The Jazz Flute
A Possible Addition for Home-grown Band Organs

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If you are used to hearing mostly fairground and carousel organs, it is quite possible that you may have never heard this pipe before. Jazz flutes are typically found on dance organs, especially Belgian dance organs. This pipe was invented in 1925 by Guillaume Bax, an employee of the Mortier organ company[1]. The jazz flute appears in several forms. Basically it is a flute pipe that has a small hole drilled on the backside of the pipe, directly opposite of the cut up. This hole has a pallet that covers it when the tremulant is off. When the tremulant is on, a small pouch on the back side of the pipe causes the pallet to rapidly open and close the hole. This causes the pitch of the pipe to rise and fall, giving a vibrato effect to the pipe.

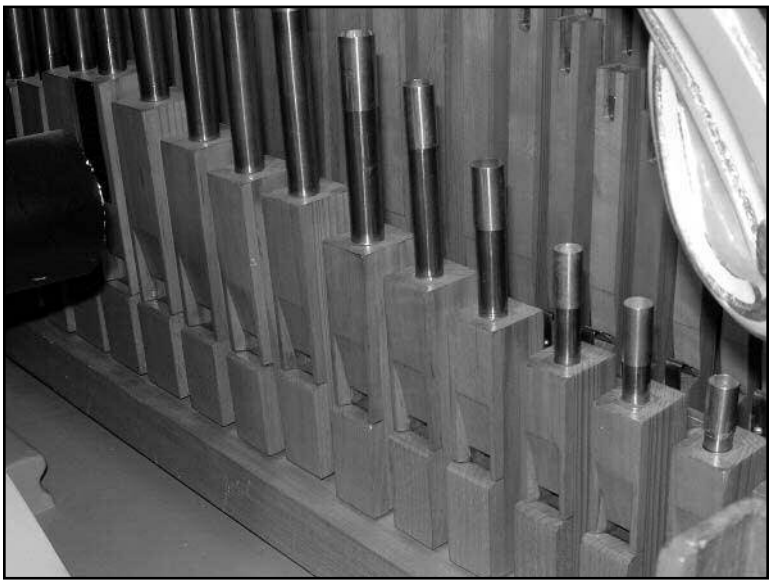

Figure 1. Jazz flutes typically found on a Mortier organ.

The two basic styles of the jazz flute are as a fully stoppered pipe, and a half-stoppered pipe like a chimney flute (**Figures 1 & 2**). I also know of at least one other example, which is a completely open flute pipe. All three types are different in quality, the fully stoppered pipe being somewhat mellow, the half-stoppered and fully open pipe being somewhat brighter. These pipes can, of course, be used without the tremulant, and the fully stoppered type works well for a foundation rank. Because this type of pipe can be used for two kinds of tonal effects, and occupies the space of only one rank, this makes it attractive as a possible voice for a band organ. If you like the occasional sound of organ pipes with a tremulant, it also has the advantage being able to use the same source of air as all of the other pipes, since it's pitch is not modulated by a change in air pressure. In other words, you don't have to have a separate regulator and chest for these pipes.

The sound of a jazz flute with the tremulant on is certainly an acquired taste. I must admit, when I first heard a set of these pipes, they sounded very strange to me. But after a while, I got hooked and looked forward to hearing them. Of course it's also possible that no matter how well they are made and regulated, you might never like them! One of the reasons that some jazz flutes never sound good is that when the tremulant is on, the pallets on the back side of the pipes never get closed between the pulses from the tremulant. This is usually because the springs that close the pallets are old and weak, or simply misadjusted. When this happens, the pallet tends to float over the hole when the tremulant is on, causing the pipe to sound sharp. Even though without the tremulant, the pipe is in perfect tune. The pallet must completely close between each pulse so that the listener gets to hear the real pitch of the pipe between pulses. With this type of a tremulant system, the pitch of the pipe is only changed in the sharp direction. Traditional tremulant systems usually swing a bit flat, as well as sharp. The ear can tolerate sharpness much more than flatness, but it is very important that the pallet on the back of the pipe gets closed between pulses from the tremulant, otherwise, they will never really sound in tune. A well adjusted set of jazz flutes can have a sort of human quality, or sometimes imitate the sound of the reed section of a big band, or just a strange solo sound that completely contrasts with most other voices in a band organ.

Figure 2. Decap style jazz flutes.

[1]Information courtesy of Tom Meijer of the Netherlands.

The hardware requirements for a complete jazz flute system consist of basically three parts. The first part is, of course, the pipes, which can be any of the types mentioned before. The second part is the tremulant itself, and the third part is the chest, which goes directly behind the jazz flutes. (**Figure 3**) I call the chest the "jazz chest" for lack of a better term. This chest is not necessary, but makes for more efficient use of the modulated air. Decap organs, like Mortier, had jazz flutes also. When the tremulant is on in a Decap organ, all of the jazz flutes have their pallets modulated, regardless of whether or not the pipe is actually playing. If there are 23 pipes in the rank of jazz flutes, all 23 pallets are modulated simultaneously. In a Mortier system, only the pipe that is in play gets its pallet modulated. The jazz chest is the hardware that "decodes" which pallet to modulate. It is also more fun to watch the backside of a set of jazz flutes that has the jazz chest, you will see pallets wiggle only on those pipes, which are playing. As the notes change, the pallets will seem to "jump" left and right. Since these kinds of projects are for my own amusement, the more interesting, although more complicated system with the extra chest, seemed like the way to go for me.

Figure 3. Two rank pipe chest showing the "jazz chest" directly behind the jazz flutes.

The pipes that I chose for my organ are based on pipes from a Decap organ. These are fully stoppered flutes, which make for a good foundation sound, as well as a solo voice with the tremulant on. The scale is slightly large, which gives them a nice flute type sound. They are on a chest that has two ranks of pipes, the brass piccolos at the front, and the jazz flutes in the back (**Figure 4**).

Figure 4. Two rank chest: brass piccolos at the front and jazz flutes towards the back.

The design for the tremulant is based on designs found in Mortier organs (**Figures 5 & 6**). As originally designed, this tremulant was supposed to work from a pressure signal from the register box. My operating system is all suction, so I made a few modifications so it would work from a vacuum signal. The extra valve and pouch can be seen in **Figure 7**. The tremulant comes apart into three large "layers" (**Figure 8**). The bottom layer receives the input air from the organ and is continuously charged. The center layer has the delivery nipple that goes to the jazz chest. This layer also has the pallet that is modulated by a

Figure 5. Tremulant for jazz flutes.

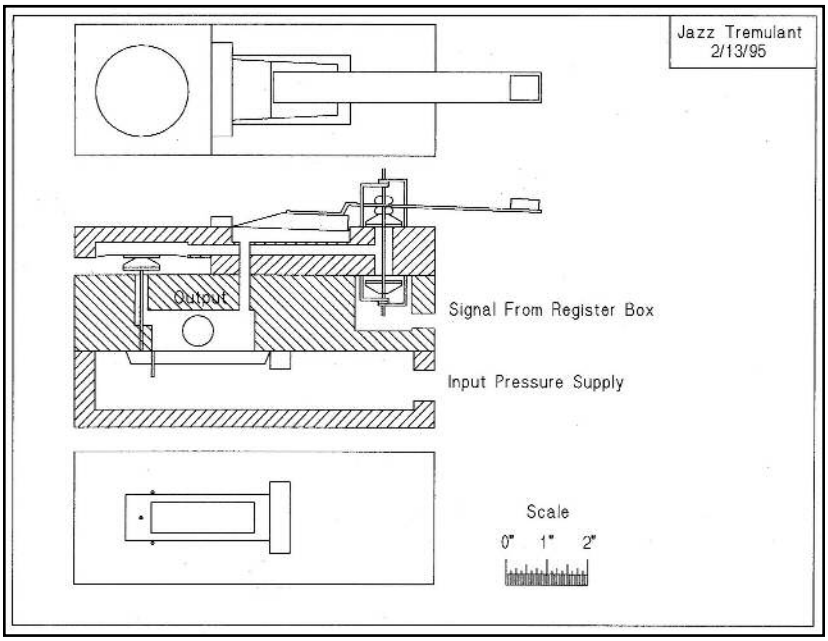

Figure 6. Drawing with a cross section of the tremulant.

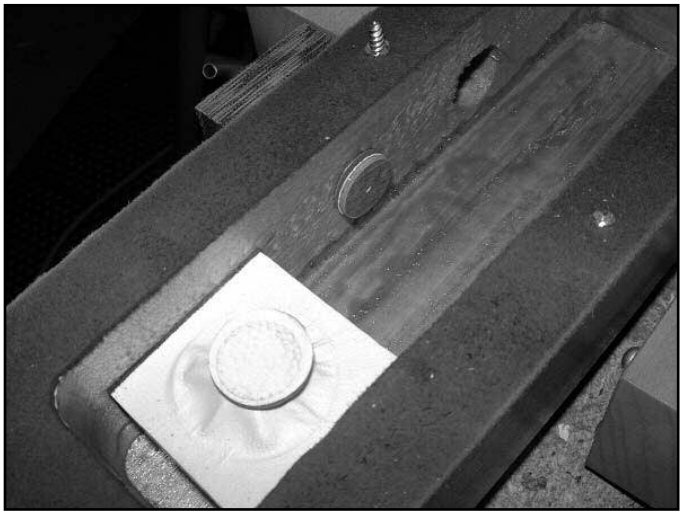

Figure 7. Extra pouch and valve for operation from a vacuum signal.

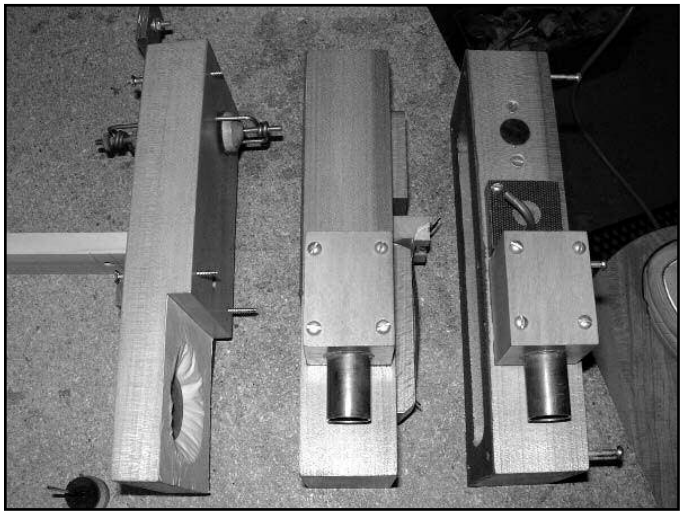

Figure 8. The three "layers" of the tremulant.

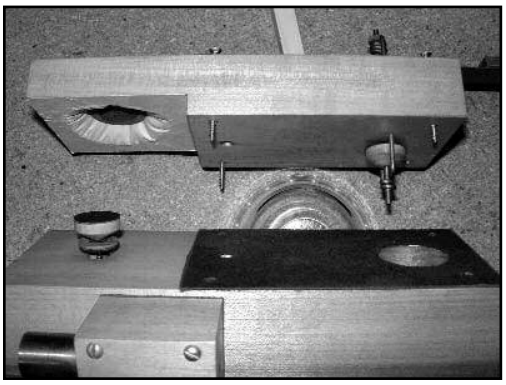

Figure 9. Top and center layer of tremulant

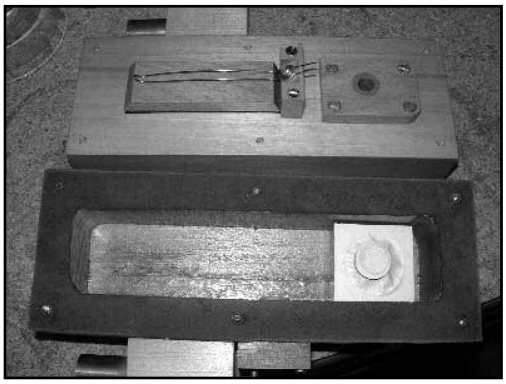

Figure 10. Center and bottom layer of tremulant.

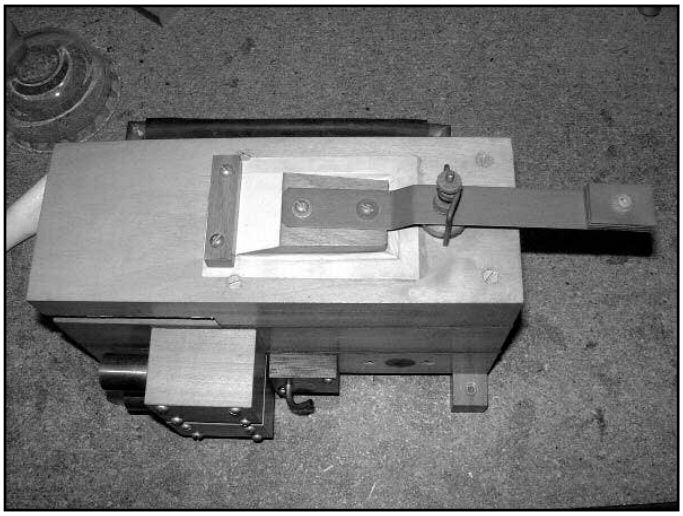

Figure 11. Top view of tremulant showing hinged weighted arm.

pouch from the top layer. The top layer also has the valve that turns the supply to the pouch on and off. The tremulant goes into operation when a pressure signal comes from the register box. In my case, a vacuum signal, through an extra valve. This causes the large pouch in the top layer to inflate (**Figure 9**), and opens the pallet in the center layer. The pallet (**Figure 10**) allows air from the bottom layer into the rectangular pouch in the top layer. This rectangular pouch has a sort of hinged lifter that is attached to a weighted arm (**Figure 11**), and connected to a double disk valve. As the disk valve assembly rises, it cuts off the supply to the large pouch in the top layer, and allows the

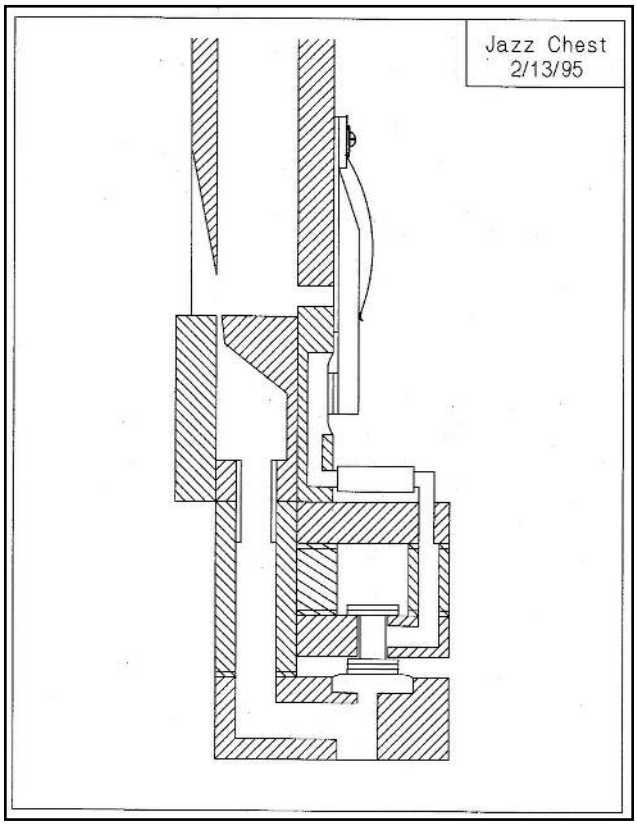

Figure 12. Cross sectional view of jazz chest and one jazz flute.

jazz chest to vent out of the top disk. The pallet closes, the arm falls back down, and the process starts all over again.

The jazz chest (**Figure 12**) receives the modulated air when the tremulant is on. There is one valve in the chest for each pipe in the rank. **Figure 13** shows some of the valves installed in the bottom board of the chest with a few of the valves in place, and some of the fluted valve stems awaiting their valves to be glued in place. The valve is moved by a pouch, which is inflated by the same air that blows the pipe when in play. **Figure 14** shows the pouch board. **Figure 15** shows the nearly finished pouch board, with some of the lifter

Figure 13. Bottom board of jazz chest with a few valves installed.

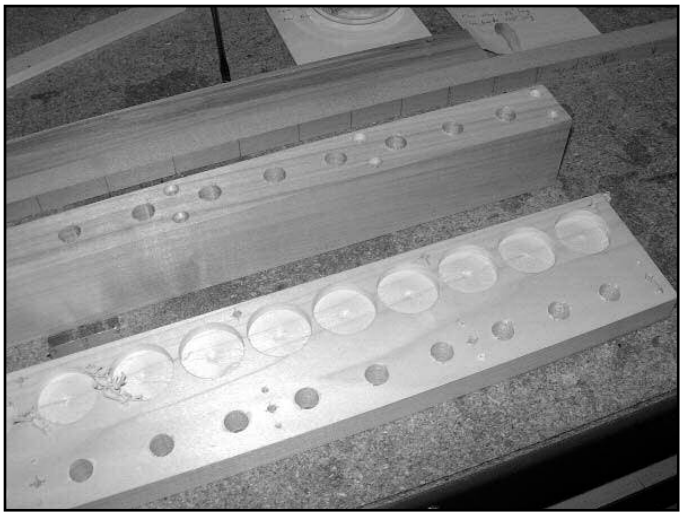

Figure 14. Unfinished pouch board and toe board.

Figure 15. Nearly finished pouch board with some of the lifter disks in place.

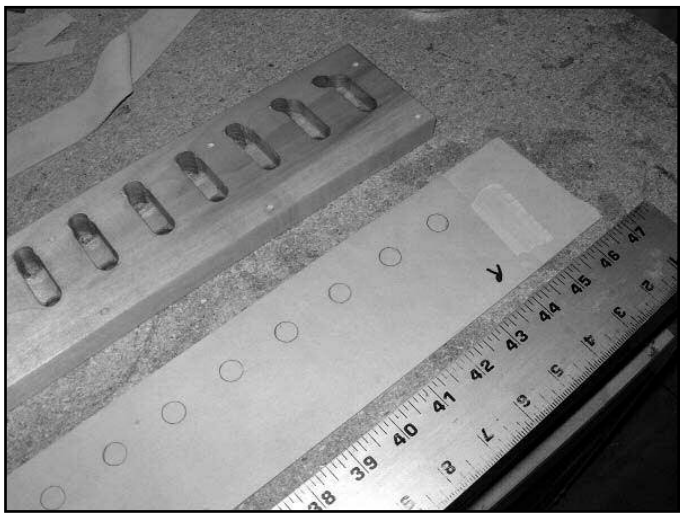

Figure 16. Grooves connecting pipe valve to pouch.

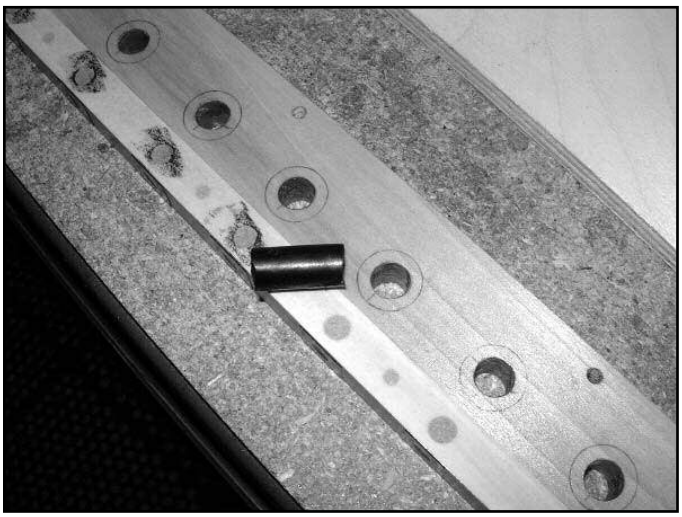

Figure 17. Transfer of hole positions to a strip of paper with a black crayon.

disks in place. In my drawing, the pouch that moves the valve is one inch in diameter, I later increased this to 1¼" inch diameter. The center to center spacing of the small pipes is closer than the center to center spacing of the pouches. This forced the connecting groove that goes between the pipe valve delivery port, and the jazz chest pouch to not always be a straight line, especially at the ends of the chest (**Figure 16**).

There are many gaskets in this assembly that have passages for air that pass through them. Some of these gaskets should have the holes cut in them before they are glued in place. **Figures 17 & 18** show the transfer of the hole positions to the gasket. A piece of paper the same size as the gasket is taped in place, and the holes are marked by rubbing a black crayon on its side over the hole to be transferred. The marked paper is positioned over the gasket material, and a tube punch is used to cut through both layers. The result can be very accurate, and avoids having to accidentally cut into the wood behind a glued gasket. Some of the holes can be cut after the gasket is glued, if the holes go all the way through the board or chest. An extra long tube punch works well for this, or simply redrilling the holes through the gasket and into a piece of scrap.

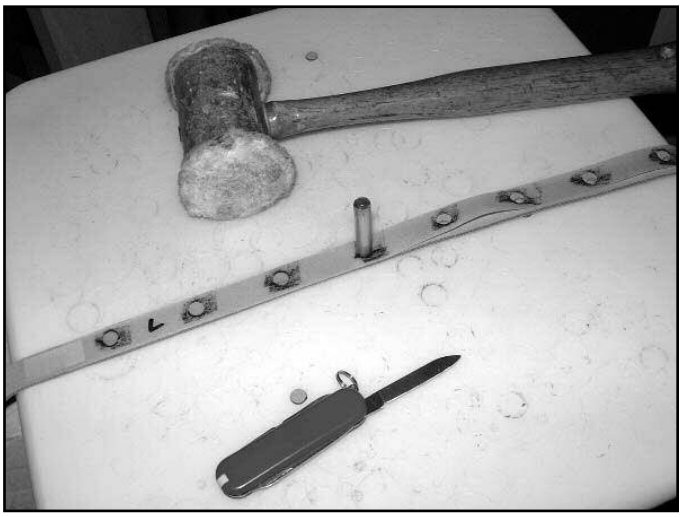

Figure 18. Punching through the paper transfer strip and gasket.

Figure 19 shows a jazz flute and a brass piccolo with new toes being installed. Before the glue on the toe is allowed to set, the pipe is squared up with the chest, and the glue allowed to dry with the pipe in position. This allows pipes to be easily removed and replaced with assurance of always being straight on the chest. When the pipe plays, the pouch is inflated, allowing the modulated air to go from the jazz chest into the back side of the pipe. The pouch on the back side of the pipe inflates, and pushes on the pallet, opening the hole, causing the pitch of the pipe to change.

Figure 19. Installation of new toes and squaring pipes to chest.

Photos: Author

David Wasson is becoming a frequent contributor of high quality techanical articles for the *Carousel Organ*. Those COAA members that attend mid-summer rallies are familiar with David's truck-mounted player organ. David arranges and punches all the music for the organ.