

Evolution or Intelligent design

When Ktesibios invented the pipe organ, it had only one rank. The air pressure was generated by bells plunging alternately into water to generate the necessary wind pressure.

<http://www.mlahanas.de/Greeks/Ctesibius1.htm>

Later, the wind pressure was generated by bellows powered by human beings doing the “step ladder”, until Cavaillé-Coll changed that and used the whole body (arm and legs) to power those bellows (the precursor of an exercising machine!). Now we have blowers and no one has ever complained about it. So is it not time to look at other parts of a pipe organ and see what can be done to simplify, increase the capabilities and reduce the cost of a modern pipe organ ?

The tracker organ is dead ! Long live the tracker !

The tracker organ was probably the best design that could be used to control the numerous pipes that compose an organ, when electricity was not available. Because space was always limited, certain ranks had to be assigned to certain keyboards or pedal, still allowing coupling between keyboards, at the expense of loosing some of the capabilities of the organ. Keys became more and more difficult to move and the wonderful invention of the Barker box that Cavaillé-Coll used extensively, solved the problem.

Then came the “magnets”, which I prefer to call relays, because this is what they are. One relay is placed close to a pipe, and when energized by an electrical current, frees the little plate that was stopping the wind from going to the pipe. Then the pipe speaks.

It has long been debated whether Cavaillé-Coll approved or disapproved the use of such “magnets” that appeared at the end of his life. According to his daughter, he refused to take position, saying he was too old for that. In fact, electricity had not been completely mastered at that time and he was afraid of fire breaking out in the chambers of the organ. Remember, he got the contract at Saint Denis because the organ burned a few days before the inauguration.

So “magnets” started to be used and most of the theater organs at the beginning of the 20th century were using them (Wurlitzer and others). I have seen these, even used them, but they do not make sense: complex wind routing adds to the craftsmanship necessary to build those wind chests.



The Peterson Valve

The Peterson relays, they call it “valves”, are the right answer to the problem: a single hole at the bottom of the pipe is kept closed by a felt pad attached to a relay. When activated, the relay pulls the pad away from the hole, thus letting the air through the pipe. Is not that simple: one pipe, one straight hole, one valve ? Every 21st century organ should be built that way...

This now means that any single pipe of any rank can be under the control of an electronic board. And of course this board will have a MIDI interface to be compatible with most of the 21st instruments. How about controlling your pipe organ from a guitar ? Just the thought of it may be a sacrilege for some of you, but why not ?

For more information on MIDI, see for example:

<http://www.pipeorgans.com/pipe-organ-midi/index.cfm>

So we now have a pipe organ where each pipe is controlled by an electric current going through a coil which attracts a felt pad to let the air go through, and which is controlled by an electronic board which has a MIDI interface. Your keyboard has also a MIDI interface and sends “note on”, “note off” messages to the electronic boards to turn the pipes on or off. So everything is connected together. Furthermore, you can even have wireless MIDI connections, so that there will be no wires between the console(s?) and the pipes. You can put your console(s) anywhere, or move it, or even replace it with a computer that will play instead of you (oops, sorry!).

Can we have velocity sensitive keyboards, please ?

More complex, but possible. In order to do that, you have to add what is called an analog to digital converter (ADC) to each key. The value of the pressure you are applying to the key is read by the computer and that value sent through the MIDI interface to the proper pipe. This information is part of MIDI. The only problem is that you have to add a digital to analog converter or DAC (the reverse of what you did at the key) which will progressively copy the movement of the key, and open the relay accordingly. These types of electronic circuits are readily available (you may have one or several in your i-pod) and they are relatively cheap.

Although, after having played with organs for the past three years (yes, I am new to the field and I am not afraid of saying so), organs are very simple instruments: you just have to repeat the operation (whatever it is) sixty-one times (or more) per rank to make it work...

The draw knobs are dead ! Long live the draw knobs !

Draw knobs are how you control the stops in your organ. But if you think of it, mechanically, they are a pain. And electrically, if you want to change the registration they are even more of a pain. You have to have special relays to activate or deactivate them, which makes the wiring more complex. So why not have “touch-pad LCD screens”, the same that you use at the airport to get your e-ticket. You may have as many monitors as you want, or as many screens (aka menus) as you want: great, swell, positive, solo, pedal, etc., And because it is under computer control, each stop can be selected for any keyboard. No more coupling, nor more frustration, you are in control. Furthermore, any combination can be stored and retrieved any time during the performance. Aren't we getting somewhere ?

The assistant is dead ! Long live the assistant !

The organist is a very physical person. He plays with his hands, he plays with his feet, he plays with all his body, trying to move as little as possible on the bench on which he/she is seated (although Mozart also played with his nose). Because of that, he needs an assistant to turn the pages of the score or to change the stop selections he has chosen for a particular piece. That person is usually competent, but you never know.

The only mean of communication that an organist has left when he/she plays is his/her voice. What if the changes in the stop selection were controlled by the voice of the organist. Voice recognition is not what it was 10 years ago: you now have these automatic phone machines that ask you to answer by yes or no. You hate them, I do too. But this could be some way to control the machine, not the human. You could speak in a microphone, in *mezzo voce*, a “next” or a “two” or whatever, to change the stop

selection. The computer will recognize your voice and make the appropriate changes. Would not that be great ?

Page turning is dead ! Long live to page turning !

But the assistant is still here: he still has to turn the pages...

Well, not exactly. Your home or office computer probably has an LCD (Liquid Crystal Display) monitor, one of those very flat screens that are being used in laptops and desktops computers. No more of these ugly, TV like, bulky monitors we had at the end of the 20th century. They exist in all sizes, from very small to very large, horizontal or vertical, and they are thin. They can fit on the music rack where your music sheets used to be.

What if you had your score scanned prior to your performance and displayed on the monitor while you play. And to get to the next page, you just have to say, *mezzo voce* in the microphone that looks like the one you are using with your cell phone, "next". You get the next page , and you continue playing without any further disturbance, pages after pages after pages.

Your assistant is gone. No more stop selections at the wrong time, no more turning the pages with his/her hands in front of the score. Gone. Welcome to the 21st century.

But we could go a step further. What if the computer that controls your organ was capable of recognizing where you are in your music and was able to "turn the pages" without any human intervention. Most sequencer programs, for example Cakewalk (<http://www.cakewalk.com>), are already capable of doing that. A simple command could be added to automatically "turn" the pages.

One more thing. At home or during the flight to your concert, you could look at the score, make annotations (in blue, pink, or green) on the digital score, save the whole thing on a memory stick, and when you arrive at the organ, just stick in you memory stick: it's all there, to your liking, ready to play, without any assistant, just using your talent.

Conclusion

We have now reached organist heaven. Can we go a step further ?

With all the money we have saved, maybe it's time to build gold flute pipes. Don't they sound better...