viscount Classical organs

Physis Explained

4. Tuning options for Physis organs

[Head shot presenter]
Aside from the voicing possibilities with Viscount's Physis-based organs, it's possible to change aspects of their tuning. For example, you can select one of a large number of historical temperaments such as Werckmeister or Valotti, which you might want to use to obtain a more authentic sound with some types of older music. You can also make fine adjustments to the basic pitch of the instrument to tune it with others, and you can transpose your playing up or down.

Additionally, there are some options that affect the tuning relationships among notes of individual ranks, and the tuning anomalies that arise from drops in wind pressure. Because Physis organs are based on a simulation of the way that real pipes behave, the tuning relationships can be varied in real time according to the moment-by moment changes in wind pressure and ensemble that would occur in a pipe organ. For example, real pipes interact with each other to varying degrees, if sounded together. Tuning can sag when wind pressure drops, depending on the type of pipe, the number of notes sounding, and so forth.

[Title: Transposition, temperaments and tuning]
[Control panel]
This is the Tuning page of the Physis control panel. The first option on the list allows you to transpose a performance by a specific number of semitones up or down. In it's default state, as you see here, it's not transposed, and a C major chord sounds in C major, but if we take it down to minus one then everything is taken down a semitone. That could be used for playing with baroque instruments tuned to A415, for example, or you could simply use it to play hymns in a different key without having to figure out the transposition yourself. The range is 6 semitones either way.

Next on the list we can select the temperament to which the organ is tuned. The default is equal temperament, which is how most modern instruments are tuned. In equal temperament every semitone is essentially the same fraction of an octave and there are no perfectly harmonic intervals except octaves. It's a compromise that works well for the majority of situations, but over history there have been all sorts of alternatives that spread the tuning errors out differently across the scale. These make some intervals and keys more in tune than others. Each has its adherents and you may find that some baroque and early music sounds better in one of these, for example.

I'm not planning to go into the intricacies of historical temperaments here, but it's perhaps enough to show that you are unlikely to run out of possibilities with a Physis organ. If we go down the list you'll see some of the options (show). If we select this version of Meantone, for example, you can hear that a chord of C major is quite well in tune, but C sharp is clearly much further out.

Next on the list, the Base Key sets the note from which the selected temperament's circle of fifths is started. This needs to follow the transposed pitch of notes if the transposer is used, so if you're playing at baroque pitch (the transposer set to –1) and you want the Base Key to be equivalent to written C, then the Base Key should normally be set to B.

At the bottom of the list you can fine tune the organ's pitch, so it can be played with other instruments. Concert pitch has A above middle C tuned to 440 Hz, but you can vary this up to a semitone either way.

[Title: Ensemble and Air Pressure]

Ensemble introduces small natural differences in tuning between one note and another. Pipe organs are never exactly in tune, and factors such as temperature and ageing will result in different degrees of "out of tune-ness". At a setting of nothing the notes are perfectly tuned, and as the value is increased you can hear that there is a larger amount of tuning variation among the different sounding ranks and notes. The algorithm that controls this is fairly sophisticated in that any de-tuning is not necessarily fixed or uniformly distributed, in order to deliver a realistic result. A value of 3 or 4 usually results in something that sounds reasonably convincing, or perhaps 5 for something sounding a bit more jangly.

Below this is Air Pressure, which simulates the drop in wind pressure that can result in pipe organs when a lot of wind is demanded in a short time. If you play large tutti chords then you will notice this more. At a value of nothing the wind pressure remains constant no matter what stops are drawn or what notes are played. A sort of perfectly stable (but impossible) wind supply, you might say. As the values are reduced the effect becomes more obvious, mainly in the tuning relationships and change of ensemble during the onset of chords.

In the most recent versions of Physis the number of gradations on the Air Pressure scale was doubled, so there are 8 levels rather than 4. A former value of –1 is now –2 for example.

This basic Air Pressure setting also interacts to some extent with the more advanced winding options possible in recent versions of Physis, which simulate different styles of wind supply, but we'll take a look at those another time, along with subtle features such as the tuning style of celestes.

[Presenter head shot]
I've shown you how the tuning characteristics of Physis-based organs can be adjusted to accommodate different performance contexts, and to simulate aspects of pipe organ behaviour for improved authenticity. These features make the organs adaptable to a wide range of situations, able to simulate many of the subtle tuning inconsistencies that give pipe organs an interesting sound.