

## **Choosing an Organ**

### **Abstract**

This article is intended to present the information that can guide churches and non-Orthodox synagogues in the purchase of the primary musical instrument for accompanying choirs and the congregation, and to serve the secondary purpose as a good recital and concert instrument.

### **A. Pipes vs. Electronics**

#### **1. Introduction**

With moderately sized pipe organs costing half a million dollars or more and similar money amounts required for repair of pipe organs that have suffered damaged from flooding or earthquakes and similar incidents, main-stream traditional churches have occasionally considered electronic replacements. Recent advances in electronics and electro-acoustics have made possible electronic organs that closely approximate the sound of pipe organs at a fraction of the cost.<sup>1</sup> Let us discuss both engineering and philosophical issues involved in the comparison between the two types of organs, with our suggestion for selecting the pipe organ option when at all practical.

#### **2. Sound Source Directional Characteristics**

A layman or musician not technically trained in acoustics can easily determine that sound from typical organ pipes is directional, simply by walking in a circle around an organ pipe in an outdoor environment while a friend excites its sound by blowing. This is best done with flue pipes of principle/diapason or "string" tone, which have more harmonics than organ pipes producing "flute" tone. The experimenter will notice the difference in sound as the pipe is heard from various directions. This suggests that thorough analysis of a single pipe for recording in any medium for later simulation or reproduction in an electronic organ should require many microphones forming a sphere around the pipe. Summing or averaging the signals from these microphones to present a picture of total sound power output is not always as straightforward as may be assumed, but requires careful analysis of how the center of tone production moves

at the pipe from the fundamental frequency through the harmonics. It can be done. Then, of course, playback to be thoroughly accurate should be through a loudspeaker with the same directional characteristics as the pipe. This may be a hopeless task, as anyone trying to purchase or build a truly omni-directional loudspeaker array for test purposes, possibly a simpler task, can attest. Then this process must be repeated for each pipe in the original organ. In most cases, the resulting organ would then require more space and be at least as expensive as the pipe organ it is intended to simulate.

In fact, this degree of accuracy has never been attempted by any electronic organ manufacturer. While complete simulation of a pipe organ requires this approach, more normal sound reproduction methods may suffice in many cases to provide an instrument that is close enough to real pipe organ sound to satisfy most people most of the time, including many musicians. Indeed, this writer has recommended specific electronic organs for projects where pipe organs were impractical or would be poorly served by the building's architecture and acoustics.<sup>2</sup> But expectations to exactly reproduce the effect of a real pipe organ will not be met in all music for all performers and listeners without the full scale approach of the previous paragraph.

### **3. Philosophical Differences**

Such pipe organs as those surviving from Bach's day, including those he played and/or had his involvement as an advisor, the great organs of Cavaille-Coll known to the composers Frank and Widor, and modern instruments, some like the Aeolian-Skinner/Schoenstein in the Mormon Tabernacle with pipes from much older instruments, and some like that the Casavant in the Reorganized Church in Independence Missouri, and the Fisk at the Lausanne, Switzerland, Cathedral, that are completely new, are truly great works of art. They are icons of Western Civilization as much as the Mona Lisa, the ceiling of the Sistine Chapel, Chartres Cathedral, the Seagrams Building in New York, and the music of Bach and Frank that are played on those organs. At the dawn of the 21<sup>st</sup> Century, worldwide, there are probably over one hundred artistic and dedicated organ builders who can produce instrument of this high quality, organs that would delight both Bach and Frank, and restore and repair organs needing such attention. Isn't the difference *only a matter of degree, and not principle*, between replacing or substituting an electronic instrument for such a

real work of art, a pipe organ, and substituting a photograph for a real painting, or even providing recorded organ performances and possibly even recorded choir performances to lead a congregation in singing? And then why have live concerts?

Where money is tight, this writer suggests that a temporary electronic organ be installed, and a long-range plan developed to provide the most basic pipe organ first, then additions as money becomes available and is specifically raised for the purpose, until the full organ-as-work-of-art is realized. Somewhere along the line, the electronic would be returned to the manufacturer, sold, or used elsewhere in the building complex. But insure at least half the electronic organ funds available are spent on the loudspeakers. Most electronic organ installations are very limited in musical quality by insufficient loudspeaker power, resulting in distortion, and this is one fault that can be avoided by enough loudspeaker power, with the required amplifier power as well.

## **B. Choosing the Pipe Organ**

### **1. Some History**

Although there is some evidence that an organ of some type may have been in used in the Second Jerusalem Temple, it was not until after the Middle Ages, during the Baroque period in Europe, that the pipe organ matured into a musical instrument inspiring compositions of great composers that have earned a permanent place in the canon of great works of art of western civilization. The organs that Buxtehude, Bach, Couperin, and Handel played and approved, that have survived until today, are considered fine musical instruments, worthy of preservation and restoration. They can still serve the primary purposes of a church organ if the style of worship is similar to that in the churches of that period. Today, this style is most frequently found in traditional Lutheran churches, and some Moravian and Mennonite churches have music that also fits this type of organ, even with less repetitive style of worship. Following this period, the invention of the swell box and swell shutters made possible variation of organ dynamics, independent of adding and subtracting stops, a “stop” being a rank of pipes from base to treble providing one characteristic tone color, plus effecting tone color and adding loudness when added to other stops. This led to the

development of what is sometimes called the symphonic organ or romantic organ, an organ considered as an alternative to a full symphony orchestra. A second high-point in organ development was reached with the organs of Cavaille-Cole, and the music of Cesaer Frank, in Belgium and France, with some parallel developments in organ building in England and North America, both the USA and Canada. As the full symphonic organ developed, it became larger, with far more stops than the Baroque organs of Bach's day, and pneumatic levers assisted the key action, replaced in part by the use of electricity in the early 20<sup>th</sup> Century. In some cases, architects that did not understand the acoustical implications of the role of the organ in worship, on occasion used the flexibility of electric control to hide the organ in chambers, rather than having it exposed as fine piece of visual church art. A reaction to these trends was the organ reform movement, which in sum represented a return to the style and details of the organ of Bach's day. This movement began in Germany, quickly spread throughout northern Europe and then throughout Europe and America.

In North America, the prominent organ builder, British-born, G. Donald Harrison, used the phrase "American Classic" to describe organ building attempting, and often succeeding, features of both the Baroque and Romantic periods in complementary and useful fashion for organs that render all periods of organ music with some authenticity as well as serve their primary worship assistance function. This type of instrument is available today, along with mechanical action organs that are carefully designed and built to conform both to the demands of the musical literature of the Bach period and the specific worship requirements of the specific church. Some have also proven wonderful instruments for the French Romantic period as well. Other countries developed particular national styles. One of the most distinctive, and worthy of emulation in specific situations, is the Spanish, with emphasis on the brilliance of exposed reed stops. Well before World War Two, the German Walker firm built organs particularly suited to the requirements of the German Reform (Jewish) Movement, and some idea of the sound of these instruments can be realized at Temple Emanu-El in New York City, Washington (DC) Hebrew Congregation, and North Shore Congregation Israel in Glencoe, Illinois. The late Herman Berlinski, educated as a music classmate of Kurt Mazur in Leipzig, and taught organ by Robert Baker, was involved at one time or another with all three instruments and was an authority on the Walker Reform Movement organs..

## **.2. The Process**

The Music Director, Organist/Choirmaster, should always have a major say in the purchase of a new organ or renovation of an old one, since he or she has the musical knowledge to understand the specific requirements. Often a consultant more familiar with the details of organ construction and costs is hired. The committee responsible for decisions should visit at least eight or ten organ installations of builders being considered, learn the history of the installations as well as doing some careful listening. The process should not be hurried. The American Guild of Organists and the American Pipe Organ Builders Association both have extensive literature to guide in the selection and installation of pipe organs, even including suggestions for fund raising.

## **References**

- .1. Information given the authors over a long period by building committees and organ consultants. The reader can verify by discussing the matter with most church building committees or music committees.
- .2. "The First Presbyterian Church, Stamford, Connecticut," *J. Acoustical Soc. of America*, **31**:7, Klepper, D. L., p. 879-882, July, 1959; with the follow-up comment in "References," "Tent-shaped concert halls, existing and future," *J. Acoustical Soc. of America*, 124:1, Klepper, D. L., p. 15-18, July, 2008; "The Distributed Column Sound System at Holy Cross Cathedral, Boston, the Reconciliation of Speech and Music", *J. Acoustical Soc. of America*, **99**:1, Klepper, D. L., p. 417-425, January, 1996 *Acoustics in Worship Spaces*, D. Ingram, E. L. Barnes, C. Hampton, D. Klepper, and R. Nohren, American Guild of Organist, New York, 1976, *Acoustics of Worship Spaces*, David Lubman and Ewart A. Wetherill, Editors, Acoustical Society of America, Melville, NY and Sewickly, PA, 1985