

Musik Production Work Process for Cubase Pro and Vienna Ensemble Pro using Articulation Maps

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After many years of working with Logic Pro I have decided to change my **Digital Audio Workstation (DAW)** to Cubase Pro for many reasons.

The **purpose** of this abstract is to help composers to **achieve an efficient music production working process** with articulation maps used in Cubase Pro. I wish providers of sound libraries would supply these articulation maps along with their products, the creation of which for tree structured HMI is very tedious and time consuming.

I have created articulation maps for Cubase Pro of sound libraries, the graphical user interface of which have a tree structure (as the synchron collection of Vienna Symphonic Library(VSL)).

Example of **Humas Machine Interface (HMI)** for Viennas Synchron Strings:

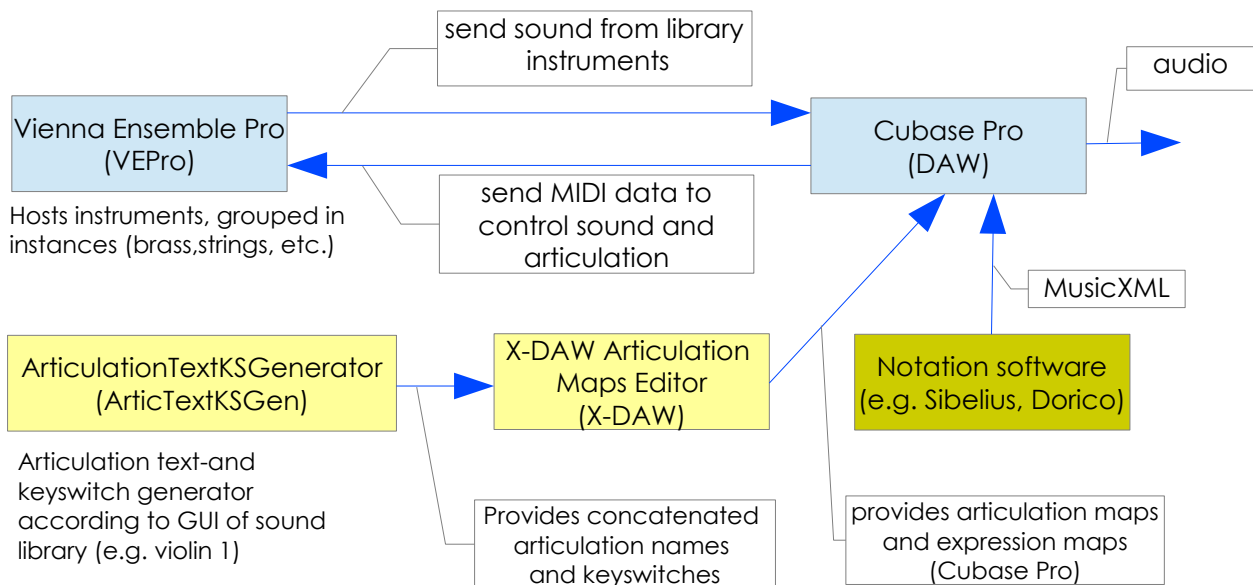


This tree structure required a special **ArticulationTextKSGenerator** (KS=keyswitch), realised and programmed in an **OpenOffice table dokument**. It can be downloaded for free and the composer is free to modify this helper tool according to his requirement for many sound libraries . It should be possible to open and modify in EXCEL on Window PCs as well.

Every step to create a project will be explained using articulation maps in detail below. First let us have an overview of the elements (software tools) when creating a project

Creating a Production Project using articulation maps

1 Overview



Remark:

- **Vienna Ensemble Pro:** https://www.vsl.co.at/de/Vienna_Software_Package/Vienna_Ensemble_Pro
- **Cubase Pro:** <https://www.steinberg.net/de/cubase/>
- **X-DAW Articulation Maps Editor:** http://www.audiogrocery.com/a.g_toolkit_pro.htm
- **ArticulationTextKSGenerator:** Useful particularly for tree structured HMI (GUIs) interfaces as Symphonis Strings by VSL. It is an OpenOffice Table document the cells of which contain algorithms to generate articulation texts and key switches. free download.

This production setup allows to work very efficiently and flexibly. Advantages of this setup are:

- Changing music project (DAW, Cubase Pro) without changing the Orchestra (VEPro)
- Possibility to distribute the MIDI instruments on several computers (VEPro) e.g. for performance reasons
- Working with one MIDI channel per instrument (DAW) and yet having all the selection of articulations using articulation maps (Cubase Pro: expression maps): e.g. Violin 1 of synchron strings by VSL has over 150 articulations! Useful when importing scored as MusicXML from notation software.
- Use of many different sound libraries (on VEPro)

2 Create Instrument Groups

2.1 Vienna Ensemble Pro (VEPro)

VEPro is a software that communicates with the DAW from different computers or just from the same computer as the DAW. Instruments of many sound libraries (e.g. Vienna Synchron instruments) (<https://www.vsl.co.at/de>) can be loaded into this software: The example project below shows different instances of instrument-groups (woods, brass, percussion, keyboards, string, etc.) containing sound instruments.



You start to **create a Project in VEPro**: See corresponding manuals, video tutorials. For every instruments many plugins can be loaded as well: filters, equalisers, reverb, delays etc.

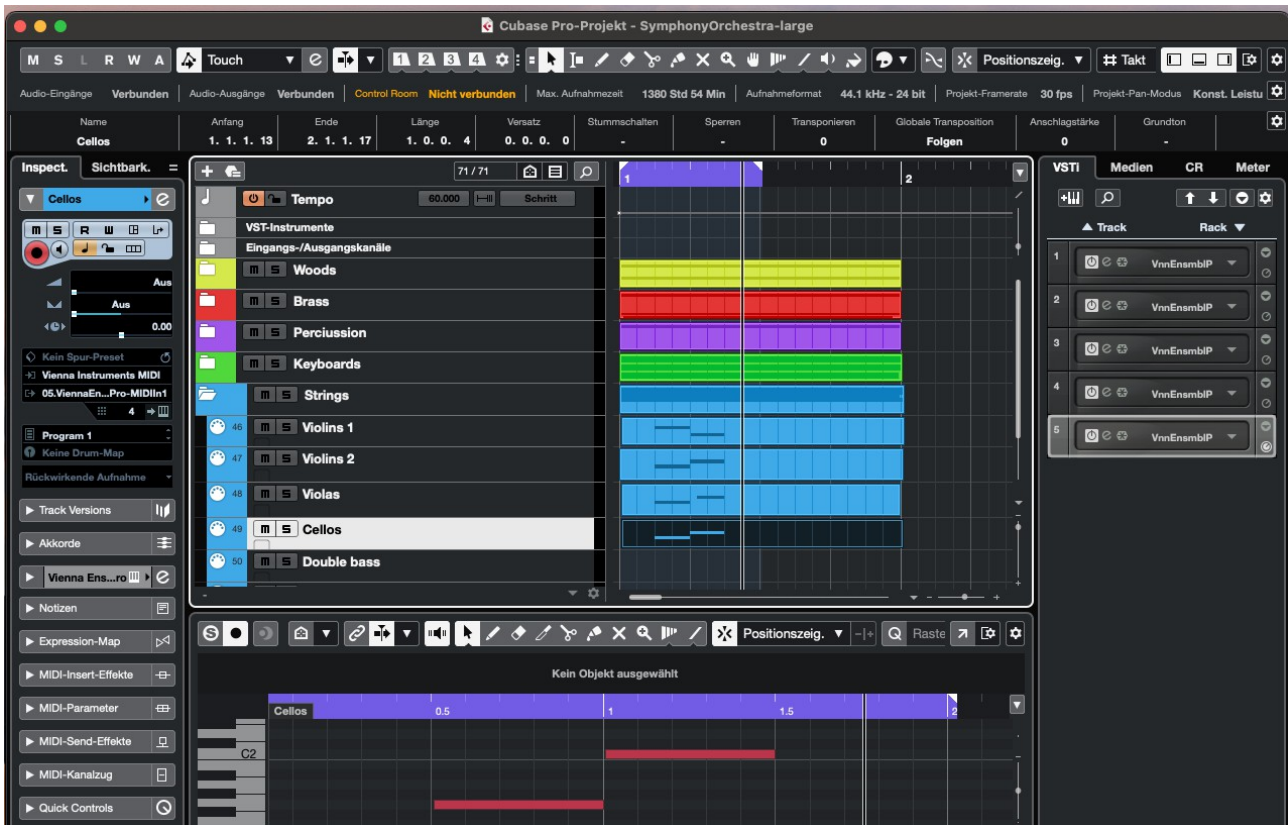
Every instance of instrument-group (e.g. Brass) in VEPro **corresponds** (and communicates) to a **VST-Instrument in Cubase Pro** (see below in Step 2).

After creating this project in VEPro, you cannot hear sounds yet. First we have to create a project in Cubase Pro that leads to a connection between VEPro and Cubase Pro.

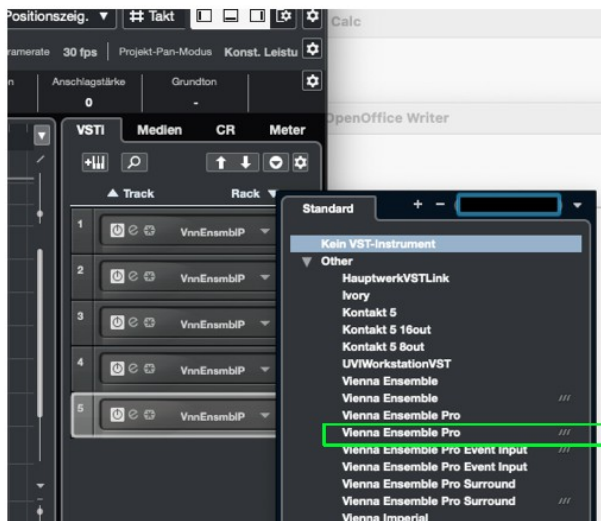
2.2 Cubase Pro (DAW)

2.2.1 Create VST-Instruments

Cubase Pro (<https://www.steinberg.net/de/cubase/>). This DAW has all the information to control the sound of the instruments hosted in VEPro: e.g. volume, articulation, notes. As the DAW does not contain MIDI instruments, it is easy to switch from one project to another, leaving the instruments in VEPro. This significantly contributes to an efficient workflow. Cubase also allows to import MIDI - and MusicXML files, exported from your Notation software (Sibelius (<https://www.avid.com/de/sibelius/>), Dorico (<https://www.steinberg.net/dorico/>), etc.)



You start to create a **VST-Instruments in Cubase Pro** from an empty project: Choose **VSTi/Rack/Vienna Ensemble Pro** ///.



See also <https://www.vsl.info/de/manuals/vep7/notes-for-cubase> ,

<https://www.youtube.com/watch?v=erz5GakWtiY>

In the **example** above, every instance of instrument group in VEPro (Woods or Brass-sy or Percussion or Keyboards or Strings-sy) now corresponds to one of the five created VST-Instruments in Cubase Pro.

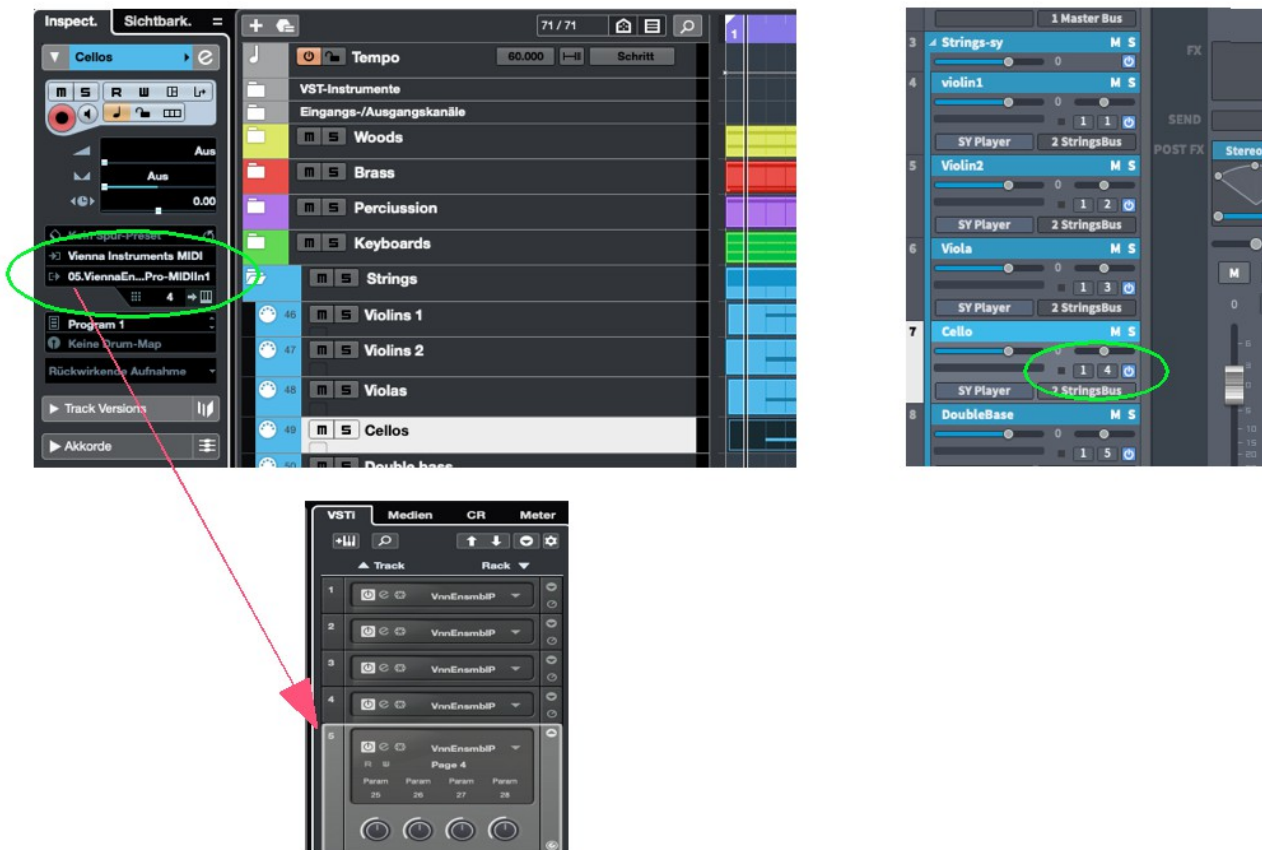


Now we have established the connection between Cubase Pro and VEPro. But you still do not hear sound when played on the (virtual) keyboard of the instrument in VEPro (e.g. Violoncello). We have not created a MIDI instrument in Cubase Pro yet.

3 Create MIDI instruments

3.1 Cubase Pro (DAW)

Create a MIDI instrument and select the MIDI port and channel according to the ones defined in VEPro. Instruments can be grouped in folders. Set colors to instrument groups.



Cubase Pro.:

VST-Instrument 05, MIDI port 1:

05.ViennaEnsemble...Pro-MIDIIn1

VST-Instrument **Nr 05** of the input routing can be seen here

VEPro:

Instance String-SY

MIDI Port 1, MIDI channel 4

(for cello)

When playing a note on the (virtual) keyboard in VEPro, you should here sound now!

4 Create articulation text and key switches

4.1 ArticulationTextKSGenerator

Start by opening ArticulationTextKSGenerator (OpenOffice Table Document, to be downloaded from Website:)

This table with formulas in its cells allow you to generate concatenated articulation sets and their associated key switches used to generate articulation maps in X-DAW Articulation Maps Editor (X-DAW) according to the HMI (Human Machine Interface) of the instruments loaded into VEPro. Therefore this programmed table can be called an **articulation text and keyswitch generator**.

Property tabs

- **Definitions Tab** contains some filewide definitions used for the generation (calculation). An important definition is the middle c:
 - Cubase Pro defines middle c as C3
 - Logic Pro defines middle c as C4
- **MIDINrToNote** contain tables to calculate the key switches according to the defined middle c in the definition tab.

If you use a DAW with middle c = c4 (e.g. Logic), then you have to change this information (middle c) in the Definitions-tab before going on with creating Articulation Maps and key switches using X-DAW (see below): all the key switch-results will be corrected when changing the middle c definitions.

4.1.1 Used as downloaded

The ArticulationTextKSGenerator as downloaded already contain all the results for the **brass- and string instruments of the Vienna Synchron Instruments**: text and associated key switches:

textresult for x-daw	keyswitches
shor/stac.short/bold	C0/C1/A6/
shor/stac.short/agil/	C0/C1/A#6/
shor/stac.short ff/	C0/C#1/
shor/stac/bold/	C0/D1/A6/
shor/stac/ff/	C0/D1/A#6/

By default the ArticulationTextKSGenerator has defined the **middle c as C3 for Cubase Pro**.

Example: Cello of Vienna Synchron strings



This view represents the articulation as seen in VEPro of the cello.

HMI: It is very important to set the base of key switches as notes and **not as white notes** (e.g. C6 but not C6(w)), since the formulas in the ArticulationTextKSGenerator require half steps between key switches: c,c#,d,d#e,f,f# etc. and not c,d,e,f,g !

To do: In HMI of the Instrument: Check every possible combination of the articulation and change the key switch base notes when they are defined as white notes! You can simply change to normal note by using the selection "**Note**" instead of **White Note**" when clicking into the base note.

If you do not need to modify the results in the ArticulationTextKSGenerator, then you can go reading the chapter to transfer (copy) these results into the **X-DAW Articulation Maps Editor** (see chapter below)

4.1.2 Used to create new articulations

The composer is free to define his/her own articulation results of a sound library, preferably with HMT the structure of which has a tree structure (as shown in the example below).

There are a lot of formulas used in many cells. The German version of OpenOffice was used to create this Document. Hopefully you can get what the formulas mean. There are only a few terms to be acquainted with. Eventually I will provide an English version in the near future.

But if you have defined the formulas for one line, you can copy it to all other lines! Normally just by dragging the result-cell down all to the end.

- Start to understand all the cells of all columns of one line
- add a new tab in the ArticulationTextKSGenerator (Document) and name it as the instruments you want to create articulations for.
- copy another instrument's articulation into this new tab and modify.

4.1.2.1 HMI of the instrument of the sound library

Example: Cello of Vienna Synchron strings



This view represents the articulation as seen in VEPro of the cello.

HMI: It is very important to set the base of key switches as notes and **not as white notes** (e.g. C6 but not C6(w)), since the formulas in the ArticulationTextKSGenerator require half steps between key switches: c,c#,d,d#e,f,f# etc. and not c,d,e,f,g !

To do: In HMI of the Instrument: Check every possible combination of the articulation and change the key switch base notes when they are defined as white notes! You can simply change to normal note by using the selection "Note" instead of white key when clicking into the base note.

The articulation C1 is the base key switch for the column. Therefore the keyswitches for this column are as follows:

Articulation name	key switch on DAW with middle c = C4 (e.g. Logic Pro)	key switch on DAW with middle c = C4 (e.g. CubasePro)
Short notes	C1	C0
Long notes	C#1	C#0
Legato	D1	D0

Therefore the result in **ArticulationTextKSGenerator** for middle c = C3 for this example results to:

`|long/espress.p/soft.relea/` `C#0/D#5/F#6/`

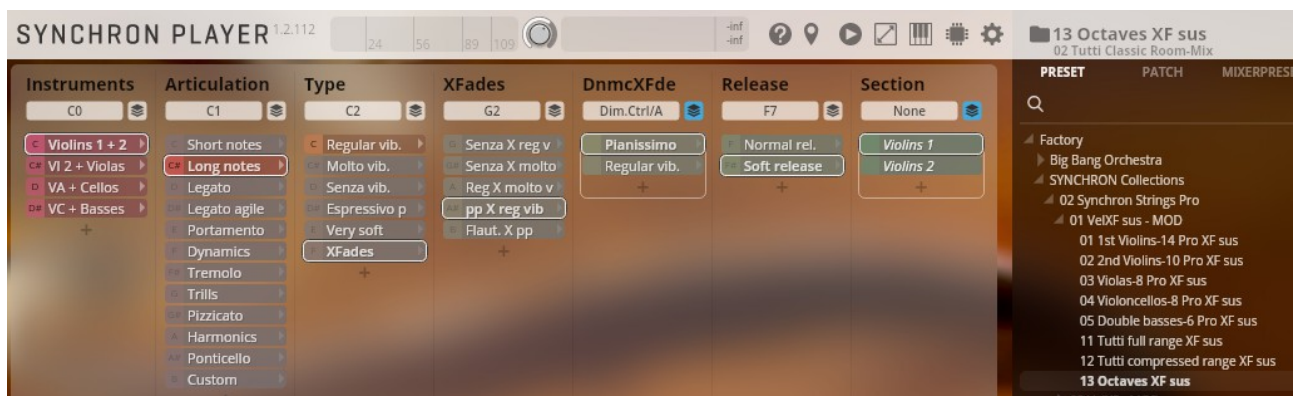
See table: VI-Sy-Violoncellos-8 Pro XF sus.

This information later has to be copied into the X-DAW Articulation Maps Editor (see below)

4.1.2.2 Special Treatments of Articulation Maps

For flexibility reasons and to keep the number of articulations in a reasonable range for selection in DAW (e.g. Cubase Pro), a few instruments need special key switch handling

4.1.2.2.1 String: Octaves XF sus



The **Instruments** key switch setting (first column) must be handled manually in Cubase Pro:

This approach allows more flexibility and reduces the numbers of MIDI tracks and also limits the number of possible articulations choices per instrument to a reasonable amount.

Set base key switch of Instruments C0 (the default value) if you want distinguish instruments in octaves. Thus the following instruments can be selected:

key switch (HMI on VEPro)	key switch (Cubase Pro)	Key switch (Logic Pro)	Instruments
middle c=C4	middle c= C3	middle c= C4	

C0	C-1	C0	Violins 1+2
C#0	C#-1	C#0	VI2 + Violas
D0	D-1	D0	VA + Cellos
D#0	D#-1	D#0	VC + Basses
None	none	None	all possible string instruments

All other articulations are handles as usual with articulation maps

5 Create Articulation Maps

The results generated by the **ArticulationTextKSGenerator** serve as inputs to create articulation maps for your DAW e.g. Cubase Pro)

Example from above:

`long/espres.p/soft.relea/` `C#0/D#5/F#6/`

5.1 X-DAW Articulation Maps Editor

This tool is a blessing!

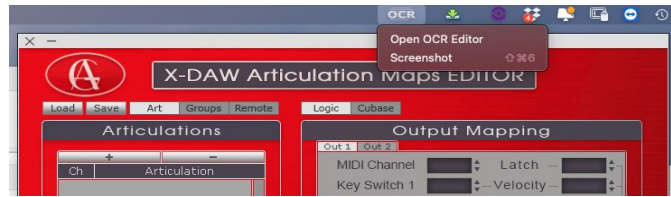
- open X-DAW



see information: X-DAW Articulation Maps Editor http://www.audiogrocery.com/a.g_toolkit_pro.htm

5.1.1 Scan Articulation text of instruments from ArticulationTextKSGenerator

This tool enables any text on the screen to be scanned by the OCR technique, available on the top right of the screen area:



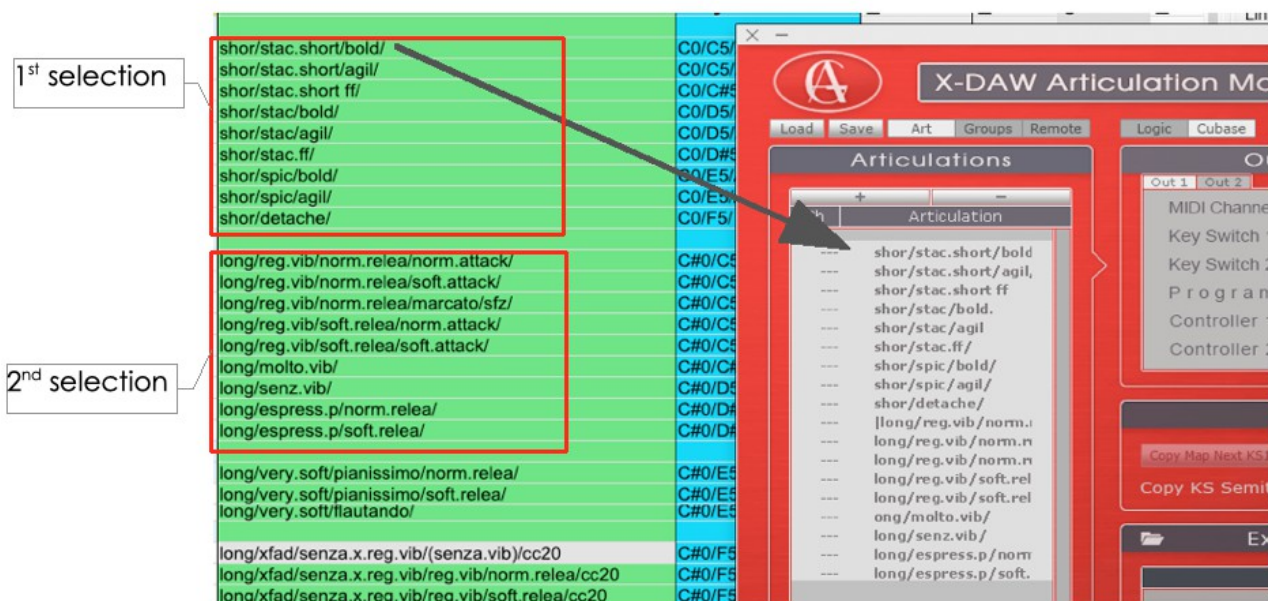
The use of OCR (Optical Character Recognition) requires an internet communication)

How to bring in the results from **ArticulationTextKSGenerator** into X-DAW:

- start X-DAW and from the **OCR** options select Open OCR Editor and set **Auto Pasting** to "on"; close the OCR Editor by clicking anywhere else.
- select **Screenshot** from the **OCR** options. The cursor shape will change, ready to select scanning area.
- draw a rectangle area within the **textresult for X-daw** of the ArticulationTextKSGenerator to scan several lines of articulation names for the particular instrument at once

```
shor/stac.short/bold/  
shor/stac.short/agil/  
shor/stac.short ff/  
shor/stac/bold/  
shor/stac/agil/  
shor/stac.ff/  
shor/spic/bold/  
shor/spic/agil/  
shor/detache/  
  
long/reg.vib/norm.relea/norm.attack/  
long/reg.vib/norm.relea/soft.attack/  
long/reg.vib/norm.relea/marcato/sfz/  
long/reg.vib/soft.relea/norm.attack/  
long/reg.vib/soft.relea/soft.attack/  
long/molto.vib/  
long/senz.vib/  
long/espress.p/norm.relea/  
long/espress.p/soft.relea/
```

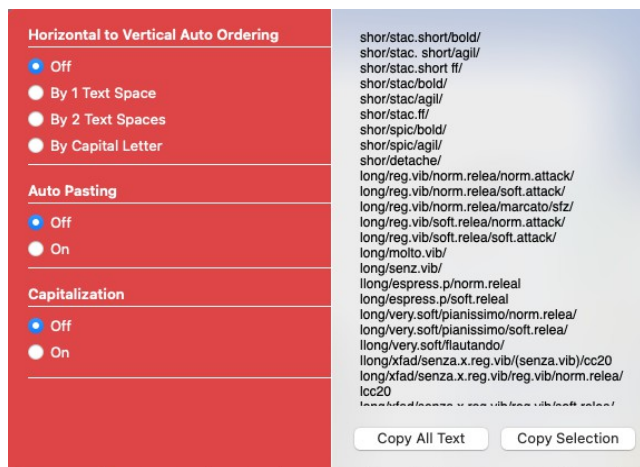
- The text is automatically copied into the Articulation area of X-DAW (it takes a few seconds)



- Continue this procedure until all lines have been transferred into X-DAW

An alternative Procedure with Auto paste = off (optional)

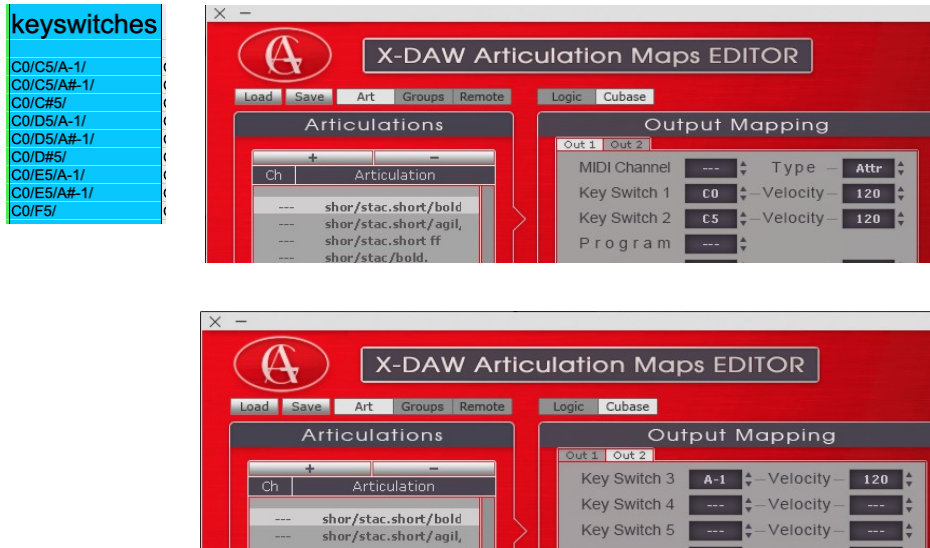
- open the **OCR Editor** and set **Auto Paste to "off"** for better choosing where to paste the text
- Close OCR Editor by pressing anywhere else and select **Screenshot** from the **OCR Menu** and select the lines in ArticulationTextKSGenerator you want to copy
- press **CopyAll Text** as soon as the text appears in the following window; it takes a few seconds to calculate



- In X-DAW click in the area Articulation on a line you want to include the new scanned text, and paste the content from the buffer into this area by using the key commands of your operating system (Mac (cmd + V) or Windows etc.)
- repeat this procedure until you have copied all text into X-DAW.
- Correct some text in **Articulation** which have not properly been converted by clicking into the line of the Articulation area
- leave the MIDI channel "Ch" to default "---" for flexibility in Cubase Pro to assign MIDI channels there.

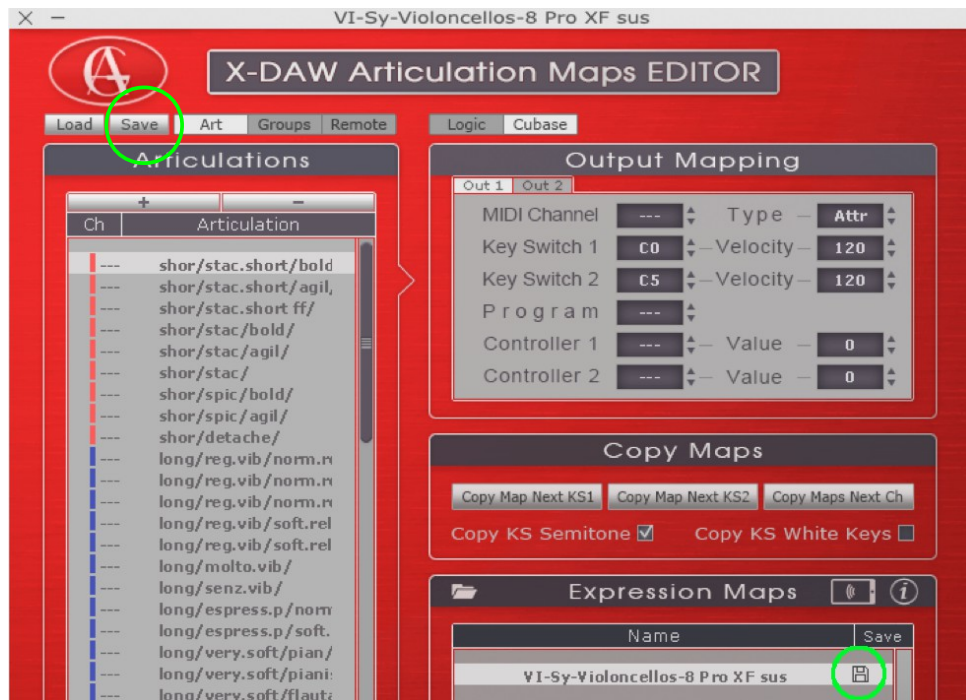
5.1.2 Enter Key Switches to corresponding articulation text

- Enter key switches manually from **ArticulationTextKSGenerator** into X-DAW. Unfortunately the key switches (KS) cannot be transferred (yet?) as easily as the text as has been shown above into X-DAW. There are five key switches that can be defined in X-DAW in the current version, in two tabs **Out1** and **Out2**.



5.1.3 Save Articulation Map

- After bringing in all the keyswitches, you are almost done: Give this set of articulation in X-DAW a name for the instrument and save the articulation map within Audio Grocery in its own format by pressing the **save** button on top left area. See also video tutorials for this program X-DAW.
- Create Articulation map for Cubase (they are called **Expression maps**) by **selecting the Cubase button** and by clicking on the **floppy** icon. If Logic Pro can handle these articulation maps properly in the future, you can save the maps similarly by pressing the Logic tab beforehand.



- In Cubase Pro directory the created Expression maps are now available to be imported into Cubase: Example directory

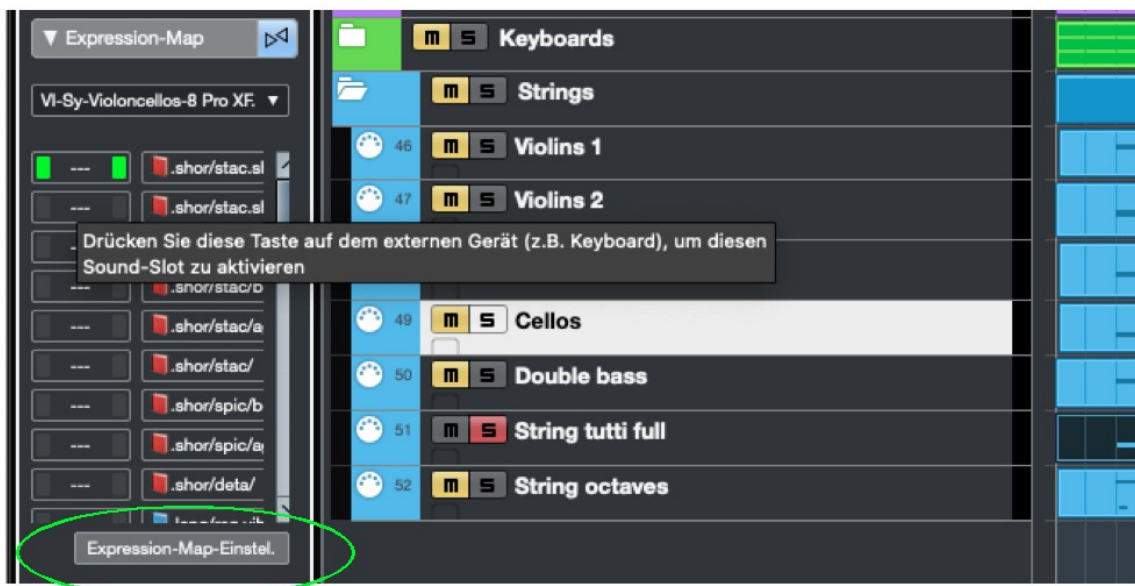


6 Import Articulation map into Cubase Pro

in Cubase Pro Articulation maps are called expression maps.

6.1 Define the expression map for your MIDI channel (instrument: e.g. cello)

In the **Inspect** tab open the **Expression Map Properties** after selecten the MIDI channel



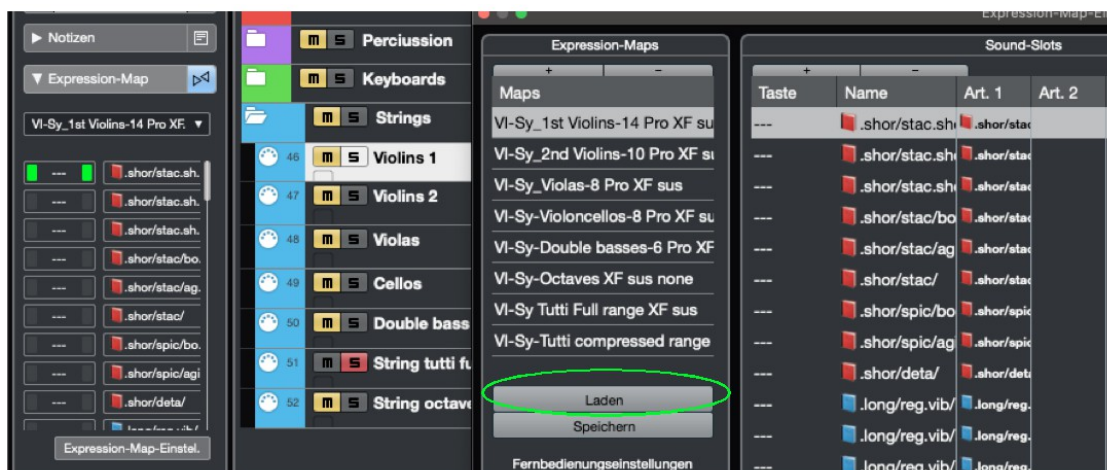
In the new window you can load the expression map. **In this window all the expression maps have to be loaded** for the entire project. So there is only one table to load (expression)maps.

So it is a good idea, to name these maps so as to easily identify to what instrument group the instrument belongs to (woodwind, brass, percussion, etc.):

Example: **str**-Violin1, **str**-violin 2, etc and **bra**-trumpet1, **bra**-trumpet2, etc.

This approach facilitates the search for an articulation for the instruments.

- **Load** all expression maps you need for all instruments



- **Select** the corresponding expression map for the selected MIDI channel (instrument) using the **Expression-Map-Property**.



7 Apply Articulation Maps on selected notes

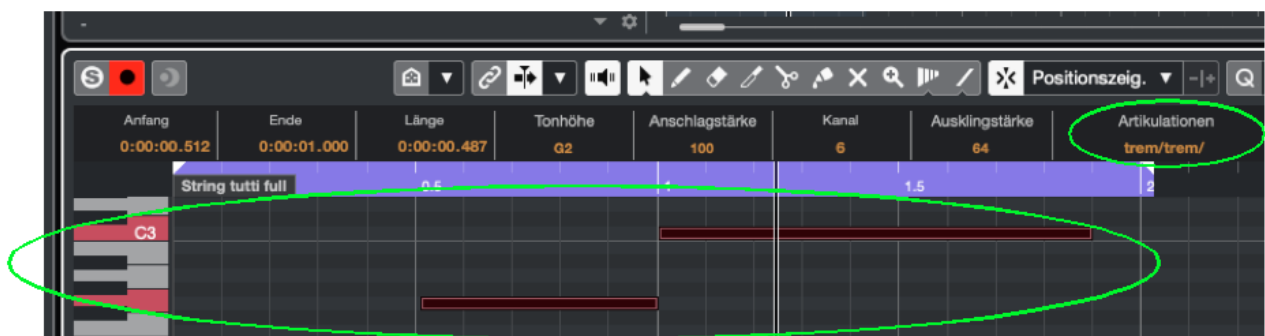
Example:

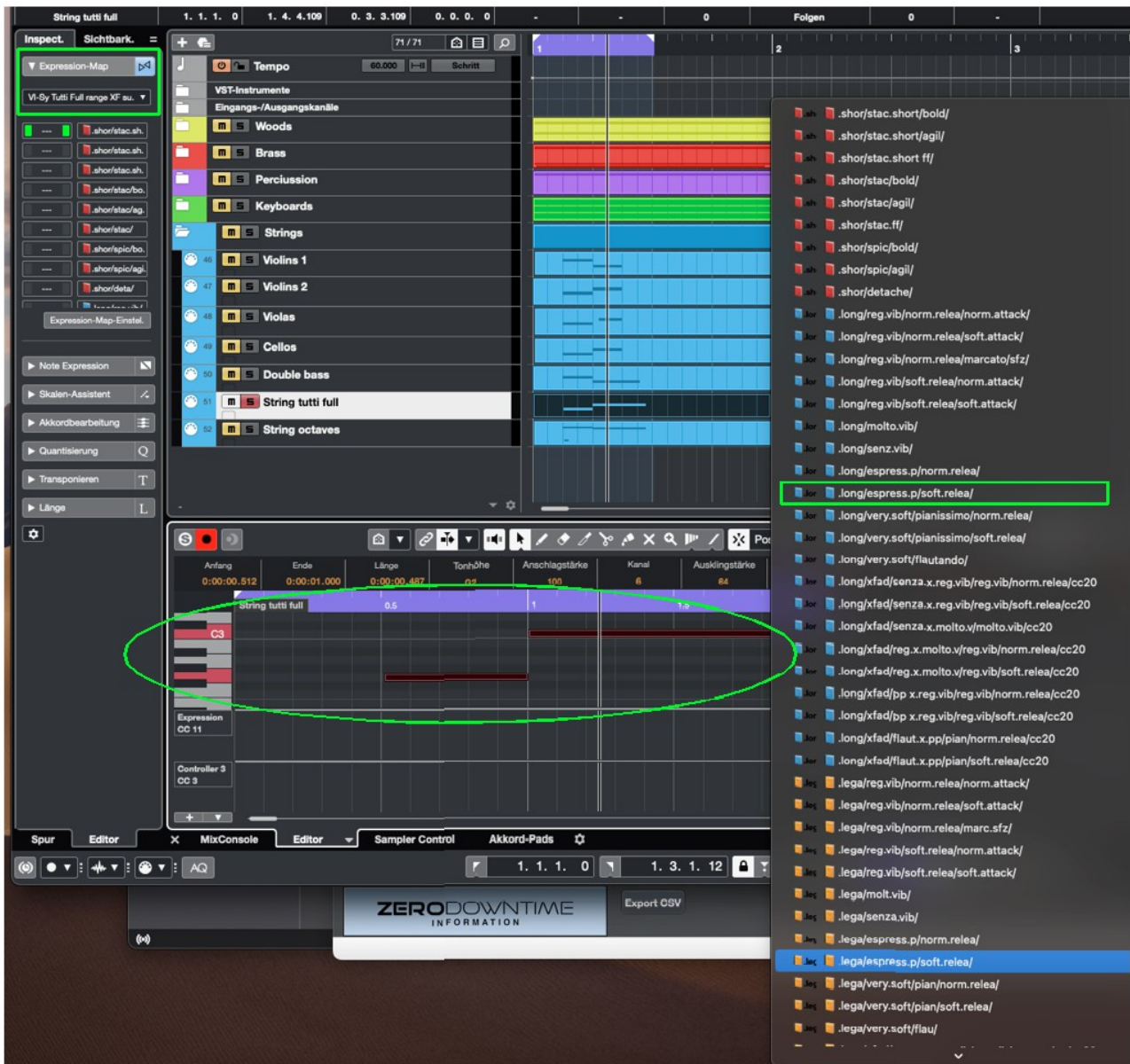
Articulation from ArticTextKSGen:

long/esspress.p/soft.relea/ **C#0/D#5/F#6/**

Articulation (expression-) map selection in Cubase Pro:

- First **select notes** for the desired articulation in the desired MIDI channel:
- Then choose articulation via the **Articulation tab**: you can then scroll through all articulations loaded for the particular MIDI channel (instrument)





8 Start playing the piece

Now you are done and you can start to play the whole project in Cubase Pro. You may also start to play it from within Vienna Ensemble Pro (e.g. space bar).