Pipe Organs, Temperature, and Humidity

By Howard W. Weaver

There is often misunderstanding regarding the operation and care of pipe organs in rooms, such as churches, where the heat is turned off during mid-week in the winter. Using the instrument when the room's temperature is lowered will not physically harm the organ. It will, however, render the organ out of tune, if the organ is tuned for normal room temperature (approximately 70 degrees F.) and there is a variance in temperature of plus or minus two degrees or more in either direction.

The pitch of organ pipes goes up or down in direct relation to the air temperature in the room. Most pipes go up or down at the same rate, so that the organ is reasonably "in tune with itself" whether the room is warmer or cooler than normal. However, the "reed" pipes (Trumpets, oboes, Clarinets, etc.) do not rise and sink in pitch at the same rate as the flue" pipes (Principals, Flutes and Strings), hence, the organ will sound out of tune when both kinds of pipes are used at the same time. This, of course, is why the organ tuner is careful that tuning is done only when the room and organ chambers are at normal temperature.

This change in pitch with change in air temperature is common to orchestral instruments as well. It is not caused by the almost negligible expansion or contraction of metal pipes during changes in temperature. It results from changes in density of air at different temperatures. A pipe organ will come back in tune when the temperature around the pipes returns to that at which it was tuned.
When heating a cold room allow time to gently let all the organ's pipes and mechanisms reach normal temperature completely. Similarly, when using air conditioning to cool a room, allow time for its effect to reach the areas where the pipes are located.

Many organs in old European churches have generally lasted a long time. One reason is that those building did not have heat! Heat, per se, does not harm pipes, however dry heat most certainly does! Modern building kept warm all winter long generally see their humidity levels drop, which, over time, dries out the wood, glue, leather, etc., of the organ's action. In a room that must be heated every day, humidity levels must be monitored and moisture added to the room's air via a humidifier of some sort. A relative humidity of 40% to 50% is recommended.

In churches, lowering the heat level during the week will tend to minimize the drying out process. heating the room for a midweek choir practice may not cause significant dryness, however, it would be prudent to provide a humidity indicator near the organ to verify humidity levels.

Pipe organs can provide the musical needs for those who play and hear them for hundreds of years, so it only seems reasonable to provide the really minimal and inexpensive steps to insure this longevity.

About the Author

Howard Weaver began his career in organ building at age seventeen as an apprentice in the engineering department of M.P. Möeller Organ Company of Hagerstown, Maryland. He served in various capacities there including Director of Engineering, Director of Operations, Sales Manager, and ultimately as Vice President of Design and Product Management.

Over the years, Mr. Weaver was involved in many important projects at Möeller. He personally designed the casework and supervised the engineering, manufacture, and installation of the instrument at Calvary Church in Charlotte, NC, the largest, all-new organ ever built and the thirteenth largest organ in the world. Other major organs over the years were the instruments at Mary Our Queen, Baltimore, MD; St. Paul the Apostle, New York City; Cathedral of St. Paul, Birmingham, AL; National City Christian Church, Washington, DC; First Presbyterian Church, Midland, TX; and Spring Hill Presbyterian Church, Mobile, AL, and the organs at the US Air Force and US Naval Academies. In the course of his career he has been involved in approximately 2,500 organ installations.

Howard has been privileged to extensively study English and European pipe organ building and case design. He is welcomed into the organ factories, and has maintained friendships with the many fine organ builders there. In addition, he has been involved in operational courses at Penn State University, American Management Association in Washington, DC, and the Maryland Center for Quality & Productivity at the University of Maryland.

Currently, he is associated with A. E. Schlueter Pipe Organ Company, as Organ Design Engineer (Emeritus).