TOWARD MORE EFFECTIVE TREMOLOS

by E. S. "Tote" Pratt

As any theatre organ technician, whether professional or amateur, well knows, the proper setting of trems as to speed, depth, beat and exhaust is a matter of balance, adjustments *ad infinitum* and patience.

The relationship between the regulator and the trem is critical. Wurlitzer regulators utilize three input valves: A central cone valve attached to the top board by a threaded rod which opens with any air demands; a small flap valve which is activated by a dowel when the top of the regulator falls 1/2" from maximum opening; and a large flap valve which opens when the dowel is depressed after the regulator falls an additional 1/2", compensating for air usage as required to keep the pressure stable. A trem merely robs air in measured cycles, causing the regulator to compensate after exhaust from the trem occurs. The valves react to the preset trem beat as the regulator falls and rebounds.

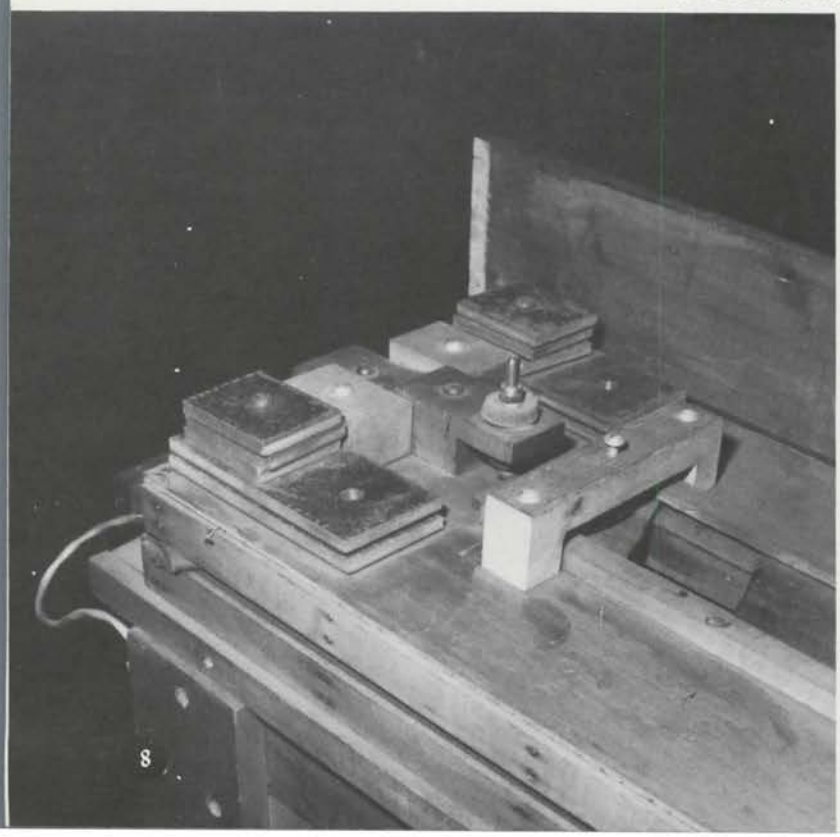
With the Tibia's requirements for a deep, high air exhaust, all three valves should open, causing a maximum collapse and rebound cycle to provide the optimum "sobbing" Tibia tremulation. Conversely, as an example, in the case of strings and Vox Humanas, the trems are set to exhaust less air with a faster, shallower beat; only the cone valve and perhaps the small flap valve would be involved. Felt washers on the dowel guide pins provide small adjustments to the dowel length before opening valves to achieve the desired tremulation.

The nominal regulator height when inflated is approximately 6" from the top of the regulator to the bottom, which is controlled by the position of the cone valve. The four corners of the regulator top board have to be the same distance from the bottom board if a good trem is to be assured. This balance should be achieved without changing the pressure, by adding or subtracting "S" hooks to the regulator springs.

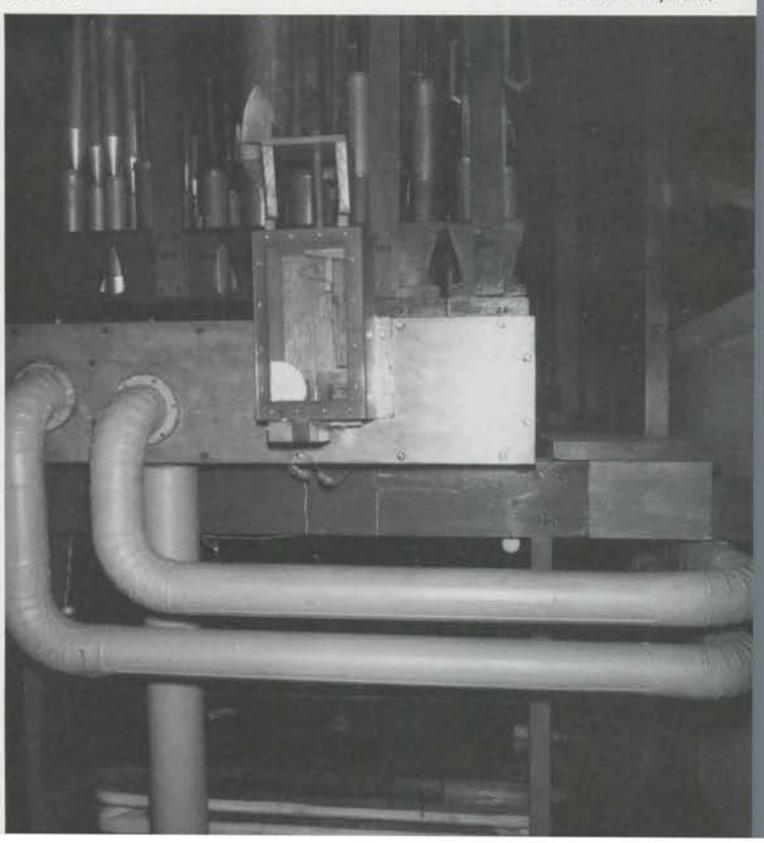
The tremolo itself is a complex of inter-relating adjustments. The air input orifice setting and the output-setting top slide on the trem must have a direct relationship to each other, otherwise the trem will "choke" out. This latter adjustment generally controls the speed of beat. The depth of the beat (air exhaust) is contolled by the rise of the trem, which in turn is determined by the length of the connecting rod between the top of the trem and the large valve below. The total rise should be between 3/4" and 1-1/4 to 1-1/2". The longer the travel the more air is exhausted. Any change must be compensated for by further adjustments in the input and output valves on the trem to get the desired beat. Substantial weights are highly recommended on trems to improve this.

You will note that weights on regulators are not covered in this instance, because on the OVC-ATOS 3/28 Emery Wurlitzer in Cincinnati no weights are used on any regulators. Substituted are large weights (2 × 4 × 1/4 cold rolled steel) on the trems, eight for Tibias, two, four or six for other ranks — except for Voxes using no weights — mounted on each side of the lift ear in the front of the top board. Use of these weights provides reliable

Weighted trem showing two 2 × 4 × ¼ weights plus equivalent small weights mounted close to the head end to get trem beat desired (fast Tibia on 15" pressure), shown with part of muffler box removed. *(Bob Lodder photo)*



Solo brass chest showing three of the elbows on the Vox and Solo trem lines, and the new 4" windline replacing the original large rectangular trunk. (Also shows full-scale display action unit.) *(Bob Lodder photo)*



quick starts when the trem tab is depressed, and deep, easily adjustable beats without sacrificing steady wind when the trems are off. After all, regulators are designed to provide absolutely steady wind at the preset pressure and to rebound quickly after increased air demand has ceased. Weights on regulators virtually destroy the regulator's purpose. The weighted trems impart all the depth, sensitivity and lushness needed for all the ranks.

At the Emery we have done considerable research on trem problems. Here are the results:

1. Only hard lines (metal, soldered) used on all chest and trem lines, no flex runs:
2. No weights on regulators, only on trems:
3. Long wind lines to trems, 3" unobstructed, 18' to 25' long (trems are in the basement under the chambers at Emery);
4. Elbows, minimum of five in each line;
5. Reduce manual chest feed line sizes (selective, see below).

Long wind lines and elbows to trems provide friction in the line to cushion reverses caused by trem exhaust/shut-off cycles, preventing "bubbles," uneven trem action and doubling of the beat at regulators, and making adjustment of the trems simpler. We have two Solo Tibia trems — fast and slow, using the same trem wind line — both easily adjustable at the trems with no regulator adjustments required.

Wurlitzer used rectangular wood wind feed lines to chests where four or five ranks of the same pressure were on a common chest. The first step for a better trem is to replace the rectangular wind line with a 4" metal line. The trunk formerly used was 2-1/4" × 18" I.D., or 40 square inches. The replacement 4" line is 12 square inches, or about one fourth of the original volume of air. After the switchover, we checked the wind pressure using all the affected ranks and leaned on the bottom octave to rob air. The notes played did not fade and the pressure drop was negligible, showing that there was plenty of air volume with the new piping and reduced line size. Note that our 16' Bourdon and offsets are fed by a separate untremmed regulator. The five ranks involved are 8' Open Diapason (GG up), Flute, VDO, VDO Celeste and Clarinet (10"wind). The resultant tremulant was beautiful and most effective even with dissimilar rank characteristics.

We performed similar surgery on the Solo brass chest (four ranks), with the same significant results. These ranks are Brass Trumpet, Brass Sax, Quintadena and Oboe Horn — 61 pipes each. Both regulators involved in this modification are standard 32" × 35" Wurlitzer units.

This proves the maxim that oversize wind lines are really an extension of the regulator's steady wind parameters and make the ranks hard to tremulate. In the original Albee installation three other ranks, on this same Solo regulator and trem, were double-decked with a long 6" feed line — a Kinura, Solo String and Orchestral Oboe — all low demand ranks. By changing this to a 4" line we reduced the air volume 50% . The common 3"; trem line was broken halfway between the two chests with a tee to the trem, rather than coming out of the four-rank chest directly to the trem. This again provided a delightful smooth theatrical tremulant, equally effective on all seven ranks. The 3" (7 sq. in.) trem line was hard put to shake the wind in the former rectangular wind trunk (52 sq. in.) configuration, as in the Solo.

Allen Miller, in his most interesting and competent article in THEATRE ORGAN (September/October 1984), touched on the problem of oversize wind lines, and Lance Johnson, whose excellent column will be sorely missed, has several times advocated the elimination of weights on regulators, so there is ample professional empirical support for these changes.

In both chambers, new chest end windboxes were made by Art Havlovic, 1" deeper than the original to permit the 4" wind line to be attached to the bottom for a shorter run. Long runs and excess elbows are detrimental when used on feed lines. Joe Deifel fabricated the 4" hard lines. Bill Ahlert and Art Kessler did the disassembly and assembly to perfection.

All of our 12 trems now impart a variety of beautiful, lush, balanced rhythm and beat, truly orchestral in nature, which was the intent of the "unit orchestra" concept.

Some installations, such as pizza parlors, seem to favor a definitive trem, with a deep, heavy drop and a slower rebound, using large weights on regulators, and shorter trem lines. In many cases where this is used, the regulators cannot perform naturally to maintain set pressures.

We have found that our trems have been acclaimed by visiting organists, by our own chapter staff and by patrons of our weekend movies. Of course, no trem settings are all things to all people. There are as many opinions as there are organists. We have done what we believe is advantageous for a good theatre organ sound. To attest to the results of this, Grant Whitcomb, in his review of the 1984 Convention Afterglow at Emery, said in part ". . . the organ . . . with probably the best rate of tremulation . . . of the convention . . . ."

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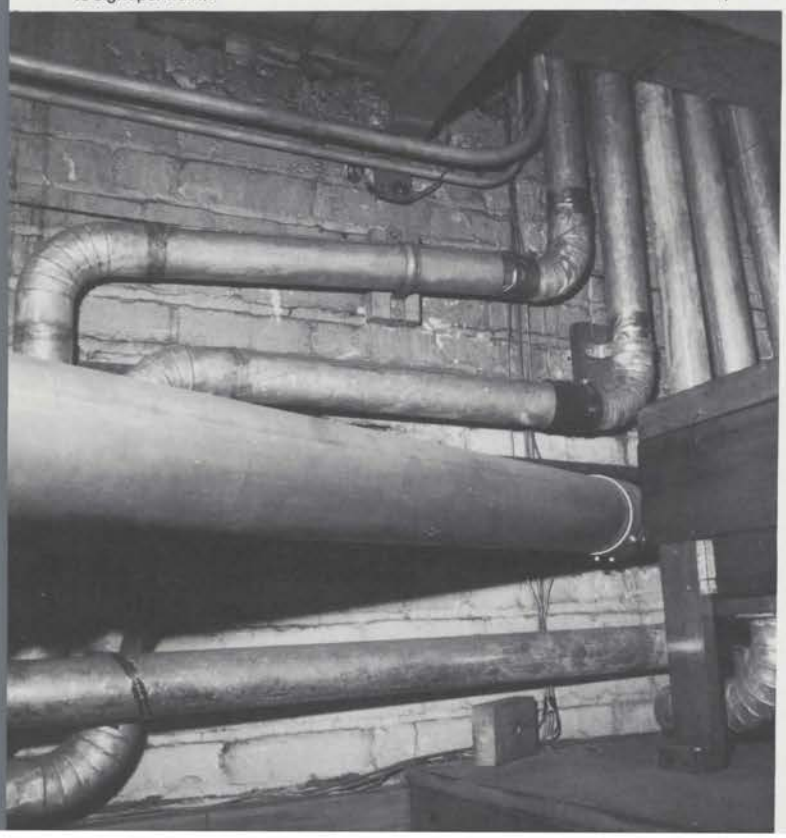
Basement section of trem lines at the Emery Theatre, showing additional elbows used (up to eight per trem). *(Bob Lodder photo)*



A method of adding elbows on a chamber trem installation. *(Bob Lodder photo)*