

**A survey of the Pipe Organ at
St. George's Episcopal Church
Arlington, VA**



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Introduction

This report on the recent survey of the pipe organ at St. George's Episcopal Church contains a great deal of information about all the various components used in the instrument. Because of the complex nature of pipe organs, there are numerous terms to describe these components that are generally unfamiliar to most people. It would be worthwhile to become fluent with at least the basic terms used to better understand the organ's current condition and history. A glossary of useful terms can be found at the end of this report.

I am grateful to the Vestry, Organ Committee, and Dr. Ben Keseley for the opportunity to visit your parish to inspect this instrument, and trust this report will aid you in what is clearly a very exciting chapter in the life of St. George's Episcopal Church.

John Santoianni

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A survey of the pipe organ at St. George's Episcopal Church, Arlington, VA

Overview

The current pipe organ at St. George's Episcopal Church was originally built in 1915 by M.P. Möller Incorporated of Hagerstown, MD, as Opus 1991. After serving the Memorial Lutheran Church in Shippensburg, PA for about forty years, the organ was rebuilt, reconfigured, and moved to Arlington, VA, by the Newcomer Organ Company of Washington, D.C. At St. George's, it was fitted with a new console built specifically for the church by the Möller company. A cover letter and the specifications for the organ dated April, 1955, are included on pages 35 to 38 of this report. Prior to the decision on this particular organ, the church had considered five different options for a new instrument as is shown in an undated document on pages 39 and 40.

This instrument replaced a smaller organ by the Wicks Organ Company of Highland, IL, which had been relocated from the former edifice according to church records. The windchests and pipework of the Wicks organ were set into the wall above the doors that lead to the hallway. The decorative wooden case front can still be seen. According to the records at the church, this organ was to remain in place until the Newcomer organ was installed and "satisfactorily completed and accepted" by the church, after which the Wicks organ became the property of the Newcomer Organ Company.

The Newcomer Organ Company contracted directly with Möller to build a console specifically for St. George's, and the blueprints are in the files on the organ. The plans specify a fairly standard two manual and pedal console of rift sawn white oak—an interesting choice of wood, since this type of sawing produces the greatest waste of lumber. The panels are veneered plywood, while the structural members are solid oak. See page 41 for a portion of the blueprints.



Figure 1: the console seen through the rood screen.

A portion of the Service of Dedication from January 20, 1957 can be found on pages 42 and 43. It gives a brief description of the instrument including the stoplist.

Not long afterwards, the organ underwent a major renovation according to a contract dated April, 1971. This work included replacing many components from the 1957 installation (see pages 44 and 45). This version of the organ was dedicated on October 3, 1971. A page from the Service of Dedication can be found on page 46.

The console contains the keyboards, pedalboard, and switches that turn the various sets of pipes on and off, and it is where the organist sits to play. This is often the only part of the instrument the general public sees, and is often mistaken to be the entire instrument. The **stop knobs** turn the various **ranks**, or sets of pipes, on and off (Figure 2). There are various mechanical devices to aid the organist, most notably the **combination action**. On this organ, the combination action is a mechanical device that allows the organist to set various combinations of stops that can be recalled at the push of single buttons called **pistons** (Figure 3). There are pistons for each division, as well as general pistons that affect all three divisions at once. This allows the organist to change stops quickly without having to manipulate many stops at once.



Figure 2: Great division stop knobs.



Figure 3: Great keyboard and pistons.

The current pipe organ occupies a large divided chamber at the very front of the church. Each of the two side-by-side sections measures 13' high, 11' 7" wide, and 12' deep. This chamber was built specifically to house the organ and was designed to fit seamlessly with the existing building. Interestingly, the chamber included stained glass windows, a curious expense that only the organ tuners

would get to appreciate once the organ was installed. All but one of the windows has been covered with wooden or metal panels, presumably to better manage the temperature of the chamber (Figure 4). The chamber and console sit behind a rood screen which partially hides the console, organist, choir, and **swell shades**.



Figure 4: Christ the King window in the organ chamber, with Trompette resonators in silhouette.

The organ has three **divisions**: Great, Swell, and Pedal. The Swell division, played on the upper manual of the console, is located in the left half of the chamber (Figure 5). The Great division, played on the lower manual, is located in the right half. The pipes for the Pedal division are divided between the two chambers.

The pipes sit atop **windchests**. The windchests hold pressurized air and the “**action**” (the devices that open and close to allow air into the pipes to make them speak).

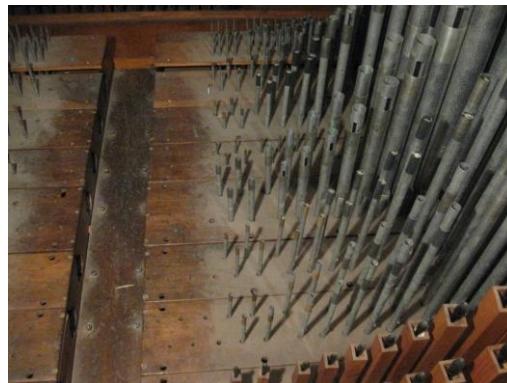


Figure 5: A section of the upper portion of the Swell windchest showing the rackboard and pipes, and quite a bit of dust.

Offset chests are windchests for the largest pipes. They are separate from the main windchests, and are usually found on or near the floor level.

Under the windchests and connected to them are wind **regulators** that hold the air at a constant pressure and of sufficient volume for the proper speech of the pipes (Figure 6). These are boxes with ribs that allow the top, or head, of the regulator to rise or fall, closing or opening a valve to control how much pressurized air enters the windchest. Springs and weights attached to the head are used to set the proper wind pressure. A **blower**—an electric motor attached to a fan in a metal housing—supplies the pressurized wind to the wind regulators.



Figure 6: When the wind regulator is filled with pressurized air, the head rises, expanding the ribs.

All divisions are said to be “under **expression**,” meaning that there are vertical shades, like Venetian blinds, that open and close at the player’s discretion, to make the sound of the pipes louder or softer to the listener (Figure 7). The shades are driven by expression machines controlled by pedals which the organist moves at the console.



Figure 7: A view of the shades in their open position, allowing the full sound of the pipes to fill the church. By closing the shades, the organist can reduce the amount of sound that leaves the chambers.

The current state of the Newcomer pipe organ

The Console

Overview

My visit to St. George's in November of 2013 found the console as I had expected. A 56 year old console, if only used for Sunday services, will have been played almost 3,000 times. This does not count extra services including Christmas, Easter, weddings, and funerals. This would easily take the number over 4,500. Add to that the many times it has been used for practice or rehearsal, and it could easily double or triple that number.

Because of use and age, the various components show sign of great wear. The keyboards and pedalboard generally receive the most wear, as is evident in the following photos. The ivory touch plates (key coverings) are scalloped in the middle of the keyboard (Figure 8). There is also too much side-to-side play in many of the keys because the felt bushings inside the key levers are worn out. This results in a noisy keyboard. More troubling for the player is the uneven adjustment of the contacts. When depressed, different keys strike their contacts at a different points in their motion, creating variations in when the pipes speak. This needs to be adjusted so the organist can rely on a consistent touch.



Figure 8: Scalloped ivories of the Great manual

The pedalboard usually gets the most wear and tear of all components of a console simply because of the nature of how it is played. On this pedalboard, the ebony caps of the sharps are worn down, and the finish on the lower maple portion has been worn away by the feet. The pedal naturals show signs of mold and mildew, as well as wear on the upper surfaces (Figure 9).



Figure 9: The pedal keys showing wear as well as stains from mold and mildew.

Nameplates are used on the console to identify assorted mechanical devices, including the stops for each division of the organ. All of the nameplates have become distorted with age (Figure10).



Figure 10: nameplate for the Swell stops.

There are three pedals just above the pedalboard. Two of these control the **expression shades** (also called **swell shades**) for the Great and Swell. The third, on the far right, is the **crescendo pedal**. This pedal gradually adds stops as it is pushed forward. The expression pedals have seen a fair amount of use, and the rubber treads have worn down to a smooth surface in the centers (Figure 11).



Figure 11: The pedals for the Great and Swell expression shades; the crescendo pedal.

The combination action has a limited number of pistons. There are five each for the Swell, Great, and Pedal **divisions**, as well as five that control “Full Organ” (i.e. stops on all three divisions at once). While this type of combination action was state-of-the-art in the early 20th century, by modern-day standards, it does not give the organist many combinations to work with.

The Möller company was slow to incorporate the use of electronic components and stuck to its tried and true conservative versions. This console uses many solenoids to move stops and couplers. The motion of these solenoids can be sluggish and can add up to a lot of noise (Figures 12 and 13).



Figures 12 and 13: Parts of the Combination Action, and two large solenoids which operate part of it.

The combination action on this organ is sometimes slow, generally noisy, and not always dependable. It is a “setter” type: the organist holds down the “set” button and draws the desired stops. The drawback to this type of combination action is there is only one memory level. If the organist has many pieces to register for a service or other program, or if there are several organists, the limited number of pistons can be a disadvantage. Pistons would need to be reset as needed, perhaps even during a service. There are now products that allow numerous levels of memory, so that each piston can be set to a number of

combinations, or different types of services (weddings, memorial services, etc.) can have their own level or levels.

Console Mobility

The console was fitted with 25 extra feet of cable, often called the umbilical cord, that exits the console at the rear (Figure 14). This cable can be pulled through a hole in the floor so the console can be moved to either side, or rolled in front of the screen for recitals or other events where the organist needs to be seen. However, the cable is fragile, so the console is best left in place: moving it could break wires in the cable, resulting in dead notes or dead stops.



*Figure 14: The cable, or umbilical cord, connecting the console with the relay.
Note its tenuous condition.*

The dolly on which the console sits is missing a wheel; the corner is propped up on a block of wood. This, perhaps, makes the above caveat moot.

On/Off Switches

For unknown reasons, there are three switches to turn on the organ; these are located on the left wall in the chancel. This is apparently an improvement, since the organ used to have to be turned on in the Boiler Room. The switches control, from left to right, the blower, a contactor that seems to have no function, and the **rectifier**, which turns 110 volt alternating current into 12 volts direct current for the low-voltage electric components of the organ. Ideally, there would be only one switch, at the console, to turn on all the electric components.

Behind the console are nineteen switches for the lighting. This is the greatest number I have ever seen next to a console. The organist has enough to do during a service without having to be the lighting designer as well. These numerous switches need to be at least moved or better yet converted into a more modern system. This needs to be addressed with the planned renovations.

The timer for the chancel lighting clicks, serving as a never-changing metronome for the organist.



Figure 15: An extremely large number of lighting switches and rheostats, clearly intended for the organist to control.



Figure 16: The contactor for the blower motor

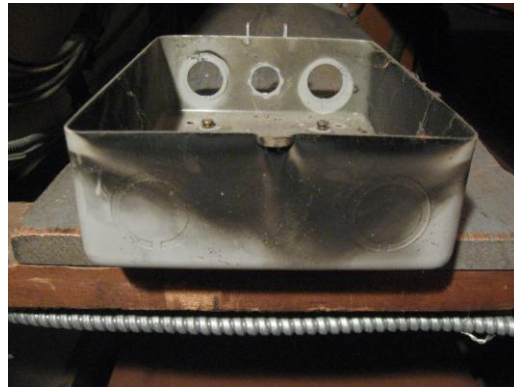


Figure 17: The cover from a former contactor that burned up at some point

Console Lighting

I was surprised to find no pedal or music desk light, as these are common and essential features. The pedalboard, expression pedals, and toe studs (pistons operated by the feet) are all cast in darkness. While organists do not often need to consult their feet, proper lighting is extremely useful. The lighting overhead produces shadows on the Swell manual as well as coupler tabs, making both difficult to see and negotiate. If a service were held in candlelight with the overhead lights unlit, it is not clear what the organist would do. Lighting for the pedalboard and music desk would be a welcome addition.

Bench

Another part of the console that is often neglected is the bench. This one has become wobbly with age and use, and has very loose joints. This writer has seen more than one bench collapse, and many more whose squeaking joints are distracting.

Chambers

Overview

As noted above, the two divided chambers each measure 13' high, 11' 7" wide, and 12' deep, and run across the very front of the church. The walls are plaster, the hardness of which assists the sound of the organ getting out into the nave.

While it was admirable for the church to add a dedicated room for the pipe organ, and great care was clearly taken to ensure it matched the existing edifice in materials and style, the room failed in two important ways.

First, the chamber has three outside walls, presumably with a minimum of insulation if any. Since the stability of the tuning depends on keeping the chamber at the same temperature as when it was tuned, the heat or cooling loss through these walls is problematic (See Tuning Stability in the Glossary, page 49). Second, there is evidence of water damage in both chambers at the ceiling level and corners (Figures 18 and 19). It is clear that the rose window limited the height of the chamber, and the flat rather than sloping roof maximized the area of the chamber (Figure 20), but having a flat roof over an organ is simply asking for trouble. I am actually amazed that there isn't greater evidence of water penetrating the room.



Figure 18: Swell division, right rear.



Figure 19: Great division, right front.



Figure 20: The organ chamber viewed from the parking lot. It would be interesting to find out how many people know that this actually houses the pipe organ.

The worst water damage is found in the Swell division, left front, where plaster is flaking off (Figure 21). Fortunately, nothing has fallen into the pipework, especially the reed ranks, since even small pieces of debris can keep a reed pipe from speaking.



Figure 21: Swell division, left front, showing flaking plaster

Infestation

Mice and other rodents find pipe organ chambers ideal places for housing, and there is evidence *throughout* the Newcomer organ that mice have been visiting for some time (Figure 22). There is no way for me to determine how long the feces have been here; this is a question for your regular technicians.

While I am not an authority on animal droppings, my presumption is that there has also been at least one squirrel inside the console, as evidenced by the larger and lighter colored feces (Figure 23).



Figure 22: mouse feces, Swell front walkboard.



Figure 23: Possible squirrel feces inside console.

Care should be taken when removing animal feces, particularly that of rodents, because of the risk of disease. The church should consult a trusted exterminator to see if there is recent rodent activity.

No exterminator should enter the organ chambers without the presence and guidance of your organ technicians because of the potential of damaging the instrument.

While not as terrible as rodent infestation, moths do damage certain parts of pipe organs. There is evidence of moth larvae in the felt disk of the Pedal/Great Principal 8 offset chest (Figure 24). The damage is minimal and has not affected the performance of the valves. Most felt used today is treated to be moth proof.



Figure 24: Evidence of moths in the windchests.

Mold and Mildew

Mold and mildew are growing on the Pedal Bourdon 16 and on a windline in the Great chamber (Figures 25 and 26). This is a too-common occurrence in churches where the humidity tends to be high and the air circulation in the chambers poor. This happens even in recently built instruments when the conditions are ripe.

The mold on the wooden pipes is both active and dead. The white patches are growing; the darker patches are mostly stains from past growth. Washing the pipework in a strong bleach solution will kill the mold and mildew, but the stains will remain. (Of course, washing will not cure the problem of elevated humidity and poor ventilation.)



Figure 25: Bourdon 16 showing mold and mildew.



Figure 26: Great windline showing the same.

Lighting

The only lighting in the chambers, other than what spills in through the open shades, is one incandescent light bulb for each side (Figure 27). This only dimly illuminates the top of the chests. For any work that needs to happen underneath the chests, the technician needs to bring in a drop light or use a headlamp.

If the chambers are not well lit, the technician is less likely to see problems which need attention. Poorly lit chambers make repairs more difficult, and colleagues have confirmed that they are less likely to make an onsite repair where lighting is poor.



Figure 27: Incandescent lighting in the Swell chamber.

Winding

Blower

At some point the blower for the organ was moved from its former location in or near the Boiler Room to the Swell side of the organ chamber. (The galvanized former windlines remain visible to those willing to venture through the trap door; Figure 28.) This move ensured that the air entering the windchests was the same temperature and humidity as in the chambers. The downside was that it greatly increased the amount of wind noise coming from the chambers.



Figure 28: Former windlines under the chancel

The very first thing I noticed when turning on the organ was the assault of wind noise. There is no better word to describe this, a point that cannot be overstated. This is one of the noisiest pipe organs I have ever encountered. Some effort was made to reduce the din, including putting the blower in a felt-lined muffler box and adding blankets to the box. A good deal of the noise is simply the turbulence of the wind coursing through the windlines. This is a failure of the design and execution of the relocation of the blower. There are also numerous leaks in the winding system that have developed over the years and that add to the roar. The shades would clearly need to be closed during services, when the organ is not in use, simply to reduce the noise.

The blower (Figure 29) was made by the Meidinger Company of Switzerland. This company discontinued the production of its pipe organ blowers some time ago, but many are still found in pipe organs. The 220 volt motor has sleeve bearings and runs at 3360 rpm. Typical of this brand, the housing is made of cast iron. Since the blower is installed in a muffler box with limited room for inspection, it was not possible to see the serial number plate. Based on its size, it is likely a half-horse power motor. As long as the motor is regularly oiled, it should run without problem for many more years. However, the bronze sleeve bearings are non-standard for American electric motors; should they fail, it will be extremely difficult, if not impossible, to replace them.



Figure 29: Meidinger blower in a muffler box lined with felt which is only partially effective in reducing wind noise.

Windlines

Windlines move the pressurized air from the blower to various wind-regulating devices (Figures 30 and 31). The original windlines were made of galvanized steel, with some connectors made of rubberized cloth. When the blower was moved from its previous location, large PVC pipe was used to connect the blower to the plenum (a junction from which other windlines emerge). While PVC pipe may not be the most attractive alternative to traditional metal windlines, it does provide a smooth inner surface, and it is inexpensive and readily available.



Figure 30: Painted, galvanized steel windlines (grey) and rubberized cloth sleeve (black).



Figure 31: PVC pipe used to connect the blower to the plenum.

Wind Regulators

The Great division wind regulator, filled with pressurized air, is shown in Figures 32 and 33. A close-up of one of the leather corner gussets reveals several patches. On-site repair work can often be less than pretty, but the repair did stop the loss of wind. The overall condition of the leather on the regulators is nearing the end of its useful life, and more patches will be necessary if the regulators are not rebuilt.



Figure 32: Regulator filled with pressurized air.

Figure 33: Unusual paper patch on a corner gusset.

The 1971 contract for renovations states that the “Swell Division Pedal Reservoir [is] to be completely releathered. All others are to be treated with Dow Company Silicone conditioner.” The wind regulators were clearly rebuilt at some point, but it is not clear when.

Concussion Bellows

When many pipes suddenly speak all at once, the wind pressure in the windchests can drop. This can result in a sag in the pitch of the pipes. The problem is remedied by adding spring loaded concussion bellows: should the pressure drop, the bellows collapse, increasing the pressure until the wind regulator has time to recover. The Newcomer organ has three concussion bellows: one for the main Swell chest, one for the Great chest, and one for a large offset chest (Figures 34 and 35). These bellows need to move quickly and freely to respond to a drop in pressure. In their current state, with their leather old and hardened, their motion is restricted, making them less effective than they need to be.



Figure 34 and 35: Concussion bellows for the Swell and Great windchests.

Tremulants

Tremulants add an expressive vibrato to the sound and can be effective when tastefully used. There are several types of tremulants. The Newcomer organ uses an out-of-balance flywheel (Figure 36). When the tremulant is turned on, a relay turns on a 110-volt AC power source. This turns on the electric motor, and the flywheel turns. Because it is off balance, the head of the wind regulator moves up and down as it reacts to the flywheel. The resulting pulsation of wind sent into the windchest creates the tremulous effect on the pipes. The weight on the flywheel can be adjusted to alter the depth of the vibrato.

The unit for the Great works well enough, but the Swell unit makes noise when on. I was not able to trace the sound, but it did not appear to be the bearings on the motor.

The stop knobs for the tremulants were moved during the 1971 rebuilding work and added to the batten above the Swell keyboard as rocker tabs. The then vacant stop knobs on the stop jambs could now be used for the Krummhorn 8 in the Great and the Sifflole 1 in the Swell. This kept the speaking stops with their respective divisions.



Figure 36: The tremulant motor on the Great wind regulator.

Wind pressure

The wind pressure is set at $3 \frac{1}{2}$ ", a typical number for an organ of this size. The wind pressure is measured on a manometer. This apparatus has a "U" shaped tube, half filled with water. Attaching a hose from a hole in the windchest to the tube allows the wind pressure to lower the water in one leg of the "U," which raises the water in the other leg. Wind pressure is measured by reading the distance from one meniscus to the other. Larger instruments may have multiple wind pressures, but smaller instruments are generally based on one pressure.

Pipework

Overview

The pipework for this organ is mostly from Möller's Opus 1991, built in 1915 and installed in Memorial Lutheran Church, Shippensburg, PA. According to the Organ Historical Society's Pipe Organ Database, which quotes the book *List of More than 5200 Möller Pipe Organs* (Hagerstown, Maryland. M. P. Möller, 1928), the 1915 organ had two manuals and 32 registers. The same organ was described in St. George's church records from the 1950s as having 17 ranks. Möller's "32 registers" must have included all stop knobs and coupler tabs, not just speaking stops.

The opus number was scribed on the "bay leaf" of a pipe in the Great division (see Figure 37). The pitch is stamped (D), as well as the stop name (OP, or Open Diapason).



Figure 37: The Opus number has been scratched into the metal: 1991.

Pipework Condition: Metal

Overall, the condition of the pipework is good to fair. Some ranks of pipes were new when the organ was relocated, and other ranks may have been added from different sources. For example, according to the contract of April 1955, "All reed pipes to be new and shall be manufactured and voiced by the Möller Organ Company." These ranks are the Trompette 8, the Oboe 4, and the Trompette 16 extension of 12 pipes. The Krummhorn was added in the 1970s.

When the organ arrived in Arlington, it was only 40 years old. The pipework was cleaned and probably repaired as needed. The majority of the pipework is now almost 100 years old.

The metal pipes are tuned by moving a tuning slide up or down to make the pitch flatter or sharper respectively. As the slides are made mostly made of coke tin, they are resistant to corrosion, but not immune (Figure 38). For some reason, brass plated slides were used for the top octaves. Slides of this age can be difficult to move when tuning.



Figure 38: Metal pipes with coke tin tuning slides. Wooden pipes with stoppers lower right.

Pipes are held in place in a variety of ways. Larger metal pipes are often held in place with cotton twill tape (Figure 39). This tape is now almost 60 years old and is in fragile condition. This can be dangerous: falling pipework can injure the technician and will certainly damage the pipes.



Figure 39: Large zinc pipes held in place with cotton twill tape.

Pipework Condition: Wood

As mentioned above, some of the wooden pipework is coated with mold and mildew. This was mostly evident in the Great chamber.

Most of the wooden pipes are stopped and half-length, meaning that a 4' pipe will produce a pitch twice as low as the length would suppose. The stoppers need to be packed with leather to obtain an air tight seal or the pipe will not speak properly (Figure 40). The fit of the stopper cannot be too loose or it may fall into the pipe, nor can it be too tight as this will make tuning difficult and may even crack the pipe. As the leather ages, it dries out and begins to disintegrate.



Figure 40: Stopper of a Stopped Diapason pipe showing old, dried leather.

The 1971 contract states that “stoppers [are] to be re-packed as required.” “As required” means that some of the leather may be original to 1915. This seems unlikely but not impossible. All the stoppers are due for repacking to insure tuning stability.

Wooden pipework of this age can be subject to cracks or checks (cracks starting from the end of a board). Glue failure can result in split joints. Most of the wooden pipework has fared well, with the exception of the mold and mildew. The low C on the Bourdon 16 has either a stopper problem or a crack.

When ranks are repacked, it is typical to find other small cracks or damage otherwise not seen during an inspection.

Windchests and Action

Main Windchests

When the organ was relocated from Pennsylvania, either it retained its original action, or—if that action was tubular pneumatic—the action was replaced by Möller. The action is the part of the windchest that allows pressurized air to enter a pipe when a key is depressed. The type of action the organ had when it arrived in Arlington used pouchrails that held circular leather pouches. In the center of the pouches were thick, leather-topped felt valves that sealed the windchest hole communicating to the pipe. According to the contract from Newcomer dated April 28, 1955, the leather pouches “shall be completely re-leathered with highest quality imported leather specially tanned for organ use.”

Sadly, only 15 years later, the organ was to receive a major overhaul, including the removal of the pouchrails from the main chests and replacing them with “electro-magnetic actions,” according to the contract prepared March 3, 1970. This type of action is more commonly known as a direct valve action, or direct electric (Figures 41 and 42). The magnets typically use between 12 and 15 volts DC supplied by a rectifier.

It is not clear from the contract why the change was made so soon after the installation. While the leather used in 1955 may have been “specially tanned for organ use,” the quality of the leather or the tanning process may not have as high as presumed. Extreme heat and cold may have lessened the life expectancy of the leather. In viewing the overall project, using direct valve action as a replacement was no doubt the least expensive alternative to releathering all the pouchrails, with the expectation that it would last longer than leather. Bear in mind that there is one pouch for each pipe in the organ, and either alternative meant around 1200 new direct valve actions, or pouches, or a combination of both.

It can also be presumed that adding direct valve action allowed the builder to “unify” the chests. Because the original action was a “straight” action, the various pipes could not be “borrowed” from one stop to another. With this new action, each action magnet could be wired so that it could serve more than one stop (see e.g. Sifflo stop below). While on paper this seems like an economical solution, in reality it is best used only sparingly. It gives the impression of the organ having many stops, but as the pipes are used for multiple purposes, it robs the organ of a full sound.



Figure 41: Underneath the Swell chest showing the bottom boards.



Figure 42: With a bottom board removed, a view of the Swell chest, showing the direct valve action.

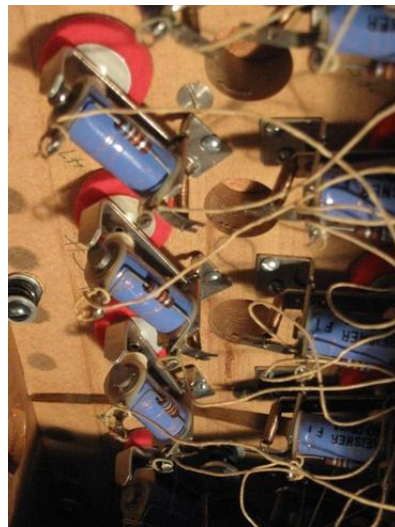


Figure 43: a view of the electric action from underneath the toeboard.

The electric action is attached to the underside of the toe board. The pipes are on top of the toe board. When a key is pressed and the magnet is energized (blue cylinder), it attracts the metal arm holding the valve (red disk). The valve is pulled away from the toe board, and pressurized air rushes into the toe hole which communicates with the pipe, and the pipe speaks.

Offset Chests

The electric action shown above is often not able to accommodate the size of the opening in the windchest needed for the larger pipes. Consequently, in this organ, two different types of action were used. For some offset chests, the original pouchboards were releathered (Figure 44). For other offset chests, a direct valve action was used (Figure 45). It is unclear why the builder did not simply choose one or the other, rather than using two different actions. These two types of actions should both move at about the same speed, so there should be no discernible difference between the two.



Figure 44: Pedal offset chest with releathered pouch.



Figure 45: a pouch and direct action valve.

Relay

In an organ of this type, an electro-mechanical device called a relay magnet is used to send the DC current to the proper windchest magnet. When a key is played, it energizes an electro-magnet (double blue coils in Figure 46) that pulls a metal contact plate towards the magnet. The contact plate strikes all the contacts at once. One of the contacts has been wired to connect to the positive side of the rectifier voltage, so the current now flows to all the other contacts on that relay magnet.

From there the current flows to a series of gang switches, visible above the relay magnets. If a stop has been turned on at the console, a gang switch for that stop is turned on. Its electro-magnet energizes and pulls a set of contacts against corresponding posts. Each of these posts is wired to a specific magnet in the windchest. The manuals have 61 contacts and corresponding posts; the pedals have 32.



Figure 46: The relay, also called a Switching System.

The current for the key being played then flows to its individual magnet; the valve opens, and the pipe plays. Thus, the key is the first on/off switch; the relay is the second; and the gang switch is the third.

For better or worse, the huge amount of wind noise overwhelms the sound of the magnets. (The sound of the electric action valves opening and closing can be heard by turning on the right hand switch for the organ rectifier alone, putting on all the Great division stops, and playing some chords.) It is likewise difficult to hear the hum of the gang switches over the wind noise, but it is there. The greater the number of stops that are on, the greater the cumulative sound of the magnets.

Electrical-Low Voltage DC

Wiring

The low-voltage wiring seems to have been done in a workmanlike manner, and the material used and how the work was planned are typical of the time period and style of organ.

Rectifier

Most electric parts of pipe organs run on at least 12 volts direct current (DC), the same as a typical automobile. A rectifier transforms household current of 110 volts alternating current (AC) into DC. The rectifier for this organ is located beneath the choir and was newly installed during the 1971 work (Figures 47 and 48). While old, it appears to be functioning well, and does not show signs of deterioration.



Figure 47: The rectifier under the choir.



Figure 48: Inside the rectifier, showing it is set for 15 volts DC.

Electrical-110/220 Volts AC

The testing of 110 and 220 volts alternating current is best addressed by a licensed electrician. Because electrical code varies from state to state, and even from county to county, I cannot comment on this aspect. However, there were some obvious areas of concern.

Underneath the choir, in the area where the rectifier resides, is an open electrical box that clearly should be covered (Figure 49).

Inside the Swell chamber is a fuse box rather than a circuit breaker box (Figure 50). It is not clear if this still functions. If it is still live and a fuse does “blow,” there must be enough replacements on hand in the correct amperage. This should be brought up to current electrical codes.



Figure 49: open electrical box.



Figure 50: Electrical box with screw-in fuses.

Expression Motors/Shades

In order to make the sound of the pipework softer, artificial means must be used. Reducing the pressure on the pipework would make the sound softer, but the pitch would sag. Increasing the wind pressure would make the pipes louder, but the pitch would rise.

The way around this is to put the pipework in a chamber and to put shades on the front of the chamber that can open and close. These look like vertical Venetian blinds; they stand out on this organ as there is no grille cloth to hide them. Each division has eight shades, held in a very sturdy frame (Figure 51).

A letter from Newcomer dated August 17, 1971 discusses removing the grille cloth and sending samples (colors and styles of weave) for replacement. The issues were its condition as well as mold and mildew. No action seems to have been taken at that point. It is thought that the cloth was removed between 1977 and 1981, but nothing replaced it. The shades and frame were possibly stained a darker color at this point, but this is just speculation.



Figure 51: Expression shades.

It seems unusual that no action was taken to replace the cloth, since the typical aesthetic for such an installation would have been to cover what would have been considered unsightly shades. However, not covering the opening would improve air flow, which would help the stability of the tuning. It was probably too late to help with the mold and mildew issue.

The device that moves the shades is called an expression or swell machine. The type used here has rubberized cloth envelopes; these inflate or deflate to move a control arm, which in turn moves the shades. The arrow in Figure 52 points to these envelopes. The shades are connected with a control arm so they move in unison.

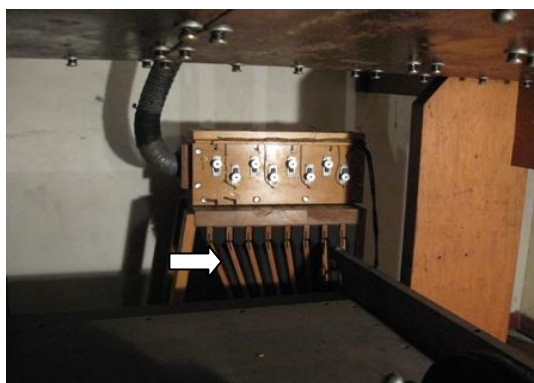


Figure 52: Eight stage swell machine.

There are eight stages to these swell machines, although there is a problem either with how they are adjusted or with the contacts at the expression pedals at the console. There should be eight distinct incremental stages of motion visible with the shades, but the Swell side only reveals five, and the Great side seven. As these machines were recently rebuilt according to information in church records, I presume that this is an issue of adjustment. Being out of adjustment means that there cannot be a smooth crescendo or decrescendo, since some stages of motion are simply too great. This should be investigated and corrected for the benefit of musical performance.



*Figure 53: Expression pedals for the Great and Swell in their open positions.
On the far right is the crescendo pedal.*

Description of the Various Ranks of Pipes

Overall, the sound of this pipework is typical of Möller instruments—both the older pipework from 1915 and the newer reeds from 1971. With a few exceptions, neither is particularly exciting, or in many ways even interesting. The pipework does the job it was built to do as Möller intended. There are a number of lovely stops, but overall, it is not the most successful instrument.

A brief note on notation

The lowest octave of pipes is notated C-B; the second, or tenor octave, is notated c-b; the third, middle octave c'-b'; the fourth octave c''-b''; the fifth octave c'''-b'''; and top c is c'''' . This somewhat antiquated notation originated in lute tablature and was also used in organ music, particularly with the Baroque composer Buxtehude. Other notation simply uses numbers—1 being the lowest note and 61 being the highest.

A brief word about pipe families and pitch

Organ pipes are essentially of two families: flues and reeds. Flue pipes work very much like a recorder: a thin column of air strikes a sharp edge, causing a column of air to vibrate. The length of the pipe determines its pitch. Some flue pipes have an air tight stopper at the top of the pipe. This causes the pipe to sound an octave lower than its speaking length (as in the Stopped Diapason).

The second family consists of reed pipes. A brass tongue vibrates against a hollow tube called a shallot. The number of oscillations of the tongue per second along with the length of the resonator (a tube which extends above the reed tongue) determines the pitch.

The Arabic numerals in the stop list below refer to the pitch of the stop. Eight foot pitch means that low C of a flue pipe will have a speaking length of 8'. Middle C on this stop will have the same pitch (essentially) as middle C on a piano. Four foot pitch means that the pitch is one octave higher than 8' pitch. Sixteen foot pitch sounds an octave lower than 8' pitch. The Octave Quint $2\frac{2}{3}$ ' plays a fifth higher than the 4' pitch. These pitches are based on the harmonic series--the naturally occurring overtones in music. In writings on pipe organs, pitch designation may or may not use the foot symbol '.

The Roman numerals refer to the number of pipes for each note. The Plein Jeu stop is what is known as a Mixture. In this case, when one note is played, three pipes will sound. Playing low C on this stop will sound the pitches C above middle C, the G above that, and the C above that. Again, this is based on the harmonic series.

The current stoplist: 28 speaking stops, 23 ranks

Great	Swell	Pedal
Diapason 8	Geigen Principal 8	Bourdon 16
Melodia 8	Stopped Diapason 8	Lieblich Gedeckt 16
Dulciana 8	Salicional 8	Principal 8
Unda Maris 8	Voix Celeste 8	Gedeckt 8
Octave 4	Principal 4	Octave 4
Octave Quint 2 2/3	Flute Harmonique 4	Flute 4
Super Octave 2	Fifteenth 2	Mixture II
Krummhorn 8	Plein Jeu III	Trompette 8
Tremulant	Siffloite 1	Trompette 16
	Trumpet 8	
	Oboe 4	
	Tremulant	

Great stops

Diapason 8: This rank of open pipes forms the foundation of the Plenum, or full organ. The voicing is not very interesting. The action inside the windchest is noisy from c' down.

Melodia 8: This is the loveliest stop on this organ, especially from c' up. This is an open wood stop, with a bottom octave of stopped pipes as was typical. The bottom octave is generally too soft in comparison with the rest of this rank.

Dulciana 8: This has a sweet sound and seems a fairly useable stop.

Unda Maris 8: This rank starts from tenor c as was typical for modest instruments. It is tuned slightly sharp of the Dulciana to form a celeste, meaning that the out-of-tune nature of the two stops produces a pleasing undulation. The stop is not used by itself, but only in tandem with the Dulciana. There are some voicing problems, generally meaning that there are notes that are too loud or too soft. Tenor c is a damaged pipe which is currently sitting on a walkboard in the Great division.

Octave 4: This stop is generally used to set the temperament on most organs, and then the pitch is transferred to the other stops. Used in the Plenum, this one is not particularly interesting in nature. The voicing is uneven in places.

Octave Quint 2 2/3: This seems to be in lieu of a Mixture on the Great. If there is only one **mutation** stop on an organ, it is often this one.

Super Octave 2: The top octave of this stop has some voicing problems, but given how noisy the chambers are due to wind, it may not be worth improving.

Krummhorn 8: This reed stop was added in 1971 and was built and voiced by Möller. It is a small scale reed, with half length resonators and parallel shallots. All the reeds were sharp during this visit; the last

tuning must have been with a higher temperature in the church. This stop has a typical Möller sound for the 1970s in that it is thin in nature.

Chimes: While there is a stop knob for the chimes, neither chime action nor the chime tubes themselves are to be found in the chambers. My understanding is that the chimes are stored somewhere in the building, perhaps the attic.

Swell stops

Geigen Diapason 8: This is a foil to the Diapason 8 in the Great and forms the basis for the Swell plenum. There is undue action noise up into the tenor octave. The stop does not have a terribly distinctive sound.

Stopped Diapason 8: This is second only to the Melodia in its beauty of sound. There is unnecessary action noise in the bottom octave. The stoppers were repacked with new leather according to church records in the 1950s, and the leather is now at the end of its useful life.

Salicional 8: While a pleasant sound, the Salicional too has some voicing problems.

Voix Celeste 8: This is used in conjunction with the Salicional, as described above with the Unda Maris. The notes c, b'' are slow to speak. While not particularly interesting, it works well with the Salicional.

Principal 4: Again, not a particularly interesting sound.

Flute Harmonic 4: Starting at middle c, this open flue stop has pipes that are twice as long as their pitch length. A hole is drilled into the body of the pipe at the midway point, causing the pipe to speak not at its fundamental pitch, but an octave above (its first harmonic). The stop is interesting from middle c up, less so below that. It also has some uneven voicing.

Fifteenth 2: This stop adds some brilliance but is not terribly distinguished.

Sifflote 1: According to the program for the Service of Dedication dated 10/3/71, this rank was added in 1971, along with the Krummhorn. It is not actually an added rank, but rather the organ builder added wiring to "borrow" pipes from other ranks for this new stop. It uses c'' to c'''' of the Gedeckt rank, then c''' to c'''' of the Harmonic Flute, and finally c''' to c'''' of the Fifteenth 2. The top octave of the Sifflute breaks back, meaning that it plays the same pipes as the octave below.

Trumpet 8: This rank was new to the instrument in 1955, made and voiced by Möller. It is a small scale reed that has full length resonators to F#, then half-length resonators to C. It has parallel shallots. It is very uneven and needs regulation. Because the temperature was different during my visit than when it was last tuned, the pitch was sharp. There is a dead note on e'''. The sound is thin, typical of Möller's reed work at the time, and too small a scale of reed for this room.

Oboe 4': As with the other reed, the Oboe tuning is sharp. It is useful played down an octave as a solo stop, or to add brilliance to the Trumpet 8. It would probably be more useful as an 8' stop by adding an 8' bottom octave.

Plein Jeu: This 1' mixture breaks back every octave. The only true mixture on the organ, it is useful to complete the Great plenum, as there is no mixture in the Great division.

A note about Unit Stops

The pedal makes extensive use of the idea of "unit" stops. The Lieblich Gedeckt 16, Gedeckt 8, and Flute 4 are all part of a rank of 56 pipes. The Lieblich Gedeckt 16 plays pipes 1 (the rank's lowest C) to 32; the Gedeckt 8 plays pipes 13 (the second C) to 44; the Flute 4 plays pipes 25 (the third C) to 56. This is often done in pedal divisions because it saves space and money and is generally a successful alternative to having three separate ranks for these three stops.

Pedal Stops

Bourdon 16: the low C has voicing problems, perhaps a crack in the pipe.

Lieblich Gedeckt 16 (unit with Gedeckt 8 and Flute 4): the low C has a voicing problem as well. This is a good alternative to the louder Bourdon 16.

Principal 8' (unit with Octave 4): Tenor d# does not speak. The voicing is generally the most uneven of the stops.

Mixture: the Pedal mixture uses extended Principal rank at 5 1/3 and 2. This is one of the strangest mixtures I have seen. Neither of the two most common rank pedal mixtures, the Rauschpfeife or Rauschquint, is configured like this one. The lower pitch is the quint, and the upper the unison, but the latter is at an octave higher than expected. Used with the Bourdon 16, Principal 8 and 4, it works as a mixture, but is very odd. The pipes for this stop are borrowed from the Pedal Principal 8 and 4 unit rank.

Notes not playing

There are a handful of notes not playing on this instrument. In one case, a pipe was bent over at its foot. In other cases, it may be a wiring problem or a faulty direct valve action. It was beyond the scope of this survey to identify the issues with all dead notes. There were only a handful of notes not playing, and the nature of the problems could be addressed during a routine tuning and maintenance visit.

Other Areas of Concern

A ladder to a Great division walkboard is not securely connected to anything. One side has a pointy stile, waiting to impale an unsuspecting organ technician (Figure 54).



Figure 54: dangerous ladder in Great chamber.

Assessment and Recommendations

This pipe organ, which was moved, renovated, enlarged, and installed by the Newcomer Organ Company in the mid 1950s and reworked in the early 1970s, is a worn out and tired instrument. That it sounds as well as it does is greatly due to the talents of your Minister of Music, who clearly strives to keep you unaware of its numerous deficiencies.

Were this parish to consider reworking the instrument a third time during the proposed renovations, it would be difficult for me to advise where to start. There is so much that is simply in extremely poor repair that you could not repair only one portion: you would need to address the entire instrument. The cost of renovating the existing instrument versus building a new instrument is something the church needs to consider very seriously. Even if all components of the Newcomer organ were repaired and updated, you would still be left with an instrument that reflects century-old building practices. The cost to rebuild could easily be up to half that of a new instrument.

I do not mean to imply that the service companies that have worked on this instrument were negligent. The monetary commitment necessary for churches to engage in ongoing repair work on an aging pipe organ can be substantial, particularly on one which has undergone so many alterations. It is often the case that only catastrophic failures motivate repairs (just as people often ignore recommended maintenance schedules for their automobiles).

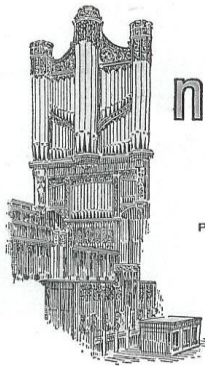
If St. George's were to keep this instrument, all the various components would need cleaning, repairing, upgrading, revoicing, or replacement. The entire organ would need to be removed to repair, paint, and insulate the chambers. The chamber wiring would need to be upgraded to bring it up to code. The

console would need to be gutted for a new combination action. The console shell would need to be refinished, and possibly altered to accommodate any additions. The wiring from the console would need to be replaced due to its fragile nature. The relay would need to be replaced. Decisions would need to be made about changing the action used and whether new windchests are in order. The keyboards would need to be either repaired—including replacing worn ivories, rebushing the keys, adding extra pistons, and repairing the key cheeks—or replaced. The mold-covered pedalboard would need rebuilding or replacing. Serious consideration would be needed to address the excessive wind noise.

Rebuilding this instrument essentially means replacing a vast portion of it just to bring it into good working order. There is pipework that is just not worth saving, especially the principals (Great Principal 8, Octave 4, etc.). The reeds are simply too small in scale for the room and really need replacing.

The best part of the organ is actually the room—not the chambers, but the nave. In many ways the organ sounds better than it has a right to, not because of its few merits, but because of the acoustics of the church. I was amazed at how well the sound carried down the aisle, how the sound seemed to hang in the air. My hope is that the upcoming renovations do not alter the acoustics, and that the church hires an experienced acoustician to work side by side with the architect.

This church deserves an instrument that can take full advantage of its wonderful acoustics and complement the growth and high quality of the music program, not only for today, but for generations to come. St. George's Episcopal Church is being given a wonderful opportunity to look at the big picture, to envision the new church interior as a whole—including a new pipe organ. I cannot in good faith recommend that the existing instrument be rebuilt, given its age and its great number of failings.



NEWCOMER ORGAN COMPANY

3339 18TH STREET, N W.

WASHINGTON, D. C.

PHONE ADAMS 2800

EVERYTHING
PERTAINING
TO THE
ORGAN

April 30, 1955

Rev. Hedley J. Williams, Pastor
St. George's Episcopal Church
Arlington, Va.

Dear Rev. Williams:

We wish to acknowledge and thank you for the organ contract.

Your copy of this contract is enclosed.

You will note that we have crossed out the word "Optional" beside the Swell Stop "Plein Jeu" in the specifications and have initialed same since this stop is to be installed with the original installation.

The Pedal 8' Trompette stop should read 32 notes instead of 32 pipes. We have corrected this typographical error and initialed same.

Sincerely yours,

NEWCOMER ORGAN COMPANY

E. B. Newcomer
E. B. Newcomer

EBN/c

Manuals: Compass C4 to C4, 61 notes
 Pedals: Compass CCG to G, 32 notes
 Action: Electro-pneumatic throughout
 Console: Detached. Stops and intra-manual couplers to be controlled by draw knobs. Inter-manual couplers to be controlled by tilting tablets.
 Pitch: A - 440

APRIL 28 1955
 \$11,775

Great Organ

Diapason	8'	61 pipes
Melodia	8'	61 pipes
Dulciana	8'	61 pipes
Unda Maris T. C.	8'	49 pipes
Octave	4'	61 pipes
Octave Quint	2 2/3'	61 pipes
Super Octave	2'	61 pipes
Chimes (from present organ)		20 bells
Tremulant		

Swell Organ

Geigen Principal	8'	61 pipes
Stopped Diapason	8'	61 pipes
Salicional	8'	73 pipes
Voix Celeste T. C.	8'	61 pipes
Principal	4'	61 pipes
Flute Harmonique	4'	61 pipes
Fifteenth	2'	61 pipes
Plein Jeu (optional)	III Rks.	183 pipes
Trompette	8'	61 pipes
Oboe	4'	61 pipes
Tremulant		

Pedal Organ

Bourdon	16'	32 pipes
Lieblich Gedeckt	16'	32 pipes
Principal	8'	32 pipes
Lieblich Gedeckt	8'	12 pipes
Octave	4'	12 pipes

Pedal Organ Con't

Flute		4'	12 pipes
Super Octave		2'	12 pipes
Trompette	from Swell	16'	12 pipes
Trompette	from Swell	8'	32 notes <i>M.S.</i>

Couplers

Great to Pedal
Great to Pedal 4'

Swell to Pedal
Swell to Pedal 4'

Swell to Great 16'
Swell to Great
Swell to Great 4'

Great 16'
Great 4'

Swell 16'
Swell 4'

Great Unison Separation
Swell Unison Separation

Adjustable Combinations

Pistons 1-2-3-4-5 Affecting Great Stops
Pistons 1-2-3-4-5 Affecting Swell Stops
Pistons 1-2-3-4-5 Affecting Pedal Stops (operated by toe studs)
Pistons 1-2-3-4-5 Affecting Full Organ (Pistons 1-2-3 duplicated by toe studs)
General Cancel Piston

Pedal Movements

Great to Pedal Reversible
Swell to Pedal Reversible
Balanced Expression Pedal - Great Organ
Balanced Expression Pedal - Swell Organ
Balanced Crescendo Pedal
Sforzando Pedal (Duplicated by manual piston)

Accessories

Action Current Indicator (Light)

Crescendo Indicator (Light)

Sforzando Indicator (Light)

Organ Bench with Music Shelf

Concave and Radiating Pedal Clavier

Electric motor, blower, and action current device of ample capacity,

Chests: Are of modern design with an individual pouch and valve for each pipe. Chests shall be completely re-leathered with highest quality imported leather specially tanned for organ use.

Magnets: Latest "outside" designed chest magnets to be used exclusively.

Flue Pipes: All metal flue pipes shall be thoroughly washed and repaired where necessary.

Modern tuner slides will be installed on all pipes including basses.

All wood flue pipes shall be thoroughly cleaned and all stoppers to be re-packed.

All flue pipe scaling to be carefully checked and re-scaled where necessary and all pipes to be revoiced for this particular installation.

Reed Pipes: All reed pipes to be new and shall be manufactured and voiced by the Moller Organ Company.

Console: To be entirely new and as noted in specifications, stops to be controlled by draw knobs. It shall be manufactured by the Moller Organ Company.

Console to be movable and supplied with 25 ft. of extra cable.

Summary: Since every working part in this instrument shall either be new or replaced, it is the intent of this proposal to convey and guarantee to the Church that the inherent high quality of Moller shall be rigidly maintained in the re-manufacture of this pipe organ.

Special conditions: "It is mutually understood and agreed that the party of the first part will purchase the Moller Organ presently located in the Memorial Lutheran Church in Shippensburg, Pennsylvania and will dismantle and store it without cost or charge to the party of the second part. The major part of the structural parts and pipes of the re-manufactured organ specified in this agreement is to be obtained from the aforesaid dismantled organ. The party of the first part will commence installation of the re-manufactured organ promptly upon receipt of written notice to proceed to be given by the party of the second part, and will complete installation within a reasonable time thereafter. The Wicks organ presently installed in the Church will remain the property of the party of the second part until the re-manufactured organ is satisfactorily completed and accepted by the party of the second part. The Wicks organ shall not be removed from the Church until the re-manufactured organ is satisfactorily completed. Upon satisfactory completion of the re-manufactured organ, the Wicks organ shall become the property of the party of the first part and shall be promptly removed at the sole expense of the party of the first part."

PIPE ORGANS

A Rank is a set of pipes ranging from 12, 32, 44, to 61 in number (that is from a partial keyboard to a full keyboard). Each rank sets forth a particular quality of sound: such as, a flute, a string tone, a reed tone (oboe or trumpet), a diapason (the heavy body sound), etc.

I. Present Organ, Made by Wick Organ Co., Illinois - 4 Ranks: Total of 293 Pipes
Chamber poorly located so that sound does not assist choir, and rules out use of valuable space for Church (Sunday) School, and other functions.

This instrument lacks the necessary volume for our size Church, and does not provide color for accompaniment, or body for congregational singing.

A study of re-locating our Organ Chamber is under way. The Junior Warden has been making this study, and believes it would be possible to construct an addition to the west wall (under the Rose Window). Such addition should in his opinion be designed by an architect, so as to fit in with the lines and appearance of the rest of the edifice.

II. Proposed New Wicks Organ - Would be 8 ranks: Total of 597 pipes

Cost	\$10,748.50
Allowance on Present Organ	4,013.00
	<u>\$ 6,735.50</u>

Since an average cost of one rank (61 pipes and equipment thereto) appears to rang from \$1200 - 1300 the cost of this organ seems high since only 4 ranks are added to our present instrument.

III. Lewis and Hitchcock, Washington, D.C. - Would be 8 ranks: Total of 609 pipes
This company proposes to utilize our present organ and add to it.
Cost \$7500.00 (approximate)

For the same reason cited in II above, this seems expensive for the addition of 4 ranks.

IV. Schantz Organ. This company offers two organs; one to be 8 ranks: Total-677 pipes
Cost \$10,915.00, With sale of our organ at \$3,000.00 (approximate)
The second choice to be 10 ranks: Total of 799 pipes
Cost \$13,000.00, With sale of our organ at \$3,000.00 (approximate)

V. Moller Organ - Hagerstown, Md., Local Agent and Independent Organ Builder-
Newcomer Organ Co., Washington, D.C.

This will be a re-manufactured organ with all parts new except metal pipes, wood and wind chests, pneumatic action replaced by modern magnetic electric system; new console built by Moller factory; re-leathering of valves and wind chests.

Metal pipes and wood chests (seasoned to last for years) will be retained; reed metal pipes will be new, with choice of tone in our control.

This organ was built by Moller in 1915 and is in excellent condition. The Church in Shippensburg, Pa. housing it is renovating and cannot fit it into their proposed new chambers. They are buying a new organ and offer this for sale thru Moller with Newcomer as agent.

At present, organ has 17 ranks and when rebuilt will have 21 ranks with total of 1302 pipes.

Will carry the guarantee of a new organ.

1349

-2-

Cost (our present organ in trade) \$9,975.00

Terms \$ 200.00 - to bind contract
1000.00 - 60 days
~~\$1200.00~~

This will hold organ in storage until we are ready to have it installed.
There is no time limit imposed on storage, or any storage cost.
On delivery and at beginning of installation - \$3787.50 due.
After satisfactory installation and acceptance, \$4987.50 final payment.
Organ has excellent tone, color, and body and will gain added color from rebuilding.

Present Wicks Organ to be traded in and become property of Newcomer Organ Co.
Wicks organ shall not be removed until at the request of Church.
All expenses in removal of organ to be borne by Newcomer Organ Co.

W

was Miller organ installed

CONSOLE	DETACHED TYPE
CABINET DESIGN	B 2
CABINET WOOD	EXTERIOR - RIFT SAWN WHITE OAK INTERIOR -
CABINET FINISH	EXTERIOR - TO COLOR BLOCK #0-507 INTERIOR -
MANUALS	TWO & PEDAL
MANUAL KEYBOARDS	CC TO C4, 61 NOTES
PEDAL KEYBOARD	CCC TO G, 32 NOTES
STOP CONTROLS	DRAW-KNOBS & TILTING TABLETS
ACTION	ALL ELECTRIC
WIND PRESSURE	
ACTION CURRENT SUPPLY	10-15 VOLTS, 30 AMPERES

DATE _____

APPROVED BY _____

NEWCOMER ORGAN COMPANY,
WASHINGTON, D.C.

SCALE - 1" = 1'-0"			
REV.	REV.	CHECKED	DATE
		F	2-27-56
		L. C.	

M. P. MÖLLER, INC.,
HAGERSTOWN, MD.

M-9642

DRAWING NO. 102

In 1950 we installed an organ of five ranks with 293 pipes in our former Church edifice, which organ was the first unit of a larger instrument suitable for our present Church. Careful study revealed that to add to this unit was considerably expensive and would have removed invaluable Sunday School rooms. Fortunately, we were able to incorporate into our present organ all Memorials, Thank Offerings, and Contributions given for the first unit of the organ, as well as to erect a much more suitable chamber in which to house it. A screen blending with the wall will be erected in front of the chamber.

{23}

Thus we now have an organ of 21 ranks (by rank is meant a group of pipes which speaks forth a particular quality of sound, such as a flute, a string tone, (as a reed, etc.) totaling 1339 pipes. +61 -1400

With the incorporation of all gifts to our former unit of an organ and the aid of a Capital Improvement Fund established by the Vestry we have purchased this fine instrument for \$9,975.00. If purchased on the present market its cost would be about \$25,000.00.

As far as we know this instrument is the largest two manual organ in the Metropolitan area. Visiting organists have been favorably impressed and we should give thanks that in St. George's we have a more fitting instrument to offer praise and glory to Almighty God.

After the Service you are invited to see the Organ and Console which are directly behind the Altar.

We express our appreciation to Mr. Benjamin F. Markert who at the request of the Vestry supervised the planning and construction of the chamber which not only contains the organ but adds beauty to the architecture of the Church.

* * * * *

Alexander Schreiner, the famous Organist with the Salt Lake City Tabernacle, will play a recital in this Church on March 14th at 8:30 p.m. Patrons' cards for reserved seating are available through the Organist or Church Office at \$1.

THE ORGAN

Great Organ

8' Diapason
8' Melodia
8' Dulciana
* 8' Unda Maris
4' Octave
* 2 2/3' Octave Quint
* 2' Super Octave
Chimes (20 Bells)
Tremolo

Swell Organ

* 8' Geigen Principal
8' Stopped Diapason
8' Salicional
8' Voix Celeste
* 8' Trompette
* 4' Principal
4' Flute Harmonique
4' Oboe
* 2' Fifteenth
* III Ranks Plein Jeu
Tremolo

Pedal Organ

16' Bourdon
16' Lieblich Gedeckt
* 8' Principal
8' Gedeckt
4' Octave
* 4' Flute
* 2' Super Octave
* 16' Trompette (from Swell)
* 8' Trompette (from Swell)
* III Ranks Mixture

Accessories

5 General Pistons
5 Swell Pistons
5 Great Pistons
5 Pedal Pistons
12 Couplers
2 Expression Pedals
Crescendo Pedal
Sforzando

Built by
The Newcomer Organ Company
Washington, D.C.

The pipes for this organ originally stood in an instrument built in 1915 by the Moller Organ Company for a Church in Shippensburg, Pennsylvania. The Newcomer Organ Company offered it to us as a re-manufactured instrument carrying the guarantee of a new organ. All parts are new except the pipes, both metal and wood, and the wind chests, which improve with age. The pneumatic action was replaced by a modern magnetic electric action, and new stops were added as indicated by astericks. The new reed pipes and console were built by the Moller Organ Company with provision for the console to be moved anywhere in the Chancel on special musical occasions.

RENOVATIONS TO BEAN
APRIL 1971 \$
COMPLETED BY SEPT.
\$12,250.00

SPECIAL NOTES

It is mutually understood and agreed that the renovation of the existing pipe organ shall be performed in accordance with the following list of major operations and in strict accordance and adherence to accepted organ building practices of the industry.

MAJOR OPERATIONS

- Flue Pipes: The existing pipe work to be used in fulfilling this agreement. All pipes to be thoroughly cleaned. Stoppers to be re-packed as required.
- Reed Pipes: All reeds to be factory re-voiced.
- Chests: The existing manual windchests are to be completely re-vamped to allow the installation of electro-magnetic actions. New electro-pneumatic actions are to be installed for the few bass pipes whose valves must be retarded in closing to allow the pipes sufficient wind to develop its proper tone.
- The existing Pedal Chests, of an entirely different design than the manual chests, are to be completely re-leathered. All electro-pneumatic action leathers are to be treated with Dow Chemical Company silicone conditioner.
- Reservoirs: Swell Division Pedal Reservoir to be completely re-leathered. All others are to be treated with Dow Company silicone conditioner.
- Console: Entire unit to be thoroughly vacuum cleaned and all felts moth proofed. Re-bush Pedal Clavier. Adjust all electrical contacts for proper air gap.
- Relays: New electro-magnetic relays to be installed for the Great and Swell Divisions to accommodate new electro-magnetic chest units.
- Tremulants: Existing electric inertia units to be thoroughly inspected and all worn parts to be replaced.
- Shade Motors: New units to be installed for Great and Swell Divisions.
- Rectifier: A new unit of ample capacity to be installed.
- Blower & Motor: The existing unit shall be used. It will be thoroughly inspected and any necessary adjustments and/or repairs performed.

MAJOR OPERATIONS CON'T.

- Misc. : The plaster partition dividing the Great and Swell Divisions which was fractured for the installation of the 32' electronic pedal shall be properly encased to prevent further sifting of plaster dust. Remove the 32' electronic equipment from the tuning passage board of the Swell Division and install in such a manner as not to interfere with future maintenance of the instrument.
- Cleaning: Organ chambers to be thoroughly cleaned before re-installation of manual pipes.
- Finishing: The organ to be artistically tone regulated and tuned to A - 440 pitch at 70 degrees.
- General: It is impractical to list all the various operations involved in the renovation of an organ. It is the intent of this proposal to perform all minor, as well as major, operations to produce a completed instrument which will be comparable in every respect to a new organ.

EBN/c
3/18/70

Minister and People: The grace of our Lord, Jesus Christ, and the love of God, and the fellowship of the Holy Spirit, be with us all ever more. Amen.

* * * * *

THE ORGAN RESTORATION AND IMPROVEMENTS OF ADDITIONS

Our pipe organ was originally installed in 1957 and was built by the Moller Organ Company. At that time and now in 1971 the Newcomer Organ Company re-built and installed improvements. Through the years the leathers which control the flow of air into the pipes deteriorated due largely to air pollution. This resulted in almost one-half of the organ unable to sound.

Through a development in space age technology, silent electro-magnetic controls were found practical as a replacement of leathers. This has been done at a total cost of \$12,895.00. Since our organ would cost over \$50,000.00 to replace it was considered justifiable to embark upon a project of restoration which would permit full use of the organ and considerably reduce cost of maintenance in the future.

Members of the congregation gave some \$9,000.00, with the balance of the cost coming from endowment funds. We are grateful to all contributors and to the Music Committee for their careful preliminary study and fulfillment of this restoration. Members of our Music Committee are: Dr. Edwin Davis, Chairman; Mr. and Mrs. Thomas Payne; Mr. and Mrs. Robert Culbert; Mr. Randolph Phillips; Mrs. Emmerson Cook; and Mr. Richardson Dougall, ex officio.

With the addition of a Sifflöte rank and a Krummhorn rank we now have an organ of 23 ranks totalling 1,400 pipes. (A rank is a group of pipes which speak forth a particular quality of sound, such as a flute, a string tone, a reed, etc.)

The Krummhorn gives the organ a needed solo instrument which also contributes to ensemble playing. This is a gift from the Clarendon Circle to the Glory of God and in memory of their departed members: Gertrude Johnson, Gladys Martin, Marian Carle, Daisy Faunce, Mabelle Hardin, Bertha Teller, Lucy Herbert, and Blanche Marshman.

Glossary of Common Pipe Organ Terms

8 foot pitch: the speaking length of an open flue pipe 8 feet long at low C. At 8 foot pitch, middle C on a pipe organ will have (essentially) the same pitch as middle C on a piano.

16 foot pitch: speaking one octave lower than 8 foot pitch.

4 foot pitch: speaking one octave higher than 8 foot pitch.

Action: the parts of an organ that allow pressurized wind to enter the pipes.

Block (Reed Pipe): The part of the reed pipe that holds the shallot and tongue, and from which extends the resonator.

Block (Wooden Pipe): a rectangular piece of wood that is glued to the back and sides of a wooden pipe. The front edge of the block and the cap form a slot through which passes a sheet of wind that strikes the upper lip. Compare with Languid.

Blower: an electric motor attached to an enclosed fan that supplies a constant supply of wind.

Borrowed: in direct electric or electro-pneumatic actions, the ability to use ranks, or portions or ranks, for more than one stop.

Bottom Octave: the lowest octave on an organ keyboard.

Cap: A thin block of wood that is attached to the block of a wooden pipe. A slit between the top of the cap and the block allows a sheet of wind to pass through which strikes the upper lip of the pipe.

Case: the wooden structure that contains windchests, action, and pipes.

Combination Action: a device in the console that turns on pre-selected stops.

Concussion Bellows: a portion of the winding system that helps maintain the proper wind pressure when many pipes are speaking at once.

Console: the Keydesk or Case that contains the playing mechanism of the organ.

Coupler: a device that allows the stops from one manual to be played on another manual or in the pedal.

Crescendo Pedal: a control at the console operated by the feet that gradually adds stops as it is pushed forward.

Division: that portion of pipework playable from one of the manuals or pedal, such as Great division, Swell division, or Pedal division.

Electromagnet: a device that produces a magnetic field when electricity is applied.

Expression: used after "under," this describes pipework enclosed in a chamber with louvers that open and close to increase or decrease the volume.

Expression Pedal: see Swell Pedal.

Flue: the body of a pipe.

Flue pipe: a pipe that produces sound when air enters the foot, strikes the upper lip, and exits via the mouth. As opposed to a Reed Pipe.

Foot: the conical lower portion of a metal pipe.

Full Length Reed: a reed pipe whose resonator is equal to its acoustic speaking length, i.e. for an 8' reed, low C will have a resonator approximately 8' long (see partial length reed).

Languid: a horizontal metal disk between the foot and body of a metal pipe. The front edge of the languid and the lower lip of the pipe form a slot through which passes a sheet of wind that strikes the upper lip of the pipe. Comparable to a block on a wooden pipe.

Louvers: wooden Venetian blind-like vanes that open and close—see Expression.

Manuals or Keyboards: those sets of keys played with the hands.

Middle octave: starting with the third, or middle c, extending up to the third b.

Mixture: a stop which uses multiple ranks of high pitched pipes.

Mouth: an opening in a pipe at the languid or block, having an upper and lower lip, where the sound is produced.

Music Desk: a long board with a wide lip located above the top manual of the console that holds music

Mutation: a stop or rank of pipes that does not speak at the unison or octave, but at a pitch relating to the harmonic series. On this instrument, the mutation stop is the Octave Quint $2 \frac{2}{3}$ that speaks a fifth above the Octave 4.

Offset Chest: a windchest generally for larger pipes, often the bottom octave a 16 or 8 foot rank. These windchests are set on or close to the floor to maximize the available vertical space.

Open Flue Pipe: an organ pipe that is open at the top, as opposed to a stopped pipe.

Parallel shallots: a shallot that does not taper to be wider at the bottom.

Partial Length Reed: a reed pipe whose resonator is not its full acoustic speaking length but a fraction such as $\frac{1}{2}$ (see full length reed).

Pedalboard: that set of keys played with the feet.

Pistons: buttons at the console under the keyboards that control the combination action.

Plenum (sound): Meaning “full” organ; a combination of stops from the lowest principal rank up to the mixture.

Plenum (winding): a box connect to the blower from which other windlines extend .

Rank: a complete set of pipes from the lowest sounding note to the highest, of one particular timbre or family. Most ranks on this organ have 61 pipes.

Reed pipe: a pipe that uses a vibrating brass “tongue” to produce sound, as opposed to a Stopped Pipe or an Open Flue pipe.

Relay: An electro-mechanical or electronic switching system that sends electric current to the appropriate wind chest magnet.

Reservoir: a wooden box with expandable ribs and leather corner gussets, that maintains a constant wind pressure. Also called a Wind Regulator.

Resonator: the metal tube of a reed pipe extending above the block that affects the tone and amplifies the sound. This is similar to the flared tubing on a brass instrument.

Rocker Tabs: as opposed to stop knobs, these tablets move on an axis to turn on and off.

Scale: the proportion of length of the pipe to its diameter. Principals or Diapasons have wider scaling; string stops such as the Salicional have narrow scaling.

Shallots: The hollow tube inside a reed pipe upon which the reed tongue beats.

Stop Jambs: the section of a console that holds the stop knobs.

Stop Knobs: switches at the console that the organist pulls to turn on a stop and vice versa.

Stop: often used interchangeably with rank.

Stopped Pipe: a pipe with an air tight stopper at the top. This type of pipe will sound an octave lower than its acoustic length, i.e. a four foot stopped pipe will produce an eight foot pitch. More likely a wooden pipe, but some metal pipes are stopped as well. See Flue Pipe.

Straight: meaning that a rank of pipes or even a division cannot be borrowed for another division (although the rank or division can be coupled).

Swell Box: an enclosure with Venetian blind-type shutters. By opening and closing the shutters, the sound becomes louder or softer to the listener.

Swell Pedal or Expression Pedal: a control at the console used by the foot to open or close the swell box.

Swell Shades: the louvers on the front of the chamber that open and close.

Switching System: another name for a relay.

Toe: the very bottom of a pipe that sits in the toe hold of a windchest.

Toe Stud: pistons for the combination action that are operated by the feet.

Tenor octave: the second octave on an organ keyboard.

Tuning Stability: A pipe organ will remain in tune as long as the temperature of the ambient air in the chamber remains constant. If the temperature rises, the pitch rises, and vica versa. The pitch does not rise or fall evenly, but exponentially depending on the size of the pipe. Large pipes move little; small pipes much more. To complicate matters further, it is the flue pipes, not the reed pipes, which change the most. Theoretically, the organ will go back in tune when the temperature returns to where it was when the organ was tuned.

Unit Stop/Rank: a stop that uses only part of an extended rank of pipes. A rank of 72 pipes could have two stops, one using pipes 1-61, the second using pipes 13-73.

Voicing: the art of the person who manipulates the mouth of the pipe to achieve the proper speech, tone, and volume.

Wind Regulator: a wooden box with expandable ribs and leather corner gussets, that maintains a constant wind pressure. Also called a Reservoir.

How Pipes Work

Open Flue Pipes

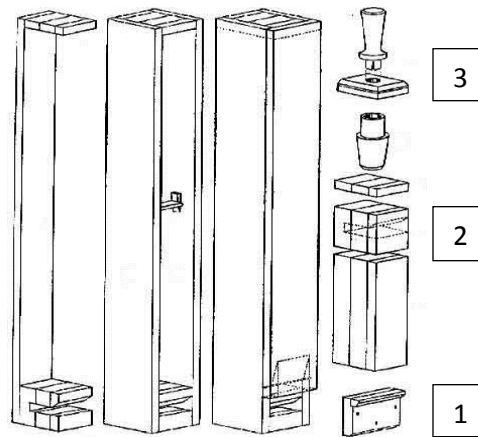
Wind enters at the toe (6), travels through the foot (5), is forced, in the shape of a sheet between the lower lip (4) and the languid (3), strikes the upper lip (2), and sets the air column inside the body (1) in motion.



The speaking length of the pipe (from the languid to the top of an open pipe) determines the pitch, and the scale (proportion of diameter to speaking length) determines the timbre or quality of sound. The wider the scale, the more fundamental you hear (fewer overtones) making it more flute-like. The narrower the scale, more overtones are present, making it more string-like.

Stopped Pipes

Here is an illustration of a typical stopped wooden pipe, similar to the Stopped Diapason in this instrument. From left to right, it shows how it would be glued up during construction. The part on the far right shows the cap (1) (what would be the lower lip on a metal pipe), the languid (2), and a stopper and handle (3). The pipe would have a wooden foot as well that is missing in the illustration. The sound is produced in the same way as the open flue pipe.

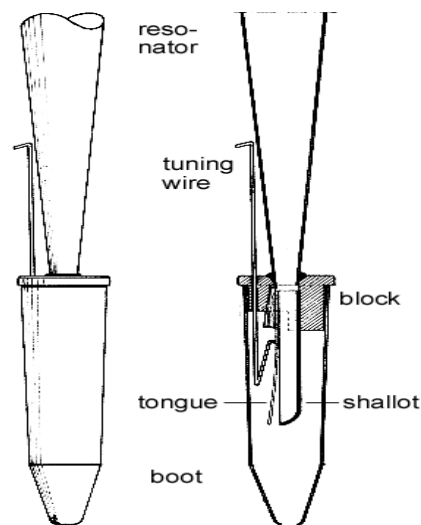


Stopped pipes have an unusual acoustical property. If a stopped pipe with a speaking length of one foot is played, it will produce the same pitch as an open flue pipe of two feet. One advantage of stopped pipes is that they take up less height than their open flue counterparts.

Reed Pipes

Reed pipes use a brass tongue that beats against a hollow tube called a shallot. It is similar in principal to a clarinet mouthpiece. Air enters the toe of the boot where it tries to make its way into the open face of the shallot. The pressure causes the tongue to strike the shallot and then spring back to its starting place. For a pipe playing middle C, this action occurs 261.3 times a second (presuming Equal Temperament and $a'=440$). The tuning wire can be moved up and down which either increases or decreases the vibrating length of the tongue, and thus lowers or raises the pitch.

The resonator amplifies the sound just as it does on a brass instrument. Resonators come in a wide variety of shapes that change the timbre of the pipe.



John Santoianni is the *Ethel Sieck Carrabina Curator of Organs and Harpsichords* at Duke University, a position he has held since 2002. Under his care are eleven pipe organs ranging in size from single manual instruments having about 200 pipes, to four manual and pedal organs with almost 7000 pipes. The eight harpsichords owned by Duke represent a wide range of builders and styles.

John also cares for a select group of organs and harpsichords in the Triangle as well as consulting with churches in the Southeast.

He holds two degrees in organ performance: a Bachelor of Music from the Oberlin Conservatory and a Master of Music from the New England Conservatory where he graduated with Distinction in Performance. He also spent a year studying with Maestro Stefano Innocenti of the Conservatorio "A. Boito" in Parma, Italy, and visited and played numerous instruments in Italy and Spain.

John worked with the Bishop Organ Company and the Lauck Organ Company before starting his own company, Advent Pipe Organ Services, in 1992.