger) section, , ,  and  intermediate section sizes ( and  e.g. for Dimension libraries a group and a desk), and  a single player (or the smaller section). In contrast, for Dorico Single Players these symbols are reversed, so that  gives the single player (e.g. the Solo Violin) and  the corresponding section (e.g. the Chamber Violins). These remain active until you specify another one of them, so that you can conveniently dial the section size at the beginning of the score. Please see table IIb in the appendix for details.

If you prefer a universal effect of section symbols across the orchestra—always decreasing the section size as you go from  to —you can also for solo instruments use the corresponding Section Players (based on the “inverted” presets). As the divisi symbols all these symbols just send particular values of the continuous Section Controller (CC20), see table IIb. For non-Dimension libraries you can also dial intermediate values to get different mixtures, as discussed before. In case of the Expressive Vibrato, Mute or Tune playing techniques these control symbols also give you easy access to the corresponding vibrato intensities, mute strengths or detuning intensities instead.

VSL libraries do not include distinct sampled second violin sections. Another great way to use section control is to obtain such distinct second violin sections by either using the two sampled sections included in non-Dimension presets (e.g. *Appassionata* and *Orchestral*) or any two distinct mixtures of them. In case you only need small section sizes you can also use the two violin groups in Dimension section presets as two distinct violin sections (see table IIb) and accordingly using groups (resulting e.g. in section sizes 4,4,3,3,2), desks or individual players for the other strings.

Section Players of the flexible Dimension libraries even offer the powerful auto-divisi feature, described above, which presents the most convenient way to realize divisi. In this case all different voices/players are realized and fully automatically distributed in a single VI pro instance (using the *Section Dimension Articulate Presets*). However, therefore all players can only use the same playing technique. If you need different voices to play different playing techniques (e.g. one voice arco and the other pizzicato), you can instead use Dorico’s *Independent Voice Playback* feature. To use it you have to enable Independent Voice Playback in the Track Inspector in Play mode. Dorico in this case automatically creates additional VI pro instances and instantiates the same Dimension Section preset in each of them (for the violins you might have to manually select the appropriate first or second version, should Dorico pick the wrong one). You can then directly select the two groups, respectively up to four individual desks/players manually for the individual voices in Dorico. This is done by assigning the clear directions **I.** or **II.** (group) , respectively **1.**, **2.**, **3.**, or **4.** (desk) to the corresponding voices, e.g. at the beginning of the score/movement, see table IIb. The voices are now independent and each can have distinct playing technique(s). Just as well you can also have the different voices on different staves by simply adding more section players to your score and analogously assigning the directions for the individual desks or groups.

For even more detailed control of Dimension libraries you can also access each Dimension player individually by using Single instead of Section Players in your Dorico score (which are realized by the distinct *Individual Player* presets for each Dimension player). This gives you complete control over the performance of each player. It can again be either done by adding them on different staves or with Dorico’s Independent Voice Playback on a single staff. In this case a distinct Dimension player is automatically added every time by Dorico and no directions are required in the score.

The Dimension Strings libraries recorded not only every single player individually, but even the complete range of each individual string, and you can choose on which string a given part is played. For the *Dimension Strings Individual Player* presets (which are obtained by adding Single Players in Dorico) this can be done for nearly all playing techniques (merely sul ponticello and sul tasto do not offer the corresponding samples) with dedicated directions from the *Strings* panel of the toolbox: **sul I** yields the first (highest) string, **sul II** the second string, **sul III** the third string, **sul IV** the fourth (lowest) string and finally **0** open strings, as standardly used in the orchestral literature, while **ord. corda** yields regular playing. For the Violins string I-IV are the E, A, D, G string for Violas and Cellos the A, D, G, C string and for the Basses the D, A, E, B, string, while the highest bass string is not individually accessible in the VSL. The individual strings naturally have a smaller range and other strings are used once you exceed this range. The Individual Player presets offer full 3D control and allow you to control two additional parameters continuously, see the Articulate Presets Manual.



As discussed, for the *Dimension Strings Section* presets (which are obtained by adding Section Players to Dorico), the above symbols control the size of the instrument section (with Articulate Presets' unique auto-divisi). These presets are the largest VI pro presets ever created and in every respect stretch the limits of VI pro (offering 2D control). Nevertheless also the section presets offer string control for all articulations included in the Standard library, listed in Table III in the column marked with "S". In this case it is accessible by analogous, distinct, but likewise standard, string control directions. Without additional symbols the regular version is used. Assigning one of the numbers **①**, **②**, **③**, **④** yield the corresponding string (again going from high to low) and **⑤** yields open strings. These directions can be ended, returning to regular playing, by the direction **ord. pos.**

For further string control, all Articulate Presets for the strings alternatively allow you to continuously control the bowing position all the way from sul ponticello via normal bowing to sul tasto. This feature is based on Articulate Presets' 3D control, see table IV. It works great for the Dimension Strings, where sul ponticello and sul tasto playing styles are sampled in particular detail. Yet, sul ponticello/tasto playing styles in VSL Dimension libraries don't offer you individual sampled strings.

## Dynamic transitions and velocity X-fade

As discussed before, Dorico automatically play back dynamic transition notated via standard notation symbols (hairpins, ...) from the Dynamics panel using the flexible "velocity X-fade" feature in Vienna Instruments pro. The velocity X-fade blends adjacent dynamic layers (4-6 for standard playing techniques and 2 for legato) to obtain a gradual and smooth transition of the sound as the dynamics increases. With velocity X-fade you can moreover also realize subtle dynamic changes an instrumentalist would automatically introduce in the course of sustained notes to significantly improve the realism of the playback by using CC1 in the Automation lane, as discussed previously.

For convenience velocity X-fade is standardly activated, so everything works automatically. However, 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 can be 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.

## Supplementary score symbols

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 mostly directions and affect all following notes.

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. These additional playing techniques can be accessed by supplementary (control) score symbols and are listed in Table IV. 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 quite 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 all 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 chooses 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 controllers 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.





## Recorded and Dorico-generated phrases




This subsection 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 the Automation Lane. In rare cases 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.

## Recorded dynamic transitions

The VSL also includes various recorded dynamic transitions that can be used to increase the realism of the playback. This is particularly useful, because with the dynamic X-fading that is used standardly for dynamic transitions it could in very exposed solo passages happen that you can sound out two instruments playing, which would not be desired. Although the recorded dynamics are less flexible, they can make quite a difference 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 toolbox. 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 (e.g. a 3s diminuendo)—while in Conductor Mode all are available.

Even when using recorded dynamic transitions, you can still keep the appropriate score representation of dynamic transitions in terms of hairpins: The above control symbols can be hidden in the score. And by temporarily turning off velocity X-fade via  (and afterwards on again by ) ordinary hairpins in the score have no effect on the playback. Yet (static) dynamic symbols like  nevertheless control the velocity and access the different velocity layers of recorded medium and light dynamics.

## 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 bug in Dorico, the general repetition version, which chooses the appropriate sound based on the note length, does not work for measured tremolos so far, but any specific 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 attribute , see Table IV.

## Recorded Trills

In addition to the standardly used Dorico generated trills, the recorded trills included in the VSL can add further realism, These are accessible by additional trill symbols with interval specifications, and

for some libraries also larger intervals or specific versions, like Baroque trills, can be selected in Conductor mode with the Vertical and Horizontal controller, see the Articulate Presets manual.

### Time-stretching & custom matrices

If the timing of a recorded phrase, interval transition, ... does not match a particular passage in your music, you can even change this via time-stretching in VI pro (which requires disk space). For legato/portamento there is already a dedicated, flexible matrix, accessed by  , that you can activate (see the Articulate Presets Manual). By using one of the custom matrices (#121-124 in VI pro), that are accessed by   ①, ...  ④, you can create a custom version of a patch or another matrix to make changes on a case by case basis. Similarly, this way you can also create your own custom matrices to permanently extend Articulate Presets and then use them in Dorico.

## Score Representation

In the score all standard musical symbols are automatically properly played back using the attributes and directions in tables I & II in the appendix. 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, which have been specifically 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 IIIc) 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 not shown in the score.

## 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 *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 the included individual instruments and playing techniques in Conductor mode using the standard combinations of score element 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). In case of playing techniques, that switch depending on the note length, it is important to select the specific version (e.g. you should choose **sus.** instead of “natural playing” to access program 1). The 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 playing technique is *sul ponticello repetitions legato*, and finally according to table IIa below in the appendix this particular playing technique (which accesses the desired program in the Combi instrument) 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 or techniques the score of the 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 to the score, that does not play back the note(s) (via *Suppress playback*), but gives you the correct score representation.

## Mixdown, positioning and reverberation

If you use a MIRx venue, the entire mixdown and reverberation works completely automatically directly within VI pro. In particular all the panning is taken care of and the various instruments appear where the various players would be seated in the corresponding venue. Articulate Presets use the *Natural Volume* feature of VI pro so that all orchestral instruments are also already

normalized to the level they would have in the corresponding venue at the simulated position. Nevertheless you can surely use Dorico's mixer to enhance or attenuate certain instruments. Moreover, since Articulate Presets use the *Synchronize* feature of VI pro you can conveniently move the *entire* VSL orchestra to any other MIRx venue by opening the VI pro instance for any instrument (pressing the corresponding  symbol in Play mode) and selecting the *Venue* in the *Reverb* tab.

In Dorico generally an overall reverb is used and the individual tracks include sends to the reverb bus. For users that do not use MIRx, we have left these sends active so that you can choose whether you want to use the reverb in VI pro or the on in Dorico. Yet, if you use MIRx where the reverb is already consistently generated for each individual instrument at the appropriate position in the corresponding venue, such an overall reverb is not required and will generally just "muddy the sound". Therefore, you should for most realistic results switch it off (or mute the track) in Dorico's mixer window!

## Shaping the instrument sound

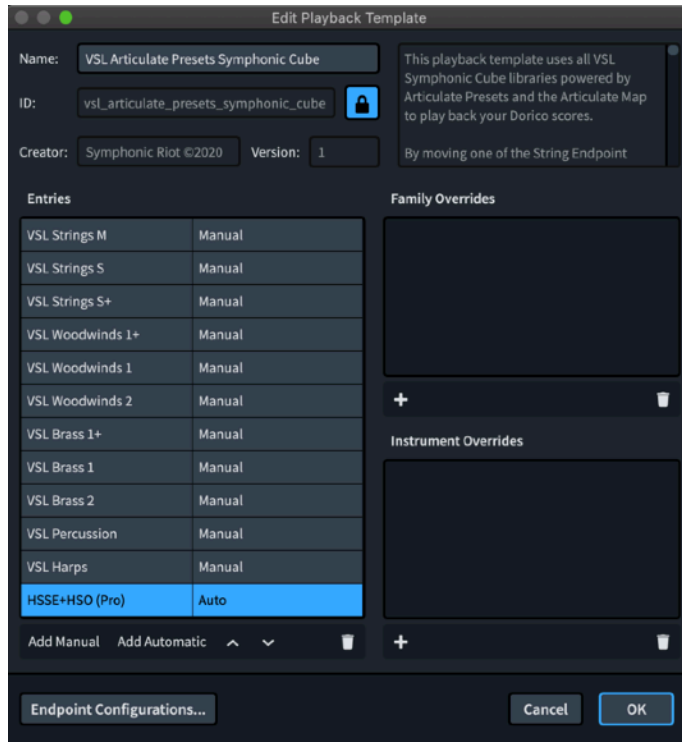
Most Articulate Presets standardly allow you to mix two different sections to control the size of the instrument section. However, this mixing of different versions can also be used to shape the sound. For instance, even if you want a large strings section it can be useful to mix in solo or chamber strings to give the sound more definition or simulate the first desks in an orchestra. This is somewhat similar to mixing different microphone positions to shape the sound, as is possible in many sample libraries (e.g. the VSL Synchron Series). However, the possibility to mix completely different sampled versions gives you even much more freedom. And taking into account that all these instruments can be consistently simulated in various different venues with MIRx you will nonetheless obtain a coherent sound, and have a huge range of possibilities to shape the sound, which so far required a DAW and was simply impossible within a Notation software.

Several instruments within the VSL offer even four different sampled libraries. For the strings there are e.g. Solo, Chamber, Orchestral and Appassionata versions, for the trumpets there are Trumpet (C), Trumpet (Bb), Trumpets (C, a3) and Fanfare Trumpets (Bb/C, a6) and for the horns there are Viennese Horn, Triple Horn, Viennese Horns (a3) and Epic Horns (a8). With a little trick the Dorico implementation allows you even to mix all these distinct versions to shape the sound in even more detail! Simply add both the appropriate solo and section version of the corresponding instrument to your Dorico score and you can obtain any desired mixture (using the *Strings L Section* Endpoint Configuration, or adding the *Tenor Horn* respectively *Tenor Trumpet* as solo instrument). Then copy the corresponding stave so that both the solo and the section stave play the same and adjust the two faders in Dorico's mixer and the Section Controller (CC20) in the Automation Lane or use the dedicated score symbols to dial the required mixture between the up to four different versions. Finally you can merely add either of the two staves to the printed version of the score.

## 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 distinguished 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 or in order to access recorded second instruments

directly. 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 all the implemented instruments, you can use in Dorico, are shown in Table I in the Appendix.

To create a custom Playback Template you can create a new or copy an existing template and then edit it by pressing the pencil button. In the list (see figure) simply remove and add libraries so that the list reflects the VSL libraries you use. E.g. if you purchased several Articulate Presets packages you should combine them into a

single Playback Template (via “Add Manual”). Dorico uses a given instrument from the Endpoint Configuration it is first defined in, so it can be necessary to reorder them with the arrows. The Playback template should include all the Endpoint Configurations for libraries you actually use but no others so that Dorico can use the Halion Symphonic Orchestra version (included as last entry).

Many of the included Playback Templates can be configured. These include several alternate Endpoint Configurations and you can select the appropriate one by *moving it to the upper position*.

- In the Symphonic Cube Template you can select which of the included section string libraries (Orchestral or Chamber) you want to use by moving Strings M or Strings S Section(+) above
- For Strings S and D, there are Endpoint Configurations for solo and section string players, so that you can easily combine different libraries (e.g. Strings L sections and Strings D solo players)
- Several libraries include recorded second solo instruments supplementing first instruments in other libraries and there are dedicated Endpoint Configurations marked with a + that allow you to use both first and second instruments instead of merely different MIRx settings. In case of the Strings S they add Violin 2 and Cello 2, in case of Woodwinds 1 and S, Flute 2 and Viennese Oboe as well as Clarinet 2 and Bassoon 2, while for Brass 1 and S, the Triple Horn and the Bb Trumpet. If you want to use all, the order of the Endpoint Configurations should be S+, 1+, 2.



- The Strings S Section+ Endpoint Configurations also offers distinct first and second violin sections when mixing in corresponding solo instruments as "first desks"
- The new Complete Package in addition includes Endpoint Configurations that contain *all* Single Players included in both the Symphonic Cube and Dimension libraries (see table I for details)
- The Solo Strings and Basic Orchestra Playback Templates include Endpoint Configurations for the Vienna Imperial, while Symphonic Cube and Large Orchestra also for the VSL Harpsichord. You can activate them by moving them above the HSO in case you use these libraries.

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 Playback Templates and then choose the one you want in a given score (e.g. to conveniently choose between different String sections).

Dorico at present does, as far as the playback is concerned, not properly distinguish between different versions of the same instrument in different keys (e.g. C and Bb trumpet or Bb and Eb clarinet). I.e. it will play both Bb and C trumpets arising in the score by either of these trumpet instruments, depending on which of them arises in the first Endpoint Configuration in the selected Playback Template. There are auxiliary instruments that allow you to access the alternate version (see table I below).

## Using Vienna Instruments libraries without Articulate Presets support

Articulate Presets and the Articulate Map already cover *all* contemporary orchestral instruments included in the vast Vienna Instruments Series, representing the worlds largest sample database. However, there are still a few Vienna Instruments libraries that are not covered at this point, like Voices, Historical Instruments or more Jazz-oriented instruments. In order to give Articulate Presets users that own these libraries the chance to use most of them in the same common framework within Dorico, we have developed the *VSL Compatibility Map* that is free to all registered users of Articulate Presets. In contrast to the vast Articulate Map, the Compatibility Map does not rely on dedicated Articulate Presets for these instruments but uses the *Vlpro* factory presets that come with the VSL library. Both these presets as well as the VSL Compatibility Map are surely much more basic (~25 compared to 1000+ switches) and only cover key playing techniques (roughly what is included in VSL standard libraries), please see Table VII in the Appendix for details. Moreover, the VSL Compatibility Map does not offer continuous control or other features that enable the very varied playback the Articulate Map offers. In particular it is not possible to shape the sound in detail as can be done with Articulate Presets. Nevertheless, also the Compatibility Map chooses between a small range of different versions depending on the note length and uses the same score symbols (e.g. **rep.** to select repetition symbols). This way you can use most VSL libraries in this common framework and have access to a huge arsenal of (even very specialized) instruments, that is completely unmatched by any other Dorico implementation.

For VSL libraries supported by Articulate Presets there are preconfigured Playback Templates, so that everything is already set up. In contrast, in order to set up the VSL Compatibility Map for one of your other VSL Vienna Instruments series libraries, that are not supported by Articulate Presets, requires more experience with Dorico. You have to create an Endpoint Configuration and then include it into your Playback Template. Please see the Dorico manual for details on how to do this.

# 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 sections. Solo instruments marked by a star are not based on distinct samples but merely use different MIRx placement and settings. Aside from second violins, other section instruments marked with a star are merely replacement instruments that actually use the corresponding solo instrument. To access second instruments directly, there are also several replacement instruments. Endpoint configurations with an additional “-“ at the end include the standard library versions of the presets. In addition there are Endpoint Configurations “VSL Piano” and “VSL Harpsichord” containing the Vienna Imperial and the Harpsichord from the Special Keyboards Collection.

Table IIa 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. Table IIb lists the general add-on symbols to control the sections size, to choose the string for Dimension Solo Players and to switch velocity X-fade on (necessary for Dorico dynamics) or off.

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. These are all attributes unless explicitly indicated. The precise order/ placement is generally 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 played VSL playing technique.

Tables 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 V shows the instruments as well as the score symbols for the playing techniques implemented in the Articulate Percussion Map. For all other Percussion instruments and playing techniques included in the VSL Percussion library see the section *Extended Percussion* above.

Table VI 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 VII finally lists the basic playing techniques implemented in the VSL Compatibility Map that allows users to use their VI libraries, for which dedicated Articulate Presets are not available, in the same common framework. Yet, note that this requires to create corresponding Endpoint Configurations for these libraries first.

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

<b>Endpoint Configuration</b>	<b>Supported VSL Libraries</b>	<b>Implemented Dorico Instruments [VSL instrument]</b>
VSL Strings S		legacy, replaced by the Endpoint Configurations below
VSL Strings S Solo	Solo & Cham. Strings I & II	Violin 1, Violin 2*, Viola, Violoncello, Contrabass
VSL Strings S Section	Cham. & Solo Strings I & II	Violins 1, Violins 2*, Violas, Violoncellos, Contrabasses
VSL Strings S Solo+	Solo & Cham. Strings I & II + Solo Violin 2 & Cello 2	Violin 1, Violin 2, Viola, Violoncello, Violoncello 2, Contrabass; Violin 3*; Treble Viol [Violin 2], Bass Viol [Cello 2]
VSL Strings S Section+	Cham. & Solo Strings I & II	Violins 1, Violins 2, Violas, Violoncellos 1 & 2, Contrabasses
VSL Strings M	Orch. & Cham. Strings I & II	Violins 1, Violins 2*, Violas, Violoncellos, Contrabasses
VSL Strings L	Orch. & App. Strings I & II	Violins 1, Violins 2*, Violas, Violoncellos, Contrabasses
VSL Strings D Section	Dimension Strings I - III + Ponticello Bonus	Violins 1, Violins 2*, Violas, Violoncellos, Contrabasses;
VSL Strings D Player		legacy, replaced by the Endpoint Configurations below
VSL Violins D Player	Dimension Strings I - III +	Violin 1-8 [Dimension], Violin 9*-16* [Dimension Seconds], Treble Viol 1*-8* [Second Dimension Violin 1*-8*]
VSL Violins C Player	Solo Strings I & II, Violin 2, Dimension Strings I - III +	Violin 1 [Solo], 2 [Second], 3-10 [Dimension], 11* [Solo], 12*-19* [Dimension], Treble Viol 1* [2. Solo], 2*-9* [2. Dimension]
VSL Violas D Player	Dimension Strings I - III +	Viola 1-6 [Dimension]
VSL Violas C Player	Solo Strings I & II, Dimension Strings I - III +	Viola 1 [Solo], Viola 2-7 [Dimension]
VSL Cellos D Player	Dimension Strings I - III +	Violoncello 1-6 [Dimension]
VSL Cellos C Player	Solo Strings I & II, Cello 2, Dimension Strings I - III +	Violoncello 1 [Solo], 2 [Second], 3-8 [Dimension]
VSL Basses D Player	Dimension Strings I - III +	Contrabass 1-4 [Dimension]
VSL Basses C Player	Solo Strings I & II, Dimension Strings I - III +	Contrabass 1 [Solo], 2-5 [Dimension]
VSL Woodwinds 1		legacy, replaced by the Endpoint Configurations below
VSL Woodwinds 1 Solo	Woodwinds I	Flute, Oboe [French], Clarinet (Bb), Bassoon; Flute 2*, Oboe 2* [French], Clarinet (Bb) 2*, Bassoon 2*
VSL Woodwinds 1 Section	Woodwinds I	Flutes, Oboes [Viennese], Clarinets (Bb), Bassoons
VSL Woodwinds 1 Solo+	Woodwinds I & II	... ; Flute 2, Oboe 2 [Viennese], ..., Flute 3*, Oboe 3*
VSL Woodwinds 2	Woodwinds II	Piccolo, Flute [2.], Alto Flute, Oboe [Viennese], English Horn [French], English Horn 2 [V.], Clarinet (Eb), Bass Clarinet, Contra Bassoon; Treble Flute [2.], Baritone Oboe [V.], Alto Clarinet [Eb]
VSL Woodwinds S	Special Woodwinds, Clarinet (Bb) 2 & Bassoon 2	Bass Flute, Oboe d'Amore, Heckelphone, Contrabass Clarinet, Basset Horn; Clarinet (Bb) [2.], Bassoon [2.]; Clarinets (Bb) [2.], Bassoons [2.]; Contra-Alto Clarinet [2.], Mini-Bassoon [2.]
VSL Woodwinds S+	... , + Woodwinds I	... ; Clarinet (Bb), Bassoon, Clarinet (Bb) [2.], Bassoon [2.]; ...
VSL Woodwinds C Solo	Woodwinds I & II, Clarinet (Bb) 2 & Bassoon 2	Flute 1, 2 [Second], 3*; Oboe 1 [French], 2 [Viennese], 3*; Clarinet (Bb) 1, 2 [Second] 3*; Bassoon 1, 2 [Second], 3*

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

Endpoint Configuration	Supported VSL Libraries	Implemented Dorico Instruments [VSL instrument]
VSL Brass 1		legacy, replaced by the Endpoint Configurations below
VSL Brass 1 Solo	Brass I	Trumpet (C), Horn (F) [Viennese], Trombone, Tuba, Trumpet (C) 2&3*, Horn (F) 2-4* [Viennese], Trombone 2*
VSL Brass 1 Section	Brass I	Trumpets (C), Horns (F) [Viennese], Trombones, Tubas*
VSL Brass 1 Solo+	Brass I & II	... , Horn (F) 2 [Triple], 3* [V.], 4* [T.], 5&6* [V.], 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]; Bass Trombones*, W. Tubas*
VSL Brass S	Special Brass, Trumpet (Bb) [normal+muted], Flugelhorn	Cornet, Alto Trombone, Euphonium, Trumpets [Fanfare]; Flugelhorn, Trumpet (Bb) [2.], 2* (Bb) [2.]; Tenor Trumpet [2.], Tenor Trumpets [2.]
VSL Brass S+	... , + Brass I	... , Trumpet (C), 2 (Bb) [2.], 3* (C), 4* (Bb) [2.], 5* (C), Trumpets (C); ...
VSL Brass D Section	Dimension Brass I & II	Trumpets (Bb), Horns (F), Trombones, Tubas [Low Brass], Wagner T.
VSL Brass D Player		legacy, replaced by the Endpoint Configurations below
VSL Trumpets D Player	Dimension Brass I & II	Trumpet (Bb) 1-4 [Dimension]
VSL Trumpets C Player	Brass I, Trumpet (Bb), Dimension Brass I & II	Trumpet (Bb) 1, 2-5 [Dimension], 6* (Bb); Trumpet (C) 7, 8*,9* [Cube]
VSL Horns D Player	Dimension Brass I & II	Horn (F) 1-4 [Dimension]
VSL Horns C Player	Brass I & II, Dimension Brass I & II	Horn 1 [Vienna], 2 [Triple], 3-6 [Dimension]; 7*-9* [Vienna], 10*-12* [Triple]
VSL Trombones D Player	Dimension Brass I & II	Trombone 1-4 [Dimension], Trombone 5&6 [D low], Bass Trombone 1 [D low]
VSL Trombones C Player	Brass I & II, Dimension Brass I & II	Trombone 1 [Cube], 2-5 [Dimension], 6&7 [D low], Trombone 8* [Cube]; Bass Trombone 1 [Cube], 2 [D low], 3* [Cube]
VSL Tubas D Player	Dimension Brass I & II	Tuba 1 [Dimension low], Wagner Tubas 1-4 [Dimension]
VSL Tubas C Player	Brass I & II, Dimension Brass I & II	Tuba 1 [Cube], 2 [Dimension low]; Wagner Tuba 1 [Cube], 2-5 [Dimension]
VSL Percussion		legacy, replaced by the Endpoint Configurations below
VSL Timpani	Percussion	Timpani, Timpani 2*, Timpanis*
VSL Percussion Kit	Percussion	Toms, Floor toms, Snare Drum, Bass Drum, Tambourine, Suspended Cymbal, Crash Cymbal [Piatti], Tam-tam, Triangle, Jam Blocks [Rails], Whip, Anvil [Hammer]
VSL Extended Percussion	Percussion	Accordion [Drums], Bandoneon [Percussion], Electric Piano [Bells], Honky-Tonk Piano [Mallets], Keyboard [Cymbals&Gongs]
VSL Mallets		legacy, replaced by the Endpoint Configuration below
VSL Mallets & Bells	Percussion	Celeste, Glockenspiel, Vibraphone, Marimba, Xylophone; Glockenspiel 2*; Tubular Bells
VSL Harps	Harps	Harp, Harp 2; Harps*
VSL Piano	Vienna Imperial	Piano
VSL Harpsichord	Special Keyboards	Harpsichord

Table II (a): General playing styles

Score	Score element		Type	VSL playing style	Ended by Score element
	>	+ additional score elements	attribute	accent (sound change for all playing techniques marked under A)	
	vib.	+ additional score elements	direction	vibrato (available for all playing techniques marked under V)	ord. vib.
	poco vib.	+ additional score elements	direction	light vibrato (available for all playing techniques marked under V)	ord. vib.
	senza vib.	+ additional score elements	direction	no vibrato (available for all playing techniques marked under V)	ord. vib.
	con sord.	+ additional score elements	direction	muted/con sordino (available for all playing techniques marked under M)	senza sord.
	⊕	+ additional score elements	direction	half-muted (available for all playing techniques marked under M)	or open
	⊙	+ additional score elements	direction	harmon mute (trombone only, available for playing techniques marked under M)	or ○
	o	+ additional score elements	attribute	artificial harmonics / flageolet (available for playing techniques marked under H)	
	◦	+ additional score elements	attribute	half-harmonics (available for all playing techniques marked under H)	
	sul pont.	+ additional score elements	direction	sul ponticello (available for all string playing techniques marked under P)	ord. pos.
	sul tasto	+ additional score elements	direction	sul tasto (available for all string playing techniques marked under T)	ord. pos.
	clusters	+ additional score elements	direction	clusters (available for playing techniques marked under C)	ord.
	HD	+ additional score elements	direction	High Definition (available for short playing techniques marked under D)	SD
	©	+ additional score elements	direction	Conductor mode (available for all playing techniques marked under ©)	└
	fast	+ additional score elements	attribute	fast (available for performance playing techniques (leg. & rep.) marked under I)	
	med.	+ additional score elements	attribute	medium (available for performance playing techniques marked under I)	
	slow	+ additional score elements	attribute	slow (available for performance playing techniques, pizz. & trem. marked under I)	
	⓪	+ additional score elements	direction	open string (for Strings D Section playing techniques marked under S)	ord. pos.
	①	+ additional score elements	direction	string 1: E (Violin), A (Viola/Cello), D (Bass) (Strings D section techniques under S)	ord. pos.
	...			string 2: A (Violin), D (Viola/Cello), A (Bass)	
				string 3: D (Violin), G (Viola/Cello), E (Bass)	
				string 4: G (Violin), C (Viola/Cello), B (Bass)	

Table II (b): Add-on control symbols (Alternate ones from the Choral panel)

	Divisi symbol	non-Dimension libraries	String symbol	Dimension libraries	Alternate	Controller value
Section Player	<b>unis.</b>	large (strings L,M,TR-L,HO-L) / small section (strings S, winds)		full section (all players), <i>auto-divisi</i>		Section CC20 = 0
		intermediate section size / three-quarters of the section		VI: 6, VA & VC: 4, DB & brass: 3, <i>auto-divisi</i>		Section CC20 = 32
	<b>div. a 2</b>	intermediate section size / half of the section		group (half of the section), <i>auto-divisi</i>		Section CC20 = 63
		intermediate section size / a third of the section		VI: 3, <i>auto-divisi</i>		Section CC20 = 80
	<b>div. a 3</b>	intermediate section size / quarter section		desk (VI,VA,VC), player (brass), <i>auto-divisi</i>		Section CC20 = 98
	<b>div. a 4</b>			desk (VI), player (brass), <i>auto-divisi</i>		
	<b>div.</b>	small section / single instrument		single player, <i>auto-divisi</i>		Section CC20 = 127
	<b>I.</b>	—		group 1		Section CC20 = 34
	<b>II.</b>	—		group 2		Section CC20 = 38
	<b>1.</b>	—		desk/player 1		Section CC20 = 84
	<b>2.</b>	—		desk/player 2		Section CC20 = 88
	<b>3.</b>	—		desk/player 3		Section CC20 = 92
	<b>4.</b>	—		desk/player 4		Section CC20 = 96
Solo Player	<b>solo</b>	solo instrument	<b>ord. corda</b>	regular playing (for Strings D Player)		Section CC20 = 0
		a quarter of the section	<b>sul IV</b>	string IV (for Strings D Player): G (Violin), C (Viola/Cello), B (Bass)		Section CC20 = 32
		half of the section	<b>sul III</b>	string III ((for Strings D Player): D (Violin), G (Viola/Cello), E (Bass)		Section CC20 = 63
		two-thirds of the section	<b>sul II</b>	string II (for Strings D Player): A (Violin), D (Viola/Cello), A (Bass)		Section CC20 = 80
		three-quarters of the section	<b>sul I</b>	string I (for Strings D Player): E (Violin), A (Viola/Cello), D (Bass)		Section CC20 = 98
	<b>tutti</b>	small section	<b>0</b>	open strings (for Strings D Player)		Section CC20 = 127
All		velocity X-fade (on)		velocity X-fade (on)		X-fade CC28 = 127
		velocity X-fade ending (off)		velocity X-fade ending (off)		X-fade CC28 = 0

Table III (a): General playing techniques

Score	Score elements	©	M	P	T	H	D	S	C	V	I	A	Note Length	VSL Playing Technique
	("natural" playing)	1	7	61	x	70+	109+	109+	68	x			Very Long	sustained
		3	x	x	x	x	x		x	x			Long	long portato / sustained fast
		5	77	x	x	x	x		x	x			Medium	medium portato / long detache
		6	78	x	x	x	x						≤ Short	short portato / short detache
	<b>sus.</b>	1	73						x	x				sustained
	<b>prog. vib.</b>	(direction, end: <b>ord. vib.</b> )	2	74										sustained progressive vibrato
	<b>esp. vib.</b>	(direction, end: <b>ord. vib.</b> )	4	76										sustained expressive vibrato (xVib) / xMute / xTune
	<b>rep.</b>	(or <b>—</b> ...)	1	73	61	x	70		x				Very Long	sustained
	(direction, ends by <b>ord.</b> but best to apply range)	36	92	35	x	33		x					Long, Med.	legato repetitions (speed c.)
		x	94					x					≤ Short	portato repetitions (speed c.)
		24	86	68				115+	66	x	x	x	(116)	interval legato & perf. trill (speed controlled)
		15	87							x				interval marcato (speed controlled)
	<b>prog. vib.</b>	14	66											legato progressive vibrato / legato espressivo
	<b>esp. vib.</b>	16	88											legato expressive vibrato / xMute / xTune (speed cont.)
		19												legato time-stretched
	<b>rep.</b>	25	92	35	x	33		114+		x	x		(115)	legato repetitions (speed controlled)
	<b>•</b>	8	8	63	x	71+	111+	x	69	x	x		≥ Short	staccato
		0+		(67)		(112)								
		9								x			Very Short	staccato short
	<b>trill</b>	18	90											performance trill
	<b>rep.</b>	29	96						67	x				staccato repetitions (speed controlled)
	<b>rep. portato</b>	27	94					x	72	x	x			portato repetitions (speed controlled)
	<b>fp</b>	49	75					118+	62	x	x		(119)	fortepiano
	<b>sfz</b>	51	x	64	x			x	70	x	x			sforzato
	<b>sfz</b>	53	x							x				sforzatisissimo

Table III (b): String playing techniques

Score	Score elements	©	M	P	T	H	D	S	V	I	A	Note Length	VSL Playing Technique
	<b>détaché</b>	(direction, end: <b>ord. son.</b> )	5 6	77 78	62	x		110+ (112)	x	x		≥ Medium ≤ Short	long detache short detache
	<b>dét. long</b>		5	77					x	x			long detache
	<b>dét. short</b>		6	78			109+ (110)			x			short detache
	<b>^</b>		7										espressivo / marcato
	<b>!</b>		9										short staccato
	<b>—</b>	<b>sul</b>	22										interval legato sul (forcing a particular string)
	<b>—</b>	<b>slur</b>	13	x						x			interval legato slurred (speed controlled)
	<b>—</b>	<b>/</b>	21	x		x				x			interval portamento
	<b>—</b>	<b>détaché</b>	23										interval detache
	<b>—</b>	<b>sfz</b>	20										legato sforzato / zigane / tune
	<b>spicc.</b>	(direction, end: <b>ord. son.</b> )	17	89			113+ (114)	120		x			(interval) spiccato (speed controlled)
	<b>martelé</b>	(direction, end: <b>ord. son.</b> )	x				x						(interval) harsh
	<b>rep.</b>	<b>spicc.</b>	30	95		31	x			x			spiccato repetitions
	<b>rep.</b>	<b>martelé</b>	31				x						harsh repetitions
	<b>rep.</b>	<b>bow vib.</b>	26							x			bow vibrato repetitions
	<b>♯</b>		12 (11)	84	65	x 67	72 x			x	x		tremolo tremolo slow )
	<b>♯</b>	<b>♯</b>	23										interval tremolo
	<b>pizz.</b>	(direction, end: <b>ord. son.</b> )	10	82				113	x			≤ Medium, ≥ Long	pizzicato, pizzicato slow
	<b>rep.</b>	<b>pizz.</b>	28						x				pizzicato repetitions (speed controlled)
	<b>col legno</b>	(direction, end: <b>ord. son.</b> )	x									≤ Medium, ≥ Long	col legno, col legno slow
	<b>⊙</b>		x										snap pizzicato
	<b>flautando</b>	(direction, end: <b>ord. pos.</b> )	68							x			flautando



Table III (c): Wind, Percussion & Custom playing techniques

Score	Score elements		©	M	C	D	V	A	Note Length	VSL Playing Technique
	por. long		3	62			x	x		long portato
	por. med.		5	77	65		x	x		medium portato
	por. short		6	78		109+ (110)		x		short portato
			7							marcato / blared
		sus.	22							legato sustained
			20							legato grace / tune
	ft.	(direction, end: <b>ord. son.</b> )	12	84	63					fluttertongue
	ft.		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		72							rip
	rip		x							rip with fall release
	multiphonic		69							duo- (BTR, CTB), multi- phon.(CL2),low FX(CBA)
	p.d.l.t.	(direction, ends by <b>ord.</b> )	61							pres de la table
			72							damped
		, ...	121, ...							custom matrices 1-4

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

Score	Symbols	Vertical	Horizontal	©	M	P	T	H	V	VSL Playing Technique
										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
		<b>fast</b>	version 1-6	63						mordents staccato up
		<b>fast</b>	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
		<b>fast</b>	maj.   min.   chr.   w.t.	key: C   ...   B	43					recorded runs fast/spiccato upwards
		<b>fast</b>	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	I	VSL Playing Technique
							Dorico generated measured tremolo eighth
							Dorico generated measured tremolo sixteenth
		<b>fast</b>		41	93		recorded fast repetitions (fast measured tremolo)
			sequencer pattern	97	98		sequencer repetitions
	<b>rep.</b>	<b>-</b>		32	x		upbeats 1 repetitions
	<b>rep.</b>	<b>=</b>		34	x		upbeats 2 repetitions
	<b>-</b>		tempo	48	66		upbeats 1
	<b>=</b>		tempo				upbeats 2
	<b>≡</b>		tempo				upbeats 3
<b>por. long</b>							Dorico generated chromatic glissandi
			interval: 2.  ...  oct.	—	44		glissandi upwards
			interval: 2.  ...  oct.	—	44		glissandi downwards
		<b>fast</b>	interval: 2.  ...  oct.	—	45		glissandi fast upwards
		<b>fast</b>	interval: 2.  ...  oct.	—	45		glissandi fast downwards
		<b>slow</b>	7. maj.   min.   6.   5.   4. maj.   min.   dim.	key: C   ...   B	67		harp glissandi slow upwards
		<b>slow</b>	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
		<b>fast</b>	7. maj.   min.   6.   5.   4. maj.   min.   dim.	key: C   ...   B	69		harp glissandi fast upwards
		<b>fast</b>	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 Playing Technique
							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
		<b>fast</b>	maj.  min.  dim.  aug.	key: C   ...   B	47		recorded arpeggios staccato/fast upwards
		<b>fast</b>	maj.  min.  dim.  aug.	key: C   ...   B	47		recorded arpeggios staccato/fast downwards
		<b>legato</b>	maj.  min.  dim.  aug.	key: C   ...   B	64		recorded arpeggios legato upwards
		<b>legato</b>	maj.  min.  dim.  aug.	key: C   ...   B	64		recorded arpeggios legato downwards
		<b>legato</b>	<b>fast</b>	maj.  min.  dim.  aug.	key: C   ...   B	65	recorded arpeggios legato upwards fast
		<b>legato</b>	<b>fast</b>	maj.  min.  dim.  aug.	key: C   ...   B	65	recorded arpeggios legato downwards fast
		<b>spicc.</b>					string arpeggios upwards
		<b>spicc.</b>					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
		<b>fast</b>	maj.  min.  dim.  aug.	key: C   ...   B	66		3-note harp arpeggios fast upwards
		<b>fast</b>	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 IV (d): Control symbols to access dynamics

Score	Score elements	©	M	P	T	C	V	Note Length	VSL Playing Technique
		...							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 diminuendo 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	P	I	Note Length	VSL Playing Technique
		fast	<					fast repetitions crescendo
		fast	>					fast repetitions diminuendo
								sequencer repetitions dynamics
	rep.		<					legato repetitions crescendo
	rep.		>					legato repetitions diminuendo
	rep.	portato	<					portato repetitions crescendo
	rep.	portato	>					portato repetitions diminuendo
	rep.		<					staccato repetitions crescendo
	rep.		>					staccato repetitions diminuendo
	rep.	spicc.	<					spiccato repetitions crescendo
	rep.	spicc.	>					spiccato repetitions diminuendo
	rep.	martelé	<					harsh repetitions crescendo
	rep.	martelé	>					harsh repetitions diminuendo
	rep.	bow vib.	<					bow-vibrato repetitions crescendo
	rep.	bow vib.	>					bow-vibrato repetitions diminuendo
	rep.		<					upbeats 1 repetitions crescendo
	rep.		>					upbeats 1 repetitions diminuendo
	rep.		<					upbeats 2 repetitions crescendo
	rep.		>					upbeats 2 repetitions diminuendo

Table V: Unpitched percussion instruments and playing techniques

Instrument	Score	Symbols	VSL Playing Technique
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
			roll hard / soft
Tambourine		L (or natural) / R	hit open variation 1 / 2
		L / R +	hit muted variation 1 / 2
			normal / thumb tremolo
Suspended Cymbal		(natural) / soft	hit hard / soft mallet
			hit stick
			tremolo hard / soft mallet
Crash Cymbal (Piatti)		(natural)	hit normal
			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: 3D control

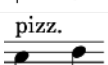

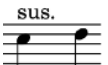
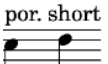
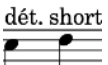
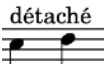


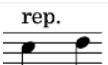

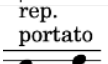
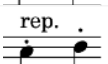
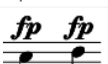
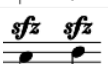

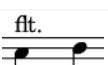
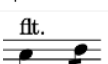
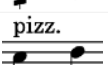
Score	VSL Articulation	Vertical (CC2)	Horizontal (CC3)	Section (CC20)
	normal ("natural playing")	attack behavior (sus. <> long portato <> marcato)	vibrato intensity (strong <> light <> no vibrato)	section size (solo <> section, ...)
	normal expressive vibrato	attack behavior (sustained <> long portato)	—	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 AP 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, ...)
	repetition	legato <> portato <> staccato	—	section size (solo <> section, ...)
	tremolo	attack behavior	tremolo intensity (tremolo <> normal)	section size (solo <> section, ...)
	fluttersongue	—	fluttersongue intensity (fluttersongue <> 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, ...)



Table VII: Playing techniques implemented by the VSL Compatibility Map

Score	Score elements	V	Note Length	VSL Playing Technique
	("natural" playing)	x	≥ Medium	sustained
			≤ Short	portato short / detache short
	<b>sus.</b>	x		sustained
	<b>por. short</b>	(winds)		portato short
	<b>dét. short</b>	(strings)		detache short
	<b>détaché</b>	(strings, direction, ended by <b>ord.</b> )		detache short
	<b>•</b>			staccato
	<b>—</b>			interval legato
	<b>rep.</b>	(direction, ended by <b>ord.</b> )	Very Long	sustained
			Long, Medium	legato repetitions
			≤ Short	portato repetitions
	<b>rep.</b>	<b>—</b>		legato repetitions
	<b>rep.</b>	<b>portato</b>		portato repetitions
	<b>rep.</b>	<b>•</b>		staccato repetitions
	<b>fp</b>			fortepiano
	<b>sfz</b>			sforzato
	<b>♯</b>			tremolo / fluttertongue
	<b>flt.</b>	(winds, direction, ended by <b>ord.</b> )		fluttertongue
	<b>flt.</b>	<b>♯</b>		fluttertongue
	<b>pizz.</b>	(strings, direction, ended by <b>ord.</b> )		pizzicato