



# PIANO TECHNICIANS Journal

*Official Publication of the Piano Technicians Guild*

September 1997

Vol. 40 • #9

## *Inside:*

- *The Technician's Guide to Grand Hammer Installation*
- *Q&A Special*
- *Strictly Thirds Temperament*
- *The 30-Ton Soundboard Press, Part II*
- *Popular Piano Technology*
- *The Tuner's Life, TT&T, Q&A & Much More*



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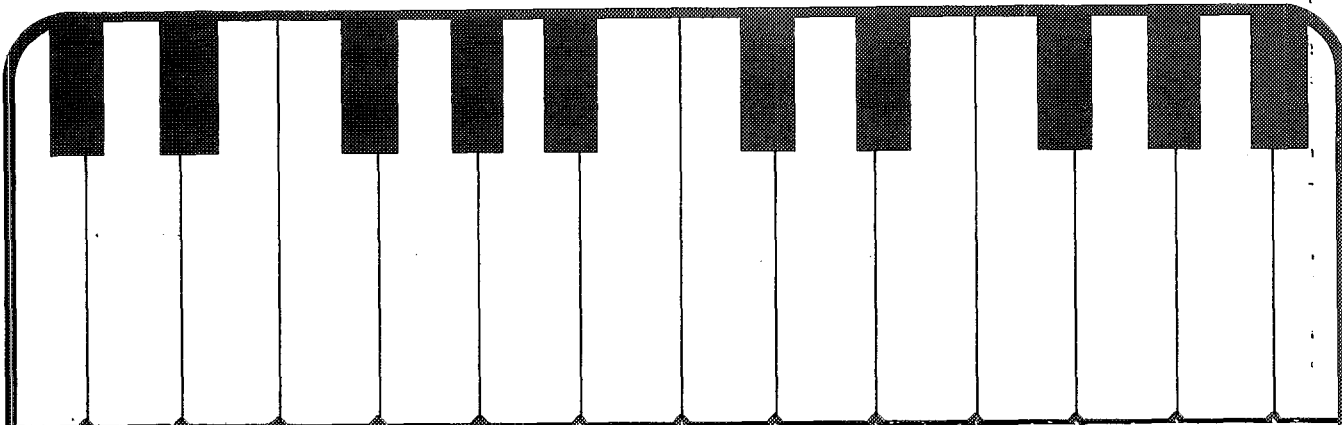
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David Hanzlick, CAE  
Publisher/Executive Director

Steve Brady, RPT  
Editor

Jim Coleman Sr., RPT  
Del Fandrich, RPT  
Newton Hunt, RPT  
Contributing Editors

Joe Zeman  
Director of Communications

Sandy Roady  
Director of Member Services

Jerri Dowdy  
Assistant to the Executive Director

Catherine Wilane  
Director of Finance

Midge Sheldon  
Advertising

Home Office  
Phone: 816-753-7747  
FAX: 816-531-0070  
E-Mail: ptg@ptg.org

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205 McCraw Street • Seattle, WA 98109

Fax: 1-206-285-7610 • E-Mail: sbrady@u.washington.edu.

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## Editorial Perspective

### A Worthwhile Textbook

By Steve Brady, RPT  
*Journal* Editor

Dr. Gearman's book, *Piano Tuning, Regulating and Repairing*, first appeared in 1988 and has undergone two revisions since then, in 1991 and 1995. This means that the current edition is still up-to-date. Gearman, an Associate member of PTG, worked as a music educator and piano technician from the 1950s to 1977

and now works as a piano technician in both Florida and Minnesota.

The present volume devotes a whole section specifically to tuning, with chapters on tuning the first note, using tuning tools, tuning checks (both beginning and intermediate), fine tuning, pitch alterations, and achieving a stable tuning. Two temperament methods are also given, one for beginning tuners

and one for intermediate. The tuning section concludes with brief chapters on historical temperaments and electronic tuning aids.

The middle of the book consists of sections on common in-home repairs, more extensive repairs such as hammer hanging, keytop replacement, and plastic elbow replacement and regulation of both vertical and grand actions. Also included are sections on tone regulation and business practices, plus a number of appendices on adhesives, piano supply companies and tool and supply lists. The book concludes with an ample bibliography and an index.


The book was conceived as a comprehensive, basic text for classes in tuning, regulating and repairing pianos as well as "a ready reference for troubleshooting problems and for review." It is, to this reader, at least as comprehensive as any other book on the subject. In addition to containing a staggering amount of information, the organization of the material into 87 short chapters makes the information accessible in a special way and readily lends itself to use in classes. Many of the chapters incorporate a uniform format: background information, tools needed, repair procedure — most chapters also include a select bibliography. All these features, plus the large page format and

a binding which allows the book to lay open fairly easily, make the book especially useful.

On the downside, Dr. Gearman's book has all the earmarks of a self-published work (which, indeed, it is); a

number of the pages are simply photocopied from other sources and stuck in with their own unique type-faces and quirks. A number of

pages, including one facing pair, are completely blank. Depending on their provenance, the book's illustrations are inconsistent, ranging from clear, nicely done drawings and diagrams to photocopies of photographs (the resulting images being quite poor), to crude drawings which get the idea across — but not a bit more. One might make a case that Gearman's book contains more information or better documentation than the standard basic text on piano technology, *Piano Servicing, Tuning, and Rebuilding*, by Arthur Reblitz, but at a mere \$10 more (and with 42 more pages), the Reblitz volume is vastly more appealing, mainly due to the higher quality of its illustrations. While Gearman's research appears to be excellent and exhaustive, the visual presentation in many cases dilutes an otherwise fine effort.

In any event, I feel that the Gearman book is well worth its price for the reasons mentioned above. In addition, its thrust is different from that of many similar texts in that it doesn't attempt to cover heavy rebuilding, allowing more space and detail to be given to other topics such as in-home repairs. This book really deserves more professional publication; perhaps it would be a good project for collaboration between Dr. Gearman and the PTG Foundation. 



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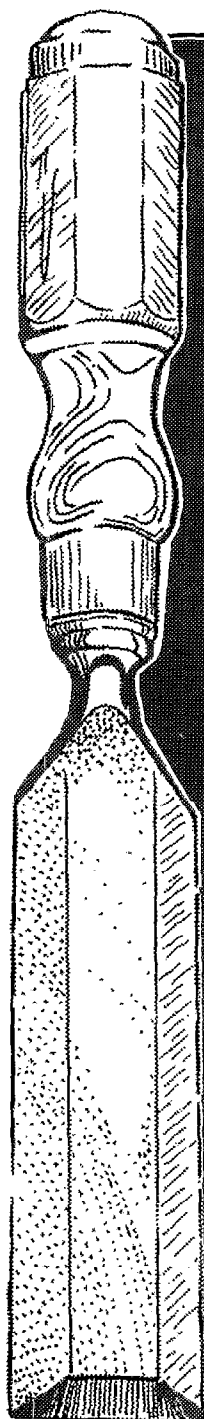
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## FEATURES

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## COVER ART

*This month's cover shows the use of a simple metal jig for checking rake angle during the hammer hanging operation. For more information see RPT John Hartman's article, "The Technician's Guide to Grand Hammer Installation," beginning on Page 17.*

# PIANO TECHNICIANS Journal

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## Piano Technicians Guild Board of Directors

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*President*

P.O. Box 386 • Oxon Hill, MD 20745

(301) 567-2162

E-Mail — DQEV60A@prodigy.com

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(701) 241-7066

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(301) 441-3555

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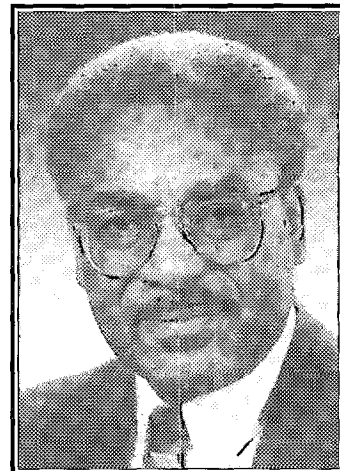
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Did you ever observe ants dragging a little sliver of a scrap intent upon moving that morsel to a distant location? If you have, you will surely have noticed their total dedication to the task at hand. If you attempted to disrupt them, I'm sure it wasn't long before they were immediately back at the task they were pursuing before you interrupted their progress.

If ants are not your fancy, let's talk about kids. When a kid gets his or her

mind set on something there is just no way you, as a parent, are going to get their mind off of it. A good example would be the typical scenario that takes place if there is a movie your child wants to see. You as the parent will definitely know about this movie because this kid will give you no slack in telling you about the movie, who plays in the movie, how exciting it is, etc. You will hear some type of statement associated with this movie with virtually every bit of verbiage emanating from this youngster. Does this sound familiar to any of you?

The point that I am making is this: September is National Piano Month. Year 2000 is the 300th anniversary of the invention of the piano. Both of these events are extremely important to us as piano technicians and we need to pass this information on to our clients. If each person reading this *Journal* would make the same type of commitment the ants have regarding the morsel they are busily working to relocate or the same type of drive the kids have relative to getting permission to see a particular movie, then the information we desire our clients to have will definitely be shared.

The question may be asked: "How does this relate to me as a piano technician?" That is a fair question. As a technician, it is important for you to not only know your craft, but also the background information surrounding your craft and all the supporting materials that serve to extend your general depth of knowledge, which is beneficial to you when you talk to and advise your clients. When your enthusiasm is high, relative to the significance of this information, the energy you display impacts

your client and in turn they are energized and their interests and enthusiasm will be increased.

It is this intense interest and fascination with the piano and its development over the years that positions the advent of the 300th anniversary as a truly significant happening. Let's face it, marking the birth of the musical instrument that has dominated the musical and cultural life at all levels is what we are talking about. In the field this is perhaps our most important short-term organizational goal. What better time to make this impact on our clientele than during National Piano Month?

Therefore I am asking all of you to join in and participate in doing the following:

Immediately include in any and all dialogue you have with your clients some mention of National Piano Month and Piano 300.

Since January, the *Piano Technicians Journal* and various *Updates* have a number of articles containing wonderfully beneficial general information relative to the history of the piano, new books and articles about manufacturers as well as the history of tuning. A review of *Journals* from earlier this year, and prior issues if you desire to research them, include more information than any of us can share with our clients considering the limited time most of us have for such interaction.

Remember ... the key to this seemingly small, but at the same time so exceedingly huge, project is our individual and enthusiastic involvement.

Please join in this exercise ... you will be amazed at the results a small amount of dedication will yield. ■



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*Top Two Prize Winners selected Kawai.*

The 9th Van Cliburn International  
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*First Prize Winner selected Kawai.*



*It's becoming a familiar refrain.*



## Presidential Citations

During the course of an association year there are many, many truly wonderful things our members are involved with which are really noteworthy. These efforts are undertaken not for the purpose of gaining attention although it would be fantastic if each and every occurrence could be brought to the attention of our entire membership. Somehow that is not practical or realistic.

Sometimes, however, there are actions performed by members that are so spectacular they need to be singled out. Such is the case with the three people selected this year as deserving of a presidential citation. Normally these citations are read at the time they are presented and only those present have the privilege of hearing what was said in the recipients behalf.

This year the recipients were personally presented to the assembly but the citations were not read. Now each of you have the opportunity to enjoy these citations and believe me each recipient more than deserves this complete recognition.

**Ronald L. Berry, RPT**

The establishment of Prairienet without question has made it possible for the Piano Technicians Guild to be on the cutting edge of the ever-advancing electronic communication technology.

The vision exhibited by yourself which resulted with what we today know as "ptg!" has certainly broadened the ability of anyone who uses the medium to enjoy its benefits.

You were also instrumental in the development of the web site which PTG enjoys and will forever be grateful.

It is actions such as these which you have initiated over the years and so freely shared with our organization which moves me to recognize you in this way.

It is an honor for me as President of the Piano Technicians Guild to present this Citation.

**Andrew M. Rudoff**

It is a fact of life that electronic communication is here to stay. Your dedication and tireless energy as a member of the Electronic Communication Committee has been no less than spectacular.

Because of your efforts the Piano Technicians Guild now has its own server as we step further into cyberspace. Although our entire membership is not yet involved with the Internet, I am reminded of the fact that not too many years ago it was not uncommon to pick up the telephone and discover someone was using the party line which prohibited your use of the phone at that time. The telephone was not always as efficient as it is today. Therefore, your

efforts now put us on track for the future . . . whatever the future may bring.

Your prodigious labors for the benefit of all of our present Internet users and all of those who will become a part of this communications medium in the future leads me to this recognition.

It is indeed a pleasure for me as President of the Piano Technicians Guild to present this Citation.

**David G. Hughes, RPT**

For more than a year now you have been intricately involved in perhaps the most far-reaching action every regarding our Code of Ethics and professional standards within our ranks.

The time you took away from your work in order to prepare the necessary trail in your fight for honest and decent relations between technicians among themselves must not go unnoticed. In addition you have shown that the trust clients, which are the lifeblood of any business, place in us will not only allow our craftsmanship to be displayed but our integrity as well.

You have exemplified in an extraordinary manner the right of a member to be heard and to, as it were, "have their day in court." You have maintained conduct which reflects the ethics and attitudes which are contained in the Bylaws of the Piano Technicians Guild and as such they are the very core of what we as an organization are and continually strive to be.

Your persistence and fortitude have not only served you well but are indicative of the precepts and fundamentals upon which this organization was founded.

It is with great pleasure and marked significance that I present to you this Citation as a model member on this 40th Anniversary of the Piano Technicians Guild.

— Marshall B. Hawkins, RPT  
President

## To the Members of PTG:

It was a very happy day in our lives, Saturday, July 26, 1997, when with the help of so many we were able to be at the PTG convention and again see so many friends who have remained so dear to us over the years. Many thanks to Warren and his lovely wife, Helen, Steinway, and the members of PTG who made it possible for us to visit since the PTG convention was so close to our home, and this was the only chance we would have to travel any distance to see our PTG family. It speaks well for the membership of PTG in how they made Warren and Helen, who knew no one there, feel so comfortable and at home in the Exhibit Hall.

Many thanks to the PTG Foundation in their sale of Fred's tools. He had once said maybe they could get \$200. We understand the total now is \$1,389 and still counting. It really is heart warming to see such a real interest in the tools and the memories associated with the tools.

Thanks again to all who made that day so special to us.

— Mimi and Fred Drasche

## Bechstein Pinblocks

Norm Albers made some interesting comments and observations in his letter (June 1997 *PTJ*) regarding the Bechstein series. The load-supporting systems in pianos are certainly very complex and, when strung, contain many force components not discussed in the articles. My intent was to focus on only part of the system and discuss the forces which could cause the characteristic Bechstein cracking.

Quoting Albers: "His [my] hypothesis depends on a gap at the pinblock step allowing a crack, but I don't see the crack allowing downward movement to close the gap. The iron is not flexible,

*Continued on Page 15*



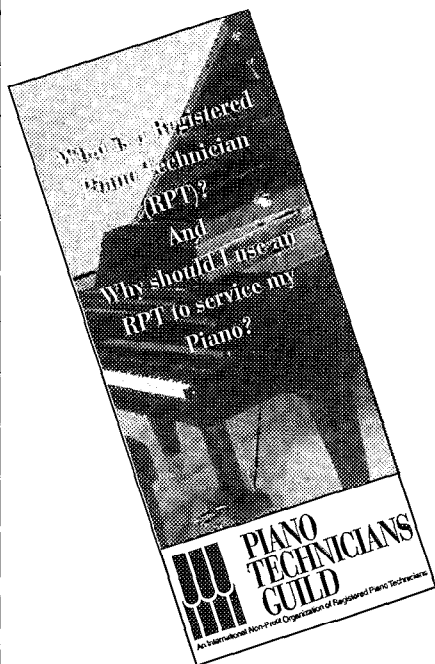


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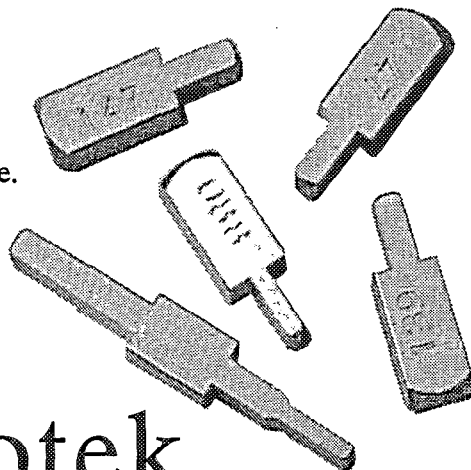
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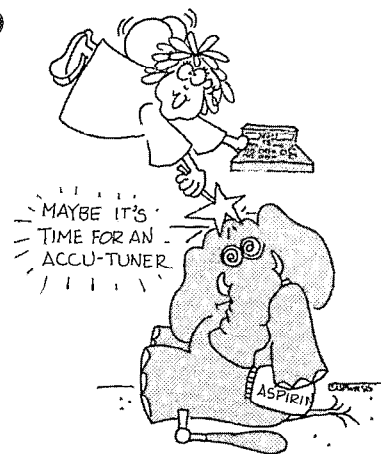
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# Tips, Tools & Techniques

## TT&T

### A Handy Homemade Voicing Tool

#### Materials:

- 3/4" wide rubber mute
- Voicing needle
- Grand damper socket with two screws

#### Tools:

- Ruler
- Two small pieces of scrap wood
- Drill with 1/16" and 11/64" bits
- Single-edge razor blade
- Vise-Grip® pliers
- Small flat-blade screwdriver

#### Instructions:

1. Using two small pieces of scrap wood to support the sides of the rubber mute, drill a 1/16" pilot and then an 11/64" hole through the width of the mute, 1 3/4" from the tip.
2. Cut the fat end of the mute off 2 1/8" from the tip.
3. Push the damper socket into the 11/64" hole so that the eye lines up with the length of the mute and is centered inside.
4. With a pair of Vise-Grips, push the voicing needle through the center of the fat end of the mute until you can see the tip inside the damper socket. Then push the needle 1/4" deeper.
5. Decide how long you want the needle to be when you are finished. Clamp the Vise-Grips so you can see that length between the jaws and the end of the mute. Pull the needle from the mute, place it between two pieces of scrap wood, and break it at the jaws of the pliers.
6. Mark a 1/16" square around the needle hole and cut the mute so that it tapers from the center of the 11/64" hole to the 1/16" square.
7. Push the needle, blunt end first, into its hole. Thread the screws into both ends of the damper socket and alternately tighten them until they hold the needle very firmly.
8. Cut a 1/16" x 1/16" x 1/2" piece of rubber from the scraps to place over the needle when in storage.

— Mitch Staples, RPT  
Dublin, Ohio

Reprinted from Alpha Bits, newsletter of the Washington, DC Chapter.

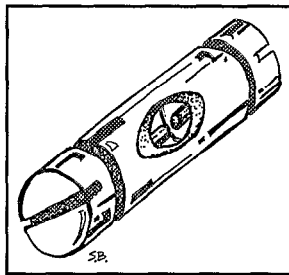
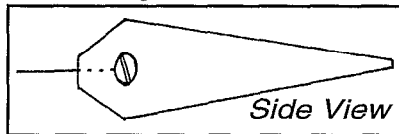


Figure 1



Side View

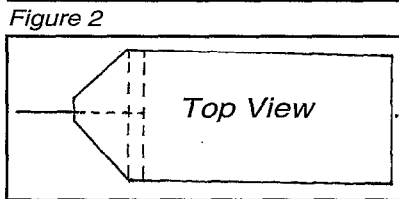


Figure 3

Top View

## TT&T

### Double-Sided Tape

Several years ago I attended a mini-technical where someone shared a tip about using double-sided carpet tape for attaching sandpaper to the paddle. It works great!

Here is another use for that wonderful tape. After the earthquake, I had to repair a lot of grand lid hinges and install lid catchers (APSCO part #3055). To locate the position, first install the "female" part to the rim, then add carpet tape to the "male" part and assemble it with the part on the rim. Close the lid and apply slight pressure on the male part. It will stick to the underside of the lid. Then mark, drill holes, and put in the screws. It's done, no guess work!

The same principle works to attach locks on grands or verticals and to locate the exact position of the lock latch under the keybed.

— Isaac Sadigursky, RPT  
Westlake Village, CA

Reprinted from In Tune, newsletter of the Calgary, Alberta Chapter

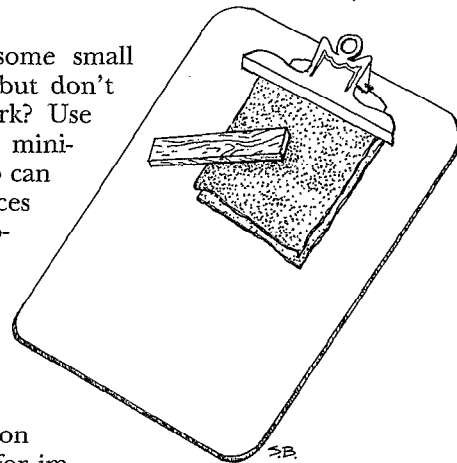
## TT&T

### Clipboard as Workstation

Need to sand some small pieces in the field, but don't have a place to work? Use your clipboard as a mini-workstation. The clip can be used to hold pieces in place for gluing together, and the flat board is ideal for sanding. Hint: place two or three sheets of sandpaper on the clipboard bed to cushion slightly. This allows for imperfections in the board and makes sanding easier as you flip from one grade of paper to the next without removing the paper from the clipboard!

— Bob Bartnik  
Richmond, VA

Reprinted from the Richmond Chapter Update

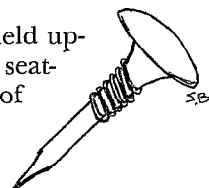


## TT&T

### From Glide to Punch

A Steinway-type keyframe glide stud held upside down makes a handy brass punch for seating strings, etc. Grind the tip to the shape of a screwdriver's tip for this purpose.

— Bruce Fellows, RPT  
Little Valley, New York





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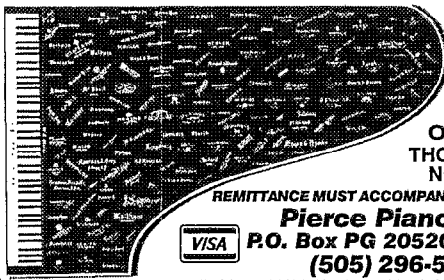
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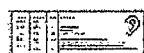
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## Q & A/EDITOR'S ROUNDTABLE

### Q: **Stripped Screwholes in Steinway Hammer Flange Rails**

I've encountered a handful of stripped hammer flange screws on a Steinway model O. Is there any effective method of tightening these up, short of the difficult job of replacing the rail itself?

— Richard Boyington, RPT  
Memphis, TN

**A:** Charles Ball, RPT: I have encountered institutional Steinways with numerous stripped hammer flange screws. I have had excellent results using gap-filling super glue in the hole — just enough to line the threads. Don't forget to shoot the screw with McLube, or you may have a permanent installation! If the first application of the glue does not hold, try a second.

Ed Foote: Depends on what you mean by effective. To some, effective is what gets the instrument out the door. To others, effective means they can sit in the audience of a concert hall, watching some maniac pound out a concerto, and not wonder how big a stink it would be if one of the middle hammer shanks left the rail.

The wooden dowel is the problem here, the uncompromised repair is the replacement of the wooden dowel, but that can be tricky. Replacing the rail, *in toto*, is probably easier, if you can maintain tolerances, and not char the core during soldering.

In situations where the rail had to be repaired in place, I have had long-term success, under heavy use, by doing the following:

Use of a catalytic resin compound such as used in auto body repair. This stuff sets up quite hard, and quick, so you have to have the prep done properly.

1) Open the screw hole up with a drill bit the same diameter as the hole in the brass rail, ( but not through the bottom!). This provides a solid base for the resin.

2) Lubricate the screw and the area around the screw hole.

3) Fill the hole halfway with resin, and insert the screw, aligning it with the two adjacent screws, which should be in their holes without the flanges.

**Now this is the critical part!**

4) The screw in the resin must be farther down in the hole than it will be when the flange is attached!! This allows there to be some clearance on the bottom of the threads, without which, the screw will destroy its threads when it bottoms out simultaneously on the flange and bottom of hole.

5) The resin should be hard as a rock in 1/2 hour, so remove the screw, and with a Dremel™ grinding disk, remove all the protruding resin from the top of the hole. Don't try to cut the excess off with a knife, you will probably crack the glass sleeve you have just so carefully made.

Good luck, and oh, by the way, if the piano is in the shop, and it is a Steinway, and there are numerous stripped holes, go on and replace the rail; even the best repair is a band-aid.

Jeffrey Hickey, RPT: You guys are working way too hard! This common problem can be easily, quickly and painlessly repaired in a few moments. The following repair is permanent, and works on *any* screw repair where massive amounts of wood haven't been removed — especially by other "repairs."

Don't attempt the toothpick repair! The first time you turn the screw you get ground sawdust in the screwhole. This isn't effective in a flange rail repair; that screw must go in and out many times in the life of the piano, and you need a solid repair. I'd be cautious with the epoxy and CA-glue repairs for the same reason. You need a permanent repair that will allow you to get the screw in and out while holding firmly, you need a repair that won't take forever, you need a repair that Steinway would approve of, right?

About 15 years ago, I attended a tech-session at Sherman Clay (the then Steinway dealer) in San Francisco. The technical was to demonstrate the differences between the Hamburg and New York production lines — but the real gem was this repair:

Leather Insert — When a screw is stripped (especially flange screws) you need a quick permanent repair. Cut a thin piece of backcheck leather (or scrap a bit thinner, upright catcher-leather for instance) equal to the depth of the screwhole. It should cover less than 1/2 the *circumference* of the screw-hole (or the hole is too stripped for repair by this method). For a common stripped flange screw you'll need a thin strip about as wide as a thick paper match. Put a thin coat of woodworker's glue on the rough side and force the leather into the hole with an awl (or the wire from a rubber-mute). Use the awl to align the rough side against the wood and establish a spot to insert the screw. Insert the screw slowly — make sure that the leather is not being forced ahead of the screw as you tighten it down. Tighten it only as far as it would normally sit with the flange in there, too. Leave the screw in for 15 or 20 minutes if possible (you *can* leave the screw after the first insert, but I'm more comfortable letting the glue have a chance to dry a bit first), then back it out and replace the flange. Tighten the screw as you normally would. Congratulations, you now have a permanently repaired screwhole. You can trust this repair, and treat such screws with complete confidence. Use it anytime you have a (slightly) enlarged screwhole to fix; flange screws, fallboard screws, cheekblock screws, — even door hinges can be fixed with panache and style. Try it, it works.

As the screw turns into the leather, it forces the leather tight against the inside of the hole, and pushes the screw into the wood on the opposite side. The threads actually burnish the leather, and form threads on its surface, while the screw has a fresh bite on the wood opposing it. I have *never* had this repair fail on flange screws.

The critical factor here is the thickness and width of the leather you are using. I toddled off to a boot-repair shop and gathered several scraps of leather, various thicknesses, for this repair technique. A flange screw needs a thin leather for the repair, while a lyre screw wants a thicker piece. Note that I said, "Half the *circumference* of the screw-hole;" the leather should not cover more than 1/2 the screwhole when complete, and usually only covers a third or less. Scraps of leather that have been skived are tapered from thin to thick, and give you the

*Continued on Page 14*



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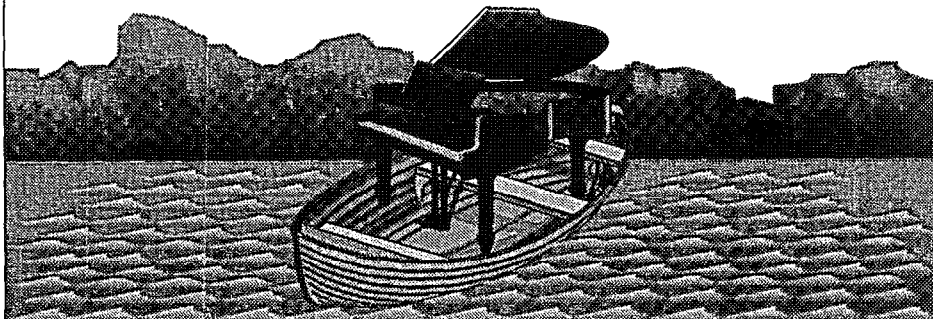
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# Q & A/EDITOR'S ROUNDTABLE

Continued from Page 10

best choice for each repair (rather like the tapered hunks of hammer felt we get in a "scrap" collection from the suppliers). Applying this repair becomes almost automatic. With several holes to repair, you simply cut several identical pieces and do all operations in an 'assembly-line' style.

**John Musselwhite, RPT:** Go to your local bolt and screw supply house and pick up flathead sheet metal screws one size up but the same length.

This was the repair method recommended by Joe Bisceglie 10 years ago and it's always worked for me. It affects the "authenticity" of the instrument slightly, so if you're concerned about that, then plugging (not doweling) the hole and redrilling is another alternative.

**Ben Treuhaft:** If you replace stripped-hole screws with bigger uglier ones, wouldn't that terminally screw the holes? (rebuttal to John's idea about using oversized flathead screws in stripped hammer-rails.)

**Musselwhite:** They are basically the same screws (other than the thickness) that Steinway used for many years, and even the heads are similar in size. While they aren't pretty like the dome-topped nickel-plated screws of the earlier years (or the German-type screws with integral washers), the repair works as long as the wood isn't totally rotten, and it's fast. As you mentioned though, it does introduce the problem of what happens when they get stripped.

Oh, and it's not "my" idea — it was suggested to me by Joe Bisceglie, former senior factory technical manager at Steinway.

I'm definitely not saying this is the right way to fix this, or the best way, it was just a suggestion for a practical and speedy fix when necessary. Unless the instrument has already been altered I prefer using a small tapered leather bolster as has already been discussed.

**Bob Davis, RPT:** There have been some good repairs posted, but don't forget to look into the original reason for the stripped screws. Sometimes it's just over-enthusiastic tightening, but sometimes it's replaced shanks with flanges that are thinner than the originals which cause the screws to bottom out on the nether side of the rail. The technician then strips the screws in a vain attempt to tighten them. Repairing the stripped hole will be wasted effort in this case unless one makes the screw shorter or the flange taller (with a washer).

Also, be careful not to get glue on the cloth — it can leave you with bad traveling and spacing problems. Cut it with a razor between two flanges and lay it out of the way. For instance, take off the shank at the injured hole *and* the one to its right, then cut the cloth against the shank to the left, and lay the cloth to the right.



## Key "Flop" in Small Verticals

There is that annoying tendency for keys of some vertical pianos to be weighted so heavily towards the front that it interferes with repetition (jack doesn't return under butt, lost motion is soaked up by key flop) and sometimes even key return. Is there any solution short of reweighting the keys?"

I'm sure there are cheap practice room pianos someplace that you pros have had to render useful. I've seen jiffy weights

tacked on (sometimes just on the offenders, not all keys!), but of course what goes down must first go up, so that's in the reweighting by adding instead of subtracting category, blegh!

— Jack Lofton, RPT & Audrey Karabinus, RPT  
Seattle, WA



**Barry Heaton (England):** First of all, check the obvious, the jack springs to see if they have not weakened with heavy use.

You can sometimes regulate this problem out. The Langer 80 action is very susceptible to repetition failure. To overcome this problem I re-regulate to the following:

- Set the blow to 44 mm
- Set the let-off to 2 mm
- Set the checking to 12 mm
- Set the depth of touch to 9.5 mm.

You must have firm front rail punchings for this close a tolerance. When regulated, turn the jack stop rail as close to the jacks as possible before it interferes with the jacks.

What you are basically doing is altering the angle of attack at which the jack meets the butt, therefore, with the angle of attack reduced when the jack returns under the butt. There is less leather for the jack to come in contact with, thus reducing friction. Also, you may consider putting some anti-friction material on the key pins. Take a look at the butt springs (if it has them) to see if the tension is too great.

**Bill Maxim, RPT:** Have you checked that there is no wear interfering with the return of the keys, such as a notch wearing in the balance pin bushing, or cupping of the wippen cushion cloth where it touches the capstans?

**Steve Schell, RPT:** I had to repair a fairly new vertical piano one time which had poor repetition due to improper key weighting as you described. In this case, the hammer return springs were very strong, and the keys had apparently been leaded to achieve some target downweight, resulting in much lead in the front side of the keys. Problem was, the key and wippen could barely return to rest without the help of the hammer spring, which they do not have in normal playing. It felt horrible, even though the regulation and friction levels were fine.

To remedy the problem, I removed most of the leads, then weighed off the keys so that each key/wippen combination had an upweight of (if I remember right) 15 grams with the hammer held out of the way. This assured that these parts could return easily under playing conditions. I then weakened the hammer return springs to achieve an agreeable downweight, something like 46-48 grams. This fixed the problem; it felt great and repeated well.

To diagnose your piano: test to see if a given key with it's wippen sitting on it (but not the hammer) can lift at least 12-14 grams back to rest position when depressed. If it cannot, key reweighting will be the answer.

All of the above assumes that there are no excess friction problems anywhere, and that the sustain pedal is depressed or blocked so the damper spring cannot help the wippen return.

**Bob Davis, RPT:** Is this a direct-blow console? If so, some of them depend on the weight of the wippen to cause the key to return. If the wippen flange center is tight, the key won't re-



## Q & A/EDITOR'S ROUNDTABLE

turn, no matter how the action is regulated. I have seen some actions like the ones you describe, which are in good condition and still don't work, and I don't see any other explanation than a design which is too close to the edge.

Rear weight is not always a bad thing in such a design. In those cases, if the flanges are good and there's not lots of weight in the front of the key, adding weight to the back will not only solve the problem, the added inertia will usually make the action feel better, rather than worse.

**Jeffrey Hickey, RPT:** Your comment on the smaller direct-blow pianos using the wippen-weight to "settle" the key caught my attention, and reminded me of a particularly nasty problem I had with such a beastie last year. The solution to this might be related!

The piano in question had such a set of "front-heavy" keys. If you lifted the wippens by hand, the keysticks would fall down with an audible "clunk" on the front-rail cushions. Many notes would not reset after being played, lightly or heavily, and it appeared (to me) that this was a crummy design right from the start by the factory that built it. Being unhappy with the piano's design did not solve the problem, however, so I tried to determine just what they had in mind when they built this thing. Surely it must have at least functioned!

I found that the worst offenders were through the middle of the tenor, and that few existed in the bass, and none in the high-treble. Most annoying was the fact that neighboring keys, with the same front-heavy balance, did not always behave the same way. Some stuck, others didn't. I found that the problem keys would "stall" at almost exactly the half-way point in the return stroke. What happens at that point? What could the problem be?

First, I figured it must be that the wippen-cushion was dented. Surely the capstan was hanging-up in a deep groove, and simply couldn't dig its way out. Right? So I took a brush to a few cushions and "reshaped" them — didn't help a bit. In fact, there was no change in the problem (which surprised me! I was sure it would alter the equation at least a little!). I kept thinking about the point at which the key hung-up — and found the answer!

The problem turned out to be the damper-lever felt. The wippen-spoons had chopped into the felt deeply enough that the edge of the spoon was below the surface of the felt! What was occurring was that the spoons were actually being held by the edges of the hole that they'd cut into lever-felt! Duh! Every time the key was depressed, the spoons were buried completely in the felt and could not lift away from it when the key was released.

It would have been a major job to replace the felt and re-regulate the entire damper array to the new felt; re-regulate the damper-lift, re-regulate sustain pedal lift, etc. So I took a little short cut in the procedure. As the felt along the damper-lift rail was in fine condition, only a little compressed and not hard or crunchy, I decided to leave that section of the felt on the lever. I only cut away and replaced the felt along the zone where the spoons made contact. I used a felt a little thinner than the original, as this reduced the amount of regulation required in setting the damper-lift to the key (the lift had gradually been adjusted over the years as the spoons were eating away at the felt. The felt I used roughly approximated the point that the spoons currently were regulated to).

I don't think that this alteration was any sort of compromise of the action's operational integrity. The new felt is firmer, and should last longer than the original. The thickness of the felt is only slightly thinner than the action cloth originally used as the spoons were particularly thin (and this might help explain why they chopped away the felt, too). I needed less than 15 minutes to correctly set the damper lift to the keys, and zero adjustment to the damper-wires to set pedal-lift (which I checked first, of course).

**Bill Maxim, RPT:** Usually when this happens, in my experience, there is a build-up of some sort on the spoons which is wearing the felt prematurely, and needs to be scraped off.

On occasion, when I have run into this situation on an old upright, cleaning off and polishing the spoon, and filling the hole by putting a dab of glue onto a damper spring punching and working it into place, has relieved the problem for as long as the old clunker could be expected to last.

To test for this condition, depress the damper pedal and see if the key returns better than with the damper pedal released. ☐

## Letters

*Continued from Page 8*

and if anything, wouldn't the cracking rotate the agraffe side away from the gap?" The point has been made in other *Journal* articles on plates that cast iron is much more flexible than it is often given credit for. It is important to keep in mind that the rotating component of force is applied by the strings and tuning pins to the pinblock. The friction of the pinblock against the plate flanges and the screws through the plate into the pinblock step resist pinblock movement. I believe the tension in the plate bar which causes the cracking is the result of the pinblock pulling down on the front plate screws. I don't see how the resulting (slight) movement can do anything but close a gap between the pinblock step and the plate.

However, thank you for repeating that this is an hypothesis. I didn't attempt to prove anything. My purpose in analyzing the problem was simply to gain the confidence to proceed with the repair. In a situation like the one in the Bechstein, I have a very strong desire to establish a probable cause for the problem before attempting to fix it. The fact that the repair was (and is) successful provides some evidence that the hypothesis is correct, but is certainly not conclusive. If I had five Bechsteins with cracked plates to mess around with, and was free to trash two of them, I could probably generate more conclusive evidence of whether or not the hypothesis is true.

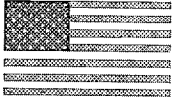
Since writing the articles, I have been made aware that quite a few Bechsteins have been successfully restrung and kept in service without repairing the cracks. The fact that these cracks seem to be self-limiting is an important aspect of the problem. I don't feel that the characteristic cracking means that there is anything wrong with the engineering of the Bechstein system, except, perhaps the level of craftsmanship required to implement it. If the construction is not just right, the consequences are serious. The "American System" has a large production advantage here: it can be pretty far off and still function effectively.

— Bob Hohf, RPT ☐



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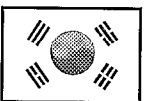
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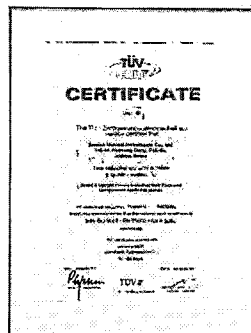
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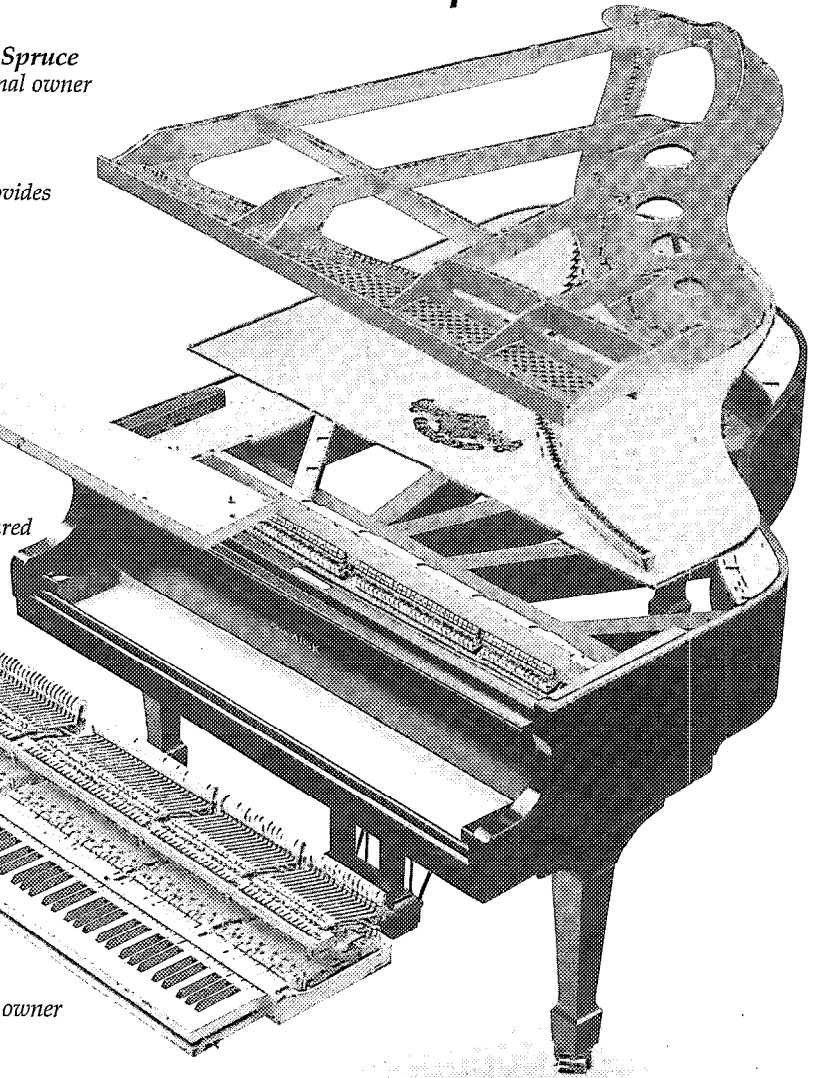


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# The Technician's Guide to Grand Hammer Installation

By John Hartman, RPT  
New York City Chapter

**P**IANO TUNING, MINOR REPAIR, REGULATING AND VOICING REPRESENT THE TRADITIONAL FOUNDATION OF THE piano technician's craft. In the past, when extensive work was needed, most piano owners returned their piano to the factory in which it was built. With the decrease in piano manufacturing in this country, responsibility for providing more extensive service naturally has fallen on the technician. While many technicians have declined to adequately train to provide a broader range of services, the demand remains strong. Those that meet this challenge will find many benefits, including engaging and profitable work. This article addresses grand hammer installation, which I consider the technician's first step beyond piano service.

Piano hammers may need replacement for many reasons, environmental damage from water or fire, over-voicing, or inferior installation by an unqualified technician are a few. We may also replace hammers to change the tone of the piano in order to suit the client's taste. More often, though, the hammers are simply worn out. Damage occurs each time the hammer collides with the string, grooves are cut into the hammer's face by the strings, particles of felt—felt dust—fly into the air and the surface contacting the string becomes compacted. The hammer is the least durable part of the piano and needs replacement more often than any other component. Since piano hammers naturally deteriorate as the piano is played, it seems probable that most technicians experience the need for hammer replacement. I have found, however, that we piano technicians are often remiss in performing needed hammer replacements.

I have come to this conclusion after seeing many very old pianos with their original hammers intact, often with the felt worn halfway through to the wood core! I have two such examples in my shop at this time; both are Steinway model Bs, one dating from 1890 and the other from 1910. What is intriguing, and also disturbing, is that both instruments retain all of their original parts, everything; strings, key tops, and action parts, including hammers! They are both in very poor condition and are scheduled for complete rebuilding. You may think that I am grateful, finding these treasures in their original condition, and I am. But what shakes me up is contemplating what could have led to this state. Very little music was made on these pianos, either from a lack of interest (I find this hard to believe, as a Steinway B just begs to be played), or due to the horrendous condition that these pianos were allowed to slip into. Either way, we can be sure that a minimal amount of money had been earned by piano technicians caring for these pianos beyond that received for periodic tuning.

Our responsibility as professional technicians is to make sure that we maintain fine pianos in useful playing condition. Just remember that inferior pianos

professional piano service.

I have designed this article to get you up to speed with quality hammer replacement, whether you consider yourself fairly accomplished or a rank beginner. Even seasoned pros may find a few tips and tricks to add to their store of knowledge.

First, drawing on some stories from my own experience, I would like to discuss two issues I consider of some importance: the appropriate application for hammer replacement, and the quality of craftsmanship. I recently examined a Steinway grand piano that is being considered for a complete rebuilding job. Dating from the teens, this once fine instrument clearly needed help. The case looked as though it had been through a war. The strings and tuning pins were badly rusted and I could see my shoes through the soundboard. Although it had received regular tuning, it was dreadfully out of tune due to very loose tuning pins. I do not even want to describe how it sounded. It was shocking to hear that the client actually used this relic to make music! It was even more surprising to find that the hammers were recently replaced. Even though the job looked decent I could not help but to think "what a waste of time and money." This is a clear

case of inappropriate application; the new hammers were totally out of proportion with the condition of the rest of the piano. I could not discern from the way the instrument sounded that the hammers were new. It is important to remember that hammer replacement

has its proper time and place. Doing one thing, like replacing the hammers with disregard for the overall condition of the piano, will not lead to positive results. Keeping the whole piano in balance is essential to quality piano work.

My experience during a visit to the showroom of a large rebuilding shop illustrates another essential point. A prospective buyer had hired me to inspect a rebuilt grand piano. Everything seemed

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***"I slid the action back in and quietly left, musing about the beauty and sanity of our simple craft, thinking that the world would be a better place if craftsmanship were first mastered before moving on to the higher level of art."***

only frustrate music making, and without music, we are out of a job. This means that in addition to regular service, such as tuning and repair, we need to be prepared to offer more extensive reconditioning and rebuilding services. We should be willing to educate and advise our clients about these issues. Learning how to replace grand hammers expertly is not only the first step toward a higher level of technical skill, but also a step towards offering our clientele truly pro-



# The Technician's Guide to Grand Hammer Installation

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fine until I removed the action, the new hammers were glued at all sorts of odd angles and badly misshapen. I had never seen such a careless job. Nothing was right; many hammers were so askew they were almost touching, and there was no semblance of a smooth strike line. I brought up these problems with the sales person who had been chattering the whole time about the high standard of craftsmanship the shop maintains. Holding her nose high in the air the salesperson said with obvious pride, "No, no, no, nothing is wrong, our technician is a true artist who only cares how the piano sounds, not what the hammers look like." I slid the action back in and quietly left, musing about the beauty and sanity of our simple craft, thinking that the world would be a better place if craftsmanship were first mastered before moving on to the higher level of art.

## Part One: Basic Concepts and Techniques

### Hammer Selection

Hammer selection is a complex subject that will only be briefly commented on here. The type of hammers you choose as replacements will affect how the piano sounds as well as how the action feels. You must consider both aspects when choosing replacement hammers. Today's technician has a large selection of replacement hammers from which to choose. While helpful in many ways, the array of available hammers can create confusion. Contradictory advice and outlandish claims made by dealers of piano hammers create the impression that just about any tone problem can be solved with the proper selection and voicing of hammers, some even claiming that no or very little voicing will be required.

Understanding the basics of hammer construction can dispel some of this confusion. First, there are two basic ways of making hammers. We call the first the cold-pressed method: the felt is pressed onto the hammer molding without the aid of heat or steam. Cold-pressed hammers are made with felt that is able to withstand the tension produced by the bending process around the molding

without tearing. This means that the felt cannot be excessively dense, so all cold-pressed hammers are relatively light for their size. Cold-pressed hammers will usually need the addition of hardeners to sound best. Until 30 or 40 years ago cold-pressed hammers were the only hammers made. This means that many pianos requiring replacement hammers originally had cold-pressed hammers.

Recently, many piano manufacturers have been using *hot-press* hammers. The process is similar, except that the felt is heated and sometimes steamed before bending. This will plasticize the felt, fa-

hammers, but I caution that some manufacturers, especially European ones, have changed the design of their piano actions in recent years to accommodate heavier hot-pressed hammers.

Another important factor in the selection of hammers is the relationship between the weight of the hammer and the design of the action. In simple terms, the piano action is a mechanism that accelerates the relatively slow motions of the pianist's hands into the faster speed needed for the hammer to properly impact the strings. The relationship between how far the hammer travels to how

much the key is depressed is called the transmission ratio of the action.<sup>2</sup> A transmission ratio of 5 (or 5:1), for example,

would mean that the hammer travels 5 units of distance for every one unit of key dip. Another, and even more important consequence of the action transmission ratio, is how it affects the touch at the front of the key. Every gram of weight added to the hammer will be felt at the key, amplified by the transmission ratio. This means that one gram added to the hammer of a 5 ratio action will be felt at the key as 5 grams.<sup>3</sup> The same weight added to a 7 ratio action will add 7 grams to the touch. In order to achieve a normal touch (50-55 grams down weight) a large proportion of the weight of the hammer needs to be balanced by adding lead to the front end of the key. Actions with low ratios need less lead in the key than those with high ratios for any given

**"Keeping the whole piano in balance is essential to quality piano work."**

cilitating the bending process. The method achieves two goals: heavier and denser felt can be used, requiring little or no additional hardener, and the shape and surface appearance can be controlled. Some hot-pressed hammers can be ready for sale with little additional sanding while cold-pressed hammers are sanded to the final shape. Hot-pressed hammers are heavier than cold-pressed hammers of the same size.<sup>1</sup>

Ideally, one should select hammers that are close in type to the original hammer. If the piano was made before 1950, it is fairly certain that it originally had cold-pressed hammers. If made later, it may or may not have had cold-pressed hammers. Some manufacturers may be able to supply appropriate replacement

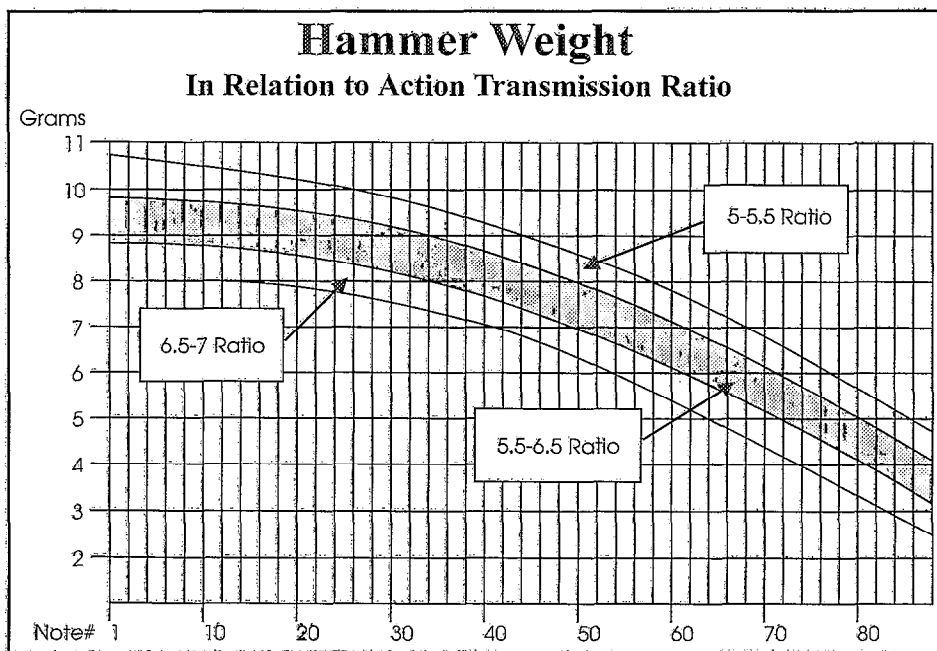


Chart 1



## American Style Grands

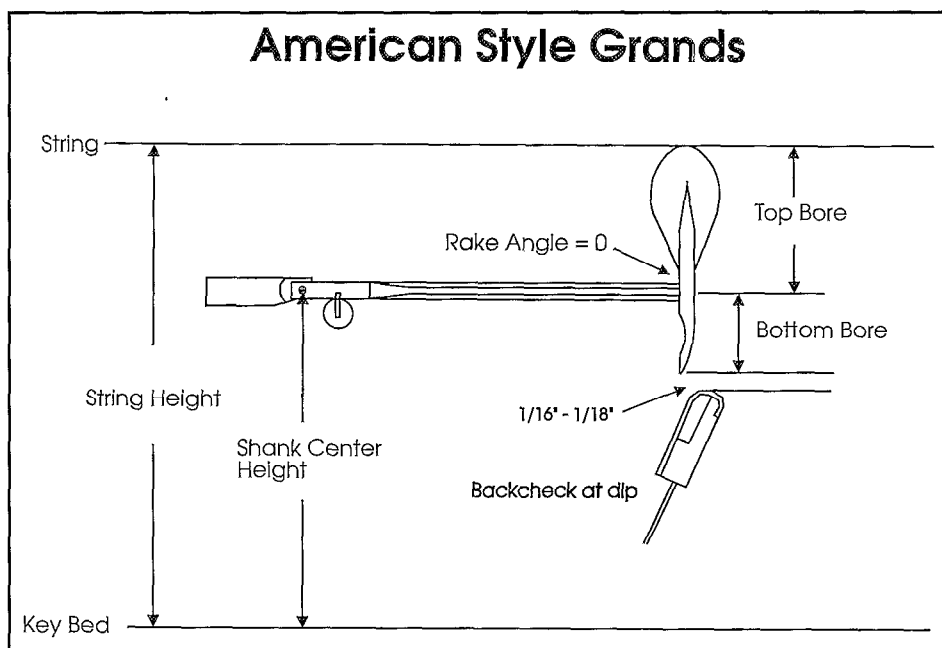


Figure 1

hammer weight. In order to keep the amount of lead in the key within normal limits, the hammer weights throughout the scale need to be adjusted to the transmission ratio of the action. High ratios of 6.5 to 7 require light hammers while lower ratios can tolerate heavier hammers.<sup>4</sup>

To find the action's transmission ratio you can use the method described by Chris Day of the Boston chapter in the November 1994 *PTJ* issue, pp. 15-16. A more involved method that produces very accurate figures can be found in the *PTJ*, June 1996, "The New Touchweight Metrology," by David Stanwood.<sup>5</sup> If you know the transmission ratio of the action, you can find the appropriate hammer weight (see chart).

### Bore Distance and Rake Angles

Whether you plan on boring the hammers you have selected yourself, or you are buying your hammers pre-bored, an understanding of grand hammer geometry is valuable. One of the most important relationships is the distance from the hammer's crown to the center of the hole (top bore), and the distance from center of the hole to the end of the tail (bottom bore). There are two distinct styles of hammer geometry on the modern piano. American style grands are the most common type, and are represented by brands such as Steinway, Mason and Hamlin and many, but not all, American-made grands. Many Pacific rim pianos such as Yamaha and Kawai use the same style hammer geometry. The top bore

distance on these grands is easily figured by subtracting the shank center height from the string height. American style grands, designed with a 0 degree rake angle, have the hammer glued to the shank at a right angle as seen from the side (see Figure 1). The bottom bore is measured by the distance from the shank center height to the height of the backcheck at dip minus  $1/16'' - 1/8''$ .

The German and European-style grands are more difficult to calculate because the hammers are glued onto the shank with a positive rake angle. The shank over-centers (that is, rises above horizontal) when the hammer strikes

the string (see Figure 2). If possible, use the original hammers as a reference to bore the new set. If the original hammers are not available, I suggest experimenting on one note to find the right combination of top bore and rake angle to make the hammer strike the string squarely and allow the action to be properly regulated.<sup>6</sup> Once you find the top bore, figure the bottom bore from the backcheck as described above.

### Boring Angles

The boring angle is the angle of the hammer in relation to the shank as seen from above. It is measured in degrees of deviation from parallel with the shank. For most of the scale, the boring angle design dictates that the hammer will be parallel with the string. However, when angling the hammer to follow the string places the hammer too near its adjacent hammers, adjustments will be needed. For example, in many grands the boring angle in the bass does not follow the string precisely. I suggest copying the original boring angles in the bass and adjusting the rest to follow the strings.

In the tenor, where there is a gradual sweep from beginning to end, I have been using a simple template to find the boring angles (see Figure 3). A  $1-5/8''$  wide strip of  $1/4''$  plywood is cut to the length of the tenor section at the strike point. Draw a line down the middle of the plywood. Install the action and with a felt pen mark the strike points of the end hammers in the tenor area onto the

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## German and Euro-style Grands

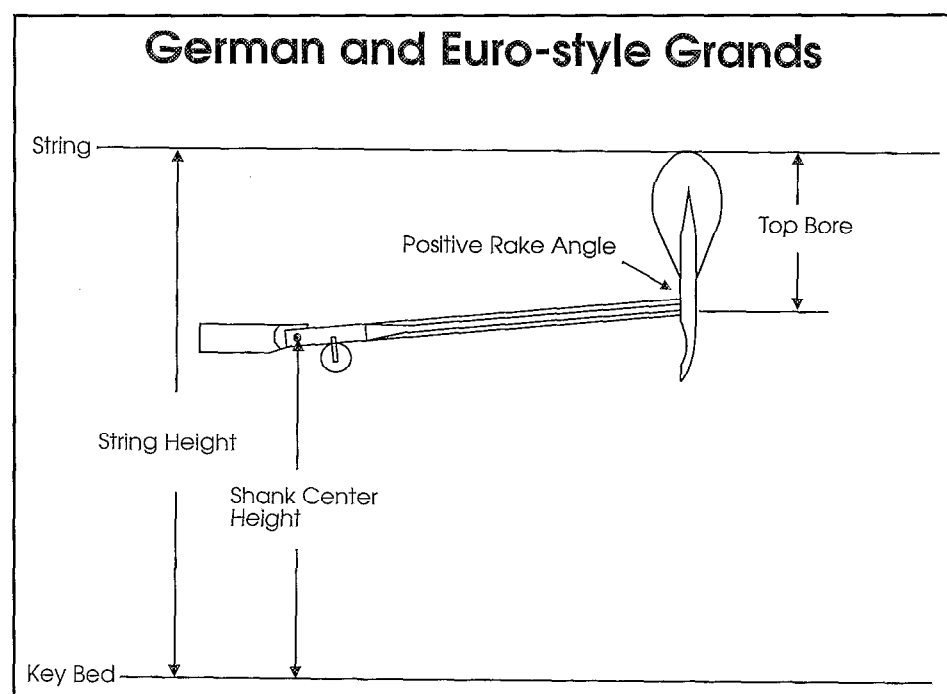


Figure 2



## The Technician's Guide to Grand Hammer Installation

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strings. This is easier to do if you remove the dampers. Remove the action and hold the template up to the strings from underneath with its center line matching the pen marks on the strings. Use a pen to trace the center line of each unison onto the jig. This template is useful in a number of ways. A protractor can be used to determine the boring angle schedule for the new hammers, and later it can be used as a guide while gluing.

### Burning Angles

The angle that the hammer makes in its direction of travel is called the burning angle, named for the practice of applying heat to twist the shank into adjustment. Although we can make this adjustment after the hammers are glued on, it is best to install the hammers as accurately as possible in this regard. Learning how to judge the burning angle is fundamental to efficient and accurate hammer hanging. I find it best to compare the spacing of the crown of the hammer in relation to its adjacent hammers' crowns at rest, then compare the spacing of the tail with these same hammers' crowns when the hammer is lifted. The hammer is carefully lifted high enough so its tail is level with its adjacent hammers' crowns (see Figure 4). This technique requires that each hammer be lifted as part of the gluing process. Adjustments are made before the glue is fully set. With practice, you can detect

often we compromise the burning angle somewhat when the boring angles are steep. This can improve the clearance between adjacent hammers. Since models vary so much it is difficult to give a fast rule for doing this properly. I suggest using the angle which will provide the best clearance to the hammers as they rise to meet the strings. This slight compromise is used to best advantage where the hammers are spaced closely. It is not needed, for example, in the Steinway model D tenor area, where the hammers are spaced farther apart.

### Part Two: Free Hand Hammer Gluing

Many technicians, including myself, use some sort of jig to assist in gluing the hammers on the shank, but the best way to learn is by using only a straight edge

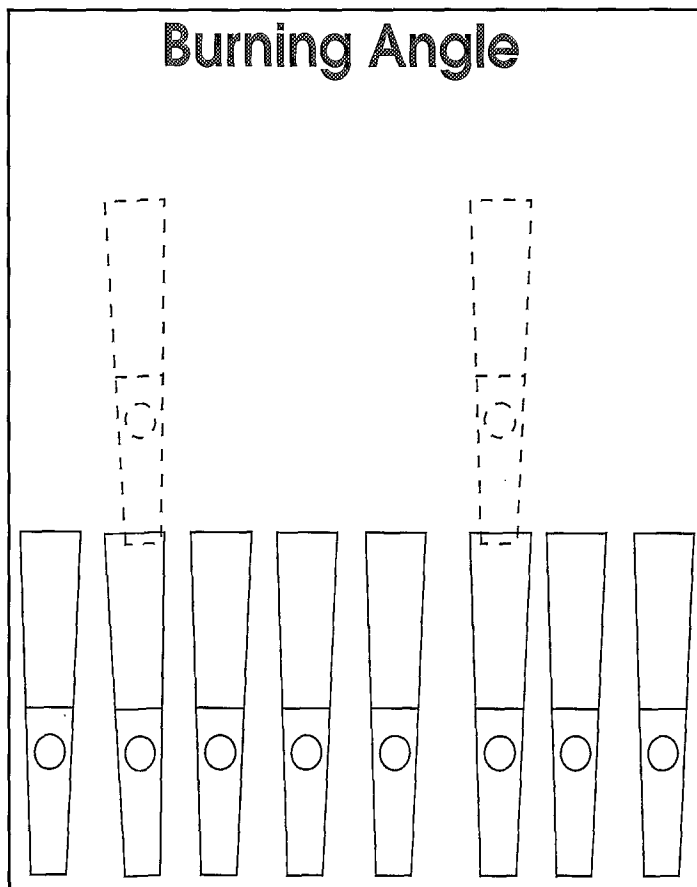


Figure 4

and shanks which are adjacent to the end hammers of each section as guide hammers. For example, in a piano with 20 bass hammers, number 2 and number 19 will be the guide hammers. Write the serial number and note numbers on these guide hammers. Remove them from the rail and set them aside for later. Remove the rest of the shanks and install the new shanks.

If retaining the original shanks, remove all the hammers from the shanks with the exception of the guide hammers in each section. Use hammer-removing pliers or split the hammer from the tail with diagonal cutters to remove them from the shank. Take care not to damage the shank center pin. After removing the hammers, clean the glue from the shanks with a hammer shank reducer (#16107 APSCO).

### Spacing and Traveling Shanks

It is usually best to space and travel the shanks before gluing the hammers.<sup>7</sup> If I am installing new shanks, I first space the flanges evenly on the rail looking for consistent spacing between the flanges. At the same time, the shank ends are evenly spaced over the wippen rest cush-

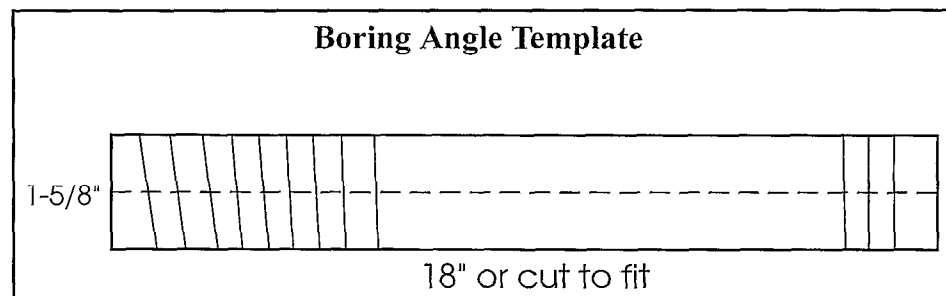


Figure 3

burning angles of one half of a degree. It may be helpful to practice by examining the hammers on several grand pianos. It is easiest to observe the burning angle in the treble section, where the hammers are glued parallel to the shank. In the tenor and bass, the boring angles can create complications. Generally, the burning angle is at a right angle to the shank's center pin. It is certainly okay to proceed this way for the entire scale, but

and gluing free hand. While a bit more difficult than using a jig, the method described below will rapidly develop your dexterity as well as sharpen your judgment.

### Removing the Hammers and Saving the Guide Hammers

If new shanks are to be installed with the new hammers, save those hammers



ions. Papering the flanges to travel the shanks proceeds from rough to fine in a series of passes. First, lift all of the shanks straight up in the air (see Photo 1). Mark which shanks are tilted to the left or right. I use a #2 pencil and mark on the flange tops which side of the flange needs paper. I can also indicate by either a short or long line how much paper to

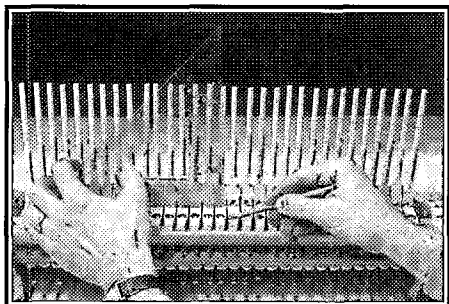


Photo 1

use. To apply the paper I loosen the screw, lift the flange, and insert the paper gum-side up between the rail and the flange.<sup>8</sup> The screw is retightened to seat the paper to the flange. I tear the paper off leaving some showing to indicate which shanks have paper. After this roughing-in, further refinement is made by testing the shanks in the usual way, lifting them from rest with a thin screwdriver (see Photo 2). Cut off the papers with a razor blade after traveling all the shanks. If the original shanks are retained, it is easiest to travel the shanks before removing the hammers.

## Glue Preparation and Problems

Hide glue is the most common adhesive used for hammer hanging. I find it best to mix the glue with cold water to the consistency of wet oatmeal making sure to wet all the glue crystals. I let this set for 20 minutes or so until the glue crystals have softened. Heat the glue, adding additional water as needed to bring the glue to proper consistency. A strong bond between hammer and shank

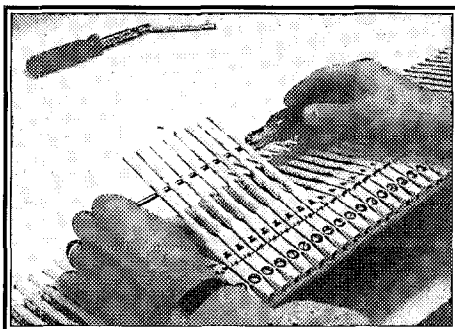


Photo 2

relies heavily on the formation of a glue collar between the two parts. This requires that the glue consistency be as thick as possible. I like to keep the glue at a point just past the state of forming long strings by occasionally adding a few drops of water. It seems that different grades and brands of glue will have diverse working properties. I use #251 gram-strength hide glue available from Bjorn Industries.

## Gluing the New Guide Hammers

Install the new guide hammers first. Care and accuracy are very important since the rest of the hammers will be installed in relation to these guide hammers. Take the new hammers for the beginning and end of each section of the scale and with a sharp pencil draw a line on both sides of the guide hammer through the center of the molding from the cove to the crown of the hammer (see Photo 3). Connect the side lines across the hammer tops and mark the center of this line with a cross. Do the same with the original guide hammers and screw them to the rails in correct order.<sup>9</sup> You have now marked the strike points (where the hammer contacts the string) of all the guide hammers.

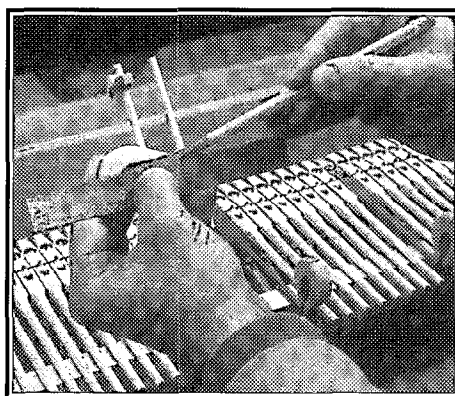


Photo 3 (above)

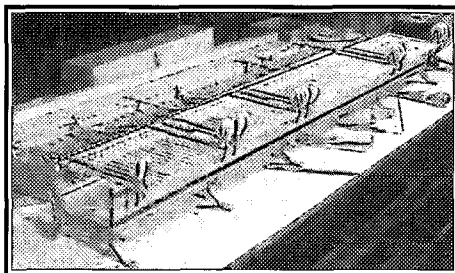


Photo 4 (below)

To glue the hammers to the shank in a straight line, you will need some sort of fixture to hold all the shanks level and straight. In Photo 4 you will see I have made use of my key leveling stick. It is not

essential, but it may be a good idea to check if the original hammers were glued correctly. Stretch a dark-colored thread from the strike point of the first hammer to the strike point of hammer #88. Usually the strike line is straight but if it is obvious that the original strike line was intentionally curved, it may be wise to copy this. Fit and glue the new guide hammers to their shanks. Make sure the strike points of the new guide hammers line up with the adjacent originals and that the new strike line is straight. It is best to start with hammers #1 and #88 and fill in the rest to line up with the thread. Use a jig to check the guide hammers making sure they are glued on perfectly perpendicular (or at the appropriate angle in the case of European-style pianos) to the shanks. Photo 5 shows a simple metal jig used for this. You can also achieve adequate accuracy by lining up the strike points and the bottom end of the tails of both the old and new guide hammers.

## Dry Fit the Hammers to the Shanks

With the new guide hammers now installed it is time to ream the remaining new hammers to fit the shanks. This is done with a straight flute, tapered reamer available from any of the supply houses. Most are designed to fit into a combination handle. If the hammers were bored with the correct diameter hole for the shank, they should slip onto the ends of

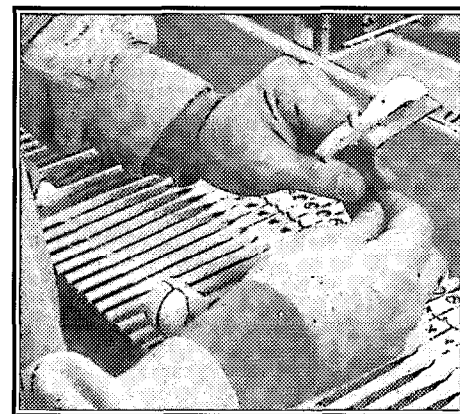


Photo 5

the shanks but be too tight to be moved in as far as needed. Starting from base end, slip the hammer onto the shank. Check to see if the boring angle is correct. The boring template described above can be a great help in the tenor section. Place it on the bench in front of the action and parallel to the strike point

*Continued on Next Page*



## The Technician's Guide to Grand Hammer Installation

Continued from Previous Page

or on top of the shanks. Enlarge the hole with the reamer, correcting for any error in boring and rake angles. Correct reaming is achieved when hammer has a slight amount of play as it is lined up with the strike point. There should be enough play to allow for gluing and to make slight adjustments in hammer angles. If the hammer falls over easily, too much play has been introduced.

### Glue the Hammers to the Shanks

After reaming the hammers we are ready to glue them to the shank. Working from the bass, select the correct hammer and apply glue to the inside of the hole with a 3/16" dowel.<sup>10</sup> Using a small brush, apply a dab of glue to the end of the shank. Insert the hammer onto the shank and spin the hammer one or two turns. This forms the glue collar and helps prevent the glue from dripping. The forming of the glue collar involves a number of factors: glue consistency, the correct amount of glue applied to the shank, air temperature and pace of work. Before the glue sets, you should line up the hammer with the adjacent hammer by feeling with your fingers. Check and adjust using a straight edge as a guide to align the new hammer with the guide hammers. Check both the heads and the tails (see Photo 5). Make an initial check of the burning angle. After going on to glue the next hammer, go back and adjust the burning angle; with hammers on both sides you can do a more accurate job of adjusting. Use the boring angle template as a reference in the tenor section.

### Trim the Shanks

If you installed new shanks with the

hammers, you will need to trim the shank end flush with the backs of the hammers. The best tool I have found so far is a 1-1/4" abrasive cut off wheel in a Dremel<sup>TM</sup> or other motor tool. Earlier, I used a Japanese hand saw, but it tended to grab the shanks on occasion. In either case, support the hammers while cutting. For this purpose I have fashioned a simple block of wood with a felt padded groove on top and a non slip bottom (sandpaper). Pressing with the thumb of one hand while cutting the shank end off with the tool in the other hand steadies the shank and prevents damage to the pinning (see Photo 6).

### Conclusion

I hope this guide has been helpful, but remember no amount of coaching can replace practice. The experience of teaching hammer hanging both on an individual basis and at PTG conferences

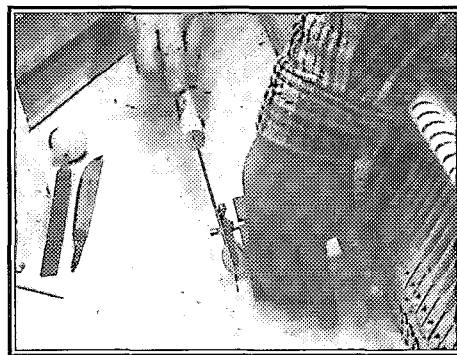


Photo 6

has taught me a few things to keep in mind. Every complicated process can be broken down into simple steps. Each small step has its correct place in the whole process. For example, don't correct the gluing angle until the heads and tails are lined up. Practice each step separately at first. Practice correcting the burning angles whenever you are regulating an action. Work slowly and deliberately to develop skills. Quality is more impor-

tant than speed; do each thing as well as you can. Speed and efficiency will grow out of well-developed skills, but skills will never develop from hurried and sloppy work. A well-thought-out and orderly process will always make the work go more smoothly.

### Notes

1. In recent years hot-pressed hammer manufacturers have made available hammers with a wide range of felt densities, filling in the gap between light, cold-pressed hammers and very dense and heavy, hot-pressed hammers.
2. The term "Transmission Ratio" is from *The Piano Hammer*, Walter Pfeiffer, pg. 108. Pfeiffer defines the action's transmission ratio as the amount the hammer rises divided by the amount the key is depressed. Using a drawing of the action, measurements of the action levers are taken with the key at half stroke. A simple formula is used to find the transmission ratio. Since the ratio varies somewhat throughout the stroke of the key, the ratio at half stroke is used as an average.
3. There will also be an increase in friction due to the knuckle pressing more firmly on the repetition lever and jack.
4. The action's transmission ratio is by no means a constant figure from piano to piano and can vary from a ratio of 5 to a ratio of 7. On average, the ratios have been getting lower over the years. Older grands from the late 19th century had a ratio of 6.5 to 7 while grand pianos made today often have ratios of 5 to 5.5. Even some highly respected piano manufacturers find difficulty in maintaining a consistent transmission ratio from piano to piano, or from one end of the action to the other. It is also worth noting that changing other action parts can have a surprising influence on the ratio, particularly the hammer shanks, where a small change in the proportion of the knuckle will have a large effect on the transmission ratio. Shanks with knuckles further from the center pin will create a lower ratio.
5. Stanwood defines transmission ratio as "Strike Ratio," the amount of weight needed at the front of the key to balance one gram of strike weight.
6. Drop screws and let-off regulating buttons neither too low nor too high.
7. Some technicians are surprised to

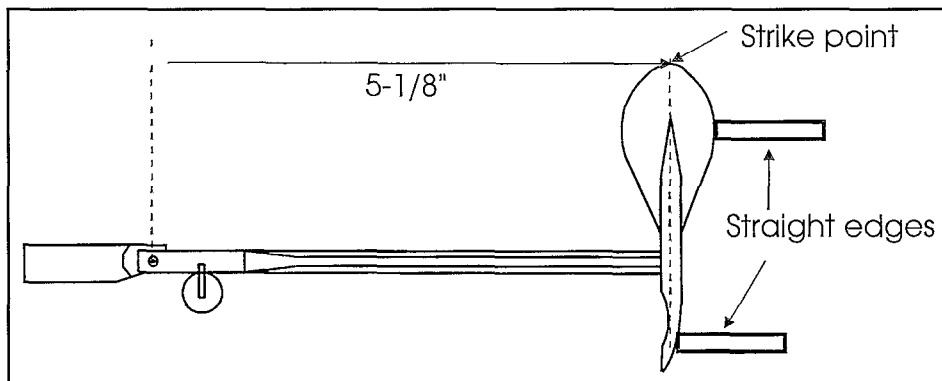



Figure 5



hear that using the burning angle technique mentioned above allows one to glue on the hammers without first having traveled the shanks. My current practice is to travel the shanks only after the hammers are installed; it is much easier to see mistraveled shanks this way.

8. This works on shank flanges such as Steinway and Yamaha. If the flange rail has a lip, the flange screw will have to be completely removed to paper the flanges.
9. Number the new shanks that are temporarily removed so you can reinstall them in their correct location.
10. I prefer to ream and glue while facing the back of the action, but many technicians prefer the opposite. 

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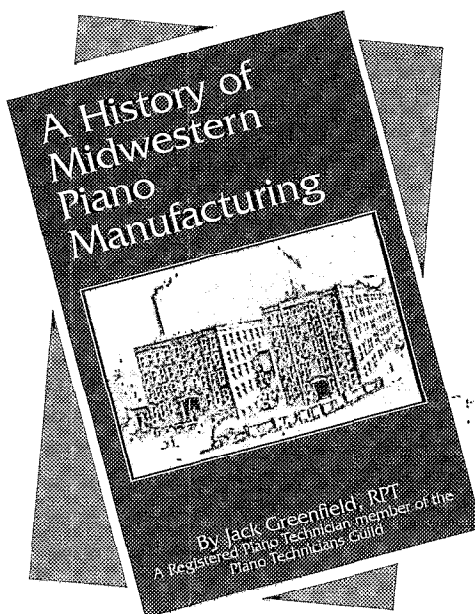
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### About The Author

Jack Greenfield, RPT, is a longtime member of the Piano Technicians Guild. He was born and raised in Chicago and was graduated from the University of Chicago with a degree in chemistry. He started his career in piano technology in 1977 as an apprentice member of the Chicago chapter, and he continues his membership there. In 1978 he passed his examinations and was named Craftsman member.

For years Jack has been a prolific writer of articles for the PTG *Journal*. He has had more than one hundred published articles to his credit, articles that range in subject from acoustics to a description of historical temperaments.

The genesis of this book was his authorship of a series of articles for the *Wippenpost*, the newsletter of the Chicago PTG chapter, which took place over a four-year period. When approached with the idea of expanding the series into book form, he was reluctant at first. He changed his mind, however, and the result is an absorbing tale of an industry that — although small — holds an important place not only in commerce but in the artistic community of the country.



Jack's writings are not limited to contributions to the *Journal*. He was invited to contribute articles to the *Garland Encyclopedia of Keyboard Instruments*, a three-volume set covering all aspects of the piano, harpsichord, and organ. He contributed some ten articles to

this publication, mainly on piano builders.

Jack has many awards to his credit. The Piano Technicians Guild awarded him the "1985 Member of Note" award and in 1997 created the Jack Greenfield Award for the best contribution to the *Journal*. In 1996 Jack was voted a Sustaining Member of the Piano Technicians Guild, a singular honor, which shows the esteem in which he is held by his colleagues.

— Fred W. Tremper, RPT

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# Q&A Special

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**By Delwin D. Fandrich, RPT**  
**Contributing Editor**

## Question for Del Fandrich:

Thank you for your articles on "Action Power" (PTJ 8/96 & 12/96).

Would you please comment on the wood grain orientation found in piano keys? In my experience, most piano keys (except for those found in a couple of late model Asian verticals I've seen) are made with the wood grain running flat (horizontal) this is also how guitar necks are made, though it seems they would be stronger (stiffer) with the grain running vertically.

Conversely, hammer shanks, at least in vertical pianos, have the grain running front to back (vs. flat to their direction of motion). But, I have before me a Renner hornbeam grand flange and shank assembly made with the grain running flat; maybe I've just never noticed this because in installing shanks in grands usually I needn't choose which way the grain is turned. The buckskin on this shank's knuckle is oriented so the jack moves against the nap to return underneath, which puzzles me, too.

Also, in regulating recently made studio uprights of a certain make I often find the action feels a bit mushy in the center of the keyboard even with thin balance rail cloth punchings and lost motion reduced as much as is practical. I have not tried flexing the balance rail, but have wondered whether the cushioning on the butts is too thick or too soft where the jacks push against it. Can you offer any advice about how firm or thick the cushioning there should be?

— Channing Bartlett, RPT

## Answer:

Mr. Bartlett is bringing up several different issues here, but mostly they involve getting energy from a finger to a piano hammer. I'll discuss them more or less in the order in which they appear.

### Wood Grain Orientation in Piano Keys

There are other characteristics besides just "strength" — *How strong is strong? Or, for that matter, how strong is strong enough?* — that must be considered in choosing the most appropriate grain orientation in any part made of wood. In piano keys, the *strength* — or, perhaps more suitably, the *stiffness* component of strength — of the wood used is not really the most significant consideration. For the species of wood historically used in piano keys — sugar pine, the various spruces, and even the somewhat less desirable basswood (or *linden*) now found in some pianos — grain orientation will have only a moderate influence on key

stiffness. Since beam stiffness increases with the square of the height of the beam, the thickness of the key blank (the thickness of the key blank determines the height of the key) will have more influence on key stiffness than will the alignment of the wood grain. Adding or subtracting one or two millimeters to the height of the key will have a much greater affect on the stiffness of a key than will changing the grain orientation from horizontal to vertical. A much more important factor is the vertical stability of the key. In this application, the stability characteristic of the key in the vertical plane must take precedence over stiffness and wood is generally more dimensionally stable perpendicular to grain.

Understand that some wood movement in response to varying climatic conditions is inevitable. Also, that it is aesthetically and functionally important for both the horizontal spacing and the vertical height of the front of the key — the *head* — to be reliably maintained. The horizontal, or side to side, spacing of the key head is fixed by a front rail key pin that is fitted into a bushed mortise cut into the bottom of the key about 20 mm back from its front edge. Thus fixed, no amount of wood movement is going to affect the side-to-side spacing of the key front. At the back of the key, even if there is some slight side-to-side movement of the capstan (and the backcheck in the case of the grand), not much will happen unless the movement is so great that two adjacent keys actually rub together.<sup>1</sup>

However, if there is any wood movement that might affect the vertical position of the key head — that is, if the *key height* changes — the result would be much more noticeable. The back of the key is held down by the weight of the action mechanism resting on the capstan, leaving the front of the key free to move up and down. The keys will go out of level if the wood warps in that direction. Depending on how much movement takes place, this change could become quite noticeable to the pianist, both visually and tactilely. Obviously, if the front of the key were to move up or down in response to a warping key stick, the key travel distance — i.e., *key dip* — will change. If the key travel distance decreases enough to reduce or eliminate after-touch, the hammers may block or bobble against the strings. If the key travel is excessive, the action may function reasonably well, but the pianist may have trouble achieving quick repetition.

Some pianists are quite sensitive to even subtle variations in key level and key travel. In my experience, many pianists (especially those with relatively small hands) start to be bothered by key travel distances much greater than 9.5 to 10.0 mm (0.374" to 0.394"). More than once I've been asked to further reduce key dip to approximately 9.0 mm (0.354").<sup>2</sup> The problem of excessive key dip is already present in some pianos, most notably the current version of the Steinway action. The geometry of this action requires a nominal key travel of 0.425" (10.8+ mm). And this is not the only action that requires a key dip specification in this range. More than a few actions besides the Steinway have been built that require key travel in the 10.5 mm to 11.0 mm range. Since this is already at the outside edge of usability, you certainly wouldn't want anything to happen to the key that would increase this dimension any farther.

The best practice, then, is to first choose a wood that is light in weight and is reasonably stiff, but especially one that is dimensionally stable as its moisture content fluctuates from one extreme to the other. The grain of this wood should then be oriented in such a way as to further reduce



the adverse effects of the remaining inevitable wood movement as much as possible. In the case of piano keys, this means that the wood grain is usually aligned horizontally.

## **Wood Grain Orientation in Guitar Necks**

I'm not really qualified to comment on guitar necks although I suspect that the wood grain orientation here is chosen for much the same reason. My guess is that the guitar maker would want the neck most stable in the vertical plane, both to aid tuning stability and to maintain a reasonably constant spatial relationship between the strings and the frets.<sup>3</sup>

## **Wood Grain Orientation in Hammershanks**

After reading your comments about the wood grain orientation in your sample Renner hammer shank, I picked out a few from one of the sets we have in stock. I now have in front of me six hammer shanks. Three of them were made by Renner. Of these one of them has the grain running horizontally, one has the grain running vertically and one has the grain running at about 60 degrees from horizontal. The other three are Pratt-Win/Baldwin hammer shanks. Again, one has roughly horizontal grain, one has a grain angle of approximately 80 degrees and the third is about 45 degrees.

One of the things I have always appreciated about this industry is the way all of the various piano and action makers agree on how certain parts should be made and then how consistent they all are in making them that way! Lest it sound like I'm being too hard on the manufacturers here, I've also observed that there is even more disagreement among piano technicians about how to *rebuild* those same pianos.

Like the piano key, the stiffness of the hammer shank depends *much* more on its vertical height and its cross-section shape than it does on the orientation of the wood grain line. While in theory grand hammer shanks should be slightly stiffer and slightly more stable (at least for our purposes) if the wood grain were to always run vertically, in practice it doesn't seem that any of the action makers pay much attention to this subtlety any longer. If anyone has reliable evidence contrary to this, please let us all know. I have to admit that, since it's not something I can do anything about, I long ago stopped fretting about wood grain orientation in grand hammer shanks. Still, it would be nice if they were consistent within the set.

Regarding the grain orientation of upright hammer shanks, I doubt seriously that any manufacturer pays much, if any, attention to this any more. I remember visiting one factory in which the production manager proudly proclaimed that the wood grain of all of the hammershanks in *their* actions was carefully aligned along the axis of the hammer. He said this while we were in the hammer department watching the workers shank hammers. In actual fact, of course, they were simply picking up the hammer shanks at random and stuffing them into the hole in the hammer head. Again, if there really is an exception to this practice, I'd be delighted to hear about it. Before calling or writing though, please make sure you have firsthand evidence based on your own actual observation. Information coming from a manufacturers specification sheet, from the most well-meaning classroom instructor, or from the creative copywriter's glowing fantasies found in a brochure or service manual is not always completely accurate or reliable.

Over the years I've used a lot of hammer shanks and have found little variation in strength that I could directly attribute to wood grain orientation. Which is a good thing; I'm not even sure how possible it would be to consistently maintain this alignment in a production environment these days. Let's face it. If a particular piece of wood has an annular ring count of 6 grains per inch, the late wood layers will be about 4.25 mm (0.167") apart. Since hammer shanks typically are only about 5.6 mm (0.219") in diameter — sometimes as little as 4.8 mm (0.188") — some of the shanks cut from this wood will be nearly all early wood and some will be nearly all late wood. The problem is often one of seeing and clearly identifying a well-defined grain line.

Aligning the wood grain of a vertical hammer shank front to back as you indicate probably does help to stabilize the side to side alignment of the hammer and should provide slightly greater stiffness in the fore and aft direction. So, production aside, in our workshops, where we have the luxury of a bit more time and, hopefully, a bit more concern with doing the thing right, it's probably worth the effort. Continue selecting and aligning upright hammer shanks as you've been doing. In the case of grand hammer shanks, I can only suggest that you try to not worry about them too much!

The point should also be made here that selecting tight grain, stable wood and properly seasoning it before cutting it into hammer shanks would help more than anything that can be done during action assembly.

## **Leather Grain Orientation**

### **on Hammer-Shank Knuckles**

Go to three classes where hammer-shank knuckles are even mentioned and you'll get seven different opinions about grain, or nap, or orientation. Quite frankly, I'm not entirely convinced it really matters either way.

One theory has it that the nap should lie front-to-back so that the jack has an easier time returning to rest position. While the effect of this may be noticeable on the regulating bench, in real life it won't have much influence on action performance. Keep in mind that things happen much faster in actual operation than they do on the bench. Although we like to say that there is no lost motion in the grand action and that the jack is always in contact with the knuckle, this is really only true when the action is properly regulated and it is at rest or when the jack is accelerating the hammer towards the string. Between the moment that the jack trips and the hammer goes into free flight and the time that the jack is reset for another cycle there are considerable periods of time during which there is no contact between the jack and the knuckle. During this time the jack seems to reset itself quite reliably no matter how the nap of knuckle leather is oriented.

The other theory would have the nap lying back-to-front so that the tip of the jack has less friction resistance as it is being tripped at jack let-off. Again, while this sounds good in theory, in actual practice it is pretty hard to prove any actual benefit from this configuration. The jack and knuckle are both in motion at the moment of jack let-off. There is (relatively) quite a lot of force and mass driving the jack as its tail contacts the let-off button. It is doubtful that any differences that may be theoretically present due to leather nap orientation can be either felt or measured in the real

*Continued on Next Page*



# Q&A Special

*Continued from Previous Page*

world.

In both cases several other factors will have much more affect on action performance than will the orientation of the nap:

- The geometry and regulation of the tip of jack — The tip of the jack should mate squarely against the knuckle. The jack must be properly regulated. It must be reasonably centered in the repetition lever mortise and it must be properly adjusted fore and aft relative to the hardwood tongue.
- The physical condition of the jack — The tip of the jack must be smooth and it should be of a material that has a low friction coefficient. New jacks are often found with tips that are considerably less than smooth. Often they look like they were simply chopped off with a saw, tumbled, and coated with some type of lubricant. No lubricant — be it graphite or Teflon™ or whatever — can make up for this rough surface. Even wood jacks that start out as smooth as the proverbial baby's backside can wear unevenly. The fast-growing early wood layers are somewhat softer than the slower growing late-wood layers. The softer wood wears away more quickly, leaving a slightly rippled surface on the tip of the jack. This, by the way, is a fairly good argument in favor of plastic jacks. There are a variety of plastics — some complete with molded-in lubricants — that greatly outperform wood in this application.
- The type of leather and how it was tanned — I am not a fan of the thick, soft leather being used on hammer-shank knuckles by many action makers today. It packs down prematurely. It has a propensity to squeak unless regularly lubricated. And, perhaps its worst feature, it absorbs excessive energy from the jack that should be getting to the hammer shank. Knuckle leather should be as thin and firm as practical. The only problem that I'm aware of with this type of leather is that it can be slightly noisy if the action regulation is a bit sloppy — a problem that seems to be aggravated with the use of aluminum action rails.
- The structural integrity of the knuckle — The leather should be tightly wrapped around the underfelt. The underfelt should be very firm and should be tightly wrapped around the hardwood tongue. The tongue should be square to the hammer shank and firmly glued into the milled slot in the hammer shank.
- The type of lubrication, if any, used on the knuckle leather — The leather used on the hammer-shank knuckles found in certain imported pianos and on aftermarket action parts tend to develop squeaks as the jack tip slides across it. The traditional lubricant for jack tips and knuckle leather has been graphite. However, graphite is messy, it is hygroscopic and it packs down and develops squeaks of its own. In short, it is not an appropriate lubricant for this purpose. Teflon™ spray lubricants and, more recently, Teflon™ powders can be used with much more success. If a Teflon™ spray is used, it should be one that leaves no oily liquid component behind. The liquid carrier must be non-oily and it must completely evaporate after application.
- The physical condition of the knuckle leather and underfelt — If the underfelt is flattened and the leather loose and sloppy, there will be both energy transfer and functional problems.
- On upright hammer butts, basically the same general rules apply — Since the underfelt on the hammer butt actually

determines the shape or contour of the hammer butt "knuckle" you should stick to the same thickness felt as was originally used. It should be as firm as is practical. The knuckle leather should also be smooth and firm and, within limits, thinner is better than thicker. It should be stretched tautly across the underfelt, i.e., it should not be "baggy." (Actually, the upright hammer butt functions much better with a grand-style round knuckle inserted in place of the underfelt and leather system currently being used. But that is a subject for another time.)

## **"Mushy" Feel in Upright Piano Actions**

The leather and felt cushion of the hammer butts would not account for an action feeling mushy only in the center portion of the scale. Nor would the design of the keys unless there was a significant dogleg to them only through the specific area in question. Usually, at least in vertical pianos, the greatest key dogleg occurs through the bass section. In keys with excessive flare there can be quite a bit of friction drag resulting from the key bushing bearing hard against the balance rail pin. This can create a very sluggish feel to the key when it is struck with a medium hard to hard blow.

A few years ago — well, okay, a couple of decades ago — to accommodate their new automatic band saws, Wurlitzer made vertical piano keys with all of the flare cut behind the balance rail button. The side force on the bushings from the resulting dogleg was so great that it produced several functional problems during normal play. I remember several owners who interpreted this as a voicing problem; as they tried to play the piano at anything more than moderate volume levels the upper bass section would sound considerably weaker than the tenor section. This side force was so severe that, between the resulting friction, the bending balance-rail key pin, and the distorting key, there was a distinct and very noticeable difference in key touch and the action saturation level across the bass/tenor break. The keys on the bass side of the break felt both stiff and mushy at the same time. It was a very odd feel. I don't remember the numbers, but the friction component was very high and very noticeable when the touch was tested for up- and down-weight. It became unacceptable in operation. I also recall that the left side key bushings in the upper bass section wore out at about two to three times the rate of those in the tenor section.

To locate the actual cause of the problem you describe you will have to look for a cause that will make only keys in the central portion of the keyboard feel this way and will not affect the two ends. It's not likely that any manufacturer would use different materials in just one part of the action. Without knowing the specific model piano you are having problems with — and then examining a similar instrument — I can only speculate as to the actual cause of the problem you are encountering. A few thoughts do come to mind:

- **Balance rail support** — The way many vertical piano balance rails are built these days, they can be pretty flexible. This is no problem if the rail is firmly bedded to a solid keybed. If, however, the balance rail is floating through a portion of its span, it can flex quite a lot under medium to hard play. This would not normally be suspected since both the front and balance rails are usually screwed directly to the keybed. If, however, the piano under consideration has a height-adjustable key balance rail like those used in Baldwin verticals, it is possible that it is not seated firmly against the leveling screws through the center section. It is also possible



that the leveling screws are located too far apart to fully support the keyframe rail. I've used this feature myself and have found that, even with a fairly stiff balance rail, at least five height adjustment screws are needed to provide adequate support.

It's worth checking for balance rail flex even in the balance rail is shimmed to height. I once found a balance rail in a new studio piano that had shims at the two ends and at the bass/tenor break leaving the entire tenor section free to float. These shims, along with the appropriate screws, were located about 300 mm in from each end of the rail. I have to assume the installation was designed that way. Whether intentional or accidental, it was a pretty "bouncy" keyset.

■ **Keybed design**—A poorly designed keybed may not provide adequate support for the keyframe. A couple of years ago I examined the keybed of a certain model Yamaha vertical—it was a fairly tall "professional upright," (I no longer remember which one) that used a keybed resembling a "hollowcore" door. Instead of being filled with a rigid honeycomb core, however, the space between the skins was filled with a foamrubber-type material. Aside from helping to make the keybed sound "less hollow" when it was tapped, I could think of no useful function for the foam filler. It certainly did nothing to improve the stiffness of the keybed. Needless to say, this keybed design was not inherently endowed with structural rigidity, it looked good, though.

■ **Keybed support**—Keybeds on "entry-level" pianos have been getting thinner and thinner. Historically the practice has been to provide some support for the keybed by connecting the back edge to the plate in some manner. Check to see if this has been done. Even if this support exists, though, it may be doing little to provide support for the middle and front edge of the keybed where the balance rail and the front rail lie. If the keybed is one of the new "thinner-is-better" varieties, support along just the back may not be enough to ensure adequate stiffness. If the keybed is somewhat floppy, it may be helpful to attach a wood brace under the keybed to provide the necessary support.

■ **Action rails**—Action rails that are too flexible could cause the problem you are encountering—particularly if the action rail is one of those prone to rotating slightly under a load. While I'm certainly not a fan of poor-quality wood action rails, neither do I much like the aluminum action rails favored by the Japanese and Korean piano makers or, for that matter, the wood-cored, tubular brass action rails that have been used by Steinway for the past umpteen hundred years. Aside from the obvious potential service problems, none of these have impressed me as being as rigid or as quiet as a properly designed and executed wood rail—the benchmark for which has been and remains the Renner laminated action rail. They are wonderful to work with, they are stable in any climate, they are extremely rigid and they propagate less action noise than do the various metal rails.

■ **Action rail support**—A couple of months ago, I examined a 112.5 cm (44.3") Kawai vertical piano<sup>4</sup> at a local college which had just two action brackets: one at each end of the action stack. Since no effort had been made to increase the rigidity of the main action rail in any way, I leave you free to speculate about how structurally rigid this arrangement is. That rail wanted to flex under just the force of the nasty look I gave it when I first saw the setup. Needless to say, this action does exhibit the symptoms you describe. Unfortunately, this problem cannot be cured through regulating and it

matters not at all what type of felt or leather is used on the hammer butts. In this case the appropriate boss that the top of the action bracket would rest against, if it were there, does exist—though it has not been drilled and tapped—on the plate. It might be possible to obtain another action bracket and install it at the bass/tenor break. I'm not sure that the customer should be expected to bear the cost of this procedure, however.

Problems like this one, "I ... find the action feels a bit mushy...." — can sometimes be very tricky to track down. You often can't find any one thing obviously "wrong," like broken parts or an action center so sluggish the parts won't move. There is always a cause (or causes), though. Just keep digging until you get that *Whack on the Side of the Head*.<sup>5</sup> I hope the above ideas help.

## Notes

- 1) Yes, I know — if the capstan felts are old, the hammer line may be a bit unstable as the rounded heads of the capstans move in and out of the holes they have worn for themselves. But I'm really not going to worry about it too much. There is a limit to how much can be done to shield the piano owner from the effects of inadequate piano maintenance.
- 2) This can be easily done with most actions by first reducing the key dip to 9.0 mm and then reducing the hammer blow distance until reliable aftertouch is achieved. If there is a hammer shank rebound rail, it should be adjusted appropriately. If individual rebound pads are used on the wippens, they should be replaced with thicker felt as necessary.
- 3) Speaking of guitars, can anybody explain to me the why and the how of guitar soundboard acoustics and why they have evolved as they have? There seem to be several quite different and distinct styles — most of which appear to be in violation of even more of the basic acoustical laws and principles than are the existing piano soundboard designs. I've not conducted exhaustive examinations of all of the different varieties of guitars being built, but from a purely acoustical design standpoint those I have studied appear to be quite ill suited to their intended purpose. Like most contemporary piano soundboards, they do appear to work — some of them reasonably well in spite of their design, others less so, but surely there is room for much improvement. Or am I really missing something here? — *ddf*.
- 4) Actually, before the needs of marketing prevailed, this was closer to a 107 cm (42.125") piano. Approximately 55 mm (about 2 inches) of its overall height is nothing more than an empty wood box with a couple of short slots cut in it located between the top of the pinblock and the lid. Surely this has no function other than to provide better numbers for the marketing pitch to the school board. It suddenly became a "Studio" piano which, as we all know, is much better than a "Console" piano. Taller is better, right? Another interesting feature of this piano are the soundboard ribs. They are made up of short pieces of spruce that are finger-jointed together through the body of the rib. While they do look a bit odd I'm not sure I can find much fault with them either acoustically or structurally. It would be interesting to test the acoustic properties of a well designed soundboard — unfortunately, this one isn't — using ribs of this construction 10 or 20 years from now.
- 5) *A Whack on the Side of the Head* is a marvelous little book on creative thinking. It was written by Roger von Oech and is published by Warner Books, Inc., 666 Fifth Avenue, New York, NY 10103. I highly recommend it as a tool to help unlock the latent creativity found in all of us. 📖



# Strictly Thirds Temperament

By Jim Coleman Sr., RPT  
Contributing Editor

This is a temperament for those who are more advanced and are used to listening to the faster beats. As I see it, there are two primary advantages to this system:

1. Tuning by faster intervals speeds up the work.
2. Finding the natural speed and progression of the faster intervals early on, avoids errors and skewing of the scale.

## Scheme

Temperament range: F3 to A4

	F3	F#	G	G#	A	A#	B	C	C#	D	D#	E	F	F#	G	G#	A4
Step #:			3			2			5			4			1		(Four major 3rds)
Note:			F			A			C#			F			A		
Step #:					7			6		8							(Four minor 3rds)
Note:			F		G#			B		D			F				
Step #:								9			10						(Two major 3rds)
Note:						G#		C			E						
Step #:					11					12							(Two major 3rds)
Note:					G			B		D#							
Step #:						14				13							(2 major 3rds)
Note:						F#				A#		D					

## Details

Tune four contiguous major 3rds from F3 to A4

3 2 5 4 1  
F A C# F A

- Check A-A octave and F-F octave with two 3rd-10th tests.
- Check that F3 3rd is approximately seven beats per second preliminarily.
- Check even progression of all four 3rds. So far, everything is done just like in the Baldassin/Sanderson Temperament. If the C#4 was tuned to an even balance between the F3 M3rd and the C#4 M3rd, then it is correct. If the C# M3rd is too fast for the F4 M3rd, then it will be necessary to move both F's flatter in order to maintain the octave relationship and make all four M3rds progress evenly. Likewise, if the C#4 M3rd is too slow and the F4 M3rd is too fast, then both F's will need to be made slightly sharper, but leave the C#4 alone.

Tune four contiguous minor 3rds from F3 to F4

7 6 8  
F G# B D F

- The rationale for this is that just as the contiguous M3rds help spread out the tempering evenly, having four contiguous m3rds within an octave will also help maintain a smooth progression throughout the temperament octave and will better help to keep the 4ths and 5ths even. This avoids the problem of skewing the temperament one way or another, as often happens when tuning just by 4ths and 5ths.

- First, locate the B3 by tuning a pure 5th down from C#4 and tuning a pure 5th up from A3; then you can positively locate B3 by balancing it as two 4ths between F#3 and E4. The two 4ths should be almost equal. If anything, the upper 4ths could be only perceptibly faster. This locates the B3 faster with less opportunity for error than in the standard Baldassin-Sanderson temperament.
- Check location of G# with C# as normal beating 4th as well as balancing the two minor 3rds between F3 and B3.
- Check location of D with 3rd-6th test F-A and F-D. The 6th should beat 1 bps faster than the M3rd. Also, the two minor 3rds between B3 and F4 should be in even progression.

After these two progressions of major and minor 3rds are made, there are only six more notes to tune. You just can't miss.

Tune two contiguous M3rds from G#

9 10  
G# C E

- Check F-C-F (5th-4th test), the 4th being twice the speed of the 5th; and G#-C with G#-F (3rd-6th test), the 6th being barely more than 1 bps faster than the M3rd. The G#3 M3rd should be only slightly slower than the original A3 M3rd, and the F-5th should be tempered only slightly on the narrow side as can be proven by the 6th-10th test (G#2-F3 being only slightly faster than G#2-C4).
- Check location of E with A-E-A and C-E with C-A (5th-4th, 3rd-6th). The C4-E4 M3rd should be only slightly slower than the C#4 M3rd and the A-E 5th should pass the 6th-



10th test. The C-E M3rd should equal the G#3-F M6th.  
**Tune two contiguous M3rds from B**

11	12
G	B D#

- Check whole tone scale of 3rds for evenness.
- Check G with C, D, and E and the like neighbor intervals compare G-E 6th with G#-F 6th.
- Check D# with G# and A# as proper 4ths and 5ths.
- Compare F 6th, G 6th, and G# 6th.

**Tune two contiguous M3rds below D**

14	13
F#	A# D

- Tune F#3 as a normal 4th to B and normal 5th to C#4.
- Check F# 6th with neighbors.
- Check that they fit with neighbors.
- Tune A#3 as 4th to F3.
- Check that A#3 M3rd equals G# M6th.

- Check that F#3 M3rd fits between neighbors.
- Check that A#3 M3rd fits between neighbors.
- Check chromatic scale of 3rds.
- Check A# contiguous 4ths with F3 and D#.
- Check F# with B and C# and with parallel 6ths to F#-D#.
- Check all parallel 6ths.
- Check all parallel 5ths.
- Check all parallel 4ths.
- Check all chromatic minor 3rds.
- Check all 6ths with major 3rds one step higher.
- Tune F#4, G4, G#4 as octaves to fit in between F4 and A4.
- Check all affected intervals, 3rds, 4ths, 5ths, 6th, octaves, 10ths.
- Tune down from E3 as octaves to bottom of tenor section. Check all affected intervals, 3rds, 4ths, 5ths, 6ths, octaves, 10ths. **FD**

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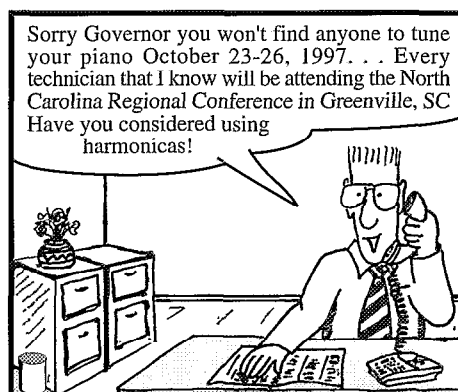
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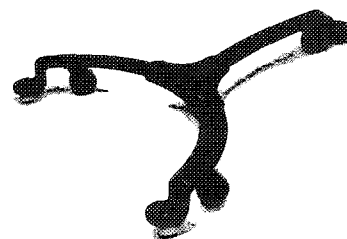


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# The Davies 30-Ton Pneumatic Soundboard Press — Part II

By Clair Davies  
Bluegrass, Kentucky Chapter

## The Parts List

The first step in building the press is to get all the parts and materials together. The total cost will run between \$650 and \$850, depending on prices in your area. The following list includes everything, down to the smallest item.

1. Yellow pine (20) 2" x 6" x 10' (#2 grade or better)
2. Yellow pine (9) 2" x 8" x 8' (rip in two for various rails)
3. Swivel casters with 4" hard rubber wheels (3)
4. Lagscrews (16) 3/8" x 3" (for carriage posts)
5. Lag screws (48) 1/4" x 1 1/4" (for casters and carriage hinges)
6. Fender washers 1 1/4" (16) and screws (16) #10 x 1" (for moveable posts)
7. Mill discharge hose (100 feet) 1 1/2" ID, 300-PSI test
8. Parker brass pipe fittings
  - a. 218P-2 Hex-Head Plug (1)
  - b. 2202P-4-4 90° Street Elbow (17)
  - c. 209P-4-2 Bushing (17)
  - d. 216P-2-2 Hex Nipple (17)
  - e. 2203P-2 Union Tee (17)
  - f. 3814-6-CL 1/8" Urethane hose (35')
  - g. 801-4-BLK 1/4" ID Hose (1')
  - h. H8CP 1/4" Hose Barb, 20 series nipple (1) (male quick disconnect fitting)
  - i. PVB08-2 Plug Valve
9. Clippard Minimatic brass pipe fittings

- a. 11924-1 Hose Barb (16)
- b. MQC-VP Valve Body (16)
- c. MQC-F Hose Connector (16)
10. Pipe reducer bushings (17) 1 1/4" x 1/4"
11. Pipe plugs (17) 1 1/4"
12. Hose Clamps (34) 1 3/4"
13. Angle iron (136') 1" x 1/8"
14. Machine bolts (102) 5/16" x 2 1/2"
15. Hex nuts (204) 5/16"
16. Pipe strap (30') 3/4"
17. Scrap pieces of Falconwood or Delignit
18. Panhead screws (170) #10 x 3/4"
19. Machine bolts (34) 3/8" x 3 1/2"
20. Finishing nails (68) 8d
21. Panhead screws (68) #10 x 2" (for bottom beam pressure blocks)
22. Hinges (6) 3" x 3"
23. Pipe thread compound (2 tubes)
24. Steel washers (34) 1/8" x 1 3/8"
25. Steel rods (3) 1/4" x 36" (cut 34 pieces 1/4" x 3")
26. Thin backrail cloth (15) 1 1/2" x 52"

## Notes on Parts

Most of the hardware items can be gotten at any hardware store. It will be cheaper, however, to buy the large amount of angle iron at a steel specialty house, where they will be able to cut the required 68 pieces to length.

The specified amount of yellow pine lumber allows about 10 percent extra for waste. The mill hose comes in 50- and 100-foot rolls. Only 68 feet are needed so there will be some left over. Mill hose is used for wash-down in factories and on ships and is rated well in excess of what is needed for 100 psi. Technically, it's not fire hose, although it looks similar.

The hose will be found at a large rubber supply company. Among manufacturers there's some variation in the actual size of the nominal 1 1/2" hose, so be sure the pipe-reducer bushings and pipe plugs fit it. Look for the iron pipe fittings at a big plumbing wholesaler because the reducer bushings are not a common size.

The Parker Hannifin Company (800 272-7537) can give the name of a nearby retailer for the small brass pipe fittings for the valve assembly. Both the Parker and the Clippard fittings are actually for hydraulic systems.

Items 8g, 8h, and 8i are for connecting the soundboard press to the compressor. The plug valve can keep the

system pressurized in case the compressor is temporarily needed elsewhere.

Maple can be substituted for Falconwood or Delignit if a somewhat heavier piece of steel is used on top of it in place of the big washer.

The backrail cloth is glued to the bottom beams to protect the soundboard, which obviously goes into the press upside down.

To avoid costly mistakes, I recommend making and testing one complete rib clamp before cutting up all the materials and drilling all the holes.

## Constructing the Carriage

The next step in building the press will be to construct the carriage, the rolling base on which the rest of the press is built.

The widths of the boards for the rails must be a consistent 3 7/16" all the way around. The locking of the dogs depends on this. The rail lengths are shown in the small triangle drawing (See Figure 1).

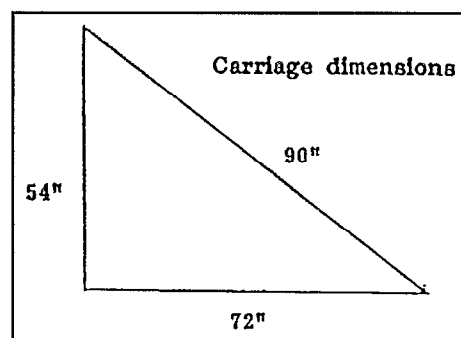


Figure 1

Note that the corners of the carriage are hinged together as a simple way to make the acute angles (See Figure 2).

Assemble the top and bottom triangles of the carriage separately. Lay the rails out in a line on the floor to attach the hinges. Leave the hinge for the right angle corner until last. Its screws will be easy to reach when you pull the triangle together. Then connect the two triangles with the stationary corner posts, using the large lag screws. Note the positioning of the lags in the side-view drawing. Their asymmetrical arrangement helps prevent racking (See Figure 3).

In the photos from last month's article and in the side view of the carriage, observe that the moveable posts, one near the rightangle corner and one each in the middle of the two longer sides, give support while allowing the rib clamps to



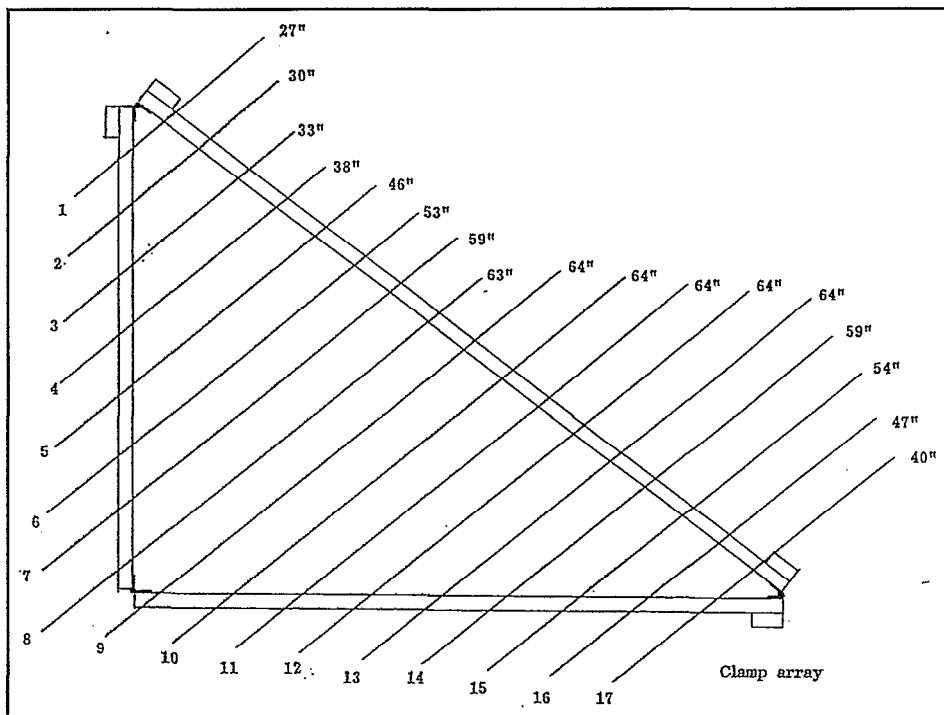



Figure 2

be moved around freely to accommodate every possible rib array. The moveable posts are held in place by fender washers and are moved by tapping them with a mallet.

The length of the carriage posts will depend on the height of the operator. For example, my press carriage is 30" high, which puts the beams at the most comfortable level for my height of six-foot one.

Lastly, turn the carriage over and put on the large casters. They are screwed to two-by-fours which cross the corners of the triangles and keep them rigid. Since the press will weigh almost 500 pounds, it wouldn't be wrong to use even larger casters.

Next month, the 17 Rib Clamps will be assembled and the press will be complete. 

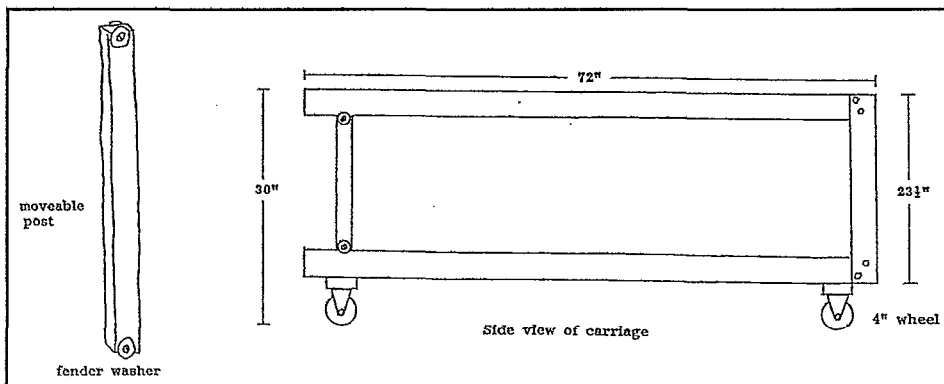


Figure 3

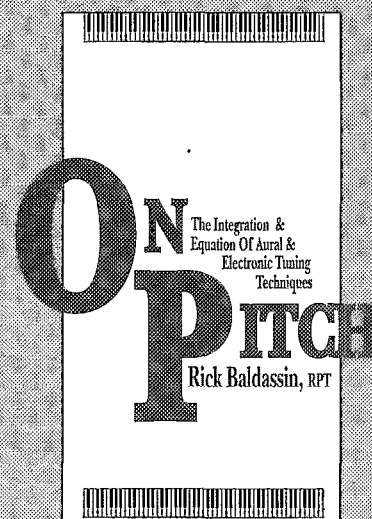
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# Popular Piano Technology — Downbearing & Crown

By Ernie Juhn, RPT  
Long Island-Nassau Chapter

The purpose of these articles is to provide some “plain language” information and act as a balanced counterpart to the numerous quite excellent pieces of information which often contain a lot of technical expressions and formulas which can present a problem to the newcomer as well as some technicians with a natural dislike for formulas and special technical expressions or phrases.

Let us start with an often misunderstood subject. Soundboard crown and downbearing. First of all, yes, you *can* have one without the other. Mind you, I did not say that we *should* have one without the other. First, let's examine the soundboard crown. When speaking about the crown, it always means the curvature of the soundboard which is a necessity in successful piano sound propagation. As a rule it is built into the soundboard during manufacture and maintained by the ribs. The simplest way to determine if a crown exists is to hold a string alongside a rib against the board. The center of the string should *not* contact the soundboard (Figure 1). There should be a gap. How much of a gap will be discussed later. It also varies with location, meaning that at the longest rib this “gap” is wider than at the little rib at the edge of the soundboard. If, on the other hand, no such gap can be found, or if you can lift the string at one end away from the soundboard and the center of the string is still resting on the board, it is a sure indication of no crown or “negative” crown.

The theories about the amount of crown needed to produce the best results vary drastically among the various designers and manufacturers. Adding to the complication is the fact that the piano is, by nature, not a “symmetrical” device. Bass strings are long and treble strings are short. Consequently the center of the soundboard is not really where one would expect it to be. Another seldom-understood fact is that the thickness of the soundboard varies. Most boards are “feathered off” at the edges. This change in thickness as well as the amount of “crown” in various areas of the instrument are greatly responsible for the ultimate tone quality of the piano.

Now, subject number two — “downbearing.” Again, the simplest way to determine if downbearing is present is by using a string. If you hold a string tight against the termination

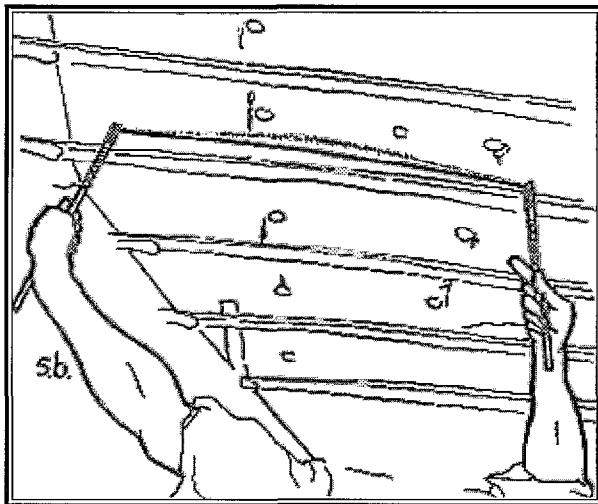


Figure 1 — Gap between string and center of soundboard, showing that crown is present.

points, the center of the string should rest on the bridge. In fact, even if our string is lifted slightly above one of the termination points (generally that is easier at the point closest to the hitch pin), the string should still contact the bridge — indicating that there is some downbearing present. (Figure 2). Obviously, that is a rather simplistic explanation and much more should and has been already said and written about the subject. The object here, however, is to stress that the point of contact on the bridge must *always* be higher than the termination points. If we understand that, it is easy to see that theoretically we could increase, or decrease, the amount of downbearing by making the bridge higher or lower. But couldn't we also accomplish that by increasing or decreasing the crown? Of course we could.

The conclusion of this exercise is simply to point out that in order to determine if there is a crown on the soundboard (theoretically) we cannot simply measure with a string or any sophisticated gauge at the bridge! We *must* examine the soundboard itself. Now a little practical lesson in assumption and conclusion (contradicting myself). Almost all piano manufacturers set the crown first and *then* the bridge height. Even the cheapest piano manufacturer uses this method. If we assume that these two steps were performed properly, and obviously the bridge height is not going to change much by itself, we *can* check at the bridge with a string, rocker gauge, bubble device or whatever tool — and read crown conditions of the soundboard with a certain degree of reliability.

So far we have dealt with pretty uncomplicated facts. However, in the piano business, matters are not always that simple. Unfortunately, I have to upset the feeling of accomplishment, security and confidence by making a few more statements which will complicate matters slightly.

First, let me introduce another kind of bearing — the side bearing. When a string goes over the bridge it contacts it on a rather large surface. I am comparing a piano bridge, for instance, to the situation on a violin or a cello (Figure 3). In order to assure perfect bond of string with the bridge, the ingenious idea of side bearing is the solution. Without going into details about angles and thickness of bridge pins, it is important to

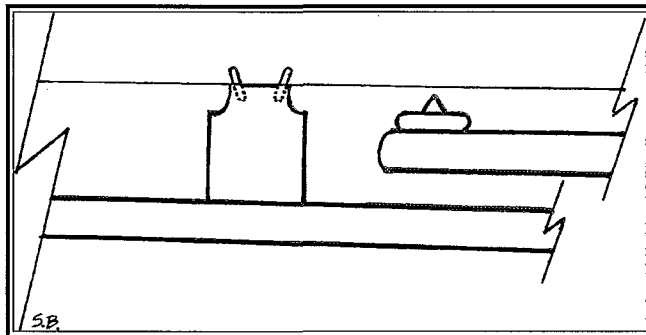


Figure 2 — Gap between string and aliquot as string touches bridge, showing that downbearing is present.



recognize that there have been some rules established which should be known to the technician; for instance, that the angle of the bridge pins does have an influence upon tone quality. It does, however, also have an affect upon the need for more or less downbearing.

Taking into account that the right amount of downbearing is crucial to certain tonal qualities of the instrument, piano designers have traditionally "balanced" one feature against the other when they created various models. The result is often an instrument with seemingly inconsistencies in downbearing over the entire scale. It is therefore quite possible to find a piano with rather little downbearing in certain areas when measuring at the bridge. The piano will sound fine and most likely has enough of the necessary crown in the soundboard when measured properly as described at the beginning of the article.

Here are some tips. As a rule, there must be a reason for a technician to check bearing and/or crown. If the complaint is about tone quality of one or maybe two or three notes, it is almost sure that it has nothing to do with either the crown or the downbearing. After all, why should the problem cease to exist one note below and one note above the offending one(s)?

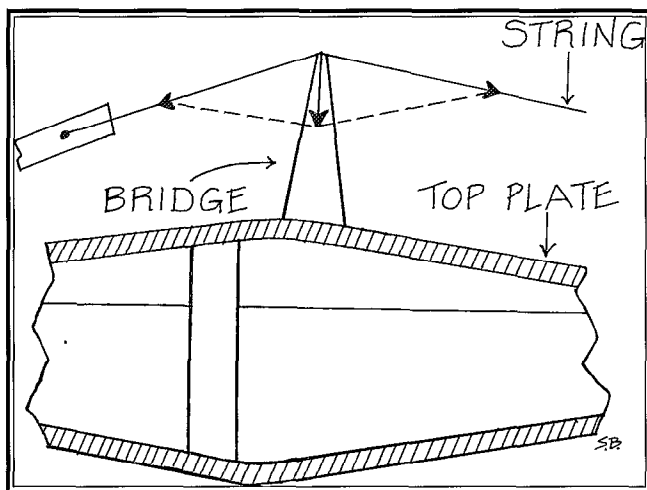


Figure 3 — Side view of violin showing small contact area between string and bridge.

I would, however, look at the side bearing. I would also check for cracks in the bridge cap, and/or loose bridge pins. Very often, a poorly glued or loose "long bridge extension" is wrongly diagnosed as a downbearing problem (see *PTJ*, Sept. 1995, page 33).

Finally, and I can't emphasize this enough, whatever the complaint may be, be sure of your diagnosis. Let me explain — if a customer complains about a permanent buzz, noise, tone problem or the like, which never goes away and the technician hears it too and can't find anything else wrong, it is quite possible

that we will resort to checking the crown and/or downbearing. We may even find that things are not quite as they should be — and we assume that this is the problem. Watch out! It may well be that the problem is caused by something entirely different like a caster on an upright, a long hinge pin or a key left permanently in the lock of a grand.

Think of the possible consequences; I leave it up to your imagination. It could involve a dealer, manufacturer or rebuilder. It might result in an unnecessary, costly repair. Piano technicians don't carry malpractice insurance — we only lose customers. ☐

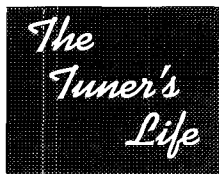
## My "Mr. Davis"

By Leroy Fritz, RPT  
St. Louis Chapter

One day in the fall of 1953, I went with friends who wished to purchase a used baby grand piano. We went to the rustic shop-sales building of an elderly man, Frank Davis of Alton, Ill. At the time I was the Director of Music for the Alton Public Schools, with the responsibility of all musical instruments.

In the course of conversation I mentioned that I was interested in piano repair. Mr. Davis, then 87 years old, said that if I'd like, I could work with him in his shop in my free time. When the school year was over I went to his shop to

study piano repair. One of the first things he did was to hand me a tuning lever and start telling me the proper use of it. I told him that I didn't plan to become a tuner, but he replied, "Okay, but you need to know a little about tuning to learn repair!"



My interest grew through those summer months. I continued to work with Mr. Davis on Saturdays during the school year, the next summer, etc. He told me that he had learned his tuning skills by working in the old Bahnsen Piano Factory in St. Louis as a chipper. He told of dragging piano backs with strings from the racks, chipping them, and working a 10-hour day.

His most interesting story was about having a special heavy-duty wagon built that would hold four of the old upright pianos, back to back, strapped and covered. He would hitch two teams of horses to the wagon and take off through the rural area north and east of Alton, selling pianos farm-to-farm. As he said, every family had lots of children, no TV or radio, and therefore was receptive to the idea of purchasing a piano. When he was at a home near noon he was invited to eat with them and if late in the afternoon, he was invited to spend the night, putting his horses and wagon in their barn!

Some time ago I was called to repair and tune an old upright piano in Jerseyville, Ill. While I was repairing the

action the young lady told me about the sentimental attachment of her family to this old piano. She related that her grandfather had purchased the piano from a traveling piano salesman in Calhoun County before 1900. That piano salesman was none other than my Mr. Davis. I told her I had known him well and that he was my tuning teacher. She was so thrilled she ran to the telephone to share the story with her grandmother.

Occasionally, while working with Mr. Davis, I asked him to let me pay for the time he spent with me. He declined, saying that I would repay him by passing on the skill to younger people. Since then I helped my brother, Lloyd Fritz, who is now a Registered Piano Technician in Reedley, Calif., and more recently have helped Kenneth Conrady, who is an Associate with the St. Louis Chapter of the Piano Technicians Guild. I have been a Registered Piano Technician since 1980.

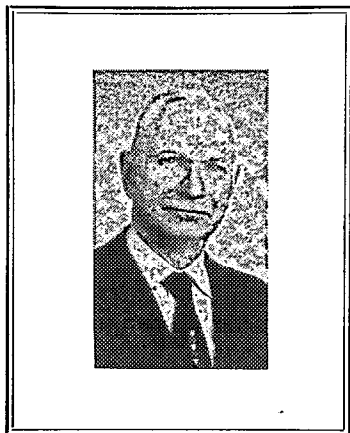
I honestly believe that I am working at the best job in the world. Where else are you thanked by the customer as he/she hands you the check? ☐



# THE TECHNICAL FORUM

THEO. G. GOSE, Editor

8209 Escanaba Avenue, Chicago 17, Illinois



THEO. F. GOSE, Technical Editor

If it is true that "Variety is the spice of life" then the Forum for this month is a real spicy one, for we have variety enough to interest everyone.

Our technical editor, Theo. F. Gose, is convalescing from surgery as this is written, but he has kept his guiding hand on the throttle, and, with the assistance of our contributors—to whom much thanks is due—our readers are assured of a full department of ideas which they can apply in their own work. An old saying goes, "Those who run may read." We would like to paraphrase it by saying "Those who read may write" and that means you, fellow technician. We have a thousand readers for every ten writers, and that doesn't add up the way it should. You can make the score look better by chipping in with your own pet ideas of how to make piano service better and more profitable. We'll be looking for you. ....

Now here is an article by Larry Scheer with some thoughts on how NOT to do certain things. Larry is no stranger to our readers; he has contributed many inspirational as well as technical articles. We predict that you will be hearing more from him in the months ahead.

## HELP WANTED

By Laurence Scheer

Many of the discoveries of the world were made by people who were not professionally engaged in the field in which they achieved success.

For instance, some inventions responsible for the advancement of railroading . . . the air brake . . . the Pullman car . . . the coupler . . . were created by people who knew nothing about railroads.

After reading last month's column "Hall of Shame" we can see that talent is sometimes misdirected. We see qualities of imagination, inventiveness and

observation that have been used for wrong purposes. If this show of originality were properly used, it might be the starting point for new discovery and invention.

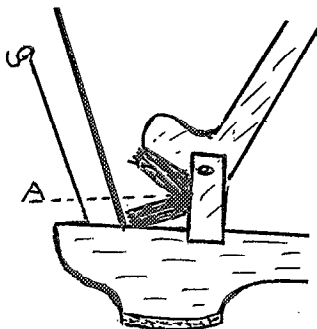
Actually, it is not the man who is intentionally dishonest that is so hard on a profession's reputation, as the honest man who doesn't know what he is doing.

When we see the dabbler, the greenhorn and the bungler doing things to pianos that astound us, we might try to find out their good qualities to start with, and help them correct their mistakes. We could bring them into our shop courses as apprentices and give them training. As apprentice members in our Chapter, we could supervise and control them, and lessen their free-lancing at the customer's expense.

Sometimes it takes a non-trained worker to show us the opportunities we are missing in our own field. If we can give him the basic training of our craft, we might turn him into an asset instead of a threat.

When tuners get together they often talk about the "Believe It Or Nots" they have seen in pianos.

Have you ever seen a cracked soundboard mended with caulking compounds; a wound bass string substituted with a single strand wire tuned an octave higher; tuning pins tightened by driving finishing nails down the side?



Did you ever see a wad of paper, bent in the middle, substituted for a jack spring . . . the loss of an A1 bass string overcome by gluing the Bb whippens to the A whippens using a thick front rail punching in the space to make the key sound like Bb . . . missing broken bass

strings replaced by breaking up the double strings, and moving them down until there was a string to a note?

We will find out so often that the author of these "Believe It Or Nots" are not professional piano tuners. Sometimes a Do-It-Yourself piano owner calls on the advice of a fellow inventor. They apply their knowledge of mechanics to the piano, and get a lot of personal satisfaction out of their work.

A reliable tuner does not often resort to poor ethics in his craftsmanship because his reputation stands or falls on the quality of his service.

One way of solving the case of the ignorant craftsman is to find out who he is, and invite him to shop meetings. We can offer him help and training without being critical, patronizing or rude.

Maybe if we give him a hint or two as to how to improve his work, he can get the idea of how much more he could learn if he attended Chapter meetings.

We might even feel able to praise him for his ingenuity in repairing the piano as he did, and suggest that the right way to do it is easier and more profitable.

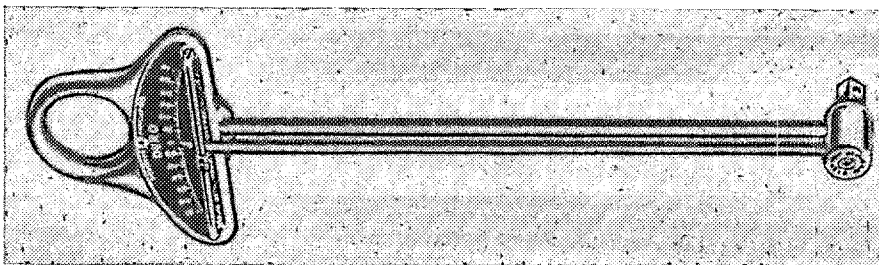
Mahatma Gandhi once said that the best way to get rid of an enemy was to make him our friend. There was never an idea that worked out better in business.

Modern industry today recognizes the man who is trying to learn by helping him with his training. It is good business to help the man who knows how to help himself because once this person has direction, he will benefit the industry as well as himself.

Giving the newcomer a helping hand is something like preventive medicine. It catches the trouble spots while they're small, and keeps them from growing bigger. At the same time, the treatment usually benefits everyone that is engaged in it.

Since one of the aims of our American Society of Piano Technicians is to find good potential for tomorrow's tuners, perhaps coralling the greenhorn is as good a place to start as anywhere. This chap is determined to go somewhere in spite of his ignorance, so we might as well get in step with him, and steer him until he is going.

While we still have Larry on the hook





# Grand Illusions ...

## The Page for Serious Cases



### The Puzzler

By Dan Levitan, RPT  
Puzzle Editor

#### Puzzler #4

##### Standard Actions

The following definitions describe nouns which, used as verbs, are actions that a piano technician might perform while working on a piano. For instance, "A person who is incapable of speech" describes a mute; it is also possible to mute the strings in a piano. How many words can you identify?

1. a small flake of wood or stone
2. writing style
3. short woody plant
4. the extractable fluid contents of plant cells
5. a melody
6. an organized container for keeping papers in order
7. quite a bit of ledger paper
8. a private road
9. the region beyond the earth's atmosphere
10. a close friend in Australia
11. a stiff, conventional person

12. sometime home for pets
  13. the up-and-up
  14. the buttocks
  15. a region of sprawling development along a major roadway
  16. the state of being comfortable
- 0-4: Let's see now — these are the keys; some are white, some are black, and you push them down like this....
- 5-8: Time to hit Braid White again.
- 9-12: That's better!
- 13-16: Total pro.

#### Solution to Puzzler #3 —

##### An Unfortunate String Break

What did he do? He left all the coils in place, lifted the wire off the bridge, made a hitchpin loop on the right-hand string, snipped off the excess wire, put the loop over the hitchpin, and pulled the right-hand string up to pitch. Now the unison was only missing its middle string, so when the shift was engaged the hammer had the right-hand string to strike. ■

Unfortunately, the Journal's long lead time precludes publishing reader mail at the same time as a puzzle's solution. However, interesting mail regarding puzzles will be printed when possible, even at the expense of the puzzle editor's dignity. Ideas and suggestions for future puzzles are always welcome, subject, of course, to whatever modification the whim of the editor may deem necessary. Puzzle mail (snail mail only) may be sent to Daniel Levitan, Puzzle Editor, 530 First Street #6, Brooklyn, NY 11215.

### Hire Me, Or Else

By Doug McKay

There's no point in sitting around waiting for the phone to ring. You've got to get out there and *threaten* your customers.

Don't say, "Hire me, or I start pulling off fingers." (Unless you're a *lot* bigger than the guy.)

Instead, put your face about three inches from your customer's and say: "You've got a lovely family. It would be a shame *if anything should ever happen to them.*"

And then there's the old standby, "Tune it, or I shoot your dog." (Before you try this, make sure he *likes* the dog.)

It reminds me of the good old kneecap-

cracking days of the Tuners Union.



If you're like some tuners (the ones who charge a lot), you like to turn a simple service call into an event. You come early, and stay late. You throw in a little extra repair for no charge. And at the end, you like to share a glass of wine with your customer.

But *which* wine? Do you open the Burgundy of the Valpolicella with the Bösendorfer? Chardonnay or White Zinfandel with the Kimball console?

Wonder no more. Toddle down to the Valley Hi outlet, and pick up a complimentary copy of our *Wine Guide for Piano Professionals.*

Cheers. ■

### Why It's Great to be 40

By Mark Stivers, RPT

1. Fewer brain cells to cause neuroses.
2. No one ever says, "Out of my way, kid, yer botherin' me."
3. Get to use the "40 and Over" checkout line at supermarket.
4. If you don't smell bad, people will be pleasantly surprised.
5. Most aliens prefer to abduct young, healthy specimens.
6. Your energy and attractiveness are now compared with a much older group.
7. Everybody who outdid you in high school is probably a total mess by now.
8. No need to exert any effort whatsoever trying to be cool and trendy.
9. Only 15 years till you can join the AARP.
10. Rogaine is fun and so easy to use! ■

### PIANOMAN Adventures

by Alan Hallmark

Invigorated by the wealth of educational classes at the Piano Technicians Guild International Institute, **PIANOMAN** returns home to a redefined standard of excellence.

More powerful than a 9ft. Concert Grand

Able to carry three to four heavy tool boxes and a vacuum cleaner at one time

Can complete a half-step pitch raise in a single bound

And who, disguised as a mild-mannered service technician, wages a never-ending battle to preserve artistic piano tone, touch, and the standard pitch to A-440

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## Essentials of Advertising

**By Gary A. Neie, RPT  
Chairman Economic Affairs  
Committee**

Advertising is an essential part of every business, however, we all use different forms of advertisement to build and maintain our businesses.

Yellow page ads, I think, are

### Economic News & Views

essential to keep your name before the public. It is difficult to establish how much business

you receive from the telephone ads, but we all know of cases where we have received business from having them. A lot of new customers come to us this way, especially people who have recently moved into the area. I use a display ad that is 2 inches high by 2 columns wide trimmed in red, with red and black print in the ad. It contains the name of my company, my name, a picture of a grand piano, the PTG logo, my address, and phone number, all for \$158.30 a month. I also have a line ad in the yellow pages and one in the white pages. This service covers the 318 telephone area of approximately 200,000 homes and businesses. I also run a yellow page, business card-sized ad in a community paper that covers approximately 25,000 homes and businesses for \$18.50 a month. I used to advertise in several other small town areas, but found that I was not drawing enough business from them to justify the cost.

I do know that my costs are just a gauge, as yellow page ads vary from place to place depending on the coverage. Your location may be absolutely too expensive to run an ad of any size and others of you can run several ads at the cost that I am paying.

I also continually run a classified ad in our local newspaper that covers the same area as our 318 telephone

area for \$110.00 a month. I have tried advertising in smaller area newspapers without much success.

Of course the very best advertisement you can get is "word of mouth." Your customers are going to talk about you, either good or bad depending on your work, and we all know that "bad news" travels faster than the speed of light, so try to always generate "good news." Time after time I have gone into communities to tune a church piano and wound up with a couple days work. I remember many times working in a church and hearing footsteps coming up the stairs, the majority of the time it is someone wanting a piano tuned while you are in the area. Which brings me to another terrific form of advertising. I drive a van with the name of my company, address, and phone number written on two sides and the back. I know that this form of advertising works as people tell me all the time, "I saw your van parked at the church," or "at home" or "running around town."

The other forms of advertising I use include: each new customer gets the PTG Pamphlet "How Often Should My Piano Be Serviced," a business card with the tuning date written in, a self-adhesive sticker placed inside the lid of the piano, on the back of the piano, and under the bench lid, with my company name, address and phone number. They may also get a PTG technical bulletin on Humidity Control, a technical bulletin on Rebuilding/Reconditioning, and possibly a technical bulletin on Voicing, Regulating, Finish Care, or Pitch Raising, depending on the situation. These bulletins are so beautifully written and to the point on each subject that you are losing money if you are not taking advantage of them. The new customer also gets a "follow up" beautifully designed card in the week following, welcoming them as a new customer.

Each customer gets an invoice, of

course, with a sticker on the bottom of it that says "Thank you for your business." I often have customers comment that they like the touch.

You always need new customers as well as cultivating your regular customers. We at one time had a "tooner" in our area who built a business just going from home-to-home and church-to-church; however, his repeat business never got off the ground and he soon moved out of the state. He even went into another line of work, thank goodness. He was a terrific salesman, where most of us have difficulty with "cold calls," he didn't have any trouble at all.

If we are building a new business or don't have enough business, there are several things that we can do. We can do some work for the local piano dealer, some dealers are easier to work for than others. We can use the telephone to call potential customers or repeat customers. We will get a lot of rejections using this method as many other businesses are also using the telephone, almost to the point of burnout. We can make "cold calls" going from community-to-community, place-to-place and church-to-church, knocking on doors wherever this is permitted. You can enlist music teachers to help you. Many times piano dealers in your area become friends with them. Help them from time to time, be available, be friendly. Read the book "How to Win Friends and Influence People," read other motivational books and listen to motivational tapes while you drive between jobs to keep your own attitude at it's top operating capacity. To make friends you have to be a friend. Smile when you talk on the telephone, look at yourself in the mirror each morning and practice looking friendly, get that scowl off of your face. To be successful you first have to convince yourself that you are

*Continued on Next Page*



# Celebrate September

# National Piano Month

## National Piano Month Perfect

## Kick-off for Piano 300 in Year 2000

*By the Division of Musical History  
Smithsonian Institution*

The year 2000 marks the 300th anniversary of the invention of the piano. The Smithsonian Institution, in collaboration with the Library of Congress and Westfield Center for Historic Keyboard Studies and other institutions and organizations — is planning a large-scale project, called PIANO 300, celebrating the birth of the piano and its 300 years of influence.

The project will consist of an exhibition at the National Museum of American History, performances, broadcasts, publications and recordings, public and educational programs. PIANO 300 will explore the piano as a complex machine, a handsome work of decorative art, and the vehicle for an infinite variety of human expression, reflecting technological, cultural and social changes from the Industrial Revolution through the present day.

The centerpiece of PIANO 300 will be an exhibition at the Smithsonian's National Museum of American History, tentatively scheduled to open in March of 2000. Located in more than 5,000 square feet of space, the exhibition unfolds in a film theater and six modules. Elements of the exhibition will include:

- A selection from the Smithsonian's internationally distinguished collection of some 180 pianos, dating from the 18th through the 20th centuries, representing builders and manufacturers from all over the world.
- Audio sets featuring recorded sound of the instruments on exhibit.
- Photographic and iconographic displays and interactive video kiosks, describing the invention of the piano and its dissemination throughout Europe, the Americas and the rest of the world.
- Selected manuscripts and editions representing three centuries of piano music from the Library of Congress.

- Action models and diagrams emphasizing the complexity of the piano as machine, and the range of technological innovations brought to bear on piano manufacture.

- Patents, advertising, programs, playbills and periodicals illustrating the "business" of the piano.

The Smithsonian's division of print and electronic media is planning a comprehensive media package, including extensive national radio broadcasts and two television programs: a two-hour documentary, centered on the extraordinary relationships between technological and industrial innovations and how these have interacted with culture, and a performance special.

Piano 300's public programs are envisioned to occur within a two-year period, from 2000 - 2002, in various locations throughout the United States and will include:


- Symposia, lectures, workshops and panel discussions geared to provide audiences of many ages with opportunities to interact with scholars, performers, technicians, and instrument builders; to experience first-

hand the various forms the piano has taken over the past 300 years; and to explore in greater depth the topics raised in the exhibition and the pre-concert conversations.

- Collecting local and regional oral histories of the piano.
- Distribution of printed materials.
- Traveling exhibitions.

These programs aim to provide individuals with the opportunity to assess their own experiences with the piano and to place those experiences within the cultural histories of their communities, their nation and the world.

Obviously, this is a very large, and very ambitious project, which the Smithsonian feels has broad educational appeal and the potential of reaching audiences of many ages across the country. They hope to forge collaborative working relationships with a number of organizations, to help raise public consciousness around the piano.


If you are interested in receiving future mailings about the project, please write to: PIANO 300, NMAH 4127/MRC 616, Smithsonian Institution, Washington, D.C. 20560. 

## Essentials of Advertising

*Continued from Previous Page*  
successful.

You need to spend some time with each customer learning of their tastes and desires, complimenting them on their children, pets, home, etc. I just know that you are making points when you return for your next tuning and mention "I see your Judy is graduating this month," or, "Did you get that new puppy for little Joey." You are writing these things down at each stop and entering them on your computer records aren't you? Name and ages of children, name of dog or cat, place of employment, school name, their likes and dislikes and any other pertinent information that will help you to remember this customer and be able to start a conversation that will be of interest to them.

Give some time back to the community and back to PTG, get on

a committee and go to work. Most of all, if you make promises to a customer or to a committee *keep those promises*. Be on time, I think this is one of the most important things that you can do in building your business. Dependability, in this day and age, is a rare quality. Dependability and knowledge will help you to greater heights. If you accomplish these two things you will always have work. So in conclusion, as I have said before, "Get to those annual, state, and local conventions and seminars — never stop learning." I talk to tuner/technicians all the time that are too busy or too broke to go to meetings and conventions. I am absolutely convinced that if you acquire enough knowledge, work at building your business, and present a friendly face to your customers that you will always do well regardless of the competition you have. Just be the best in your area and let the rest follow your lead. 



# Industry News

## **Americans Enthusiastic about Making Music**

### **Findings Bolster Music Industry**

#### **Charge at Nashville Trade Show**

**Carlsbad, CA**—America is a country full of amateur music makers, according to the 1997 "American Attitudes Towards Music" poll conducted by the Gallup Organization. A total of 113 million, or 53 percent of Americans over the age of 12 are current or former music makers, and an overwhelming majority—86 percent—of those music makers first learned how to play an instrument between the ages of five and 14. These and other encouraging findings were released as the music industry prepared for the annual NAMM trade show in Nashville, Tenn. in July.

In addition to reporting on amateur music participation in the U.S., the 1997 poll reveals trends over the past five, 10 and 50 years regarding American attitudes toward music. Not only are more Americans playing music and buying musical instruments, but their support of learning music in school has significantly increased over the past 50 years.

Commenting on the findings, President/CEO of NAMM, the International Music Products Association Larry R. Linkin said, "We're very encouraged by these statistics, which show more and more Americans of all ages embracing active music making. In general, the survey reveals a growing recognition that music enhances the quality of life."

#### **Profile of American Music Makers**

Two-thirds of all American households (66%) can be characterized as player households in which someone plays or has played a musical instrument, an increase of four percent since 1994. A typical amateur musician is 29 years of age, even though most learn how to play a musical instrument during school years. Only 13 percent of new music makers start over the age of 14; only 6 percent over the age of 18.

#### **Instrument Ownership & Popularity**

Nearly half of all households (43%) own at least one musical instrument, an increase of three percent since 1994, with 77 percent of current player households owning at least one instrument.

While people who play are more likely to own instruments, 14 percent of households with no players still own an instrument.

Nearly eight in 10 amateur musicians decide on their own which instruments to play. Pianos and guitars continue to be the most popular of all instruments played, 33 percent and 18 percent, respectively, followed by the flute (6%), drums (5%), clarinet (5%), trumpet (4%), saxophone (4%), organ (3%), violin (3%), trombone (2%), electronic keyboard (2%), harmonica (2%) and others (8%). While the piano is popular among all age groups, the guitar is more likely to be played by someone 18 to 49 years of age than younger or older, and the organ is more likely to be played by someone over age 50.

#### **Role of Music in American Life**

The 1997 poll also shows an increasing appreciation of music as a life component. Since 1994, more Americans believe playing a musical instrument is fun, offers a means of self expression, provides a sense of accomplishment, is a good hobby and is a very important part of life. In addition, 97 percent agree that playing a musical instrument can help young people channel their energy in a creative way, and 82 percent agree that music brings the family together.


Given that almost 90 percent definitely agree that music helps a child's overall intellectual development, it is no surprise that an overwhelming nine in 10 agree that music is a part of a well-rounded education, and 88 percent — up 4 percent from 1992 — agree that schools should offer instrumental music instruction as part of the regular curriculum. The poll also found that 70 percent of respondents believe music education should be mandated by the states to ensure that children receive music education in school. In fact, the number of Americans supporting music as a basic part of the school curriculum has increased 20 percent over the past five years.

#### **Continuing Opportunities**

With more Americans recognizing the value of music in education, family and life, there are continuing opportunities for the music industry to reach out to current, former and even non-players. Reinforcing this opportunity are findings that three in four agree he or she is

not too old to play a musical instrument, and one in five former players said they would play again if they had more time.

Two key challenges facing the music industry are to reach adults over 18 and over 65 years of age, when the number of Americans learning music is the smallest. Currently, more than half of the respondents age 65 or older believe they are too old to learn to play a musical instrument. "Clearly, we need to shatter the misconception that music can't be learned and enjoyed by adults and older adults. As an industry, we need to address these growing segments of the population and find new ways to make music a part of their lifestyles," added Linkin.

For further information or a copy of the 1997 Gallup study, contact the American Music Conference, 5790 Armada Drive, Carlsbad, CA 92008 at (760) 438-8001, or visit the AMC World Wide Web site at <http://www.amc-music.com>. 


## **Piano Hospital Receives Donated New Yamaha**

Officials with Cascade Piano Co. have donated a brand new Yamaha U3 professional upright to Emil Fries Piano Hospital & Training Center.

Officials with the Portland, Oregon piano company and Yamaha Corp. of America presented the piano last June at the center's annual graduation banquet.

Emil Fries Piano Hospital & Training Center was founded by Emil Fries in 1949 to teach visually impaired students the craft of tuning and regulating pianos. Among the instruments the students used was a 24-year-old Yamaha upright, which received the equivalent of 600 years of tuning and 100 years of use. Because that piano outperformed all the other pianos in terms of endurance and tuning stability, officials with the Piano Hospital had requested the donation of another Yamaha upright.

Cascade Piano Co. is family owned and has been serving the Northwest for more than 70 years. The Piano Hospital regularly offers pianos to the local community for events and concerts.

Emil Fries was blind from an early age and received his training from the Washington State School for the Blind. Mr. Fries passed away in his sleep June 7, 1997. 



# Foundation Committed to PTG's Heritage

Who is the Piano Technicians Guild Foundation and why do they always want money? What do they do with the donations they get?

PTGF's goal is to accrue a large endowment whose interest would support scholarships, grants and care of the PTGF museum. This will take a bare minimum of \$100,000. A more realistic goal would be \$1,000,000. Presently PTGF has assets totaling about \$50,000. We have a long way to go!

Are PTGF scholarships a worthwhile endeavor? Ask this year's winner, Dan Alberts of Connellsville, PA. This scholarship, given annually, provides an Associate member with free registration to our Annual Institute and pays the test fee for one of the RPT exams.

Ask Karen Lilly, the MTNA teacher and recipient of the 1997 PTGF Grant if she is a better teacher for the \$1,000 we invested in her! Eligible members are encouraged to apply for the award to fund projects in a piano-related area, such as

independent study or a graduate-degree program.

I believe that the recipients of these scholarships and grants would tell you to support the PTGF so that these programs can continue. The goodwill they generate between teachers and technicians benefits us all.

In our Home Office in Kansas City there is a large room that houses pieces of piano history and objects of PTG's past. Sunlight filters through windows and illuminates a replica of the first piano made in the United States crafted by the Connecticut Chapter to commemorate the bicentennial. Shelves, made by Kimball, hold the Russian tuning tools of Isaac Sadigursky and the Howell tools fashioned by a blacksmith. Several cherished Golden Hammer awards are on display in this museum. A 7/8 scale set of Bösendorfer keys grace the walls along with several bridges and other piano parts. There are the personal papers of William Braid White and others here that must be preserved.

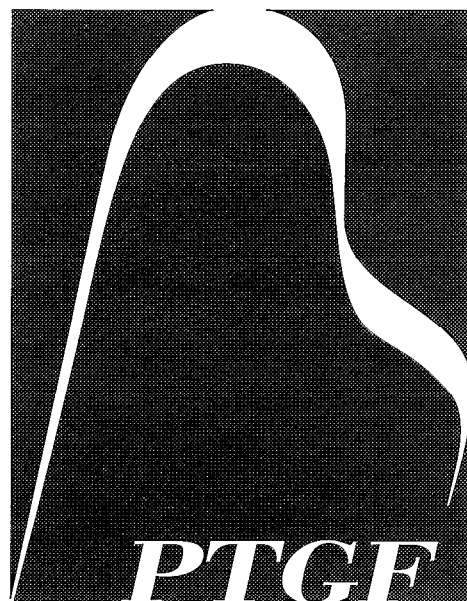
It would be great to have some interactive displays that could teach children about how a piano works and what technicians do. This museum could be opened to the public on a limited basis. Perhaps some of our collection would benefit the Smithsonian and Piano 300.

All of this costs money. The PTGF Board of Directors thanks all of you who have made donations in the past; donations in memory of dear friends; donations to honor those members and chapters who have done so much for us. Many of you have signed your \$1,000 life insurance over to the foundation and some have even remembered PTGF in your wills.

PTGF sells books, pins and T-shirts that can be found in the new PTG Merchandise Catalog. Jack Greenfield's book "A History of Midwestern Piano Manufacturing," John Travis's book *A Guide To Re-stringing* the "Calculating Technician", and "The Piano Action Handbook" are available for sale and will also benefit PTGF. PTGF Board Members are not reimbursed for expenses or travel. Your money builds that Foundation endowment.

PTG should be proud of its Foundation. The scholarships, grants and museum are important member benefits. They remind us of our commitment to our customers, our membership, our profession and our children. PTGF helps us remember the past and prepare for the future.

— Laura Kunsky, RPT  
PTGF President



## Invest in the History of PTG

The Piano Technicians Guild Foundation exists to preserve the history of PTG and advance its goals.

In addition to historical preservation, the PTG Foundation provides a scholarship each year for a music teacher's further study and two scholarships to enable PTG Associate members to attend the annual PTG Convention and Technical Institute with the goal of passing the RPT examinations.

You can help the PTG Foundation's work through tax-deductible contributions, memorial gifts, or designation of the Foundation as the beneficiary of your PTG death benefit.

Three contribution levels have been established:

- Patron (\$100 or more)
- Contributor (\$50 - \$99)
- Supporter (\$35)

To make a contribution, or for more information, contact:

**PTG Foundation**  
**3930 Washington**  
**Kansas City, MO 64111**  
**(816) 753-7747**

### *Piano Technicians Guild Foundation Mission Statement*

*"The Piano Technicians Guild Foundation is formed to support the goals of PTG by preserving and displaying historical materials and providing scholarships and grants for piano performance, study and research."*

#### **PTGF Board of Directors**

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Barrington, IL

##### *Vice President*

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# Membership Benefit

## Professional Development

Access to professional development opportunities is a chief benefit of membership in an association, and the Piano Technicians Guild is no exception.

The Guild offers a variety of ways for members to enhance their professional knowledge and skills. The PTG Annual Convention and Technical Institute is the premier venue for continuing professional training. The 1997 Institute featured more than 150 class sessions over three and one-half days. Institute courses are taught by leading experts in the field and are frequently conducted through hands-on learning.

Closer to home, regional conferences around the country offer high quality education, and local chapter meetings offer important opportunities for the advancement of members' technical knowledge. Most chapters meet regularly and offer technical

programs. These programs provide a setting where technicians can share experiences and exchange technical knowledge in their home communi-



ties.

The Piano Technicians Guild also offers its members a rich source of information through its publications. Each and every publication is designed and written by piano technicians, for piano technicians.

The *Piano Technicians Journal* offers a variety of technical articles each month from some of the best writers in the field. Tuning, repairs, rebuilding techniques and client relations information are covered in-depth each month.

*Journal* articles on specific topics are available for sale in the *Journal* reprint kits. The kits cover topics such as general repair, rebuilding skills, keys, pinblocks & plates, among others.

The study guides for the technical and tuning examinations provide a wealth of information for all technicians, from novice to expert.

The PACE (Professionals Advance through Continuing Education) Program offers in-depth lessons to help Associate members define the knowledge and skills that make a professional piano technician. The PACE program covers repairs, vertical and grand regulation, and tuning.

The Vertical Regulation Curricu-

lum is designed to provide an instructor with a comprehensive program to teach vertical regulation to students. The program is available to members for purchase at discounted prices in sets containing one instructor manual and four student workbooks for \$100; one instructor manual and ten student workbooks for \$200; or 15 student manuals and one instructor manual for \$225. The instructor manual and student workbooks may also be purchased separately. Non-member prices are also available.

The PTG film library offers films and video tapes on a variety of technical and general interest topics for a nominal rental fee. Chapters and individual members may rent the films and tapes for technical programs at chapter meetings, individual instruction, or for school or community programs. Further information about this service may be obtained by calling the Home Office.



Each professional development program and publication of the Piano Technicians Guild seeks to enhance the professional knowledge and technical skills of PTG members. Most programs are available to members at a substantial discount and to non-members at full price.

For a complete description of each product, please consult the PTG Business Aids and Merchandise Catalog or contact the Home Office at 816/753-7747; fax 816/531-0070; email [ptg@ptg.org](mailto:ptg@ptg.org).



# RECLASSIFICATIONS

*"Congratulations" to Associates passing the test in July*

## Region 1

144 Rochester, NY

Cynthia Crombach  
3120 Elmwood Avenue  
Rochester, NY 14618

## Region 2

282 Charlotte, NC

Alicia R. Shumate  
1118 McDowell Farms Drive  
Charlotte, NC 28217

## Region 4

493 Western Michigan

Loren D. Groening  
3862 Michigan, N.E.  
Grand Rapids, MI 49546

601 Chicago, IL

Henry S. Kopek  
676 Gannet Lane  
Bolingbrook, IL 60440

## Region 5

641 Kansas City, MO

David A. Vanderhoofven  
309 N. Cox Avenue  
Joplin, MO 64801

## Region 7

985 Puget Sound, WA

Mariko Kondo  
15313 A Street South  
Tacoma, WA 98444

## Region 1

061 Ottawa, ON

Todd A. Alessi  
4228 County Route 24  
Russell, NY 13684

190 Southeastern Pennsylvania

Curt M. Brown  
1225 Stump Road  
Feasterville, PA 19053

## Region 2

301 Atlanta, GA

Britt Y. West  
Rt. 3, Box 3476  
Danielsville, GA 30633

322 Northeast Florida

Kevin L. Padgett  
3674 Community Road  
Brunswick, GA 31520

327 Central Florida

Jack L. Coley  
312 Nw 28th Street  
Ocala, FL 34475

331 South Florida

Heriberto J. Payan  
9260 Sw 169th Street  
Miami, FL 33157

# NEW MEMBERS

**JULY • 1997**

## Region 3

701 New Orleans, LA

Kenneth P. Eschete  
414 Delaronde Street  
New Orleans, LA 70114

## Region 4

452 Cincinnati, OH

Daniel E. Hunt  
7902 Buckeye Crescent  
Cincinnati, OH 45243

481 Detroit-Windsor, MI

Susan E. Moran  
3544 Whispering Oaks Drive  
Ann Arbor, MI 48108

Brian A. Murphy  
936 Emerson  
Troy, MI 48084

481 Detroit-Windsor, MI

Robert L. Scott  
6384 Crane Road  
Ypsilanti, MI 48197

600 Waukegan, IL

Joel A. Nelson  
35 Pine Avenue  
Lake Zurich, IL 60047

## Region 5

801 Denver, CO

Barth Story  
930 Bunyan Avenue  
Berthoud, CO 80513

803 Boulder, CO

Edward N. Ranum  
912 Prescott Street  
Fort Collins, Co 80525

## Region 6

631 St. Louis, MO

Keith A. McElwrath  
1278 Brenthaven  
Florissant, MO 6303

## Region 7

972 Portland, OR

Robert C. Day  
5516 SE Foster  
Portland, OR 97206



## Robert Carr

December 6, 1947 - July 16, 1997

Robert Carr died on July 6th, 1997. Unless you had met him, or lived in the State of Florida, it is unlikely you would have heard about Robert Carr. This is not because he wasn't involved in PTG activities—he was. His efforts were legion, his dedication was singular. But he was always in the background; never seeking control, even refusing recognition. Robert was the proverbial “tired-but-willing” dray horse of Florida PTG. He was always somehow able to find the strength to shoulder the load for another mile, or much too often, to the end of the journey. Early Sunday morning, July 6th, Robert came to his journey's end.

Robert was born December 6th, 1947 in Hutchinson, Minnesota. His family soon moved to Howey-in-the-Hills, Florida, where his father served the community as the Presbyterian Minister. Robert attended Howey Academy from kindergarten through his senior year in high school. In 1965, Robert attended the Yale University and in 1969 received his B.A. degree in the History of Music. His first job after graduation was teaching at Clermont Junior High School in Florida.

Robert was always a highly principled individual. In the late 60's, he obtained Conscientious Objector status, and served two years of alternative service at the Duval Home for Retarded Children. In 1971, he married his childhood sweetheart, Catherine Lofgren. His first son, Joshua, was born in 1977, and his second son, Joel, was born in 1982.

Robert's involvement with PTG began in 1973, when he joined the Central Florida chapter, during the era of Aubrey Willis. Robert was fortunate and wise enough to take advantage of the great personalities who founded Florida PTG. He learned the trade, and graduated from the Aubrey Willis School of Piano Technology with honors. Over the years, Robert held every chapter office numerous times and was the chairman of many Florida State Seminars. For many years, he was the only C.T.E. in the State.

Robert was an Elder in the Presbyterian Church, and he loved to sing in the choir. He was also a member of the Central Florida Fossil Hunters Club, the Central Florida Kol Club, and the Midnight Oil MacUsers Association. His latest hobby, so typically eclectic, was collecting sewing machines.

Robert is survived by his wife Catherine, his sons Joshua and Joel, his mother Margaret of Clemont, FL, his sister Mary Jordan of Batow, FL, and his brother Bill of Ballston Lake, NY.

## In Memory ...

**Raymond Hempler**  
Wichita, KS

**A. Y. Hibbard**  
Northwest Indiana

**William Koeller**  
Alaska

**Walter White**  
Baltimore, MD

## EVENTS Calendar

October 11-12, 1997

### TEXAS STATE

Ramada Hotel Downtown, Ft. Worth, TX  
Contact: David Reed (817)735-4420  
4004 Lovell, Ft. Worth, TX 76107

October 18-19, 1997

### NYSCON

Ontario Province  
Radisson Hotel, Corning, NY  
Contact: Donald McKechnie  
(607)277-7112  
1660 Slaterville Rd., Ithaca, NY 14850

October 23-26, 1997

### NORTH CAROLINA REGIONAL

Embassy Suites Convention Center, Greenville, SC  
Contact: Don Valley  
(864)574-6165 or (864)574-1201  
P.O. Box 844, Fairforest, SC 29336

February 20-22, 1998

### CALIFORNIA STATE CONVENTION

Pomona Valley, Riverside, CA  
Contact: John Voss (909)794-1559  
2616 Mill Creek Rd., Mentone, CA 92359

March 26-29, 1998

### PA STATE

Hotel Brunswick, Lancaster, PA  
Contact: James Bittinger (717)846-3589  
43 N. Clinton St., York, PA 17404

All seminars, conferences, and conventions events listed here are approved PTG activities.

Chapters and regions wishing to have their function listed must complete a seminar request form. To obtain one of these forms, contact the PTG Home Office or your Regional Vice President.

Once approval is given and your request form reaches the Home Office, your event will be listed through the month in which it is to take place.

Deadline to be included in the Events Calendar is at least 45 days before the publication date; however, once the request is approved, it will automatically be included in the next available issue.



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# AUXILIARY

## E X C H A N G E

**Dedicated To Auxiliary News and Interests**

## *Retirement in You Future?*

A few years ago I visited my retired voice teacher at Illinois Wesleyan University. We chatted for a while, and I asked him how he enjoyed his new life. "Wonderful," he said. He found he was more busy than when he was working full-time.

His next comment was insightful. "Be sure you have some activity to take up your time. If you don't, while the first two weeks are wonderful — you loaf around the house and sleep late. After that, though, you find yourself climbing the walls."

Fred and I took that to heart. We discussed retirement and discovered we both wanted change. Our first act was to find out where we wanted to live in the last few years of our lives. We created a list of what our requirements were. First, we wanted four seasons, although we required longer springs, summer and fall and shorter winters. This eliminated places like Florida and Hawaii. Next, we wanted a university town that had the kinds of cultural events we wanted. This included musical events, plays I might act in, a good library, and classes we might want to attend. Also on our list was public radio. Fred never watches television news; he gets 90 percent



*Phyllis Tremper  
PTGA President*

of his information from NPR. That was very important.

We then looked around and Fayetteville, Ark., filled the bill. We bought property there and await the time we can locate there.

Next, came the questions of activities. This centered around Fred, for a wife is never retired: cooking has to be done and beds have to be made. He considered two possibilities, woodworking and gardening. Woodworking soon fell aside for the cost of machinery and materials was much too costly. Gardening is suspect. He worked long and hard creating a garden on our property here in Morehead. The only thing he raised was weeds. He now claims he

is developing a new species of weed. He calls it *weedus giganticus*, subspecies *kantkillus*. He is still looking for an activity. I suggested gourmet cooking, which would be fine with me.

Of course, all of this assumes there is financial freedom. Johnny Carson, a very rich man, once observed that having money only relieved you of the fear of not having money. We have been financially conservative all of our married lives. We have our Social Security income to look forward to; also, the IRAs we stashed away, and the retirement program at the university where Fred works. We hope we have enough. Fred can continue tuning while in retirement, on a highly reduced schedule, of course.

So, try this exercise: decide where you want to live in retirement, plan for your financial security, and create activities that will keep you out of mischief.

Anyway, think it over. Make your plans. Today is fine; yesterday was better. Don't wait until tomorrow. It comes sooner than you think.

In any event, *Put a Little Music In Your Life*. It will make your retirement that much sweeter. ■



# PTGF Members Join IAPBT Conference in Europe

Three members of the Piano Technicians Guild Auxiliary were present at the International Association of Piano Builders and Technicians conference held in Switzerland, and while we did not attend lectures or classes, we did our bit to cement and renew international relations among technicians and their wives. Mary Sanderson, Marie Willis and Agnes Huether enjoyed the clear, crisp but sunny air atop the Alps and shared conversations with the local women as well as gals we knew from England, Norway, Japan and Korea. We met Dorothea and Fred Odenheimer as well, although they would not be traveling with us as they were to return to their relatives in England. We were all quite taken with the Brown Swiss cattle that sport large bells hung about their necks. A charming sound is given off and the farmer always knows the whereabouts of his herd. Everyone enjoyed watching the wind gliders from their jumping off spot, their leisurely descent and smooth landing. A visit to a glass factory in Lucerne was informative and impressive. On our last evening at Emmetten, following our formal banquet, all were treated to a special performance by a juggler, acrobat, comedian, mime, and "piano tuner" named Olli Hauenstein. He had all the technicians rolling with laughter as he performed for over an hour and a half. His special grand piano took abuse like no other.

The next morning, as we prepared to board our bus for points south, we hugged our good byes to our friends from England, Korea, Germany, Japan and Switzerland. Our leader, Ed Hilbert, RPT, introduced us to our driver, Vincenzo. In short order we were off to Lake Lucerne, a city tour, a cable-car rail ride to the top of Mt. Pilatus, a cruise on Lake Lucerne and a narrow gauge ride up to the peak of another alp. Following our overnight in Lucerne we were "on the road again," heading for Interlocken and the Italian border, but not before we rode over the famous Simplon Pass and dined in a restaurant atop that road. Our cameras got a workout as well as our bus, capably handled by Vincenzo.

En route we stopped in the Grunewald Valley for another photo op and viewed the famous Alps Eiger, Muench and Jungfrau. Magnificent resorts abound and we were impressed with the fast running river and churning white foam from alpine washes.

It was late afternoon as we rode into Milan, Italy's second largest city. It's a huge industrial city, headquarters of the Fashion Industry, the Stock Exchange, the Sforza Castle and the cemetery where Toscanini is buried. In the evening we attended a concert

at a local cathedral (9 p.m. to 11 p.m.) and it was tremendous. The audience of families with their children, plus tourists, students and young adults all enjoyed the choir and musicians performing works of Bach, Vivaldi, Mozart, Schubert and Monteverdi. Our thanks go to Anne Doerfler, Associate Piano Technician, for tipping us off about the concert.

We numbered 15 on this tour. Seven couples and one singleton. There was never a harsh word — Larry Crabb kept us in tow as well as our leader, Ed Hilbert. Would you believe each day as the bus rode on there was a quiz given to the technicians. True, false, fill in the blank — that sort of thing, and would you believe there was considerable discussion about the merits of one answer over the other. We non-techs might wonder which answer was the right one, but we did know that the agraffe was the wire that secured the cork on top of the champagne bottle! We non-techs knew who composed TAPS. The RPTs did not! We non-techs did know that a giraffe was an African mammal — but I won't say what the techs thought it

was.

Our group was prepared for most any emergency. We had two licensed EMTs, a pharmacist, a doctor, a dentist and a choir director who wrote our petitions for our Sunday morning service, to which we replied in plain chant: "We praise and thank God." There was also a gal who knew all the verses to "You're the Top," but nobody asked her to sing. Our dentist could play the piano *without* sheet music and sounded like Clint Eastwood.

If you really want to know about what to see or where to go, get a Baedeker or other guide book, but we'll be able to tell you about the hilly roads and streets, the slippery marble steps as one ascends the Acropolis, the way one must duck as your boat enters the Blue Grotto on the Isle of Capri, the very narrow bunks of the "stateroom" on the ferry down the Adriatic Sea, the crowds at the Sistine Chapel, the gloom of the catacombs, the delight of a gelati (ice cream) and the *Simplon Pass*. It must be seen.

— Agnes Huether  
Recording Secretary ■

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For more information, call the PTG Home Office  
**(816) 753-7747**

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**SENECA PIANO KEY.** Quality key services at competitive prices. Sharps replaced, key bushing and the finest key recovering at any price. Write or call for price list and information on quick return of your key work. Seneca Piano Key, Ted Oberhaus, 4977 Frontenac Road, Trumansburg, NY 14886; 607-387-3095

**OLD-WORLD QUALITY RESTORATIONS/REBUILDING** by PTG technicians. Reasonable prices. To the trade, individuals or Institutions. 20 years experience with Steinway, Knabe, M&H, Baldwin, Chickering, Bechstein and many others. Nationwide Service. Heartland Piano Restorations. Toll-Free 1-888-874-4266. Visit our Home page: [www.Heartlandpiano.com](http://www.Heartlandpiano.com)

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**REPLACEMENT SOUNDBOARD PANELS** — North Hudson Woodcraft has been producing **QUALITY** soundboard blanks for over 100 years. We will custom build a spruce soundboard to your specs. Rib stock, shim stock, and quartersawn Hard Maple also available. For information and prices call: **NORTH HUDSON WOODCRAFT CORP.** (315)429-3105 - FAX (315)429-3479.

**RESTORATION OF CARVED WORK,** turnings, inlays, and marquetry, including repair of existing work and reproduction of missing pieces. Edwin Teale; 18920 Bridgeport Road; Dallas, OR 97338; 503-787-1004.

**PIANO KEY SERVICE**—  
.075 Tops with fronts - \$105.00 .095 Premium Tops with Fronts - \$125.00  
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Keys Rebrushed: Premium Cloth - \$95.00  
Custom Keys Made - Call for Price  
Many other services available. Call or write for price list. **FREE** return freight on pre-paid orders of \$75.00.  
**WALKER PIANO SERVICE,**  
554 State Route 1907, Fulton, KY 42041,  
1-800-745-6819.

**SIGHT-O-TUNER SERVICE:** Repairs, calibration & modifications. Fast, reliable service. Richard J. Weinberger; 18818 Grandview Drive; Sun City West, AZ 85375. PH. 602-584-4116.

## TRAINING



**NILES BRYANT OFFERS TWO HOME STUDY COURSES:** Electronic Organ Servicing: Newly revised. Covers all makes and models — digital, analogue, LCT's, synthesizers, etc. Piano Technology: Tuning, regulating, repairing. Our 87th year! Free booklet; Write or call **NILES BRYANT SCHOOL**, Dept. G, Box 19700; Sacramento, CA 95819 — (916)454-4748 (24 hrs.)

**BILL GARLICK SEMINARS**—Upgrade your skills at intensive six day resident seminars at Bill's home. Applications are invited for upcoming seminars in tuning, grand action regulation, historic tunings, harpsichord maintenance. Tuition includes instruction and use of facilities, private bedroom (share baths), breakfast and lunch. Write or call for information. Bill Garlick, RPT, 53 Weeks St., Blue Point, NY 11715; 516-363-7364.



**NORTH CAROLINA REGIONAL CONFERENCE** October 23-26, 1997 • Embassy Suites Resort Hotel Golf and Conference Center • Greenville, South Carolina. National and Regional Instructors along with Major Piano Manufacturers and Preferred Suppliers will be on hand for 2-1/2 days of comprehensive classes offering a full range of piano service topics. In a supplemental all-day class Thursday, October 23 learn to design and build your own pneumatic soundboard and bridge presses. Bring your spouse and enjoy a get-a-way in the spacious surroundings of a luxury resort hotel. For more information contact Don Valley, RPT (864)574-6165.

**THE RANDY POTTER SCHOOL OF PIANO TECHNOLOGY**—Home Study programs for beginning students, associate members studying to upgrade to Registered Piano Technician, and RPT's wanting to continue their education. Tuning, repairing, regulating, voicing, apprentice training, business practices. Top instructors and materials. Call or write for information: RANDY POTTER, RPT; 61592 ORION DRIVE; BEND, OR 97702; 541-382-5411. See our ad on page 3.

## VIDEOS

### INSTRUCTIONAL VIDEO TAPES.

Victor A. Benvenuto. Piano Tuning, \$50.00\*; Grand Regulating, \$50.00\*; Grand Rebuilding, \$100.00 (2)\*; Key Making, \$50.00\*; Soundboard Replacement, \$29.95\*. (\*Plus S/H). The Piano Shoppe, Inc., 6825 Germantown Avenue, Philadelphia, PA 19119-2113; Ph. 215-438-7038, Fax, 215-848-7426

### SUPERIOR INSTRUCTIONAL TAPES

\*\* All videos at one price, \$50 @ \*\*  
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**PIANO TECHNOLOGY EDUCATIONAL MATERIALS.** \$49.95 each reel—Vertical Piano Regulation, presented by Doug Neal. Presented by Cliff Geers: Plate & Pinblock Installation Part I, Plate & Pinblock Installation Part II, Wood Repairs, Soundboard Repair, and Grand Hammer Replacement. Add \$5 per order for shipping and handling. Questions? Call 712-277-2187. Mail orders to PTEM, 3133 Summit, Sioux City, IA 51104.

## WANTED

**WANTED!! DEAD OR ALIVE:** "Steinway uprights and grands." Call collect, Ben Knauer, 818-343-7744.

### STEINWAYS!! STEINWAYS!!

STEINWAYS!! Absolute highest cash prices guaranteed for your Steinway grand pianos. Any age, any condition. Immediate pick-up. Virtuoso Pianos, 800-449-3850.

**WANTED:** Very old Chickering Grands to restore. PTG member, technician would appreciate your referrals. Contact Michael W. Hart, P.O. Box 268, Corbin, KY 40702 (606) 528-8760.

**LOOKING FOR KEYFRAME** with keyboard or if necessary, the whole action for an 88 key 6'1" Steinway A #121116. Call Leopold at N.Y. Piano Center at 1-800-642-5648.

**LOOKING TO BUY OSLUND KEY MACHINES**—any condition. Vincent Izzo's Piano Gallery, 516-437-4386

**WANTED** by PTG member/technician. A copy of the book "Historical Pianos." Please call 606-528-8760.

**PIANOS! PIANOS! PIANOS! !!!**Free phone appraisal!!! Buying all types of usable pianos. Cash or bank check on pick up. Won't hesitate on price. Call us first for fast professional service. "Steinway, Mason-Hamlin command specialty prices." Jay-Mart Wholesale, P.O. Box 21148, Cleveland, OH 44121. Call Irv Jacoby 1-800-411-2363, or collect 216-382-7600/FAX 216-382-3249.

Have you seen a **MERRIFIELD PIANO?** (Built by the Western Cottage Piano & Organ Co. in Ottawa, IL during the mid to late 1800's.) I am interested in buying a **MERRIFIELD PIANO**, any condition. Please fax, call or email if you have any information regarding a **MERRIFIELD PIANO**. Fax: (619)974-5290, Phone: (619)823-4775. Email: ginnym@cerfnet.com

**WANTED: TINY PIANOS** such as the Wurlitzer Student Butterfly or other small types. No more than 50 keys. Call toll-free: Doug Taylor, 1-888-895-6211. I'll pay shipping!

**WANTED: Heintzman, Mason & Risch, Nordheimer, Steinway & Sons, Mason & Hamlin, Knabe & other vintage grand pianos.** Call Karl Verhnjak RPT or Rod Verhnjak, Surrey, B.C. 1-800-240-7426. [www.dirrect.ca/verhnjakpianos](http://www.dirrect.ca/verhnjakpianos)

**WANTED:** By PTG Member Technician—**OLD ROSEWOOD VENEER.** Any size or amount acceptable. Contact Michael W. Hart, P.O. Box 268, Corbin, KY 40702 (606) 528-8760.

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# PianoDisc<sup>TM</sup>

September 1997

News From The World of MSR/PianoDisc, Knabe, Mason & Hamlin

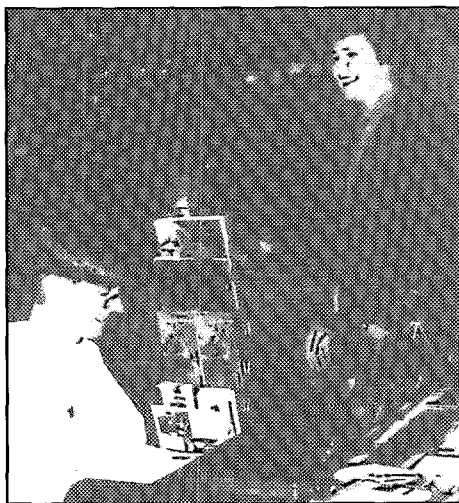
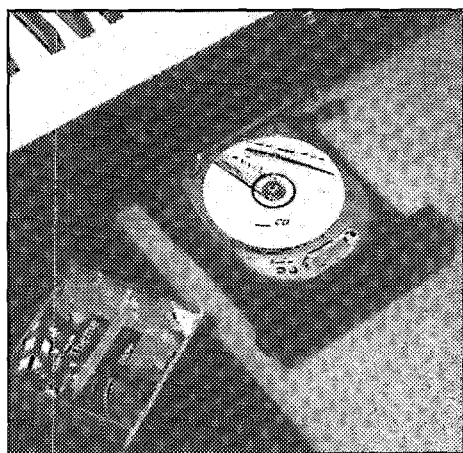
## Detroit dealer has "a better idea"

Evola Music, of the greater Detroit metropolitan area, has proven that not all the ingenuity in the Motor City is applied to the auto industry. Their "better idea" involves the placement of the portable CD player used with the PDS-128 Plus system in a customized drawer located under the keybed.

The drawer they use was designed by Evola's on-staff technician, David Anderson, and independent technician, David Lohnes. It's made of molded plastic, or a sheet metal base with a wooden front panel, and painted to compliment the piano's finish. The assembly is then mounted under the keybed, on the side opposite the 128 Plus control unit. Using drawer glides, the drawer offers easy access to the portable CD player housed within.

"With a 128-Plus it's a real nice combination," commented Michael Evola. "Customers appreciate having the CD player close to the control unit but out of sight."

"We applaud Evola Music for this wonderful innovation," remarked MSR President Gary Burgett. "It proves that they go the extra mile for their customers."



## Concert is highlight at Summer NAMM

MSR's Chris Logan knows how to draw a crowd in Nashville: sing a great country song! The talented singer/songwriter knows how to **keep** one, too; follow that first great song with four more!

Our District Sales Manager gave NAMM Show attendees an impromptu concert when Nashville pianist, Kyle Hankins (who performs on tour and in the studio with country great Lacy J. Dalton), dropped by the booth. The two performed five of Chris' own compositions. Hankins had no trouble playing the pieces since he'd recorded them with Chris earlier this year.

What many of her dealers may not know is that Chris once had her own country band, "Chris Logan and Northeaster." (They opened for "Alabama," Willie Nelson, and other top country acts.)

"I have the best of all worlds: the love of music and a sales career that allows me to share that love with others. PianoDisc brings music right into the home and what more can any musician ask?"

## PianoDisc

## Free tech classes are money in the bank!

How would you like to make an investment that is virtually **risk free**? One that practically **guarantees you profit** for years to come? And what if all it would cost is your **time**? Would you be interested?

For one week every month, PianoDisc makes that kind of investment available to piano technicians, with its **Installation Training Classes**. Tuition is **free** and technicians from all over the world have discovered that giving one week to this hands-on, intensive training is probably the best investment they've ever made.

To attend, you must have a minimum of two years experience as a piano technician. Classes, usually kept to a maximum of 10 participants, are held at the MSR/PianoDisc factory in Sacramento, CA. One of Sacramento's fine hotels gives trainees an attractive group rate and offers shuttle service from the airport to the hotel, as well as to and from the factory each day. Continental breakfast is available at the factory and lunch is provided by PianoDisc each day as well.

Students are given hands-on training in all phases of installation: from cutting the slot in the keybed to troubleshooting systems in the field. Each receives installation guides, a history of all of our software and components, and information on all models of PianoDisc. They're also given a lengthy factory tour covering everything we do from engineering to editing our disks.

Once they've successfully completed the class, participants receive certificates which acknowledge them as Certified PianoDisc Technicians. They are encouraged to return for **Continuing Education Classes** each year thereafter, to fine-tune their skills, learn about any new products and upgrades, and further advance their knowledge of the system.

For more information about what may literally be "**The Investment of a Lifetime**," call PianoDisc at (916) 567-9999.

Don't forget to check out our MSR website at [www.pianodisc.com](http://www.pianodisc.com)

### 1997 INSTALLATION TRAINING SCHEDULE

#### TECH TRAINING

Sep. 23-28    Oct. 21-26



#### CONTINUING EDUCATION

Sep./Oct. 30-2    Oct. 28-30

Tuition for the Installation and Continuing Education seminars is free, but a \$50 refundable deposit is required for confirmation. The PianoDisc Continuing Education Seminars are restricted to PianoDisc certified technicians in good standing. For more information, call PianoDisc at (916) 567-9999.

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# Tech Gazette

Yamaha Service

September 1997

**Last month**, we discussed the procedures for soundboard construction used by one of the world's most modern piano facilities, Yamaha Music Manufacturing (YMM) in Thomaston, Georgia. Over 50% of the Yamaha pianos sold in the USA are built in this factory.

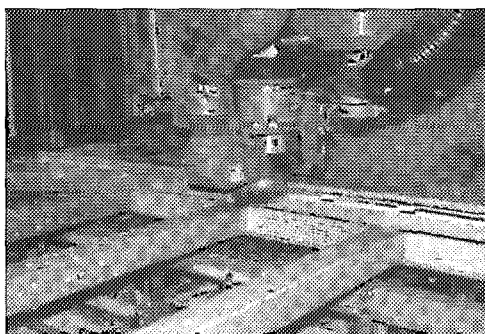
Over the next few months the Tech Gazette article will focus on the back assembly line.

## *Robotic Shaping Of The Soundboard*

One large problem to overcome when making the strung back assembly is that of shaping the soundboard liner. This is the piece of wood attached to the wooden backframe on which the soundboard is glued.

A properly constructed soundboard is not flat, but has a compound curvature that raises the center of the soundboard toward the strings. The curvature is called the crown and is approximately a 60 foot sphere, although not truly spherical. In this way, when the edges of the soundboard are glued to the liner, the crown is reinforced.

As you can imagine, this procedure is very difficult to do by hand, and the computer controlled machine shown here was designed and built by Yamaha. It utilizes technology and design unmatched in the industry today. It was born out of the need to

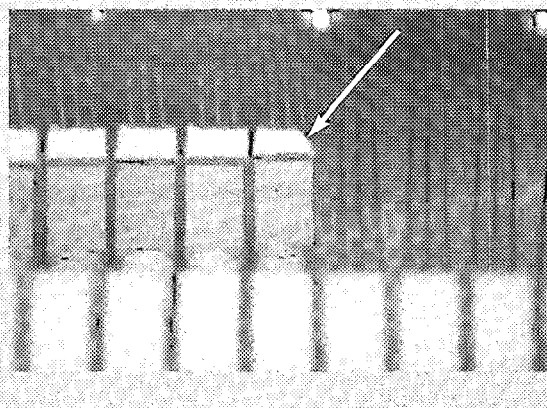


shape the liner to the same precise compound curvature on every piano built of that model, and out of the experience of building over 5,000,000 pianos. Almost by definition it is impossible to duplicate this precision any other way.

In addition to the curvature, the liner must be machined to accept the rib ends, for all Yamaha pianos utilize full length ribs that are glued into the "notched" liner. The Yamaha machine is programmed to do that job as well!

## *The YMM "Tip of the Month"*

As you know, dampers do not cover all the treble strings. There is always a definite "stopping place" where the string covered by the last damper stops ringing and the next high pitch continues to ring. At Yamaha, the last damper is trimmed so that it leaves one string ringing. This gives a smoother transition across that area for the pianist and the listener.



***Stay tuned for next month's information from Yamaha Music Manufacturing.***