My Haarlem Hauptwerk Music Studio

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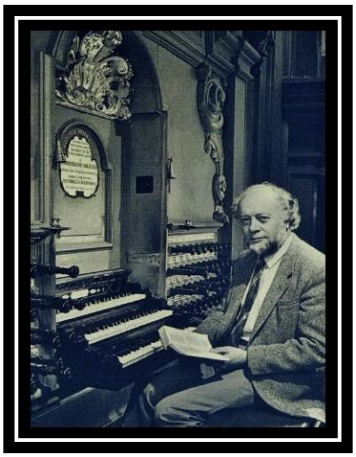
Most organists have likely heard or read something about Hauptwerk. Hauptwerk is a highly sophisticated computer-based program coded to authentically reproduce real pipe organ sampled recordings via MIDI enabled keyboard instruments, thus making world-famous organs readily available to organists everywhere. With a massive library of over 150 third-party instruments, organists everywhere can finally enjoy playing some rather amazing pipe organs from around the world in the comfort of their own home.

Initially, I was reluctant to embrace this unfamiliar technology, yet brazenly optimistic that I would somehow wrap my mind around designing a successful build of my own studio Hauptwerk instrument. Challenges turned into months of late evenings devoted to copious research and long-distance exchanges with Hauptwerk developers, engineering experts and fellow colleague end users. On-line, I discovered a plethora of mostly useful documentation related to Hauptwerk builds (*although some suggestions left much to be desired*), thus armed with a sense of confident hope, my design plans took on a remarkable life of its own.

The impelling desire which drove me to build my studio Hauptwerk instrument is easily traced back to my early undergraduate organ studies at Nyack College many years ago. It was there on the hillside campus overlooking the Hudson River and Tappen Zee bridge that a floodgate of life changing opportunities opened some rather amazing chapters for me including studies and master classes with organist Virgil Fox, and international organ studies on the renowned 1738 Müller Organ at St. Bavokerk in Haarlem, the Netherlands with organist Klaas Bolt. Klaas was the highly acclaimed professor of organ at the Sweelinck Conservatory in Amsterdam, and the municipal organist at St. Bavokerk. His improvisational curriculum instilled in me life-long study habits based on a theoretical framework of judiciously slow practice and methodical compositional analysis. To this day, St. Bavo remains near and dear to me. Allow me to share some history about this beloved instrument.



Klaas Roelof Bolt

Visitors to St. Bavo are literally struck by the sheer scale of the building that houses the world-famous Christiaan Müller organ which was built between 1735 and 1738. The organ measures 98 feet in height and covers the entire west wall, totally obscuring what once was a large stained-glass window that had to be removed to accommodate the organ. The organ consists of 68 stops, 5068 pipes and 118 ranks spread over three manuals and pedal. The magnificent case is a breath-taking visual feast for the eyes; an explosion of exuberance filled with 25 extravagantly carved figures sculpted by Jan van Logteren, including two life-sized trumpet heralders; (a female heralder poised on the outside of the 32' tower on the left side, and a male heralder poised on the outside of the 32' tower on the right side), plus several cherubs and allegorical figures all making music.

Adorning the two massive outside 32' pedal towers are the imposing Biblical figures of King David playing the harp on the left column, and Asaph, the prominent Levite musician (on the right column) holding a lute. Asaph is credited with authoring Psalm 50 and Psalms 73 through 83 during the reigns of King David and King Solomon.

Crowning the central casework are two ornately carved lions bearing the coat of arms and motto of the city of Haarlem, "*Vicit vim virtus"* (*Latin for "virtue conquered violence"*) making this elaborately adorned organ case a triumph of both architecture and sculpture. It may come as a surprise to some that the city of Haarlem actually owns this organ. St. Bavo municipal organists are appointed by the city council and employed by the city of Haarlem.

The Rugwerk (*Choir*), Hoofdwerk (*Great*) and Bovenwerk *(Swell*) divisions of this organ are visually placed above each other and clearly distinguishable, flanked on both sides by two enormous 32-foot pedal towers. This monumental organ was played in 1740 and 1750 by Georg Friedrich Händel who was especially fond of the Vox Humana stop; and in 1766 by ten-year-old Wolfgang Amadeus Mozart.

Recently, the Flentrop Orgelbouw of Zaandam, Netherlands restored the St. Bavo Müller organ. Following eight months of intensive polishing and restoration, layers of new tin foil were meticulously applied to all of the façade pipework, necessitated by natural corrosion of the metal, and plentiful nasty bat droppings. The restored organ looks absolutely spectacular.

Haarlem summer organ concerts attract world-wide visitors, and even more visitors during their famous biennial international Organ Festivals. In my opinion, this is one of the most visually beautiful organs in the world, and is both indescribably thrilling to play and listen to in person. So how does this brief historical dissertation connect with my Hauptwerk story?

A while back, Richard McVeigh (*https://www.beautyinsound.co.uk/*) demonstrated a professionally recorded sample set of the St. Bavokerk Müller organ which captivated my undivided attention and literally took my breath away. The beauty, the articulation, the clarity of each individual note of each engaged stop was nothing short of an unbelievable audio smorgasbord to my ears. The meticulously sampled sounds were realistically true and accurate, just like those sounds you would experience in person seated at the St. Bavo console. Voxus engineers masterfully recorded this stunning sample set from two separate perspectives; the up-close front set (those sounds you hear seated at the console), and the rear set (those sounds you hear from the audience's perspective). These two independent tonal perspectives can be custom blended in Hauptwerk to suit an organists taste based on the acoustical audio perspective desired.

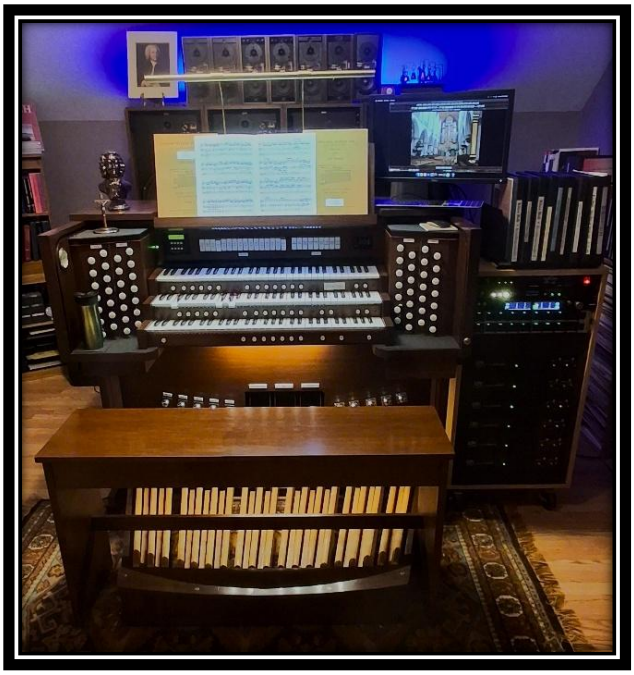
With the focused goal of bringing this cherished instrument into my music studio, intense investigation and preliminary design plans eventually produced the desired finalized blue-prints. Tireless mind-boggling research consumed me with technical options and dizzying specifications. Countless hours were spent reviewing hair-splitting comparisons between PC and Mac operating systems. External peripherals like commercial amplifiers were researched, as well as 3-way speakers, Thunderbolt capable multi-channel mixers, audio and MIDI cables, and a host of other tchotchke needed to build an authentic replication of the Haarlem organ to my unapologetic fastidious satisfaction. I was resolved that if I couldn't reproduce exemplary convincing tonal results that actually sounded like the St. Bavo Christiaan Müller organ, I would walk away, scrub the entire project and reinstitute my former studio Allen organ. Mediocre results have never been an acceptable norm in my book.

Ultimately, I incorporated a dedicated Mac Studio Computer to run the Hauptwerk V9 advanced edition and the Voxus Haarlem professional-extended sample set. Research clearly validated for me that real-time audio applications are much easier to set up and troubleshoot on a Mac than a PC. A necessary purchase was a PACE 3rd generation iLok USB-A device which safely stores your purchased licenses from Hauptwerk, Voxus and Milan. The iLok USB must be connected to your computer at all times in order to run all the programs, authorize your software and validate your purchased licenses.

Because of their brilliantly engineered compatibility with Thunderbolt 5, research led me to incorporate a MOTO multi-channel audio mixer in my setup. Every component in the system was researched ad nauseum to ensure musical performances would be free from any annoying "ping" and "lag" latency computer issues while playing. During the build, I decommissioned all of the Allen Organ amplifiers, all Allen sound boards and the Allen capture system. Allen amplifiers were upgraded and replaced with high end commercial QSC amplifiers. Additionally, I upgraded Allen's 15" speakers with JBL 15SW5P speakers. Upgrading these two important audio chain elements eliminated the possibility of undesired "clipping" or distortion associated with underpowered amplifiers and inferior overdriven speakers. To reproduce the real feel of the two 32' stops, I incorporated a JBL SRX828SP subwoofer system.

The visionary goal in designing my music studio Hauptwerk organ was not to blow the roof off of my home (*although it probably could with very little effort*), nor rile up my neighbors, nor aggravate my very supportive loving wife; but rather to design and engineer a legitimate worthy instrument that would realistically and cleanly replicate the St. Bavokerk organ experience in my home. Copious research led me to great companies like Voxus Virtual Organs and Milan who painstakingly sampled and recorded many beautiful organs from around the world like the Christiaan Müller organ I now cherish.

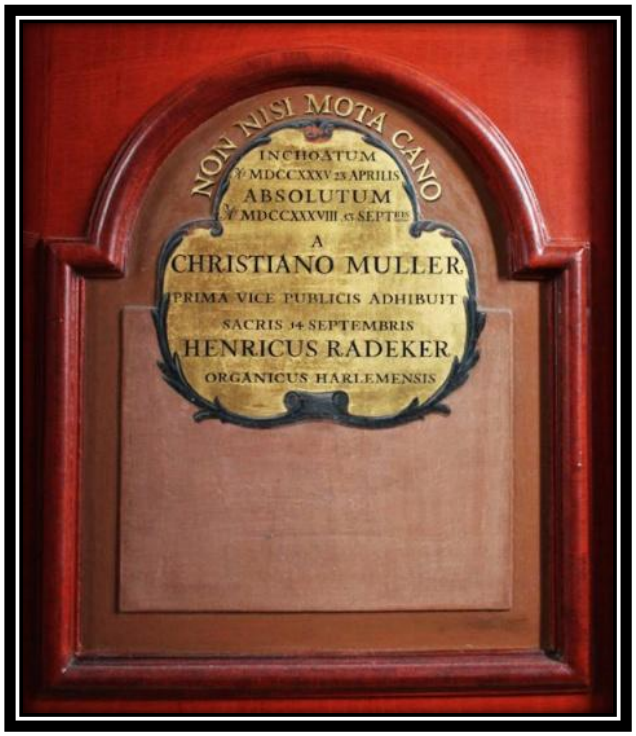
For techies amongst us, some noteworthy products I incorporated in my system build include an ASUS touchscreen monitor, MOTO 16A audio mixer, six (6) QSC-RMX850 amplifiers driving 12 channels of sound to (12) full range 3-way Allen speaker cabinets and (12) 2-way Allen monitor speakers; two (2) Behringer DS2800 distribution signal splitters, two (2) Aphex Aural Exciters, two (2) Furman Surge Protectors with power on/off sequencers, Mac Studio computer with Sequoia 15.6.2 operating system, Apple M3 Ultra chip with 28-core CPU, 60-core GPU, 32-core Neural Engine, 256GB unified memory, and 2TB SSD storage. Inner-connections include RapcoHorizon N1BLC-5MS cables, six Thunderbolt 5 ports, two USB-S ports, a HDMI port, 10Gb Ethernet port, and a dedicated headphone jack for quiet peaceful household late-night rehearsals.



At the very heart of my studio organ is a 3-manual draw-knob Allen Organ with MIDI on all divisions. I utilize a Roland UM-ONE mk2 USB MIDI interface between the Allen and my Mac Studio. Hauptwerk registrations are fully compatible and incorporated into the Allen thumb and toe presets. As a heads-up, builders need to totally disconnect the Allen combination action in order for Hauptwerk to work its magic. As a performer, it's wonderful having instantaneous registration changes readily available on this magnificent instrument which in real life would require the help and expense of two console assistants on either side of the bench pushing and pulling stops. The crowning achievement of this project for me is daily experiencing anew those breath-taking St. Bavo sounds I experienced so many years ago as a student, and later in life as a returning visitor.

Haarlem Stop List

Hoofdwerk (*Great*)	**Rugwerk** (*Choir*)	**Bovenwerk** (*Swell*)	**Pedaal** (*Pedal*)	**Koppels** (*Couplers*)
C-d3 (*C-g3*)	C-d3 (*C-g3*)	C-d3 (*C-g3*)	C-f1	Hoofdwerk + Bovenwerk
Praestant 16'	Praestant 8'	Quintadena 16'	Principaal 32'	Hoofdwerk + Rugwerk
Bourdon 16'	Quintadena 8'	Praestant 8'	Praestant 16'	Pedaal + Rugwerk
Octaaf 8'	Holpijp 8'	Quintadena 8'	Subbas 16'	Pedaal + Hoofdwerk
Roerfluit 8'	Octaaf 4'	Baarpijp 8'	Roerquint 12'	Pedaal + Bovenwerk
Viola di Gamba 8'	Fluit Douce 4'	Octaaf 4'	Octaaf 8'	*Rugwerk + Hoofdwerk*
Roerquint 6'	Speelfluit 3'	Flagfluit 4'	Holfluit 8'	*Rugwerk + Bovenwerk*
Octaaf 4'	Super Octaaf 2'	Nasard 3'	Quintpraestant 6'	
Gemshoorn 4'	Sesquialter II-IV	Nachthoorn 2'	Octaaf 4'	* = Hauptwerk sampleset
Quintpraestant 3'	Cornet IV	Flageolet 1 1/2	Holfluit 2'	
Woudfluit 2'	Mixtuur 1' VI-VIII	Sesquialter II	Mixtuur VI-X	
Tertiaan 2' II	Cymbaal III	Mixtuur 2' IV-VI	Ruirschquint IV	
Mixtuur IV – X	Fagot 16'	Cymbaal III (+terts)	Bazuin 32'	
Scherp VI-VIII	Trompet 8'	Schalmei 8'	Bazuin 16'	
Trompet 16'	Trechterregaal 8'	Dolceaan 8 '	Trompet 8'	
Trompet 8'	Tremulant	Vox Humana 8'	Trompet 4'	
Oboe 8'		Tremulant	Cink 2'	
Trompet 4'				



If you haven't yet investigated Hauptwerk, and have a MIDI capable instrument, I'd highly encourage you research the many options out there that are available.

Finally, I would be totally remiss if I didn't gratefully acknowledge and personally thank Marien Stouten (Voxus Virtual Organs), François Ratté (Support Manager Milan Digital Audio) and Curtis Snow (Sales Engineer, Sweetwater Sound) for their tireless support, endless correspondences and friendships that helped me build and finalize my dream Hauptwerk studio organ. If you haven't read Timothy Masters "Building a Hauptwerk Organ", I'd highly recommend you pick up a copy of his insightful well written book as a good starting reference for your Hauptwerk adventure.

Larry Hoey began playing the organ for church services at the age of 10, igniting his lifelong passion for musical excellence as a performer, recitalist, choral director, mentor, coach and teacher. 2026 marks 65 consecutive years for Larry as a church organist. His principal organ pedagogues and mentors include: Erba Dunne, Kathleen Marie Buswell, John Buchanan MacMillan, Donald M. Scott, Klaas Roelof Bolt, Russell Saunders, Virgil Fox, and his two close friends, Royal Dwight Jennings and Carlo Curley.

For 35 years, Larry was associate music director and concert pianist for the regional 90 voice "Valley Chorus". For 14 years, he was resident principal organist and associate music director for the Diocese of Scranton at St. Peter's Cathedral; the Diocesan Mother Church. He is currently music administrator, choral director and organist for the Catholic Community of the Epiphany in Sayre, PA, and a member of the Binghamton Chapter of the American Guild of Organists, a member of the Conference of Roman Catholic Cathedral Musicians, the National Pastoral Musicians, the Aircraft Owners and Pilots Association, and a 4th Degree Worthy Sir Knight of the Patriotic Knights of Columbus.