viscount Classical organs

Physis Explained

3. Physis voicing parameters

[Head shot presenter]
In previous tutorials we've taken a broad look at the voicing flexibility possible with Viscount's Physis organ system. Now I'm going to dig a bit deeper to show you some of the more detailed voicing options for individual pipe sounds.

Because Physis is based on a computer model of the way organ pipes work, the timbral quality of its voices can be changed by adjusting parameters of the pipe model. Whereas a pipe voicer would be able to adjust things like the scale of the pipe, the cut-up, the height of the mouth and so forth, the Physis model translates these things into controls that an ordinary user can approach more easily.

Almost all of the voicing parameters can be accessed from the control panel on the organ itself. The only thing you can't get at here is the note by note regulation of a voice's loudness, for which you need the Physis Editor software and a laptop.

DIP to Black
TITLE Flue voicing parameters

[Control panel shot]
In order to access the detailed voicing parameters from the home screen, you need to select VOICES then EDIT PARAMETERS, and finally the relevant division of the organ. In this case I'll work on the GREAT. As with other voicing options, you then get a list of the stops on the instrument, so you can choose which one to edit.

We're going to start out with a flue stop, in this case a 4 foot Harmonic Flute, as the effects of changes are quite audible. Having selected it we see the list of voicing parameters available. Its basic tonal quality has been designed, but we can make some adjustments here to fine-tune the voicing.

CHARACTER at the top of the list is roughly equivalent to altering the scale or diameter of the pipe for flue stops. As with pipe voicing, as we vary this from a wide scale at the bottom of the range to a narrow scale at the top, the tonal character varies from being mellow to quite bright. So in this case the sound is rather flutey at the bottom and gets almost principal-like at the top.

Moving down to AIR NOISE, we have a way of altering the breathiness of a voice, or the sound of wind blowing through a pipe. At the bottom of the range the sound has an almost pure tone with no air noise, and at the top the sound is very breathy.

The next parameter in the list affects the stability of the tone, and it's labelled HARMONIC NOISE. It affects both the fundamental tone and all the harmonics. At the bottom of the range you can hear that the tone remains absolutely stable as the note is sustained, while further *up* the tone begins to burble in a random fashion, and at the top of the range it's quite unstable. If you listen to the sounds of real pipes you'll notice that some of them do this more than others. It depends on winding, mouth height and the degree of nicking employed, among other things.

ATTACK is relatively straightforward, and controls the rate at which the virtual pipe speaks. For flue pipes the design attack value is 0, but you can make them slower to speak by increasing the value. For reed pipes the design attack value is 4, in the middle of the range, and you can make them both slower and faster to speak than this.

RELEASE DETUNING affects what happens to the pitch when you release the key. At high values you tend to get something of a pitch droop as the wind pressure falls when the key is lifted. As with the other Physis parameters, some real pipes and winding systems tend to do this more than others, so the amount of it you set will depend on the style of organ you are trying to emulate.

There are some further parameters to adjust if we scroll down from here. The KEYBOARD LOW AND HIGH LEVELS allow you to regulate the way that loudness changes across the range of the keyboard. The LOW level gradually scales up or down the level below middle C, and HIGH does the same thing above middle C. This is superimposed on any individual note regulation that might have been done using the Physis Editor software, so it acts as a general scaling of loudness across the note range.

VOLUME has the same effect as the voice volume setting shown in a previous tutorial, and simply sets the basic loudness of the voice across the whole range.

Finally it's possible to choose which of two TREMULANTS affects this voice. Elsewhere in the system you can set the global speed and depth of these two tremulants.

[Dip to black] Select Trumpet on Great.
TITLE Reed voicing parameters

With reed stops the AIR NOISE parameter is not available, as it's not really relevant, but we have FREQUENCY SKEW instead. Here we're looking at a trumpet voice's parameters. Frequency skew affects the pitch instability during the onset of a note. When it's low you can hear that the note starts up quite smoothly on pitch, but when it's high there's something of a squawk as the note starts up, while the pitch settles. Again, some styles and voicings of real reed pipes tend to do this more than others, so you might want more of it to emulate the speech of a Spanish Trompeta Reale than you would for an English Cornopean for example.

[Dip to black] Select mixture on Great.
TITLE Mixture voicing parameters

In this case of Mixtures, CHARACTER behaves slightly differently, because a mixture stop is made up of multiple ranks of pipes, each sounding a different harmonic. If we adjust the CHARACTER you can hear that the relative amounts of different harmonics making up the mixture change, there being more of the quint, or fifth of the scale, component at the top of the range, and more of the octaves at the bottom. Essentially the mixture is more quinty and rich at the top, and brighter and less quinty at the bottom.

[Head shot presenter]
That completes my short tour of the detailed voicing parameters available on Physis organs, giving you a sense of the degree to which virtual pipe sounds can be tailored to suit a particular voicing intention. Unlike sampled organs, the pipe sound here is being synthesized from scratch, in real time, so we have a very wide range of control over its speech, stability, and timbral character.