

A. What is Hauptwerk?

- A computer program that plays back, in real time, user-triggered recordings (known as samples) of organ pipes and related sounds (such as blower noise, stop action sounds, etc.). The samples are loaded into a computer's temporary memory (RAM) to enable lag-free playback of the sample set.

B. How does this compare to a commercial digital organ (Allen, Rodgers, etc.)?

- Today's digital organs typically use samples of a selective number of pipes in a rank and then stretch-tune those to create other nearby notes. Conversely, Hauptwerk plays back samples made of each pipe in a rank for greater realism. This requires significantly more fast-access memory than what is typically used in a digital organ.
- Digital organ samples also tend to be much shorter in duration to save on memory, and often use only one sample of the pipe release transients or, in some cases, only approximate the sound of those transients with digital processing. Hauptwerk samples are usually much longer, and often use multiple samples of the release transients, again for greater realism. Some Hauptwerk sample sets also include surround-sound versions for greater realism.
- Some modern digital instruments, such as the Johannus LIVE, are now using Hauptwerk-style sample technology for greater realism and flexibility. Viscount Organs uses the alternative technology of computer physical modeling which essentially creates the organ sounds from scratch in real time based upon modeled characteristics of real pipes.

C. What is needed to run Hauptwerk?

- At a minimum, Hauptwerk requires 1) a music keyboard 2) with a MIDI connection (often via USB) 3) to a computer 4) running the Hauptwerk program 5) using a Hauptwerk-compatible sample set 6) with audio output from the computer 7) to headphones and/or speakers.
- A Hauptwerk system can be as simple as using a single inexpensive MIDI keyboard (with no pedalboard) driving the most basic Hauptwerk program running on a low-cost PC using a free Hauptwerk sample set (one is included with all versions of the Hauptwerk program) and heard by plugging headphones or earbuds into the PC's sound card.
- More complex systems use either an existing MIDI-enabled digital organ or a purpose-built console connected to a suitably-equipped PC or Mac with the choice of multiple sample sets heard through a higher-end sound system which could include multi-channel audio and a surround-sound speaker system.
- The size and sophistication of the Hauptwerk sample set that can be loaded and played is dependent upon 1) the amount of available RAM (the largest sample

sets can require upwards of 128 GB or more of RAM while smaller sets can require less than 4 GB of RAM) and 2) the performance capabilities of the computer processor.

- The reality of the sound heard is also dependent upon the type and sophistication (and cost) of the audio system used. External audio interfaces are often employed to provide greater fidelity and flexibility for optimal sound reproduction, and the room is also a factor in a speaker-centric sound system.

D. Hauptwerk information, hardware setups, available sample sets, and related sites can be seen at these links (clickable in the PDF file):

Hauptwerk web site: <https://www.hauptwerk.com/>. There are currently two available Hauptwerk versions available for purchase: Lite as a subscription only and Advanced as a subscription or perpetual license.

Hauptwerk sample sets: <https://www.hauptwerk.com/instruments/>. A comprehensive listing of sample sets available for Hauptwerk.

Contrebombarde: <https://www.contrebombarde.com/concerthall/home/front>. A free site where thousands of performances using virtual organs are posted. An excellent resource for hearing what different sample sets sound like, and for hearing a variety of virtual organ performances.

Classic Midi Works: <https://www.midiworks.ca/index.php>. Components and resources for DIY Hauptwerk consoles.

Noorlander: <https://www.noorlanderorgels.com/en>. Example of a company producing various models of purpose-built Hauptwerk consoles and systems.

Mixtuur: <https://www.mixtuur.com/>. Another company supplying purpose-built Hauptwerk consoles/systems.

Other Hauptwerk console and hardware vendors:

<https://www.hauptwerk.com/hardware/>. A listing of several Hauptwerk hardware vendors.

PCorgan.com: <https://www.pcorgan.com/FotosEN.html>. An excellent resource for viewing hundreds of examples of Hauptwerk consoles, many custom-built, others adapting existing consoles, and some using a collection of off-the-shelf components (MIDI keyboards, etc.).

Alternatives to Hauptwerk:

<https://sites.google.com/site/walworthvirtualpipeorgan/software>.