

HAVERHILL OLD INDEPENDENT CHURCH



HAUPTWERK™ v.5 SAMPLE SET EXTENDED SET

USER MANUAL

Version 2.00 - © Lavender Audio 2020



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HAVERHILL OIC Extended ~ HAUPTWERK™ Version 5 Sample Set

INSTALLATION INSTRUCTIONS

Thank you for purchasing this sample set. Please note that installation files for the Haverhill OIC set are available either for download or can be supplied on a USB Memory Stick at a modest additional cost. It is recommended that you take a little time to read the user manual available either online or on the installation media to familiarise yourself with the various features it offers.

Installation of the Haverhill OIC Full set

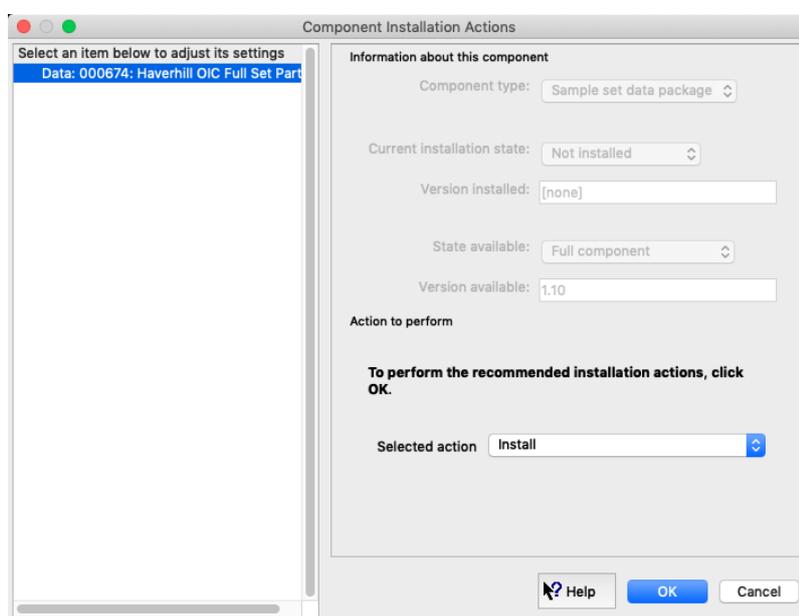
The Full sample set requires a total of two Data packages and one Organ package to be installed. These are identified as follows ...

Haverhill-DataPackage-674

Haverhill-DataPackage-675

Haverhill-Full-OrganPackage

For correct installation, it is essential that Hauptwerk's component installer is used. Start Hauptwerk and (unless installing from a download) insert the USB memory stick into a suitable USB port. In Hauptwerk, choose "File | Install organ, temperament or impulse response reverb..." and then navigate to the USB drive or to the location you saved the downloaded installation files and find the first data installation package (674). Once Hauptwerk has analysed the package you may be presented with the sample set licence which you will need to accept. After a while, the following screen is presented:



Ensure that the Selected installation action for the [Data] item is set to Install and then click OK. Installation should then proceed and the whole process should complete quickly. Repeat this process for DataPackage-675. When it comes to installing the Haverhill-Full-OrganPackage, you will notice that two organs are available to be installed - these are as follows ...

Haverhill Old Independent Church

This is the standard full organ based on the existing instrument in the Haverhill Old Independent Church.

Haverhill Old Independent Church Bonus Mini Set

This is the same organ as that provided for the separately available Haverhill MiniSet and is included here by way of a bonus. It can be installed if you wish, but it is not essential for the full set to function. Note that this organ doesn't install any extra samples - it makes use of those that are installed for the full set.

Installation of the Haverhill OIC Extended set

The Extended set requires that the Data components of the Full set have already been installed; in addition, the following two components will also need to be installed:

Haverhill-DataPackage-676

Haverhill-Extended-OrganPackage

Assuming all required packages have been installed successfully, the organ is now ready to load for the first time. Further details about this and the various Haverhill sample sets in general can be found in the user manual, which is available within Hauptwerk once the set has been loaded (From the menu at the top of the screen, choose Organ | Show organ information...).

NB. Use of this sample set requires an update to your iLok account. You should have received details of this update by the time the USB Memory Stick has arrived. If not, please contact Lavender Audio.

3. Specifications and background information

The following information is provided as background to the creation of this sample set. It is by no means required reading but may help when considering the options available as the organ is loaded for the first time as well as helping with the various organ specific settings that Hauptwerk provides.

The Haverhill Old Independent Church organ was recorded using the ORTF mic technique. This was felt to give the optimum balance of direct and reverberated sound whilst maintaining a good stereo image. The organ was recorded from a distance of approximately 4m from the front pipes. All samples are presented at a resolution of 24 bits and a sample rate of 48 kHz.

Multiple releases were recorded, which add greatly to the realism of the sample set. All pipes have a release recorded for both staccato and sustained notes and a third set of releases were recorded for the Swell chorus reeds (not Oboe) and for all Great and Pedal stops (including the Trumpet en Chamade). These releases are for notes held for a duration between staccato and sustained (*portato* - typically 200 to 500 mS, depending on pitch). Some of the pedal notes have a total of 4 releases. Despite the relatively modest acoustic of around 1.5 seconds, this extra layer adds noticeably to the realism. It was found that for the softer stops a portato release made no difference to the overall sound.

Please note that the multiple releases are handled automatically by Hauptwerk and that no special hardware is necessary.

Each sample was sustained for an average of 6 seconds and each has been programmed to have either 3 or 4 loops. Having more than one loop imparts some life to the sound and makes long sustained notes sound more realistic.

Up to 16 tremulant samples were taken for each Choir and Swell stop and these were processed using a special tool kindly provided by Milan Digital Audio. A limiting factor to the realism of the tremulant model is that the releases are not modulated in any way, so in effect a tremmed sustain has a non-tremmed reverberation. However, the relatively short reverb time of the building tends to minimise this problem.

Likewise a large number of Choir and Swell samples were analysed for the level and harmonic differences between the swell box being open and shut and the results of this used to programme accurately Hauptwerk's swell models. Both the tremulant and swell parameters can be further adjusted by using the voicing tools (Advanced edition only).

The organ is tuned to equal temperament at approximately A=450 Hz. All of the samples have been left at their recorded pitch with only the most out of tune being repitched from within the organ definition file. As a result, the normal tuning errors that are found in even the best regulated organs are present here and therefore contribute to the overall realism of the organ. However, it may be considered necessary to use the organ at standard concert pitch (A=440). This is possible and the organ definition file has been carefully programmed to produce appropriate randomised tuning errors when not using the original organ tuning (the strength of these tuning errors can be adjusted within Hauptwerk or even disabled completely so the organ plays in perfect equal temperament). The most realistic sound, though, will be when the original organ tuning is selected.

Note that adjusting the random tuning errors has no effect in original organ tuning mode .

The Extended Set makes use of all of the original Haverhill OIC samples and adds various other samples to provide a complete and highly flexible three manual instrument. Some of the new stops are formed from samples from other sources - they have been artificially placed in the Haverhill OIC acoustic using convolution reverb to help match them to the existing Haverhill organ samples. The remaining new stops are formed from existing Haverhill OIC samples which have been repitched from within the organ definition file and then revoiced as necessary. Further details may be found online at www.lavenderaudio.co.uk where there is also a document outlining the differences between the Full and Extended sets.

4. System requirements and loading the organ for the first time

The Extended Set numbers some 58 speaking stops, 4 of which are comprised of two ranks (which double the memory requirements for those ranks). Therefore, despite the relatively short reverberation time which limits the amount of memory needed for reverb tails, a significant amount of system memory is still needed and therefore a 64 bit operating system is highly recommended. The sample set was developed on a PC consisting of an Intel Core 2 Quad Q6600 processor with 8 GB of system memory running Windows Vista 64 bit and this platform has proven more than adequate to run this organ with all realism features enabled.

The following table gives very approximate figures for the amount of RAM (memory) the organ requires with various different loading options set. None of these figures take into account the RAM needed by the operating system or Hauptwerk itself. Where no figure is given, that particular loading option (although valid) hasn't been tested, generally because it wouldn't make sense to use it. Of course, not all ranks need to have the same settings.

	24 bit	20 bit	16 bit	14 bit
Uncompressed	?? MB	□	~ 8000 MB	□
Lossless compression	?? MB	7210 MB	4840 MB	□
Single loops and compression	□	5555 MB	3840 MB	3570 MB
Single loops and releases with compression	□	□	□	2995 MB

To achieve best results, the organ should be loaded at 24 bits resolution, no memory compression and with all realism features enabled. If your system doesn't have sufficient memory to allow this, then it is recommended to try the following in order until the set loads reliably (it is wise to allow for a small amount of unused memory to keep the operating system happy !)

- ◆ Use lossless memory compression (audio quality is unaffected although polyphony is reduced by approximately 15%)
- ◆ Load some or all samples at 20 bit resolution
- ◆ Load some or all samples at 16 bit resolution.
- ◆ Only load a single loop on some or all samples.
- ◆ Load some or all samples at 14 bit resolution
- ◆ Only load single releases for some or all samples

It is possible to go a fair way down this list with little obvious loss of realism or quality – however the last option should both be avoided if at all possible. Loading single loops means that very approximately only half of the sustain section of each sample will be loaded, leading to a useful saving in memory space.

You can also reduce the load on your computer's processor by disabling the wind model (not appropriate in the US), and by disabling real time harmonic shaping, both of which will affect the realism of the organ.

An ideal amount of RAM is 16 GB, which will allow the organ to be loaded at full 24 bit resolution. Failing that, 8 GB RAM still allows for a lot of flexibility in loading at 20 bit resolution. For those running Vista under 8 GB of RAM, experience suggests that some stops ought to be loaded either with single loops or at 16 bit, as a total memory load of 7210 MB places something of a strain on the operating system. With 4 GB of system memory, the compromises are more significant, although loading with single loops at 14 bit resolution still retains a surprisingly high level of audio quality. Where your operating system limits usable memory to 3 GB or less, inevitably not all stops will be able to be loaded unless release sample truncation is enabled.

The first time the organ is loaded the sample cache is built. This takes a considerable time – maybe 15 minutes or more. However, subsequent loads are much quicker.

Once the organ is loaded, you can use Hauptwerk to connect the keyboards, stops, pistons and swell pedals of your MIDI setup as necessary. Default settings for all of the sample set's inputs have been carefully specified, so this process should only take a minimum of time. If your MIDI rig has only one or two manuals, then it is well worth using Hauptwerk's redirectable keyboard feature to help access all three manuals.

5. Haverhill OIC Extended Sample Set Screens

The **Console** screen is for the purist, as it offers the most realistic view of the instrument without the extra features that are seen on the other pages. All of the keys, pedals and stops respond to the mouse as well as providing a visual indication of remote control via MIDI. Although much of the display should be intuitive, here are a few pointers for those not familiar with this sort of organ.



The Great is the middle manual, with Choir below and the Swell above (unlike some European organs where the equivalent of the Great is at the bottom). Both Choir and Swell are enclosed, being controlled by the left and right pedals respectively.

Either side of the swell pedals are eight combination pedals - these act as divisional pistons to the Pedal Organ and are numbered 1 to 8 working from left to right. The combination pedal to the far left is simply a reversible acting on the Great to Pedal coupler.



The **Stops + Pistons** page offers a convenient way to control the organ from a single screen. There are 8 pistons for each division and 20 General pistons. They are all fully programmable – select the stops you wish to assign to a piston and then click on the setter piston (labelled 'S') followed by the piston you wish to assign the combination of stops. It's important then to click on the setter again to switch it off after you have finished programming the pistons. The 'C' piston is a general cancel.



These controls allow you to couple the piston action. For example, if the “Great and Pedal Combs Coupled” is enabled, then pressing a Great piston will also operate the corresponding Pedal piston (and vice versa). Neither combination coupler is affected by any piston, divisional or general.



Basscouplers offer a way of playing the pedal organ from the manuals. This can be useful in various circumstances, not least if your virtual organ lacks a pedalboard ! The basscoupler is intelligent in that only the lowest manual note sounds on the pedalboard, meaning that only one note is played at a time giving a far more musical result than a simple “Pedal to Manual” coupler. The state of the basscouplers is stored and recalled with the general pistons only – the divisional pistons have no effect.



Melody couplers are, in effect, the opposite to a bass coupler in that they only couple through the highest note of any held chord.



For those who are using Hauptwerk with a four (or more) manual console, a virtual solo organ has been provided. The keys are not displayed and there are no individual stops for this division, but a transfer has been provided to allow the Choir Trumpet en Chamade and the Tuba to be playable from the Solo. When the transfer is active, both of these stops are only playable on the Solo, with both being muted on the Choir organ. In addition, with the transfer active, the Choir divisional pistons have

no effect on the Trumpet en Chamade or Tuba drawstops.

The general pistons, however, do act upon these stops, regardless of the position of the transfer stop. In fact, the transfer stop itself is also affected by the general combination pistons.

The next two pages (**LH and RH jamb**) spread the contents of the Stops + Pistons page over two pages and are of use if you have a multi-monitor setup. The stops and couplers in each screen are all linked, so that if you operate a particular stop in (for example) the Console screen, its counterpart in the Stops + Pistons and appropriate Jamb screen will

also change. Notice the Crescendo display, which allows you to see whether or not the Crescendo feature is active. The Crescendo facility is described in detail below.

The **Settings** page allows a quick and convenient way of enabling or disabling stop action noise, key action noise and blower noise as well as setting the relevant noise levels. To set the volume level, simply click on the appropriate LED bar graph and the volume will adjust to the point where you clicked. The calibration of the bar graphs is in decibels. Key action noise on the real organ is quite quiet, the exception being the bottom octave of the Swell which is noticeably louder. It was generally not possible to remove this totally from these samples (although enough has been removed to make the effect of playing this part of the Swell with several stops drawn acceptable), so even with the key action noise switched off, note on and off noise will still be noticeable to an extent. Both swell pedals are perfectly silent in operation, hence there is no noise associated with their operation.



There is also the facility to set the volume of the Trumpet en Chamade. When this organ was sampled, the decision was taken to sample the Trumpet en Chamade from a greater distance than that used for all other ranks. The reason for this is that this stop is absolutely devastating at the console as well as sounding a little harsh. Once further back in the church the natural acoustic gives the stop a much rounder and more musical sound – of course, the stop was voiced to sound good in the church rather than at the console, so it seemed to make sense to take advantage of this when sampling. This then raises the question of what volume level to use for the stop, hence the facility to give that decision to the end user.

Please note that Hauptwerk Advanced Edition has comprehensive voicing facilities and this is highly recommended if you wish to make changes to the volume, tone or tuning of other stops.



Optionally, it is possible to load the Great and Choir Trumpet en Chamade as two separate and independent ranks, allowing each to be voiced separately with Hauptwerk's voicing tools (Advanced Edition only). If memory is at a premium, then do not load the Choir Trumpet en Chamade and switch on the Single Rank switch to still allow this stop to sound on both Choir and Great.

Although Hauptwerk does now allow tremulant speed to be continuously varied, a two speed tremulant remains available which may be independently set on both Swell and Choir. With the Slow Tremulant switch on, the trem speed is about 4 Hz - this rises to nearly 7 Hz once the switches are turned off (1 Hz is the equivalent of one tremulant cycle per second). The tremulant speed on the original organ is the faster of the two speeds.



The last two pages deal with the **Crescendo** facility. The crescendo pedal is a way of effecting a rapid build-up and subsequent reduction of stops, ranging from *ppp* to *fff* and back again. The mechanism for adding and subtracting stops is designed to have no effect on the registration already drawn, which means that you won't see any stops moving as the pedal is operated (the stop action noise sounds will be noticeable, however). This has the advantage that whatever combination of stops is drawn when the pedal was first operated will be maintained once the pedal has returned to zero.

The crescendo facility has 30 stages and is fully programmable for all stops and most couplers. On each programming page, working from left to right, you can set whether a stop is brought on by the pedal by clicking on the relevant place in the grid and turning on or off the appropriate light. Lights for the speaking stops are green and for the couplers are orange - the colour difference is there purely to help differentiate between the two.

Note that if any alterations are made to the crescendo system, these changes are not automatically stored once the organ is unloaded. Changes are saved by choosing "Save Combination As ..." from the Combinations menu.

To make use of the crescendo pedal, a hardware continuous MIDI control will need to be mapped. There is no graphical display of the pedal itself and therefore no way of using the mouse to operate it. The crescendo display on the Stops + Pistons and LH Jamb displays shows the position of the crescendo pedal - this is worth checking if you have stops sounding when none are drawn.

6. In use ... setting this organ in historical context and some thoughts on registration and repertoire.

The English romantic organ was at its height in the late 19th and early 20th centuries. The trend had been to move away from the classically conceived organs of the 18th and early 19th centuries to organs which employed increasing wind pressures and a greater variety of flue and reed colours using newly designed pipework. The organ was increasingly being seen as an orchestra as imitative stops became more realistic and the fashion of the day was for an overall smooth and round tone.

Traditional chorus structures were displaced by a heavy emphasis on unison tone whilst such upperwork that remained was being voiced relatively quietly. Mixtures tended to be pitched quite low with some quite unsubtle breaks which didn't always help the performance of polyphonic music. Henry Willis commonly employed a tierce in his mixtures and Arthur Harrison's Great mixtures often included a flattened 21st rank as well. Some builders, notably Robert Hope-Jones almost totally abandoned anything above a 4 foot rank, even in large instruments (eg. Worcester Cathedral). In contrast, builders such as T.C.Lewis and J.J.Binns kept truer to the organ's classical traditions, maintaining a proper chorus in many of their instruments. Despite the more conservative approach, Binns was still quick to employ the latest techniques and sounds, this being a necessity in order to maintain a competitive edge amongst his peers.

The Extended Haverhill organ looks to build on the existing colours and allow the organ to be more flexible in terms of the repertoire that may be convincingly performed. The emphasis is on sympathetic additions rather than wholesale change - no neo-baroque style mixtures here.

The **Great** diapason chorus from 16 foot to a "clean" mixture has been left almost as is – an extra rank has been added to the Mixture to even out some of the breaks as well as to add a small degree of extra brightness. The extended set features a newly sampled Stopped Diapason, adding a softer flute option. The Suabe Flute (originally from the Choir and slightly revoiced) works well with either 8 foot flute. The new Clarion is mainly taken from the Posaune and adds a reedy brightness.

The **Swell** organ is now provided with a proper secondary principal chorus. The Mixture has been totally reworked and is now "clean" - ie with unison and quint ranks only. In conjunction with the newly sampled Fifteenth it adds an authentic English brightness to the 8 and 4 foot principal ranks. The Sesquialtera is a reworking of the original Swell mixture, pitched at 17.19.22 in the bass and 12.15.17 in the treble. Otherwise, this division is as Binns left it, with fine chorus reeds giving an impressive full swell at one end of the spectrum and silky soft strings allowing a peaceful pianissimo at the other end.

The **Choir** organ has been extensively remodelled to provide more in the way of romantic sounds as well as a proper cornet séparée. The Viol Celestes provides a keener string celeste in comparison to the Swell Voix Celestes and the Unda Maris uses the existing Dolce samples to give a flute celeste when drawn with either the Dolce or Concert Flute. The Flautina from the swell organ forms the basis of the Nazard and Tierce and with the Stopped Flute (Swell Stop Diapason) completes a useful family of small flutes on this division. A small Trumpet expands both chorus and solo options and the powerful Tuba allows the organ to tackle properly works of the many English romantic composers who call for this distinctive stop.

As with the swell, the **Pedal** organ gains a more complete principal chorus whilst the 32 foot additions are more romantic touches. The existing Harmonic Bass (Pedal Bourdon quinted with the Pedal Open) is considered so effective that a 10 2/3 Quint has been provided to allow this effect to still be available.

The Haverhill organ is suited to a wide variety of repertoire. English music obviously works well, with much of the output of SS Wesley, Alfred Hollins, Charles Stanford, Hubert Parry, Percy Whitlock and Herbert Howells being a good fit. However, the Preludes and Fugues of Bach and Buxtehude can sound good and although the tone of the organ is quite some way from being a Cavaille-Coll, the French romantic school can sound very effective. The German romantic era is also worth exploring – Mendelssohn generally sounds good and many of the colours called for by Karg-Elert and Reger are there, although it's easy for some of Reger's music to sound a little "muddy" on an English romantic organ.

When registering, bear in mind that the octave couplers can be used to great effect – the full compass of 61 notes helps to lessen the problem of running out of notes at the top. The soft swell strings with octave coupler are very pleasant and at the other end of the scale, adding the Swell to Great octave coupler is very effective in full combinations. In the

build up of the swell, the Oboe stop would typically be drawn quite early, often before the mixture. A useful smaller full swell can be obtained by drawing 8, 4 and 2 foot flues, the Mixture, Sesquialtera, Oboe and Contra Fagotto.

Returning to the Great, bear in mind that the Viola is really a small open diapason and therefore quite usable with the Principal and Fifteenth. In addition, the combination of Hohl Flute, Principal and Fifteenth works very nicely in contrapuntal music. Solo options are enhanced with the cornet on the Choir (ie Concert Flute, Stopped Flute, Nazard, Flautina and Tierce) and the Sesquialtera (with 8 and 4 foot flutes) on the Swell is another possibility.

For both the French and German romantic school, it's best to avoid too much heavy 8 foot tone. The Choir Orchestral Oboe sounds quite French and that stop along with the Choir flutes, Viol di Gamba and Principal can be good for Cesar Franck. The Choir Concert Flute is a lovely stop – try coupling it to the Swell strings and then using it as a solo against the strings.

The swell is a good starting point for lighter music – try the Stop Diapason, Viol d'Orchestre, Mixture and Oboe with the octave coupler and tremulant for a more than passable theatre organ sound.

All of the above is very much intended as a starting point to encourage exploration of the organ and discover combinations that work for you. There is also no reason why external reverb should not be added to place the organ into a bigger acoustic.

The Great Mixture, Swell Mixture and Swell Sesquialtera all comprise of two ranks of samples as far as Hauptwerk is concerned. These are labelled A and B in the loading and voicing screens. For those who are using Hauptwerk Advanced Edition and wish to use the voicing tools, the following information will help when adjusting the voicing of these stops. The numbers in the Rank columns refer to the number of semitones above unison pitch (eg 15 refers to a 2 foot rank and 19 refers to a 1 1/3 foot rank)

Great Mixture IV		
MIDI Note Range	Rank A	Rank B
36 - 47	15 . 19 . 22	26
48 - 59	15 . 19 . 22	12
60 - 78	8 . 12 . 15	19
79 - 83	8 . 12 . 15	1
84 - 96	1 . 5 . 8	12

Swell Mixture IV - II		
MIDI Note Range	Rank A	Rank B
36 - 54	15 . 19 . 22	26
55 - 59	15 . 19 . 22	12
60 - 66	12 . 15	19 . 22
67 - 78	12 . 15	19
79 - 96	12 . 15	

Swell Sesquialtera III		
MIDI Note Range	Rank A	Rank B
36 - 59	19 . 22	17
60 - 96	12 . 15 . 17	



7. Acknowledgements

Finally, grateful thanks go to the following people ...

Brian Swallow, the organist at Haverhill Old Independent Church for his great support and enthusiasm in getting this project off the ground. Karen Knight, the minister of the church and the lay elders and congregation for their hospitality and for agreeing to allow the sample set to be made publicly available.

Peter de Vile, who tunes and maintains the organ to a very high standard.

Martin Dyde and Brett Milan for their help and support in bringing the sample set to fruition.

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