

Cubase Articulate Maps for Articulate Presets

Complete integration of the VSL into Cubase



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User manual

3rd Edition

Introduction

What are Cubase Expression Maps?

The *Cubase Articulate Maps* completely integrate Articulate Presets into Cubase and allow you to select *all* playing techniques included in the Vienna Symphonic Library (VSL) via Cubase's convenient *Expression Map* feature.

A Cubase Expression Map is a set of *Articulation Definitions*, that allow you to control the different playing techniques and versions included in an orchestral library within Cubase. An Articulation Definition includes up to four different identifiers—either score symbols or text specifications: in Cubase and this manual these are called *Articulations*. They can be assigned to a note and together determine the particular sound this note will play. They are divided up into four groups and at most one articulation from each group can be assigned. When you assign the appropriate articulations to a note, Cubase automatically sends all required Midi events to select the corresponding playing technique in VI pro before the note is played. Articulations in Cubase can be either *attributes* that affect only a single note or *directions* that affect all following notes until another one is specified.

With over 100 articulations (i.e score symbols and text specifications) and over 2500 individual Articulation Definitions, the Articulate Maps are very likely the most detailed Expression Maps ever created! There are two distinct Cubase Articulate Maps: The *Composer Map* offers maximum convenience and allows you to access *every* individual articulation version included in the VSL conveniently in Cubase, e.g. via clear score symbols like a composer—without the need for any additional control events. The *Conductor Map* offers maximum control and gives you complete control of your orchestra, like a conductor, to even to control the nuances of the performance by additional continuous controllers (CC) via Articulate Presets's signature *3D-control*.

While recording the Cubase Articulate Maps encode the active playing technique, depending on external control Midi events, automatically in the recorded note. Thereby these playing techniques are e.g. automatically properly displayed in the score. Both the Composer and the Conductor Map come in two versions that allow you to either access all 128 different playing techniques by program change messages or the most important ones by one octave of dedicated key switches.

Setup

What you need to do to get started

To install the Expression Maps, simply copy them anywhere on your disk. Within Cubase select *Expression Map Setup...* from the *MIDI* menu. Press the *Load* button at the bottom of the left panel, locate the appropriate Expression Map in the file dialog and press the *Open* button. Finally, you have to assign the Expression Map for each instrument track in the Expression Map section of the *Inspector*. Now you can access the entire VSL conveniently from within Cubase. Enjoy!

Features of the Articulate Map

How to integrate the VSL into Cubase

Standardly Articulate Presets allow you to access all playing techniques included in the VSL via 128 program change messages, and all the different versions of an articulation by additional continuous controller events. The Cubase Articulate Maps further simplify the handling dramatically and allow you to access *all* articulations and the Composer version even *all* their different versions directly and conveniently in Cubase's various editors via standard musical symbols (like “^” for marcato) and clear text (like “con sord.”, “slow” or “2s”)—yes, we really mean *everything* included in VSL full libraries! I.e. no additional Midi events besides the notes are required and you do not have to memorize program change numbers and controller assignments to access all sounds—including phrases realized via VI pro's Auto Playback and Pattern (APP) sequencer. The VSL is still unmatched when it comes to recorded dynamic transitions, phrases, They can strongly increase the realism, but for most users they likely sit unused on their disk since up to now they required a significant effort. With Articulate Presets and the Composer version using them couldn't be simpler: E.g. you can conveniently select a recorded fast minor upwards run in G# by selecting the score symbol “↑”, representing an upwards run, and the three text attributes “fast”, “min.” and “6/G#” from the list—or similarly the third version of a downward whole tone run realized within the APP sequencer by selecting “↓”, “whole” and “III”. As you can see the usage is completely self-explanatory. For convenience all implemented score symbols and text identifiers are shown in Fig. I in the appendix, where they are ordered according to their group. For completeness Table III provides the full list of possible articulation combinations to access all versions of playing techniques included in the VSL.

Wherever possible, the Articulate Maps adapt the conventions of the VSL factory map to make it easy for users that have used it before. I.e. the score symbols and text instructions defined there are also available in the Articulate Maps, but the Articulate Maps introduce many more and give you thereby far more control over the performance of your music. For instance, whereas the VSL factory Expression Map implements only a single portato or detache version “-” (which switches short and long detache based on the playing speed), the Articulate Maps give you full access to all three sampled portato versions (short, medium and long) included in the VSL.

Just as the VSL factory map, the Articulate Maps define both attributes and directions. Most articulations are attributes that affect a particular note. However, articulations that access performance interval or repetition patches, and therefore inherently involve several notes (and their transitions), are implemented via directions, that you have to specify before the corresponding group of notes. The same holds for special playing styles that typically affect a whole part, like muted (“con sord.”), as well as different vibrato versions. For a nice score image the new definitions avoid technical terms related to the sample library implementation and use “musical” descriptions, just like the definitions in the VSL factory map.

In the Cubase Articulate Maps directions are available in groups 1, 3 and 4. There can be one active direction in each group at a time (e.g. both “legato”, “con sord.” and “sensa vib.”). In Cubase directions affect all following notes from the point on where a direction is given to the point where

any other articulation—either direction or attribute—from the same group is specified. E.g. if you specify “molto vib.” (from group 4) and afterwards use a crescendo (which generally requires length specification from group 4), you will have to specify “molto vib.” again if you want it to continue.

As shown in Fig. 1, in the first group the available directions are “detache”, “portato:”, “pizz.”, “col legno”, “legato”, “portamento” “marcato”, “spiccato” and “trill” (specifying the performance trill articulation—recorded trills are obtained by trill-symbols as note attributes). If you want to change from *any* of these playing styles to a sustained articulation (which does not require an articulation from group 1), choose the direction “non leg.”.

In the third group the directions are “con. sord.”, “sul ponticello” and “sul tasto”. These can be explicitly ended by “senza”, generalizing the “senza sord.” direction in the VSL factory Expression Map.

Finally in the fourth group the directions are “int.” (specifying more rarely use performance interval articulations that are not explicitly included in group 1), “rep.” (specifying performance repetitions), “rep. cre.”, “rep. dim.”, “sul”, “molto vib.”, “con vib.”, “senza vib.”, “prog. vib.”, “esp. vib.” (giving access to the expressive vibrato (xVib) matrices—the sampled *espressivo*, available for some strings, is accessed by the additional attribute “str.” instead). If you want to change from any of these playing styles to a playing technique that does not require an articulation in group 4 (e.g. the standard staccato), choose the direction “std.” (abbreviation for “standard”) to end it.

Composer vs. Conductor Map

The Composer version of the Cubase Articulate Map is the most convenient way to use the VSL in Cubase. It allows you to access the entire VSL by clear articulation instructions in the score or the other editors, without the need for sending any explicit Midi events like program change messages or controllers. Due to present restrictions in Cubase, the Composer Map does not offer Articulate Preset’s 3D control and for tracks where you want to use it you will have to use the Conductor version of the Articulate Map, discussed below, instead.

An articulation instruction in the Composer Map fixes the matrix position in VI pro to completely one of the sampled versions (labeled in the matrix) and automatically sends the corresponding continuous controllers before each note. For instance standard sustained notes give you the upper/left cell in the matrix and additional vibrato or attack specifications the other sampled versions.

The Conductor version gives you access to the unique 3D-control of Articulate Presets, which goes far beyond a few sampled versions and allows you for many articulations to continuously control the nuances of the performance by additional continuous controllers that e.g. dial the attack behavior or vibrato intensity. In the Conductor Map only the program change message is sent and you can specify the additional continuous controllers, the Horizontal Controller (CC2) and the Vertical Controller (CC3), yourself to access any cell in the 2D matrix space and quasi-continuously crossfade the sampled versions—in combination with the (always active) Section controller—in a 3D sound space. Please see the *Articulate Presets Manual* for details. To do this you have to send the corresponding Horizontal and Vertical Controller values before the respective note.

While the Composer Map gives you convenient access to every single version of a playing technique that offers different versions (e.g. a particular one of the dozens of sampled runs) via dedicated articulations, the Conductor Map only selects a particular VI pro matrix (e.g. the one

including all runs) by sending the corresponding program change message and you will have to manually send the appropriate controller values of CC2 & 3 to access the desired version. Please see the Articulate Presets manual for details. Moreover, you will have to send the appropriate controller values, when you switch back to another matrix, e.g. one that offers 3D control.

General attributes and directions

In the Composer version of the Articulate Map there are several articulations that can be applied to various playing techniques. First of all there are the vibrato instructions *molto vib.*, *con vib.* and *sensa vib* in group 4. which select the different sampled versions with strong, normal/light and no vibrato. These are available for sustained notes, selected portato articulations and in a few cases also for legato articulations. If the corresponding vibrato version is not available for the used instrument the available versions are used. In contrast in the Conductor version you can even continuously control the vibrato intensity with the Horizontal controller (CC2).

Similarly with the Composer Map you can for most sustained string articulations (non-legato, tremolo, ...) select the fast attack version via the attribute “fast” from group 2. Finally, in both versions of the Articulate Map, as in the VSL factory set, for most articulations an accent can be added as a note attribute, which uses the same samples but increases the velocity of the given note by 20% and imposes a minimum velocity of 40.

External MIDI control

The Cubase Articulate Maps also allow you to select playing techniques via Midi messages from an external Midi controller. There are two different versions of the Cubase Articulate Maps, since Cubase requires the user to choose between Key Switches and Program Changes Messages.

The *Program version* of the Articulate Maps responds to the standard 128 program change messages implemented by Articulate Presets, which are listed in table III of the Articulate Presets Manual. You might have to set the *Remote Settings* parameter to *Program Change Messages* in the lower left of the *Expression Map Setup* window to activate them.

The alternative *Key version* implements key switches for the most important articulations. You might have to set the *Remote Settings* parameter to *Key Switches* in the lower left of the *Expression Map Setup* window to activate them. These key switches are on the lowest piano octave and follow the universal layout introduced by *Art Conductor* developed by *Babylon Waves*, as shown in table II. If you use *Art Conductor* Expression Maps you can thereby conveniently access all main VSL articulations with the same key switches as in all your other libraries. The universal key switches in *Art Conductor* range from C to A and this octave has been completed in the Key of the Articulate Map, by adding further important articulations, namely Repetitions and Special Dynamics. In the Conductor Map the A-2 also gives you access to the Performance Trill instead of the major trill, which is easily accessible via G#2.

As shown in table II, due to the additional Continuous Controllers used by Articulate Presets (Vertical CC2 and Horizontal CC3) the 1-octave *Art Conductor* layout gives you in the Conductor version access to *all* main playing techniques—and due to 3D-control even control over the nuances of the performance! For instance, the *Long* articulation allows you for wind instruments to blend from sustained to long portato and eventually to marcato by changing the Vertical Controller,

whereas the Horizontal Controller dials the vibrato intensity from strong via light to no vibrato. Similarly, *Short* and *Staccato* give you access to all sampled short note versions. For the strings, the Legato articulation allows to blend from normal legato via slurred legato to a full-fledged portamento via the Vertical Controller. I.e. you actually have direct access to much more than is explicitly labeled in the Playing Technique column (as shown in the Horizontal/Vertical columns). The first column of table II also shows the number of the corresponding Articulate Presets matrix.

The key switches standardly start with C-2 but you can easily change this by adjusting the *Root Note* parameter in the *Remote Settings* on the lower left of the Expression Map Setup window—e.g. to a higher octave, when using a small keyboard or low orchestral instruments. Moreover, if you want to add further key-switches or change them according to your preferences, owing to the fact that the Articulate Maps apply to all chromatic orchestral instruments, you can conveniently do this in the *Remote* column of the Expression Map Setup window.

Important: Please keep a backup of the original files and create copies whenever you make changes.

Table II: Key Switches of the “Articulate Presets Key” Expression Map, following Art Conductor conventions

#	Key	Playing Tech.	Availability	Vertical	Horizontal
1	C	Long	strings / winds	sustain normal \diamond fast attack / sustain \diamond long portato \diamond marcato	vibrato intensity: strong \diamond light \diamond none
13	C#	Legato	strings / woodwinds ex BCL / HOs, TB, CTB / other winds	normal \diamond slurred \diamond portamento / normal \diamond grace / normal \diamond glissando / —	— (interval speed)
15	D	Marcato	all ex TU	attack behavior	— (interval speed)
12	D#	Tremolo	strings / harp / winds	tremolo normal \diamond fast attack / bisbigliando / flutter tongue	tremolo intensity: tremolo \diamond normal
17	E	Spiccato	strings S & VI-L / M, L ex VI	\diamond harsh / —	— (interval speed)
8	F	Staccato	violins L / all others	long \diamond short	A/B: tight loose / —
5	F#	Short Tenuto	strings / winds	detache long \diamond short / portato medium \diamond short)	vibrato intensity
10	G	Pizzicato	strings M&L ex VC-M / VC-M / VI-S, VC-S / VA-S, DB-S	\diamond col legno \diamond snap	\diamond slow / \diamond vib. \diamond slow / \diamond secco / —
37	G#	Trill minor	strings S&M / L; woodwinds ex CBA; HOs, TU, CTU / TRs	—	—
37	A	Trill major or Perform. Trill	strings S&M / L; woodwinds ex CBA; HOs, TU, CTU / TRs	—	—
36	A#	Repetitions	all	legato \diamond portato \diamond staccato	— (repetition speed)
49	B	Dynamics	all	fortepiano \diamond sforzato \diamond sforzatissimo	vibrato intensity

Using the Articulate Map

All playing techniques right at your fingertips ...

General handling

You can view and specify the playing technique directly in Cubase's Editors (*Score, Key, In-Place*). The handling in the different Editors is similar and will be described for the Score Editor as an example, please see Cubase's manual for more details.

In the Score Editor attributes can be assigned to a selected note in the *Articulations Inspector* on top of the Score window (you might have to activate the Articulation control in the Inspector by clicking on the small cog to the right). You can choose up to four attributes—one from each of the four groups. The different attributes are selected from a long list, which includes all entries included in the different groups (see Fig. 2 below) separated by thin lines. The Articulate Maps have been designed in an elaborate way to make sure that the list is ordered in a way that the important score symbols and text attributes are easily accessible on top of the list, and only rarely used special symbols (e.g. key specifications for recorded phrases) require you to scroll to the bottom of the list. The list shows both the name and a full description. Therefore it gives you a clear overview in Cubase's editors and in particular in the score (see below), and at the same time enables a convenient articulation selection in pull-down menus.

Directions (and attributes) can be selected in the Expression Map pane under the *Symbols* tab to the left of the score. The directions appear in small quadratic tiles arranged in a large column. Once you selected a symbol just press on the position in the score, where you want to insert the direction. The direction then applies to all following notes until it is ended by an articulation in the same group as the direction. In the Symbols tab you can choose which types of symbols are shown by clicking on the small cog at the bottom of the symbols tab. This allows you to deactivate other symbol sets in case your screen is smaller and you want to see more symbols at a time.

Whereas there are several VSL factory Expression Maps for the different instruments, there is by design only a single Cubase Articulate Map for all instruments. This has the big advantage that you can move a sequence from any chromatic instrument to another one and, as far as this is possible, it will play back as expected. Within their limited set of supported playing techniques, the VSL factory Expression Maps are fool-proof, in the sense that they will automatically replace one if it is not available. The Articulate Map does the same wherever possible, but since it is completely universal and supports *all* playing techniques included in the VSL, there are inherently cases where this cannot work anymore, since an advanced version, e.g. a recorded phrase, is simply not available for a given instrument. In this case you will have to manually replace the special playing technique to play back correctly—e.g. in case of a phrase by adding the individual notes, to be played by one of the available playing techniques.

Most articulation combinations in the Articulate Map, shown in Table III, are completely self-explanatory. Since the number of articulations in Cubase are limited to 128, for some rare playing techniques, which are only available for selected instruments, substitute attributes had to be

chosen, though. E.g. clusters are specified by the attribute “chromatic” and the tune-in attack for the trumpet is obtained by the attribute “down”. In some cases there are two alternative ways to obtain the same articulation. For instance, the standard portato note attribute “-” yields a medium portato and the separate note lengths (long, medium and short) are either obtained by separate symbols with a dot below (long) or above the bar (short), or alternatively by the “portato” direction supplemented by the additional attributes “fast”, “med.” and “slow”. Similarly, pizzicato is implemented both through the direction “pizz.” and the note attribute “+”, whereas portamento is implemented both through the direction “*portamento*” and the attributes “/” and “\”.

As discussed before there are two qualitatively different Articulate Maps, see Table I. The Composer version gives you convenient access to all recorded sounds included in the VSL without requiring any other Midi events than the notes. The Conductor version allows you to access further nuances by additional continuous controllers via the unique 3D control of Articulate Presets. For each track you can independently choose which Articulate Map you want to use. This gives you the flexibility to shape the sound to the level of detail you want. E.g. you could standardly use the convenient Composer version and use the Conductor version where you want to control the playback in detail.

In case of articulations with different sampled versions (e.g. runs), that are in Articulate Presets accessed by the matrix controllers (Vertical (CC2) and Horizontal (CC3)), the Conductor version generally requires you to explicitly send the controller values to select the desired version (e.g. a major run in C) in addition to the notes. In principle the A/B switch likewise has to be sent in the Conductor version, but in many cases, where there are separate symbols for the two different versions (e.g. for up and downward runs), also the A/B controller is automatically sent even in the Conductor version.

Score Representation

In the score all playing techniques are automatically properly displayed using the attributes and directions in Fig. II in the appendix, as shown for examples based on the Composer version in Fig. I. This gives you automatically 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, or hide any of the automatically used symbols from being displayed in order to improve the final (“printed”) score. For instance instead of the text direction *legato*, you might want to add explicit slurs between the notes. In this case you can hide the direction *legato* so that only the slurs are displayed in the score. The same holds for attributes, like the small dynamics, strength or length attributes shown in Fig. I, in case you want to replace them in the final score by proper dynamics symbols.

For recorded and sequenced phrases special score symbols are used. Whereas most of them follow standard musical notation (trills, mordents, ...) for other recorded phrases (runs, arpeggios, ...), that are usually fully notated in the score (by the corresponding range of individual notes), the score symbols given in Fig. II in the appendix are introduced and are added to the base note. Examples for runs, arpeggios and glissandi are shown in Fig. I. If you prefer to have these phrases fully notated in the score, you can simply add additional muted notes.

The Dorico Articulate Map

Steinberg also offers its own notation software, called Dorico, which largely expands on the notation capabilities of Cubase. There is a dedicated Articulate Map for Dorico, which is built from scratch to



Figure I: Examples of the score representation of various phrases.

take into account all the advanced features of Dorico, to automatically play back your score, as well as the possibility to create custom Playing Techniques and Score Engravings. The Dorico Articulate Map can in particular automatically select the appropriate playing technique depending on the length of a given note. There are complete *Playback Templates* for all supported VSL full libraries, so that everything works automatically out of the box. In addition the Dorico Articulate Map, just like the Cubase Articulate Maps, gives you full access to Articulate Preset's signature 3D control. This significantly raises the bar, as far as the realism of the playback is concerned, that can be achieved with notation software. Please check out the Dorico implementation (e.g. via the *free Dorico SE*), if you prefer a score-based approach but think that a realistic playback necessarily requires a Digital Audio Workstation (DAW).

Appendix

All the details ... just in case

This appendix provides all details on the implementation of the Cubase Articulate Map. Figure II shows the implemented directions and attributes, ordered according to their group.

The extensive Table III, extending over five pages, shows the full list of possible articulation combinations, ordered by the program numbers of the corresponding playing techniques in Articulate Presets. It uses the following conventions and abbreviations:

- / ... separates definitions for different instrument *id* ... identical articulation written out before in this cell
- ; ... in each group all articulations at the same position—separated by semicolons—can be combined
- , ... any combination of articulations separated by commas can be independently chosen in the four groups

Directions Group 1	Attributes Group 1	Attributes Group 2	Attributes Group 4
non le Non Legato pizz. Pizzicato col leg Col Legno legato Legato portan Portamento marca Marcato spicca Spiccato trill Trill	Long Portato Detache / Portato Short Detache / Portato Staccato Staccatissimo / Harsh Marcato Pizzicato Snap Pizz Slide Slide Tremolo / Fluttertongue <i>fp</i> Fortepiano <i>sfz</i> Sforzato <i>sff</i> Sforzatissimo Crescendo Diminuendo <i>pfp</i> Crescendo-Diminuendo <i>fpf</i> Diminuendo-Crescendo Trill Trill half tone Trill whole tone Grace note Mordent up Mordent down Phrase Repetitions Fast Repetitions Run Up Run Down Arpeggio Sta/4 Up Arpeggio Sta/4 Down Arpeggio Leg/3 Up Arpeggio Leg/3 Down Glissando Up Glissando Down Upbeats 1 / Ricochet Upbeats 2 / Ricochet speed Upbeats 3 / Ricochet a3	lgt. Light str. Strong / Straight med. Medium slow Slow fast Fast dyn. Dynamic(s) key Key whole Whole chrom Chromatic cre. Crescendo dec. Diminuendo up Up down Down Harmonics Artificial Harmonics Natural	Accent Fall acc. Accelerando I V1 / 1s II V2 / 2s III V3 / 3s IV V4 / 4s V V5 / 5s VI V6 / 6s VII V7 / 1.5s VIII V8 / 8s IX V9 / 9s X V10 / 10s 80bpm 80bpm 90bpm 90bpm 100bp 100bpm 110bp 110bpm 120bp 120bpm 130bp 130bpm 140bp 140bpm 150bp 150bpm 160bp 160bpm 170bp 170bpm 180bp 180bpm 190bp 190bpm 200bp 200bpm 210bp 210bpm 220bp 220bpm Minor 2. / C Major 2. / C# Minor 3. / D Major 3. / D# 4. / E Minor 5. / F Major 5. / F# Minor 6. / G Major 6. / G# Minor 7. / A Major 7. / A# Octave / B
Directions Group 3	Attributes Group 3		
senza Senza Sordino / Variabile con sc Con Sordino sul poi Sul Ponticello sul tas Sul Tasto	maj. Major min. Minor chr. Chromatic w.t. Whole Tone dim. Diminished aug. Augmented		
Directions Group 4			
std. Standard int. Interval rip. Repetition rip. cr Rep. Crescendo rip. dir Rep. Diminuendo prog. v Progressive Vibrato esp. vi Espressive Vibrato senza Senza Vibrato con vil Con Vibrato molto Molto Vibrato sul Sul			

Figure II: Directions and Attributes implemented in the Expression Map

Table III (Part 1): Cubase Articulation Definitions included in the Expression Map





































#	Playing technique	Group 1	Group 2	Group 3	Group 4
1	sustained; sustained fast attack	—, <i>non leg.</i>	—; fast	—, <i>senza</i>	—,  , <i>std.</i> , <i>senza vib.</i> , <i>con vib.</i> , <i>molto vib.</i>
2	progressive vibrato / vibrato down	—, <i>non leg.</i>	— / down	—, <i>senza</i>	<i>prog. vib.</i>
3	long portato	 ; <i>portato</i>	—; slow	—, <i>senza</i>	—,  , <i>std.</i> , <i>senza vib.</i> , <i>con vib.</i> , <i>molto vib.</i>
4	exp. vib. (xVib) / tune	—, <i>non leg.</i>	— / down	—, <i>senza</i>	<i>esp. vib.</i>
5	long detache / medium portato	 ; <i>detache / portato</i>	—; —, med.	—, <i>senza</i>	—,  , <i>std.</i> , <i>senza vib.</i> , <i>con vib.</i> , <i>molto vib.</i>
6	short detache / portato	 ; <i>detache / portato</i>	—; fast	—, <i>senza</i>	—,  , <i>std.</i> , <i>senza vib.</i> , <i>con vib.</i> , <i>molto vib.</i>
7	marcato / espressivo		—	—, <i>senza</i>	—,  , <i>std.</i> , <i>senza vib.</i> , <i>con vib.</i> , <i>molto vib.</i> / —
8	staccato		—	—, <i>senza</i>	—,  , <i>std.</i>
9	short staccato		—	—, <i>senza</i>	—,  , <i>std.</i>
10	pizzicato; col legno; snap pizzicato	<i>pizz. or</i>  ; <i>col legno;</i> 	—, slow; —, slow; —	—, <i>senza</i>	—,  , <i>std.</i>
11	xfade velocity (xVel); espressivo; tremolo slow	—, <i>non leg.</i> ; —, <i>non leg.</i> ; 	dyn.; str.; —	—, <i>senza</i>	—,  , <i>std.</i> ; <i>esp. vib.</i> ; —, <i>std.</i> ;
12	tremolo / fluttertongue; tremolo fast attack		—; fast	—, <i>senza</i>	—,  , <i>std.</i>
13	legato; legato slur; portamento	<i>legato;</i> <i>legato;</i>  , <i>portamento,</i> 	—	—, <i>senza</i>	—,  , <i>std.</i> , <i>senza vib.</i> , <i>con vib.</i> , <i>molto vib.</i> ; <i>int.</i> ; —,  , <i>std.</i>
14	legato progressive	<i>legato</i>	—	—, <i>senza</i>	<i>prog. vib.</i>
15	interval marcato	<i>marcato</i>	—	—, <i>senza</i>	—,  , <i>std.</i>
16	legato xVib / xTune	<i>legato</i>	— / down	—, <i>senza</i>	<i>esp. vib.</i>
17	spiccato; interval harsh	<i>spiccato;</i> 	—	—, <i>senza</i>	—,  , <i>std.</i> ; <i>int.</i>
18	perform. trill; + speed	<i>trill.</i>	—	—, <i>senza</i>	—,  , <i>std.</i> ; <i>int.</i>
19	legato time stretched	<i>legato</i>	—	—, <i>senza</i>	<i>acc.</i>
20	grace / zigan / sfz tune	 /  ,  / <i>sfz</i> / <i>leg.</i>	— / — / — / down	—, <i>senza</i>	<i>int.</i> / <i>int.</i> / <i>int.</i> / —, <i>std.</i> ; 
21	glissando	 or 	—	—, <i>senza</i>	<i>int.</i>
22	legato sul / sustained	<i>legato</i>	—	—, <i>senza</i>	<i>sul</i>
23	interval tremolo / det.	 / 	—	—, <i>senza</i>	<i>int.</i>
24	interval universal	<i>legato</i>	—	—, <i>senza</i>	<i>int.</i>

Table III (Part 2): Cubase Articulation Definitions included in the Expression Map












































#	Playing technique	Group 1	Group 2	Group 3	Group 4
25	repetition legato	<i>legato</i>	—, slow, med., fast	—, <i>senza</i>	<i>rep., rep. cre., rep. dec.; rep.</i>
26	rep. bow vibrato		—, slow, fast	—, <i>senza</i>	<i>rep., rep. cre., rep. dec.; rep.</i>
27	repetition portato		—, slow, med., fast	—, <i>senza</i>	<i>rep., rep. cre., rep. dec.; rep.</i>
28	repetition pizzicato		—, slow, fast	—, <i>senza</i>	<i>rep., rep. cre., rep. dec.; rep.</i>
29	repetition staccato		—, slow, fast	—, <i>senza</i>	<i>rep., rep. cre., rep. dec.; rep.</i>
30	repetition spiccato	<i>spiccato</i>	—	—, <i>senza</i>	<i>rep., rep. cre., rep. dec.; rep.</i>
31	repetition harsh		—	—, <i>senza</i>	<i>rep., rep. cre., rep. dec.; rep.</i>
32	repetition upbeats 1		—, slow, fast	—, <i>senza</i>	<i>rep., rep. cre., rep. dec.; rep.</i>
33	repetition harmonics	—, <i>non leg.</i>		—, <i>senza</i>	<i>rep.</i>
35	repetition upbeats 2		—, slow, fast	—, <i>senza</i>	<i>rep., rep. cre., rep. dec.; rep.</i>
35	rep. sul ponticello	—, <i>non leg.</i>	—	<i>sul pont.</i>	<i>rep., rep. cre., rep. dec.; rep.</i>
36	repetition universal	—	—	—, <i>senza</i>	<i>rep.</i>
37	trills	 ;  ^{HT} ,  ^{WT}	—	—, <i>senza</i>	2b/C, 2/C#, 3b/D, 3/D#; —,  , <i>std.</i>
38	trills accelerando	 ^{HT} ,  ^{WT}	—	—, <i>senza</i>	<i>acc.</i>
39	grace notes		up, down	—, <i>senza</i>	intervals & scales: 2b/C, 2/C#, 3b/D, 3/D#, 4/E, 5b/F, 5/F#, 6b/G, 6/G#, 7b/A, 7/A#, 8/B; —
40	mordents (legato)	 , 	—	—, <i>senza</i>	I, II, III, IV, V, VI; —
41	fast repetitions		—	—, <i>senza</i>	repetition tempos (bpm): 140 - 220; —
42	runs legato	 , 	—	runs: maj.; min.; chr.; w.t.	scales: intervals & scales; <i>id</i> ; —; —; —
43	runs legato fast & spiccato / furioso	 ; 	fast / up; down	runs / —	scales / —
44	gliss. / fast (S.S.) / falls	 ; 	— / up; down / —	—, <i>senza</i>	intervals & scales / — / 
45	glissando fast / harmonics. / falls fast muted arpeggio (A.S.)	 ,  / — /  ; 	 fast /  up; down	—, <i>senza</i> / <i>id</i> / <i>id</i> / <i>con sord.</i>	intervals & scales / — /  —
46	arpeggios staccato / sequencer	 ,  /  ; 	—	arps: maj.; min.; dim.; aug. / —, <i>senza</i>	scales / I - X; I, II
47	arpeggios stac. fast / muted sequencer	 ; 	fast / —	arps / <i>con sord.</i>	scales / I - X; I, II, —
48	upbeats / ricochet / arpeggio (A.S.)	 ;  ;  /  , 	— / fast; —, down; — / up; down	—, <i>senza</i> /	upbeat tempos (bpm) 80 - 160, 180, 200, 220 / 150 - 190, 210; <i>acc.</i> ; — / —

Table III (Part 3): Cubase Articulation Definitions included in the Expression Map

#	Playing technique	Group 1	Group 2	Group 3	Group 4
49	fortepiano		—	—, <i>senza</i>	—, , <i>std.</i> , <i>senza vib.</i> , ...
50	trills dynamics	; ;	cre., dec.	—, <i>senza</i>	2b/C, 2/C#, 3B/D, 3/D#, —, <i>std.</i> ; —, <i>std.</i> ; —, <i>std.</i>
51	sforzato		—	—, <i>senza</i>	—, , <i>std.</i> , <i>senza vib.</i> , ...
52	trills accelerando dyn.	,	cre., dec.	—, <i>senza</i>	—, <i>std.</i>
53	sforzatissimo		—	—, <i>senza</i>	—, , <i>std.</i> , <i>senza vib.</i> , ...
54	crescendo-dim.	ppf	—	—, <i>senza</i>	1(I)-6(VI), 8(VIII)-10(X)s —
55	diminuendo-cre.	fpf	—	—, <i>senza</i>	4(IV), 5(V), 6(VI), 8(VIII)s —
56	strong dynamics	,	str.	—, <i>senza</i>	1(I), 1.5(VII), 2(II)-6(VI)s —
57	fast repetition dyn.		cre., dec.	—, <i>senza</i>	repetition tempos —
58	medium dynamics	,	med.	—, <i>senza</i>	1(I), 1.5(VII), 2(II)-6(VI)s —
59	tremolo dynamics		cre., dec.	—, <i>senza</i>	—, <i>std.</i>
60	light dynamics	,	lgt.	—, <i>senza</i>	1(I), 1.5(VII), 2(II)-6(VI)s —
61	sul ponticello sus.; + fast a. / pres de la t. sul tasto sus.; + f. a. / muted xVel sus.	—, <i>non leg.</i>	—; fast / — / —; fast / dyn.	<i>sul ponticello</i> / <i>sul ponticello</i> / <i>sul tasto</i> / <i>con sord.</i>	—, <i>std.</i>
62	sul pont. detache / sul tasto detache / muted long portato / sul pont. dynamics	or , .	— / — / — or slow / —	<i>sul ponticello</i> / <i>sul tasto</i> / <i>con sord.</i> / <i>sul ponticello</i> /	—, <i>std.</i> / —, <i>std.</i> / —, , <i>std.</i> / 1.5(VII), 4(IV)s; —, <i>std.</i> /
63	sul pont. staccato / sul tasto staccato / t.-ram sta. & low FX / sustain fall release / muted dyn. med. vib. / chords / 4-note arp. straight	. <i>non leg.</i> , — , ,	— / — / str. / — / med. / str. / str.	<i>sul ponticello</i> / <i>sul tasto</i> / — / —, <i>senza</i> / <i>con sord.</i> / —, <i>senza</i> / arps	—, <i>std.</i> / —, <i>std.</i> / —, <i>std.</i> / / <i>molto vib.</i> / —, <i>std.</i> / scales
64	sul ponticello sfz / sul tasto sfz mordents staccato / muted fluttert. cre. / 3-note arp. straight	 ; ,	<i>sul pont.</i> / <i>sul tasto</i> / up; down / cre. / str.	<i>sul ponticello</i> / <i>sul tasto</i> / — / <i>con sord.</i> / arps	—, <i>std.</i> / —, <i>std.</i> / I, II, III, IV, V, VI / — / scales
65	sul pont. trem.; + f. a. / sul tasto trem.; + f. a. / arpeggio legato / 3-note arp. slow / muted fast rep. dyn.	 , 	—; fast / —; fast / — / — / cre., dec.	<i>sul ponticello</i> / <i>sul tasto</i> / arps / arps / <i>con sord.</i>	— / — / scales / scales / repetition tempos; —, <i>std.</i>
66	sul tasto legato snap pizzicato / arpeggio legato fast / 3-note arp. fast / muted upbeats	<i>legato</i> , , ,	— / — / fast / fast / —	<i>sul tasto</i> / —, <i>senza</i> / arps / arps / <i>con sord.</i>	—, <i>std.</i> / —, , <i>std.</i> / scales / scales / upbeat tempos; —, <i>std.</i>

Table III (Part 4): Cubase Articulation Definitions included in the Expression Map




















































#	Playing technique	Group 1	Group 2	Group 3	Group 4
67	muted trills dyn. / 4. trill & lip trill / muted upbeats B / harp glissandi slow /	    ,  ,   , 	cre., dec. / — / up / slow	— / — / <i>con sord.</i> / harp keys: maj.; min.; w. t.; aug.; maj.; min.; dim.	—, <i>std.</i> / 4/E / upbeat tempos / harp scales: scales; scales; 2b/C, 2/C#; I, II, III; scales; scales; 2b/C, 2/C#, 3b/D
68	mut. art. harm. sus. / flautando / cluster sus. & duop. / legato + fall release / sustained blared / harp glissandi med.	—, <i>non leg.</i> / —, <i>non leg.</i> / —, <i>non leg.</i> / <i>legato</i> /  ,  , 	 / lgt. / chromatic / — / str. / med.	<i>con sord.</i> / —, <i>senza</i> / —, <i>senza</i> / —, <i>senza</i> / —, <i>senza</i> / harp keys	—, <i>std.</i> / —, <i>std.</i> / —, <i>std.</i> /  / —, <i>std.</i> / harp scales
69	mut. art. harm. stac. / cluster staccato / random pizzicato / marcato + fall rel. / portato blared / harp glissandi fast	 /  + <i>marcato</i> /  , 	 / chromatic / chromatic / — / str. / fast	<i>con sord.</i> / —, <i>senza</i> / —, <i>senza</i> / —, <i>senza</i> / — / harp keys	—, <i>std.</i> / —, <i>std.</i> / —, <i>std.</i> /  / —, <i>std.</i> / harp scales
70	art. har. sus. & flag. / cluster sfz & duo. B / sus. marcato + fall r.	—, <i>non leg.</i> /  / 	 / chromatic / —	—, <i>senza</i> / —, <i>senza</i> / —, <i>senza</i>	—, <i>std.</i> / —, <i>std.</i> / 
71	art. harmonics stac. / fast rep. triplets / tune-in sus. + fall rel. / cluster dynamics	 /  —, <i>non leg.</i> /  , 	 / fast / whole / chromatic	—, <i>senza</i> / — / —, <i>senza</i> / —, <i>senza</i> /	—, <i>std.</i> / 130 - 180bpm; —, <i>std.</i> /  / 1.5(VII), 4(IV)s; —, <i>std.</i> /
72	nat. harmonics sus. / stac. rep. triplets / rip & FX, + fall rel / cluster repetitions	—, <i>non leg.</i> /  . —, <i>non leg.</i> / —, <i>non leg.</i>	 / med. / up / chromatic	—, <i>senza</i> / — / — / —	—, <i>std.</i> / <i>rip.</i> / —,  / <i>rip., rip. cre., rip. dec.</i>
73	muted sustained; muted sus. fast attack	—, <i>non leg.</i>	—; fast	<i>con sord.</i>	—,  , <i>std.</i> , <i>senza vib.</i> , <i>con vib.</i> , <i>molto vib.</i>
74	muted prog. vibrato	—, <i>non leg.</i>	—	<i>con sord.</i>	<i>prog. vib.</i>
75	muted special dyn.	 ,  , 	—	<i>con sord.</i>	—,  , <i>std.</i>
76	muted xVib / tune	—, <i>non leg.</i>	— / down	<i>con sord.</i>	<i>esp. vib.</i>
77	muted l. det. / m. por.	 ; <i>det.</i> / <i>por.</i>	— ; —, med.	<i>con sord.</i>	—,  , <i>std.</i>
78	muted short det. / por.	 ; <i>det.</i> / <i>por.</i>	—; fast	<i>con sord.</i>	—,  , <i>std.</i>
79	muted cresc.-dim.	pfp	—	<i>con sord.</i>	1(I) - 6(VI), 8(VIII) - 10(X) s; —
80	muted staccato		—	<i>con sord.</i>	—,  , <i>std.</i>
81	muted strong dyn.	 , 	str.	<i>con sord.</i>	1(I), 1.5(VII), 2(II) - 6(VI) s; —
82	muted pizzicato	 or <i>pizz.</i>	—	<i>con sord.</i>	—,  , <i>std.</i>
83	muted medium dyn.	 , 	med.	<i>con sord.</i>	1(I), 1.5(VII), 2(II) - 6(VI) s; —
84	muted tremolo; + f. a.		—; fast	<i>con sord.</i>	—,  , <i>std.</i>

Table III (Part 5): Cubase Articulation Definitions included in the Expression Map





























































#	Playing technique	Group 1	Group 2	Group 3	Group 4
85	muted legato; +slur; portamento	<i>legato; id; portamento,</i> 	—	<i>con sord.</i>	—,  , <i>std.</i> , <i>senza vib.</i> , <i>con vib.</i> , <i>molto vib.</i> ; <i>int.</i> ; —,  , <i>std.</i>
86	muted legato prog.	<i>legato</i>	—	<i>con sord.</i>	<i>prog. vib.</i>
87	muted marcato	<i>marcato</i>	—	<i>con sord.</i>	—,  , <i>std.</i>
88	mu. leg. xVib / xTune	<i>legato</i>	— / down	<i>con sord.</i>	<i>esp. vib.</i>
89	muted spiccato	<i>spiccato</i>	—	<i>con sord.</i>	—,  , <i>std.</i>
90	muted perf. trill	<i>trill.</i>	—	<i>con sord.</i>	—,  , <i>std.</i>
91	muted trills	 ^{HT} ,  ^{WT}	—	<i>con sord.</i>	—,  , <i>std.</i>
92	muted rep. legato	<i>legato</i>	—	<i>con sord.</i>	<i>rep.</i> , <i>rep.cre.</i> , <i>rep.dec.</i> ; <i>r.</i>
93	muted fast repetitions		—	<i>con sord.</i>	repetition tempos; —
94	muted rep. portato		—	<i>con sord.</i>	<i>rep.</i> , <i>rep.cre.</i> , <i>rep.dec.</i> ; <i>r.</i>
95	muted rep spiccato	<i>spiccato</i>	—	<i>con sord.</i>	<i>rep.</i> , <i>rep.cre.</i> , <i>rep.dec.</i> ; <i>r.</i>
96	muted rep. staccato		—	<i>con sord.</i>	<i>rep.</i> , <i>rep.cre.</i> , <i>rep.dec.</i> ; <i>r.</i>
97	seq. repetitions	 ;  ; 	—	—, <i>senza</i>	I - X; I, II; —, <i>std.</i>
98	muted seq. repetitions	 ;  ; 	—	<i>con sord.</i>	I - X; I, II; —, <i>std.</i>
99	seq. rep. dynamics	 ;  ; 	dyn.	—, <i>senza</i>	I - VIII; I - IV; —, <i>std.</i>
100	muted seq. rep. dyn.	 ;  ; 	dyn.	<i>con sord.</i>	I - VIII; I - IV; —, <i>std.</i>
101	seq. trills	 ;  ;  ; 	—; —; —; slow	—, <i>senza</i>	I - IV; VII - X; VII - X; —, <i>std.</i>
102	seq. runs key	 , 	key	—, <i>senza</i>	I - VI; —, <i>std.</i>
103	muted seq. runs key	 , 	key	<i>con sord.</i>	I - VI; —, <i>std.</i>
104	seq. runs whole	 , 	whole	—, <i>senza</i>	I - VI; —, <i>std.</i>
105	muted seq. runs whole	 , 	whole	<i>con sord.</i>	I - VI; —, <i>std.</i>
106	seq. runs chromatic	 , 	chromatic	—, <i>senza</i>	I - VI; —, <i>std.</i>
107	muted seq. runs chr.	 , 	chromatic	<i>con sord.</i>	I - VI; —, <i>std.</i>
108	muted seq. trills	 ;  ;  ; 	—; —; —; slow	<i>con sord.</i>	I - IV; VII - X; VII - X; —, <i>std.</i>

Table III (Part 6): Cubase Articulation Definitions included in the Expression Map

#	Playing technique	Group 1	Group 2	Group 3	Group 4
109	ind. strings sus.; trem.	—, <i>non leg.</i> ; 	str.	—, <i>senza</i>	— (open string), I-IV
110	ind. strings det.; stac.	 ; 	str.	—, <i>senza</i>	— (open string), I-IV
111	mu. ind. str. sus.; trem.	—, <i>non leg.</i> ; 	str.	<i>con sord.</i>	— (open string), I-IV
112	mu. ind. str. det.; stac.	 ; 	str.	<i>con sord.</i>	— (open string), I-IV
113	ind. strings pizz.; muted ind. strings pizz.	<i>pizz.</i> or 	str.	—, <i>senza</i> ; <i>con sord.</i>	— (open string), I-IV
114	rep. individual. dyn.	<i>legato</i> ;  ,  , <i>spiccato</i> , 	slow, fast; —, —, —, —	—, <i>senza</i>	I - IX; —, <i>std.</i>
115	muted rep. ind. dyn.	<i>legato</i> ;  ,  , <i>spiccato</i>	slow, fast; —, —, —, —	<i>con sord.</i>	I - IX; —, <i>std.</i>
116	legato ind. speeds / ind. strings legato; portamento	<i>legato</i> / <i>legato</i> ; <i>portamento</i>	slow, med., fast / str.	—, <i>senza</i>	—, <i>std.</i> / — (open string), I-IV
117	muted leg. ind. speeds / muted ind. strings legato; portamento	<i>legato</i> / <i>legato</i> ; <i>portamento</i>	slow, fast / str.	<i>con sord.</i>	—, <i>std.</i> / — (open string), I-IV
118	marc. ind. speeds / ind. strings fp; sfz	<i>marcato</i> /  ; 	slow, fast / str.	—, <i>senza</i>	—, <i>std.</i> / — (open string), I-IV
119	mu. marc. ind. speeds / muted portamento / mu. ind. str. fp; sfz	<i>marcato</i> / <i>portamento</i> /  ; 	slow, fast / — / str.	<i>con sord.</i>	—, <i>std.</i> / —, <i>std.</i> / — (open string), I-IV
120	spiccato ind. speeds	<i>spiccato</i>	slow, med., fast	—, <i>senza</i>	—, <i>std.</i>
121-128	custom matrix 1-8	—, <i>non leg.</i>	dyn.	—	I - VIII