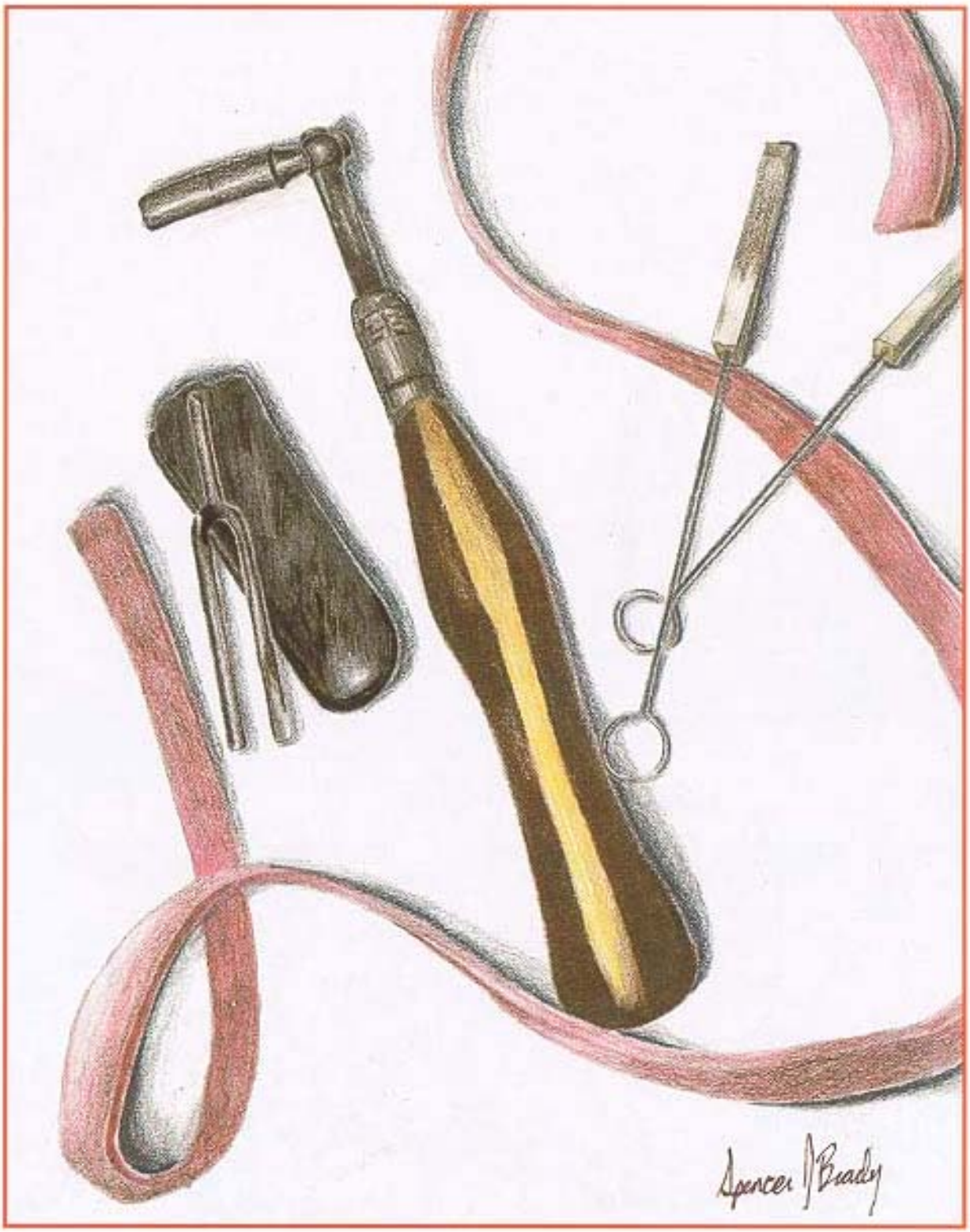
PIANO TECHNICIANS
# Journal
*Official Publication of the Piano Technicians Guild*

December 1995 Vol. 38 • #12



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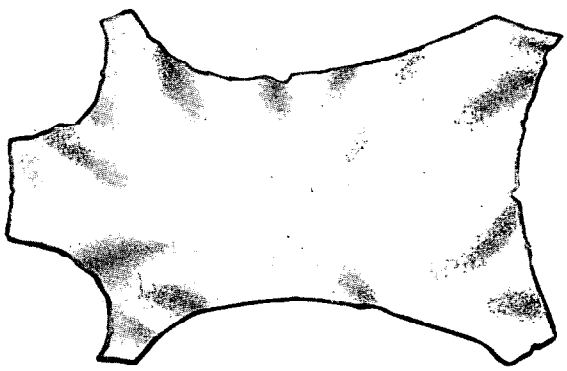

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PIANO TECHNICIANS
# Journal
*Official Publication of Piano Technicians Guild*

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## *Editorial Perspective*

# *The Discovery of the Piano*

**Steve Brady, RPT**
***Journal* Editor**

A doctor friend of mine recently expressed amazement that we piano technicians could possibly have enough subject matter to fill a monthly magazine running to some 60 or 70 pages. As I reflected on this, I realized once again how different our craft seems to others than it does to us. To a physician who has dozens of journals to choose from, and who must in all likelihood read several every month just to keep from falling behind, our profession must seem like a static, immutable blast from the past. After all, discoveries about the human body are being made every day. These discoveries must be reported, and hence the need for journals. The piano, on the other hand, is a machine which was *invented* in about 1700; what can there possibly be left for anyone to say about it?

Within my first five years out of tuning school, I was fortunate enough to find a collection of all the past issues of the *Piano Technicians Journal*, to buy them, and to read them from cover to cover. Twice. Why on earth would anyone do such a thing?

Granted, all the past issues in 1974 amounted to less than half of what it would be today. But that's part of the point. In 1974 there was precious little in the way of printed material about piano tuning and technology. My textbook in school had been a thin volume published by Tuner's Supply Company, titled *Repairing and Regulating of Pianos.* Although it bore a 1971 publication date, it had obviously been written long before. In 1974, *Piano Tuning and Allied Arts,* by William Braid White, was still considered the "tuner's Bible." This book was first published in 1917! Sure, there had been a few new books about piano technology in the 60 years between Braid White's and Arthur Reblitz's books, but there sure wasn't much in print when I entered the field. So I read the past *Journals.*

Now, I don't mean to denigrate the reading of past *Journals.* I learned a lot about piano work, and also absorbed a lot of the history of our profession and our organization. In fact, I recommend the experience highly. But the material in journals tends to be diffuse; that's the nature of a journal. If you want structured or highly organized information, you need a book. And a good book at that.

My doctor friend was further astounded when I told him of the explosion of technical literature in our field within the last five to 10 years; literature I wish had been available when I began my training in 1972. It would have made my training, not to mention my reference library, much more complete.

But why do we tuners need a journal? Why do we need continuing education? Because our knowledge of pianos is evolving. I like Eric Schandall's statement in last month's *Journal*: "I've often felt we have been like early Egyptologists studying the pyramids — speculating about, but not really understanding, how they were built. This has begun to change, as it must." PTJ

■ ■ ■

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## FEATURES



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## COVER ART

*The still life of the tools commonly used by piano technicians on this month's cover was created by* Journal *Illustrator Spencer Brady using colored pencils.*

## COLUMNS & COMMENTS



## DEPARTMENTS



## IN ADDITION




PIANO TECHNICIANS
# Journal
Volume 38 • Number 12 • December 1995

# Strategic Planning: Politics & Policy — Elections of Officers

In last month's article I took a look at how Council works within the framework of our political system. Several points were identified to generate thinking into how members are represented in the "Council" system of governing:

1. Are the views of all member effectively represented by the delegates?
2. Since Council meets only once a year, can it meets its requirements of governing in a timely manner?
3. Associate members are not directly represented.
4. Council often gets bogged down in doing "committee" work.

This month I will examine the process of selecting the individuals who serve on the **Board of Directors.**

**PTG President**
***Leon Speir, RPT***

## *Elections of Officers*

One of the primary duties of Council each year is to select those who will serve the following year on the Board of Directors. Two methods are utilized for selection of Board members:

- The **Executive Committee**, consisting of the President, the Vice President, and the Secretary-Treasurer is selected by the entire council assembled as a body. A majority vote of the assembled council delegates is required for election, except when a candidate is seeking a third term in office, then a two-thirds vote of the delegates is required.
- Selection of the seven **Regional Vice Presidents** is carried out by individual regional caucuses. The main body of council breaks up and each delegate is asked to report to an assigned area to meet with the other delegates from their respective region. These smaller bodies of delegates (seven in all) then each selects its regional representative (Regional Vice President) to serve on the Executive Board. A majority vote of those assembled in the regional caucuses is required for election, except when a candidate is seeking a third term in office, then a two-thirds vote of those assembled is required. After the regional caucuses have make their selections, the entire council body then reassembles to ratify the elections of the Regional Vice Presidents.

When examining the selection process to elect the Board of Directors, some of the questions we may ask ourselves are:

- Are the views of all members effectively represented by the delegates? Sometimes chapters delegates do not attend the regional caucuses even though the delegate is present in council. The Regional Vice President is then selected by only a handful of delegates representing a fraction of the chapters in the region.
- Should selection of the Regional Vice President be carried out by ballots sent to each chapter within the region?
- Should officers be elected to serve a two year term instead of one?
- Should terms of office be limited to two years?
- Should the two thirds vote requirement be eliminated for election to a third, fourth, etc. term?

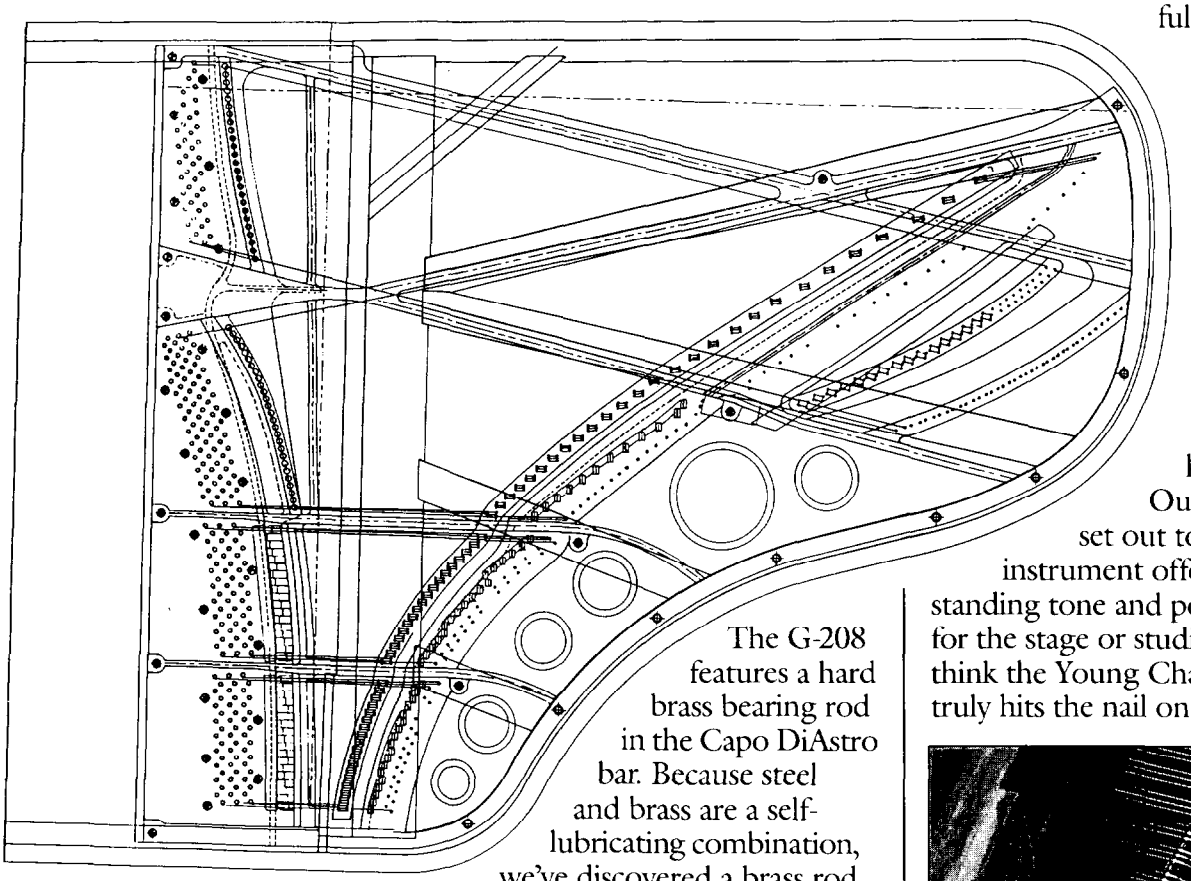
With these questions I will conclude my articles which examine our system of government. Obviously, I have neither asked all the questions or addressed all the issues which relate to this topic. My purpose has been to present this information to examine if there is a need among the members to make a change. If there is a need, let your representative on the Board know your views. If there is a need, this year of *"Strategic Planning"* is the time for a thorough examination of the political system to develop a proposal for change.

In this Holiday Season, as we reflect over this past year, I hope it has brought each of you happiness and prosperity. From my family to yours, **"HAPPY HOLIDAYS AND A PROSPEROUS AND HAPPY NEW YEAR"!**

# A nuts and bolts guide to the new Young Chang G-208.

Our engineers are obsessed with the little things because they recognize the importance of attention to detail. But lately, they've become equally obsessed with big things, and the result is 6′10″ long. Our new G-208 grand is a departure for us and represents the smallest and largest of our latest innovations.

The G-208 is a 6′10″ grand piano of an entirely new scale design. It features our new "Asymmetrically Crowned" soundboard which places the highest part of the crown in each rib directly under the bridge providing maximum support under the downbearing pressure of the strings. This new soundboard design exhibits improved power, projection and tuning stability, and offers a longer soundboard lifetime. We're so pleased with this new design, we're now incorporating it into all our grand pianos.



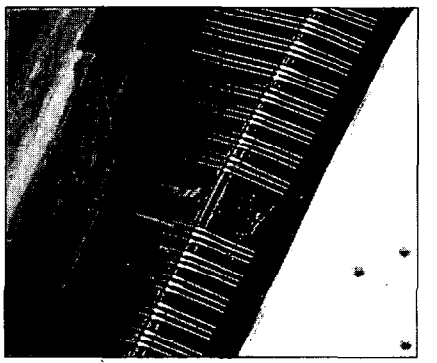
The G-208 features a hard brass bearing rod in the Capo DiAstro bar. Because steel and brass are a self-lubricating combination, we've discovered a brass rod offers better control of strings during tuning. In addition, the brass rod is easily replaced later in the life of the instrument eliminating the need for reshaping of the capo bar.

We also took a close look at our action and developed an all-new action design which improves response without loss of projection or clarity.

Our new double duplex system terminates the strings at the rear of the bridge and near the tuning pins with duplex bars. Both duplex lengths of the strings for each note are then terminated in equal length offering improved sustain, projection and clarity.

Together these innovations create an instrument with a rich, full sound, greatly improved response and a remarkable evenness of tone throughout the entire range of the keyboard.

Our engineers set out to design an instrument offering outstanding tone and performance for the stage or studio. And we think the Young Chang G-208 truly hits the nail on the head.



*Because strings bear against a replaceable brass rod, tuning control is improved.*

For technical information on our new G-208 grand piano, write to us at Young Chang America, Inc., 13336 Alondra Blvd, Cerritos, CA 90701. Or call 310/926-3200, ext. 237.

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# Letters

## Noises in Uprights, Rejoined

I'm writing to comment on Ernie Juhn's article, "Noise Clinic - Part 2." In the section, "Noises in Uprights," he emphasizes **not** tightening damper lever flange screws. His point was that tightening the screw might upset the seating of the damper felt on the string and cause after-ring. That may be appropriate when troubleshooting noises and clicks, but not appropriate in another case. I frequently run across uprights where a few dampers have shifted sideways enough so that the damper does not damp one string sufficiently. The tendency would be to bend the wire to correct the problem. I have found that tightening the flange screw may shift the damper head back far enough to correct the problem; then, if not, I bend the wire. I find the *Journal* very helpful in my work, and want to encourage you to keep up the good work!

*— Cordially, Bill Maxim, RPT*

## Ernie Juhn Replies:

I agree with Bill Maxim. I should have written: "When routinely tightening screws it might be a good idea not to tighten damper flange screws because...." In cases as the one Bill describes, my remarks, of course, do not apply.

## Yamaha Disklavier Service Class

(I recently) attended a set of marvelous classes hosted by Yamaha's incomparable Brian DeTar at Cascade Piano in Portland and at Don Lawson's Keyboard Center in Eugene, covering the care and feeding of Yamaha's exciting new "player-piano" or Disklavier System (that's DKV, for the acronym-minded). The classes covered (hopefully) all the intimidated tuner/technician needs to know about the servicing of these fascinating devices.

Before attending these classes I had only a vague knowledge of how the system operated and less about servicing it! I knew there was a small computer in there to read and operate the "disks," and that the keys were thrown by solenoids (which made me think of car-starters — yup, the solenoid's shot, better replace it). What I did not know was how extremely refined and elegant (read: *simple*) the whole system actually is, and the amazing sensitivity in *total* reproduction it produces. The Disklavier's ability to reproduce so precisely the input from the pianist from keystroke to pedaling is nothing less than astounding. The added benefit of MIDI compatibility allows the Disklavier to speak to other MIDI equipment, function as a "trigger" for all sorts of voices and effects, and lets you store all these onto the system's disk for playback or editing. The designers even allowed for updates to the computer's software with replaceable ROM modules (a small screwdriver run under the module lifts it into your hand from it's niche on the electrical-looking-thingie under the keyboard). Yamaha has put the acoustic piano into the 90's and beyond, no doubt.

How did they do that? With, as Brian put it, "a nearly bullet-proof system" of sensing keystroke, hammer velocity, and pedal travel. Not merely "on-off" but actual pedal travel from 0 percent to 100 percent, to capture all the nuance live performances actually produce. What did it take? Two sensor rails, one for hammer velocity and one for keystroke, a set of "gray-scale" sensors for pedal travel (not just "on-off," but how far? how fast?), drive-solenoids for each key and pedal with variable response capabilities, and a small computer equipped with a program capable of processing the input from the photo-optic sensing system (at the hammers, keys, and pedals) into the output of energy at the keys and pedals with such remarkable precision. They did this without altering the standard piano action. The only additional weight or alteration of the action is the addition of a tiny "flag" or metal tab on the hammer-shank and bottom of the key for the sensors to read motion from. And the servicing is straight-forward and. . . well, I won't say idiot-proof — moron-resistant, maybe???

Servicing the system starts with a simple "Record and Playback" of every note, from Key #1 to #88 with a firm touch and then operating each of the pedals three times. The playback reveals any gross errors in sensor alignment (or your playing!), and lets you know if one of the two sensor rails is grossly out-of-alignment (ie; Did the system play what you played? Louder or softer in some sections? Not at all in others? Did the pedals move? Did they move as you moved them?). Then you ask the system to report an "Error-History," which tells you of any faults or temporary shut-downs by any of the system's sub-parts since you last serviced the instrument. From there, you check basic regulation, adjust positioning of the sensor rails, adjust the pedal rods and sensors, and then ask the system to *self-adjust* to the new settings on the sensors for maximum sensitivity and reproduction. The Disklavier runs through all the keys at ppp, mf, and fff, and then allows you to adjust any minor discrepancies between the computer's vision of the world and what *is* the real world. It really is rather simple and straight-forward, and well within the average tuner/tech's ability to service. The total time that a complete servicing of the system requires is maybe 20 to 30 minutes, and about 10 minutes of that is the piano running through its own diagnostic functions and digesting what you've changed in sensor alignment.

I strongly recommend that everyone attend the next Disklavier Service Seminar given within your area. It's fascinating, fun, and extremely interesting.

*— Jeffrey T. Hickey*
*TUNERJEFF@aol.com*

P.S.— The Disklavier has only *91* moving parts, they are the drive solenoids for each of 88 keys and three pedals. Basically, the solenoids are cylinder-shaped electromagnets with a plunger that is lifted by applying current to the magnet. Because the plunger is lifted by a magnetic field

**Continued on Page 12**

The 2nd GPA
Dublin International
Piano Competition
Dublin, Ireland
*All Six Prize Winners selected Kawai.*

The 42nd ARD International
Music Competition
Munich, Germany
*First Prize Winner selected Kawai.*

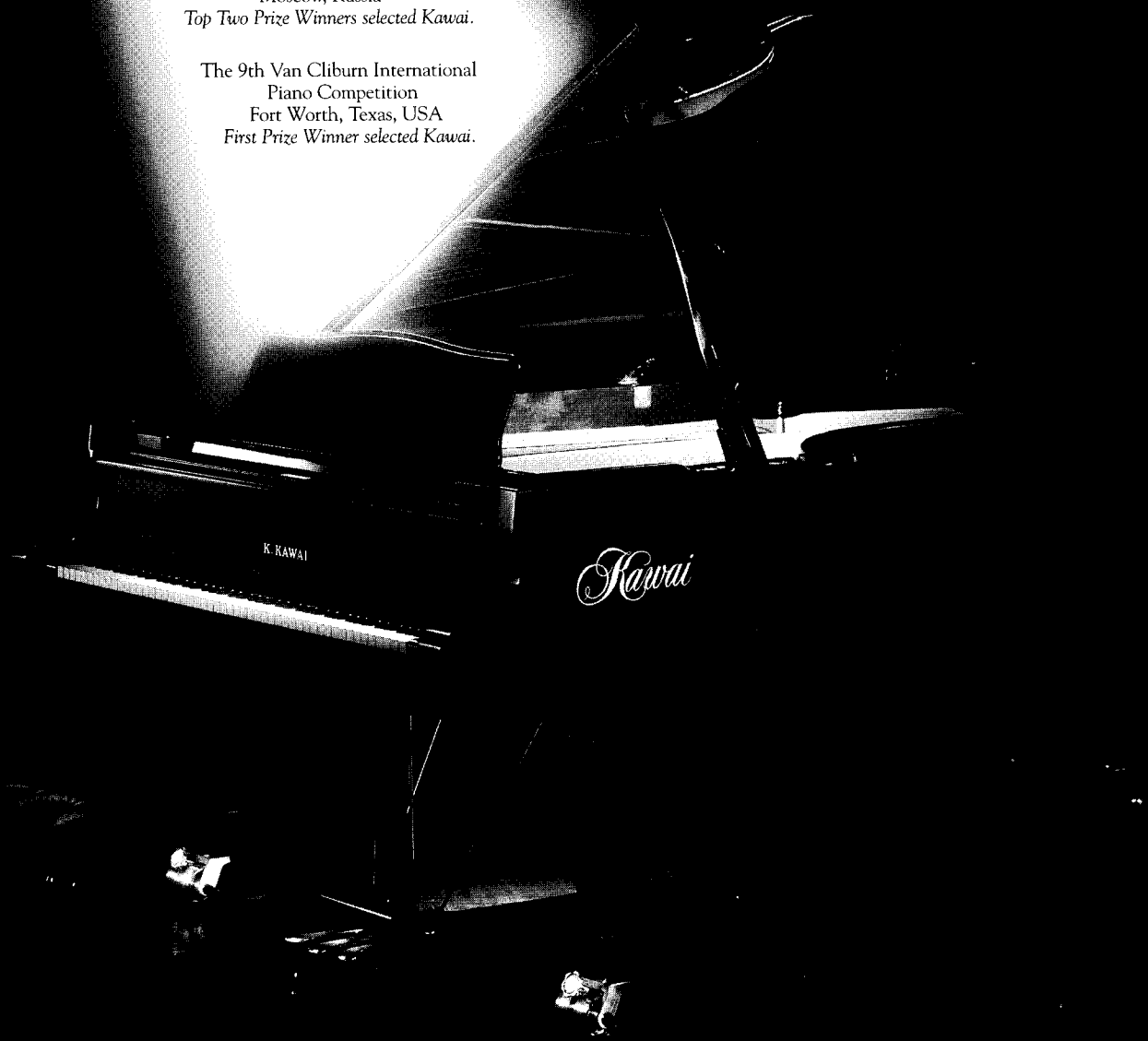
The 45th Ferruccio Busoni
International Piano Competition
Bolzano, Italy
*First Prize Winner selected Kawai.*

The 11th Santander
International Piano Competition
Santander, Spain
*First Prize Winner selected Kawai.*

The 2nd Hamamatsu
International Piano Competition
Hamamatsu, Japan
*First Prize Winner selected Kawai.*

The 10th International
Tchaikovsky Competition
Moscow, Russia
*Top Two Prize Winners selected Kawai.*

The 9th Van Cliburn International
Piano Competition
Fort Worth, Texas, USA
*First Prize Winner selected Kawai.*



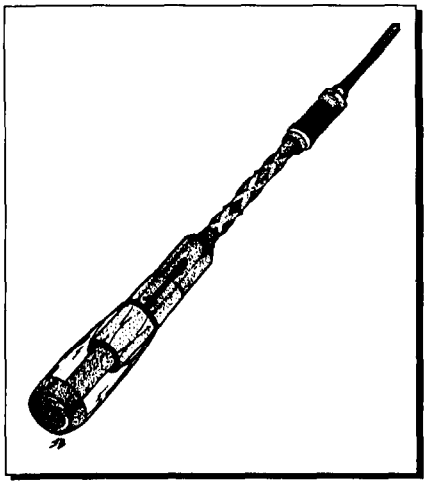

*It's becoming a familiar refrain.*

TT&T

## Push-Drill

*(Reprinted from "The Kansas City Beat')*

I have long suggested that piano technicians carry a push-drill as I have found that with such a drill one can drill almost any hole needed. Such a drill can be carried in a technician's tool case, while electric drills, I assume, must stay in the car until needed, so a push-drill saves me trips out to the car. Okay, okay, a push-drill can't handle the right-angle drilling needed for some piano work, but still, I wouldn't be without my old-fashioned Yankee drill.



I recently got a lesson in just how old-fashioned push-drills are. Cordless electric drills are standard fare, and in the last few years have mostly pushed the older alternatives out of the hardware stores. I still think, old fogey that I am apparently becoming, that cordless drills are a nice idea, but that the technology does not yet exist to execute this nice idea properly. In other words, the batteries available for cordless electric drills are neither powerful nor long-lived enough to make them truly workable. (In the past 15 years I have had exactly one push-drill. How many cordless electric drills have you had in that time?)

Not long ago, I needed new drill bits for my push-drill and went to a number of hardware stores, coming out of each empty-handed. Indeed, I nearly caused an international incident in one store when, after being asked by a sales clerk what I was looking for, I was unable to describe the bits in terms that were in any way recognizable to the hapless clerk. He thought that I was too stupid to properly describe what I thought I wanted, and I thought ... well, never mind what I thought. I went to Sears, found the oldest-looking sales clerk I could, asked him for bits for my push-drill, and he asked, "Which size shank?" Success! He knew what I was talking about and had an ample supply.

I am happy to report that Sears still stocks what appears to be a good push-drill for about $25. It comes with a set of eight bits included. Extra sets of bits cost about $8. I'd stock up if I were you.

*— Kent Swafford, RPT*

TT&T

## Center Pinning — Hidden Secrets!

Center pinning, hidden secrets! Like those sleazy tabloids, such titles catch your attention. Of course, we all know there are no hidden secrets to center pinning; however, there are a few that often get passed over in center pinning discussions.

Health problems associated with cholesterol are new to us. Years back, people had cholesterol problems except they didn't understand what it was all about. Unfortunately, a few piano manufacturers unwittingly introduced cholesterol into piano actions. What? You don't believe it? Animal fat was a lubricant used in pianos a few years back. Among its many uses was as a lubricant in flange centers, thus the introduction of cholesterol into piano actions. Well, I don't know if we can really call it cholesterol, but the term fits in with modern technology. However, long-term results of the animal fat lubricant are no joke. Old Steinways are among those pianos that often have sluggish actions as a result of animal fat lubricant. They call it tallow.

Use of center pin lubricant will generally offer a temporary solution. If the problem is aggravated by moisture, installation of a heater and switching control might improve the situation. And, there is the old standby — repinning all the centers.

None of the above offer a permanent fix. Repinning is a waste of your time and the customer's money because the animal fat is still there, waiting to reactivate. The only real fixes are: rebush with new cloth or replace the flanges (if a vertical) or shanks and flanges (if a grand). Generally, a piano this old and with the sluggish action problem needs new hammers and much other work anyway, offering the perfect opportunity to replace all those old flanges and permanently correct the problem.

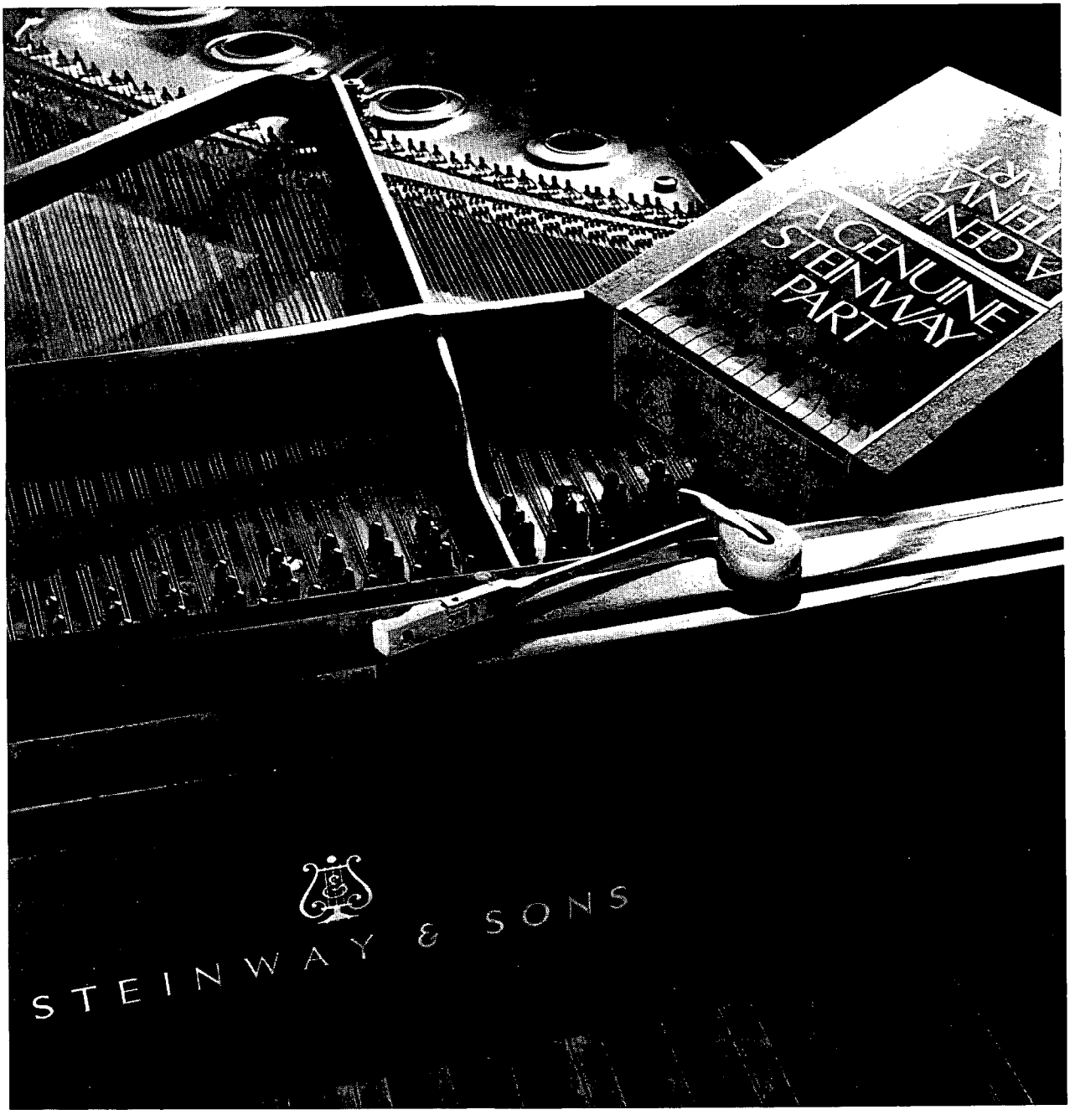
On with the tale. Have you ever corrected a tight hammer flange by repinning it, only to have it continue to bind afterwards? So, you remove it once again and check the center and it appears to be acceptable; yet when you put it back again it is still sluggish? Try this! Slightly loosen the flange screw and see what happens. If the flange is now free, you have isolated the problem. What problem? Simple: the working face of the flange is warped. When tightened against the rail, it literally puts a twist in the flange center bore and binds the center pin.

To correct this condition, resurface the flange face. Place a mill bastard file or some medium-grit sandpaper on a good flat surface, drag the face of the flange across the abrasive several times using gentle pressure. Drag it a couple of times diagonally, then switch flange direction slightly and do it a couple more times. If the flange has a spring-cord loop, place it to the rear, away from the direction of motion so you don't roll it under and damage it. In association with warped flanges on actions using aluminum main rails, be sure the rail surface is clean and free of burrs and free of distortion caused by driving in the flange screw. Correct by scraping. The end of a flat file should do the job. You can improve on this by grinding a slight angle on the end of the file — about 10 degrees.

Sloppy bushing procedures or poor-quality bushing cloth

**Continued on Page 12**

# STEINWAY

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# Tips, Tools & Techniques

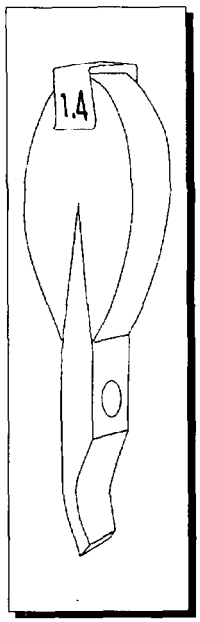
*Continued from Page 10*

are other sources of problems. If the bushing cloth is not trimmed properly it will flare out causing binding. Pin lube is unlikely to help this problem and may even aggravate it. Removing the flanges and trimming the cloth or replacing the cloth and repinning are the only solutions.

Textbook training advises us to always re-pin by reaming to fit the next-larger size pin, but there are vertical pianos with hammer butts using a small plate clamp that holds the center pin in place. If the pin is equally tight in both sides of the flanges, you might try using the next-smaller pin, with no reaming required.

*— Gerald Foye, RPT*

## T T&T Regulating Repetition Springs



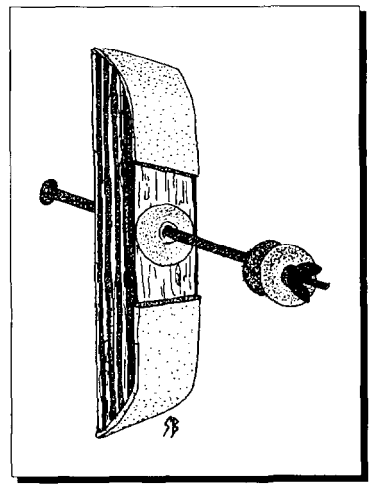

Adjusting the tension on grand repetition springs has always presented difficulties. Judging just how fast the hammer rises and being consistent from note to note is close to impossible. I have developed a technique that is helpful.

I have found that a slow hammer rise is much easier to set consistently than a fast one. Yet, I have a penchant for a relatively fast spring tension, as do many concert technicians. Attaching a small weight to the hammer will slow the hammer rise to a point where the speed can be judged. The clip-on weights are made from .017 inch galvanized roofing flashing weighing 1.2 gm, 1.4 gm and 1.6 gm.

Determine the degree of spring tension that works best for the particular action and client (I like 1.4 gm). Find the clip-on that slows the hammer rise to a very gradual climb. Using the weight, set the rest of the springs so all the hammers rise the same. I have found that using the same clip-on throughout achieves a perfect gradation of hammer rise from slow in the bass to faster in the treble. As a bonus you can also use the weights to help set the repetition lever height. Before taking the clip-ons off, set the repetition lever so the jack just rubs on the knuckle (rolling the jacks).

*— John Hartman, RPT*

## T T&T World's Best Lid Prop



This lid prop was developed by technician Clair Davies of Kentucky using common piano materials: a piece of pinblock stock, soundboard buttons, a pedal prop rod, a cloth front-rail punching, and leather scraps. Of all the lid props for vertical pianos that I've used over the years, this is absolutely the best. It's easily adjustable to work with practically any lid angle needed. Clair sells them for $12, and they're worth every penny.

*— Isaac Sadigursky, RPT*

# Letters

*Continued from Page 8*

(ie; no mechanical or physical input), *there is no appreciable wear on the moving parts* except at the contact point between the top of the plunger and bottom of the key. The latest improvement to the pedal system was to remove the separate rod for pedal function and make the standard pedal-rod into the plunger itself. This allows astounding precision in both pedal movement sensing and reproduction. The Disklavier is not only elegantly designed, it is functional and extremely durable as well.

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***(Editor's note: The following questions and answers were taken from the Internet discussion group, "pianotech.")***

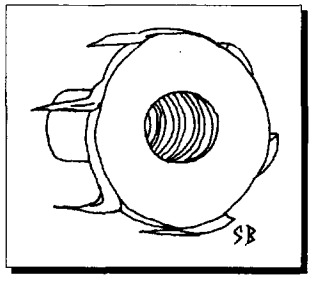
## Q Lyre Screwhole Repair

A colleague is looking for the *PTJ* article which covered the repairing of stripped-out lyre screw holes with T-nuts. Does anyone's index list this?

*— Kent Swafford, RPT*

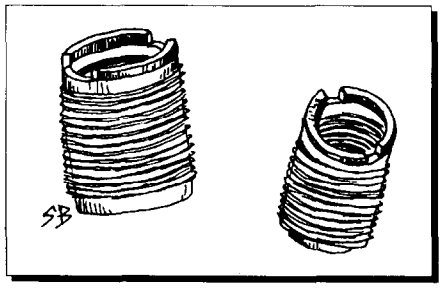
## A From Steve Brady, RPT

The article in question was the "Technical Forum" by Susan Graham in the February 1989 issue of the *Journal*, pages 12-14. To repair the stripped screwholes, you install a T-nut in each of the stripped holes. You then replace the existing wood screws with machine screws to fit the T-nuts (either 1/4" or 5/16"). Reading the article first can save you some frustration because Susan gives several excellent tips on preparing the holes and installing the T-nuts.




## A From Tom Seay, RPT

An alternative to the traditional T-nut grand piano pedal repair is to use a solid brass insert, sold by Woodworker's Supply of New Mexico (part # 866-994). This is a 3/8-16 threaded insert which goes into a 1/2" hole drilled into the existing screw holes. The insert has external knife threads and machine threads on the inside. You simply drill the new holes, screw in the inserts, and install 3/8-16 lag bolts with washers to attach the lyre to the keybed. These inserts cost about 65 cents each. I've used this method a few times and it really does work well. By the way, they have four different sizes ranging from 8-32 to 3/8-16. Their number is 1-800-645-9292.




## Q Credit Cards

Does anyone have firsthand experience with accepting credit cards from customers for services rendered while servicing pianos?

*— Keith A. McGavern, RPT*

## A From Larry Fine, RPT

I've never accepted credit cards in the field for tuning (because I haven't been tuning for some time), but I have accepted them for years in selling books — over the phone, on the Internet, at conventions, etc. You can either bring your card imprinter with you in your car, or imprint a bunch of forms in advance with your name and account number (or whatever your imprinter prints) and then write in the customer's card number and expiration date at the completion of the tuning. Fill the rest of the slip out, have the customer sign it, and give them the customer's copy. Back at home, you can process the slip electronically with a terminal or computer program, depending on what your bank requires; or if you process it manually (non-electronically), which means you send the bank a bunch of paper slips each week, you can call a phone number to get a voice authorization before sending it in so that if it's bad, you'll know right away and can call the customer. I have gotten a relatively small number of transactions that failed authorization, and it usually turns out to be that either I or the customer accidentally transposed two digits in the card number (which is why it's probably better to bring the card imprinter with you — it doesn't make mistakes). The credit card company automatically deposits the money in your local bank account (or wherever you direct) a few days after the deposit is received by mail, in person, or by terminal. Different credit card companies and banks have different procedures, but the one I've described is typical.

Some banks don't like to issue credit card merchant status to people who work out of their homes. If you do mail order, like I do, that's a double strike against you. Only one bank in the entire Boston area caters to people like me. They charged me 5 percent of the sales as a fee — this is a very high fee, as high as you'll find. Recently, however, I joined NAMM (the National Association of Music Merchants), which has a group program

***Continued on Page 18***

*Continued from Page 16*

that allows its members to do MasterCard/Visa transactions for only 1.72 percent. They also handle American Express and Discover, but those two organizations charge different fees — currently 1.88 percent for Discover and 3.75 percent for AMEX. The only problem is that you have to join NAMM, which costs $150 a year. For me, it still cuts my bank charges by half, but you would have to estimate whether it would be worth your while for the amount of credit card business you would do. For a mail-order company like mine, I could not survive if I did not do business by credit card. I doubt that's true for piano tuning. Look at how many times you've been asked if you took credit cards (and how many times you've been turned down for not doing so) to determine if it would be worth your while. On the other hand, if you're trying to sell, for instance, a regulating job, and you say, "By the way, I accept MasterCard and Visa," it might make the difference in getting the customers to part with their money. Hope this has been of some help.

## A From Del Gittinger, RPT

I've been set up to take credit cards with the exception of American Express for about three years now. I don't have a great number of clients who charge a normal tuning or service call. But, accepting the cards comes in very handy when extra service is needed for additional unplanned expenses. The client is more easily sold on the extra work if they can put it on their plastic and pay for it later.

My costs are $5.00 per month for the data terminal on my desk and a small (somewhere around 2 percent of the charge) fee per transaction. One charged tuning covers my annual cost.

The extra work sold because of accepting credit cards more than justifies the expense. The money is automatically deposited in my checking account by electronic transfer in a guaranteed maximum 48 hours.

## Q Re-gluing Horizontal Damper Flange in Grand

I have made my services available to a Chickering action that was "regulated" and needs regulating — while I'm in there I thought I might try to anchor the one damper flange that has come unglued from the flange rail. It sits horizontally and hangs in there all right since it is sandwiched in by two rails. It is mid-section and hard to see, let alone reach. Anybody got any ideas?

*— Audrey Karabinus, RPT*

## A From Richard Anderson, RPT

Slip about 6 inches of the right size of clear vinyl tubing (⅛"?) over the nozzle of your CA bottle. You can then snake the tubing into the flange and watch the CA flow as you tip the bottle. Good luck.

## Q Back Separation Repair

Back separation — the piano's, not mine. Can anyone supply me with or direct me to a *Journal* article on the procedure for repairing a separating back on a vertical piano? Should the tension be lowered? (I'm assuming: yes.) Would you use wood glue or epoxy in addition to installing bolts front-to-back? Should you draw the separation together using clamps and install the bolts, or can the bolts be used to draw it together? Thanks for any info.

*— Jeff Stickney, RPT*

## A From Newton Hunt, RPT

Jeff, this is not such a big deal, especially if you have the piano in the shop. If it is in the home it is more involved because you have to plan for each step so you have the tools needed.

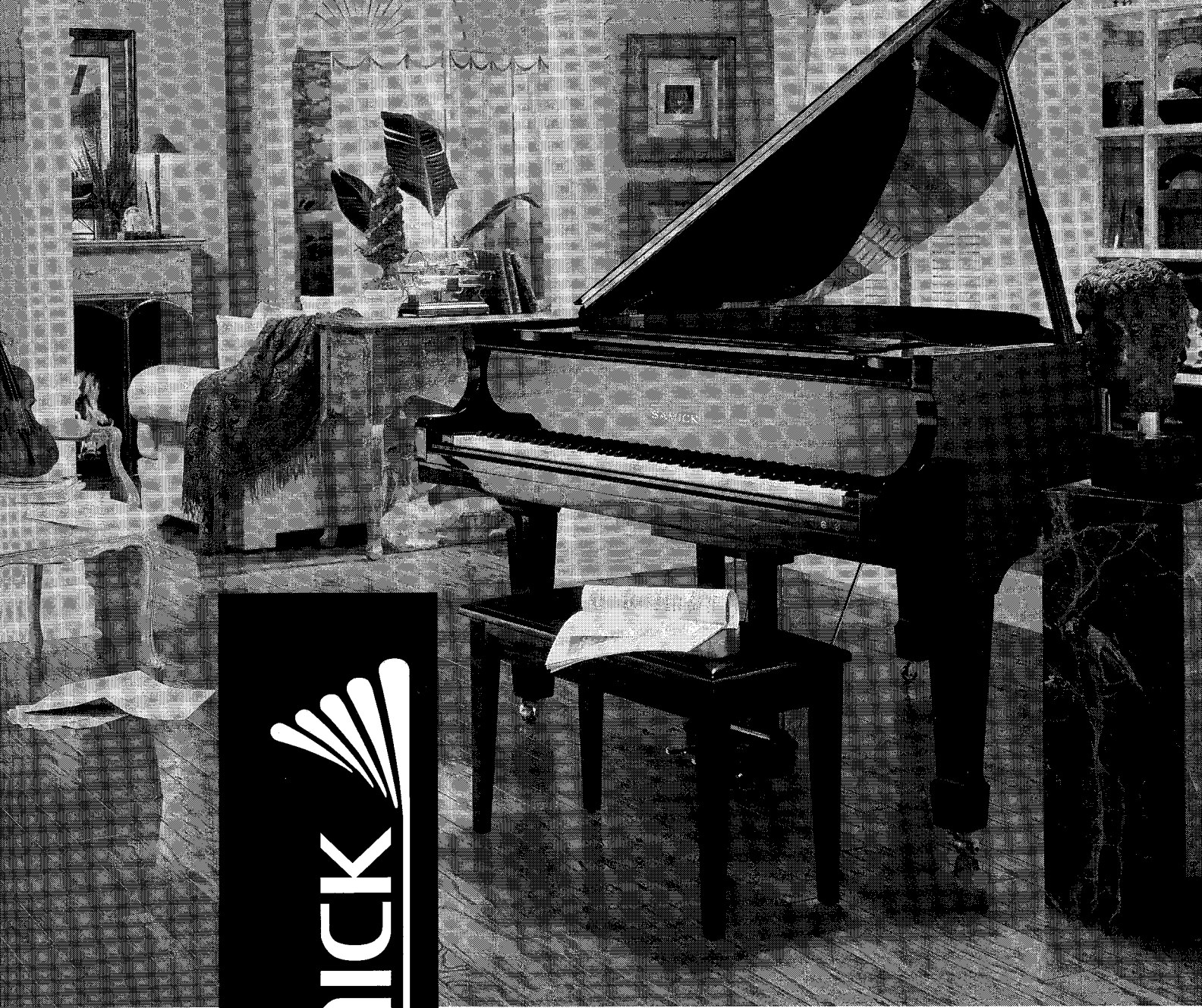
Lay the piano on its back and lower the tension of one string of a unison, then the second string of each unison and then the final set. Remove a screw from the plate that will allow the bolt to go through a back post. Drill out this hole to 1/2", all the way through.

If no convenient screw is available, you will have to drill through the plate to get a properly positioned bolt. All bolts should be near the upper edge of the plate where the factory put a bunch of screws.

Get 7/16" carriage bolts, washers and nuts from the hardware store. The bolts need to be long enough to go through the piano but not so long that you will run out of thread to tighten. The bolts go through from back-to-front so you have a nice finished appearance from the back of the piano and so nuts and such will not be gouging out the walls.

When all is prepared, bolts fitted, etc., then clean out the crack so you are not going to have an open crack. Get or cut blocks to protect the plate and have several dry set C-clamps

*Continued on Page 20*



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# Q&A

*Continued from Page 18*

ready when the glue goes in.

Using syringe, sticks, or whatever, get as much glue in the crack as you can. I would use regular wood glue. Get the C-clamps going, the bolts in the right holes, tighten it all up several times to get it as tight as you can, including all the rest of the plate screws you can get to. Allow to set for a day or so, then tighten the bolts again and remove the clamps. Then tune, tune, tune.

It works.

## A — From Paul Dempsey, RPT

I'm not sure which issue of the *Journal* has the topic you inquired about [*See Jack Krefting's article in the September, 1980 issue. SB*] , but you are on the right track in dealing with this problem. Yes, let down the tension. Yes, pull the separation together with clamps, then secure by drilling out the plate lag bolt holes through the back and countersink for the appropriate size nut and washers. Titebond® glue is fine. Check to see that the back posts' glue joints are solid. I have seen these fail as the back separated. Hope this helps.

## A — From Ron Berry, RPT

Check the bottom of the plate as well. Very often if it is coming apart at the pinblock, it will be loose at the bottom as well. Clamp the pinblock before you drill out the screw holes to accept bolts. This will keep wood chips from getting in the way of getting a good glue joint. PTJ

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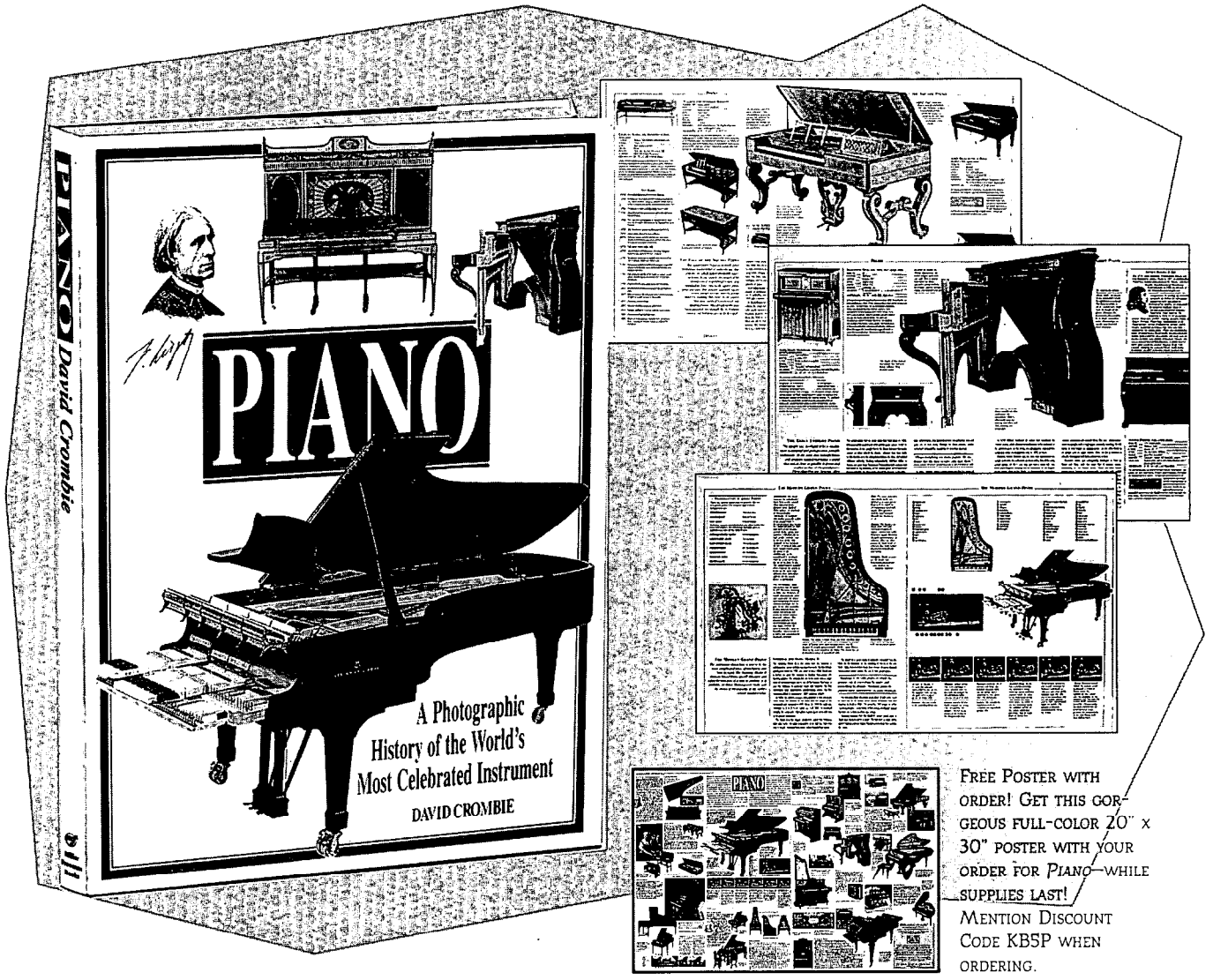


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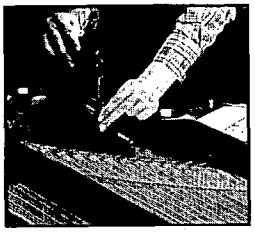

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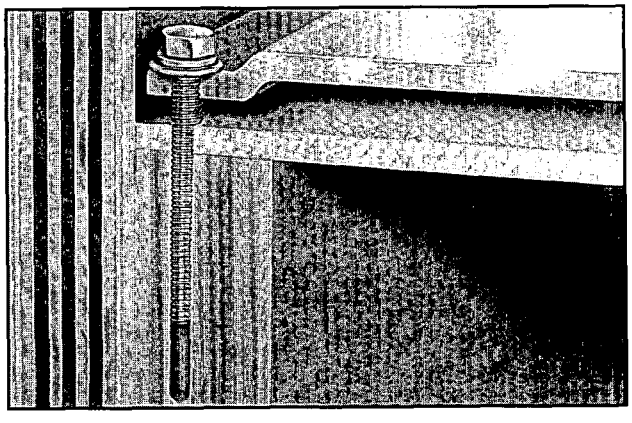

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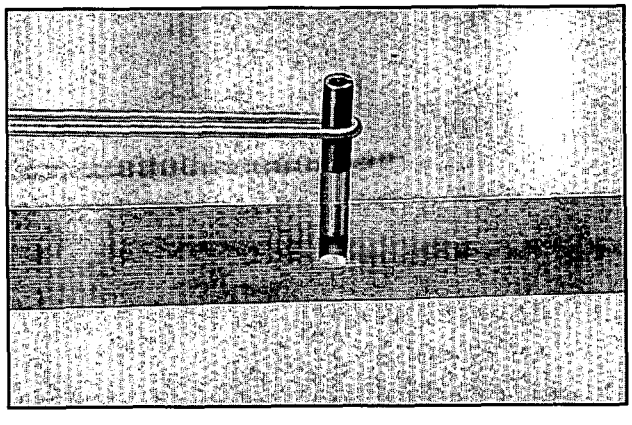

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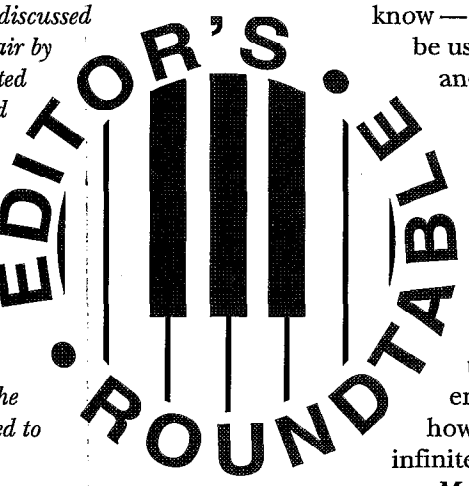
# Agraffes

*Steve Brady, RPT*
*Journal Editor*

## Introduction

*My answer to Zen Reinhardt's question in the May issue spurred a fascinating discussion on agraffes among the Internet group, "Piano-tech." At about the same time, Michael Wathen came up with a difficult broken-agraffe problem, which was also discussed by the group, concluding with a successful repair by Michael. For this Roundtable, I've selectively edited portions of those discussions, and also added material from other technicians and also from past* Journals, *to provide added depth.*

*Our cast of characters: Tom Seay, RPT; Ron Torrella, RPT; Dennis Johnson, RPT; Mark Story, RPT; Richard West, RPT; Ron Berry, RPT; Frank Emerson, RPT; Brian DeTar, RPT; Michael Wathen, RPT; Tim Hast, RPT; Isaac Sadigursky, RPT; Chris Robinson, RPT; Susan Graham, RPT. [A past editor of the* Piano Technicians Journal, *Susan is rumored to be scuba diving in the Bahamas. SB]*




***Steve Brady, RPT:*** In the May issue, my suggestion to use an "agraffe-removing tool" to square agraffes to the strings was a reply to Zen Reinhardt's question about aligning agraffes in the home as part of a regular service call. This will work very well in cases where the agraffes are out-of-square and simply need a nudge to straighten them up. It won't work so well if the agraffes are either too loose or too tight. If they are too loose, no amount of squaring will keep them square. If they are too tight to be turned by the tool in a regular combination handle, you can either attach Vise-grips® to the shank of the tool, or use the combination T-handle offered by Schaff. Glen Hart sells an agraffe-removing tool designed for use with a socket drive, and that would work here, too. The important thing, though, is that once you have enough leverage to turn a tight agraffe, you don't overdo it and break the agraffe. If the agraffe is too tight to turn clockwise with mild effort, I wouldn't force it. The right way to correct that is to use thin washers under the head of the agraffe or to remove material from the bottom of the head with a hollow mill or similar tool. Obviously, you have to remove strings (and the agraffes) to do that kind of work.

***Tom Seay:*** Do the supply houses carry those thin washers anymore and, if so, what are they called? Also, do they come in different thicknesses?

***Ron Torrella:*** You've come to the right place! They're called agraffe-shimming washers. APSCO sells them on page 91 of catalog No. 96 (right-hand side, right column, just below agraffes).

***Mark Story:*** I've never been able to get the washers to work very well - even the thinnest are too darn thick. Usually, you only need to take up a third of a turn or less. Someone calculated this for a *Journal* item once (where's that *Journal* CD ROM?), and concluded what we already know — you can't make a washer thin enough to be useful. You could, I suppose, use a washer and then mill the agraffe to fit.

***Steve Brady:*** The *Journal* item you refer to appears in the February, 1983 issue, on page 14. Bill Pealer, RPT, calculated all the washer thicknesses necessary to align agraffes in one-degree increments, and presented these in table form. Neither he nor Jack Krefting, then PTJ Editor, concluded that you couldn't make a washer thin enough to be useful; Krefting did remark, however, that washers are not available in an infinite assortment of thicknesses.

***Mark Story:*** What I have resorted to is using a piece of thin copper wire wrapped in a ring. The copper is soft enough that it will flatten to take up the slack that you need.

***Ron Torrella:*** I guess you've figured out how to get that tiny piece of wire to stay out at the perimeter of the agraffe seating area. As I recall, most agraffes have a recess in the area where they seat against the plate. Do you, perhaps, circle the copper wire several times? How about taking a hammer to such a ring before dropping it under the agraffe? Matter of fact, that's how I get the supply house washers to fit (the ones that you mentioned as being too thick to be of use). If they're too tall, I smack 'em a few times with a hammer. They usually flatten out to where they're useful. Okay, once in a while their diameter gets a little on the hesitant-to-get-into-the-seating-area side (too big diameter-wise), but I've found that I can trim them with a pair of end cutters to make them fit.

***Frank Emerson:*** We have experimented with an agraffe made by Kluge in Germany. It is made with a very thin collar formed into the outer edge of the mating surface of the base. This thin bead will compress somewhat, enough to achieve correct alignment. If there is interest, I will get more details.

***Brian DeTar:*** The agraffes he is referring to can be had from APSCO at a fairly reasonable price. Although it *is* possible to compress the outer ring on the underside of the agraffe to facilitate alignment, it may still be necessary to use

***Continued on Next Page***

# Agraffes

*Continued from Previous Page*

thin washers to maintain proper agraffe *height*. Remember, agraffes are made from brass and, as such, are subject to premature crystallization from excess tension caused by over-tightening.

Okay, okay, how much is "over-tightening"? I wouldn't go more than 1/2 turn past the point of contact with the plate. Better yet, learn to develop a sense of trust in your instincts.

***Susan Graham:*** In my experience, to be on the safe side it is advisable to "force" the agraffe no more than a quarter turn past the point where it first contacts the plate.

***Brian DeTar:*** As a point of clarification, the actual amount of rotation of the agraffe after contact with the plate is going to be determined by the amount of "lip" on the underside of the agraffe. The more lip, the more you *have* to turn the agraffe to avoid potential buzzing or other problems. I have seen quite a bit of variation within a set of agraffes.

This illustrates, however, how important it is to *feel* our work. "A laborer uses hands to create, An artist uses heart to create, but a craftsperson uses hands *and* heart to create".

To use the above as illustration, if the lips are of unequal dimensions, it will be necessary to turn one agraffe more than the other to get the same "feel" of snugness. That's why it's still possible (probable) to need washers for "fine tuning" agraffe position.

***Susan Graham:*** In 1983, Chris Robinson introduced a tool called a hollow mill, which is a metal cylinder with blades protruding from one end. The threaded shank of the agraffe fits loosely into the hole in the center of the cylinder, so the blades contact the bottom surface of the head, and remove shavings of brass. This allows a very fine adjustment in the position of the agraffe. However, the hollow mill is an expensive part, and it does not come with a stem. My machinist recommended another tool called a counterbore. It has the same center hole and protruding blades arrangement, but it is on a shank like a drill bit (see Figure 1). A 22/32" is the smallest size made with the necessary 1/4" aperture. The cost of the counterbore is not quite such a bite out of the tool budget. With the shank, this tool is easier to handle than the hollow mill, and it can also be chucked in a drill press.

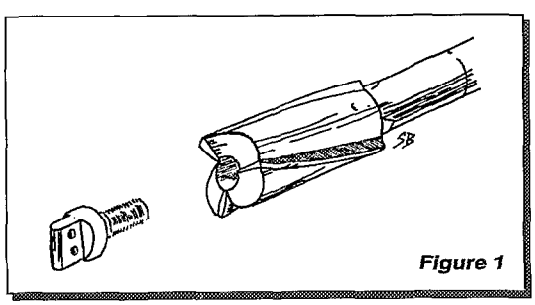


**Figure 1**

***Steve Brady:*** But even once we have the agraffes perfectly squared to the strings, we may still have buzzes and rattles traceable to the agraffe, or at least to the string buzzing in its hole.

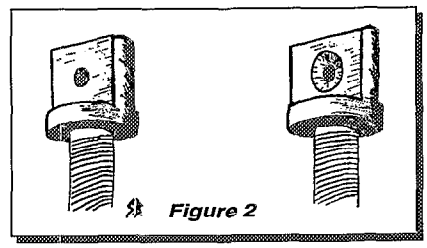


**Figure 2**

***Dennis Johnson:*** These buzzes are most easily proved by prying up on the wire behind the agraffe, and fixed by replacing it. Once you start looking for bad agraffes, you seem to find them just about everywhere. After years of tuning the wire will wear away the top of the hole where it is thin due to the countersink from each side, and then start to buzz. Even when this is subtle, as is often the case, it is still devastating to the harmonics. It is surprising how often original agraffes were defective and not even countersunk. Agraffes should routinely be replaced whenever you are restringing, and each hole inspected with a magnifying glass before installing it. I use Glen Hart's agraffe tool, and highly recommend it.

***Isaac Sadigursky:*** Dennis is right about original agraffes sometimes not being countersunk. Here are examples of single-string agraffes with and without countersinking (see Figure 2). I also have some trichord agraffes which haven't been countersunk. These agraffes will cause buzzing even in mezzoforte playing. They can be removed and easily countersunk for re-use in repairs.

***Chris Robinson:*** There are several fine technicians across the country who have been replacing agraffes as a routine aspect of their rebuilding work for a number of years now. Most of us, however, have dealt with this problem by simply ignoring it. There are reasons for this oversight; replacing agraffes is a time-consuming operation which is fraught with hazard. The dimensions to be contended with include height of strings, spacing of strings, shank diameter, thread pitch, and squareness to the flare of the strings themselves.

There is an effective compromise between leaving original agraffes as they are and replacing the entire set. It's possible to resurface the insides of the holes to remove string burrs and re-establish correct counterbore. The tool for this is a modified center drill (see Figure 3), mounted in a round holder. It's applied to the hole from the speaking-length side as shown in Figure 4.

The center drill is available from Do-All tools as item number D-400R (Radial type), and the catalog number is 710-243205 for the number 2 size. If you buy this tool [*They're very inexpensive, and sold in packages of 12. SB*], you'll need to have the point reduced to .060".

***Steve Brady:*** The modified center drills are now available from Pianotek piano supply company. They need to be used at a slow speed to avoid hogging into the brass of the agraffe. An alternative to doing this by hand is to chuck the center drill into a Foredom tool with a variable-speed foot control.

*Isaac Sadigursky:* Regarding agraffe breakage in older Steinways, the problem seems to occur mostly in grands in the serial number range 230,000 to 265,000, or roughly 1924 to 1930. The broken ones removed by Kermit Williams and me are not threaded completely to the top of the shank, similar to the broken agraffe shown in Figure 5. This would mean that during installation, the worker had to force the part, essentially jamming it in place and seriously overstressing the brass.

The painful experience happens when those grands go through the process of restoration and restringing. Maybe a few break in the shop and get replaced, and a few years later the old original agraffes start to break and jump like popcorn. This leaves the technician with a dilemma: whether to back up his promises and take the piano back into the shop and restring the bass and tenor sections after replacing all the agraffes, or go through court being called a defendant. Who needs it?

*Steve Brady:* To summarize, then, we have three choices when preparing to restring a piano. We can a) ignore the agraffes, b) resurface the agraffe holes, or c) replace all the agraffes. Option "a" is not really an option anymore — we know better. If certain conditions apply, the holes can be resurfaced with little chance of repercussions. To me, these conditions would be: no replacements are present, the piano is not a Steinway built between 1924 and 1930, and this is not a major rebuild. In institutional settings, for instance, pianos get restrung fairly frequently. I don't think it's necessary to replace all the agraffes with every stringing; however, when we get to the point of replacing pinblock, soundboard, and bridge caps, it just doesn't make sense to leave the original agraffes in. So, option "c" would be the preferred one whenever the piano is being thoroughly rebuilt, or whenever there seems to be a good chance of agraffe breakage in the near future.

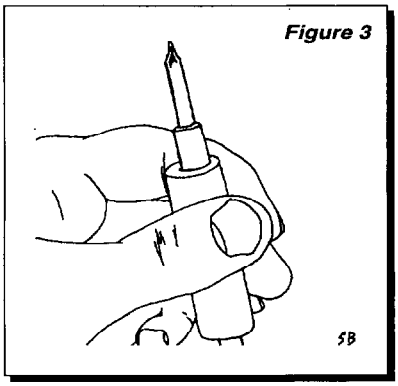


Figure 3

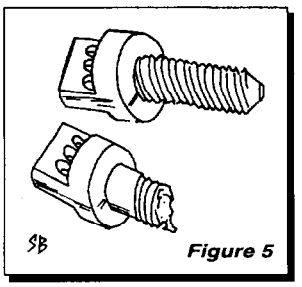


Figure 5

*Richard West:* Since agraffe problems have come up, I've heard agraffes can buzz. I've never run into the problem but it seems to me that there is too much tension on an agraffe to allow the base or threads to buzz against the plate. I know "buzzes" can come from poorly leveled strings, but I wouldn't call that an agraffe buzz. Anyone out there fixing agraffe buzzes?

*Ron Berry:* I ran into buzzes that were not from the wire against the agraffe, but from the agraffe against the plate. Another tuner had told them it was the bass strings, and a few of the buzzes were. I ended up replacing the bass strings, but found that many of the agraffes were only tight to the plate when turned past where they needed to be. With the agraffe washers and a little "crunch" I was able to get them tight in the right spot. The buzz they were making was more like the sound of a loose winding on a bass string than the normal sizzle of a string rattling in the agraffe.

*Michael Wathen:* I just restrung a Baldwin M with Acu-Just™ hitch pins. I replaced the agraffes. When I brought the piano up to pitch one of the agraffes shot out of the hole. It turns out that the hole in the plate is stripped. Suggestions and ideas?

*Frank Emerson:* Baldwin has a technical bulletin describing such a repair. There are oversized agraffes which would allow you to tap the hole to a larger size and install the oversized agraffe. Only the threaded portion is oversized.

Another option is to drill and tap the hole from the bottom, but not all the way through. Then install a special bolt with a hole drilled through its length. When the bolt bottoms out in the hole it is broken off flush. The threads for the original agraffe are then tapped in the pre-drilled hole in the bolt. This repair is used by Baldwin and O. S. Kelly, and is described in more detail in the technical bulletin available from Baldwin Technical Support at 501-483-6116.

*Brian DeTar:* I am not sure of the thread size of the agraffes you used, but the simplest solution would be to use an agraffe with the next larger thread size. If that's not possible, there is a product called a HeliCoil which is, simply, a thread

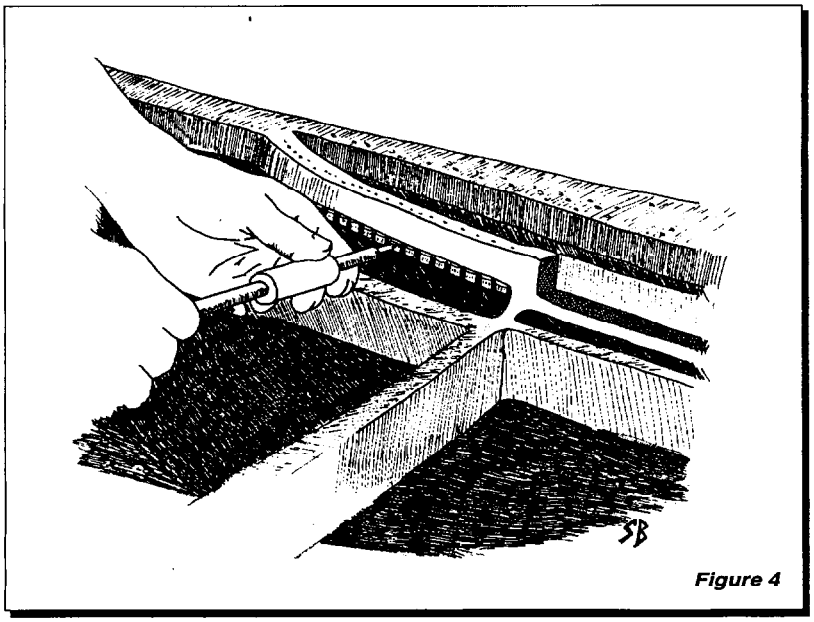


Figure 4

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# Agraffes

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insert. It usually comes in a kit form (many times including the drill bit) and is available at most auto supply stores. It's commonly used for spark plugs and the such, so there will be no strength issue. Installation is quick and very simple (about 10 to 15 minutes).

***Michael Wathen:*** I visited the machine shop for Aerospace Science here at my school. I showed my problem to the fellow in charge. He looked through some charts then told me that the thread size of my agraffe was not available in HeliCoils. The agraffe was 1/4" by 36. He believes that a good epoxy should do the job. So it was agreed that we would proceed with epoxy, and if that doesn't work then he will reduce the shank of the agraffe slightly then cut new threads on to it in a dimension that will correspond to a HeliCoil that is available.

***Frank Emerson:*** I do not believe that epoxy would be a good solution. There is a great deal of upward pull applied to the agraffe, and the best of epoxies may not be adequate to the task. My experience with HeliCoils has been that they work okay until the threaded member is later removed. At that point the HeliCoil tends to either come out with the threaded member, or be forced out when it is re-installed. It's pretty much a one-time fix.

There is a reason that the tiny 36-thread/inch is used. It is necessary to allow "overtightening" to the correct alignment of the agraffe. With a courser thread, I am afraid that you might have difficulty with aligning the agraffe to the strings. A 36-thread/inch agraffe can be overtightened up to a 1/4 turn to achieve the correct alignment, while an 18-thread/inch agraffe would break off before yielding to this amount of overtightening. The best alternatives are an oversized agraffe, maintaining the 36-thread/inch but with a larger diameter, or the special threaded insert described in our tech bulletin.

***Michael Wathen:*** I tried the epoxy. The epoxy was old so it never setup. I then called Baldwin and they were kind enough to send the technical by way of FAX. It turns out that the technical is nothing more than a handout for a class given by Paul Bergan of the Houston Chapter in 1978. So thanks, Paul, wherever you might be.

I followed the advice of this technical. I drilled the hole in question out to 5/16" but not all the way through the plate. I then tapped the hole to 3/8-16 with a tapered tap. I couldn't tap down far enough since the taper of tap bottomed out in the hole, so I ended up drilling the rest of my 5/16" hole through the plate with a 1/4" bit. I was then able to tap the hole as deep as I needed to go. Next I purchased a 3/8" 16-hex head bolt 3/4" long. I will take this bolt to a machine shop where they will drill through it and tap for a 1/4" -36 agraffe. The diameter of a 3/8" screw without the threads is .293". Drilling a hole through the center 1/4" would leave the walls of this insert to about .020" thick.

I had to order this tap from Schaff since no one around here seems to have this odd size tap on hand. When I go to thread my insert in the plate it should break off flush with the top of the hole quite easily when the insert bottoms out in the hole.

***Tim Hast:*** Michael, the procedure you mentioned is not as difficult as it might seem. I have done this twice. Both times we bored the 3/8" hole all the way through the plate. We bored a hole through a piece of 2-by-4 pine and threaded it to screw the 3/8" threaded stock into in order to hold it in the correct position to drill a smaller hole in the middle to tap out for the agraffe threads. After you have made your plug use some 5-minute epoxy to lube the threads, insert the agraffe in the new plug and install the whole assembly.

***Michael Wathen:*** I finally received the hex head bolts back from the machinists. I had four of them done. They looked quite nice with the hole drilled perfectly through the center and tapped for 1/4"-36. It cost me $25 and a lot of time when all I really wanted to do was go ahead and finish the piano.

I ran one of these bolts into the hole that I had enlarged and tapped. When the bolt bottomed out in the hole I marked the bolt as close to the surface of the plate as possible. I then removed the bolt and with a hacksaw cut through the threads at the place where I had made my mark. Next the bolt went into the piano one last time and when it bottomed out this time I gave a couple of slow turns until the head sheared off. This shear left an uneven surface but I was able to make things okay with a 1/2" drill. The agraffe went in and tightened up without a hitch. It worked like a charm. I did not epoxy the insert as was suggested because I had a great fear of the threads becoming messed up when I sheared off the head. If I had used epoxy I might have run into some difficulties getting that bolt out.


*I just love a happy ending, don't you? Thanks to all our participants in this fanciful discussion, which was over ten years and several thousand miles in the making.* ***SB***

# Tuning Longevity

*Daniel Levitan, RPT*
*Contributing Editor*

**"Once we have a good understanding of the general humidity conditions in our area — allowing us to predict how a piano's moisture content might fluctuate until the piano is next tuned — as well as an understanding of how the piano will probably go out of tune in response to that change in moisture, we can use this information to increase the longevity of our tunings."**

*What's the difference between an ordinary tuning and a concert tuning? Ask 10 tuners this question, and you'll likely get 10 answers, including the answer that there is no difference. To my mind, there are at least a few; and one, which you may not have thought about before, is the longevity required of the tuning.*

## Stability vs. Longevity

I'm not referring here to tuning stability as we usually understand it — the use of good hammer technique to set the pin and string in such a way that the string will not continue to render through the agraffe, capo, or pressure bar after the tuning hammer comes off the pin. This kind of stability is fundamental to all tuning. Instead, I'm referring to the length of time that the client wishes the piano to stay in tune. For most concert tunings, that length of time is measured in hours; for most other tunings, it is measured in months. In concert work, the morning after is no concern, but for the most part tuning is a longer-term proposition. In this article, we'll look beyond tuning stability at some techniques for increasing the longevity of our tunings as well.

Let's begin by considering why pianos go out of tune in the first place. Most of our clients seem to feel that the two principal reasons a piano goes out of tune are heavy playing and moving. We tuners, on the other hand, know that these factors have little effect on our tunings. If we have done a good job of setting the pin, our tunings can shrug off a heavy pounding; and most of us have seen pianos turned on their sides and hauled across town without being knocked out of tune to any significant degree. Instead, we tuners recognize two quite different causes for out-of-tuneness: one, new strings, as on a new or recently rebuilt piano; and two, a changing environment around the piano.

It is not unusual to see an older piano that has not been tuned for years, but which, if it were regularly maintained at some point in its life, has not fallen flat to any appreciable degree. On the other hand, it is common to find that a new piano that has not been tuned for even a few months has gone drastically flat. Aside from making sure all the strings are well-seated at their bearing points, that the coils are snug, and so on, there is not much that we can do to prevent this tendency of new strings to flatten. However, we can reduce the effects by anticipating this flattening and leaving a new piano somewhat sharper than usual — in the expectation that, as a result, we will have less pitch raising to do at a future date. Some manufacturers seem to have perfected the art of anticipating the degree to which their instruments will flatten in shipment, and their instruments often come out of the crate at just about concert pitch. Other manufacturers seem to ignore the tendency of new pianos to flatten and leave quite a bit of pitch raising to be done on the showroom floor.

A case can be made against such preemptive sharpening. Perhaps the piano will ultimately be more stable if we adhere rigorously to A-440 while it is new. Perhaps we have an obligation to our clients to tune always at A-440 no matter what the circumstances. As for me, I've found that leaving a new piano a bit sharp — no higher than around A-443 — doesn't seem to compromise a piano's future stability, nor in most cases is it a cause for musical concern.

An analogy could be made between the practice of tuning a new piano slightly above pitch and that of regulating new action parts so that dampers lift a bit on the late side, or so that the blow distance is a bit narrow, leaving a margin for the expected compaction of new damper felt and action cloth. Many manufacturers level a new keyboard so that the keys are slightly higher in the middle. For these makers, the anticipated benefit of leaving the middle keys room to settle as they are played outweighs the associated compromise in the regulation.

The other main reason pianos go out of tune is changes in the piano's environment — most importantly, in humidity. The principal culprit here is generally

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# Tuning Longevity

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agreed to be the soundboard. Even in this age of high-tech materials, piano makers still build soundboards out of wood. If we were to set out to build a sensitive humidity gauge, we could do much worse than to take a large, thin sheet of cross-grained, quarter-sawn softwood, crown it slightly, and then fix it rigidly at its perimeter. A soundboard, made in this way, cannot fail to swell up in humid weather and sink down in dry, taking along whatever's attached to it, including the termination points of the strings. The result, as we all know, is pianos that go sharp in wet conditions and flat in dry ones.

## Humidity Changes and Tuning Longevity

Just like the stretching of new strings, changing humidity works against tuning longevity. This causes problems in ordinary tuning situations, in which we want our tunings to last as long as possible.

There are a couple of ways to tackle the problem of changing humidity. The simplest approach is the obvious one of controlling as much as possible the piano's ambient humidity, whether within the room or inside the piano itself. The various ways of doing this, and their pros and cons, have already been amply addressed in these pages by technicians more qualified in that area than I. I will only say here that, no matter how desirable humidity control may be in theory, in practice we are occasionally asked to service instruments for which humidity control is for one reason or another not currently an option. And, even in those pianos whose humidity is controlled, in very few instances will we find that control to be so perfect that the piano does not go out of tune at all between service calls. In almost all cases, then, there is some room for us to augment humidity control with other approaches.

Before we do, though, we should try to understand as well as possible the relationship between humidity and tuning instability. To do so we need to understand not only the normal humidity cycles in the area in which we work, but also the precise ways in which changing humidity causes our pianos to go out of tune.

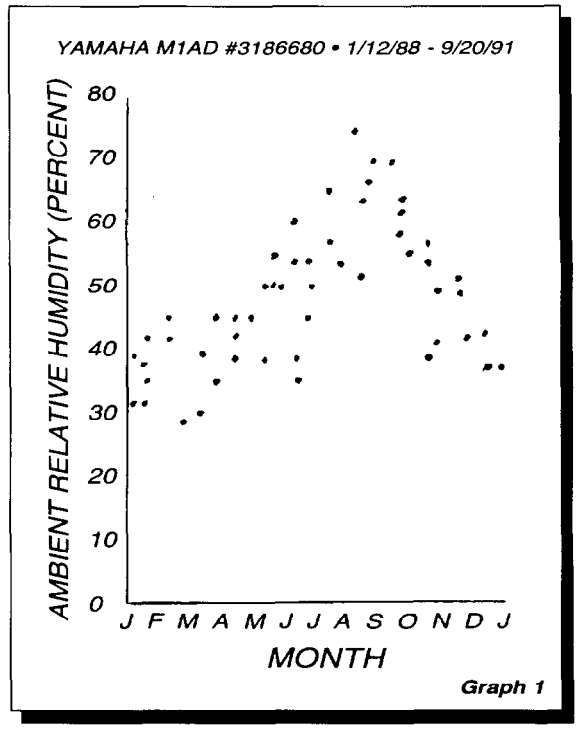
Let's begin with humidity cycles. These are no doubt different in each area of the country, but, of course, I am most familiar with those where I work, in New York City. When I first began to tune in New York, I had only a vague idea of what seasonal changes to expect in the pianos I serviced. I knew only that they would go flat in the winter and sharp in the summer. I found that many of my clients had been told by various technicians to wait to tune their pianos until after the heat came on in October, and then to tune them again after the heat went off in April. This seemed reasonable enough; but there were several occasions when I tuned a piano in November or December and was called back in less than a month to check the tuning. In these cases I found the piano had gone quite noticeably out of tune due to the changing seasons.

To get a clearer picture of what to expect from the New York climate, I began, as many of us do, to carry a hygrometer. I found that in New York the humidity in any season of the year might fluctuate as much as 20 to 25 percent from day to day. However, I noticed that the tunings on the pianos I serviced seemed to react more slowly to changing humidity. Apparently it took some time for the daily fluctuations in humidity to be felt by the wood of the soundboard. To get a better idea of the seasonal changes in the wood moisture content of my pianos, then, I also began to measure tuning pin torque readings at different seasons of the year. I found that the tightness of the pins varied considerably with the changing moisture content of the pinblock. For convenience and consistency's sake I measured torque while flattening the center string of note A4.

The two graphs which accompany this article display some of the data I recorded at that time. They were taken from a piano whose owner was resolutely against any sort of climate control, and who wanted his instrument tuned every two to four weeks. Graph 1 plots within a single year three-and-a-half years' worth of ambient room humidity measurements. Graph 2 plots torque readings taken in the same piano over a slightly different three-and-a-half year span.

The data in Graph 1 show, as expected, that while humidity can fluctuate widely, in general humidity levels tend to be much higher in the summer. Note that individual readings can be dangerously deceptive. For example, depending on the day of measurement, it would be possible to record a difference between February and August of as little as 5 percent (from 45 percent to 50 percent) or as much as 40 percent (from 30 percent to 75 percent). The data in Graph 2 show that the wood moisture content, of the pin block at least, is much more stable and predictable than the ambient humidity, both from day to day and from year to year, but that the general trend of higher humidity in the summer is the same. These data reflect my personal experience that, in general, in New York there is a period of relative tuning stability that begins around New Year's; that pianos begin to sharpen considerably around the middle of April and continue to sharpen well into August; and that around the beginning of October they begin to go flat again and do not fully stabilize for the winter until after Christmas. In such conditions, April and October are among the least stable times for tunings.

Once we are familiar with the humidity cycles in our area of the country, we



Graph 1

then need a similar understanding of the precise ways in which changing humidity causes our pianos to go out of tune. The best way I know to gain this understanding is simply to habitually spend a minute listening to a piano before tuning it. When humidity changes, most pianos do not go sharp or flat evenly across the scale; one section tends to drift more than others. It is this unevenness that seems to cause the instrument to sound out of tune to the pianist, more so than its overall sharpness or flatness. If, before we begin to tune, we note the date of the piano's last service, we can use our knowledge of local humidity conditions to get an idea of how the moisture in the wood of the piano has changed since the last tuning. Then, by comparing the degree to which the various registers of the piano have changed, we can over time acquire a general understanding of how pianos react to changing humidity, and even come to be able to accurately predict the reactions of certain models or individual instruments.

Most tuners agree that the least stable area of the piano is that containing the lowest plain wire strings. These strings usually seem to go sharper when humidity rises and flatter when it falls. If there are a few wound strings just below the plain wire on the treble bridge, these wound strings usually drift less than the adjacent plain wire, but more than the wound strings in the bass section. The bass strings, in fact, often seem to be the most stable in the piano, with the exception of the first few notes on the bass bridge. I have yet to detect a general pattern common to most pianos for these first few bass strings; not infrequently, however, they move in contrary motion to the rest of the piano, flattening as the rest of the piano sharpens, and vice versa.

Moving up from the lowest plain wire into the upper tenor, the strings seem to become relatively less and less affected by humidity. If there is a plate bar between tenor and alto, the lowest strings in the alto, just above the plate bar, will often show an instability similar in direction to, but less in degree than, that of the lowest plain wire. The higher alto becomes, again, more stable; and if there is another plate bar between alto and soprano, the first few notes in the soprano are, again, usually relatively unstable.

As if in recognition of this pattern of tuning instability, one often notices in high-quality scales that the lowest note in the alto has the same name as the lowest plain wire note in the tenor. The scale designer in these cases seems to recognize that both of these notes will tend to sharpen or flatten more or less in tandem, and so scales them as a double octave that will have a better chance of remaining more-or-less in tune.

I find the strings just below the plate bar in each section to be somewhat variable in their response, but they often echo, though more faintly, the instability of the first few strings above the plate bars.

The high treble is, to me, still unpredictable. On some instruments its reaction to changing humidity seems to be severe, and on others, negligible.

To speculate why most pianos seem to go out of tune in this way, we might note, first of all, that the lowest plain wire strings are often at a relatively low tension, and so are more easily affected by the force of the rising or falling bridge; second, that the individual bass strings are of higher tension, especially the monochords, and that the bass bridge tends to lie toward the edge of the soundboard; and, third, that the bridge under the plate bars is not held in check by the downbearing of the strings, and so is freer to move.

In any case, it's important to keep in mind that each piano is different, and that the safest way to predict what any given piano will do when the seasons change is to have listened to the way it has changed in the past.

Once we have a good understanding of the general humidity conditions in our area—allowing us to predict how a piano's moisture content might fluctuate until the piano is next tuned — as well as an understanding of how the piano will probably go out of tune in response to that change in moisture, we can use this information to increase the longevity of our tunings.

## Range of Choices in Pre-Stressing

We are aided in this by another of the differences between concert and ordinary tunings, namely, that we ordinarily tune for concerts on concert instruments, and do our everyday tunings on everyday instruments. On a concert instrument, as we have seen in past articles, our choices in tuning are limited. The notes of the temperament and the octaves have a narrow range within which they can be considered properly tuned. This is one of the reasons that larger pianos are preferred as exam instruments: there can be less disagreement among different tuners as to the correct tuning for any particular note. On smaller, everyday instruments, however, where the levels of inharmonicity are higher, we generally have a wider range of acceptability within which to work. And, as long as we have to choose one size over another for our temperament intervals and octaves, if there are no more compelling reasons, why should we not choose those sizes that will allow the piano to drift with humidity and yet sound less out of tune?

This implies both a willingness and an ability to modify the way we tune pianos to fit the requirements of a particular situation. Willingness will be a problem for you if you feel that for each piano there is only one ideal tuning, and that we have an obligation to our clients to reproduce that tuning as closely as possible each time we service the piano.

The situation is analogous to that of deciding what pitch to tune to. Many tuners insist on always returning a piano ex-

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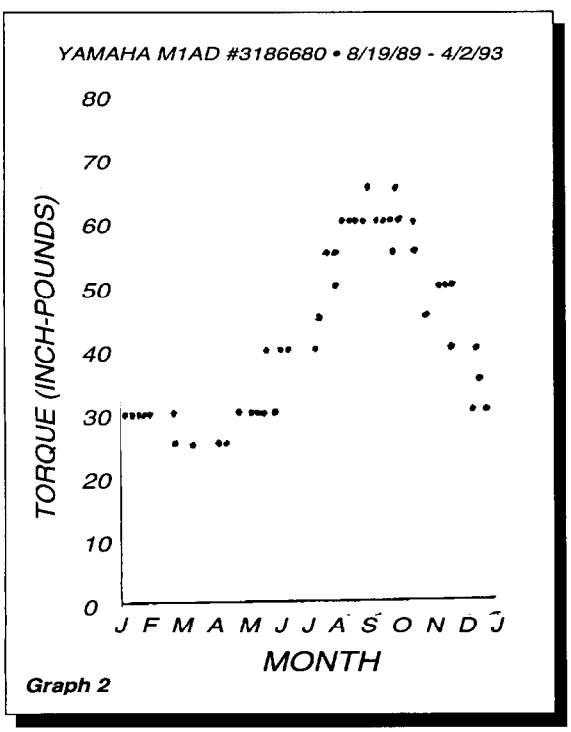

Graph 2

# Tuning Longevity

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actly to A-440. Others feel that while there are some situations that demand such a high degree of fidelity to concert pitch, there are other situations that allow the tuner to float the pitch somewhat sharper in humid conditions to reduce the need to subject the piano to constant large pitch adjustments. If you are of the former school of thought, you will probably feel uncomfortable engaging in what will seem to you like a deliberate mis-tuning of the instrument. If you are of the latter school, you may have little trouble allowing other parameters of your tunings (apart from pitch) to float a bit as well.

To make another analogy with regulation, many of us tend on uprights to leave a bit more lost motion in the dry months of winter, anticipating that in the humid months of summer the lost motion will disappear. Though the piano is not regulated to the highest standard, the idea is that the degree to which it has been compromised is small enough to justify the benefit to the pianist over the long term. In addition, this practice saves wear and tear on the capstans, and ultimately saves time that the technician can then devote to doing other things during service calls. The amount of lost motion one can safely leave in a piano depends, of course, on our judgment as pianists and technicians.

Assuming you are willing to let your tunings be somewhat flexible, you still need the ability to work within the range of acceptability for each tuning. In other words, you need to have achieved a certain level of control over your temperament and octave tuning. When we first begin to tune, it seems that only by a miracle might we ever tune a temperament with evenly progressing beat rates. As we gain experience, we begin to find that we can count on almost always producing such temperaments; and eventually we discover that, especially on smaller instruments, there is in fact a range of workable temperaments, all of which have evenly progressing beats. To be able to adjust your tunings to the requirements of the season, you must have achieved this level of control. You must, for example, be familiar with the difference between a temperament set within a 4:2 octave and one set within a 6:3 octave, and be consitently able to produce a solid temperament within any size temperament octave. You also need to have refined your musical sense to the point that you can confidently judge when a fifth has become too narrow to be acceptable, for example, or when an octave has become too wide.

With these skills in hand, you'll be able to place your tuning precisely at any point within the range of acceptability for a particular piano. If you anticipate that your tuning will drift in a certain direction, you'll be able to place it squarely on the opposite edge of the range of acceptability, giving it room to drift all the way through that range before it begins to sound noticeably out of tune. Your tuning, in other words, will last longer than if you had placed it in the middle of the range, or, worse, on the near edge. In a sense, you'll be able to pre-stress your tuning, to give it a slight bend away from the direction in which you anticipate the stress of changing humidity will force it. This won't take any more time than any other tuning, but it will help your tuning last longer.

Let's take, as an example, the Yamaha M1A from which I recorded the data in Graphs 1 and 2. It's mid-December, and we'll say that over the course of the past few weeks, we have been having a spell of warm weather. Experience tells us that we are probably in for a some cooler weather before we return to tune the piano in mid-January, and there is no climate control in this instrument, so our tuning will need to weather the drying out and flattening that we expect to occur as a result. (If we did not expect to tune the piano again for six months, we would be even more sure that the piano would dry out and flatten, and to an even greater degree.)

We'll begin with the temperament. In the temperament, there are two areas of flexibility: the size of the temperament octave, and the degree of distortion within the temperament. Let's look first at the size of our temperament octave, which we'll say is F3-F4. In the Yamaha M1 series, the lowest plain wire note is F3. It's very likely that over the next few weeks F3 will drop flat, F#3 a bit less so, G3 even less, and so on up to F4.

There is a significant amount of secondary inharmonicity in the octave F3-F4 on an M1. All things being equal, I think the M1 sounds best overall when its temperament octave is tuned as a pure 6:3. However, I expect F3 to flatten more than F4 before the next tuning; in other words, I expect the temperament octave to widen. Therefore I would prefer in this situation to tune my temperament octave on the narrow side, perhaps as a pure 4:2 or 2:1 octave, giving it room to widen as the piano dries out. To me, the sound of a pure 4:2 on a Yamaha M1 is perfectly fine, so I would simply go ahead and set that as the size of my temperament octave.

The second area of flexibility in temperament tuning is in the degree of distortion of the temperament intervals. As we've seen in previous articles, there is a strong tendency for tuners to distort (by sharpening them) the middle notes of a temperament whose secondary inharmonicity increases towards the bottom of the temperament. This makes the progression of intervals more like that of theoretical equal temperament, although it does tend to put the 3:2 fifths at the lower end of the temperament on the wide side of pure. On the M1, in mid-November, we might prefer not to distort the temperament. We expect the lower notes of the temperament to flatten over the next few weeks more than the upper ones, and sharpening the middle notes as we tune will only make the temperament sound worse as time goes by. By leaving the temperament undistorted — in other words, by allowing the wide intervals to progress more rapidly, and the narrow ones more slowly, than in theoretical equal temperament — we will create a temperament that will still sound good after the piano has dried out a bit.

If you've never tried it, this may seem like an odd way to approach your tuning, but if done with care, it can work quite well. It's particularly gratifying to tune a temperament in this way, and return for the next tuning to find that the instrument has dried out a bit, and the temperament octave has settled close to a pure 6:3 and the temperament intervals have been brought to a nice level of distortion. Had the temperament octave been tuned pure at the 6:3 level, the piano would have sounded much less in tune by the time of its next service.

Working down from the temperament, we begin to tune octaves. The degree of flexibility in the octaves will depend on the degree of secondary inharmonicity in them; it may be that there will be none, in which case we'll simply tune the octaves as pure as possible. Often there will be some inharmonicity, giving us some room

for choice. On the M1 several wound strings are found below the plain wire on the treble bridge. These we expect not to flatten as much as the plain wire just above them. Instead of tuning 4:2 octaves here, then, we might go the middle road and tune 6:3 octaves. Moving into the bass section, we can expect these strings to flatten even less. Here we might choose to tune even wider octaves, say 8:4, as long as we find the sound of them to be acceptable. (Watch for negative secondary inharmonicity here — if you find it, remember that your 4:2 octaves will be the wider ones, and so may be the better choice.) The wider the octave whose lower note is in the bass and whose upper note is plain wire, the more room the plain wire will have to flatten and still make an acceptable octave. We would be especially inclined to tune wide octaves on our M1 if we knew we wouldn't be back for six months, and so could look forward to the low plain wire flattening a great deal relative to the bass.

Going further into the bass, as the upper notes of the single octaves move onto wound strings, we may want to relax our octaves back to around the 6:3 level. Or, we may want to tune double octaves directly to the temperament. Keep in mind that the bass will more or less stay in tune with itself.

Above the temperament, we'll want to maintain narrow octaves, both for the sake of our fourths and fifths, and to give the octaves room to widen as the lower notes of the octaves, on the low plain wire, sink more than the upper notes. Above the plate bar, which in this model, fortunately, is between notes E5 and F5, we may want to widen out our single and double octaves a bit. This will give a better sound to the double octave F3-F5 now, and will allow both these notes to flatten without throwing the tuning wildly out. By A5 or so we should be back to single and double octaves on the pure side. And our high treble will probably want to be nice and tight as well, giving it room to still sound well with the middle after the middle sinks.

## The Choice is Yours

Tuning octaves in this way will have unfortunate results for the progression of our intervals. Major thirds and sixths, for example, will be very slow just above the wound strings. As they move onto the wound strings, and especially as they move into the bass, they will, in reverse progression, speed up rather than slow down. This you may find unacceptable; that's fine, then this approach is not for you.

After all, we tuners are only responsible for the sound of the piano just after we finish with it; what happens later is not really our affair. If, in spite of our best efforts to give our clients sound advice, they allow poor climate control, bad timing, or whatever, to let changing humidity make the piano go out of tune, the blame is not ours. It's equally true that any complaints we may receive because we left the piano deliberately out of tune are our responsibility. So, if we decide to tune a piano in the way I've just described, we must go carefully, and strictly at our own risk.

In fact, the sound of a piano tuned in the way I just described for the M1 is not unlike the sound of a piano after it has gone slightly out of tune sharp due to increased humidity. That's because we are trading a slight imperfection for increased longevity. As the piano flattens, we are betting that our progressions of thirds and sixths will soon fall into line, and in fact will eventually go to the other extreme.

We are gambling that the piano will go out of tune as we expect it to. And we are pushing our intervals to the edge of out-of-tuneness to do so. If our tuning is inconsistent, we are bound to have some intervals that spill over the edge into the range of unacceptability. Remember that the more consistent the tuning, the more musically satisfactory will be the slight imperfection we have built in.

To make the imperfection as unnoticeable as possible, it is extremely important to tune as well and as consistently as possible. Keep in mind that we are tuning perfect octaves—just ones of various sizes. This can help to keep us from going too far, and has the added benefit of giving the sound of our tuning a certain purity. The liberal use of tests here is a big help. And, of course, we have to take care never to get to the point of offending our musical sense.

## Conclusion

If you've never tried this approach to tuning, I can recommend it without hesitation, assuming that you have the necessary skills. Try it, and play on the piano; ask yourself how much worse it is than another tuning that you might consider slightly more optimal. It takes no more time to

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***"If our tuning is inconsistent, we are bound to have some intervals that spill over the edge into the range of unacceptability. Remember that the more consistent the tuning, the more musically satisfactory will be the slight imperfection we have built in."***

# Tuning Longevity

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tune this way, and it can certainly make your work more interesting as you customize your tunings to one degree or another to accommodate the variety of situations you encounter during the day.

I should mention two other ways to achieve this kind of pre-stressing in your tuning, but I am more reluctant to recommend them. The first falls more clearly into the category of deliberate mis-tuning, while the second falls into the category of sloppy tuning. Though, as I say, I can't recommend your using them, I will say — and I bet I'm not alone here — that I have occasion to use both approaches at certain times, though in all cases I take full responsibility for the consequences, good or bad.

The first approach, a deliberate mistuning, might be useful when you know that a piano will immediately go out of tune because of an expected severe change in humidity. As we have seen, the worst and most noticeable change in this kind of tuning drift usually happens in the low plain wire. So strip-mute the first half-octave of plain wire even if you don't usually use a strip mute; if you do use a strip mute, leave it in the first half-octave or so of plain wire while you completely tune out the rest of the piano. Once the whole piano is in tune and stable, unisons and all, go to the lowest plain wire string and detune it. If you expect the piano to flatten, sharpen the string until you judge it to be musically unacceptable, then flatten it back down just into the range of acceptability. Check especially the octaves, fifths, and fourths. Now de-tune the next higher note, in the same direction but to a smaller degree. You can begin to check your progressions of thirds and sixths as well; expect that there will be a jump at the wound/plain wire break, but make the progressions above and below as consistent as you can. Continue in this way to the end of the strip mute, blending in all your progressions, and tune out the unisons.

The other approach, which falls into the category of sloppy tuning, is sometimes a tempting alternative to properly adjusting pitch. If you come to a piano and find that it has obviously gone sharp due to an increase in humidity — that the low plain wire, for example, is especially sharp — you absolutely must quickly pitch-adjust in order to make your further tuning stable and predictable. This is especially important if you plan to slightly mis-tune as I've described; when you go to the edge of acceptability, it's vital to know that the intervals will stay exactly where you put them.

It doesn't take a genius to observe, however, that if you didn't pitch-adjust, as you later tuned out the unisons the tendency of the piano would be to pull sharp at just those spots in the low plain wire and elsewhere that went excessively sharp due to humidity; the very same notes, in fact, that will later flatten as humidity falls. Beware of this temptation. If you don't know just what you're doing, you may find yourself wasting time later on trying to fix an excessively out-of-tune midrange, and destroying the consistency you have carefully built in.

And now — just in case there's anybody out there who's not yet completely alienated by the idea of deliberately mistuning a piano — let's turn to the subject of unisons.

When you sit down to listen to a piano before you tune it, you will often notice that the unisons have drifted as well as the other intervals. If you were the last person to tune the piano, and especially if you tuned the piano recently, your immediate tendency is probably like mine, to feel depressed about your tuning technique. While that tendency may be justified, first check the unisons a little. You may find that they are all out of tune in the same way. Either all the left-hand strings may be flatter than the right-hand strings, or vice versa. In that case a good deal of the wildness in the unisons is probably due to changing humidity.

I have heard all kinds of descriptions of and explanations for this tendency of unisons to drift. In my experience, in most pianos it is the upper string of the unison which seems to drift, sharp in humid weather and flat in dry. This holds for both grands and uprights, which to me means that the cause does not lie, as I have heard some say, in the different lengths of the waste portion of string between the tuning pins and the agraffe/pressure bar/capo. In fact, I doubt that the length of this portion of the string can have much effect on a well-set string, because such a string will not creep through its bearing point.

Instead, the explanation that makes the most sense to me relates this unison drift to the geometry of the bridge. The midline of the bridge is not perpendicular to the direction of the strings. Therefore, if we assume that the bridge rises the same amount over the span of the unison, the treble string of the unison will be lifted at a greater angle than the bass string of the unison, and so will be stretched more and will go sharper.

There seems to be a great deal of variation among pianos in their susceptibility to this kind of unison drift. No doubt fine differences such as the degree of bridge roll are responsible for this variation. But if you have a piano that experience has shown has unisons that are certain to drift, the thought just might cross your mind to try doing something about it in your tuning.

No, I'm not recommending that you leave your unisons out of tune. However, think back to when you listened to the piano before tuning it. You probably noticed that some unisons sounded much worse than others. Of course, no one's hammer technique is perfectly consistent, and so one would expect some variation in the solidity of any group of unisons simply due to some pins having been set better than others. Some of this variation, though, can probably be ascribed to the kinds of unisons you left on the piano at the previous tuning. All those unisons sounded equally solid then; but they were all probably a bit different on a very fine level.

There's no such thing as a perfect unison. Even in the purest-sounding unison, we could, if we had a fine enough measuring tool, detect one string sharper than the rest and one string flatter than the rest. Even the best unison tuners among us have a range, a very small range, to be sure, but still a range, within which unisons pass as acceptable.

Now, what if you had a piano that you expected to go flat; and what if you had noticed a section of unisons that had drifted with humidity an egregious amount; and what if, when you tuned the strings on the bass side of these unisons in that section, you adjusted your sights down just a tad so that you felt that those strings might wind up, if anything, on the flat side of your personal range; and what if you tuned all the strings on the treble side of the unison so that, while they all sounded pure, you felt they were, if anything, on the sharp side ... it's interesting to wonder, what would happen then?

# Dampers

## Why Are They Always So Darn Much Trouble?

Del Fandrich

## Introduction

*Dampers and damper systems are an ongoing problem for any technician doing regular piano work; whether you're primarily a rebuilder or a tuner. It seems we spend half of our time getting pianos to make sounds and the other half getting them to shut-up. The problem is more often addressed on grand pianos, perhaps because it is usually expected that they will perform to a higher standard, so more is demanded from them. But technicians working on vertical pianos used by competent musicians would disagree. It has long been accepted that the reason upright dampers can't perform as well as grand dampers is that upright dampers can't be placed in the right spot — on the right "node" — on the string. While there is some small degree of truth to this argument, it is not nearly as important a consideration as has long been thought. Fortunately, some help is available — for both the piano builder and the technician.*

## Damping Mechanisms

When we speak of damper efficiency, we normally think of how effectively a piano damper system cuts off all of the sound of a piano when the dampers are brought into contact with the vibrating strings. Damping efficiency is a measure of the rate of energy dissipation — the rate of energy transfer from a vibrating set of strings into a damper assembly — which takes place when a damper assembly is brought into close physical contact with a string set. The damper assembly is an energy-absorbing mechanism, a form of what the sound and vibration analysis people call an *auxiliary mass absorber*, consisting of a resilient damper pad backed by a mass load and with a mechanism to support it and/or hold it against the string set.

Piano strings produce sound by vibrating at a certain fundamental pitch, or frequency, with a liberal assortment of harmonics of that fundamental thrown in. There is energy — wave energy — in the string that got there when a hammer traveling at high speed rather violently ran into it. That energy is given up to the soundboard at a more or less fixed rate, depending on the internal friction of the string, the air resistance to the string's motion and the rigidity of the string's boundaries.

The piano string is a mechanical oscillator. Now, if it were a perfect oscillator — if it had no internal friction, if there were no wind resistance to impede its movement and if its boundaries were perfectly inelastic — the string would continue vibrating forever after once being excited. Of course, there would be no sound from that perfectly inelastic soundboard either.

Obviously, these conditions don't exist in the real world; a struck string does not go on vibrating forever. Some of its energy is dissipated into the plate. A small amount is lost to heat due to internal friction within the steel string itself, and a tiny fraction is lost to wind resistance. Most of it, though, does get transferred through the bridge to the soundboard where, by forcing the soundboard to vibrate, it produces sound by the compression and rarefaction of the air molecules around it. The rate of energy transfer from string to soundboard is normally the principal controlling factor determining the decay time, or the damping rate, of a vibrating string. Left to itself, this rate of energy transfer is such that it will take from just a few seconds in the high treble section to nearly a minute in the bass and low tenor of a large piano for all vibrations within a string to die out.

The length of time it takes for all of the string's energy to be transferred to the soundboard is referred to as a piano's *sustain*, or *sustain time*. A piano with long sustain will take a long time to transfer the strings' energy to the soundboard and a piano with short sustain will take a somewhat shorter period of time to transfer its strings' energy into its soundboard. *Long* and *short* are relative terms. There are no absolute standards for a piano's sustain time although, usually, longer is better.

Of course, not all music calls for the full sustain of all the notes of the piano all the time, so a mechanism had to be developed to hasten the damping rate artificially. Using this mechanism, the pianist is able to control the ultimate sustain time; either of each note individually, or of the whole set simultaneously. Instead of waiting for all of the string's energy to be dissipated into the soundboard over a relatively long period of time, it can be transferred much more quickly into a viscoelastic felt pad which is placed against the string. Since all that energy can't simply disappear into a vacuum, what happens to it? With any luck, and a properly operating damper system, it gets dissipated within the damper pad as heat.

The Designer's Notebook

By Delwin D. Fandrich, RPT

## Damping Rates

In our perfect world we would like to have this energy transfer take place instantaneously, but in our real world it can't and it doesn't. There will always be a perceptible amount of time between the

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# Dampers

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instant a damper pad contacts the string set and point at which all of the string's energy has been dissipated into the damper pad and the string's vibrations cease. There are a lot of good reasons for this. There can be quite a lot of energy in a piano string, and it takes some finite amount of time to move all of it into the damper pad. Just to make the damper's life more interesting, let's also throw some harmonics of the fundamental frequency into the vibration envelope. And to liven things a bit more, let's make the physical requirements for damping each of those harmonics different. Now let's add in a few vibrating strings that are not part of the speaking portion of the original string set struck by our hammer — strings tuned, intentionally or not, to some harmonic of the original — that have picked up some of its energy. Even if we were able to design and build the perfect damper system for a given set of strings, the job would still not be completely defined. The soundboard — whether we want it to be so or not — is also an oscillating system. The damper system must also contend with a significant amount of energy being fed back into the strings from the soundboard, which has, up until now, been happily vibrating and oscillating along in response to the strings' movements.

Our damper's job description is not nearly complicated enough yet, so let's add in a few additional requirements. First, it has to operate in absolute silence. Okay, we can accomplish that by making the felt pad *very soft*. Of course, it also has to operate flawlessly over many hundreds of thousands of operations without deforming and going out of regulation. All right, we'll make the pad *firm*. Then, its operation must be completely transparent to the pianist. That's easy, we'll make it *very light* and free, and we'll use a *very weak* return spring (or none at all — letting gravity do the whole job). Oh, yes, let's not forget that it must abruptly terminate the motion of a violently vibrating and very massive (relative to the damper, at least) string and soundboard assembly. Well, let's see now. We'd probably better make the damper *fairly heavy* and hold it against the string with a *very stiff* spring.

So, what we need is a *very soft* and *firm* damper pad attached to a *very light* and *heavy* damper mechanism that is controlled by a *very weak* and *stiff* spring and ... Well, you get the idea. So, now that we know precisely what we want, let's take a look at what the piano builders have come up with for us.

## Piano Damper Mechanisms

Figure 1 shows a typical grand piano damper system. *(This particular drawing shows a Renner system using a swing top flange not normally used in American pianos, though it should be.)* It consists of a *damper head* with two or more *felt pads* located and supported above the string by a *damper wire*. This damper wire passes down through a bushed hole in the

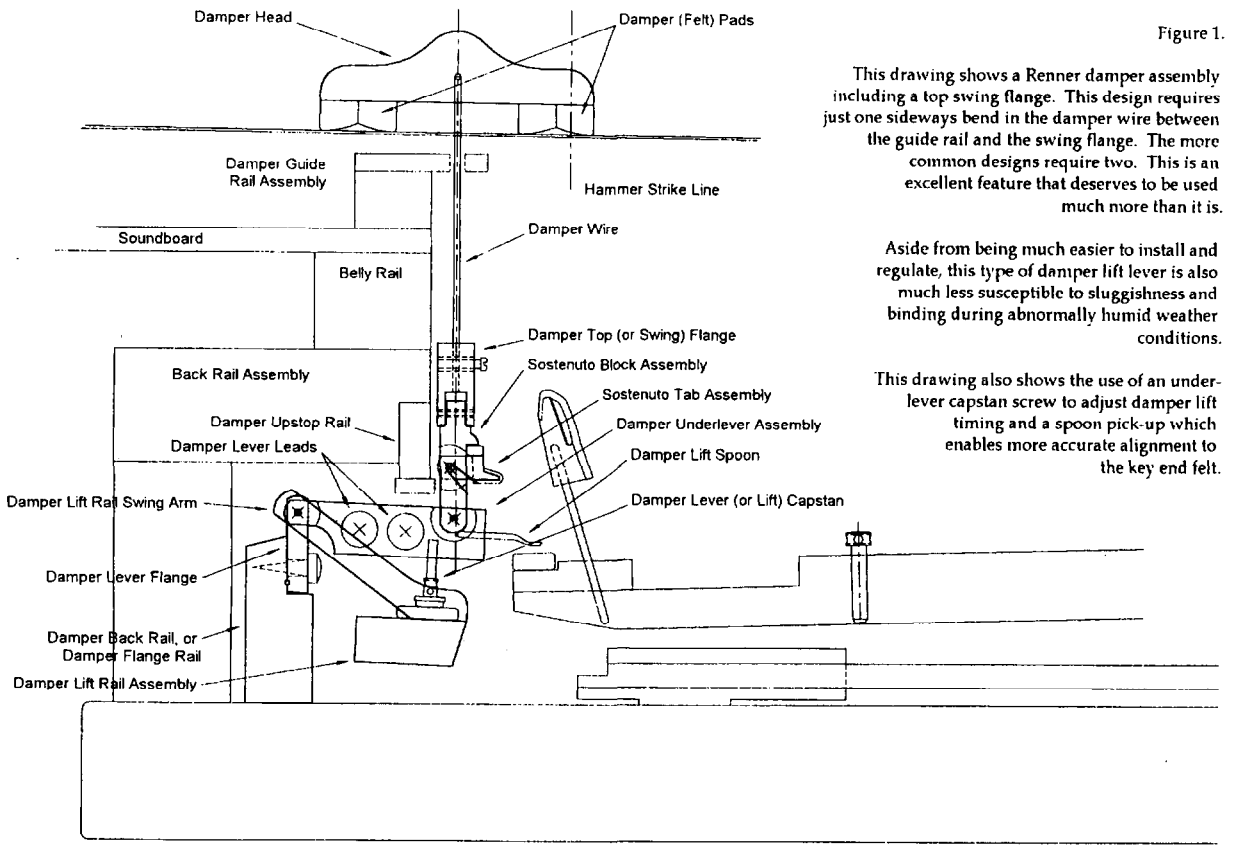


Figure 1.

This drawing shows a Renner damper assembly including a top swing flange. This design requires just one sideways bend in the damper wire between the guide rail and the swing flange. The more common designs require two. This is an excellent feature that deserves to be used much more than it is.

Aside from being much easier to install and regulate, this type of damper lift lever is also much less susceptible to sluggishness and binding during abnormally humid weather conditions.

This drawing also shows the use of an underlever capstan screw to adjust damper lift timing and a spoon pick-up which enables more accurate alignment to the key end felt.

*damper guide rail* to a *damper lever assembly.* The damper lever assembly consists of a *top flange,* usually including a sostenuto tab mechanism, an *under lever* and a *damper lever flange.* The under lever usually includes one or more *lead weights* (about which more will be said later) and usually a height adjusting *capstan screw. (Note: Is there any good reason to continue building pianos with damper systems lacking height adjusting capstans? Surely not! Here is an offer you can't refuse. I'll be happy to design a damper lever system for any U.S. piano company still using damper levers without height adjustment capstans, for no charge. Or simply adapt the Renner system as shown in the illustration — though not perfect, it is quite good.)* The damper lever flanges are attached to a *damper, or flange, rail* which may or may not be combined with a *damper lift rail* — in the better designs they are separate. The whole assembly is mounted in such a manner that either the whole assembly pivots or — and again in better designs — the separate damper lift rail rotates around the damper lever flange center pin axis which can lift all of the damper levers simultaneously when the damper pedal is operated. In the illustration, this latter system is shown. The damper pads are held against the string by a combination of spring pressure (sometimes) and the weight of the assembly (always — whether leads are used or not).

The grand damper lever is operated by being lifted by the back of the key lever when it is played. When the front of the key lever is depressed, the back of the key goes up, and the damper lift felt at the back of the key lifts the damper lever spoon, which then lifts the damper head and pads off of the strings. *(Surely all modern damper levers found in modern pianos have damper lift spoons, don't they? Tell you what — on the off chance that there may still be one or two pianos still being built without them, see the offer above.)*

By contrast, the vertical damper system is considerably less complicated — and therein lies both its beauty and its major limitation. It consists simply of a damper head and pad assembly glued to a damper block or damper dowel which, in turn, is attached to a stiff, but still bendable, wire. This wire is pressed into a wood damper lever which, in turn, is attached to the main action rail by a flange. The entire assembly is very lightweight. Since the design of the piano precludes any gravity assist, the damper pads are held against the piano string by spring pressure coming from a spring pressing against a groove in the back of the damper lever. In operation, the vertical damper lever assembly is rotated about its mounting flange when the bottom of the lever is contacted by a spoon-shaped extension at the end of the wippen.

In this article, we aren't going to concern ourselves with sostenuto mechanisms for either system, nor are we going to concern ourselves with regulating either system.

**"So, what we need is a very soft *and* firm *damper pad attached to a* very light *and* heavy *damper mechanism that is controlled by a* very weak *and* stiff *spring and ... Well, you get the idea."**

## Damper System Efficiency

A damper system's efficiency, or effectiveness, is a function of many different factors. Typically, when we encounter a grand piano with poor damping, we blame it on regulation and adjustment or the point of contact on the string relative to the hammer strike point. Sometimes — due to age and use — the pads and/or wedges have gotten packed down and are too hard. Sometimes. More often, though, the problem goes somewhat deeper, back to the original design of the system. The correct adjustment and regulation of the system are, of course, critically important. The proper fit of the felt damper pads to the strings can make or break an otherwise good design. But, no matter the quality of manufacture, the precision of installation or the perfection of the fit to the strings, there are some damper systems on some pianos that simply don't work as well as others. The question, then, is why?

Let's set aside, for the moment, any discussions of where on the string the damper pad is located. It is consistent enough from one piano to the next (at least in modern practice) that it can't realistically be used to explain the sometimes vast differences in damping efficiency between instruments. Even vertical pianos which are normally excused from the necessity of providing good damping by our explanations of damper pad location — the damper pad must be placed below the hammer where it can't contact the string directly on the striking point and therefore, we explain, they can't be expected to provide really good damping — have examples of good, occasionally even excellent, damping. More often, of course, they are used as examples of poor-to-horrible damping.

At the beginning of this article, I referred to the piano string damper as an *auxiliary mass damper,* also sometimes called a *damped absorber.* It consists of an auxiliary mass (the damper lever, wire and head assembly) backing a viscoelastic material (the damper felt) that is closely coupled to (held firmly against) a vibrating system (the piano strings) by either a spring (the damper return spring), by its own weight or by a combination of both. These dampers, while exceedingly complex to analyze and define, are fairly simple in operation. Basically, they depend on the degree of resilience within the damping material, the amount of mass in the system and the strength of the spring — if any — combined with the weight holding the assembly against the vibrating system.

It's not so much the inherent differences of design — leverages, placement on the string, etc. — between the grand and the vertical damper systems that account for the

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# Dampers

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differences in damping efficiencies as it is the differences in the mass of the parts used in each system. In the grand piano damper system, the damper head, felt pads and wire weighs approximately 10 to 15 grams — smaller and lighter in the treble and larger and heavier in the bass. The damper lever and top flange assembly adds another 15 to 25 grams — depending on the location and number of lead weights added to the lever. (The actual weight, or mass, of the damper lever assemblies is somewhat greater than this, but since the damper lever rotates about its back flange action center this is the portion of its mass that is hanging on the end of the damper wire and is felt by the damper head.)

By contrast, the vertical damper head and felt pad weighs approximately four to six grams, a typical damper dowel weighs approximately two to three, and the damper lever assembly weighs approximately eight to10 grams. Since the damper lever rotates about a roughly central axis,only a small portion of its total mass, approximately seven to10 grams, is felt by the damper head assembly.

Why make a big deal over the weight — more properly, the mass — of the various components of damper system? After all, they're moving parts and lighter is better, isn't it? The reason the mass of these components is so important is that, when all is said and done, the efficiency (effectiveness) of a piano's damper system is determined by the following:

- The compliance of the felt damper pad that is coupled to the vibrating strings.
- The amount of force with which the damper pad is held against the vibrating strings.
- The nature of the force used to hold the damper pad against the strings: i.e., weight (or mass) or spring pressure, or some combination of these.
- The effective mass of the system — the auxiliary mass — backing up the felt damper pads.
- The location of the pad contact on the string.

*(Note: There are a few other problems that can lead to isolated and specific damping problems as well, but for the most part they are way beyond the scope of this article. I'll not even attempt to deal with them here. If you have a specific question about — or a problem with — a specific piano, feel free to contact me through the* Journal.*)*

## Why Some Work and Some Don't

When you encounter a damper system that just won't work, no matter how precisely adjusted it is, you can generally trace the inherent problem to a deficiency in one of the above areas. More often than not, it will be due to a lack of sufficient mass in the system.

It is possible that in either grands — especially those using no lead weights in the damper levers — or verticals, the damper return springs can lose tension over time and not have enough tension to press the damper pads against the strings with enough pressure to ensure good damping. It is also possible that they were simply not adjusted correctly to begin with. This is more of a problem in verticals than it is in grands since they depend entirely on spring pressure to hold the damper pads against the strings. Often though, even increasing the spring tension in these systems to the point of adversely affecting key touch weight will not improve damping very much.

Good damping depends on the interaction between the string and the damping mechanism. With a simple auxiliary mass system, the reaction back to the primary system — in this case, the piano's strings — is proportional to the amplitude of motion in the primary system at the point of contact and is a function of the frequency of the wave motion in the primary system and of the mass, elasticity, and the damping constants of the auxiliary mass damper. Just as is the case with the piano string-to-bridge and soundboard relationship, there is a force-velocity ratio that exists between the string and the damper system. This force-velocity ratio is called the mechanical impedance (Z) of the damper system.

The mechanical impedance of all vibrating systems is frequency dependent and piano damper systems are no exception. Mass has a greater effect on mechanical impedance at high frequencies, and elasticity (springiness) has a greater effect at low frequencies. It follows then, that even a lightweight system with adequate spring tension will damp with reasonable effectiveness at low, or fundamental, frequencies, and indeed they generally do. It is usually the higher harmonics (frequencies) that present problems, and the pianos giving us the most problems — whether grands or verticals — are generally those using low-mass damper systems.

Grand pianos using lead weighting in the damper levers have better damping qualities than those using just springs, especially where the higher harmonics are concerned. As the pianos — and strings — get longer and there is an increasing amount of low frequency energy content in the string's vibration envelope, it is a good idea to include a return spring in the system in addition to the lead weights to better damp all that low frequency energy.

Vertical piano damper systems nearly always have too little weight — mass — to provide good damping. The impossibility of placing the damper pads on specific nodes may have some effect, but the lack of mass is by far the biggest culprit in the ineffective damping systems found in vertical pianos.

Many years ago I was rebuilding a fairly large Chickering upright piano and thought I would improve the touchweight of the action by replacing the heavy brass damper blocks and damper heads with nice modern wood damper dowels and heads. The new system looked really good — unfortunately it didn't damp worth a darn. I tried all the tricks I could think of, including strengthening the damper springs beyond the point of acceptability. After spending several fruitless hours trying to get this nice modern system to damp well, I tried replacing a couple of the wood dowels and blocks with the original brass parts. Suddenly all was well with the world! I had my damping. After fishing all of the original brass parts out of the scrap pile and replacing them on the action I had the whole system damping beautifully, and I was able to back off on the springs to the point that, on a light blow, damper pick-up was indiscernible.

All of which brings up a point I don't want to get lost here. A damper system with the proper balance between spring pressure and mass, in either a grand piano or a vertical piano, will both damp well and be easily operated. That is, in vertical pianos it will not have so much spring

pressure that it will excessively increase dynamic key touch weight — I've never seen a vertical damper system that had too much mass — and in grand pianos it will not have so much mass that it will excessively load the key and increase the dynamic touchweight of the action when played softly. Of the two, excessive spring pressure is the most noticeable and objectionable. Unfortunately, the first thing done by both factories and by many technicians when faced with a poorly functioning vertical damper system is to increase the tension of the damper spring. This almost never improves the damping effectiveness of the system, but it does make the action feel tight and sluggish — like it doesn't want to go through let-off on either hard or soft blows.

## Help! Now That I Know What's Wrong, What Can I Do?

So, what's to be done? In grand pianos with unleaded damper levers it is a fairly simple matter to add leads to them. Drill the levers and seat the leads just like you would in a piano key. Make sure you use leads designed for damper levers. They are smaller both in diameter and length. If it isn't practical or expedient to remove the whole damper tray assembly, you can often install one or more leads in the damper head itself. I usually start by installing one lead on the front part of the head (i.e., toward the front of the piano) and trying it out. One is usually enough. If two leads are required I tend to balance them front and back. In either case, I'm not sure the actual location matters all that much.

In vertical pianos the easiest fix is to install Renner's all-brass damper barrel. It's not quite massive enough for the bass section of a large upright, but it's a whole lot better than wood. Another quick fix that often turns out to be a semi-permanent fix is to attach split lead weights to the damper wires under the damper dowels or blocks. These weights are used by people who fish and are available from sporting goods stores in various sizes. (Not being a fisherman, I have no idea what these leads are supposed to be used for. I always thought the idea was to get the fish out of the water and into the boat, not to load them down with lead and drown them. But who knows? In my book, anyone who willingly gets up before dawn to go out and do battle with some poor fish is more than passing strange, anyway. I've always been of the opinion that if God had wanted me to watch the sun come up, He would have had the event occur at a much more reasonable hour of the day.) As may be, once you've selected an appropriate weight — several convenient sizes are available — simply place it on the wire just above the wood damper lever and squeeze it gently with a plier. And don't be afraid to use two if necessary. If they develop a buzz — not likely, but it does happen — a drop of white glue quiets them down nicely. Once the leads are in place, you'll probably want to check the tension of the damper spring. It's quite likely you'll be able to decrease the tension somewhat for a better action feel and still have good damping.

# "Great Ideas from the Past" Department

*By Delwin D. Fandrich, RPT*

I found this damper block mechanism in a Decker grand piano c.1900. Aside from one critical and fatal flaw — about which more later — it was one of the slickest and most easily adjusted damper systems I've ever had the pleasure of working on.

The principle moving part was a damper block assembly that fit over a set of two vertical guide pins in a movable damper lift rail. The damper lift rail was pinned directly to the inner rim at the treble end and attached to a fairly long lever at the bass end which allowed it to move up and down through an arc when the damper lift pedal was used. This resulted in a somewhat higher lift — when using the pedal — in the bass than in the treble, but didn't seem to present any problem in operation.

The damper wire went through an alignment hole in the top of the block, and then down between a "spring" pin and a serrated adjustment screw (see illustrations). While it's not very clear in the illustration, the hole for the spring pin is counter-bored to a depth of about 4 to 5 mm which allows the pin to bend out slightly — hence the "spring" in spring pin — as the damper wire passes between it and the adjustment screw. This keeps a constant pressure on the damper wire, pressing it tightly against the adjustment screw.

The damper wire started out as a normal soft — probably nickel-plated brass, I don't remember for sure — wire. The idea was that when the adjustment screw was turned counter-clockwise it would draw the damper wire down, wedging it between itself and the spring pin. In the process it was supposed to cut — actually press — small "gear teeth" into the soft damper wire. Once these teeth were pressed into the damper wire, adjusting the damper block height was simply a matter of turning the adjustment screw until the block was at the correct height. There was enough friction in the system to hold the damper head square to the wire in operation. A very simple system — and when it worked, it worked brilliantly. But there was that one fatal flaw I mentioned earlier. Although the adjustment screws seemed to be made of steel — I don't know the grade — they simply weren't hard enough to do the job. Instead of cutting nice clean gear teeth, most of them pressed rather pathetic little "gear indentations" into the surface of the wire while the serrations kind of rounded over and lost their sharp edges. When this happened the adjustment screw would simply slip on the wire when turned, making any further adjustment somewhat problematic.

Could this system be built and used successfully today? Yes, it could — it was an idea somewhat before its time, I think.

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# "Great Ideas from the Past" Department

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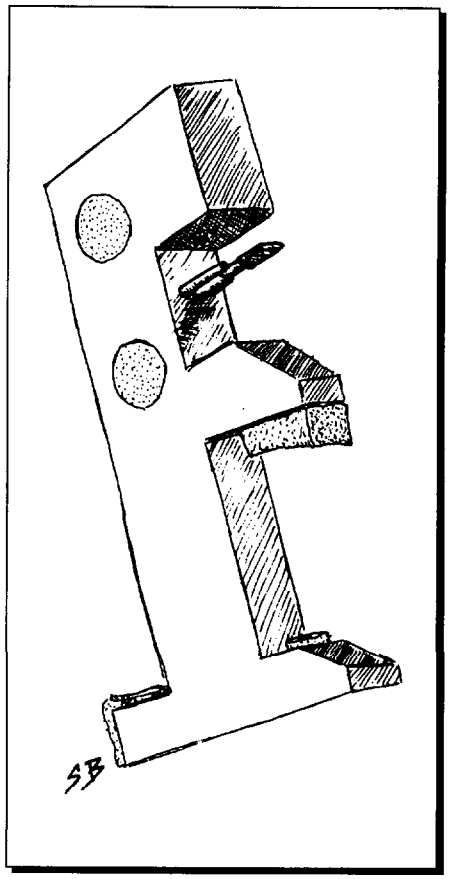
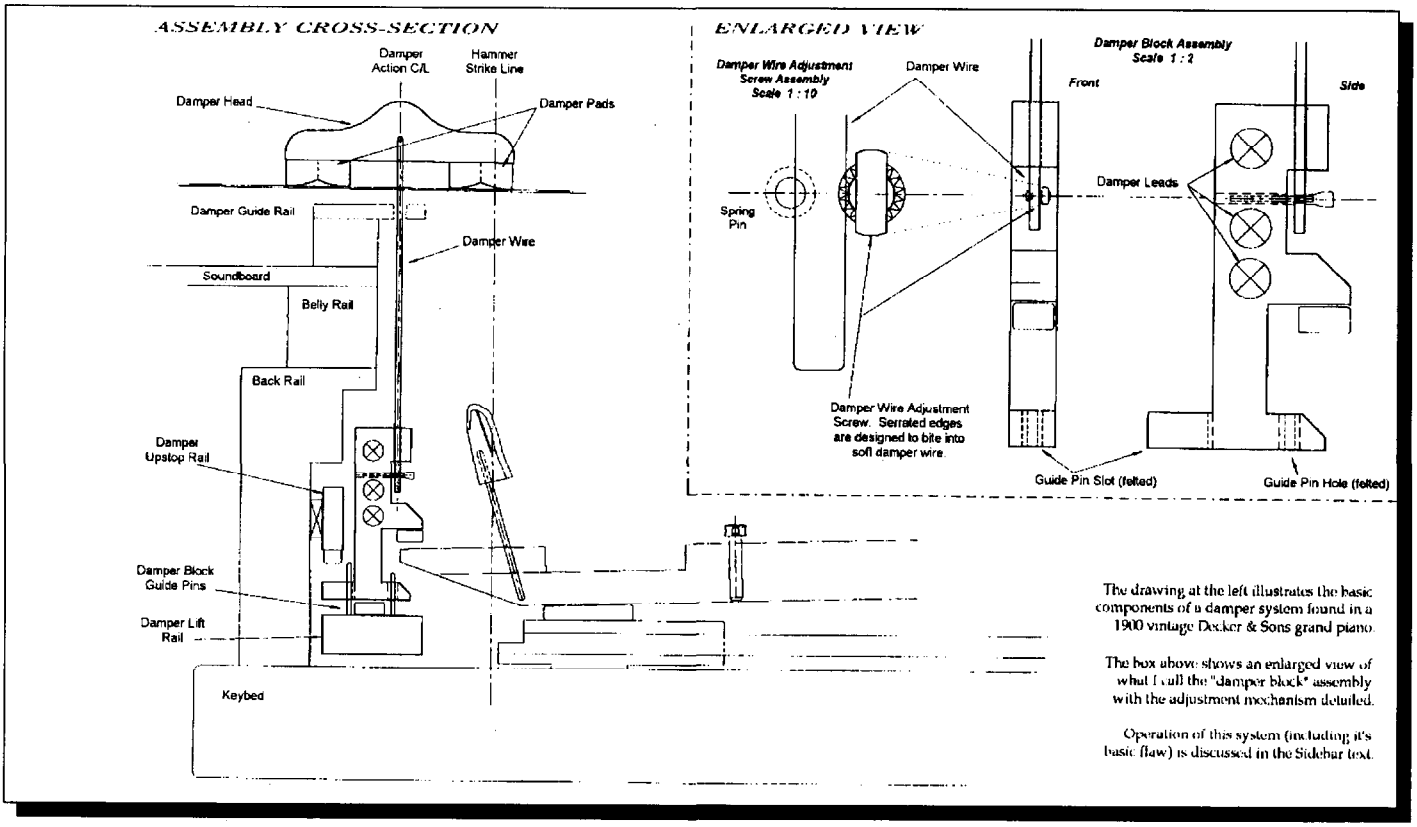
It would take a little redesign, but no really major changes from the original concept. The biggest problem to overcome would be the softness of the adjustment screw. With today's metallurgy and rapid and inexpensive heat treating processes it should be possible to make an adjustment screw that would be both cheap and reliable. Assembly should be much easier than today's system since there are no flanges to assemble. And it would certainly be much easier to assemble to the piano and regulate. Enough of these little devices did still work to prove to me the promise of the system. When they worked it was possible to adjust the damper block height in seconds.

A side benefit would be a somewhat simplified, and acoustically superior, bellyrail assembly — but that's another story.

The particular piano I worked on had only two pedals — no sostenuto pedal — but there is no reason I can think of why a standard sostenuto tab could not be incorporated into the upper portion of the damper block without too much modification. It did not use capstans on either the block or the lift rail, nor are they needed. The adjustment screw on the wire makes them redundant. Finally, the lift rail could have used a better method of mounting, also not a serious problem.

There were no other inherent design flaws in the system that I could see on the one piano that I found using them. But then my experience with the system was limited to just one instrument — albeit one that had survived intact and functioning for nearly 85 years. I've had to replace "conventional" damper systems in much younger pianos that had more problems than this one had! If any other technicians have had any experience with this system I'd be happy to hear about it — drop me a line at the *Journal.*




The drawing at the left illustrates the basic components of a damper system found in a 1900 vintage Decker & Sons grand piano.

The box above shows an enlarged view of what I call the "damper block" assembly with the adjustment mechanism detailed.

Operation of this system (including it's basic flaw) is discussed in the Sidebar text.

# Better & More Stable Tuning in Less Time

*By Virgil E. Smith, RPT & M. Mus.*

For years I have been frustrated when attempting to do fine tuning because of all the retuning that was necessary after the unisons were tuned. No matter how carefully I would tune the octave, it would end up flat when the unison was tuned. I attributed this to natural slippage due to shifting tensions during tuning, and so resigned myself to putting in the extra time necessary to do the retuning needed for best results. I was confronted with a similar problem when working with pianos that are tuned frequently for concerts. Even though the piano seemed practically in tune at first glance, I would still find many octaves slightly sharp, but when I corrected them and tuned the unison they would be flat.

After a long time, it finally occurred to me that perhaps another factor besides slippage was involved. Was it possible that one string of a three-string unison sounding alone would sound a higher pitch than the three strings sounding together? Once the question arose, it was easy to find the answer: simply mute out two strings of the upper note of a correctly tuned octave and recheck the octave. Sure enough, there was a definite beat in the octave: remove the mute and the octave was beatless again.

This discovery led to a whole new approach to fine tuning that made greater accuracy and stability possible in less time: greater accuracy because correct octaves were easier, more stable because of less string movement, and less time because it eliminates much retuning. This phenomenon does not apply to the whole keyboard, just from the temperament area to approximately where the dampers end. When tuning octaves in this area the single string of the upper note of the octave is tuned just enough sharp so that the octave is right on when the unison is tuned. Greater accuracy is possible if the unison of the lower note of the octave has already been tuned. Just how sharp the single string should be tuned to have the octave correct when the unison is tuned, can be determined by muting two strings of the upper note of a correctly tuned octave and noting the speed of the beat. On pianos that are tuned frequently the single string will often be sharp by just the right amount.

If, when the unison of the upper note of the octave is tuned, it is determined that the note is a tiny bit too sharp or flat, the error can be corrected by a technique that is much easier than retuning the octave. Mute out the right string of the upper note of the octave, then tune one of the sounding strings slightly up or down, (depending on whether the note is sharp or flat), just enough to hear a slight difference in the unison, then tune the other sounding string to match. This often corrects the problem, but if not, repeating the procedure until it does is easier than guessing again how sharp to tune the single string. When the octave is correct, tune the third string to match the other two. I cannot detect a difference in pitch between two strings sounding and three strings sounding.

Using the various octave tuning checks when tuning octaves as just described can lead to a high degree of tuning accuracy. It is important that the octave check is correct after both unisons of the octave are tuned. The temperament can only be correct if the temperament octave is properly stretched after both unisons are tuned. From the temperament the 3rds, 10ths, 17ths, 4ths and 5ths should all progress consistently, the 10th faster than the 3rd with a common lower note, the 17th faster than the 10th with a common lower note, and the 4th faster than the 5th with a common top note. With octaves tuned this accurately it is possible to have beatless single, double, triple, and quadruple octaves throughout the entire keyboard. Tuning the top octave is no problem when all the octaves below are properly stretched when the unisons are tuned. There is only one place that the top note will line up with all the lower notes with the same letter name.

If, when tuning octaves in the treble, one does not compensate for the fact that one string gives off a higher pitch than the three sounding together by tuning the one string slightly sharp, the result will be a treble much flatter than intended. The difference may be slight in the octave just above the temperament, but by the top octave it will be considerable, and the overall sound can be noticeably different.

It would be difficult for those who tune octaves by matching coincident upper partials to cope with the problem of one string producing a different pitch than the three strings sounding together, but for those of us who tune octaves by eliminating the beat between the two notes of the octave it is not difficult once we are aware of the situation. Evidently, many still feel that octaves can only be tuned by matching coincident partials, probably because they understand that it is scientifically

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# Better & More Stable Tuning in Less Time

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impossible to hear beats between two different fundamental pitches. Many of us now realize that this principle does not apply to aural piano tuning, only visual, because what is impossible is to strike a note at the piano and hear only the fundamental. The partials that also sound when any note is played not only determine the timbre and pitch of that note, but create beats at the fundamental pitch level when two notes sound together. Most of us deal with these beats regularly, but assume that they are one set of matching partials beating. They are not one set of partials beating, but a beat caused by all the partials and fundamentals of both notes sounding together. This is the beat that is heard when two strings of the upper note of a beatless octave are muted out, and the beat that can be duplicated when tuning the single string in octave tuning.

Just why one string of a unison gives off a higher pitch than the three strings sounding is not clear, but Dr. Sanderson has promised to find the answer, and I feel he will. Although it may be difficult to explain, it is not difficult to prove. Simply tune an octave beatless with both unisons tuned, mute out two strings of the upper unison and hear the beat, remove the mute and the octave is beatless again. Since one string does sound a different pitch than the three, tuning unisons immediately will produce greater accuracy. Otherwise, one is tuning to a pitch that will change when the unison is tuned. Perhaps strip-muting the piano should be confined to pitch raising. Once one becomes aware of the difference in pitch between one string and three strings of a unison and adjusts his or her tuning accordingly, he or she will be very pleased with the improvement in the tuning, the greater stability, and eventually the less time necessary to do a superior tuning. PTJ

# The Limits of Theory — Revisited

*By Bernard "Barney" Ricca*
*Physics Department,*
*University of Dallas*

Dan Levitan's series on inharmonicity has been greatly enjoyable and beneficial. I especially applaud Dan for the careful work he did for his article, "The Limits of Theory" (*PTJ*, June 1995). In that article, Dan raised a few questions about seemingly random differences in the measurement of frequency, and about frequencies which changed during measurement. I believe that these questions can be addressed by the current understanding of the physics of the piano, and it is my hope that I can present some extensions to better understand theoretically the results Dan measured. The extensions to be considered here are the effects of the soundboard and bridge, the different modes of a piano string, and some problems inherent in measuring pitch. These extensions may not have as much practical impact as Dan's articles have had, but I hope that they will at least help increase understanding of the workings of a piano.

Gabriel Weinreich, Professor of Physics at the University of Michigan, performed some investigations into pianos in the late 1970s[1]. In doing so, he made significant strides in understanding the effect of the soundboard (and bridge, etc.) on the tuning of piano strings. The results of these investigations, unfortunately, have not made it into the mainstream of piano technicians' thoughts. Much of what I am about to present is derived from Weinreich's work, and that work is gratefully acknowledged.

We begin by looking at impedance. The *physics* definition of impedance is closely allied with what we normally think of when we hear the word. For our purposes, impedance describes how hard, *and in what direction,* something must be pushed to produce oscillations. We will consider impedances to fall into one of the following three categories:

**1.** Massy. Imagine yourself and a friend throwing a medicine ball back and forth to each other. Notice that when the ball is closest to you, you must exert a force toward the center of motion to keep it oscillating. A massy impedance is one where the force on the vibrating object (e.g., the ball) is pointed toward the middle point of the object's motion.

**2.** Springy. Now, imagine you and your friend alternately stretching and compressing a spring, such as from a shock absorber. When you have the spring stretched, you must pull the spring's end away from its resting position. Conversely, when you have the spring compressed, you must push the spring's end away from its resting position. A springy impedance is one where the force on the vibrating object (e.g., your end of the spring) is pointed away from the middle point of the object's motion.

**3.** Lossy. Now, imagine that you are sawing a piece of wood by hand. Here, you must only apply a force when the saw is moving, and the direction you pull or push is in the direction in which the saw is moving. A lossy impedance is one where the force on the vibrating object, here, the saw, does not depend so much on where the object is, but on which direction it is moving.

There are two complications to this classification. The first is that the impedance of an object changes with frequency. For example, consider a child on a swing being pushed by their parent. At very low frequencies, the impedance of the swing is springy. At higher frequencies, the impedance is lossy, and at high enough frequencies, the impedance is massy. (Incidentally, the normal way of pushing the swing is at frequencies in the lossy region.) The second complication is that, in reality,

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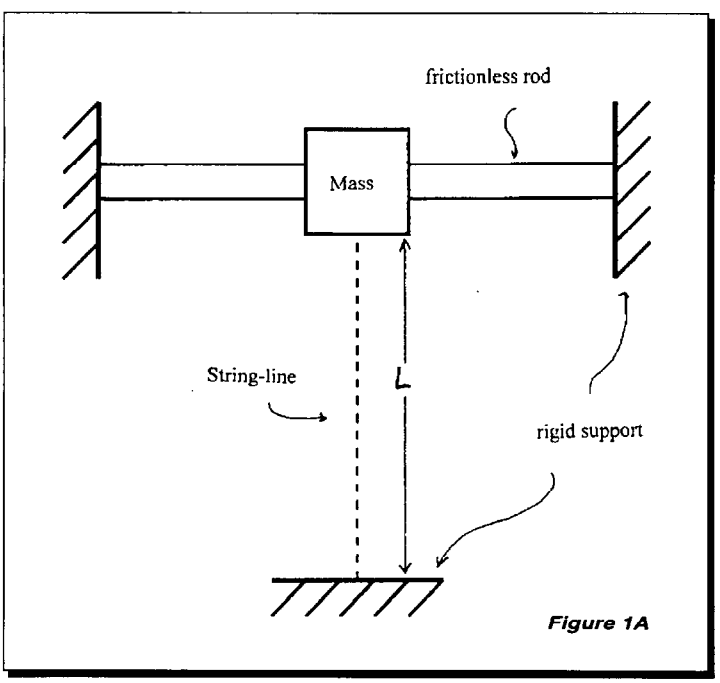


***Figure 1A***

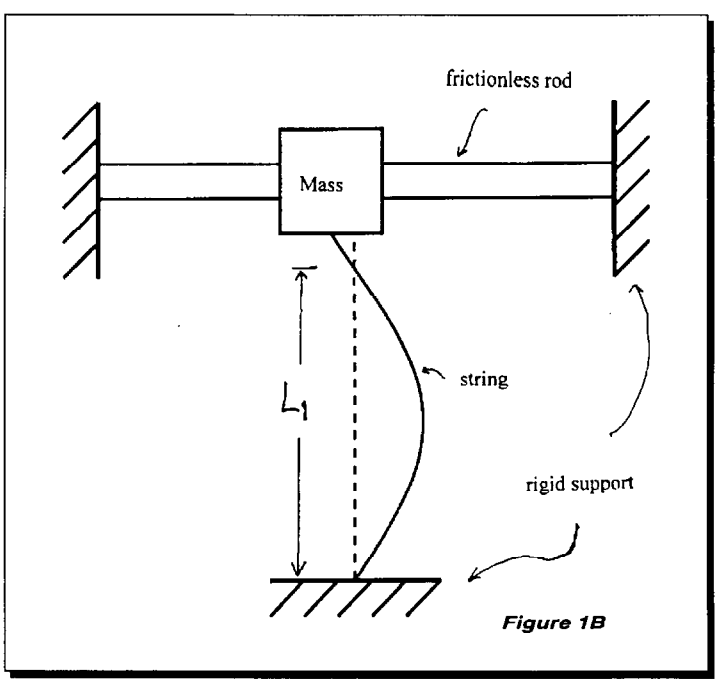


***Figure 1B***

# The Limits of Theory — Revisited

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many impedances are some combination of the three. The former of these complications will be important for us, but the latter will not.

With these ideas in hand, let us look at the effect of the impedance of a soundboard on a string. Since it is the string that drives the soundboard (after all, the hammer hits the string, not the soundboard!), we will examine the situation when the string applies the force to keep the soundboard moving. A stretched string, as we know, applies a force pulling along its length. First, we suppose that the soundboard has a massy impedance. Here, the string will seem shorter than its physical length! In Figure 1, we see a string attached to a block that moves freely along a rod. (Consider this a top view, so we do not have to worry about gravity pulling the block down.) Since a massy impedance needs a force applied back toward the center of motion to oscillate, the string must pull the mass back as shown. When the mass is on the left side, the string pulls to the right, and vice-versa. Therefore, although the string's physical length is L, the distance between the nodes is $L_1$, which is less than L. We will call the distance between nodes the effective length. The shorter effective length produces a higher frequency.

Similarly, we can show that a springy impedance effectively increases the string's length, which lowers the string's frequency. Also, we can show that a lossy impedance does not affect the string's length, and so, does not affect the string's frequency. To apply this all to a piano, (no, I have not forgotten pianos!) we must look at another property of vibrating systems.

A vibrating system is said to oscillate in a *mode* or *modes*. A mode is simply a fancy way of saying that the system has a particular frequency and shape of oscillation. Most systems can oscillate in many different modes simultaneously, and in most systems, these modes have little effect on one another. We will mostly be interested in the modes of piano strings and soundboards. The former is familiar to you all: they are the partials of a note. Each partial has a frequency and a shape. Figure 2A shows the first few modes of an ideal vibrating string. (The frequencies of these ideal partials are harmonically related.) The shapes shown in Figure 2A are only the envelopes of the mode. A series of high speed photographs of the second partial might look like the sequence shown in Figure 2B. The time it takes for that mode to undergo one complete vibration is T. (Figure 2B shows one half of a complete vibration; the other half would appear to be following the pictures upward.) Soundboards also have modes, although the shapes are more complicated, and the frequencies are typically not anywhere near harmonically related[2]. Usually, as one increases the frequency of vibration, the impedance of an object goes from springy to lossy to massy, and then repeats the cycle for each different mode in the system.

Okay, so what about pianos? Well, the impedance of the soundboard will affect the frequencies of the vibrating string, and will, usually, do so *differently for each partial.* Recall that the impedance of the soundboard changes as the frequency changes. Therefore, besides the inharmonicity due to the stiffness of the string, there will be a

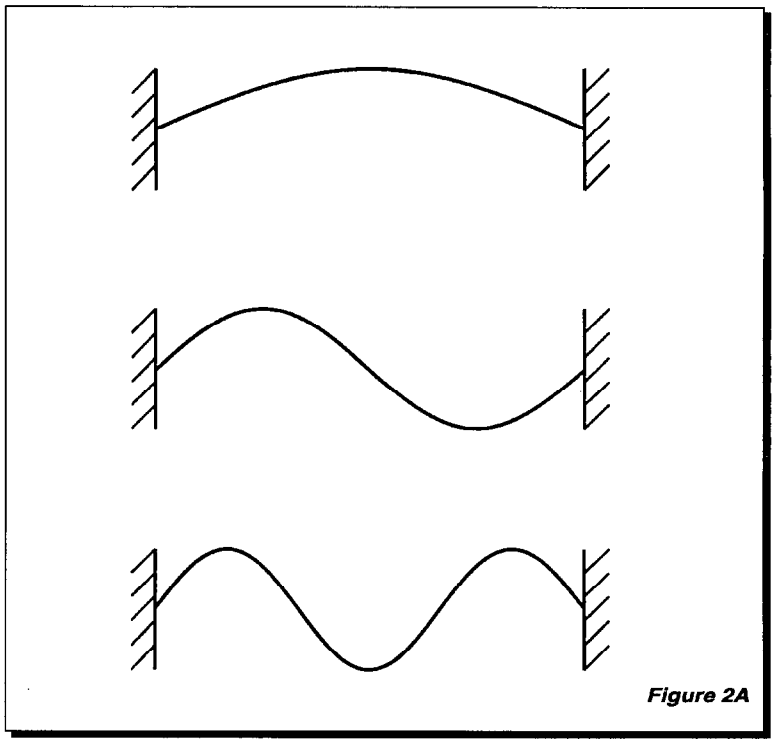


**Figure 2A**

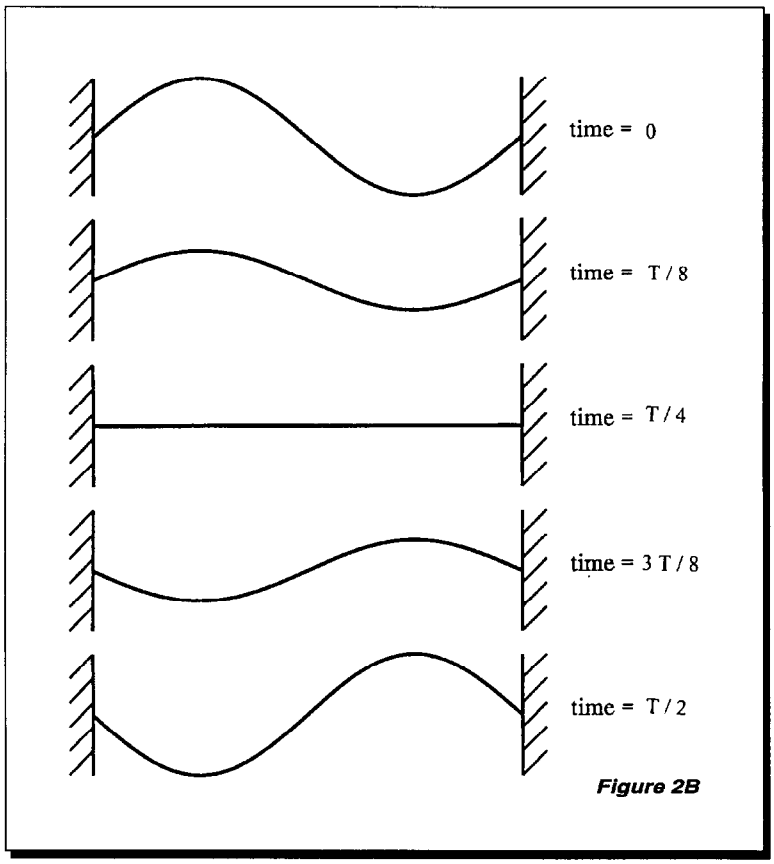



**Figure 2B**

seemingly random component of inharmonicity due to the effect of the soundboard. In fact, this component is *not* random, but seems random only because the impedance of the soundboard (at all the different frequencies!) was not measured. Measuring the impedance is not a trivial thing to do, and I do not think that it would help produce a better tuning in less time, so it is not important in the day to day work of a technician. It can, however, be of help in designing and understanding pianos, and so it should not be overlooked.

Figure 3 shows an example of what might occur. Here, the fundamental is seeing the soundboard as a massy impedance, and its frequency is raised, since its effective length is shortened. However, the frequency of the 3rd partial is lowered, since its effective length has been lengthened. We find that the 3rd partial has a frequency which is actually *less* than three times the fundamental. This would appear to be negative inharmonicity.

Looking at the impedance of the soundboard can help identify the source of some of the random fluctuations Mr. Levitan noted. The impedance of the soundboard is affected by its moisture content, in complex ways. The moisture content of the soundboard is not, however, adequately measured by the current relative humidity, and so, there is little correlation between the recorded relative humidity level, and some of the readings listed in Table 1 of Mr. Levitan's article. One thing that might produce a better understanding of the numbers in Mr. Levitan's Table 1 is a record of the relative humidity level in the several days before the tuning. For example, if the tuning took place shortly after a large rainstorm, the wood might still be more humid than the air. Knowing the current level of relative humidity is not enough information to know the current moisture content of the wood. This is one limit Mr. Levitan encounters.

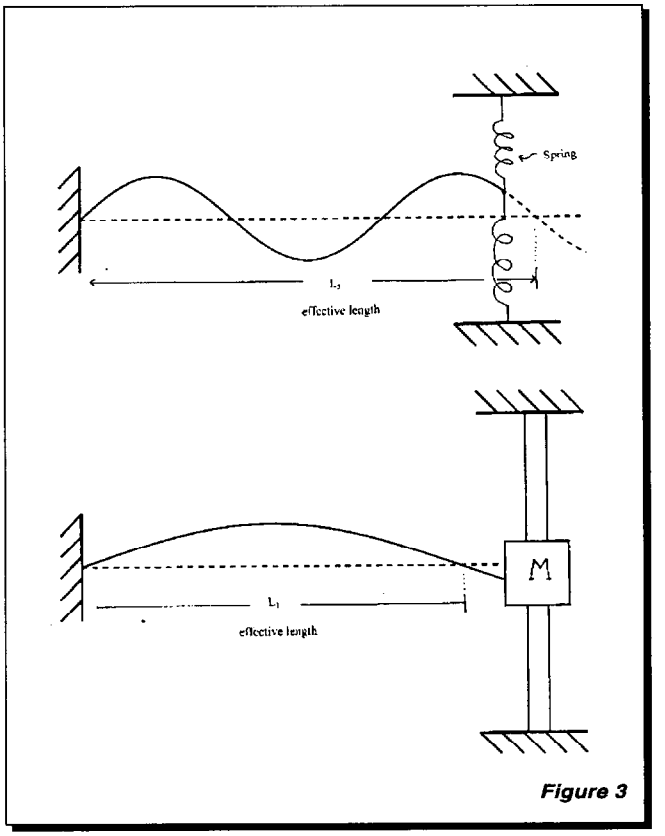


**Figure 3**

A further complication is that any given string is really coupled to the soundboard *and all the other strings!* Hence, as the piano is tuned, or even muted differently, the soundboard modes, which are really the modes of the soundboard and the other strings change their impedance. This, in turn, affects the frequencies of the various partials of the string in (seemingly) random ways.

Besides the seemingly random components of the frequency, Mr. Levitan also notes that the frequencies themselves tend to drift after the note has been played. Again, Weinreich's studies shed some light on this. The short version is that a piano string vibrates both in the plane in which it was struck and in the direction perpendicular to that direction. These two directions are different modes (because their directions are different), and *have different frequencies.* Their different frequencies are because the soundboard will have a different impedance depending upon the direction in which you try to shake it. The prompt sound of the piano is due primarily to the vibration of the string in the plane perpendicular to the soundboard. The after-sound of a single string is due primarily to vibration parallel to the soundboard, and this vibration has a different frequency than the vibration of the prompt sound. The readings from the Sanderson Accu-Tuner therefore, seems to drift in frequency because the sound drifts in frequency. If this were not bad enough, there are also nonlinear (i.e., mathematically complicated) effects that cause a further frequency change as the amplitude of vibration changes.

The effects just described could be mathematically treated by careful measurements of the impedance of the soundboard. However, such measurements would be of little practical help to the tuner, as most of you are already correcting for the effect of the soundboard when you tune, although you are probably unaware of this. (If you did not correct for these couplings, the piano would sound quite poor when you finished the job!) There is one case, however, where being conscious of the effects of the soundboard may be of help in diagnosing problems. That case, which I have only heard a couple of times, and only in the bass, is that one note insists on booming, despite much hammer voicing. Here, the problem may be the coupling of the string to the soundboard, and one may best fix this problem by adjusting the soundboard or bridge. This adjustment can be done by adding weight to the soundboard, adding or subtracting a rib, and many other things which are impractical. The more practical methods are to adjust the humidity near the piano, to check for how well the soundboard is mated to the case/rim/plate, and to examine the bridge pins. (Of course, if none of these work, then extensive soundboard repair may be called for.)

A detailed study of the effects of the soundboard on the piano could provide for a deeper understanding of the seemingly random (small) variations in the tuning of the piano. For the most part, however, we technicians produce good results, so such a study would not significantly change how we work on a day-to day basis. I hope this note will help you better understand some things you encounter. Happy tuning!

### Notes:

1. See G. Weinreich, "Coupled Piano Strings," in the *Journal of the Acoustical Society of America*, Vol. 62, No. 6, pp. 1474-1484 (1977). A less mathematical presentation of these results can be found in G. Weinreich, "The Coupled Motions of Piano Strings," in *Scientific American*, January, 1979.

2. As I finish this, the August, 1995 *Piano Technicians Journal* has arrived. Look on page 24 in John Hartman's article "The Effects of Downbearing on the Tone of the Piano...Part 1" for some representative sketches of the envelopes of the soundboard modes. PTJ

# The Business Meeting

*By Sid Stone, RPT*

The scene depicted in Bill Klein's cartoon reminds me of "The Good Ole Days" when excitement in Council sessions extended into the wee hours of the morning. What a difference a parliamentarian can make! But excitement is not the purpose of Council meetings.

This article concerns the chapter business meeting: (1) How to forestall or reduce tension, (2) How to shorten the business meeting, and (3) How to conduct business in a calm and rational manner. There are four elements that will make a meeting twice as successful in half the time: Preparation, Time constraints, Proper presentation, and Control.

Too often the mistake is made thinking that planning for a business meeting is not necessary. This is the responsibility of the one in charge. Of most importance is the chapter executive board to discuss the items to be presented to the chapter, and then to make recommendations for approval. If the chapter president feels a diversity of opinion among the members, he or she could call a special board meeting or increase the time of the regular board meeting. The board's recommendation could save valuable time and make the business meeting more manageable. Usually the board members are highly respected, and their recommendations carry a lot of weight.

Some chapters may opt to convert the entire monthly meeting to important issues as Council agenda items. In any case, it is always good to hear at Council meetings that individual chapters have been involved in decision making. We would be a better Guild if more chapters would follow through on this.

Preparation also means a knowledge of basic parliamentary rules, such as Robert's Rules of Order, and the ability to adhere to those rules. You don't have to go to the extent of adherence expressed in the award winning film by the Golden Gate Chapter, but the chairperson needs to know enough rules to keep the meeting running smoothly.

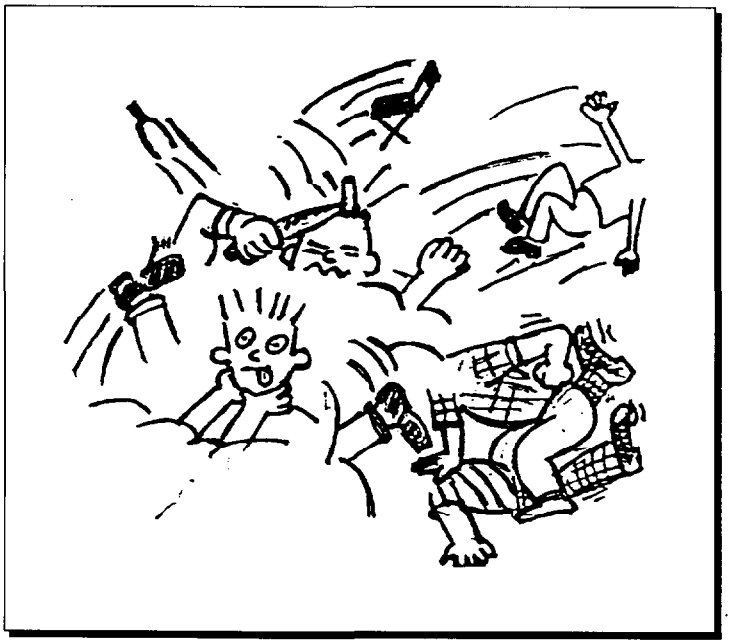
Now for the actual conduct of the business meeting, success is dependent on TLC (Timing, Length, and Control). Timing concerns the time slot in the chapter meeting. There are three segments: the business portion, the social/break/refreshments, and the technical(s). Many chapters prefer to have the business meeting first and get it over with. This may mean that some members not especially keen on chapter or Guild affairs and wanting to avoid a dull business meeting, may arrive late, but in time for the technical(s). Furthermore, a quorum may be harder to find.

On the other hand, if the business portion is at the end of the meeting, some may leave early with excuses like "I left the water running in the bath tub, and I think I hear sirens blowing." If the one in charge of the meeting is respected and capable, it matters little if business is taken care of before or after the main portion. However, it *does* matter if an outside speaker has been invited. There was one chapter with an outside speaker; and the first hour was spent as a dull business meeting that went on and on. Outside speakers are usually not as interested in the chapter's business as they are in presenting their program and getting back home.

If *Timing* is a concern, then *Length* is of more concern. You should put a time limit on the length of the business meeting, and then stick to it. It may help to have an alarm clock go off when the time is up. Of course, there may be times when you find yourselves in the position of Congress, and then you have to stop the clock. Most business meetings could be over in 15 to 20 minutes. For larger chapters the length may be extended, but don't get bogged down. When the chapter's executive board does its job, the length of the business meeting should allow no objection from the members.

If *Timing* and *Length* are important, then how much more important is *Control.* The one in charge may be the best technician in the chapter, but if he or she is not prepared and does not know and follow the basic rules of conduct, then a mild version of Bill Klein's cartoon may ensue. If the discussion is to be on the agenda at the council meeting, the chapter members should be notified and encouraged to read the *Journal* and come prepared to voice their opinions. Chapter delegates to Council need to know how their members feel on different issues; and sometimes the chapter instructs the delegate to vote a certain way. The problem with this is that all the facts may not be given at the chapter meeting; so the delegate should be given permission to change the vote of the chapter if additional information at Council requires it.

In summary, if all goes well in the business meeting, better attendance is assured, and the members are more content because of Preparation, Time constraints, Proper presentation, and Control.



*Courtesy of Bill Klein, RPT*

***At our next meeting the proposed bylaws amendments will be discussed in a calm and rational manner.***

# How Much Is This Thing Worth?

## Part 2

*By Ward Guthrie, RPT*
*Montana Chapter*

### Idealized Value Minus Repairs Method

The fourth approach is idealized value (or new) minus repair costs. We attempt to visualize the piano in perfect condition and then assign a value to it. What would a new piano of comparable quality cost? Again, refer to the Ancott Associates "Music Product Directory."

First, estimate all costs to put the piano into perfect condition. Some technicians multiply the age of the piano by $20 to $25 for each year. I do not recommend this. It is far too inaccurate. It doesn't take the condition of the specific piano into account.

When you are making an estimate of cost, don't concentrate on underbidding to get the work — you will usually regret it. Explain to the client that it is deferred maintenance, something they should have been taking care of regularly during the life of the piano.

So how can you make an accurate estimate of those repair costs? You will need a schedule of "technician-hours" needed for the various jobs, or at least a price list from a major rebuilder. The most comprehensive "technician-hour" schedule I'm aware of is by Joe Garrett of Oregon, sold by the Randy Potter School. *(Refer to the PTG Membership Directory for the address.)* You can also make your own, but it will be far more efficient to use one already created. You will do some jobs faster than the time listed, others slower. Adjust the times accordingly for your own personal requirements.

How can you figure the cost of materials? Use your supply house catalogs. Use price lists from the manufacturers. What about things like how many feet of string in each size you will need for restringing? I don't waste my time at this point for the small things. I throw in some gut feeling amount to cover some of it. When I do the job, I will watch the costs more closely.

What are the disadvantages of this method? Often you will get a low appraised value. If you are considering the piano in idealized, new condition, what do you do about some parts that are in excellent condition but do show some wear? These are the gray areas. Use your best judgment. Remember, it is one person's opinion.

Explain to the client the relative shortcomings of the methods you have used. Don't say so much that you confuse the customer. Also, are you talking rebuilding or reconditioning — the client should know. What is the difference between rebuilding and reconditioning? I like the definitions in *The Piano Book* by Larry Fine. Know how you define them and make sure the client knows the difference.

### Combined Method

When I do an appraisal, I use three different methods (current market, depreciated, and idealized minus repair), then I reconcile the results. You can average them or weigh one more than the others depending on your specific circumstances with the piano. Adjust your approach to suit your personality. Generally, I lean mostly on the current market and the ideal piano minus repairs. I rarely use depreciation schedules except on newer pianos.

### Examining the Piano

Now you should understand the theory behind appraisals and estimates. So how do you actually do it? First, have a professional appearance. How much your clients will value your opinion will be influenced by their initial impression of you. Should you dress in shop clothes to appraise a $30,000 grand piano? Certainly not — the owner would be apprehensive and probably not respect your opinion.

What tools are necessary? All of your normal tools would be. In addition: downbearing gauges (both rocker and bubble types), a tape ruler, Pierce's Piano Atlas, a good flashlight, a calculator, your appraisal form, and a crown stick or some thread for measuring soundboard crown.

*[Editor's note: the crown stick Ward mentions will be featured in the "TT&T" section of a future issue. —SB]*

On your appraisal form, I recommend the use of symbols rather than writing everything down. Have some sort of rating system that is clear to you. I use: E = excellent, VG = very good, F = fair, P = poor, and NWR = not worth repair. On the form, use these codes with some clarifying comments alongside.

For estimates, note more information. Plan to make your estimates on the high side. This will cover you for something you are sure to miss. I have seldom done an estimate where I foresaw all that was necessary. If you do the work later and your costs have increased, you will often still be all right if your original estimate was a little high. In addition, your client will be overjoyed if your final bill comes in near or lower than your original estimate. Don't ever make a low estimate hoping you will get the work over a competitor. You will usually regret it. The work may be nice, but not if you end up losing money.

What things should you look at in the piano for an appraisal? First, what is your initial reaction? Look at the piano as if you were a potential buyer. What do you first see? The case. What is the style? Has it been redesigned in some home workshop? Is the finish poor, scratched, with water marks, or have veneer missing?

What do you see next? The keytops. The same principles apply. Realize that many will buy a piano simply for the case and ivories, nothing more. They have no thought or consideration of quality. No matter how superior the musical value is, if the case and ivories are shot, the value will be much lower.

Now start looking at the piano for its musical value. Play it some, being sure to play every note. What are your general impressions for tone, regulation, tuning, and voicing? Make appropriate general notes on your appraisal form.

Check the structure next. If the plate is cracked, don't bother going on. How are the soundboard and bridges? How badly is the board cracked? (Realize that the cracks are essentially cosmetic.) Are there loose ribs? Are the bridges cracked, unglued, or separated from the apron?

Check tuning pins, pinblock, and strings. What is the pin torque? Fifty inch/pounds is generally acceptable. Do you need a torque wrench? For accurate measurements, definitely use one. However, most of us just do it by feel. From your experience, you should know if the strings will stay in tune by their feel. Have any tuning pins been driven in? This can give you some clues as to the condition of the pinblock. Has the pinblock been doped?

Especially check any strings that are obviously flat. Why are they flat? Look for broken or replaced strings. Why were they replaced? Check for rust on the strings, a dead tone, rattles or buzzes.

Check the grand pinblock from below. Remove the action and see if the pinblock is mated well to the plate flange. Use a business card to check the fit. Check the upright pinblock to see if it is separating from the back assembly.

How are the pedals? Is the grand lyre loose? Is the bottom board loose on an upright? Generally look over structural components.

What about the existing tuning? Is it stable since the last tuning? When was it last tuned? If there is a problem, what is the cause? If the pitch is flat, why? What is the tone like? It may be impossible to make a judgment on tone without tuning first. Many technicians require a tuning as part of the appraisal or estimate. Charge accordingly.

How is the regulation? Be sure to check all the important steps of whatever method you use during a regulation.

Look over the action and keys. Are the centers worn? Are there any missing or broken parts? Does the action have plastic parts?

What about the hammers? Are the string grooves deep? Are they centered on the hammer? Are some hammers flat (worn flange bushings)? The hammers can give you some great clues about the general condition of the action as a whole.

## Take Note!

Use a form to make all these notes. Write it down; you won't remember it later. A form insures you will do a routine and accurate job every time. Some use their billing form. This is all right, but your billing form should look professional. Don't use a sales receipt book you might buy at K-Mart. Make sure your form addresses all aspects of the piano.

All forms should have the date of the appraisal. Note the make, model, serial number, and age of the piano. Make notes on the physical condition and artistic merits. It might be appropriate to state the cost of a comparable new piano.

My form is constantly evolving. I have changed it often as I learn more from institutes and seminars. There are essentially two approaches to the form. One is to have numerous items to check off. You will look at many more individual aspects this way and will probably have fewer surprises if you later do the work. However, this will take more time for the appraisal. The other approach is to look at fewer aspects, but to have more blank space for writing comments. My form is a combination of the two. I try to look at most aspects of the piano, but also have space to write comments after each item.

**Continued on Next Page**

# How Much Is This Thing Worth? — Part 2

*Continued from Previous Page*

## Sending the Appraisal

After you do your work at the piano, write a letter to the client. Again, you can take two approaches, either keeping it very simple or use an itemized and extensive letter. I feel you should try to keep it simple. Generally, the client doesn't want to know all that is important to you. What they want to know is the final dollar figure. Some will want to know how you arrived there, but most will not.

To protect yourself against litigation, the bottom of your form should include a disclaimer similar to this:

"In making this appraisal, the appraiser assumes no liability with respect to any action that may be taken as a result of this appraisal."

In Montana, I generally don't write a letter. I present the client with a copy of my worksheet and then explain it verbally. You would probably be better off not to follow my example. In Montana, we pretty much still trust everyone and still do business with a handshake. That is changing though. I will probably soon need to put it in writing so there are no misunderstandings. If you live in a large city, definitely get it all in writing.

## Contracts

After completing the estimate, many use a rebuilding contract. One is shown in the June 1989 *Journal*. State the time limit after which the price may change. This is often 90 days. Have the client sign a copy to authorize any work.

What about the payment schedule? Many shops recommend a 10 percent-40 percent-40 percent-10 percent schedule. 10 percent reserves shop time and has the client make the commitment. The first 40 percent allows payment for you to purchase parts and outside labor. This payment is made when the work begins. It will help prevent cash flow problems. The next 40 percent is paid upon completion of the work. It is paid before the piano is delivered to the client's home. The final 10 percent is paid at the first home tuning.

## Insurance Appraisals

How about insurance claims? Insurance companies are most interested in two values: a comparable new piano cost, and the fair market value of that instrument. You should list both values for insurance claims. What the company is looking for depends on the policy. Be sure to write everything down for insurance claims. Be careful to protect yourself.

Insurance may be one of three types: new replacement value, market value, or depreciated value. If the insurance is for new replacement value, simply list the cost of a comparable new piano. For market value, complete a full appraisal. If the insurance is depreciated value, don't bother with an appraisal for an older piano. The company will generally not pay anything.

Encourage your clients to check their insurance policies. They should not have original price minus depreciation for musical instruments. Insurance companies don't realize that pianos depreciate much slower than cars, computers, and other items generally found in homes. They also don't realize that some pianos even appreciate.

## Antiques

Finally, what about antique pianos? Does antique just mean old? My dictionary states that anything made before 1830 is considered an antique, according to U.S. customs laws.

So what makes anything an antique? Rarity, uniqueness, ornamentation, and history are the main qualifiers. In private homes, I have seen only three pianos I would consider as antiques. Many of you in larger cities have probably seen many more.

Pianos do not become valuable or antiques just with age. Our job as an appraiser for home pianos is to judge the condition and life expectancy as a functional musical instrument, not as a collector's item. If your clients think they have an antique, they should go to an antique dealer or to a technician that specializes in appraising antique pianos. In this case, the clients are not thinking of the piano as musical instrument. They are thinking of it as a piece of furniture. Our job when appraising as piano technicians is to set a value on the piano based on its ability to make music.

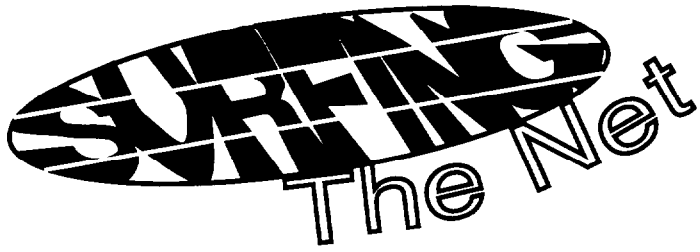
Most of us generally know nothing about true antique pianos. Don't stick your neck out and ruin your reputation trying to make yourself look like an expert in something you know nothing about.

Finally, what about squares and birdcages? Neither of these is generally worth much as a musical instrument. Tell the clients this or refer them to someone specializing in these instruments.

## Conclusion

Now that you know how, do that next appraisal yourself. You will gain confidence with appraisals as you complete more of them. Just as with many other aspects of our trade as piano technicians, you will not learn this skill from reading an article in the *Journal*. You also need experience. When you are starting, don't be ashamed of your personal opinion. You probably know more about its worth than anyone else they may have asked. So set up your forms, line out your plan of action, study your local market, and try the next one yourself. Good luck. PTJ

*... I'm heading right into the surf now, just a few more swells until I reach my favorite spot. Under the wave and out the back, deep breath, again, stroke... stroke... stoke....*




## Lesson Two: The Nuts and Bolts

**By Bill Springer, RPT, Hawaii Chapter**

Before you start net-surfing you will need to acquire a working knowledge of two basic tools: a computer, which inputs, stores, and manipulates data; and a modem, which sends and receives data over telephone lines. You will also need a way to extend these tools onto the Internet, often called a Gateway. Imagine each gateway being a knot in a giant fish net, wrapped around the earth like webbing around a Christmas ornament and you have a very simplistic view of the Internet.

The Internet is really a "network of networks" which has its own special language, protocol, and conventions, which is total "voodoo" to most normal (*grin*) people. Fortunately, there are a number of businesses out there who specialize in translating all this "voodoo" into user-friendly software, which most on-line services will provide for you free of charge. So, once you choose an on-line service, get a modem installed in your computer, and load up the proper software, you're ready to start paddling out on the Net.

## Choosing a Computer

There are two basic types of computers these days; IBM and compatibles that can run Windows, and the Apple Macintosh family. For working on-line, either type will work just fine as long as the computer is less than three years old and has a hard drive with plenty of space (200 meg and above). The newer machines with the little icons really make access to the Net easy and fun to use. Slower and older machines will work for basic services like E-mail, but to access the really cool stuff like the World-Wide Web (WWW) you will need a more modern machine and a fast modem. The on-line service provider you select will have a very detailed list of hardware requirements, so I'll let them answer those specific questions.

## Choosing a Modem

Three things to consider when choosing a modem:

1) Speed,
2) Cost, and
3) Internal vs. external.

A modem's job is to send and receive data and its speed is measured in bps (bits per second). Faster modems exchange more data in the same period of time, which makes them more efficient. Basically, the faster the speed, the higher the cost. You can also buy modems with extra "bells and whistles" like voice mail, but unless you plan to run your computer 24 hours a day you won't need these options. Right now the industry is moving to a standard of 28,800 bps, so a good rule of thumb would be to invest in a modem as close to this speed as your budget allows.

Warning! Buying a faster modem does not mean that you will be more efficient or spend less time on-line. To the contrary, a faster modem gives you much better access so you may wind up net-surfing a lot more and spending much more time on-line.

An internal modem comes on a "card" and needs to be installed inside your computer; an external type, which is about the size of a video cassette, lives outside your computer. I recommend the internal type. Internal modems are cheaper than comparable external models, and take about as much time and effort to install as re-pinning an upright hammer flange. There is actually a third type which plugs into a special port of modern laptops, so you can take the whole show on the road!

## Choosing an On-Line Service

Three things will determine what provider is best for you:

1) Where you will access or (dial-in) from,
2) How much time you spend on-line, and
3) How much money you want to spend.

I imagine most piano technicians will "dial-in" from a fixed location, either from home or work, so finding a provider with a local or toll-free access number (sometimes called a "node") is most important. The sheer size and complexity of downloadable files, especially pictures and graphics on the WWW, require minimum access speeds of 14,400 or higher. For E-Mail messages even the slow speed of 2,400 baud will work and one can do text-only WWW access at 9,600 or slower speeds, but it involves a lot of waiting while data is being received. I live in a large enough city to have both 14,400 and 28,800 access, but I would pay more than double for the faster access speed which I don't really need.

For on-line "novices," large established providers like CompuServe or America On-line are good places to start your on-line journey. These world-wide providers have hundreds, maybe thousands, of access nodes, but when you dial in you are connected to their network. Any mail or access they provide goes through them, which makes it easy to use and control. The drawback is the speed at which you can access, and you may get an occasional busy signal at peak traffic times. Both these services offer a free trial period and provide you with good, easy-to-use software and a toll-free customer service hot line if you run into problems. These companies use "point and click" mouse techniques with easily identified icons that hold your hand and lead you through the maze. There is a whole menu devoted to E-Mail. Messages are easily retrieved, sent, created, forwarded, deleted, etc. This service alone is worth the price of admission!

As you get more comfortable being on-line you may want to consider "direct access." That's where your local host has set up an access line that you dial into, then you're right on the Internet. The software is still user-friendly, but a little more complicated. You may have to pay more money for this type of access, but the access speeds are at least 28,800. The advantage here is speed and range of access. If you are doing a lot of Net-surfing, downloading a lot of shareware, or like to access libraries around the world, then this could be the place for you. In my city, there are currently three coffee shops which have computers linked up to the Internet with this direct access. People gather here and enjoy full Internet access over a cup of coffee at a nominal costs. Maybe there's something similar in your neck of the woods!

*Next time we'll talk about how to address mail and some things to watch out for.*

# PACE

Professionals Advance through Continuing Education

# LESSON PLAN

Technical Lesson #27

## *Grand Regulation - Part 8: The Relationship Between Let-Off & Drop*

***By Bill Spurlock, RPT***
**Sacramento Valley Chapter**

*This monthly lesson plan is designed to provide step-by-step instruction in essential skills. Chapters are encouraged to use this material as the basis for special Associate meetings, or for their regular meeting program, preferably in a hands-on format. This method allows the written information to be transformed into an actual skill for each member participating.*

### *In Brief*

This lesson will look at the double escapement design of the grand action, and will explore the relationship between the let-off, hammer drop, jack position and repetition lever height adjustments. Participants will learn the principles of setting these adjustments using action models. Later lessons will cover performing the adjustments on actual pianos.

### *Getting Started*

In order to pursue any serious study of piano technology, one must obtain basic resources. Catalogs from several piano supply houses, both large and small, are essential. Besides offering the necessary supplies, their pictures and item descriptions are valuable sources of information. Piano manufacturers' service manuals are also essential sources of valuable information. Most are available at no cost. Most important to participating in this Lesson Plan series are the PTG Exam Source Books, both the tuning and technical versions. Articles in these books will serve as reference material for the lessons.

### *Hands-on Session Setup*

This lesson is best taught with action models rather than complete piano actions, so participants can clearly see the parts involved. Ideally one model can be provided for each one or two participants.

Models must be already regulated for proper hammer blow, key-dip, aftertouch, and repetition spring strength prior to the meeting.

Additionally, meeting setup should include:

- extra regulating tools, and
- a well-lit work area with tables or work benches.

### *Estimated Lesson Time*

Approximately 1 1/2 hours, depending upon the number of participants.

### *Tools & Materials Participants Must Bring*

For this lesson, participants should obtain the following tools:

- a small, thin, flat-blade screwdriver for slotted drop screws,
- tool for clinch-head (conventional type) drop screws,
- selection of general regulating tools, and
- 6" steel rule, graduated in millimeters and inches.

### *Assigned Prior Reading for Participants*

PTG Technical Exam Source Book (PTG Home Office, 816-753-7747), pgs. II.8-II.12.

### *General Instructions*

Escapement is the essential feature of a piano action. This is the ability of the mechanism pushing the hammer toward the string to disengage (escape) from the hammer assembly at the last moment. This allows the hammer to rebound unimpeded from the string. Without escapement, the hammer would strike the string and stay pressed against it until the key was released, producing only a muted thud.

In a vertical piano action, the hammer butt assembly is driven to the strings by only one part: the jack. The jack disconnects from the hammer butt at the let-off point, allowing the hammer to rebound freely into check. However, in the grand action the hammershank assembly is lifted by two separate parts: the jack and the repetition lever. Both parts must disengage from the knuckle in order for the hammer to rebound freely from the string. This is the "double escapement" feature of the grand piano action—just before the hammer reaches the string, the top end of the repetition lever is stopped by the drop screw, and the jack is tripped by the let-off button.

*The timing of these two escapements is critical to action performance.* They must occur as late in the key stroke as practical for three reasons:

1) so maximum power is delivered to the hammer before escapement,

2) so the hammer will still reach the string even with the softest playing,

3) so the additional touch resistance caused by tripping the jack and compressing the repetition spring is limited to a sudden, "bump" feeling very near the end of the key travel. This creates a crisp, distinct feeling of slipping past a point of resistance that signals the completion of the key stroke to the pianist.

*This "bump" feeling is most comfortable to the pianist if felt as a single, solid ledge* rather than a gradual increase in resistance. In other words, the repetition lever should contact the drop screw at the same time the jack contacts the let-off button. Then the pianist feels a single, crisp bump rather than a vague, two-stage point of resistance. Thus when regulating, we must consider let-off and drop together so they are not only correct but synchronized.

**Photo 1:** There are four adjustments responsible for this simultaneous contact of repetition lever/drop screw and jack/let-off button:

**1) Jack position adjustment** — (see Photo 2). Aligning the jack fore and aft to the knuckle core also changes the height of the jack tender, and therefore the timing of its first contact with the let-off button. However, even though jack position affects this timing, it is not used for this purpose. The jack adjustment should be set for best action leverage and touch as described under Photo 2, prior to checking for simultaneous contact of repetition lever/drop screw and jack/let-off button.

**2) Repetition lever height adjustment** — (see Photo 3). The height of the repetition lever above the jack top affects the timing of the lever's first contact with the drop screw. However, as with jack position, this adjustment is not used for this purpose. The repetition lever height is adjusted for proper touch and repetition as described under Photo 3, prior to checking for simultaneous contact of repetition lever/drop screw and jack/let-off button.

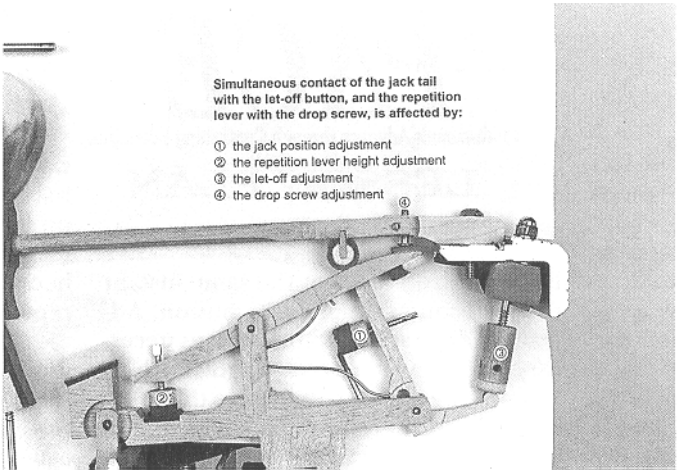



*Photo 1*

**3) Let-off adjustment** — Adjustment of the let-off button obviously affects the timing of its first contact with the jack. However, here again, let-off is adjusted to provide best control during soft playing and maximum power, and should not be compromised to coincide with the drop function.

**4) Drop screw adjustment** — The drop screw is adjusted to limit the upward travel of the repetition lever so it will disengage from the knuckle before the hammer strikes the string. Unlike adjustments 1 through 3 above, the criteria for drop adjustment have more to do with synchronizing it with the onset of let-off than with other factors.

For proper escapement, the drop screw must disengage the repetition lever from the knuckle so the hammer can rebound from the string, and the drop screw must stop the repetition lever low enough that the hammer remains out of contact with the string if it is not caught by the backcheck. However, in most actions, these requirements will be satisfied if the drop screw is simply adjusted so the repetition lever contacts the drop screw at the same instant the jack contacts the let-off button. When adjusted this way, escapement is noticeably more solid and comfortable for the pianist, and also occurs as late as possible in the keystroke. Performing this adjustment is described below under Exercises V through VIII.

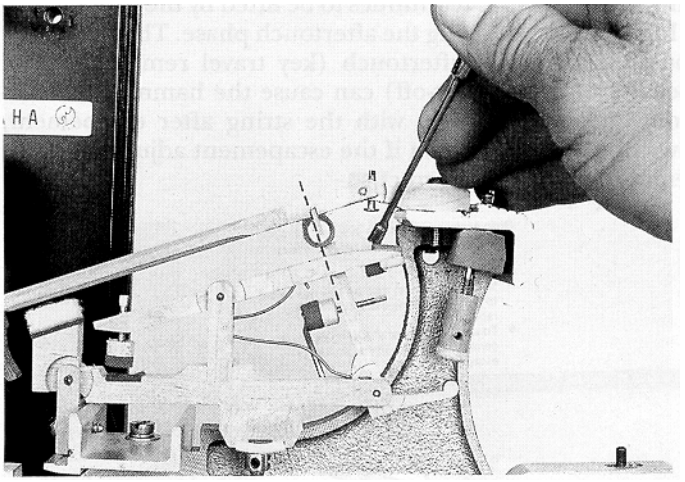


*Photo 2*

**Photo 2:** With the action at rest and the hammer blow distance correctly set, the back edge of the jack should be aligned with the back edge of the knuckle core. This is observed by depressing the repetition lever as shown. If the jack is too far back toward the hammer, escapement will feel stiff because the jack top must scrape farther across the knuckle when it trips. If too far forward (toward the drop screw) the jack may slip out before the let-off point, reducing power.

The rest position of the hammershank affects the jack/knuckle core alignment, so hammer blow distance must first be set. Normally, the blow distance will be such that the jack is 90 degrees to the hammershank at rest.

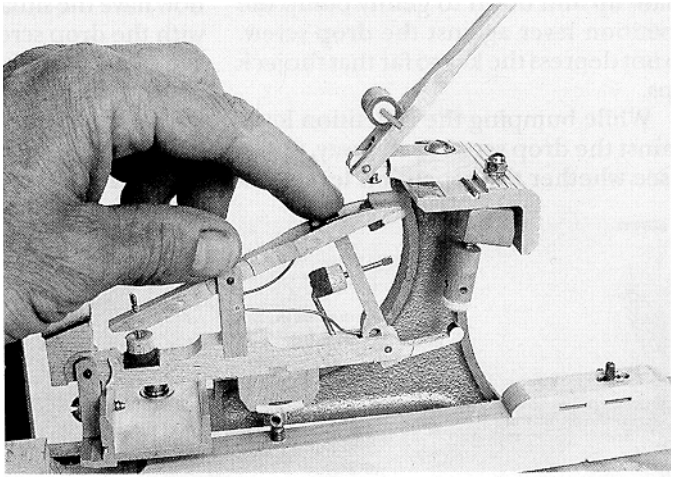


*Photo 3*

**Photo 3:** For initial regulation purposes and for this lesson, repetition lever height can be adjusted by sight and feel so the jack is just slightly below the top of the rep. lever (about the thickness of a business card). Later during fine regulation, this adjustment will be refined using a different test.

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**LESSON PLAN**

*Continued on Next Page*

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## Exercises

Participants should perform the following adjustments on their action models:

**I)** Confirm proper jack alignment as described in the caption for Photo 2.

**II)** Confirm proper repetition lever height as described in the caption for Photo 3.

**III)** Adjust let-off to 1/16" to 1/8". Note: in order to see the exact let-off point, you must move the key extremely slowly, and be able to stop its movement at any point. To do this, place the tip of your thumb under the front of the key, then depress the key slowly with the index finger of the same hand, squeezing your thumb between the key and keyframe.

**IV)** Adjust the drop screw so that when the key is depressed very slowly, the hammer drops about 1/16" below the let-off point immediately after let-off. This is a generic, approximate method of setting drop.

**V)** Depress the key slowly just until the drop screw contacts the repetition lever. Next, release the key slightly to lower the hammer about 1/2", then oscillate up and down to gently bump the repetition lever against the drop screw. Do not depress the key so far that the jack trips.

While bumping the repetition lever against the drop screw in this way, watch to see whether the repetition lever contacts the drop screw at the same instant the jack contacts the let-off button. Adjust the drop screw up or down as necessary for simultaneous contact, then "bump" the parts again. Notice the solidness of contact as both jack and repetition lever contact at the same time.

**VI)** Lower the drop screw one turn. You should now have the situation shown in Photo 4, with the drop screw too low. Watch the bottom of the knuckle as you bump the parts again. You should see that the jack lifts the knuckle slightly off of the repetition lever before the jack begins to trip. The onset of escapement will also feel less solid, since jack contact and repetition lever contact no longer coincide.

**VII)** Raise the drop screw back up while bumping against the onset of escapement. As you do, notice the escapement point becoming more solid again. Continue bumping while raising the screw an additional turn. You should now have the situation shown in Photo 5, with the drop screw too high. Watch the top of the jack as you bump against escapement. You should see the jack starting to trip out from under the knuckle before the repetition lever contacts the drop screw. The escapement point will also feel less solid.

Depress the key very slowly all the way to the bottom while watching the hammer. There will probably be little or no visible hammer drop, and the hammer may rise all the way to the string because the drop screw did not stop the repetition lever low enough.

**VIII)** Lower the drop screw back down while bumping against escapement. As an exercise, do not watch the parts—work only by feel until the onset of escapement feels most solid. This adjustment is similar to tuning in a radio for maximum clarity; you go past the optimum point in one direction and then the other until you zero in on the best spot. When you think you have found the best spot by feel, check visually to confirm.

Again depress the key very slowly all the way to the bottom while watching the hammer. This time the hammer should let-off, then suddenly drop, then rise slightly back toward the string. If the hammer ends up closer to the strings than the let-off point, and you are sure of the drop screw adjustment, the action probably has too much aftertouch. Even though one end of the repetition lever is stopped by the drop screw, the other end continues to be lifted by the wippen during the aftertouch phase. Thus excessive aftertouch (key travel remaining after let-off) can cause the hammer to interfere with the string after escapement, even if the escapement adjustments are correct. PTJ

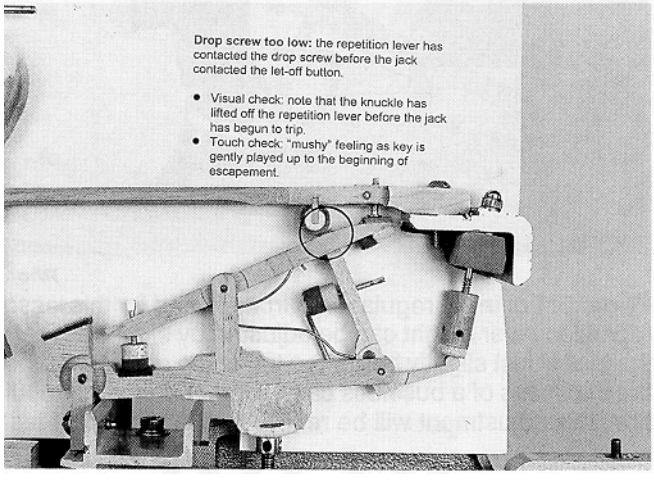


Photo 4

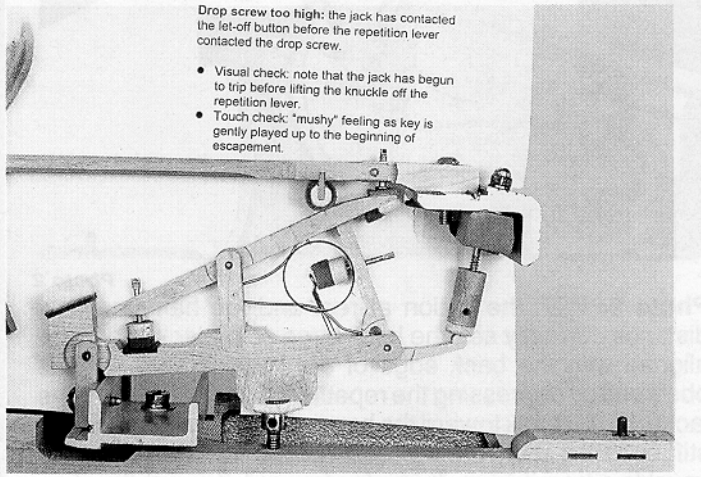


Photo 5

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# TECHNO*stuff*

Richard Anderson, RPT • Chicago Chapter

## The Traveling Shanks

Grand regulation is a lot like life. The best parts come only after lots of mundane preparatory stuff. We often think of regulation as turning capstans, drop screws and let-off buttons, but this can only be done after many hours of bedding, aligning, leveling and dipping.

One of the often overlooked and mundane preparatory steps in regulation is traveling shanks. Traveling the shanks may seem less important than checking the torque on the flange or aligning the hammer to the string, but it is an essential part of the regulation. If the shank does not travel perpendicular to the line of the strings, there will be some loss of energy and tone when the hammer strikes the string. This will also stress the flange center. Most importantly, if the shanks are not in the same spatial relationship through their travel, it will be almost impossible to align the hammers and keep them from rubbing in the section where the hammers are angled and the flanges are close together.

Traveling a shank is nothing more than making the center pin parallel to the hammer rail. This is easily done by placing a shim under the low side of the flange. The hard part is figuring out which side of the flange is low and how much shim is needed.

Common methods of traveling involve lifting groups of shanks with long-bladed screwdrivers or sticks with reference lines. The difficulty with these methods is that they only tell you how the shanks are moving relative to each other. It's difficult to judge which shanks are lifting plumb and how much to shim those that aren't.

I use a protractor set on top of the flanges. Stand the straight edge of the protractor across the flanges and against the flange side of the drop screws. Lift each shank straight up against the protractor and center the zero mark on the bottom of the protractor on the drop screw for that flange. Now look at where the center of the shank intersects the top of the protractor. If the center pin for that flange is parallel to the flange rail, the protractor will read 90 degrees. If the shank needs shimming, the protractor will show the exact number of degrees the shank needs to be shimmed and on what side the shim needs to be placed.

I usually make a pencil mark on the top or end of the flanges that need shimming on the side that the shank leans to. Then I'll go through and shim the flanges under the side with the marks. Making a mark on the flange also helps identify which shanks have been shimmed and need to be checked for burning to get the hammers back to vertical. This is important when you travel shanks with pre-hung hammers.

The choice of shimming material is important. Masking tape or striping tape will shrink as the adhesive dries over time, and the shim will get thinner causing the flange to loosen and un-travel. I like to use pre-glued paper packing tape. I bought a roll at an office supply store that will last a lifetime. I cut the tape into 11-inch lengths, and then cut those into 3/16-inch strips on a paper cutter. A quick swipe of your integral oral moisture applicator will glue the strip to the underside of the flange, and you can tear the rest of the strip off when the flange is screwed down. These strips make a convenient change of about one degree in the shank, so it's easy to shim according to the degree readings you marked on the flange.

Be sure to glue the shim to the bottom of the flange and not the hammer rail. You're fitting the flange to the rail, not the other way around. PTJ

# Industry News

## In Bankruptcy, Mason & Hamlin in Pitched Legal Battle

As an enthusiastic amateur pianist, Bud Greer had dreams of building the world's finest piano when he took over the struggling Falcone Piano Company in 1988. A year later the former Pepsi Cola Bottling executive expanded his commitment to the piano business by acquiring the Mason & Hamlin trademark and designs and establishing a new piano factory in Haverhill, Mass. Today, Greer's initial ambitions for piano building have been overwhelmed by an estimated $16 million in losses, and the future of Mason & Hamlin remains up for grabs.

A small piano maker with staggering losses should have quietly folded and vanished without a trace. But Mason & Hamlin is currently in the center of a pitched legal battle. On one side are Peter Murphy and Wolf Flippen, proprietors of Premier Piano, a Boston-based piano rebuilder that is currently trying to revive Mason & Hamlin. On the other side is the Reed Company, a Wisconsin-based investment firm that has an outstanding $1.26 million loan to Mason & Hamlin and is pushing for immediate liquidation.

Production ceased at Mason & Hamlin over a year ago due to a lack of funds, and on Jan. 11, 1995 Greer announced that he would "completely close the facility." Shortly thereafter, three creditors, including a local landlord and Reed Corporation, filed to have Mason & Hamlin liquidated, and a bankruptcy judge ordered the company to be placed in Chapter 7. In late April, after Murphy and Flippen persuaded Greer to give them control of Mason & Hamlin, they submitted a reorganization plan and convinced a bankruptcy judge to put the liquidation proceedings on hold and place the company into Chapter 11.

At present, a staff of 25, consisting of Premier Piano employees and former

*Continued on Next Page*

# Industry News

## In Bankruptcy, Mason & Hamlin in Pitched Legal Battle

*Continued from Previous Page*

Mason & Hamlin workers, is completing unfinished pianos that were left on the factory floor when Greer abruptly terminated production. Simultaneously, a comparable staff of attorneys is busily filing motions and counter-motions, debating the future of the company.

Testa, Hurwitz, and Thibeault, lawyers for Reed Company, argue that Mason & Hamlin's assets are far less than the $1.26 million owed their client and that by continuing to operate the company, what little financial value is left is being hopelessly squandered. They also charge that since Murphy and Flippen have taken over the enterprise, valuable assets, including a computer system, have been "disappearing" from the Haverhill plant.

Lawyers representing Murphy and Flippen counter that Reed's $1.26 million investment wasn't a loan, but represented equity and that they are seeking preferential treatment at the expense of other creditors. "Reed originally put the money into the company as an equity investment," charges Murphy. "After they realized that things were going bad, their representatives on the board converted the investment into a secured note with first claim on all of the company's assets. Now they want to liquidate to minimize their losses while giving the other creditors nothing."

After several hearings the Federal bankruptcy judge sided with Murphy and Flippen, refusing Reed's motion to place the company into immediate liquidation. Nevertheless, Murphy concedes the battle is far from over. "We are at the mercy of the judge, and we still have a ways to go." Assuming that Murphy and Flippen prevail in court and hold off liquidation of Mason & Hamlin, the larger question — Can the company survive as a viable commercial entity? — remains unanswered.

How can a piano rebuilding firm revive Mason & Hamlin where Bud Greer, a successful executive, stumbled badly? Murphy responds, "They [Greer and his team] tried to make this a big company overnight. Before they had a market or production capacity, they staffed up," he says. "From our rebuilding experience, we know how to build pianos, and by starting small and gradually expanding, we feel we can create a profitable business." By cross-training employees on the factory floor, Murphy feels he can build more instruments with substantially less staff. That, coupled with a leaner front office, will make for a profitable business. "It's a tough job, but it's doable," he says.

*(Excerpted from* The Music Trades, *September 1995)*

# Mannino Joins Kawai Support Team

(Los Angeles) Kawai America is pleased to announce the expansion of its technical support department with the addition of Donald E. Mannino, RPT, as the new Manager of Technical Support for Kawai pianos.

Don brings to Kawai his many years of experience as an independent piano technician and rebuilder, as well as nearly five years as National Service Manager for Young Chang pianos.

*Don Mannino, RPT*

Mannino is originally from San Diego, Calif., where he established a piano service business after studying piano performance at San Diego State University. His experience as an independent technician included rebuilding grand pianos, servicing concert pianos in a major concert hall, maintaining pianos for the San Diego Opera Co., and providing warranty service for various piano dealers and manufacturers. Mannino has written technical articles for the *Piano Technicians Journal* and is a popular instructor at Piano Technicians Guild seminars throughout North America.

Ray Chandler, long time Manager of Technical Support and Regional Sales Manager for Kawai pianos, has been appointed Director of Professional Services. In his new position he will focus on placement and use of the Kawai concert grand pianos, including the EX Concert Piano, while continuing his involvement in technical support and maintaining his schedule of dealer and technical training.

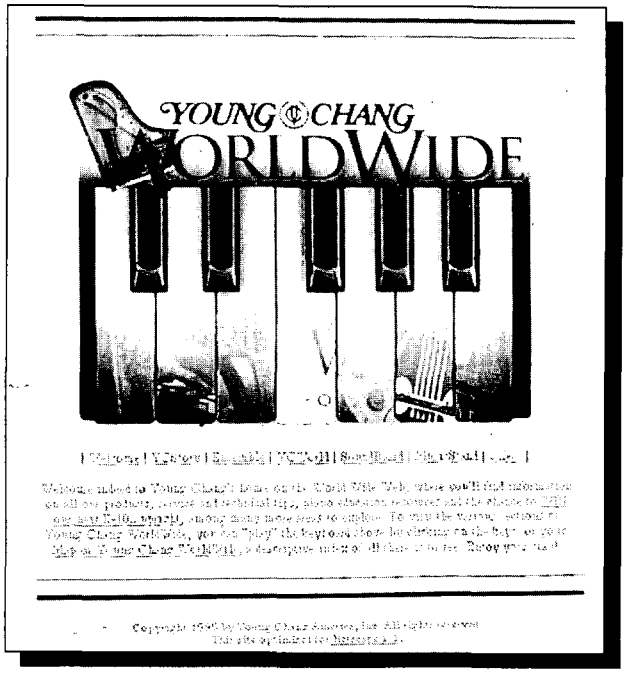
*Ray Chandler, RPT*

Brian Chung, Vice President and General Manager of Kawai America, comments, "Kawai is committed to maintaining our position as a leader in technical support. We are very excited to combine the talents of Don Mannino and Ray Chandler together in one company. This will allow Kawai to set a new standard in the piano industry for service and support."

# Young Chang Tunes into Cyberspace with Site on World Wide Web

Piano technicians will be able to tickle "virtual" ivories in cyberspace later this fall when Young Chang goes online with its own site on the World Wide Web, entitled "Young Chang Worldwide."

Technicians will be able to click onto piano keys to guide them through the site, which offers a technicians' mail box, plus important technical information from Young Chang's service manager.




Features on the web site for technicians include: **Sound Board** — where technicians from all over the world can communicate directly with Young Chang's service department through the technicians' mail box; **Young Chang Worldwide Magazine** — a technicians corner, which will be updated quarterly by Young Chang technicians, featuring information on soundboards, piano rims, action, the company's double duplex system and more.

"As a result of our communications with dealers, technicians and factory," said Lloyd Robbins, executive vice president for Young Chang America, "there have been a number of changes to our instruments, and this web site offers a perfect forum to keep piano technicians updated on all the revisions."

In addition to technical information, the web site provides a number of educational and enjoyable features for anyone who loves to play the piano, beginning with Young Chang Worldwide's home page, where a familiar keyboard aids uses in navigating through the web site.

**Welcome** — offers answers to frequently asked questions, including: "How often should I tune my piano?" and "What is the difference between a spinet, a console and a grand piano?"

**Music Box** — where users can sign up for a chance to win a Young Chang upright piano.

**The Young Chang Story** — presents the history of the piano manufacturer and how the company has grown to become one of the largest piano manufacturers in the world.

**Ensemble** — takes the user inside and out of Young Chang's line of upright pianos; from the 12,000 parts of the piano to color photos of the company's upright and grand piano models.

**Music Stand** — answers the questions: "Why play the piano?" Other features of the section include how to locate a music dealer and how to link onto related web sites.

Young Chang Worldwide can be accessed on the World Wide Web at http://www.youngchang.com.

# Kimball Terminates Grand Production

On July 1 Kimball International announced that it would exit the grand piano business, a market it has been active in for 34 years. Kimball International manufactured a complete range of grand pianos at its French Lick, Ind., facility, and at its peak, produced 28 units per day. For years, the company's 4'7" La Petite was the best-selling grand piano in the United States. Kimball is presently completing all grand piano work-in-process and anticipates a total shut-down of grand production by Sept. 1.

For the last 10 years, in response to dwindling demand, Kimball has trimmed its investment in pianos. In the late 70s the company produced nearly 275 pianos per day in three factories. Today, all piano production has been consolidated in a single 375,000-square-foot plant. A facility in Mexico that was built in 1972 as a site for piano and contract electronics production was recently converted entirely to contract electronics. The plant's key and action and piano-making equipment was subsequently sold to the Chung Zhong Ya Piano Company, a one-year-old piano manufacturer with 300 workers and a single plant in Shang Hai, China. Chung Zhong Ya produces vertical pianos under the Hermann brand and has earmarked its entire capacity for the burgeoning Chinese domestic market.

The Kimball Piano Division will continue to produce 43" console and 46" studio pianos as well as piano cabinets for Kawai and Samick. At its French Lick plant, the division also manufacturers a diverse array of contract wood cabinets including wood entertainment centers for RCA and billiard tables for Brunswick.

*(Excerpted from* The Music Trades, *September 1995)*

# Grand Illusions ...
# The Page for Serious Cases

## Mr. Piano Guy

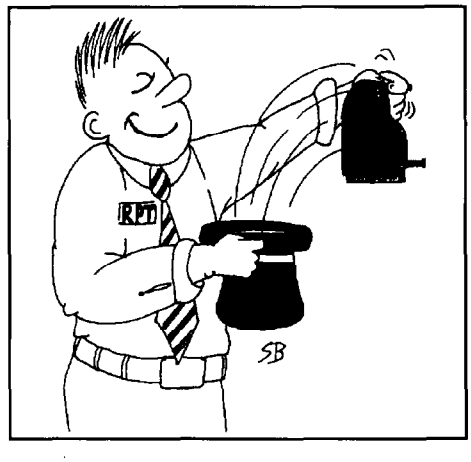
***Mr. Piano Guy is a syndicated column published by Mr. Piano Guy Academy of Piano Technology and Hamster Grooming. Mr. Piano Guy's column is published in 22 countries in 14 different languages, and is read religiously by millions of piano technicians who hang on every word. Really.***

*Dear Mr. Piano Guy:*
*Why don't we see any more pianos with aluminum plates, such as were used on the old Cable consoles?*

*— L. Baldwin; Nowhere, Arkansas*

**Dear L.:**

Mr. Piano Guy is sad to report that this is yet another great idea deep-sixed by forces beyond the control of your common everyday piano technician. Naturally, an aluminum plate would lighten the piano considerably, yet such a plate is much stronger than the traditional cast iron plate. (Ever wonder why aluminum cooking pots are really popular today, while the old iron skillet has gone the way of the dinosaur?) Unfortunately, when the Teamsters Union got wind of a piano that tuners could easily move themselves without the assistance of overpaid and under-educated troglodyte piano movers, its PR reps, Vinnie and Sal, were dispatched to the Cable Piano Company headquarters. The Cable alumi-plate quickly disapppeared from the scene, along with several company officers and R & D personnel. Consequently, all tuners now recommend that their customers hire professional piano movers to move their pianos, since they have no desire to see what it would be like to tune in a body cast.




**MPG Tool Tip:**

If you're tired of using wimpy little penlights to provide illumination while you're working in the deep, dark recesses of the piano, try using a sigmoidoscope instead. The sigmoidoscope is a powerful lighting probe used by proctologists in their examinations, and if you check around with your local proctological association or Goodwill store, you can often pick one up for small change. Be sure and rig up a bracket or holder for it, though. Mr. Piano Guy wouldn't want to think about you holding a used sigmoidoscope in your teeth while you're poking around in there.

*Dear Mr. Piano Guy:*
*What is the diameter of a #00 tuning pin?*

*— Fern Goatmilk, Cowville, CA*

**Dear Fern:**

Mr. Piano Guy would like to answer this question for you, but unfortunately, the space limitations of this column prohibit such a response. If you need that kind of detailed information, please write to the Mr. Piano Guy Academy of Piano and Hot Tub Filter Pump Technology, P.O. Box EST, New Age, CA. We would be happy to sell, er, enroll you in our complete home study course so that you, too, can be a real piano guy.

***[Editor's Note: Mr. Piano Guy may be contacted through Randy Rush, RPT, Seattle Chapter.]***

PTG Review
Dedicated To PTG News • Interests & Organizational Activities
PIANO TECHNICIANS GUILD

# Magnetic Attraction

*By Keith Bowman, RPT*
*Marketing Committee*

Perhaps you're like me. I'm a bit conservative in my business approach and avoid products or sales techniques that I perceive as gimmicky or in poor taste. I used to think magnetic products fell into this category. But then something happened.

About two years ago a client whose pianos I had recently serviced called me back because we had discussed chimney sweeps and the fact that I had just used this service. He wanted the name and number of the company. In a flash I was able to provide that information because the chimney sweep had given me a magnetic business card which I saw every time I opened my refrigerator door.

After we hung up, I went back to the kitchen and looked at my refrigerator in a new light. Every possible kind of magnet—Pizza Hut, a Realtor, a legal firm, a photographic store, a local bakery — was there. That door had turned into a multi-advertisement billboard, and it worked.

I made an immediate decision to investigate a quality magnetic business card and started becoming more observant of my clients' use of such products.

To reinforce loyalty and help generate referrals, the best place you name and number can be is where it will be seen all the time. In most homes that place has turned out to be the refrigerator door. So, how do you do it.

## Product Type

Avoid the adhesive-faced, do-it-yourself magnets. Business cards are difficult to position squarely. After application, corners fray easily when handled. Only glossy card stock looks good, but even they won't hold up to handling (remember, they will get knocked off the door occasionally) and will either be discarded prematurely or just look tacky.

The commercially available, vinyl products look professional, are smudge-resistant and are washable. They store well and last a long time without deterioration.

## Design

Since a magnetic card is usually given to an existing client, peripheral information about your business is neither necessary or even desirable. One presumes that you have given you clients all kinds of service and business information in other printed materials and that they are aware of the services you can provide. Focus on basic information; name and telephone number, logo and perhaps a slogan, but don't clutter the design with redundant information. While a regular business card should be functional and informative first, your magnetic version should be attractive looking.

Use of color reversal (color background with white text) and multiple colors are eye-catching devices.

Magnetic shapes are available in all sizes of rectangular, square or non-symmetrical shapes, with more options becoming available all the time.

## Using the Magnet

I generally offer my magnetic card at the conclusion of a residential service appointment. I judge by the following:

- If there are children in the household, be assured there are school papers and other artwork covering the refrigerator door. Another magnet is always welcome.
- If you have an opportunity to be in the kitchen or pass by their refrigerator, you can observe what they keep on the door and decide if they might put your magnet up.
- If in doubt, I simply ask if they have use of a magnet. I have several clients with an office in the home that have put the magnet on their metal desk or filing cabinet. (Be considerate of their computer disks!)
- Many grand pianos have enough flat surface area to attach a magnetic card. While I prefer a more visible area, there may be clients that appreciate your telephone number at the piano where it will stay put.

I usually don't offer a magnet if:

- I observe only ceramic, cloisonné or other high-quality, artistic, magnetically backed objects in use.
- The client has a commercial-type, glass-front refrigerator door.

## Ordering Magnets

Magnetic cards and other products are available almost everywhere these days, from mail-order business supply (like NEBS) and ad specialty companies to most larger local printers and office supply stores. Chances are you already receive catalogs that sell magnets. If they don't offer exactly what you are interested in, give them a call and they might be able to refer you to another supplier.

Ordering over the phone can be okay, depending on the complexity of your design. If you don't feel comfortable with verbal confirmation, ask to be sent a printer's proof or don't place the order. Also, be advised that a common telemarketing play is to receive a call that goes like this, "Hi, this is Sharpy from ConArt. Remember us, we made you magnetic cards?" In fact they didn't — they're banking on the likelihood that you ordered cards from someone and you don't recall the name of the company. Even if you never ordered cards from anyone, it helps them get their foot in the door.

Cost will be your main consideration. Generic, readily available sizes and shapes will be the most moderately priced. Special shapes, sizes and multiple colors will increase your cost. You will have to balance

***Continued on Next Page***

# PTG Committees ... How?, What?, Who?

*By Eugenia Carter, RPT*
*PTG Vice President*

Our bylaws charge the vice president to "coordinate the work of all standing and special committees at the direction of the President." For these past few months, I have had the opportunity to communicate with almost all of our committee chairs. Our conversations have given me an even greater appreciation for all our members who serve on these committees and how much they accomplish, especially being volunteers who generally work more than full-time! It has also led me to want to share with you the process of how our committees function.

How are our PTG committees formed? How are they selected? What do our PTG committees do? Who are the people on these committees? Before I became actively involved in PTG, these are some of the questions I asked myself. I suspect some of you may have asked these same questions yourselves. Over the next few months I plan to highlight our committees to give you a perspective of what they actually do.

The bulk of the work of PTG is completed through our committee structure. As PTG has grown over the years, this workload has increased. Council responded by adding committees to address those needs. As such, we now have 18 Council committees with about 130 people serving on them. The President and Vice President are ex-officio members of all committees except the Nominating Committee. The Council annually elects the members of the Nominating and Members Rights committees, and biannually elects the members of the Editorial Advisory Committee.

The selection process is a little longer for the other 15 committees. During the year the President consults with the Executive Committee, Board members, committee chairs, chapter officers and other PTG members for recommendations of specific people to staff the individual committees. Some of the criteria include areas of interest, willingness to serve, ability to communicate, and insuring all segments of our population are represented. Following this input, the President contacts these individual members to see if they are interested and willing to serve. After their agreement is confirmed, the President then selects the members and the chairs of all committees, and writes the charges for each individual committee. In its first action after being elected, the new Board ratifies the President's recommendations for committee personnel.

Looking specifically at a committee, we can see how it functions. Take, for example, the Bylaws Committee. Its purpose is to insure that our individual chapters and committees have a vehicle through which recommendations for change can be made to our PTG Bylaws, Rules and Regulations. Chaired by Michael Travis, members of the committee are Wade Johnson, David Frease, Dale Probst, Larry Caldwell and ex-officio member Jim Coleman Jr.

The Dec. 31 deadline for submitting proposals to the Bylaws Committee insures that members of the committee will have the time to study the individual requests carefully, determine that the proposal conforms to Robert's Rules of Order, and then make their recommendations — pass, defeat or no action. This takes time and careful deliberation by each of the six members, individually and collectively. It requires an enormous amount of work for the committee to achieve a consensus between receiving the proposals and meeting the March 1 deadline for publication.

Remembering that all PTG committee and officer members volunteer their services; this work must be done in the time left over after family and business responsibilities are finished for the day. But, the satisfaction that comes from knowing you have contributed to the continued growth and development of PTG is one of the many reasons our members continue to volunteer. If you are willing to volunteer for one of our committees, please give me a call.

# It'll Be a Classic

*By Paul Olsen, RPT*
*Institute Director*

If you are like most of us in PTG, you are looking forward to the Annual Convention in Dearborn. I know it seems early to project into that warm summer month of July, particularly while we are busily fighting these cold wintry months preparing pianos for the holiday season. It is kind of comforting, however, to occasionally remind ourselves that warmer days are around the corner, and before you know it the PTG Convention will be upon us.

The convention will take place in the Hyatt, and all under one roof, I might add. The crescent-shaped hotel is a beautiful, copper colored glass-type structure nestled in a park-like setting. Inside you will find a heated swimming pool with an adjacent whirlpool, and a fully equipped fitness center. The Hyatt includes restaurants, a rooftop revolving lounge, a gift shop and floral shop. There is a large parking lot that nearly surrounds the hotel, and the parking is free.

On display in the lobby of the hotel is a replica of the Quadricycle, Henry Ford's first automobile, which rolled out from his shop 100 years prior to our convention. He completed it in June of 1896, and on the fourth of that month removed bricks from his shop wall on 58 Bagley Avenue to make an opening large enough to get the car out. It is coincidental that our convention is convening almost exactly one century after Henry Ford introduced his first automobile to the world, and drove it near the very spot where our convention will be held. You can help commemorate this piece of history by attending PTG's 39th Annual Convention and Technical Institute and by visiting the Henry Ford Museum!

As far as classes are concerned, there will be an array of old and new topics with a variety of exciting and educational materials. The instructors are among the best in our field, with many seasoned and experienced instructors along with some new to teaching at our convention. At any rate, it will be a rewarding event, so look for more detailed listings and descriptions in PTG *Journals* during the upcoming months.

By the way, if safety is a concern, you can be assured that the area is among the safest in our country. It is clean, neat and the people are friendly. The Institute Committee and the Detroit-Windsor Chapter welcome you to attend this 39th Annual Convention.

# Magnetic Attraction

***Continued from Previous Page***
eye-appeal and tastefulness with your budget.

## Conclusion

While magnetic versions cost considerably more than regular business cards, I find that these have become one of my most effective forms of advertising with little waste. What other device can you think of that reminds a client about your service *every time they walk to their refrigerator?* Your name and number are displayed for them to conveniently pass on to a friend or neighbor.

If you are using a magnetic business card or have just become interested, pass word on to the Marketing Committee. We are working with the Home Office on the feasibility of developing a product that can be customized for the individual member to order in quantity.

In a world where so many products are made of plastics and synthetics, I, for one, am grateful that manufacturers are still making refrigerators out of metal!

# The Spies Piano: Gift of Renewal

*By Dale Weisman*

Members and friends of the Austin Chapter of the Piano Technicians Guild (PTG) have contributed their skills, artistry, and helping hands to breathe new life into a nearly 90-year-old upright piano. Upon completion of the six-month restoration project, the Guild donated the piano to Christopher House, Austin's nonprofit residential care facility for people with AIDS.

### History of the Spies Piano

The upright piano was manufactured by the now-defunct Spies Piano Company. Although the piano's date of manufacture remains unknown, it is certain that Spies pianos such as this one existed in New York in 1895. Physical characteristics — such as the piano's curvilinear keyboard cover, massive structure, and artistic details — suggest that it was built in the first decade of the 20th Century.

Decades of neglect left the piano totally inoperable as an instrument. The piano's hammers did not return after striking; each hammer had to be physically returned by hand. Hardly fit for use or display in any home, the piano itself had become a "home" for mud daubers, spiders, and various other bugs and varmints. The piano even contained a hidden "treasure" — namely an old umbrella someone had stashed inside its case.

Pieces of veneer were missing or separating from the mahogany case. The finish was partially removed and severely damaged. The ivory key tops were missing, and the black sharp keys were damaged. The piano's pitch as an "ear-bending" minor third low. The strings were rusty and "thuddy" sounding, and thus had to be replaced. The felts were hard, missing, worn, dirty, and even eaten in places by insects. All of the piano's metal parts were heavily corroded.

### Prelude: The Project Takes Shape

Austin PTG member Mike Pope bought the Spies piano in 1993 at an estate sale in Smithville and stored it in his garage for a year prior to restoration.

On April 4, 1994, Mike Pope proposed the restoration project to members of the Austin Chapter of the PTG and suggested that the refurbished instrument be donated to Christopher House. The facility's residents could enjoy the piano on many levels: as an instrument to play and listen to, as a resource for classical recitals and other musical performances, and as a comforting reminder that Christopher House is indeed a home. Pianos, after all, lend an atmosphere of warmth and homeyness to any residence.

On April 12, a delegation from Austin PTG chapter traveled to Georgetown to appraise the Spies piano for the potential rebuilding project. They documented the piano's condition by video and then showed the videotape at the PTG's May 2 meeting in Austin. After the video presentation, the PTG chapter voted to undertake the project. Subsequently, PTG officials contacted Christopher House Executive Director Carol Cody about the project.

### Restoration Begins

The restoration effort began June 3 when Mike Pope moved the piano to Mollberg & Associates Piano Restoration. Several days later, on June 6, Frank Baxter of Granger Piano reattached the piano back liner to the pin block—a critical restoration step highlighted during the chapter's June meeting.

Austin chapter president William Cory organized the restoration project into four functional areas and appointed team leaders for each area: case repair and refinishing — Bernard Mollberg; restringing — Emily Kaitz; key repair and recovering — Tom Seay; action repair — Mary Cushing-Smith.

Labor and materials were donated by PTG members. Moreover, the PTG members involved in the restoration project completed the work on their own time, outside regularly scheduled PTG meetings. A total of 16 work sessions took place between June 19 to Sept. 24, at which time the restoration was deemed nearly complete.

Carol Cody, Executive Director of Christopher House, and Don Massa, Development Director, viewed the piano for the first time on Oct. 10. Final restoration work was completed by Nov. 18, and Frank Baxter from Granger Piano Co. delivered the instrument to Christopher House on Nov. 19. Christopher House officially celebrated the piano's arrival at a dedication ceremony on Dec. 2, 1994.

Today, the restored piano graces Christopher House with its elaborate, decorative design, dark mahogany case, garland embellishments, and gracefully fluted legs. Best of all, the instrument sounds as beautiful as it looks.

### Special Thanks to Special People

Members of Austin's PTG chapter volunteered nearly 300 hours of their time to restore the Spies piano. Although it is difficult to put a precise monetary value on such an effort, it's conceivable that, based on prevailing hourly rates, a piano restoration project of a similar magnitude might cost as much as $10,000.

Many thanks go to the individuals who donated their time, expertise, and financial resources to make the project a reality. Special thanks to Mike Pope for his donation of the Spies piano. Donations of piano supplies came from many sources: individual PTG members, Mollberg and Associates, Schaff Piano Supply, and Piano Gallery. Charles Ball, Joel Rappaport, and the Austin PTG chapter provided monetary support.

Heartfelt thanks go to the following individuals: piano moving — Mike Pope and Frank Baxter; reattachment of pin block — Frank Baxter; stringing — Emily Kaitz and Chuck Rich; tuning — Emily Kaitz, Brian Henselman, William Cory, Robin Hoyt and John Sanders; stripping / refinishing / veneer repair — Mike Pope, Francisco Chavez-Silva (PTG member from Mexico), Brian Gibson, Bernard Mollberg and Emily Kaitz; action repair — Mary Cushing-Smith, William Cory, Robin Hoyt, Emily Kaitz and Tom Seay; repair of keys — Tom Seay and Robin Campbell.

# Nominations Due Feb. 1

The Nominating Committee is requesting nominations for all PTG offices at this time. Any chapter may submit a nomination, and any member in good standing may offer his or her name for consideration. All nominations must be submitted to the committee by Feb. 1, 1996 in order to be included in the Nominating Committee report to the 1996 Council. Candidates who are not included in the committee report may be nominated from the Council floor.

Please send all nominations to: Fern L. Henry, Chairman of the Nominating Committee, 3574 Cantelow Road, Vacaville, CA 95668.

# Foundation Spotlight

## *Dear Members of the Piano Technicians Guild:*

The Piano Technicians Guild Foundation has accomplished many of its goals since its formation in 1982, just a short time ago. We have awarded more than $7,500 in continuing-education scholarships to Nationally Certified music teachers. We have published the "Piano Action Handbook" and David Roberts' "The Calculating Technician," and we're now at work on new projects. We've made it possible for several PTG Associate members to attend the annual convention and take the tuning and technical examinations. We've accumulated a large amount of archival material on the history of PTG and our profession. Many of you had the opportunity to view the museum displays we put together during the Kansas City convention, and more of you will have a chance to see those materials in the future.

For the new year, starting in January 1996, we will open the PTG Foundation to "Supporters" whose contributions, tax-deductible because of our non-profit status, will be used to further our long-term goals. Become a Supporter with an annual contribution of $35.00. Supporters are not necessarily PTG members, but may be anyone interested in preserving the history and heritage of the piano, its design, its manufacture, and its maintenance. We also encourage you to consider bequests of property, gifts, and other appropriate donations that also are tax-deductible.

One of our long-term Foundation goals is to have our museum, with its history, research books, lending library, antique tools of our industry, artifacts and special historic displays, located where not only we as interested and loving piano technicians and builders can enjoy, but also that the history of piano building in the United States can be preserved. The world history of piano building as it has evolved from Germany to the United States, Japan, Korea and now China should also be recorded and preserved.

The PTG Foundation is the most logical location to preserve our past and develop the vision for the future. Join with the officers and directors to make this commitment to the PTG Foundation in 1996. If you are interested in our objectives and would like to serve, advise our Executive Director, Larry Goldsmith.

Thank you for all your past support and help.

Sincerely,

Roger H Weisensteiner

Roger Weisensteiner, RPT
President, PTG Foundation

# Events Calendar

All seminars, conferences, conventions and 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 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.

**January 5-6, 1996**
**ARIZONA STATE SEMINAR**
Ramada Inn University, Tucson, AZ
Contact: Bob Anderson
5027 E. Timrod Street
Tucson, AZ 85711
520-326-4048

**February 16-18, 1996**
**CALIFORNIA STATE SEMINAR**
Hyatt Regency Monterey,Monterey, CA
Contact: Bruce Stevens
310-423-7023

**March 21-24, 1996**
**PA STATE CONVENTION**
Sheraton of Bucks, Langhorne, PA
Contact: Webb Phillips
215-674-2555

**March 29-31, 1996**
**PACIFIC NORTHWEST CONFERENCE**
Seaside Convention Center
Seaside, OR
Contact: Randy Potter
541-382-5411

**April 12-14, 1996**
**FLORIDA STATE SEMINAR**
Holiday Inn Crown Plaza, Tampa, FL
Contact: John Ragusa
813-988-0396

**April 26-28, 1996**
**CENTRAL WEST REGIONAL SEMNAR**
University of Nebraska, Lincoln, NE
Contact: Richard West
402-472-2568

**April 27, 1996**
**HOSPITAL FOR HOPELESS PIANOS**
Sherman Clay, LA
Los Angeles, CA
Contact: Jon Longworth
818-982-2431

**May 3-5, 1996**
**NEESCO**
**New England/Eastern Canada Region**
Westin Hotel, Waltham, MA
Contact: Anthony Malionek
23 Winthrop Ave, Beverly, MA 01915
508-922-0711

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October 1995

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170 SO. CENTRAL PENNSYLVANIA

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5 JANE LANE
CARLISLE, PA 17013

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JAMES L. COX
11255 E. FORT ROAD
SUTTONS BAY, MI
49682

549 APPLETON, WI

JOHN A.
IMOBERSTEG
3270 FONDOTTO DR.
NEENAH, WI 54956

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October 1995

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172 SHERWOOD DRIVE
PORTSMOUTH, RI
02871

JOHNNY O. HARRIS
10 PALFREY ROAD
GLOUCESTER, MA
01930

122 CAPITOL AREA, NY

BRUCE G. ARNOLD
RR 1, BOX 282C
LAKE CLEAR, NY
12945

139 SOUTHERN TIER, NY

GEORGE A.
DAMASEVITZ
740 POWDERHOUSE
VESTAL, NY 13850

191 PHILADELPHIA, PA

JANET WAGNER
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NEWARK, DE 19711

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GREENSBORO, NC
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STEVE A. PATTON
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GREENSBORO, NC
27403

296 WESTERN CAROLINAS, NC

HAZEN BANNISTER
RT. 2, BOX 68A1
HONEA PATH, SC
29654

GAYLE R.MAIR
DAMPP-CHASER
ELECTRONICS
P. O. BOX 1610
HENDERSONVILLE,NC
28793

301 ATLANTA, GA

LARRY FLETCHER
13015 BUCKSPORT CT.
ROSWELL, GA 30075

331 SOUTH FLORIDA

GARY J. GERBER
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BOCA RATON, FL
33498

379 KNOXVILLE, TN

CHARLES T. BOWERS
3924 HILLBROOK DR
KNOXVILLE, TN 37931

381 MEMPHIS, TN

EDDIE L. WILLIAMS
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JONESBORO, AR 72401

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200 CARL STREET
HOUSTON, TX 77009

787 AUSTIN, TX

JEFF D. FARRIS
3703 ALEXANDRIA DR.
AUSTIN, TX 78749

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14394 WINDERMERE
SOUTHGATE, MI 48195

601 CHICAGO, IL

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BERWYN, IL 60402

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THOMAS E. TIEMENS
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RAMSEY, MN 55303

653 OZARK, MO

JOHN P. MATTHEWS
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COLUMBIA, MO 65203

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N. HOLLYWOOD, CA
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931 SANTA BARBARA, CA

CURTIS B. MOORE
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CAMARILLO, CA
93010

936 FRESNO, CA

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ARCATA, CA 95521

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BELLINGHAM, WA
98226

# AUXILIARY EXCHANGE

**Dedicated To Auxiliary News and Interests**


# *Holiday Greeting & PTGA Resolutions*

***L. Paul Cook***
***PTGA President***

Have you gotten your holiday shopping done, yet? I don't. However, I have a lot more time than you do. It's November 5th for me, and it's early December for you. How so, you ask? Remember, I must write these articles almost two months before you read them. I'm still looking forward to Thanksgiving! So I have two more months than you do to shop for Christmas. Claudia and I try to get the bulk of our shopping done by Thanksgiving, though.

I hope each of you get to be with the ones you love for the holidays. Celebrate the holidays any way you can! But celebrate! Remember, it's the thought that counts. Take the time to enjoy yourself. You deserve it! Everything else will work out later.

Now, what about your New Year's resolutions! What will you resolve to do this time? How long will you keep your promise to yourself? When you're making your lists, please consider resolving to help the PTGA Scholarship effort in some way. The Auxiliary has but two purposes for existing: one is to entertain ourselves at the annual conventions, and the other is to promote both goodwill in the music industry and the Piano Technicians Guild. We do both through our scholarship efforts. Every time we give a scholarship to some deserving piano student, we both promote the Guild and encourage piano students to work harder and carry on with their efforts. Without piano players, piano technicians wouldn't have much to do.

How can I help?, you ask. We have a Scholarship Store now. We carry a wide selection of music-related items, such as coffee mugs, ties, note pads, pens and pins, all with a musical theme to them. We sell these goods at the Annual Convention, and would like to sell them at your state's seminar or convention during the year, also. If you are willing to pitch in and help the scholarship effort, please contact me and I will arrange to have several thousand dollars worth of scholarship merchandise shipped to you to sell at your state's PTG seminar or convention.

Remember, the method of paying our annual PTGA dues has changed back to the old way this year. You will receive your own invoice, separate from the PTG's invoice for technicians. Please remember to send this back with your check in time to be included in our annual roster. There were a little more than 300 members this year. I hope to see even more this coming year. You may know someone who may be interested in supporting the guild and music, and who might like to join the Auxiliary. This person may be a friend or relative. It doesn't matter. They do have to be sponsored by a Guild member, though. I don't know why, but that's what our bylaws say. Perhaps it is to keep people from going to conventions and seminars as "Auxiliary Members" when they should be signing up as "technicians."

Now is also a good time to start thinking about attending the Annual Convention in Dearborn, Mich., the homeland of the Ford Motor Company, this July. The Ford Museum is only a short distance from the hotel, as is Greenfield Village. Greenfield Village is next to the Ford Museum and contains many original buildings and large artifacts of great interest and importance. For example, Thomas Edison's actual lab is there, as is the Wright Brother's bicycle shop. Bring your children, too. They will have a history lesson that will last a lifetime. You can also visit the Henry Ford Museum and the Edsel Ford Estate. We will be seeing many things on our day-long tour, too, which may include some of these places. The Motown Museum is not too far away, if you are into that kind of music. Claudia and I went to Motown last September, and found it very interesting to see where the music that we loved as teenagers was recorded.

Should you have any suggestions for the Annual Convention, please let me know. I will be finalizing plans very soon. I want this to be the best convention ever for you as this will be my last year as your president. The gavel will pass on to another of you at the conclusion of the 1996 Annual Convention. Who will be you next president is still unknown. Our bylaws were written to strongly encourage passing the gavel every other year, so I plan on retiring as your president this July. I still have a little more time to make constructive changes, so let me know how to make this Auxiliary and convention even better for you. I will do my best.

Now I'm going to write the November PTGA Newsletter "Message from the President" you read last month! I hope you will like it, or I should say, I hope you liked it.

# "A Funny Thing Happened On The Way To The Forum" or "A Shocking Travel Experience"

*By Karen Dickson*
*Auxiliary Journal Editor*

Welcome to this month's issue of *Piano Technicians Journal* and the Auxiliary column.

I would like to begin by introducing myself. My name is Karen Dickson, and I have volunteered to serve as the Auxiliary column editor. I am 30-something, and have only been around piano technology for a couple of years, since I met my fiance, Thomas Young.

While I am not as heavily involved in music as Tom, I did play in band and sing in choir in high school, and I currently sing in an opera company with Tom. My main interests are crafts and wedding plans. Tom and I both live and work in the Hayward area. Our town, Hayward, is in the far northwest corner of Wisconsin, about an hour's drive from Lake Superior. Hayward is a town of about 2,200 people in the third largest (land size) county in Wisconsin, Sawyer County. Hayward get's it's name from it's founding father, Anthony Judson Hayward, a major player in the logging industry of the 1880s in this part of Wisconsin.

To continue my introduction, I met my fiance, Tom, at a grocery store late one evening. He had been admiring me from afar while I was at work, at a fast food restaurant, and he was determined to meet me, so one night he just happened to "drop" into the grocery store at the same time. Well, we have been going out for two and a half years and we have been engaged since Dec. 1994.

At first, I didn't know what to think of piano technicians or piano technology, but after attending my first PTG annual convention with Tom in Kansas City in July 1994, I have found that piano technicians, especially PTG members, belong to a unique group of self-motivated people who truly are in love with their profession and are truly professional, as has been said, are "the unseen artist."

Well, after having enjoyed my first PTG convention, I decided that if at all possible, I wanted to go with Tom to Albuquerque in July 95 for the next one, and so my story, that I hope our readers find interesting:

***"A Funny Thing Happened On The Way To The Forum" or "A Shocking Travel Experience"***

When my fiance, Thomas Young, RPT, and I left our small community of Hayward, Wisc., for the PTG Convention and Institute in Albuquerque, N.M., last July 17th, we didn't anticipate any major travel problems. Our trip was proving to be a bit longer and more tiring than we thought, but we were enjoying the scenery and the trip in general. We drove my fiance's typical piano tuner, high mileage, baling wire and twine mini van to the Minneapolis airport, about a three hour drive from Hayward, where we picked up a rental car for the rest of the trip — a nice, almost brand new Olds Ciera with only 2,100 miles on the odometer, with all, and I do mean all the creature comforts. We got as far as Pratt, Kansas the first day, a good thousand miles of driving. The second day of our trip we drove across the panhandle of Oklahoma and the tip of Texas, with very little excitement, as mile after mile disappeared behind us.

Well, after we finally rolled across the New Mexico border, Mother Nature decided that we needed more excitement for our trip. We had just left the 55 m.p.h., two-lane U.S. highway for the 65 m.p.h., four-lane I-40 interstate at Tucumcari, N.M. As we approached Tucumcari we could see a very large thunderstorm ahead. We had just gotten on the freeway when the deluge hit, and we had to slow down to about 45 m.p.h. when fate intervened and my fiance Tom said, "Well, it looks like we are going to sneak between these storms" when all of a sudden a simultaneous huge **bang** and blue-white flash of light enveloped our ears and eyes, respectively. Our rental car engine quit simultaneously with the "Big Bang," and we coasted to a stop on the shoulder of the freeway. A few seconds after we stopped another "Big Bang" took place very near. At this time, I think both Tom and I could have used the services of an underwear salesperson. We were **scared**. Tom tried to start the car so we could get out of there, but to no avail. The engine of the car would turn over, but refused to fire or start. We sat in terror for a while as the rain continued to absolutely come down as a deluge, with huge ocean-like waves every time a semi truck passed by. Tom had his cell phone with him, and tried calling the rental car agency's emergency road-side assistance number to get assistance with our lightning damaged rental car.

At first Tom couldn't get into the local cellular tower, and he thought that lightning had killed his phone, but apparently it was just the heavy interference of the frequent lightning activity that prevented using the cell phone. After the storm died down a bit, about 20 minutes later, Tom was able to call the rental car agency. The first response of the rental agency was "You got hit by **what**?!".

After the storm died down, we discovered that our right rear tire was blown out where lightning went to ground (we could smell the odor of burning rubber just after the lightning struck) and the FM radio was now dead.

Well, we wound up sitting on the shoulder of the freeway for almost three hours while the rental car agency argued between their Albuquerque office and their Amarillo, Texas office as to which office was responsible for helping us. Finally, the rental agency called a local tow truck in Tucumcari, which was about eight miles from our location. The tow truck from Tucumcari towed us to a motel with a restaurant so we could eat and, if necessary, have a place to stay. The rental car agency showed up several hours later with a replacement car, so we unloaded our unusable car and transferred all our luggage and belongings to the replacement car. The rental agency truck driver left and then ... as Paul Harvey says, it's time for the **rest** of the story.

Tom and I strapped ourselves in the replacement car and left for the freeway to continue our journey to Albuquerque. About 10 miles down the road from Tucumcari, it started to rain again. We soon discovered that in the rain, every time we hit a bump, the rear end of the car wanted to slide sideways. Tom pulled off the freeway three times thinking that there must be something wrong with one of the tires. In the rain, we didn't feel safe driving any faster than 40 miles per hour, all of the 170 miles to Albuquerque. We didn't arrive in Albuquerque until 5:30 am. The replacement car turned out to have broken parts in the right rear suspension. We proceeded to check into the DoubleTree Hotel, and after about five hours sleep, ran over to the Hyatt to register for the convention. Then Tom and I headed to the rental car agency's office at the Albuquerque airport, where it took them more than an hour to give us the third car, because they hadn't put the information on the replacement car the night before into their computer properly. So, late on Wednesday of the convention, we finally had a good car again, just in time to park it for several days while we enjoyed the convention, and balloon rides, but then again, that's another story!

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Ads appearing in this publication are not necessarily an endorsement of the services or products listed.

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*Bluthner 6'4" 1910 Ebony, ornate plate w/clouds and angels $12,995; *Steinway 7'B, 1896, Ebony gloss, $19,500; *Steinway 6'1" A, 1912, Mahogany, $19,995; *Steinway 5'10" 0, Dark Mahogany, $16,500; *Steinway 5'10" 0, 1920, Light Mahogany, $16,000; *Steinway O, 5'10" 1917, Ebony, $9,500; *Steinway D, 9', 1899, Ebony, $28,900; *Mason & Hamlin 5'8" A, 1916, Brown Mahogany w/Piano Disc, $16,000; *Mason & Hamlin 5'10", 1903 Mahogany, $7,995; *Baldwin 7', Ebony gloss w/Pianocorder, $15,000; *Baldwin 6'3" L, Ebony gloss, $14,995. Call SCHROEDER'S PIANOS for a complete list of used pianos, 800-923-2311.

VICTOR BUYS Pre-1940 Steinways, Bostons, and Mason Hamlins, Pre-1975 Baldwins built in Ohio. Yamahas & Kawais made in Japan - not USA. Harps & Harpsichords 400 Fine Grands for sale. We need a Piano Technician, Church Organ Salesperson, Organ Repairman. 300 NW 54 St, Miami, FLA 33127, 305-751-7502.

PIANOS - Yamaha and Kawai grands $1850 and up. 23 Steinway grands and verticals. Large quantity of used American grands from $700 up. We buy pianos. Ed's 504-542-7090.

New from PROTEK: Pro*lube* Spray Lubricant. Protek Pro*lube* is an advanced state polymer lubricant. Designed around the successful CLP formula, Pro*lube* is for higher friction areas like the keybed and frame, shift and sostenuto mechanisms. Great for front and balance rail keypins and anywhere you would use a spray lubricant. Provides long lasting durable lubrication with virtually NO ODOR! With the addition of Pro*lube* along with CLP and MPL-1, Protek offers safe, high tech task specific tools for every lubricating need. Ask for Pro*lube* at the supply house you do business with.

REPAIR CHIPPED IVORY IN 20 MINUTES. "AcryliKey" ivory restoration system produces a strong, color-matched, nearly invisible repair. Kit contains material enough for 50+ repairs plus pigments, mixing utensils, sanding pads, and complete instructions. $39.95 ppd. Richard Wagner, RPT; 7709 S.W. Pfaffle, #40; Tigard, OR 97223; 503-624-7360.

NEW STRETCH CALCULATORS FOR SIGHT-O-TUNER USERS, $10 p.p.; Richard Weinberger; 18818 Grandview Dr.; Sun City West, AZ 85375.

AMPICO ELECTRIC PLAYER PIANO - Marshall & Wendell, 400 Rolls, 2 Electric Motors, Osborne Arch Punches 11 pcs. 3/8" to 1 1/4", Misc. Pittsburgh, PA, 412-279-4972.

## HELP WANTED

PIANO/HARPSICHORD TECHNICIAN—School of Music, Syracuse University. Duties of Supervisor of Piano and Harpsichord Maintenance: To implement and manage all aspects of stringed keyboard technology at the School of Music, including piano, harpsichord and clavichord maintenance. Concert preparation of auditorium pianos and harpsichords for recitals given by faculty, students and visiting guest artists. All performances are recorded and many are broadcast. Care and upkeep of all instruments in teaching studios as well as the practice rooms in the School of Music, which consists of the necessary tuning, voicing, regulating, repairing and rebuilding of all keyboard instruments. Supervision of eighty-seven instruments valued at $1,300,000.00 Also care for the pianos at Hendricks Chapel and Belfer Audio Archive. Send resumes to: Human Resources, Skytop Office Building, Syracuse University, Syracuse, NY 13244. Syracuse University is an equal opportunity/affirmative action employer.

## SERVICES

STRAIGHT SIDES, SQUARE FRONTS and crisp notches are the benchmarks of our quality key recovering. Tops with fronts $115 plus return shipping and insurance. Call or write for free list of our key and action restoration services. Yvonne Ashmore, RPT and Associates, 12700 La Barr Meadows Road, Grass Valley, CA 95949, 916-273-8800

KEYBUSHING: We use over 20 different sizes of Spurlock Precision Cauls. Send the micrometer measurement of the key pins and we will give you a perfect fit. Both rails high quality felt $85.00 or leather $95.00 plus return shipping and insurance. Write or call for free price list of our key and action restoration services. Yvonne Ashmore, RPT and Associates, 12700 La Barr Meadows Road, Grass Valley, CA 95949, 916-273-8800

ADD ADDITIONAL $'s to your income. Rebuild player pianos for your clients. Send us the player parts. You restore the piano and we will return the mechanism in restored condition. We guarantee our work. For more details, call or write: Jim Brady, 2725 East 56th Street, Indianapolis, IN 46220, 317-259-4307

FOR THE HIGHEST QUALITY GRAND PIANO REFINISHING call 'ADEPT of Ft. Myers, FL. Bill Collins proprietor, 32 years in the craft. Licensed for 11 years at this same location. Specializing in exquisite, high quality and high gloss, lacquer finishes. Color and natural finish matching, case restoration, and invisible repairs. PH. 813-275-7170.

PLAYER PIANOS REBUILT, BOUGHT & SOLD. Estimates given at home and systems re-installed or send in mail. Serving Georgia to New York. Nicholas Fiscina, Ph. 800-862-2138.

SOUNDBOARDS INSTALLED, topsides rebuilt. Bridge-conformed, scale-diaphragmized boards with truly quartersawn ribs (sitka, eastern, or sugar pine). You send us the case, we'll return you a piano. Quality's the bottom line. David G. Hughes, RPT. 410-429-5060. Baltimore.

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FABRICATION OF DISCONTINUED OR HARD-TO-FIND WOODEN PARTS (action or case). NO MINIMUM QUANTITIES. Call Paul Revenko-Jones 312-666-7440 or Brian Newell 312-226-2540.

PIANO HARDWARE REFINISHED. Lacquer finish or nickel plate finish. Craftsmanship and finishes are guaranteed to factory specifications. Delivery 2-4 weeks. Brass on Ivory, 302 Linden Avenue, Edgewater, MD 21037; PH. 800-865-6750.

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.

52 PIANO KEYS RECOVERED— .075 tops with fronts (molded plastic) - $95.00; .050 pyralin - $100.00; .060 pyralin - $105.00. Gloss sharps (3 1/2") - $50.00. Keys rebushed: premium cloth - $75.00; leather - $95.00. Other services available. Call or write for price list. FREE return freight on prepaid orders of $50.00. 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

WELL-TEMPERED TUTOR. Learn to tune by ear with your Macintosh computer. Use pre-programmed temperaments or create your own. If you have trouble hearing beats, this program can isolate the beats for you. Score yourself with the PTG exam. Twenty-one historical temperaments also available. Demo disk available. Mark Anderson, RPT: 510-524-0390 (California). Great teaching tool!

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.

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

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.

WANTED! ! "Sel Po" Brand Piano Trucks. Roller-bearing type. Call collect: Bill Boulton, Boulton Piano Service, Moultonboro, New Hampshire. 603-253-4606. FAX same.

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 collect 216-382-7600/ FAX 216-382-3249.

JAY-MART WHOLESALERS — !!!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 collect 216-382-7600 / FAX 216-382-3249.

STEINWAY M parts needed: Fallboards, Music Desk, Lid and Keyslip. Also interested in decrepit Steinway D, will consider any major problems but must have 20 note base section. Call John 713-351-1603.

ANTIQUE GRAND PIANOS WANTED: Any restorable condition. Top prices for pre-1850, wood-frame grands in original condition. Ed Swenson; P.O. Box 634; Trumansburg, NY 14886; 607-387-6650; Fax: 607-387-3905.

WANTED: TINY PIANOS such as the Wurlitzer Student Butterfly or other small types. Call collect: Doug Taylor, 607-895-6278. I'll pay shipping!

## DISPLAY AD INDEX






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# PianoDiscussions™

December 1995

News From The World of PianoDisc


*Liner Notes*

## McKenna joins PD Artist Series

"I think Dave McKenna is the best pianist playing right now. His lines flow like mad, he doesn't suffer from playing solo, and he's the most complete." — George Shearing, from *The Great Jazz Pianists,* by Len Lyons.

Just as in life, in the music business you can tell a lot about a man by the company he keeps. That Dave McKenna is the favorite pianist of someone like George Shearing (and the late Bill Evans) says a great deal. Can you blame his fans at PianoDisc, then, for shouting from the rooftops that Dave McKenna is a PianoDisc artist?

On September 6th, Dave flew out from his home on Cape Cod to record his debut disk. As expected, he delivered a performance full of inventions and surprises that left us breathless. With his fabulous, and highly admired single note bass line driving many of the songs, this disk will have two elements sure to entertain PianoDisc owners: it will be as fun to watch as it is to hear. (Dave's often accused of using three hands when he plays.)

Following tours with several of the best bands of the 50's and 60's, he turned to a solo career after moving to the Cape in 1966. In the 1970's Dave's great talent as a soloist was firmly realized. A prolific recording career ensued, and the rest, as they say, is history.

His PianoDisc recording contains mostly standards, both ballads and up-tempo things including a couple of the mini-theme medleys for which he is famous.

One final quote from a recent review of a McKenna CD in *Jazz Times* (courtesy of Chuck Berg): "If Bach had played jazz, he just might have sounded like Dave McKenna."

We couldn't agree more.

**See you at Winter NAMM, in Anaheim, Jan. 18-21, 1996. Same location in Hall D, Booth #2836. Don't miss out on the latest from Music Systems Research-PianoDisc.**

PianoDisc recording artist Dave McKenna.

**PianoDisc Installation Training 1995/96**

• Jan. 22-27 • March 25-30

• April 22-27

**1996 Continuing Education Series**

• April 1-3 • April 29-May 1

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**PianoDisc**

4111 North Freeway Blvd.
Sacramento, CA 95834
Phone: (916) 567-9999
Fax: (916) 567-1941

**Tech Support: (619) 258-1460 (916) 567-9999**

Our telephone lines are open daily (except weekends and holidays) from 8 AM-5 PM Pacific Time.


## KC dealer shares PD sales strategy

Kansas City dealer Karen Winney (The PianoMan Music Center) has found the secret to booming PianoDisc sales in her area. While some of the elements of her strategy may have been done before by others, Karen has put them together for a one-two punch that delivers.

**"First I'd have to say get them out there. Let people see and hear PianoDisc who might not ever enter a piano store.** I put them in malls, country clubs, even ordinary businesses that you wouldn't think of for a typical demonstration location. I put one in a graphic design firm at Christmas. I've had several sales every year from that location. **Think of unexpected places where people are likely to see them. It's 'Show and Tell Time!'**

**"When I have customers in the store. I show them PianoDisc even if they're not in the market for one. I always tell them the PianoDisc story, too. They love this great American success story of the Burgett's small company going up against a giant and prevailing."**

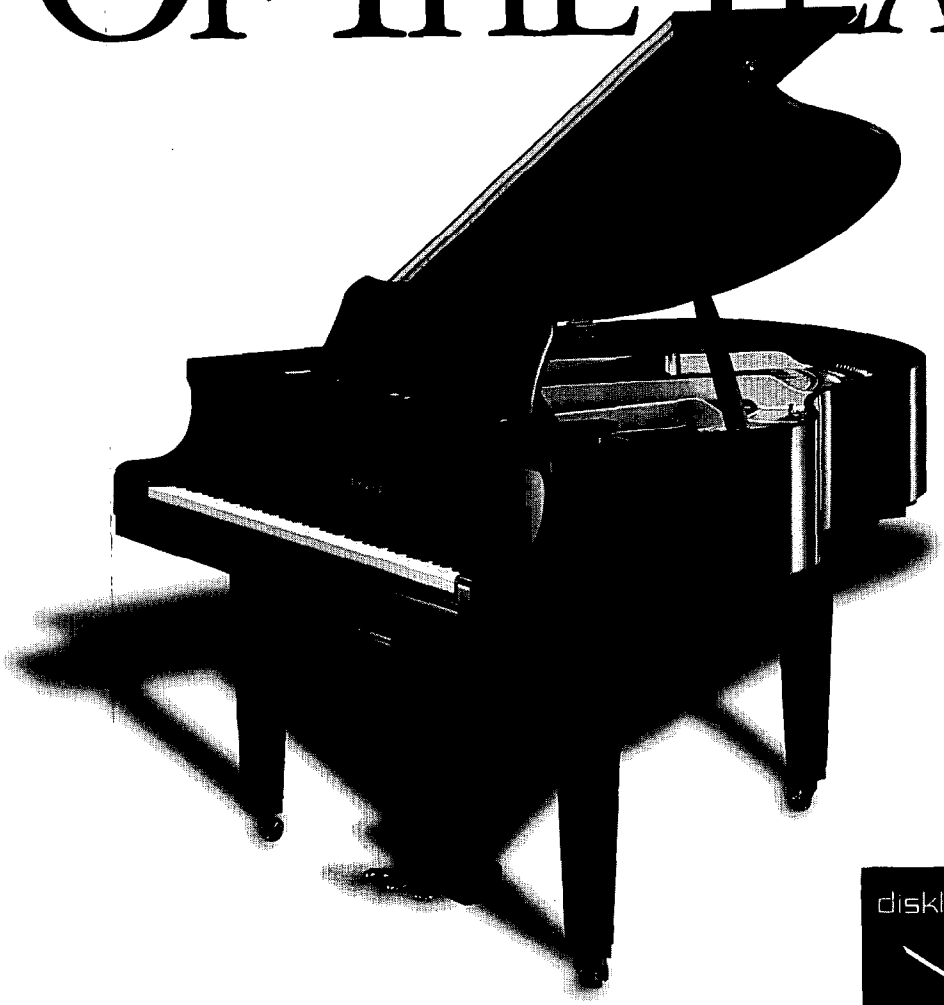
As far as advertising goes, Karen recommends the usual yellow page ads, fliers, ads in newspapers and specialty papers that are sent to homes.

**"Another thing that I do is sponsorship of concerts featuring Wladimir Jan Kochanski, a truly brilliant classical pianist. His concerts thrill people and once they discover the beauty of live piano performance, they want it in their homes.** For those who know they will never have the time or talent to reach his level, **PianoDisc is the answer.** He's now a PianoDisc artist too, so that will open even more sales opportunities."

Karen has no typical PianoDisc sales. **"I've sold many to families with children who are studying piano. It inspires them and helps them with their studies.** I once sold four to one man. He owned three hotels and bought one for each, plus had a system installed on his Steinway at home. That's not typical but it was great!

Her final advice. **"Have in-city service. Get a technician who's trained in proper installation and service. That is a must."**

# 1994 KEYBOARD PRODUCT OF THE YEAR



Dealers have chosen the Yamaha Disklavier Piano as "Keyboard Product of the Year." It just goes to show that great craftsmanship, great technology, great dealers and great salespeople can make things happen.