



Guidelines for the Installation and Maintenance of Pipe Organs

Prepared by the
Office of Liturgy and the
Liturgical Music Commission of
the Archdiocese of New York

The organ has always been considered, and rightly so, the king of musical instruments, because it takes up all the sounds of creation and gives resonance to the fullness of human sentiments, from joy to sadness, from praise to lamentation.... It is capable of echoing and expressing all the experiences of human life. The manifold possibilities of the organ in some way remind us of the immensity and the magnificence of God.

—Pope Benedict XVI

Introduction

In its *Constitution on the Sacred Liturgy*, the Second Vatican Council affirmed that “in the Latin Church, the pipe organ is to be held in high esteem, for it is the traditional musical instrument that adds a wonderful splendor to the Church’s ceremonies and powerfully lifts up the spirit to God and to higher things.”¹ The most recent liturgical documents continue to ascribe a “pride of place” to the pipe organ amongst the various musical instruments considered suitable for divine worship.² The high regard in which the Church holds the pipe organ is principally due to this instrument’s unique ability to lead and sustain the singing of a large congregation united in liturgical prayer. As well, the sound of the pipe organ is considered to be “most suited” for solo playing during the liturgy at appropriate moments.³ Pipe organs have also traditionally served an important evangelical role in the Church’s outreach to the wider community through sacred concerts, music series, and other musical and cultural programs.

Bearing in mind the significant place which the pipe organ continues to hold in the life of the Church, parishes should give serious consideration to the installation and maintenance of these instruments. The following guidelines are intended to assist clergy, musicians, and others who are entrusted with the purchase and care of pipe organs in the parishes of the Archdiocese of New York. Additional questions may be directed to the Office of Liturgy and the members of the archdiocesan Liturgical Music Commission.

The Pipe Organ - A Brief Definition



The pipe organ is a wind-blown keyboard instrument, usually playable from more than one keyboard. Keyboards for the hands, called manuals, generally have a range of 61 keys. The pedalboard for the feet normally has a range of 32 keys. Each keyboard usually controls a separate division of the organ, with each division containing one or more sets of pipes of

¹ Vatican II, *Sacrosanctum concilium*, 120.

² *General Instruction of the Roman Missal*, 393.

³ United States Conference of Catholic Bishops, *Sing to the Lord*, 88.

various timbres (*i.e.*, principal, flute, string, or reed). These sets of pipes are turned on and off by means of controls called stops. There is at least one pipe for each note of its keyboard for each stop. When a key is depressed with a stop on, air is allowed to enter a pipe, causing it to sound by means of a connection which may be mechanical, pneumatic, or electrical in operation. This connection is called the *action*.

Types of Action



Mechanical (Tracker) Action

provides a direct mechanical link between the key and the valve under its respective pipe. This direct connection allows the performer some control over the speed of the valve's operation. The information path is two-fold: the performer sends information to the valve and receives feedback from the valve. Thus, the organist has greater control over the touch responsiveness of the organ. Mechanical action usually

has a longer life span than the other types of action due to its relatively simple construction.

Tubular Pneumatic Action replaces the mechanical connections with tubes which convey a pulse of air (either positive pressure or vacuum) from the key to a small bellows which operates the valve. Thus, the actual work of opening the valve is performed by pneumatic power rather than the player's fingers or feet. In theory, the player can control the speed of the valve's operation to a certain degree, but there is no feedback returning from the valve. Pure pneumatic action is seldom, if ever, used today, but more than a few organs with this action remain in service, and a surprising number of them still function without restoration.

Electric Action replaces mechanical connections with an electrically-driven means of providing wind to the pipes. The most common type of electric action is electro-pneumatic, which combines the transmission of electricity with the efficiency of pneumatic valve operation. Electro-pneumatic has been the most common type of action used for organs in America since the early twentieth century. The durability of organs which use electro-pneumatic action depends greatly on the design of the organ and the quality of leather that is used.

All of the aforementioned types of actions permit the console to be detached from the organ pipes. With mechanical action, the distance between the console and the pipes

should generally be no more than six feet; pneumatic actions usually adhere to this limitation as well. In theory, electric actions permit the console (the “control center” of the organ) to be placed at a greater distance from the pipes, thus providing the possibility of moving the console to different locations in a given space.

Choosing an Organ Builder or Curator

Each organ company has its own style and particular focus of work. Some firms build only new organs, while others undertake restorations and rebuilds of instruments, whether those of another builder or their own. Many firms also offer regular maintenance.

Bearing in mind the respective specializations of various organ builders, and in consideration of the unique liturgical, musical, and pastoral needs of each parish, it is important that a parish and organ builder agree on the goals of an organ project before work is undertaken. An organ consultant (see below) can be very helpful in achieving a fine result.

After defining the objectives of the intended work, the parish should look for appropriate organ firms which specialize in the desired work. It is recommended that parishes not ask for bids from a broad spectrum of firms, as the range of responses received is sure to be confusing. Parishes should also note that the process of assembling an estimate for organ work can be both time-consuming and expensive for the organ builder, particularly when travel is involved. For this reason, organ builders will typically charge a fee for providing an estimate for organ work or when they are asked to evaluate an existing instrument. Such fees are sometimes credited toward an eventual purchase.

There is an abundance of skilled organ builders throughout the United States. Some exclusively build one type of instrument (*e.g.*, tracker), while others may employ a combination of action types, depending on the particular needs of the parish and the available space. The members of the archdiocesan Liturgical Music Commission have extensive experience in working with a variety of builders and are able to guide pastors and musicians through the process of identifying and selecting a qualified builder.

Purchasing a New Instrument

Placement

The ideal location for an organ is generally on a central axis and not in a chamber or behind grills. Sound projection is maximized when the instrument speaks directly into the longest part of the church building. Placing the organ in this location also

improves the chances that it will stay in tune, as tuning is directly affected by temperature.

Acoustics

The acoustics of a church building are an integral part of the organ's sound; in fact, it has been said quite accurately that, "the room makes the organ." Hard, rigid surfaces reflect sounds, while soft surfaces absorb sounds. Both high and low frequencies require reasonably rigid, smooth surfaces. The distances between the floor, walls, and ceiling, as well as the shape of these surfaces, all have strong influences on the character of the acoustical environment. Utilizing the services of a licensed, professional acoustician working in concert with a competent organ builder is often a wise investment.

Builders

Parishes are advised that the organ industry in America is unlicensed, meaning that any firm may advertise itself as an "organ builder." Conscientious builders and technicians are usually members of either the Associated Pipe Organ Builders of America (APOBA) or the American Institute of Organ Builders (AIO).

Repairing or Replacing an Organ

Each pipe organ, no matter its size or what type of action it employs, is a wonderfully complex and unique instrument. Nevertheless, there are various components that are common to every instrument:

Wind System

The wind system includes the blower and its electric motor, the regulators (also called bellows or reservoirs), and wind lines or trunks. Blowers and their motors require periodic lubrication, and a capable, licensed electrician can also be asked to check the motor's general health. A leaky organ chassis can put strain on a blower's motor. As well, it is preferable for a blower to draw its air from the organ chambers rather than from an outside source, as this may cause tuning instability. An air filter on the blower's intake is especially important in urban areas, where air pollution can accelerate the deterioration of the organ's leathers. Regulators will occasionally need to be re-leathered, wind lines/trunks may need to be re-gasketed, and any cracks or leaks should be repaired.

Windchest

A windchest is an airtight box on which pipes sit. It also contains the mechanisms which allow the pipes to speak. In an electro-pneumatic organ, the valves and pouches in the windchest need to be re-leathered every 40-50 years. The windchest may also develop cracked/warped wood or sustain water damage, which, in extreme

cases, may necessitate the replacement of the chest. Mechanical-action chests seldom need re-leathering, as the only leather present is the gasket on the valves. In some cases, leather can last a century or more on these instruments without problems. Other minor repairs which may be necessary include a gasket replacement to stop leakage and the replacement of broken magnets in primaries or electric chests.

Failing leather in electro-pneumatic organs will cause dead notes or ciphers (*i.e.*, pipes which sound when they are not played). When ciphers develop, it is advisable to obtain several bids for re-leathering the organ. It is usually more cost-efficient to re-leather an entire chest rather than individual note actions.

Console and Action

All consoles are subject to wear and tear on playing surfaces. Keys can become worn and chipped, and pedal surfaces need periodic renewal. Worn bumper felts will make both keys and pedals noisy when released. Mechanical actions can become worn and noisy or unreliable. The most common repairs of electric consoles include re-leathering, the replacement of broken contacts, and various repairs to mechanical parts (*e.g.*, springs, stop tabs or knobs, keys, pedals, etc.). It is a recommended and cost-effective practice to replace the electrical system in older consoles with new, solid-state systems which provide many benefits both to the player and to the organ. Although its appearance may be worn, the replacement of the console shell is usually unnecessary. If desired, professional case refinishing can restore the appearance for less than the cost of a replacement console.

Pipework

Pipes naturally gather dust, which affects their speech. With this in mind, pipes should be cleaned approximately every fifty years, but the exact interval will depend on the conditions in the organ chambers. It would be important to note that organs built in the 1960's and 1970's were often made with soft pipe metals that eventually cause longer pipes to physically fatigue and lean or fall over. This will be immediately evident to the organ technician, who can advise the best course of action to take in this situation.

Depending on how far problems have advanced, repairs to organ pipes can involve the addition of new wood support racks or major pipe repair. In some cases, the installation of new pipes is necessary. Wood pipes, in particular, may suffer from extremes of humidity or temperature. The most significant source of damage to organs and their pipes often comes from the work of careless tuners, especially in cases when pipes are cone-tuned. Such damage should be repaired, and care should be taken to engage reputable tuners.

Repairing an Organ

An organ is considered worth repairing when the cost of the repair does not exceed 50% of the replacement value of the organ (*i.e.*, the cost of a new organ of the same tonal resources) and when the repairs will keep the organ in good playing condition for a reasonable length of time.

Organ builders typically use the following terms when discussing organ repairs:

- **Restoration** refers to returning an existing instrument to its original condition without changing its sound or action;
- **Renovation** means making a substantial alteration to at least one component of the organ; and,
- **Rebuilding** involves retaining the organ's pipes and placing them on a new chassis.

Restoration of an Historical Organ

An historical organ is an instrument of significant artistic merit that remains relatively unchanged and unaltered from its original design (*i.e.*, voicing, pipe work, and various mechanisms and actions are completely or relatively intact). Many older organs are worthwhile candidates for restoration rather than replacement. The question as to whether to restore, renovate, rebuild, or replace an organ involves many variables and requires careful study and professional assessment. Unfortunately, fine instruments are sometimes discarded or ruined because of incomplete or inaccurate information concerning their state of disrepair. The Office of Liturgy and the members of the archdiocesan Commission on Liturgical Music are able to assist pastors and musicians in making the best decision as to whether to restore an historical organ.

Renovating or Rebuilding an Organ

If an organ is well-constructed, properly installed, and faithfully maintained, it will play well for hundreds of years. However, organs that have experienced deferred or poor maintenance may require a major renovation or even rebuilding. A pipe organ which has little historical significance or artistic merit may be a suitable candidate for renovation or rebuilding.

Additional Considerations

Tuning

In general, organs should be tuned twice annually, once after the building's heat is turned on in the fall and again after it is turned off in the spring. Frequently, tuning

involves a “touching-up” of stops that may be more prone than others to malfunction due to temperature fluctuations. Parishes should be aware that two organ technicians are needed to tune an organ properly, and travel time to and from each call is typically part of the cost of having an organ tuned. The Office of Liturgy and the members of the archdiocesan Commission on Liturgical Music are able to assist pastors and musicians in identifying and contacting reputable organ tuners.

Maintenance Budget

It may be financially necessary to have major maintenance work (e.g., re-leathering of windchests) take place over more than one fiscal year. Maintenance firms are often willing to work with the parish in developing a multi-phase plan which will keep an instrument in good working order while taking into consideration the parish's budget for organ work.

Organ Consultants

Next to the church building itself, a pipe organ will often be a parish's most expensive asset. Therefore, a parish may wish to hire a consultant who has previous experience and knowledge of the details involved in an organ project. This may be especially helpful in the case of a large or historically significant instrument. A consultant will typically assist the pastor and musician to identify any pertinent issues, define the scope of work, assemble a list of reputable builders, and prepare a request for proposals. In these cases, the consultant is hired to work for the parish and not the organ firm. As such, a consultant should not later become a bidder for the intended work. The Office of Liturgy and the members of the archdiocesan Commission on Liturgical Music are able to recommend competent and knowledgeable organ consultants.

Electric or Electronic Instruments

In lieu of a pipe organ, some churches choose to purchase an electric or electronic organ. These instruments seek to replicate both the sound and the playing style of the organ by using electronic tone generators, amplifiers, and speakers, rather than pipes, in order to produce a musical sound. It is possible for such instruments to imitate the sound of a pipe organ closely, but, in the opinion of experts, a well-maintained pipe organ will provide a superior musical experience for both the congregation and organist alike. For many parishes, the purchase of pipe organ will be a better financial and artistic investment than an electronic organ.

Final Recommendations and Procedures

1. Bearing in mind the high esteem in which the Church holds the pipe organ in her liturgical life, serious efforts should be taken by parishes to install a pipe organ in new churches and in existing churches where one is not currently present. The installation

of a substitute (*i.e.*, electric or electronic) instrument should be considered only after a significant investigation has been made by the parish into the possibility of purchasing a new or used pipe organ. Used pipe organs can sometimes be purchased at a lower price, and the Office of Liturgy and the members of the archdiocesan Commission on Liturgical Music can assist parishes in finding such instruments.

2. Parishes with existing pipe organs should have a plan for the regular maintenance of these instruments. The Office of Liturgy and the members of the archdiocesan Commission on Liturgical Music can provide parishes with the names of reputable organ maintenance firms.
3. Parishes are encouraged to contact the Office of Liturgy whenever considering the purchase, repair, or replacement of a pipe organ.
4. Parishes should not discard or not use a pipe organ in favor of purchasing an electronic organ or another keyboard instrument without having spent considerable time and effort in assessing the value of the present instrument and with a view toward its possible repair.
5. Organ projects whose cost is more than \$30,000 must be submitted for approval via the archdiocesan Request for Authorization (RFA) process for capital expenses. These projects are reviewed by the Liturgical Music Commission under the oversight of the Office of Liturgy, which gives its approval to the RFA.
6. In cases when a church will no longer be regularly used for worship as the result of a parish merger, the Office of Liturgy should be contacted by the pastor or administrator in order to arrange for an inventory and evaluation of the church's organ. This work is completed by the Liturgical Music Commission under the supervision of the Liturgy Office, and the resulting evaluation report is forwarded to the vicar general/chancellor and the archdiocesan Insurance Division.

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