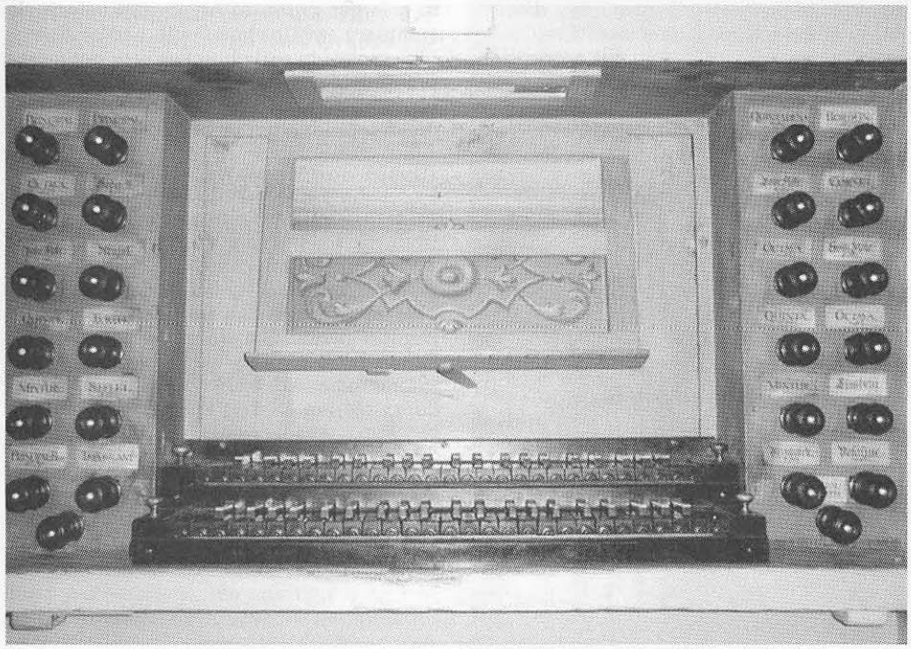
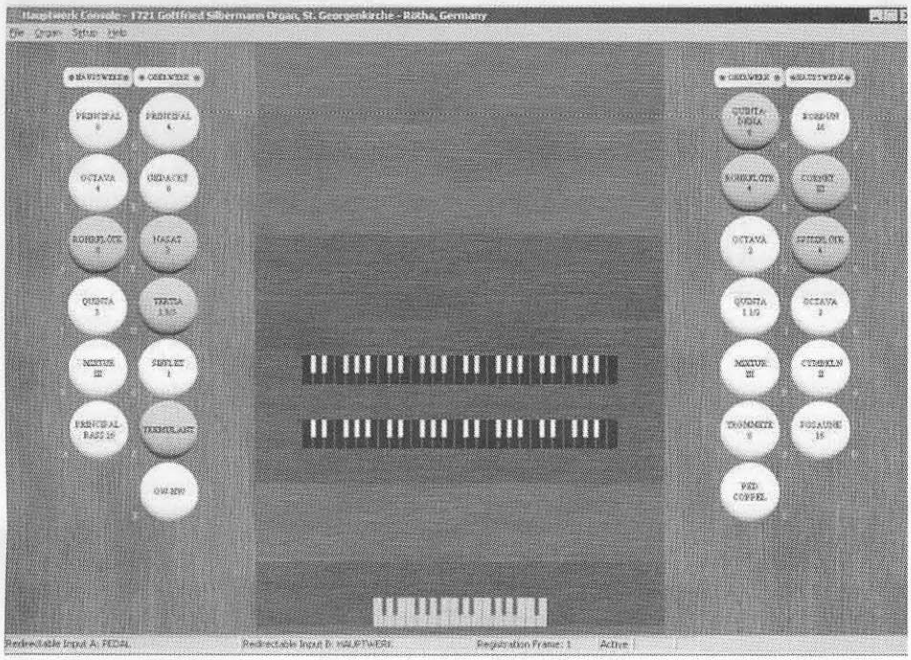
THE "HAUPTWERK" COMPUTER PROGRAM

Thomas Wichmann





Electronic representation of a historic organ—the 1721 Gottfried Silbermann organ in Rötha, Germany, and its electronic counterpart in "Hauptwerk" (images by Milan Digital Audio, used with permission)

Background

Just a few years back, the synthetic and lifeless sound of electronic organ replicas could be easily distinguished from the sound of true pipe organs. Modern electronic organs have come a long way, reproducing more and more convincingly their authentic counterparts by playing back computer samples of sounds from true pipe organs. However, because of restrictions on computing power and the amount of computer memory, most of the affordable electronic organs on the market today still don't sound like the "real thing" to critical ears.

Many of these limitations can be overcome if a fast personal computer is used for sound generation. A wonderful new PC program, called "Hauptwerk," was specifically written to utilize the power and memory of current computers in order to simulate pipe organ sound. Hauptwerk replays samples from computer memory to reproduce, in real time, CD-quality organ sounds that were sampled note by note for each stop of a pipe organ. By now, organ sample libraries are available that can be loaded into Hauptwerk and played using a MIDI-compatible organ console attached to the computer to produce a realistic reproduction of the sound generated by some of the most beautiful organs in existence.

Hauptwerk provides an intuitive screen look, which gives organists accustomed to regular pipe organs familiar controls over the virtual instrument (most importantly, stop switches that are activated by the click of the computer mouse). Personal experience with this program has shown that it is very stable, and technical help is promptly provided by the program's creator, Martin Dyde.

Available Organs

Tech-savvy organists can produce their own sample libraries for Hauptwerk (there are detailed instructions for this on the Hauptwerk Web site!). For the rest of us, there are several commercially available sample collections to choose from. All of these sounds are in stereo, and feature sound quality at least as good as that found on conventional CDs. In most cases, these samples capture not only the sound of the organ itself, but also that of the acoustic environment in which the organ resides.

Several commercial projects are under way to produce high-quality organ sample libraries. The most ambitious effort in Europe is the "European Virtual Church Organ Project" by Helmut Maier, a computer science/multimedia specialist from the University of Reutlingen, Germany, who has, thus far, provided samples from four organs, ranging from one of the oldest extant German organs, a two-rank Positif organ (built in 1654) from Griebenow, Germany, to the beautiful 20-rank Silbermann organ (1731) in Reinhardtsgrimma, Germany. Other European vendors include Jiři Zurek with his Sonus Paradisi project, who has produced samples from three historic organs in the Czech Republic, including a twelve-rank Schmid organ (Peruc, 1766), a 20-rank instrument

(1699) in the monastery of Zlata Koruna, and a 13-rank Renaissance organ (Smecno, 1587). Ariaan Hoogendijk, in the Netherlands, has provided the only sample library yet from a three-manual organ, a 28-rank instrument built by Marcussen (1965). In the U.S., outstanding sample libraries sold by Brett Milan include several modern American organs and two additional Silbermann instruments, both located in Rötha, Germany. All of these sample sets are of incredible quality and capture the beauty of the original organs with very high fidelity. The different vendors have different recording techniques, which appeal to different tastes and interests. Examples of sound output from these instruments are available on the vendors' Web sites (see appendix), which give a taste of the quality of the sound that can be expected.

Requirements and Costs

Hauptwerk organs can be played live, or can be played back as MIDI sequences stored on the computer disk. To play them "live," one needs a MIDI capable keyboard/pedal and a computer equipped with MIDI and audio interfaces. Most electronic organs built over the last 15 years are MIDI compatible, and even the most basic of these instruments will suffice. Several vendors now sell low-cost organ consoles, which do not produce any sound by themselves but provide MIDI signals for interfacing with a computer. The computer, on the other hand, needs to be fairly fast (at least a Pentium IV, running at 1.6 GHz), and needs to have a large amount of memory (a computer with 1.5-2 GB of RAM can play all of the currently available organs). Slower computer speed or lesser amounts of memory will result in a deterioration of the sound, or in a significant delay between key presses and sound production. A good audio system is also desirable. Good studio loudspeakers can reproduce the organ sounds nicely, but the greatest detail can only be appreciated with the use of high-quality headphones. In addition to these potentially pricey hardware items, one also needs one or more sets of organ samples, and, of course, the Hauptwerk program, which is sold as shareware. The current version of the program is only available in Windows format, but the upcoming version 2.0 will also be available for the PowerMac.

Conclusion

Hauptwerk can produce outstanding sound replicas of pipe organs. This program will perhaps appeal most to organists like the author of this review—people who own an older MIDI-capable organ and who are looking for ways to improve the sound of their instrument without having to replace it altogether. Better yet, given the way this type of electronic organ system works, future hardware, software, and sound improvements can be implemented at very low cost. In addition, Hauptwerk may provide a means by which the sound of (often fragile) historic organs can be preserved, and be made available to a larger group of organ enthusiasts. In summary, while those with access to true pipe organs in real churches may not need a program like Hauptwerk, all of us can rejoice in improvements like this one to electronic organ reproduction technology.

APPENDIX

1. More detail on Hauptwerk can be obtained from the extensive Hauptwerk Web site at <www.hauptwerk.co.uk>.
2. The commercial vendors for organ samples mentioned can be found at <www.Organartmedia.com> (European Virtual Pipe Organ Project), <www.clavmon.cz/sonus> (Sonus paradisi), <www.milandigitalaudio.com> (Milan Digital Audio), and <www.geocities.com/ahoogend> (Ariaan Hoogendijk).

Thomas Wichmann is a neurologist at Emory University in Atlanta, Ga., and has been an organ enthusiast for most of his life.