

**From the Workbench
of Allen Miller . . .**



Wurlitzer Chest Internal Leaks . . . or How Come The Tibia Tremulant Affects The Trumpet?

*Quite often,
fixing one problem
can cause another
to become obvious!*

There is a little known winding problem associated with Wurlitzer multiple rank chests due to their construction. The problem is leaking of wind from one chest section to the next. It is manifested in two ways. The most obvious is the tendency for one rank to be affected by the tremulant on its neighbor, which is usually only noticed when one of the tremulants is off and the other on. The second manifestation is a bit more obscure, and only happens when the tremulants are off and the wind system is tight (no air leaks.) In this case, the pressure on the lower pressure chest slowly increases, sometimes all the way to the pressure of the neighboring higher pressure chest.

Take a common situation of a four-rank Wurlitzer Solo chest for a Kinura, Tuba Horn, Tibia, and Vox Humana. Here is one chest with possibly four wind systems (four regulators and tremulants.) The construction of the chest is based upon a rim having two sides and two ends, with three partitions between. The chest ends are grooved and the partitions tenoned for location accuracy and mechanical strength. The tenons or joints between chest sections are usually glued which keeps the wind supplies separate.

But, what about a Main chest having a Flute, Violin, Celeste, Open, and Clarinet? This chest would have had only one regulator originally, and you will usually find that the joints between the chest sections are NOT glued!

In addition, a wood bar runs across the center of the top and bottom for additional stability and so that the bottom boards can be made in two sections. These wood bars are halved into the partitions, and this joint is often either poorly glued or not glued at all.

If the entire chest is on the same pressure and regulator, the slight leakage between sections presents no problem. However, consider the situation created in a common three-rank Solo chest having a style D Trumpet next to a 10" pressure Tibia. If the Trumpet is given a separate regulator and tremulant, it will usually suffer from the Tibia tremulant bleeding through and disturbing the Trumpet wind.

Even worse, what if ranks have been moved around in an expansion project and we now have a Vox on what was a Clarinet or Kinura chest? For discussion, let's say we have wound up with the Vox next to the Tibia, which was not the original case.

If the tremulant on the Vox is off and there are no other leaks, the air slowly bleeds from the Tibia into the Vox. As the Vox gets more air pressure, the Vox regulator rises, eventually closing its intake valves. Higher pressure from the Tibia continues to bleed through and the Vox regulator rises even further, but otherwise does nothing. The pressure on the Vox thus rises above the set 6" value. This is further complicated by the fact that regulator cone valves and pallets do not close absolutely air tight, so there is also some static pressure leakage into the Vox.

Well, you might say, I usually play with the tremulants on, so there really isn't a problem. Other than one tremulant affecting another and sounding like a singer with regular hiccups, you could probably live with the problem . . . until you start to tune. On the chests where the pressure is building up, flue ranks like the Tibia use so much air that merely playing a pipe drops the pressure to normal, until you get up to the top notes. You will end up tuning them with the pressure higher than normal, so they will be flat when you play them with other notes or with the tremulant on.

The problem is worse on the Vox, because reed pipes do not use much wind, and thus will not bleed off the extra pressure. The end result is that even though you have tuned the Vox, it will go considerably flat when you turn the tremulant on.

I won't even get into the crazy problems you encounter trying to adjust two tremulants which are affecting each other.

As you can guess, in modernizations of theatre organs, the musical consideration is to break up the organ into more wind systems with more tremulants to improve the ensemble. A six-rank chest which was just fine when all the ranks tremmed together will suddenly have what seems like regulator problems when you divide up the wind system.

Fortunately, there are solutions. The obvious is to glue the joints. If you are rebuilding the chest, this is simple. At this point in time, all original leather, including packing or gasket leathers have deteriorated beyond useful resilience. If you re-leather a chest without replacing pallet valve leathers, primary valves, felts, and the packing leather, you are just kidding yourself and wasting a lot of time and money. So, if you rebuild the chest, this means stripping it down to its carcass, or the basic wood frame. You don't have to disassemble the chest any further than this, but you will find it easiest to disconnect it from wind lines and stand it on end or on edge. In either position, you can flow glue into both sides of the joint either with a brush or with a plastic bottle with a "dunce cap" top (such as a mustard bottle.) This will even work with hot glue if you keep the bottle hot. In this application, I prefer to use PVC-E, which remains somewhat flexible and will not later crack and leak again.

Ideally, you want to seal both sides of the joints. If the chest is already in place, and has been releathered, it can be sealed in place. Doing this is a bit more miserable a job, however. Sealing the side having the higher pressure will work, and only sealing the joints on the partition opposite the pneumatics will probably do in most cases, although it is not the ideal solution. You can work the glue into the joint with a brush. It will probably want to run down, so you will have to use several light coats, letting the glue dry in between. You can cut leather or

rubber cloth strips and glue them over the joint. This is not easy, either, due to the limited working space inside an assembled chest. The end result may not look very pretty. Go for function. Obviously, do not slop glue all over everything, including pneumatics.

An alternative fix is to run a bead of silicone rubber along the joint. If you do this, use the tapered nozzle which comes with the tube and run a small bead, then "smear" it into a fillet by running a wet finger along the joint. Remove the excess rubber. Gobs of rubber won't do, and keep it off the pneumatics.

There is another possible solution, at least to the pressure build-up problem. Since the leaks are small, leakage in the wind system will tend to cancel this out. If your installation hisses, you probably don't have this problem at all. If you have sealed all the leaks to get a quiet installation, you can create a controlled leak or bleed in the system. Boring a 3/8" hole somewhere in the wind system will usually work. This should have a chamfered edge (countersunk) and be lined with felt to reduce noise. Then cover the hole with a muffler, or tube the air to some remote place. Don't be tempted to use several small holes, as they make more noise than a single large hole.

If the problem is only noticed when tuning the Vox, there is another quick solution if your regulator has a safety relief valve. Simply depress the valve slightly and insert something to create a slight leak while you are tuning. This wind bleeding solution will not cure interaction between adjacent tremulants, however. The only solution for that is to seal the chests from each other.

Should you encounter this situation in other than Wurlitzer chests, it is highly unlikely that this is the problem, so look into your wind manifold for the rest of the winding system for places where air could leak from one supply to the next.

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