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# Synchron Duality Strings (fx)

## Introduction

Welcome to the Vienna Symphonic Library's series of Synchron Instruments! The instruments of this collection were recorded not only at Stage A, the main hall of Vienna's revitalized Synchron Stage Vienna, but also at Stage B, our smaller and more intimate studio, thus enhancing your options for the implementation of strings in your compositions. The recordings were executed using an expansive, phase-controlled multi-microphone set-up, capturing string ensembles playing in a scoring stage with exceptional acoustics, now ready to be used in your studio. This document will provide you with the information you need to use the Library with our Vienna Synchron Player.

True to its name, **Synchron Duality Strings (fx)** furnishes you with extravagant and outlandish articulations you'll hardly find anywhere else.

## Concept

Like other *Duality Strings* Collections, the library offers two ensembles of every string group, a larger orchestral one and a smaller chamber one, playing and recorded simultaneously, but in different ambiances. Included are all kinds of effects such as clusters, cross-glissandos, vertical bowing – modern playing styles and articulations that may well become indispensable in your work! :)



crisper reverb environment.

This unique recording technique allows you to use the dual ensembles to fine-tune the sound of your compositions without having to layer different libraries, where the authenticity you can achieve is often less than you'd wish for.

Stage B also features two different microphone setups, so that you have "Bright" and "Dark" versions of the dry stage recordings at your command.

Of course, you can use the large and small ensembles in combination or separately!

## Section Sizes

| Stage A        | Stage B       | total |
|----------------|---------------|-------|
| 14 1st Violins | 8 1st Violins | 22    |
| 12 2nd Violins | 6 2nd Violins | 18    |
| 10 Violas      | 5 Violas      | 15    |
| 10 Cellos      | 5 Cellos      | 15    |
| 6 Basses       | 3 Basses      | 9     |

## Standard and Extended Library

The microphone setup was subdivided into 10 recording positions. The Standard Library includes 5 of these positions (as well as a RAM-friendly Room Mix composed of merged samples from the individual positions), allowing you to integrate instruments recorded with a stereo Decca tree into your projects with our Synchron Player software that was designed exactly for that purpose. Adding the Extended Library and thus getting the Full



- Standard Library
  - 0. A - Room Mix – Stereo
  - 1. A - Solo – Mono
  - 2. A - Mid– Stereo (L/R)
  - 3. A - Main/Room Mic – Decca Tree Stereo (L/R)
  - 4. A – Main C/Room Mic – Decca Tree Mono (Center)
  - 5. B - “Dark” microphones – Stereo (L/R)
- Extended Library
  - 6. A - Ribbon – Stereo (L/R)
  - 7. A - Main Surround – Stereo (L/R)
  - 8. A - High Stereo (3D) – Stereo (L/R)
  - 9. A - High Surround (3D) – Stereo (L/R)
  - 10. B - “Bright” microphones – Stereo (L/R)

## Mixer Presets

For each ensemble, there are a number of Mixer Presets that depict different recording situations. The basic Mixer Presets are Close, Classic, Wide, Distant, Ambience, Lush, and Lush Long. These are available in stereo versions for Room-Mix, Standard and Full, Decca Tree Multi Mic, as well as in Surround to Stereo Downmix, and Surround.

By default the classic room mixes are loaded which include the Standard Library microphone positions “Room-Mix” and “Mid” from Stage A, and “Dark” from Stage B. These are balanced in the stereo field to represent the respective instrument’s position in the Synchron Stage set-up.



## Immersive Sound and Auro 3D

Auro 3D is an immersive audio technology that allows for three-dimensional sound perception. The Belgian company Auro Technologies developed this technology based on a special speaker configuration, adding four additional speakers to a 5.1 surround configuration. These speakers (so-called “Heights”) are situated above the front and surround speakers and generate acoustic reflections that are perceived naturally due to the fact that sounds originate from around as well as from above the listener. Thanks to the comprehensive selection of discrete audio channels with the Full Library, you may mix your instruments in Auro 3D as well as in Dolby Atmos.

## Articulation categories

The Presets of each instrument group are subdivided into different Articulation categories (including one named “Custom”, ready for your own creations):

- Cluster
- Short note FX
- Vertical bowing
- Aleatoric chaos
- Scratches
- Natural harmonics
- Open string cluster
- Behind bridge
- Pegs tuning
- Chaos combis
- Harmonic combis



## Pitch

For designating pitch, the Vienna Symphonic Library uses International Pitch Notation (IPN), which was agreed upon internationally under the auspices of the Acoustical Society of America. In this system the international standard of A=440 Hz is called A4 and middle C is C4. All pitches are written as capital letters, their respective octave being indicated by a number next to it. The lowest C on the piano is C1 (the A below that is A0), etc.

The Synchron Player software allows you to set middle C to C3, C4, or C5 according to your preference. Selecting another setting than C4 will of course also change the play ranges and keyswitches accordingly.

## Presets

Presets comprise an instruments' recorded Patches in **Articulation** groups, which again contain **Types** of the respective Articulation, with further options if available. If you happen to be short of RAM, you can deactivate Articulations you do not need, and if necessary activate them again.

Throughout this collection, the keyswitches for Articulations are mapped from C1 to B1 for violins, violas and cellos, and from C6 to B6 for double basses. Type keyswitches start at C2 for violins and violas, and at C7 for the cellos and basses. Further options such as speed or playing direction are also mapped to the keyboard's 7th octave.

**Dimension Controllers** offer additional options within some Articulations or Types. The controller function is indicated by the respective caption, as of course it may take on different tasks as needed.

- **Articulations:**  
violins, violas, cellos C1–B1;



violins, violas from C2,  
cellos, basses from C7.

- **Other variants:** 7th octave.
- **XF control:** MIDI continuous controllers (CC).

The MIDI controller featured in this library is **MIDI CC3**, which is implemented as Dim.Ctrl/A to control **crossfading** between different variants of an articulation, or even altogether different articulations to blend between them.

## Preset types

The collection offers three basic Preset types for every section in separate folders named “VelXF sus - MOD”, “VelXF - MOD”, and “Velocity”. In **VelXF sus** Presets, velocity crossfading by modwheel is only activated for long notes, while the dynamics of short notes are controlled by keystroke velocity, thus facilitating phrasing. In **VelXF Presets**, all articulations have velocity crossfading activated so that you can control dynamics with MIDI controller CC1, the modwheel.

Velocity crossfading can be enabled or disabled by clicking its on/off symbol in the Synchron Player’s Perform tab, or you can use the **Velocity** Preset where the dynamics are generally controlled by keystroke velocity.

Apart from the individual string ensembles, there are also Presets containing all ensembles as shown in the screenshot below. These ‘Tutti’ are available in full range and compressed range versions. You will find them especially useful for quick layouts and for live play. The tutti Presets feature two types of stacking:

### Tutti full range

- **Mapping range:** B0–D6;  
basses B0–B2; cellos C2–B3; violas C3–F#4; 2nd violins C4–D7; 1st violins G4–D6.
- **Articulation keyswitches:** C0–A#0.



- **Mapping range:** C2–D5; basses C2–B2; cellos C2–B3; violas C3–B3; 1st and 2nd violins C4–D5.
- **Articulation keyswitches:** C1–B1.
- **Type keyswitches:** starting at C7.

Please note that in the compressed range Presets, the 1st violins sound one octave higher than played, the basses one octave lower.

## Cluster

Fast cross slides; glissando to cluster; measured vibrato; pulsing cluster; cluster trills.

- **Type:** C2–E2 (violins, violas), C6–E6 (cellos, basses).



## Cross slide fast

The working title for this articulation was “Impossible Octave Trill”, because it was notated like a trill and had to be performed on the same string. When we started recording this, the musicians thought that we must be morons utterly ignoring what is feasible on their instrument. But they soon understood that what we were looking for were the strange artefacts which occurred when they were trying to perform this impossible articulation as it was notated. The sound (at least that of the higher strings) reminds one of seagulls in panic mode – Hitchcock would have loved it!

## Glissando to cluster

Glissando to cluster, up/down, sustained and tremolo.

For *glissando to cluster*, the string section is divided into 6 groups, all starting from the same pitch. The first group remains on the starting note. The second group slides a whole tone up and remains there. Group 3 continues the glissando to the next whole tone step, and so on to group 6. The final outcome is a whole note scale cluster within an octave range. With this articulation, especially the lower strings create a very mystical, foggy



- **Up/down:** G2/G#2 (violins, violas), G7/G#7 (cellos, basses).
- **Long/tremolo XFade:** Dim.Ctrl/A (MIDI CC3).

## Measured vibrato

Measured vibrato, slow and fast, one direction and crossed.

In *measured vibrato*, the players perform roughly synchronized slow pitch movements at approximately a quarter tone interval. 2 tempos are available – a slow one with one up/down movement per second, the faster version in double time. The slow tempo and imperfect synchronization result in a kind of pulsating sound quite distinct from a regular vibrato. *Crossed* is a variant where the players are divided into two groups, with one group starting from the lower pitch, the other from the higher pitch, thus creating a pulsing quartertone cluster.

- **Speed:** F2–G2 (violins, violas), F7–G7 (cellos, basses).
- **Style:** A2–B2 (violins, violas), A7–B7 (cellos, basses).
- **Style XFade:** Dim.Ctrl/A (MIDI CC3).



## Speed Xfade

Instead of direction, slow and fast articulations are crossfaded in this variant.

- **Speed XFade:** Dim.Ctrl/A (MIDI CC3).
- **Style:** A2-A#2 (violins, violas), A7-A#7 (cellos, basses).



Here, the players also create very narrow clusters, playing about a semitone apart. However, there is no finger movement on the strings. The section is divided into three groups. The first group stays exactly in pitch, the second one plays a quarter tone lower, and the third one a quarter tone higher. Moreover, the sections perform individual, crosswise dynamic movements from piano to forte. The result is a kind of “psychoacoustic” cluster, where the pitch seems to be moving around the room.

- **Long/tremolo XFade:** Dim.Ctrl/A (MIDI CC3).

## Cluster trill

The name of this patch at least should be (more or less) self-explanatory. The string sections are divided into four groups. All of them play on the same root key (the lower



## Short note FX

Staccato, pizzicato shuffled front-back/back-front; glissando short and détaché up/down (to/from cluster); glissando pizzicato up; pizzicato on nails; hammer on.

- **Type:** C2–F#2 (violins, violas), C7–F#7 (cellos, basses).

### Staccato shuffled, pizzicato shuffled

Staccato, pizzicato shuffled front-back and back-front.

These patches sound similar to a very fast repetition. However, while the musicians are playing just one note, there are four divisi sections, thus causing the shuffling effect. Each section has to perform a thirty-second note (or demisemiquave) with increasing delay. To get this done with precision poses quite a challenge for the musicians – especially for the divisi players not performing on the beat.

Apart from that, we wanted to create a kind of 3D effect, resulting in two different versions of the articulation. In the first one the divisi section playing on the grid occupy the front row, while the most delayed section is performed by the players in the last row. The resulting shuffle effect appears to move backwards into the room. The second variation is its mirror-image, with the grid players in the back row, and the most delayed performance taking place in the front row.

Of course, this room effect only works in Stage A. Also, the basses performed just one version, because their seating does not go back into the room.

- **Direction:** G2–G#2 (violins, violas), G7–G#7 (cellos, basses).



### Glissando short, glissando détaché

Glissando short, détaché up (to cluster) and down (from cluster).

This articulation is similar to the whole-scale glissando clusters. Again, the sections are divided into six groups starting on the same key. One section remains on that key, the others moving on along a whole tone scale. Here however this happens with a superfast glissando, sliding within the duration of a staccato bow, and in a variation within a short détaché bow. The articulation also is played in reverse, starting with the whole scale cluster and executing the fast glissando into unisono.

- **Direction:** G2–G#2 (violins, violas), G7–G#7 (cellos, basses).



## Pizzicato FX

The first of these pizzicato articulations is the more common one, a “classical” glissando pizzicato. The players slide up the string after plucking a tone. The effect is more pronounced on the lower string instruments because of their stronger resonance.

The second effect, labeled “nail”, is close to a Bartók pizzicato. However, the plucked string is not allowed to hit the fingerboard, but instead is hampered by a fingernail placed next to the plucked string.

## Hammer on

Guitar players know what this means, but for players of bowed strings this performing style is not so common. It was surprising how much impact one can achieve in that way! The players do not bow or pluck the strings at all – they just hammer down a finger onto the string.

## Cellos, basses: Hammer on / col legno



- **Hammer/legno:** G7–G#7.

## Vertical bowing

Vertical bowing short, long, and tremolo.

The name *vertical bowing* derives from the perspective of a cello or bass player, i.e., down the fingerboard towards the bridge. The technique prevents the strings from oscillating like with regular bowing. It creates very fragile, quiet and ghost-like sound. Pitch is at the most defined just by the resonance of the instrument body. Per definition, tremolo yields the most interesting result.

- **Type:** C2–D#2 (violins, violas), C7–D#7 (cellos, basses).
- **Long/tremolo XFade:** Dim.Ctrl/A (MIDI CC3).



## Aleatoric chaos

Aleatoric chaos détaché (forte), legato (piano), and with vertical bowing (pp).

For these patches, the string sections are split into 4 divisi parts. Each part is pretty challenging, its purpose being exactly that the musicians will not be able to perform it accurately. – Naturally, when they got the sheet music on their desks, they were terrified and started rehearsing it intensively. We had to stop this and inform the players that precision would destroy the intended character of the articulations, so they should just let it flow.

There are three different bow styles available: détaché performed in forte, a legato in piano, and our special bow technique, vertical bowing, by default in *pp*. The character of the détaché versions might remind one of a resolute discussion of a group of people, while legato has a murmuring character, and vertical is close to whispering voices.



## Basses: Special FX

An additional gem is offered by the double basses. Herb says that he cannot describe the technique, because he simply doesn't not know how it was done. Apparently, the bass players fooled around during the sessions and generated this super-strange, out of the world (at least for basses, that is) sound. When asked how they had done it, they said that it was their "secret". Luckily, they could be persuaded to record it for this library. The patch is simply labeled "Special FX", which is the way to go when one has no idea at all about the content.

- **Mapping:** A1-E2, A2-E3.



## Scratches

Short and long scratches.

This playing technique is against all of a string player's basic instincts, as they are to be performed with very high bow pressure on the strings, and moving the bow very slowly. The result is a super harsh, eerie sound, perhaps close what you would get when a pretty muscular non-musician were holding a string instrument in his hands for the first time and trying to play. ;-) On some instruments, the resulting sound is quite similar to a forced brass flutter tongue.

When they were playing this, the musicians showed stressed features, even grimacing at times, and obviously looked so funny that our conductor Gottfried Rabl had to stop the recording session a few times because he couldn't stifle his laughter. Nevertheless, we were able to finalize these patches, too!

- **Short/long:** C2/C#2 (violins, violas), C7/C#7 (cellos, basses).



## Natural harmonics

Natural harmonics: short, long, tremolo, sul G/D/A/E/chords; trill sul G/D/A/E; glissando low/high note.

Natural Harmonics are not per se a contemporary or FX technique. However, because its absence in the Duality cosmos up to now, we decided to include standard performances of short notes, sustains, and tremolos.

There are two different mapping schemes, one of them with the pure harmonics for each string mapped to individual patches. Then there are merged patches consisting of harmonics with pitched notes, so that you also get a full chromatic scale on your keyboard for these basic articulations.

Not to leave out the FX, there are of course some specials. For *harmonic trills* frequently dip on the string with the finger holding the harmonic key. As the strings react slowly to this, one doesn't get fast pitch changes, and the result is a vibrant change of overtones. A classic amongst these articulations are the famous harmonic *glissandos*.

Finally, there are *harmonic chords*. For this, the sections were been split into 6 groups,



chromatic scale for these chords. If you use them in your compositions, you should keep in mind that this is not possible in real world performances!

- **Type:** C2–F2 (violins, violas), C7–F7 (cellos, basses).
- **String selection:** F#2–B2 (violins, violas), F#7–B7 (cellos, basses).
- **Long/tremolo XFade:** Dim.Ctrl/A (MIDI CC3).

## Trill

Trills have no merged strings and no chords.

- **String selection:** G2–A#2 (violins, violas), G7–A#7 (cellos, basses).

## Glissando

Low note and high note glissandos.



## Open string cluster

Clusters played on the open strings: short, long, tremolo, pizzicato, arpeggio.

Usually, you cannot perform clusters on open strings, except if you detune the strings themselves. So that is what we did here: the sections were split into 3 part divisi. One group stayed in tune, one was pitched down, the other one up, altogether spanning little more than a half tone.

Something we hadn't expected happened then. Especially with short notes, the sound of the sections is extremely close to that of a waterphone! Because the sound of these articulations is so unique, we filled up the empty keys between the strings with pitched samples, so that you can play a string-waterphone ensemble. The original pitches are indicated on the player's keyboard.

**Arpeggio mapping:** the arpeggio clusters are mapped to white keys, starting on the lowest note of the instrument (basses: C1) with two slow variants, and two fast variants an octave higher.

- **Type:** C2–F2 (violins, violas), C7–F7 (cellos, basses).
- **Long/tremolo XFade:** Dim.Ctrl/A (MIDI CC3).



## Behind bridge

Played behind the bridge: short, long, tremolo, pizzicato, arpeggio, and cross arpeggio.

Bowing behind the bridge is already a classic in modern string writing. As every individual instrument delivers an uncontrollable pitch, and all the instruments produce completely different overtones, you get this distinct sound.

**Arpeggio mapping:** arpeggios and cross arpeggios are mapped to white keys, starting on the lowest note of the instrument (basses: C1) with two slow variants, and two fast variants an octave higher.

- **Type:** C2–F#2 (violins, violas), C7–F#7 (cellos, basses).
- **Long/tremolo XFade:** Dim.Ctrl/A (MIDI CC3).



## Pegs tuning

Tuning pegs being turned while playing: regular up/down, and tremolo down.

This articulation is a little extravagance – we simply recorded the musicians opening their pegs. Quite understandably, this was not so popular, and therefore this was the very last articulation we asked them to perform. Of course, we needed at least two passes (normal bowing and tremolo), so we got the chance to record an extensive retuning of each section for each string.

**Mapping:** there is one variant for each string, mapped to that string's regular tuning (basses starting on C1).

- **Type:** C#2–D#2 (violins, violas), C#7–F#7 (cellos, basses).
- **Regular up/down:** G2/G#2 (violins, violas), G7/G#7 (cellos, basses).



## Regular X Tremolo

Crossfading of downward regular and tremolo articulations.

- **Regular/tremolo XFade:** Dim.Ctrl/A (MIDI CC3).



## Chaos combis

This slot features crossfading combinations of different articulations.

- **Type:** C2–E2 (violins, violas), C7–E7 (cellos, basses).
- **Crossfading/layering:** Dim.Ctrl/A (MIDI CC3).

## Cross slide

Cross slides crossfading with measured vibrato, scratches, and with added pulsing cluster.

- **XF selection:** G2–A2 (violins, violas), G7–A7 (cellos, basses).



## Cluster trill

Cluster trills crossfading with aleatoric legato, fast cross slides, and fast cross slides as well as fast cross measured vibrato.

- **XF selection:** G2–A2 (violins, violas), G7–A7 (cellos, basses).



## Aleatoric legato

Aleatoric legato crossfading with fast cross slides, cross measured vibrato, and pulsing clusters.

- **XF selection:** G2–A2 (violins, violas), G7–A7 (cellos, basses).



## Bridge layered

Articulations played behind the bridge overlaying fast cross slides, fast cross measured vibrato, cluster trills, aleatoric legato, and aleatoric vertical bowing.

- **Layered articulation selection:** G2–B2 (violins, violas), G7–B7 (cellos, basses).



## Gliss to cluster down/up

Stacked up and down glissando to cluster articulations.

## Harmonics combis

Combinations of harmonics and other articulations.



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## Vertical bow + chords

Vertical bowing short, long, and tremolo with harmonics chords added.

- **Bowing style:** G#2-A#2 (violins, violas), G#7-A#7 (cellos, basses).

## Open string cluster XF chords

Open string clusters short, long, and tremolo crossfaded with harmonics chords.

- **Cluster style:** G#2-A#2 (violins, violas), G#7-A#7 (cellos, basses).



## Harmonics XF Bridge

Harmonics short, long, tremolo crossfading with behind the bridge playing.

- **Harmonics style:** G#2-A#2 (violins, violas), G#7-A#7 (cellos, basses).



### ... XF Harmonics glissando

Crossfading with harmonics glissandos: aleatoric legato, aleatoric vertical bow, cross slide fast, measured vibrato fast, vertical bow tremolo.

- **Crossfading articulation:** G2-B2 (violins, violas), G7-B7 (cellos, basses).



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