

# Garritan Personal Orchestra 5: Expression Maps for Dorico

## Introduction

GPO5 can work extremely well with Dorico — dare I say even better than with Finale, its intended partner and stable-mate. There may be newer, better (and more expensive) libraries: but if you already own it, it's still a perfectly serviceable and versatile addition. The strings are the weakest spot; the brass is variable and requires fine handling; but the woodwind, percussion, keyboards (particularly the organs) and sheer range of instruments make it a valuable tool.

GPO5 comes with almost one thousand separate instrument samples! (There are over 100 Violins to choose from, for starters.) This is both a blessing and a curse: it provides versatility, but you need to know which ones are right for your music. The keyswitches and CC controls are far from consistent, so a large number of separate Expression Maps is needed.

GPO has other benefits: the instruments are 'pre-panned', so that Violins are placed differently from Cellos. So you don't need to Pan them in Dorico's mixer. The SFZ instrument definition format is text-based and can be edited, allowing you to improve existing instruments or even create new ones. It's light-weight, at a little over 12 GB.

This set of Ex Maps is designed as a 'basis' for further development, to suit individual needs. It focuses on the sustaining instruments: Strings, Woodwind, Brass, and to a lesser extent, keyboards. I have concentrated on the **KS** keyswitch instruments, where available, on the assumption that they are the most useful within Dorico.

## Nota bene

The 'Notation' set of instruments all use key switches in the C-2 octave (*that's minus 2*), which is outside the range of any instrument, so you'll never get any 'pedal notes' if the wrong switch is down for an instrument. The 'Standard' set of instruments are designed to be played live on a keyboard, with the switches in easy reach, and appropriate for the instrument's range. Use the Notation set!

GPO5 contains two separate sets of String samples: the 'legacy' GPO4 Solo and Section Strings (numbered 07 and 08); and the Garritan Orchestral Strings (numbered 10). I will refer to these as **GPO Strings** and **GOS Strings**.

GPO5 contains Brass samples from the Project SAM library, as well as Garritan-originated samples. Some of both of these (!) are 'legacy' from GPO4, and some are new to GPO5. The keyswitches used by the Brass samples are organised quite chaotically, so that legacy samples of either type use one set of switches, and new GPO5 samples use a different set of switches. Ultimately, there are only two types of Ex Map needed, but remembering which is needed can be difficult. (*See below for more.*)

It would be a lie to suggest that the ‘legacy’ samples were necessarily inferior or unnecessary: each has its strengths and weaknesses, and each may be best suited a particular style. Also: don’t assume that ‘Solo 1’ or ‘Player 1’ should always be your first choice. The 2nd and 3rd ‘desks’ vary in sound and style, and may be preferable for a particular effect.

The GPO5 Help files contain a *Directory of GPO5 instrument patches*, which describes everything you need to know about the keyswitches and CCs used by each instrument. Another document on *Controls and MIDI controllers* is also highly informative. Nevertheless, I have also included a spreadsheet of the switches and CCs used by various groups of instruments, also which Brass instruments use which Ex Map.

## GPO Default

For basic playback of a large number of sustaining instruments, you can probably ‘get by’ using a generic or default Expression Map, particularly for those instruments that don’t have switches, such as the Instruments for Finale. You can then use it as the basis for creating more specific maps.

### Natural

Volume is defined by **CC1** for most sustaining instruments. Note Velocity is used for ‘attack’. For KS instruments, **C-2** is the keyswitch for ‘normal’ playing — when Middle C is defined as C3; if Middle C is C4, then it’s ... **C-1**. This note is outside the range of any of the samples, so even if a switch is held on an instrument that doesn’t have that switch, you won’t get a low rumbling noise.

### Add-on: Legato

You’ll need two Add-ons: one for *Legato*, with **CC68=127**; and one for *Non-Legato*, with **CC68=0**. *(For on/off switch CCs, where all values under 64 are off and all values over 64 are on, I like to use 10 and 100 as the off and on values, as this makes it quick to alter, by the addition or removal of the zero. However, some CCs must have 0 for OFF, like the Organ Console stops.)*

### Other CCs

You could add controls for **CC23** (variation of tone) and **CC21** (Length, or release) to expressions in the ‘Default’ map, as every sustaining instrument has these.

### Ambience

The ARIA Player has some lovely Ambience settings, which give an essential bit of ‘space’ to the sounds. The extent to which the sound gets mixed with the ambience is controlled by the SEND knob is ARIA’s mixer. You can set this in the Expression Map. I like to add **CC91=64** to the **Init**, to ensure a nice 50% mix. You may or may not want this: obviously, it will only affect the sound if you’ve set and turned on Ambience in the VST.

That will get you up and running with a large number of instruments. It will also work for instruments in other Garritan Libraries, including Garritan Instruments for Finale.

## Woodwind

There are only 2 KS instruments in the entire Woodwinds: Flute and Piccolo, with keys for Vibrato, Non-vibrato or Flutter. So the 'default' Ex Map should serve for the remainder. I've created a 'GPO Woodwind' map that builds on the Default with a few extras, like configuring short notes with increased attack and reduced Length **CC21**. This works well for most of the Woodwind.

Vibrato Speed is controlled with **CC17** in some instruments.

## GPO Strings

The 'legacy' GPO Solo and Section Strings (07 and 08) all use identical KSeS and CCs, so they can all use the same Ex map. (Though you may want to create one map for Solo and one for Section, to give them slightly different defaults.) The KS instruments have a useful range of switches: upbows, downbows, tremolo, mute, pizz, and trills.

Staccato can be made using the 'auto-alternate' up and downbow, which plays a short, non-sustaining note. Accents can be made with a Base expression that sets the Note Velocity to 127.

Non-sustaining samples, such as Pizzicato, Up/Down bows, do not use **CC1** for dynamics, but use **Note Velocity** instead.

Because *Tremolo*, *Mute*, and *Tremolo Mute* are three different keyswitches, I'm not convinced that you can use Add-ons. You can't add D and E to make F..!

GPO Section Strings have keyswitches for trills, but I actually think that Dorico's interpreted trills are better. GPO Solo Strings' trills are pretty useless, as they 'wobble' once for each note on/off pair. (E.g. you repeat the note for each undulation.) So set the Playing Options to use Dorico's trills.

## GOS Strings

Almost every instrument in Garritan Orchestral Strings uses a different Map for key-switches. Tsk. The basic characteristics of the Default Map remain. In addition:

*Mute* (and '*Na (Open)*') can be supplied using Add-ons, with **CC71=127** for Mute on and **=0** for Mute off.

GOS has no tremolo switch. Also: the Marcato sample is non-sustaining, so you don't want Dorico to use this for marcato accents, as the note will stop short (unless you have the notes doubled/layered with a sustaining sound).

One criticism of the GOS samples is that they sound a bit 'late', or 'slow'. This effect can be reduced, if not removed, by applying **CC119=127**.

GOS Strings have CCs for 'ADSR': *Attack*, *Decay*, *Sustain*, *Release* (**CC73**, **CC75**, **CC70**, **CC72**). Modifying these may be useful in Ex Map conditions, like Short Notes.

Tone (**CC74**) works well with a value below 80; anything above that rings a bit 'hollow'. (It's actually a low-pass filter.)

TBH, despite the hundreds of string samples, the range of key switches and articulations, the strings remain the least impressive part of GPO, requiring the most work to get adequate results. The GOS Solo Strings are passable. “Needs more work.”

## Brass

The problem here is choosing which instruments you want, and working out which Ex Map they need. There are 3 Players, Solo and Section instruments, and SAM variants of each. Broadly speaking, all Player KS and Non-SAM Solo instruments use ‘Ex Map 1’, and all Section and SAM Solo KS instruments use “Ex Map 2”. The Piccolo Trumpet Solo KS could share an Ex Map with the Flute and Piccolo instruments, or have its own. (NB: the SAM Piccolo Trumpet Solo uses the SAM Solo map.)

The Ex Map 2 group has much in common with the GOS Strings: CC71 for Mute, CCs for ADSR and Tone. The Ex Map 1 group is more like the ‘legacy’ string instruments: Mute is a keyswitch, not a CC. You may want to synthesise conditions for Short Notes or Staccato.

You may want to create your own endpoints using Plr1, Plr 2, Plr 3 samples for three different Dorico Players of a trumpet, trombone or horn.

There are now separate Expression Maps for SAM Solo and Section Trumpet, French Horn and Trombone, as well as the more generic maps described above. (I think the SAM samples are a bit better than the standard GPO ones.)

## Percussion

I haven’t done anything for the Percussion: Percs use Note Velocity for dynamics, so will work Dorico’s default map (not GPO Default). The real work will be in creating Percussion Maps for the percussion Sets.

## Keyboards

Like percussion, most of the keyboards use Note Velocity for dynamics, rather than CC1. They need the usual Legato Add-ons. The exceptions are: Harpsichord, which has no dynamics at all, and the Organs (*see below*). Harps: I have made a map for Harps, though I’m not sure how to apply the Harmonics key switch in Dorico. The Harpsichord has three keyswitches for 8-foot, 8 & 4-foot, and Buff Stop. I’ve mapped the Buff stop to Mute and Dampened, the 8’ to Natural, and the 8 & 4 to *ff*, in lieu of anything better. The Piano is mapped for Soft, Sostenuito and Pedal pedals (CC67, CC66, CC46), plus legato playing. (The GPO pianos don’t actually ‘do’ a soft pedal, though you can easily hack the SFZ file to provide one, by cannibalising the GOS sordino EQ change. (*Details on request.*)

## Organ

The general Organs can use *GPO Default* map, as they use CC1 for dynamics. And that should suffice.

GPO’s *Custom Organ Console* instrument, combined with Dorico’s playback capabilities, offers the prospect of registration marks in the score —such as *Great 8’, Swell, Pedal, Reeds*, etc—

actually triggering appropriate stops automatically in playback. I've created another document for this, as it's a bit lengthy and tricky.

## Choir

The Choir will work perfectly well with the GPO Default map. If you want to control the vowel using keyswitches, you'll need to create a map for the Choir, and create the Playing and Playback Techniques. You may want permanent Legato (**CC68**) depending on the style.

I find the (original) Full Choir KS samples to be better than the newer separate instruments for Soprano, Alto, Tenor and Bass.

## CC16

According to the manual, **CC16** controls the 'aggressive' quality in the String and Brass samples marked 'AG'. The effect varies between instruments, but is useful in some circumstances. You may want to increase the **CC16** value for short notes, for example. Some non-AG instruments also respond to this CC in some samples for a bit of attack.

## After-touch

Dorico doesn't provide a mechanism for using after-touch at the moment (v.4.2), though GPO5 is sensitive to this parameter. GPO's SFZ files use ARIA's own virtual CCs: **CC129** ('not a real CC') for Channel Pressure and **CC131** for Aftertouch. You could edit the SFZ files to use a 'real' CC number instead. (*The details for which won't fit in this margin.*) But if we're going to use any new CCs, let's say **CC86** and **CC87**, to be consistent. (**CC128** is pitch bend, you'll be pleased to know.)

## CC260

Many of the samples new to GPO5 have an **Offset** control in the ARIA Player's Controls panel. According to a blog on the Garritan site, this controls 'the amount of delay that occurs between when each note begins and when you hear the corresponding sound.' The XML that creates the interface for each instrument's controls defines that knob as **CC260**. However, I've found no reference to this in the SFZ files. Obviously, this is well outside the normal 127 CCs, so either it doesn't do anything, or it's a private ARIA extension. It can't be mapped to a real CC, as there's no mention of it in the instrument definitions. **CC119** also works to the same purpose. Though as the SFZ code is `offset_oncc119=20000`, it seems it's just a switch to offset the start of the sample. Meh.

## Installing the Maps

You can import the maps into Dorico's Expression Maps editor dialog. Alternatively, simply dropping the *.doricolib* file onto the Hub will ensure that they are always loaded.

## Endpoints, VSTs and Playback Templates

Given the vast choice of instruments, you will need to create your own Playback Template that auto-loads the particular samples that you want for a given instrument.

To do this, you will need to create a Dorico project file with the Players that you want to use, and load the relevant samples into ARIA Player VSTs, assigning the appropriate Ex Map to each instrument. Once you've done this once, then you save the VST, Ex Map and sample data as an 'Endpoint'.

I'd suggest doing each orchestral group as a separate endpoint, so you can save different endpoints for: GPO Brass, GPO Woodwind, GOS Strings, GPO Strings, etc. Then when you make a Playback Template, you can mix or select the various groups, and use them with other sample libraries.

When you save your Endpoints, don't forget that you'll need to set up both Section and Solo Players in Dorico. Thus, you could have Garritan's Section and Solo samples matching Dorico's players. If you don't set both, you'll get an empty, silent player, or a 'fall-through' to another library, if that's how your template is set up.

On Dorico's YouTube channel, John Barron has demonstrated how to create Ex Maps, Endpoints and Playback Templates for the BBC SO Discover library from Spitfire. The principles are entirely the same. You'll notice in the video that one instance of the Spitfire VST is used for each instrument.

ARIA Player now comes as two different VST3 plug-ins: one single-output and one multi-output. The single-output VST will pass all its outputs to ONE channel on Dorico's mixer. The multi-output VST lets you assign (manually) each slot to a different pair of outputs, each of which will appear separately on Dorico's mixer. With Dorico, I recommend using the single-output VST with one VST for each instrument, rather than loading several instruments onto one VST. (The exception might be something like an SATB choir.) Generally, ARIA and GPO load very fast.

If you want to layer Garritan samples together (as they were designed to do) for one Dorico staff, then you'll need to change the MIDI channel of each slot to the same number (e.g. 01).

## Dorico's Playback Overrides and Automation

Don't forget that the Playback Overrides in the Expression map offer another method of configuring the playback: percentage note lengths, accent strengths, dynamic curves, etc.

The improved interface for drawing in CC data manually may also help to get more out of the instruments

## Concluding remarks

I've tried to keep the number of Ex Maps as few as possible: I've also tried to keep the names short. Users may prefer to duplicate maps for more specific groups, or individual instruments, for finer control.

One of the great strengths of the Garritan instruments is the use of human-readable text files for the instrument definition files, in the SFZ format. It's remarkably easy to customize them. For instance, it would be simple to change some of the keys for the switches, in order to use fewer Ex Maps. At the more extreme end of editing, entire new instruments or keyswitch groups can be created. I have also created a document listing 'fixes' for some problems in the SFZ files.

Thanks must go to Brian Roland for his detailed explanation of GPO's capabilities.

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