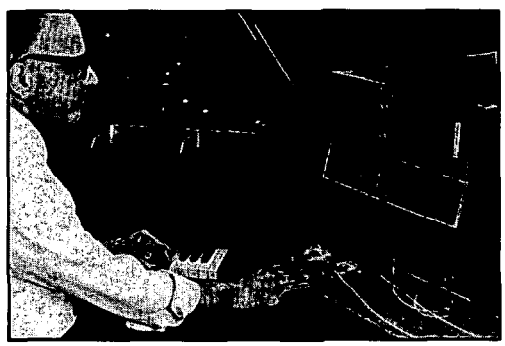
Piano Technicians Journal

November 1990

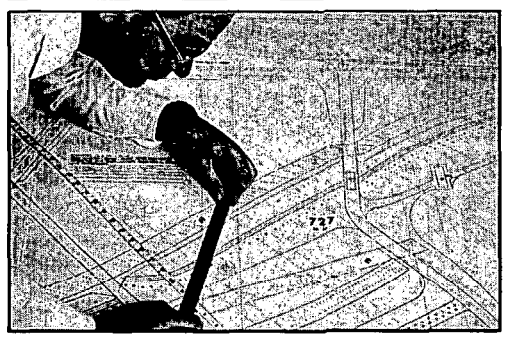
The Baldwin Piano...
You can see why it sounds better

At Baldwin we believe that perfect piano tone is an ideal shared with all those who design, build, play and service pianos. That's why continuous research in piano tone has always been one of our major commitments. And that's why our piano engineering and research department is one of the largest in the industry. And that's why you'll often find in every Baldwin piano innovations to improve piano tone introduced in our SD-10 concert grand.

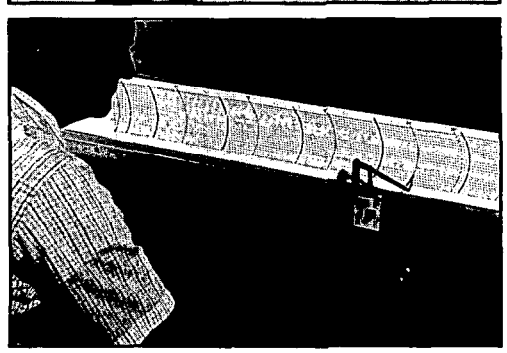
RESEARCH shows us why, as well as how, some things work better because we've taken a pioneering approach to piano improvement. We've substituted scientific testing and analysis for the unquestioning acceptance of traditional solutions. Some of the achievements that have resulted are treble termination bars (U.S. Pat. No. 3,477,331), the Acu-Just™ plate suspension system (U.S. Pat. Nos. 3,437,000 and 3,478,635), and vertically laminated bridges. Our patents are the most significant ones awarded for tonal improvements in grand piano tone in recent years.



ENGINEERING translates research into reality. To support our design innovations, we have produced our own testing and construction equipment and have expanded the use of precision tooling to insure that each Baldwin piano built will exactly match established standards of tone and performance. One example of this is a winding machine (U.S. Pat. No. 4,055,038) developed in connection with the SynchroTone™ Strings (U.S. Pat. No. 3,523,480).



MATERIAL STANDARDS insure continuing quality. For example, stringent standards for weight, dimension, taper, and hardness of hammer felt are established, and each sheet of felt is checked to be sure it meets those standards before it is accepted for production use.



First in a series of informative ads on piano tone published by Baldwin Piano & Organ Company exclusively for the benefit of piano technicians.

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For more information contact Kent Webb, Technical Service Manager; for parts contact Linda Gann, Baldwin Piano & Organ Company, Highway 63 South, Trumann, AR 72472 — Phone: (501) 483-6116

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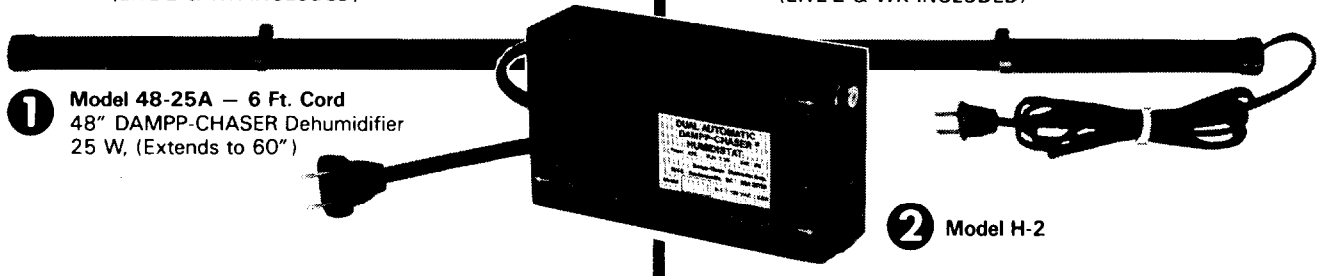

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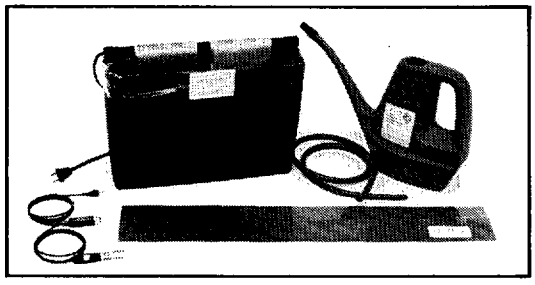

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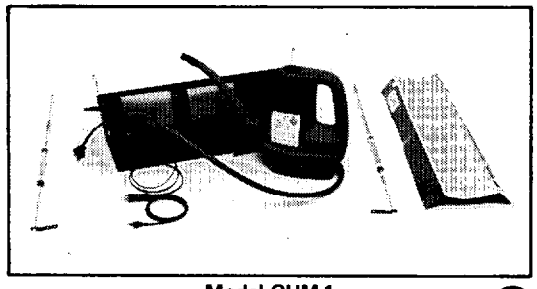

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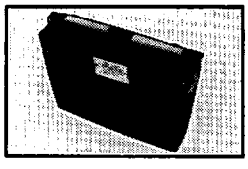

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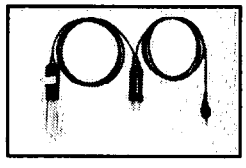

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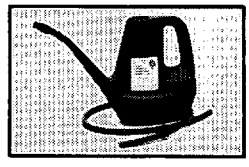

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PIANO TECHNICIANS
Journal

NOVEMBER 1990 — VOLUME 33, NUMBER 11 OFFICIAL PUBLICATION OF THE PIANO TECHNICIANS GUILD, INC.

ABOUT THE COVER:
Guild member Camille Morin, RTT, of Scotia, NY, entered this photographic study, titled "Grand Design," in a local photography contest and came up with a winner.

Piano Technicians Guild Board Of Directors

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President's Message

Dues And Don'ts

Nolan P. Zeringue, RTT
President

This month marks the beginning of the period of time in which we pay our dues. We know every year without fail our dues are due in the month of January, and notices are sent out in November, which really gives us a period of 90 days in which to pay our dues. Still there are problems every year — the deadline is at hand and some have not yet paid their dues or contacted the Home Office.

When there are many who are late in paying and time is running into March, it becomes a problem for the Home Office Staff. This is the time of the year when they have a heavy load in gearing up for the PTG Convention in July, and are also trying to get membership as up to date as possible for the PTG Directory.

The drop date was moved up to the first of March, and this did seem to be a much better approach to putting an end to past due dues running for four to five months. Collections seem to have gone well last year.

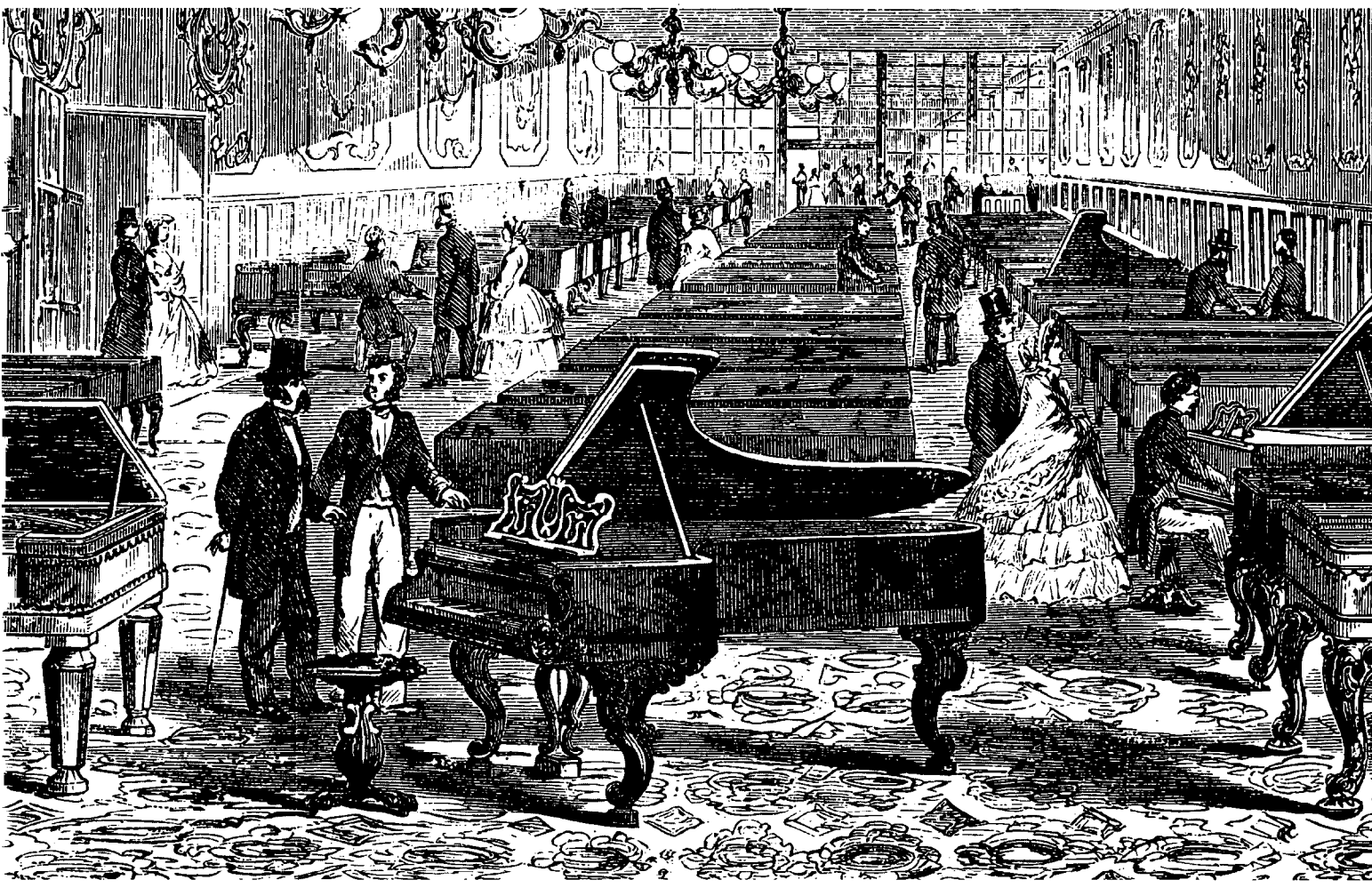
All this does not mean no excuses will be taken and the method of collection will only be hard-line. If you have a problem, please call your Regional Vice President to see what arrangements can be made for your particular case. Legitimate hardship cases will be given attention by the Regional Vice President, but you must contact him or her *before* the first of March for assistance.

The PTG Board has decided after consultation with the Home Office Staff that consideration for assistance in the paying of dues in hardship cases will be considered only if the request for consideration is made before the drop date. After the drop date has passed, it is too late to take a request for consideration of hardship payment since the membership information will have been pulled from the computers and the member dropped from the rolls of PTG.

Don't hesitate to call your Regional Vice President if you are having a problem with paying your dues. The RVP is there to serve you; this is why you in the region have elected this particular person to the PTG Board. And, of course, if the problem you have is not of a financial nature, your RVP certainly will help there also.

As soon as you get the dues billing, take out your checkbook, write the check, and get it back in the mail the same day. Let's see if we can create another problem for the Home Office Staff in having them receive 3700 dues payments in the first week after the bills go out. Wouldn't they enjoy that? Don't forget that you can pay dues by credit card. I hope we can make this year's dues collections complete by the first of March with no late payments!

Some manufacturers ask your customers to invest in their past.



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From The Home Office

Success And The Good Old Days

Larry Goldsmith
Executive Director

What's the secret of success? Clear-cut answers to that question are hard to find, particularly for those who operate their own businesses. Over the years, many writers have come up with their own secrets of success. Is the formula for success indeed 10 percent inspiration and 90 percent perspiration? Or is it that, as someone else with a more cynical perspective once said, 90 percent of success is just showing up? Here's yet another formula to consider:

- You can beat 50 percent of the people in the United States simply by working hard and not giving up.
- You can beat another 40 percent by being honest in your business dealings.
- The last 10 percent? Well, that's where creativity, ability, persistence and luck come into play.

It hurts to think that fully half of the people in this country are afraid to work hard, but it has a ring of truth. When you think about the salesclerk who simply wishes you would go away, the Monday morning autoworker who put together that lemon of a car, the bureaucrat who doesn't care how long you wait in line, you wonder if America's trend toward a service economy is such a good idea. So many of us do it so poorly.

I visited a hardware store today — my first visit for this particular store — and it was like stepping into a time warp. This was an old-fashioned place, with worn and buckled hardwood floors, bins of this and that, and fascinating gadgets tucked away in every dusty corner. I needed only two three-inch woodscrews, and I was in a hurry.

Someone met me at the door, called me sir and politely asked how he could help me. His attitude didn't change when he found out that I was only going to spend a few cents there. He found what I needed, rang it up on an old-fashioned cash register, and wrote out a receipt, all the while acting as if I was spending hundreds of dollars instead of a few cents.

It made my day. I stepped back into the 20th century feeling as if everything was right with the world. My regular hardware store is a lot bigger, and has a lot more stuff, but no one there has ever treated me as if my business really mattered to them. I'll probably still go to the big chain store sometimes, just because it's convenient and cheap and I know they probably have what I need.

But I'll be thinking about the dusty little place that treated me as if I were someone special. And I'll go back there as often as I can. I'm looking forward to it.

Pieces Of String Too Short To Use

Susan Graham, RTT
Technical Editor

A lazy late summer collection of tips for shop, field and general piano service business operation.

Regulation

Traveling: To refine the travel of parts which are wandering just slightly off course, cut the strip of travel paper in half lengthwise (so it will be under only one-quarter of the flange). What to use for travel paper? Preferably, something gummed which will stick to the flange and stay in place if the part is removed. Remember that the flange gets traveled, not the rail: glue traveling paper to the flange. I use old-fashioned paper packaging tape, cut into strips and moistened as used (varying the amount of traveling accomplished by varying the width as well as the length of the strips). Shari uses auto detailing tape, which is adhesive backed in 1/8" strips — very fast to use and comes in a variety of colors to enliven things around the shop. Many technicians use sandpaper, such as 220 garnet paper: if this is moistened before application, it too will adhere to the flange. Whatever is used should not be too soft and compressible, or results will be unstable. Be sure not to let travel paper stick out on the drop screw side of a grand hammer flange, where the repetition lever may brush against it and cause noise. Travel paper should not run down the front edge of a butt or wippen flange so far it overlaps around the bottom edge. This tilts the part in the wrong axis and/or cause overtraveling.

Parts Lubrication

When you lubricate a jack, coat not only the top surface but also the side which will contact the knuckle or butt as the key is *released*. In both grands and verticals this will be the upper 1/4" (approximately) of the side opposite the jack toe. Excess friction here can slow the return of the key as the back edge of the jack drags against the buckskin of knuckle or butt.

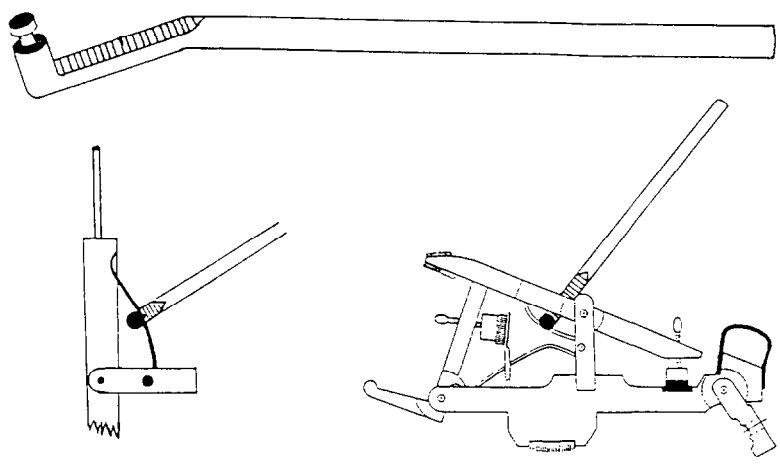
Lubricants Update:

Checking farther (but too late to get in last month's *Journal*), Pianotek carries the McLube products, Dry-Lube and VJ Lube. My apologies for the omission.

Speaking of **vertical butt leather**, you do know that some of the synthetic material used in vertical actions as a buckskin replacement on butts and catchers has gotten very hard and noisy? (A shortage of buckskin for a time during the 1970s was partially responsible for precipitating this problem.) It creates an elusive click similar to that of a loose hammer head or other action part. You may find yourself pulling and regluing hammer heads and catchers, repinning butts, etc., only to have the noise continue. The solution is to replace the "buckskin." If the piano is still under warranty, contact the manufacturer for assistance. Degree of severity will vary — it may be better left unmentioned to customers who aren't aware of it. Baldwin is at least one source of pre-cut butt and catcher leathers, supplied with a cyanoacrylate glue and instructions (for warranty work, they will also recover the butts if shipped to the factory). The action will need some regulation after replacement buckskin is installed and will then be quiet and have a much more

The Best Spring Tool Ever?

I mentioned the subject of **spring tension** in passing and now, here in the mail, is what claims to be the best spring tool, ever. Hmmph, say I, I've made perfectly fine spring tools out of old bass strings for years. Sentiment prevents me from agreeing that this new tool is better, but it is awfully nice .... works like a champ, seems almost impossible to misuse (won't kink wire) and has that wonderfully pleasing feel to the hand of a tool that knows what it's supposed to do. Looks good in the tool case, too (for those hi-tech oriented customers who insist on examining every item you carry into the house). Available from its creator, technician Glen Hart, P.O. Box 40685, Grand Junction, CO 81504.



satisfactory feel.

Speaking of vertical pianos, here are a few additional thoughts in response to a recent query about sticking keys:

In the August issue of the Journal, *Mark Mandell is concerned with sticking keys on Asian pianos. Here is the procedure I use for* new piano service *(that is the first in-home-service). Basically this is for vertical pianos although I often have to ease all front key bushings on grands as well.*

- *Tune. (Gives feel of that specific instrument.)*
- *Remove action, (if necessary) ease all front key bushings (that have not already been eased).*
- *Shim hammer rest rail to achieve some lost motion.*
- *Check dip. Generally excessive which will cause jack to come too far forward and bind against let-off rail.*
- *(After all the above, then check jack to let-off rail contact again.)*

Doing this will generally clear the piano of sticking keys and subsequent free return calls. Note: regarding dip, depress key hard and visually examine jack. A big gap between jack and butt indicate excessive dip. Reduce as required using visual check initially and by feel for final adjustments.

Gerald F. Foye

Backchecking

Reliable backchecking of the heavier hammers in a grand action can be a problem. The repetition spring must be strong enough to support the weight of the hammer, help push down the wippen body (to return the key) and pull the jack back under the knuckle. This may require it to be so strong it exerts force against the hammer prematurely, preventing checking (especially on a soft blow). In most instances, if the hammer does not actually rebound and restrike the string, the lack of actual "check" is not a problem. If double striking is a problem, determine that the tails are properly shaped and slightly roughened, and have not become glazed with use. Also check that the backcheck buckskin is uniform, without areas of excessive wear, and still has a distinct nap.

Also check the amount of aftertouch. During aftertouch, the hammer is propelled toward the string: the additional slight amount of travel at the front of the key takes place as upward motion at the back, where the repetition lever and therefore the hammer will rise slightly. This can be enough to cause the hammer to double strike. Reducing aftertouch may help: lengthening the hammer blow distance, shortening the key dip or increasing the drop. Although raising let-off will also decrease aftertouch, do not do so in this instance: let-off and drop may need to occur slightly farther from the string to help prevent the double strike. The other factors mentioned can then be adjusted for the desirable feel and to prevent the hammer from being pushed up toward the string a second time.

Business Operation

Do you have no-shows? Apart from breaking into the house, sitting on the front stoop for hours in a state of righteous indignation or overturning all the lawn ornaments and leaving (just kidding here), what can you do? You could make reminder calls to everyone the night before, but most of us feel we spend enough time on the phone as it is. One tip is to make a practice of giving your phone number to the customer as you are setting up the appointment. Here's how I work it: I call the customer, set up the date and time, get any pertinent data I need, repeat to them the date and time, and then say "Let me give you my phone number just in case something comes up." This serves two purposes. One is to let them know that I expect a call if they need to cancel. What I've noticed, however, is how many times they stop me at that point, saying "Oh, just a minute, I need to get something to write with." This is after I've told them the date and time twice. My theory is that people think they'll remember a

Illustrations by Valerie Winemiller

date, but if you give them a number they'll take the time to write it down (I use this trick even with customers who've been calling me for years — I know perfectly well they have my phone number but I want to make sure they're writing things down). This procedure is particularly important if you are initiating contact: setting up the free service on a new piano from a dealer, for instance. The customer is probably not aware that you do not work full-time at the dealer and that the flow of messages may be unreliable. Be sure they have a way to reach you at the last minute, and they understand that you do need to know of cancellations before you hit the front stoop. Your part of the bargain is to call them as soon as possible if there are changes in your plans. In addition to cancellations, I call if I'm more than 15 minutes late — and I call as soon as I realize this is going to happen, rather than waiting until the time I'm actually supposed to be there. I also call if I'm earlier than planned, both to make sure someone is home, and out of respect for my client's privacy.

And, yes, I still get the occasional missed call, and I get extremely annoyed. My policy is to wait 15 minutes, then try to find a phone and call: they don't always hear the doorbell. It also happens occasionally that an address is written down wrong, leaving me fuming pointlessly in front of the wrong house... If you have a work number, you may be able to get in contact with someone and verify that they forgot about you (or you may have to wait even longer so they can dash home and let you in). When all fails, I do leave a bill for a service call — and, usually, I get payment and an apology. It isn't worth pursuing if I don't (but I won't go back), and I'm pretty soft about believing excuses of emergency trips to the doctor, etc. (for regular customers I'll waive the service call if the story is plausible and I like the piano...). What the heck, life is too short to carry grudges. Take along a good book, and keep a list of errands you could get done (who of us can't kill an hour quite happily in a hardware store?).

Well, that's it for me. The Forum continues with the second article from David Stanwood. The first described the grand action he has patented and installed in a number of pianos. In this issue, he describes his system for weighing-off any action. I might mention (for those who are new to this subject) that his approach is somewhat different from the conventional system. Using it may work better for some and not so well for others: we print such articles not as endorsement, but to encourage thinking and the exchange of innovative, worthwhile ideas.

This *Journal* also contains (in addition to our usual stellar columnists) an article from the Dampp-Chaser Corporation, detailing suggestions for "fine-tuning" their piano climate-control system. This too, is not an endorsement, but a welcome opportunity to get technical information straight from the source.

Index Of Display Advertising

TUNING UP

Different Strokes For Different Folks

Rick Baldassin, RTT
Tuning Editor

We will begin this month with a letter from L. E. Minton, RTT, of Clayton, North Carolina. Mr. Minton writes:

I enjoy reading your articles, reprints, etc., in the Journal. *I have a burning question, however: Why is there never, or almost never, mention of proper position of the tuning hammer or lever in the lengthy and informative articles on stability? To my thinking, this is as important as any phase of stability in tuning.*

When I began studying tuning over 45 years ago, I was taught to keep the tuning hammer in line with the strings. In other words, keep the hammer as near 12 o'clock as possible. Never, never tune with the hammer at right angles to the string. Keep it near 12 o'clock, maybe at one or two o'clock when necessary.

There is necessarily and inadvertently, a slight bending of the pin regardless. If the "bend" is to the right or left, which occurs when the hammer is at 12 o'clock, there is very little pitch fluctuation. If the hammer is at three o'clock or so, the bend affects the pitch, and the pin will tend to straighten after pressure is released, affecting the stability.

When you get time and the urge, please tell the readers of the Journal *your thinking, and the thinking of other experienced tuners, on the position of the tuning hammer when tuning. Many new tuners treat the* Journal *as a Bible, and they should be aware of this fact. Perhaps you do not agree with me, but I have had good success in concert work, and agreement with others on this topic, both engineers, and fine, successful tuners.*

Keep up the good work.

When I learned tuning, my instructor told our class that the best way to tune an upright was with the left hand with the hammer between 10 and 11 o'clock, and the best way to tune a grand was with the right hand with the tuning hammer about three o'clock. He was naturally left-handed, which in my mind accounted for the fact that he tuned uprights left-handed, but his tuning of grands right-handed while being naturally left-handed made no sense to me. I chalked this up to my training as a bass player, which was that it did not matter if you were right-handed or left-handed, you still bowed with the right hand and fingered with the left hand. I figured in piano tuning, uprights were to be tuned left-handed, and grands were to be tuned right-handed.

This "correct" position of the hammer for upright tuning was confirmed by a textbook which was used for my class, which showed the hammer between 10 and 11 o'clock while tuning either left or right handed. I was not naturally left handed, but thinking that this was the "proper" way to tune an upright, I learned to tune them left-handed, with the hammer between 10 and 11 o'clock, as right-handed tuning of uprights with the hammer in this position seemed an awful alternative. A short time later, I observed the other technician at the university tuning an upright right-handed with the hammer between one and two o'clock! I was shocked, and immediately informed him that he was doing this incorrectly, and that the hammer should be between 10 and 11 o'clock, in spite of the fact that he was right handed, and obviously not talented enough to learn to do it left-handed, as I had. It did not take him long to set me straight. He told me how awkward tuning right-handed with the hammer between 10 and 11 was, and that even though it may be more "technically" correct, he could do a better job with the hammer between one and two, because it was so much more comfortable for him while he was tuning.

A short time later, I attended a class where Jim Coleman demonstrated several different hammer techniques, where he stated that none of these techniques was more "correct" than another, but that there was a different procedure involved with each of these techniques to achieve a stable tuning. Not only were various hammer positions discussed, but also various hammer manipulations, from smooth pull to impact-jerk. I was very distraught to learn that the left-handed tuning between 10 and 11 o'clock which I learned required the most pitch over-compensation to settle the string and pin, and that a system of right-handed tuning with the hammer at three o'clock required virtually none! Soon thereafter, I became acquainted with Francis Mehaffey, and saw his "impact hammer" demonstrated. This hammer is positioned such that the weight swings between 11 and one o'clock, while tuning with either the right or left hand.

It soon became clear to me that there was no one correct way to tune an upright, because I had so many examples of good technicians performing this task in so many different ways, each with excellent results. As for me, I still tune uprights left-handed with the hammer between 10 and 11 o'clock.

I learned to tune grands right-handed with the hammer at three o'clock. I did not take me long to figure out that this position would need compromising during the course of a tuning. About an octave from the top I had to change to two o'clock, and a few notes later to one o'clock, finishing somewhere between 10 and 12 for the top few notes. I noticed quickly how much more difficult it was to control the hammer when seated in front of the keyboard and the hammer positioned at 12 o'clock. I soon found myself standing perpendicular to the keyboard around the end of the instrument while tuning those last few notes with the hammer at 12 o'clock.

Some time later, I attended a class where I saw Dr. Sanderson tuning a grand piano left-handed with the hammer at nine o'clock! This seemed most backward to me, but I was envious that he could tune to note 88 and still remain seated normally, because his hammer did not run into the case, being positioned at nine o'clock. There was a catch — when he tuned the bass, his hammer ran into the case, but rather than more from nine to 10, to 11, to 12, and so on, he simply switched hands and tuned the bottom few notes right handed with the hammer at three o'clock. I was convinced that the solution for me was to continue tuning right handed, as I always had, but switch to left handed tuning in the treble, finishing this section as Dr. Sanderson had. This seemed natural, as I had mastered left handed tuning of uprights. Left handed tuning of grands should pose no problem. Boy was I wrong. As hard as I tried, I could not tune the grand with my left hand. Out of curiosity, I attempted tuning an upright right handed. No way. Not even close.

I point all of this out to illustrate that to a very large degree, what works the very best is what we are used to. Over time we learn the compensations necessary to make our system work. My first exposure to the idea of tuning with the hammer parallel to the string came from my friend Bill Garlick. His reasons were exactly those which Mr. Minton stated, and it makes perfect sense, except that I am not used to doing it that way. I have tried tuning the entire grand piano with the hammer at 12 o'clock, and found it most uncomfortable, my arm being stretched so far to reach the end of the tuning hammer, and the awkwardness of trying to manipulate the lever sideways, rather than pulling and pushing. I even tried a similar procedure with the hammer at six o'clock, where the hammer is still parallel to the strings, with no better luck. Even seated perpendicular to the keyboard so that I could pull and push on the hammer, I had no good luck. Perhaps if I were taught this way, I could do it, or if I were willing to take the time to totally relearn. Seeing so many technicians tuning in so many different ways with excellent results, has led me to the conclusion that there is not one correct way for everyone, but that there is one correct way for me, and I respect that Mr. Minton's way is the correct way for him.

This discussion parallels discussions that have taken place in this column in regard to a smooth-pulling technique, or an impact-jerking technique. Either technique can be used successfully if done properly with all of the accompanying manipulations and compensations. Never try the smooth-pulling technique with the compensations for the impact-jerking technique, or vice-versa. It will not work. Likewise, never tune with hammer at three o'clock using the compensations necessary when the hammer is at 12 o'clock, or vice-versa. This won't work either.

We could expand the discussion to include length and angle of the tuning lever head, size and shape of the tip, and length and weight of the tuning hammer. Logic would tell us that we would want as short a head as possible at right angles to the tuning pin. The tip would fit as far down on the pin as possible, and would be a perfect fit, the taper of the pin matching that of the tip. The hammer would be as rigid as possible to avoid any possibility of flexing along its length.

Sounds great, doesn't it. Sadly, we would soon find out that such a hammer would be unusable in practice, because of the physical constraints in the piano. Our first decision is then short-head or long-head. Short is definitely better. To clear the plate struts, however, a short-head means steeper angle, longer head means shallower angle. As far as the angle is concerned, the closer to a right angle the better. So you see, there is no perfectly logical choice in this regard. We must choose between a short head with a steeper angle, or a longer head with a shallower angle. Which is best? Whichever you are used to. This became apparent to me during several Master Tuning sessions for the PTG exam. More often than not, the CTEs would have the same or very similar hammers and tips, but the heads varied. Whenever a change was made as to who was tuning at the moment, the tuning hammer would be handed from one tuner to the next, and this new tuner would proceed to try to clean up a few problems left by the previous tuner. After one or two notes, the new tuner would invariably say, "Hand me my tuning hammer, would you? I can't tune with this thing!" Further inspection would show that the difference was the length and angle of the heads. Since both tuners were equally competent, I could only conclude that each had a particular type which was best for him or her, because he or she was used to it. For me, a longer head with a shallower angle works best, because I am used to it.

The next decision is the tip. I think all would agree that the tip should fit as far down on the pin as possible, but should the fit be tight or loose? If the fit is tight, there is a positive feel that exists between the hammer and tuning pin. If the fit is loose, the lost motion permits a rather effective impact system of tuning. Which is best? Whichever works for you. I started out with a very tight fitting tip, changed to a rather loose fitting tip, and have since reverted back to a tip which is rather snug, but grips the pin along the entire length of the taper. I am still able to impact the pins when I want to, but also have the positive feel necessary for my very final movements. I have, however, seen tuners use a loose tip and impact method with great success, as well as tight-fitting tips with smooth technique, also with great success.

Finally, the weight and flexibility of the hammer must be determined. Ideally, the hammer should be as rigid as possible to avoid flexing along its length. The heavier extension handles are rigid because they have two steel shafts in them. The additional weight can cause fatigue, however. Recently, a tuning hammer called the "Wonder Wand" has come on the market. Its proponents claim that its lightweight construction reduces fatigue, and that the single steel shaft allows a better feel in the palm of the hand as to what is actually happening at the tuning pin. Much of this feeling is naturally absorbed in the heavier hammers, and not felt by the tuner. The Wonder Wand is fitted with a ball at the end of the shaft, and is designed to be held in the palm like the shift lever of your car. Though I was skeptical at first, I am now more optimistic about this concept, particularly on uprights. Generally, however, I would say that I prefer the heavier handle, because I am more used to it.

As you can see, there are many combinations possible when you consider that there are both upright and grand pianos, we have two hands to

choose from, there are 12 possible positions for the tuning hammer, there are a half dozen or more heads and at least four sizes of tips available from a dozen different manufacturers, handles from light to heavy-extension type and fixed length, and smooth-pulling or impact-jerking technique. Pretty hard to establish one combination which is best for everyone, yet each of of must learn which combination works best for us.

Our next letter comes from Jesse Manley, RTT, of Griffin, Georgia. Jesse writes:

I want to thank you for the interviews with pianists, and for all your tuning information.

This summer, I celebrated my 75th birthday. I have had limited sight most of my life, and during the last few years, my hearing has deteriorated. I now have problems recognizing voices of close friends. The harmonic pattern I now hear doesn't match the one in my memory. I use two hearing aids, but have some difficulty, especially in tuning the high treble.

"Difference tones" are helping me with my treble tuning. I lose very little time by striking the treble note that I am tuning with the fourth below, and then with the fifth below.

For example, when I tune C6, I will strike it with F5, and then with G5. With F5, the difference tone is the pitch of F4. With G5, the difference tone is C4. If both difference tones sound harmonious, I have probably tuned C6 correctly.

If I am tuning a high unison, when the two strings get close to the same pitch, I usually hear a difference tone that is rather faint and fairly low in pitch. I nudge the hammer gently to cause this difference tone to drop to a zero beat, and this also produces a smooth unison.

If I have trouble hearing these high notes, it would seem that I wouldn't hear the difference tone. I have much more confidence in my tuning by using the sort of tests I have described.

If any of your readers have made use of the sort of tests that I have mentioned, I would appreciate hearing from them. I will be happy to write in detail to any tuner who is interested in what I am trying to do.

If my hearing gets much worse, I will retire. In the meantime, I am enjoying my experiments with any tests that can help me with the highest octaves and unisons in the treble.

Thanks for any suggestions you may have.

Our thanks to Jesse for his letter. Loss of hearing in the high treble is something that all of us will probably face one day. By protecting our ears from excessive noise, we may be able to delay this process. I have never tried using difference tones as Jesse described for piano tuning. I am aware of them from my study of acoustics. If any of you have used these techniques, please feel free to write and describe what you are doing. If you would like to communicate with Jesse, you may write to him at the following address: Jesse Manley, RTT, 325 Birdie Road, Griffin GA 30223.

Until next month, please send your questions and comments to:

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Tuning Editor
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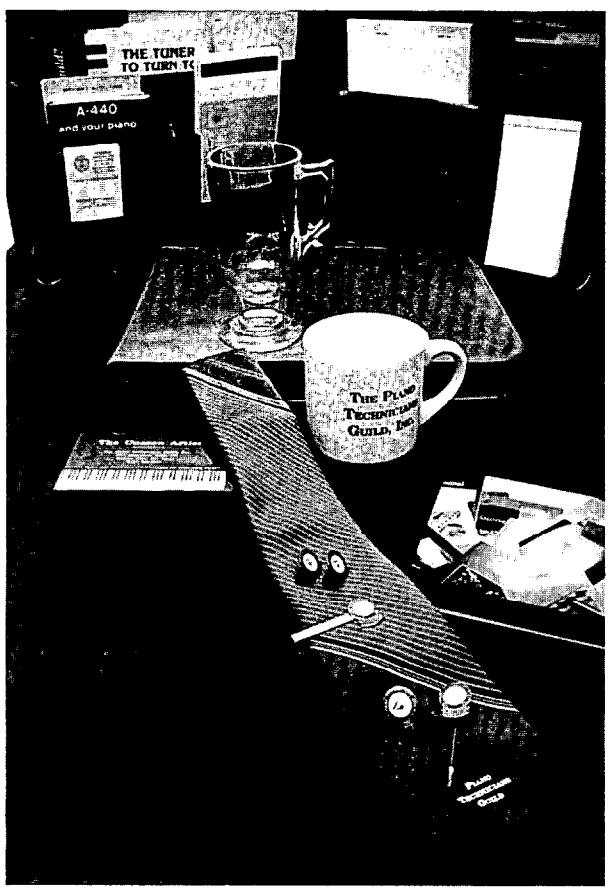
Provo, UT 84601



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At Large

Mastering Friction With The Balance Weight System

My article in the October 1990 *Journal* describes how the Stanwood Action creates a high degree of touch uniformity through individual treatment of balance weight and friction. These touchweight components are derived from the following formulas:

balance weight = downweight + upweight ÷ 2
friction = downweight - upweight ÷ 2

My approach for creating uniform touch is to weigh-off to a uniform balance weight, then to set the final touch weight values by adjusting the friction level in each key. In the Stanwood Action this is done with the aid of adjustable friction hammer flanges.

The success of the Stanwood Action would not be possible without the ability to weigh-off the keys to a uniform balance weight. Creating a uniform balance weight during the process of key balancing is a confusing and tedious task without a systematic approach to the process. I have devised a system which eliminates the need for calculation. I call it *The Balance Weight System*. Even if you don't have the option of the adjustable friction hammer flange, there are advantages to creating a uniform balance weight:

Specifically:

1. The balance weight value remains unaffected by friction, whereas upweight and downweight change daily and seasonally with friction. Therefore, balance weight is the logical point of reference when balancing keys.

2. An action with uniform balance weight has optimal uniformity of the inertial component of touch. Since inertia magnifies weight factors in the action, inconsistencies in the balance weight will be magnified when the key is struck, therefore, it is desirable to have a uniform balance weight. (There are many aspects concerning the subject of inertia which I do not have space to cover in this paper.)

3. Keys with uniform balance weight will have more uniform upweight and downweight values than if balance weight were allowed to vary (compare touchweight analysis figures before and after balancing to uniform balance weight in my previous article on the Stanwood Action).

4. When balance weight is uniform, upweight and downweight become true indicators of static friction levels in the action. In other words, the technician can quickly tell how much friction is in the key without calculation by looking at either upweight or downweight alone.

Before I describe the balance weight system, let's discuss the relationships balance weight and friction have to upweight and downweight. Table A shows pairs of upweight and downweight figures at different levels of friction and balance weight. Note that the pairs of figures in the horizontal rows all calculate the same balance weight value and that the vertical columns all calculate the same friction value.

TABLE A

Upweight/downweight pairs at various balance weight and friction levels.

Balance Weight	Friction 20	19	18	17	16	15	14	13	12	11	10	9	8
44	24	25	26	27	28	29	30	31	32	33	34	35	36
	64	63	62	61	60	59	58	57	56	55	54	53	52
43	23	24	25	26	27	28	29	30	31	32	33	34	35
	63	62	61	60	59	58	57	56	55	54	53	52	51
42	22	23	24	25	26	27	28	29	30	31	32	33	34
	62	61	60	59	58	57	56	55	54	53	52	51	50
41	21	22	23	24	25	26	27	28	29	30	31	32	33
	61	60	59	58	57	56	55	54	53	52	51	50	49
40	20	21	22	23	24	25	26	27	28	29	30	31	32
	60	59	58	57	56	55	54	53	52	51	50	49	48
39	19	20	21	22	23	24	25	26	27	28	29	30	31
	59	58	57	56	55	54	53	52	51	50	49	48	47
38	18	19	20	21	22	23	24	25	26	27	28	29	30
	58	57	56	55	54	53	52	51	50	49	48	47	46
37	17	18	19	20	21	22	23	24	25	26	27	28	29
	57	56	55	54	53	52	51	50	49	48	47	46	45
36	16	17	18	19	20	21	22	23	24	25	26	27	28
	56	55	54	53	52	51	50	49	48	47	46	45	44
35	15	16	17	18	19	20	21	22	23	24	25	26	27
	55	54	53	52	51	50	49	48	47	46	45	44	43
34		15	16	17	18	19	20	21	22	23	24	25	26
		53	52	51	50	49	48	47	46	45	44	43	42
33			15	16	17	18	19	20	21	22	23	24	25
			51	50	49	48	47	46	45	44	43	42	41

A plot of upweight and downweight against different friction levels demonstrates that balance weight is unaffected by changes in friction (figure 1). Conversely, plotting upweight and downweight against different balance weight levels shows how changing the balance of the key effects upweight, balance weight, and downweight equally (figure 2).

There are three basic rules which govern downweight, balance weight, and upweight:

1. The spread between upweight and downweight varies as a function of the total action friction.
2. Changing balance weight does not change the spread between upweight and downweight.
3. Changing friction effects the spread between upweight and downweight without changing the balance weight.

For example: If we add lead to the key so as to lower the balance weight by five grams, downweight and upweight will both drop by five grams. Whereas if we change friction in the action so downweight drops by five grams, upweight will rise by five grams and balance weight will remain the same.

Consider the following set of figures: The pairs of touchweight figures in each vertical column both have the same calculated friction shown at the top of the column. Note that the first horizontal row of paired figures have a common upweight of 20 grams. The second horizontal row of paired figures all have the same balance weight of 38 grams.

Vertical columns have constant levels of friction.

18	17	16	15	14	13	12	11	10	9	8
20	20	20	20	20	20	20	20	20	20	20
56	54	52	50	48	46	44	42	40	38	36
20	21	22	23	24	25	26	27	28	29	30
56	55	54	53	52	51	50	49	48	47	46

Let's remove the friction values at the top and the 20-gram upweight values. This creates a new table which we can use to create a 38-gram balance weight in each key during the process of key balancing. (See Work Table For 38-gram Balance Weight)

This table makes it possible to test and correct for friction when weighing-off they keyboard:

Let's say that I'm weighing-off a keyboard to a uniform balance weight value of 38 grams. I first check that the key bushings are free. If there is lead in the keys from a previous weigh-off I remove enough lead from each key so they all need some lead added in order to make the balance weight specification. I then determine how much lead to put back in each key by first testing for friction and then weighing-off the key to upweight/downweight values taken from the appropriate column in the work table.

First I test the key for friction (without regard for the balance weight). This is achieved by placing a 20-gram weight on the key and arranging any number of lead weights on top of the key so the key shows a "test" upweight of 20 grams (the actual position of the leads at this point do not relate to the final lead positioning). Once I have made the upweight 20 grams I determine the "test" downweight to the nearest even

Work Table For 38-gram Balance Weight

Test downweight	56	54	52	50	48	46	44	42	40	38	36
Corrected upweight	20	21	22	23	24	25	26	27	28	29	30
Corrected downweight	56	55	54	53	52	51	50	49	48	47	46

TABLE B

Working figures for weighing off at various balance weight levels

Balance Weight	Friction 20	19	18	17	16	15	14	13	12	11	10	9	8	
	60	58	56	54	52	50	48	46	44	42	40	38	36	TestDown
44	24	25	26	27	28	29	30	31	32	33	34	35	36	(20up) Upweight
	64	63	62	61	60	59	58	57	56	55	54	53	52	Downwt
	60	58	56	54	52	50	48	46	44	42	40	38	36	
43	23	24	25	26	27	28	29	30	31	32	33	34	35	
	63	62	61	60	59	58	57	56	55	54	53	52	51	
	60	58	56	54	52	50	48	46	44	42	40	38	36	
42	22	23	24	25	26	27	28	29	30	31	32	33	34	
	62	61	60	59	58	57	56	55	54	53	52	51	50	
	60	58	56	54	52	50	48	46	44	42	40	38	36	
41	21	22	23	24	25	26	27	28	29	30	31	32	33	
	61	60	59	58	57	56	55	54	53	52	51	50	49	
	60	58	56	54	52	50	48	46	44	42	40	38	36	
40	20	21	22	23	24	25	26	27	28	29	30	31	32	
	60	59	58	57	56	55	54	53	52	51	50	49	48	
	60	58	56	54	52	50	48	46	44	42	40	38	36	
39	19	20	21	22	23	24	25	26	27	28	29	30	31	
	59	58	57	56	55	54	53	52	51	50	49	48	47	
	60	58	56	54	52	50	48	46	44	42	40	38	36	
38	18	19	20	21	22	23	24	25	26	27	28	29	30	
	58	57	56	55	54	53	52	51	50	49	48	47	46	
	60	58	56	54	52	50	48	46	44	42	40	38	36	
37	17	18	19	20	21	22	23	24	25	26	27	28	29	
	57	56	55	54	53	52	51	50	49	48	47	46	45	
	60	58	56	54	52	50	48	46	44	42	40	38	36	
36	16	17	18	19	20	21	22	23	24	25	26	27	28	
	56	55	54	53	52	51	50	49	48	47	46	45	44	
	60	58	56	54	52	50	48	46	44	42	40	38	36	
35	15	16	17	18	19	20	21	22	23	24	25	26	27	
	55	54	53	52	51	50	49	48	47	46	45	44	43	
		58	56	54	52	50	48	46	44	42	40	38	36	
34		15	16	17	18	19	20	21	22	23	24	25	26	
		53	52	51	50	49	48	47	46	45	44	43	42	
			56	54	52	50	48	46	44	42	40	38	36	
33			15	16	17	18	19	20	21	22	23	24	25	
			51	50	49	48	47	46	45	44	43	42	41	

FIGURE 1

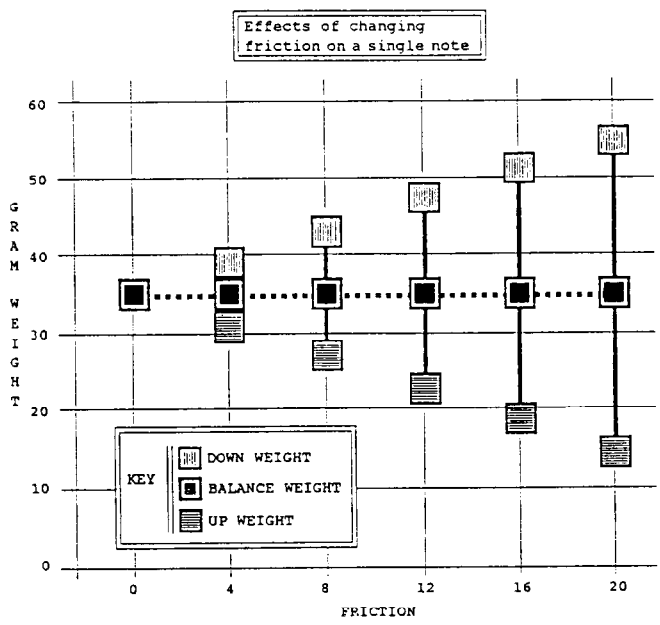


FIGURE 2

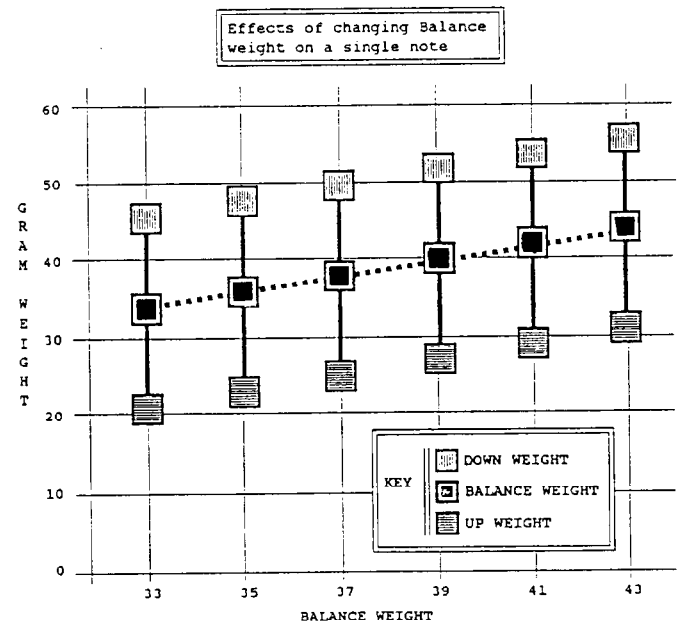


figure. The test downweight identifies the friction level in the key with a vertical column in the work table. I find the figure that matches the test downweight by looking across the top horizontal row of the table. Directly beneath this value are the appropriate upweight and downweight values for a 38-gram balance weight which correspond to the friction in that key. The key should be weighed off to these frictionally corrected values.

Now I take the lead weights off the top of the key and replace the 20-gram test weight with the corrected upweight value from the table. I then arrange the leads on the key so it lifts that upweight. Once I establish the proper upweight, I check to see if the downweight matches the appropriate value from the work table. The leads should now be in the positions where they will be permanently mounted in the key. I like to position leads in the old holes wherever possible. Even if it means clipping some weight off the lead, or flattening out a 3/8" lead to fit in a 1/2" hole. I mark the lead positions on the key and *remove the leads carefully to a tray with numbered slots so that the exact same leads go back into the same key.*

Let's review the procedure by weighing-off a hypothetical key to a 38-gram balance weight.

1. Place a 20-gram weight on the key and depress the key as if you were measuring upweight.

2. Set the upweight by arranging keyleads anywhere on top of the key so it just lifts 20 grams.

3. Remove the excess 20-gram weight and test the key for downweight. Let's say downweight measures out at 48 grams.

4. Go across the top horizontal row in the work table until you find the 48-gram figure.

5. Directly beneath are the frictionally corrected upweight and downweight values for this key. In this case they are: upweight — 24 grams, downweight — 52 grams.

6. Place a 24-gram weight on the key and arrange keyleads in their final position on the key so the key lifts 24 grams. Confirm that the downweight is 52 grams. If so, then you have created a key with a balance weight of 38 grams.

7. Mark the key and remove the leads to a slotted tray so they can be later mounted in the same key they came off.

This is the most practical method I have found to date for creating uniform balance weight.

In my shop we generally set balance weight at a uniform value of 38 grams. You may decide to use different balance weight values in which case you may refer to Table B which has working figures for a variety of balance weights.

Judging the motion of the hammer during measurement of touchweight is a critical aspect of key balancing. I like to judge the upweight in the normal fashion by depressing the key until the drop screw and the jack tender just touch their respective cushions, but without deflecting their springs. Upon release of the key, the hammer should move in a controlled downward motion that the eye can follow to a place just short of the rest position. For downweight I like to see the hammer move upwards in a sustained motion after rapping on the hammer rail with the fist. *The motion should mirror that seen in the upweight.*

I feel that keybushing friction tends to skew the meaning of upweight and downweight because it is not always uniform through the stroke of the key. I therefore favor keeping key bushings as free as possible. *I have found that it is difficult to achieve consistent results unless key bushing cloth surfaces have been treated with a dry lubricant (such as McLube #1725).*

It should be noted that friction, as measured in the key, is magnified during the actual playing of the instrument. The amount of magnification depends on the types of friction that are in the key. For instance: a key that has a friction of 15 grams, largely as the result of a tight hammer flange and a loose key bushing, will have a higher frictional component in the touch resistance during actual playing of the piano, than a key with a 15-gram friction — largely as a result of a tight key bushing and a loose hammer flange. This is because friction in the hammer flange results from the rubbing of the center pin against the felt bushing cloth. When the key is struck, the centerpin is driven more tightly against the cloth which increases the friction between the two surfaces. In the key bushing, the force of friction does not increase because the blow to the key does not tend to push the front pin and the bushing cloth surfaces against each other. This subject deserves more thorough study and discussion than I can offer here.

One last point: Buy or make yourself a set of gram weights graduated in one-gram increments. My set has enough weights so that I can make up a set for weighing-off which are mounted on a tray in a configuration like the figures in the work table. Then you don't have to look at numbers. Just find the appropriate test downweight and when you return it to the tray, your hand will fall right onto the corrected upweight and downweights. You can make your own weights by tamping lead into cut and deburred lengths of copper pipe.

In a future article I will discuss how to choose specifications for balance weight and how to use the balance weight system in mastering the adjustment of wippen helper springs.

See you in Philadelphia!

GOOD VIBRATIONS

Bridge Recapping: Consider Installing The Ready-To-Go Cap

Nick Gravagne, RTT
New Mexico Chapter

Thus far in our bridge recapping project we have jumped through a variety of hoops: diagnosing the afflictions of the original cap, then outlining surgical procedures for cap replacement; taking location measurements and making a paper rubbing, or other pattern; removing the original bridge top using both hand and power tools while making sure that the machined surface is true; and filling the original bridge pin holes with hardwood shoe pegs. The next step depends on whether you are going to purchase a ready-made cap from a bridge-making supplier — the cap comes cut to shape and thickness, graphited, drilled, notched, and sometimes pinned depending on how thick the new cap is — or whether you are planning to make your own cap.

Ready-to-go caps offer obvious advantages when considering the kinds of supplies and tools (especially machine tools), you *don't* have to have on hand. And if you've never carved a new cap you might not be interested in learning the craft. Like piano tuning, bridge making demands practice to master, and although you may have the skills, tools, and eager incentive to install a ready-made cap, the thought of taking on the entire job from bridge making through installation borders more on metal anguish than pride of accomplishment. Give yourself credit for deciding to replace the cap, no matter who makes it, rather than opting for the usual, and often less satisfactory, quick-fix repair.

Ready-Made Caps From Patterns Only

However skilled bridge makers may be, they are not very gifted in reading minds, especially when those minds cross several state lines. Give them good information. A recent issue of the *Journal* for this series explained how to make paper rubbings. The bridge maker needs a pattern reference which truly represents the actual bridge top. When sending a pattern make certain that is "says" everything pertinent, including your name, etc., and name of piano, etc. The pattern should be readable, showing pin holes (punched by you) along with the 1/8" location holes (if you drilled any), and including clearly identifiable unison "patches," complete with string grooves. Helpful, too, are indications in the rubbing as to how the notches line up with each other, as well as their orientation to the pin holes. Because bridge carving leaves plateaus of the bridge top standing higher than the lower slopes of the notches, a perfectly clear outline of the cap is impossible to get. Still, some semblance of its shape and contour can be had by both creasing the pattern paper with your hands, and rubbing the side of a lead pencil over the pattern so as to pick up the outside line (more or less) of the bridge. The new cap will be cut a bit oversize so great accuracy isn't required here anyway. An additional check can be held, though, after the old cap has been removed: place the pattern over the newly cut, flat surface so as to accurately determine and record the outline of the cap. *Caution*: this works fine where there is little, or no bridge overhang to contend with. Stay alert to such conditions.

Also, don't forget to include required dimensions, such as how tall the cap needs to be, and whether the cap is to be made uniformly thick, or tapered end-to-end. But be reasonable in both your specifications and expectations. A cap which tapers by 0.060" from one end to the other should be duplicated; but one which tapers by 0.010" should be considered uniformly thick. Moreover, be careful about specifying dimensions and requirements which reek of impracticality — strange tapering, for example, or dished-out areas, or pin angle specifications of biblical exactitude. Such requests will signal to the supplier that you are either a flaming novice, or an idealistic nut — two designations which could cause your pattern to end up back in your lap accompanied by a brief thanks-but-no-thanks letter.

Send The Old Cap — If You Can

Of course if you are fortunate enough to remove the original cap in one piece (which, I think, can only be done by invoking the black arts), or if you are able to remove it in large enough pieces so as to allow subsequent reconstruction, then the old cap, in one form or another, can be sent to the supplier in lieu of any pattern. If the old cap came off in pieces, try reconstructing with glue, and send out only if the pieces really look like the original cap; if what you end up with, however, looks more like a five-year-old's first attempt at arts-and-crafts, better to keep the thing around for an occasional laugh. If uncertain as to whether it is good enough to send, include a pattern — the one you made before the cap removal — and send both. A bridge maker prefers to have on hand the original piece, if at all possible, since anything in three dimensions increases the likelihood (or at least ease) of successful job visualization and follow through. Still, where the cap cannot be sent, pattern-only orders can be expertly filled by any skilled bridge maker.

What Does The Supplier Supply?

If either a pattern, or the original cap itself has been sent out, what can you expect when that brown-shirted UPS person shows up with a box? Should

you expect to see bridge pins in the new cap, or varnish in the notches, or what?

To pin or not to pin? Not much of a question really. Don't expect to see bridge pins if the replacement cap stands less than, say, 1/2" tall. It should be obvious (but it isn't always) that the new cap cannot have anything sticking out of the bottom — such as inserted bridge pins which completely pierce the new cap — or mating of the new cap to the bridge body cannot be done. If you prefer the taller pinned cap, allowance must be made for it at the bridge body; that is, an appropriate amount of wood needs to be removed when reducing the original bridge height. But pinning aside, ready-made caps should be thicknessed to no less than 1/4" if for no other reason than bridge makers require something reasonably substantial with which to work.

Thin caps cannot be pinned by the supplier; everything else, however, can be accomplished for you — specified thicknessing, cutting to rough shape, graphiting, drilling and notch carving. From there you are expected to glue on the cap and extend the pin holes by drilling into the bridge body, using as guides the angled holes found in the new cap. Although this is entirely possible, it takes a bit of practice and a steady hand. (Get the feel for it by drilling the rear holes first). Thicker caps are better since the drill bit can more surely "follow" a deeper hole than a shallow one. A flexible shaft designed for chucking a drill bit in one end, and mounting to the shaft of a motor at the other, is an excellent tool for this type drilling operation since it is less bulky, hence more accurate, than working with ordinary drills. But however the holes are "followed" and drilled, the technique is really not much different than re-drilling existing holes when reconditioning an old bridge.

As to the other aspects of the replacement bridge, check with your supplier. Some will routinely varnish notches and file the pin tops, others will only by request. I suggest that, whoever does it, the notches be varnished and protected before the work of installation begins otherwise they will surely become indelibly smudged.

Installing The Ready-Made Cap

As per past articles in this bridge capping series, some recorded and retrievable method of locating the new cap will have been worked out, and the body of the bridge will have been routed down (or otherwise reduced by some means). Let's imagine that the new cap is to cover the top two treble sections (about 35 unisons), its length terminating where there are no unisons, such as under a plate bar. Let's also imagine that the new cap has not been pinned by the bridge maker. Since the entire long bridge cap has not been taken down, there will exist a vertical step where the newly routed area meets the original cap, and it is here at this step where one end of the new cap will form a butt joint with the old cap. Make a trial fit: position the new cap and try it against your location method (marks, holes, pattern, or whatever). It should be very close to final position, if not right on. You may have to use your motorized disc sander to remove a bit of material from the new cap end at the butt joint. Take off small amounts of material at a time and keep trying the fit. Don't get hung up here attempting to make a beautiful, invisible butt joint. Although that's the ideal, it is more important to align the new cap properly, and equally important that throughout the project you are able to remove and relocate the cap in the same place on the bridge body. (See below @ Gluing On The Cap for methods of "brad-holding" the cap).

With the butt end looking good, and the alignment correct, determine how much waste overhang needs trimming. It is easier to trim the cap before it is installed than afterward. Place the cap in position, and using a short, stubby, sharp pencil, draw a line on the underside of the cap following the bridge body as a guide. Lift off the cap and trim to the line but take care not to remove too much material; save the final trimming until after installation. Trimming techniques include power sanding with both stationary discs and those chucked into hand drills (use small inexpensive drum sanders for inside curves); hand and power rasping; scraping; and planing. Power routing with a router or laminate trimmer works great, but is generally reserved for after-installation cap trimming. For this article, suffice it to say that the proper bit to use is a carbide "flush cut trimmer bit"; they come equipped with a roller bearing (ball bearing wheel). Power routing will be treated in more detail in the next article.

Clamping Systems

There are a few favorite clamping methods in use for installing the cap to the bridge body; each has its advantages and disadvantages:

Screws

A time-honored technique for providing clamping pressure when gluing wood to wood. Screws are used extensively in the cabinet making trades, especially for carcass construction; they offer the advantage of speed and amazing relative simplicity compared to more elaborate clamping techniques. But the actual force they impart to the glued joint, particularly to softwoods (and ill-fit, at that), is not only pale compared to clamps, but can not be evenly distributed over large sections of the work. Still, if hardwood pieces are well fitted, that is they form a good "rub joint," pan head screws used with large "fender" washers (small hole, large diameter) make for an acceptable clamping system. Drill clearance holes in the cap, spaced about every four to six inches and located in the center of unison patches. Drill smaller holes in the bridge body for threading the screws. Dry-fit the cap. If it looks good, remove the screws and cap. Screw-clamped cap installations are mostly reserved for upright pianos and no-name grands.

A couple of variations on screw-clamping: If the new cap is already pinned (and the pins are either level, or filed so) the screw clamping system can still be used. Drill all clamping holes as usual but use a longer pan head screw along the fender washer. The large diameter washer will sit on top of, and push down on, the bridge pins when the screw is tightened. Still another method requires countersinking ordinary wood screws (number seven or eight) into the cap, and the installation made as above, though without washers. But note that the larger, countersunk hole bored in the cap requires a more creative idea for the cosmetic cover-up.

Pressing Off Beam Devices

The Pony Clamp Company[1] offers pipe clamp heads which, when reversed, can apply a pushing force of considerable magnitude. Photos 1 and 2 show these clamps in action. Notice that the

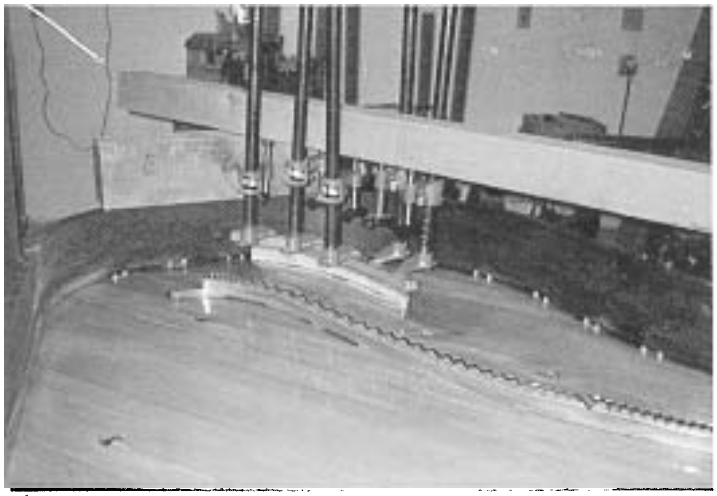


photo 1

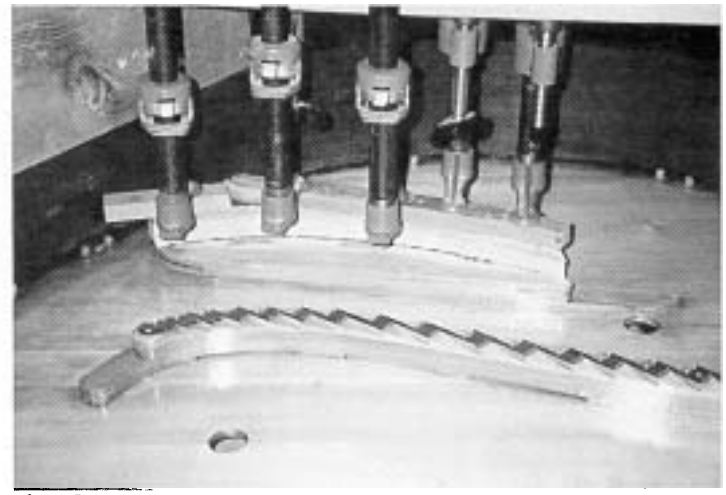


photo 2

screw clamp-jaw is pushing up on a 4x4 which, due to the large working room required by the clamps, is sitting on a six-inch spacer block at the end of the beam. The beam and block are clamped to the piano case by three-foot long pipe clamps, also the Pony type, but used in the typical clamping manner. When pressing a cap on a cantilevered bass bridge, support the underside of the overhang with blocks or wedges. Also, with any overhead beam press set-up, support the soundboard from underneath with wedges or other devices.

Another beam-type clamping technique employs the use of metal Tee-nuts which are inserted into appropriate holes drilled through the beam. For anti-pull-out security, locate the Tee-nuts on the *underside* of the beam, and screw in the long bolts which will act as the clamps. (Pictures and drawings of this device have appeared in the *Journal* over the years, mostly in connection with the techniques of soundboard repair). In practice the beam is located over the bridge and secured to the piano case with long clamps. The bolts are then turned down with a wrench thus applying the clamping force. The bolts I prefer are 1/2" diameter carriage bolts having round heads, along with a convenient square shank just under the head to which a wrench can be fit. When the round head makes clamping contact with the work it tends to stay put, rather than spiraling off center, since its contacting surface is minimal and smooth: the force, however, can be great, but spread it out with cauls and scrap blocks —standard procedure anyway in clamping techniques, right?

Notes About Beams

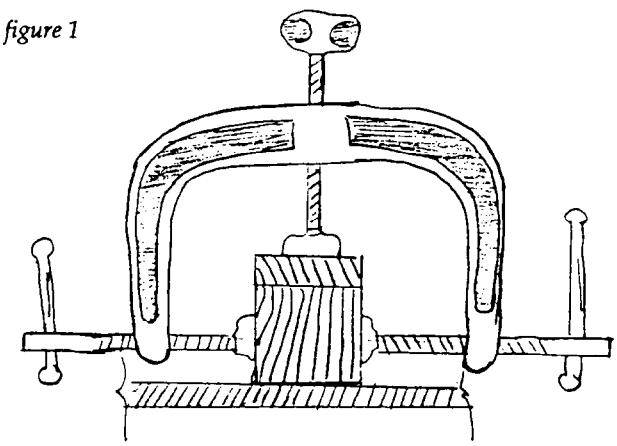
They are useless if too flexible. If using a 2x4-inch member, it must be placed on *edge* where it is considerably stiffer than if placed "on the flat." A very stiff beam can be built up by making a T-section member of two pieces — a 2x6 (or wider) placed on-the-flat for the bottom, and a 2x4 placed on edge forming the vertical piece of the "T." The advantage of the wider bottom is that it can cover a bridge section which, due to its serpentine shape, cannot be covered everywhere at once by a narrow beam. Still, all beams will flex upward as clamping pressure is applied, often times so much that, after the fourth clamp is brought to bear, the first or second actually falls out. Or if using a screw-beam, the first tightened bolts will be making minimal contact as the last are being tightened. Be alert to these frustrations and keep going back to re-tighten clamps or screws.

Similarly, a very stiff "U section" or channel, or even a multiple T-section member can easily be constructed having a wide plywood bottom against which flexible, but relatively short, go-bars can be sprung. This channel beam, which must be long enough to clear the sides of the piano case, will have to be affixed by clamps, and spaced about 18" (not critical) above the bridge tops. The channel can sit at the prescribed height on "legs" made of simple 1x4s, which are standing vertically on the soundboard at the rim, and clamped to the outside rim. Make the feet adjustable in order to accommodate various bridge height conditions as found in the various makes of pianos. Place the channel on the legs, plywood bottom down, and clamp (with moderate to light pressure) via long clamps to the underside of the rim. Use your ingenuity to imagine the critical elements of the set-up, and vary to suit your needs. Mini go-bars can be cut from any kind of wood into sticks approximately dimensioned to 3/8" by 3/4". Experiment with the go-bars; they must be able to bend a noticeable amount upon pressing home, and they must stay put as other bars are sprung into place. Once you have constructed this channel member, and worked out this technique, you will be hard-pressed (pun intended) to ever use any other.

Straight Clamping of Caps

There is a clamp on the market called an edging clamp. The device has three screws threaded into it: two in-line and opposing, and a third converging at a right angle. Figure 1 shows the essentials for cap installation. Disadvantages:

figure 1



cost — in that several are necessary and at $7.00 a piece (mail-order) you can go broke; application — in that they are sometimes difficult to set up, or don't work at all where there is steep bridge overhang; universality — in that they do not have much piano shop use outside of cap clamping; cosmetic — in that the in-line screws mar the bridge body upon tightening (and preventive scrap blocks are a nuisance to use). Still, under the right conditions they perform admirably, are much less cumbersome than beam-presses, and require no underneath soundboard support. I recommend you buy one or two from a local hardware store and try them out for a particular job. If they work, or appear to be promising for the majority of capping applications, order a slew of them at lesser prices from mail-order outlets.

Gluing On The Cap

When the fit is correct, and the waste overhang is minimal, it is time to glue on the cap. Now, glue is something of a paradox: before setting up it makes for quite a respectable lubricant, and although its life as a lube is short-lived, it can create some very gripping moments for the woodworker. We've all experienced this slippery business when, as the clamping pressure is applied, one of the pieces (in this case the cap) casually slip-slides away, precisely out of position. To prevent this annoyance, drive three or four brads into the bridge body and clip the heads off leaving about 1/8" protruding. Position the cap on the bridge body and tap down with a rubber mallet to drive the brads into the bridge cap. Lift off the cap and test to see if it can be easily repositioned into the newly made brad holes. If your bridge locating method entailed drilling 1/8" holes completely through the original bridge, exiting out the bottom of the soundboard (as explained in a previous article), then the new cap should contain appropriately located registation holes as drilled by the bridge maker (according to your pattern), or you will have drilled them in. These holes in the cap and body, when filled with 1/8" dowels, provide an excellent anti-skid system for gluing. Sometimes a hybrid system of brads and dowels is wise. In any case, for bridge caps spanning the two high treble sections, three or four brads or dowels are necessary.

As to the actual gluing, no big deal; but do consider the choice of glue. For short spans of cap, yellow wood glue is fine; but for longer spans this aliphatic goo is too anxious to set up. Where you want plenty of time to position an ingenious, but elaborate, clamping system a slow-set glue is necessary. Consider liquid hide (but see caution below), or Garrett Wade's "Slo-Set," an aliphatic resin glue allowing a working "open time" of 30 minutes. Weldwood's water-powder mix, plastic resin glue offers excellent strength and slow set-up time. Spread an even coat of glue on the bridge body using a toothed scraper, and press on the cap. Clean up glue squeeze with a damp rag and let dry.

If your new cap is not already pinned I don't recommend liquid hide glue for cap installation. In gluing a drilled cap to the body, glue will puddle and dry at the bottom of every bridge pin hole. If this glue is liquid hide it will not take kindly to being drilled through later on when the holes are "followed" and extended into the bridge body. In fact, just for spite, the glue will partially liquify into an evil, gummy substance, oozing and flowing up the flutes of the drill bit, and finally hardening into Turkish Taffy. The effect is not permanent, but chipping the taffy out of the flutes is such an obvious drag that I would doubt whether even Tom Sawyer could hoodwink Huck Finn into believing otherwise. Other "normal" glues also resist being drilled through gracefully, but at least are yielding.

Final Work

After the glue has dried there is still some work ahead. If screws and washers were used for installation, remove these, bore out the holes to a convenient dowel size and fill by gluing in dowel plugs, finally graphiting over the top end grain. The final waste overhang can be trimmed flush to the body using the tools and methods mentioned earlier, but power routing with a flush-cut-trimmer is quick and easy. Coat the raw edges of the cap (and body if it needs it) with shellac and varnish.

If the cap is not pinned, "follow" and extend the pin holes down into the bridge body using either an electric drill or a flexible shaft chucked with the appropriate bit. Wrap the bit with masking tape for a depth-stop guide. Clean up dust and drive in the bridge pins. A recent article in this bridge series discussed some techniques of pin driving, refer to it for a refresher.

Final Thoughts For First-Timers

About this time your brain may be feeling like a stone, and like it shall sink to the bottom of the lake never to be seen again. Take heart. We all felt like that when learning piano tuning — and ready-made cap installation is much easier to learn. I suggest you re-read in sequence the preceding bridge capping articles of this series until you have a handle on how the entire process progresses. If after having ingested the material again, and you still are hesitant, or nauseous perhaps, then farm-out the rebuild (or at least the bridge part of it) to someone else. After all, it is just as valuable to "know thyself" regarding those aspects of this vast work which appeal to us, and those which do not.

Those of you resolute in learning to make your own caps have probably been to the bottom of the lake and back again. And you likely feel driven to maul a piece of raw maple until it looks like a piano bridge. My sympathies are with you. We'll continue there next time.

1 (Note: Pony clamp jaws can be purchased from: Trend Lines, 375 Beachman Street, Chelsea, MA 02150. Toll-free orders, 800-343-3248. The parts are called "reversible sliding head clamps" and the ordering number is PN 56. In packs of 12 these clamp heads cost about $9.95 per set as of this writing. The 3/4" pipes necessary to complete the clamp assembly can be found in good hardware or plumbing supply stores. One end of the pipe requires the standard 14NC thread.

PRACTICALLY SPEAKING

Grand Hammers: Part III
Shank And Hammer Installation

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Sacramento Valley Chapter

The first two articles of this series discussed hammer selection, boring, and tail shaping. This month I will conclude with a look at installing and traveling shanks, determining proper strike points, hammer hanging and final trimming.

Throughout this series I have emphasized that hammers must be properly prepared, voiced, and installed if they are to reach their full potential. Simply removing them from the package and gluing them onto shanks will usually not give the best results. Likewise, faults in other action parts will also limit the performance of new hammers. For even tone and best power, all action parts must be in good condition and properly regulated. Sometimes simple cleaning and regulation will bring the rest of the action up to the level of the new hammers. In other cases extensive repairs and parts replacement are necessary if the full benefits of new hammers are to be realized.

Preparing And Installing Hammer Shanks

Hammershanks are especially important to hammer performance. They must be solidly pinned and correctly traveled so that the hammers strike the unisons squarely and rebound without scrubbing sideways against the strings. Knuckles should be smooth and round so that friction is minimal and jack escapement is crisp.

Original shanks (repinned and possibly fitted with new knuckles) can be re-used if they are long enough. However, if you discover that the optimum treble strike point requires that the new hammers be installed farther out on the shanks than original, new shanks must be used. If the original shanks have had hammers replaced once already, chances are that removing the second set of hammers will leave the shanks weak and unevenly sized at the ends. In such cases you'll get better results starting over with new shanks. If the old shanks do seem useable, running them through a shank knurler will help to re-size them for a more uniform fit later during dry fitting of the hammers.

New shanks will often benefit from re-pinning. "What? Why would they need re-pinning if they are new?" you may wonder. Well, in many circumstances — the inexpensive home piano or the practice room work horse — new shanks will probably work just fine right out of the box. However, many new shanks are pinned quite loosely; and, if we want the best tone and the most even touch on a quality piano, it is important to re-pin to ensure uniform friction levels and solid, wobble-free shanks. My personal preference is for each hammer to swing four to five times. This means that shanks in the low bass will be pinned to about eight grams friction (measured at the flange screw hole) tapering to about four grams for the high treble.

To minimize the amount of re-pinning necessary I sort new shanks according to their existing friction levels, placing those that are already correct for the bass into one pile, looser ones into a tenor pile, etc. Using one hammer each from the low bass, mid-tenor, and high treble to swingtest some shanks, I get a feel for what tightness is needed in which area of the scale. After checking a few to calibrate my eye, I can tell which pile they belong in by watching how fast the bare shanks drop from horizontal. Any that are too loose or too tight go in a separate pile for use in the treble. These of course, must be sorted or pinned for use in that area only.

Thinning Treble Shanks

Most quality grands use thinned shanks in the treble; this thinning seems to reduce the wooden impact component of tone in this area and thus give a more musical sound. If replacement shanks do not come thinned, you can

figure 1: Jig For Thinning Treble Shanks

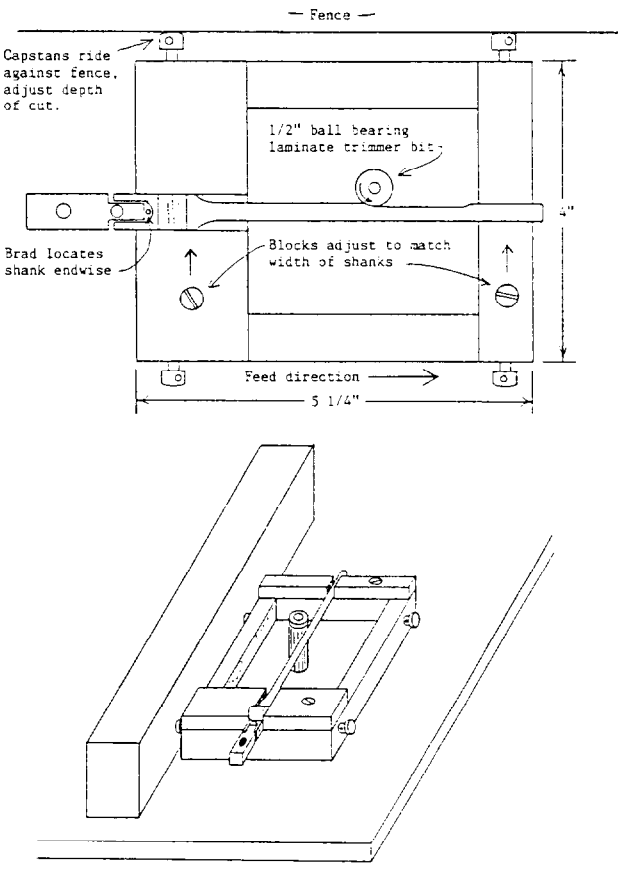
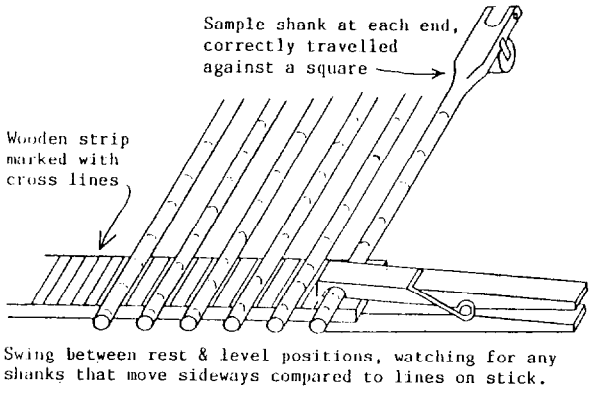


figure 2: traveling shanks



trim them yourself using the jig shown in figure 1. Used with a table-mounted router, this tool holds a shank by each end; the sides of the shank are then trimmed by a router bit. Capstans guide the jig along a fence and determine the depth of cut. With the router running, the jig is lowered onto the table and moved over against the fence; the jig is then slid along the fence as the bit trims one side of the shank. At the end of the cut the jig is picked up and turned around to trim the other side of the shank. The capstans can be adjusted to vary the shank thickness or to taper the shanks. I use a laminate trimmer bit with a ball bearing top. The bearing acts as a stop at each end of the cut; more importantly, it shrouds the top of the bit, making the work much safer as the fixture is lifted on and off the spinning bit. Note: In most routing operations the work is fed against the direction of rotation of the bit. However here the shank should be fed *with* the cutting direction of the bit to minimize chipping due to crooked wood grain.

Installing Shanks

To minimize traveling problems, wooden action rails should be carefully cleaned of old sandpaper, sanded flat, and fitted with new 150-grit paper. Be very careful if using a scraper to clean the rail; the blade will tend to dig in as it passes over the screw holes, leaving a corrugated surface. It is safer to heat the old paper slightly with an iron and then slide a chisel along, removing all but a thin paper/glue layer. This residue can then be removed using a one-inch wide, flat *non-padded* sanding block and coarse paper. I like to spray the back of my new sandpaper with a thin coat of aerosol contact cement, press it to the rail with a flat block, and trim flush. Whatever your method, avoid glue lumps under the paper which can cause traveling problems. Holes can be punched in the new paper with an awl after it is glued.

Modern Steinway action rails use a self-adhesive hammer rail cloth which can be easily removed after a brief soaking with naphtha. Common choices for replacement include original-type felt, stringing braid, sandpaper or just bare rails.

When screwing new shanks to the rail, space the flanges evenly side-to-side, so that knuckles do not rub and so there will be room to turn flanges slightly later when spacing hammers. Also, space the ends of the shanks evenly, centering each over its wippen screw; this even spacing will make it easier to judge hammer alignment when hanging hammers.

Simply screwing shanks to the rail does not guarantee proper hammer centerpin location. Some replacement flanges are slightly thinner, for example, so that the centerpins are located lower than original. In such cases the entire hammer rail can be shimmed up off the action brackets to compensate. Also, there is often extra clearance in the screw holes so the flanges are not automatically located the same distance front-to-back on the rail; here you should hold each flange back against the lip on the rail when tightening.

Steinway flanges, since they sit on a semi-round rail and often have screws that tilt, tend to roll forward or backward when tightened, leaving the centerpins and knuckles in different locations and at different heights. You can easily see this by resting a straightedge across the flanges just behind the drop screws. This misalignment can be corrected by a combination of papering under the flanges and filing slightly angled areas in the tops of the flanges so the tilted screws seat squarely. An excellent discussion of this procedure can be found in the book, "The Educated Piano," by Ed McMorrow, RTT.

Traveling Shanks

My favorite method of traveling shanks is to use a wooden strip marked with cross lines, as shown in Figure 2. This strip is simply clamped to a shank at each end using clothes pins. Of course, these end shanks must first be checked using a combination square resting on the bench top, to make sure that they rise straight and do not travel off to one side. The end shanks then guide the wooden strip straight as you move it up and down between the rest and level positions. Any shanks that travel to one side then show up clearly against the cross lines on the wood strip. This method saves having to use a square on every single shank. Note: In many sets of shanks a majority travel to one side. If these shanks are simply checked against each other instead of against accurate samples, you could end up with all shanks traveling uniformly but all to one side.

Installing Guide Hammers

I normally install new hammers in the second and next-to-last positions in each section to serve as guides in hanging the rest. The guides are installed in line with the original end hammers of each section, providing these end hammers still appear to be in their original positions.

The position of the high treble hammers is most critical; in this area where strong, singing tone is hardest to achieve anyway, slight errors in strike point can make the difference between a great treble or an average one. It is essential that the hammers be glued to the shanks in the proper location, because there is only limited adjustment available from sliding the action in and out. Thus when we glue on our hammers we must be sure that they are positioned for best tone when the action is positioned for proper clearance between keys and keyslip. This step is very important: I can say from personal experience that it is no fun to take an action back to the piano, adjust the action locator in the treble cheek block for best tone, and then discover that the keyslip will not fit back on because the action is too far out.

By sliding the action slightly in and out while playing treble keys, we can determine whether the original hammers are located properly. However, unless the new hammers are to have the same bore distance as the existing hammers now have, this test can be deceiving: Because the tip of the ham-

mer moves in an arc rather than straight upward toward the strings, a worn hammer will strike the strings closer to the capo bar than it did when new, as shown in Figure 3. (A hammer worn 1/8" shorter strikes the strings almost 1/16" closer to the capo bar than it did when new.) Therefore, your strike point test with an original worn hammer number 88 may show that the action needs to be pushed *in*, leaving too much gap between keys and keyslip, and you might think that the original was hung too close in on the shank (too close to the centerpin). Realize however, that a new *longer* hammer hung in the same position as the original number 88 will strike the strings further from the capo bar. In other words, the new longer hammer will require the action to be pulled back out somewhat to position it for best tone.

The easiest and surest way to locate your treble samples is just to mount your new hammer number 88 (or any extra hammer bored correctly) on its shank with a tight dry fit. Then adjust it in or out until you have the best tone when the action is in the position that best fits the case. When the best location is found, glue the hammer in place to serve as your top guide hammer when hanging the rest, make sure that the rake is 90°, or whatever angle you determined earlier (see first article of series).

Many pianos have a hammer line which jogs inward (toward the capo bar) at the lowest note in the top section and follows a straight line or slight curve from there to number 88. Other pianos do not have this jog but might benefit from it, so it is good to check this note just as you did number 88 to confirm that the existing hammer is actually in the best place. Also check one hammer around number 76.

My procedure for installing the other new guide hammers is as follows: First mark the center point of each original end hammer by sighting down the side of each from above while holding a pencil point at the hammer crown; when you have the point exactly in line with the molding, make a dot in the center of the hammer. On angled hammers, make sure to sight down *each* side of the hammer and center the dot side-to-side on the hammer crown. Mark the crowns of your *new* sample hammers in the same manner.

At this time you should check to see whether these original guide hammers appear to be accurate. Support all shanks on a long straightedge and stretch a thread from the center dot on number one to the dot on number 88; normally all guides from number one to the top of the agraffe section and number 88 should be in a straight line, while samples in the capo sections may be slightly closer to the flanges. If some of the original guides appear to be out of line they should be removed.

figure 3

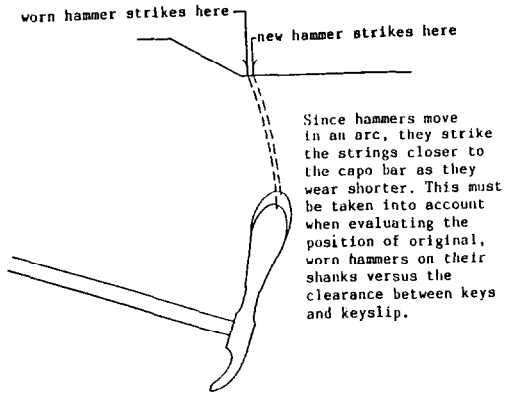
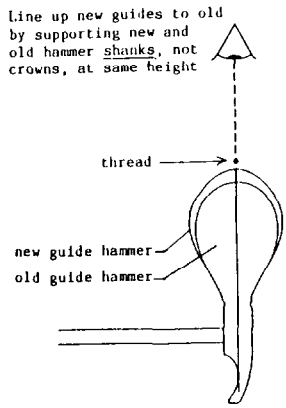


figure 4: installing guide hammers



Next, remove all original hammers except for your guides, and install and travel your new shanks (or repair originals as needed). Then, install your new guide hammers next to and in line with the original guides. Do this by supporting the *shanks* (not the crowns) of both the new and old guides at the same height on a straightedge, and lining up the dot marks using a thread stretched across as a reference line. See figure 4. Be sure to sight straight in line with the hammer center line as shown. You must make sure that the rake of your sample hammers is correct also; it is possible to have the center dots of your new samples in line but have the rake incorrect. This would cause the hammer tails to be out of line.

Repeat for each section until you have new guide hammers in the second and next-to-last positions for each section. The old original guides can then be removed and their shanks replaced (or repaired) and traveled.

Dry Fitting And Glue Preparation

In order to make small adjustments in hammer alignment during gluing, the hammers must usually be reamed for a free fit. For this, a tapered reamer is inserted from the flange side of the molding and the hammer carefully reamed until it fits freely onto the shank, with just a small amount of wobble. I like a fit that allows the hammer to slide on freely but not fall over when tilted.

A glue with adequate working time is also essential, so small adjustments can be made without straining the action centers or shearing a partially set glue joint. I prefer hot hide glue for hammers, with the gelling time retarded slightly by the addition of urea (see February 1990 *Journal*, pg. 22-23). Yellow wood glue is also a good choice.

Installing The Hammers

There are three reference points that determine hammer alignment: strike point location, rake (angle of molding to shank), and vertical alignment (hammer perpendicular to action rails). These reference points are used to hang the guide hammers. For the purpose of hanging the rest of the hammers, it is easier to use a straightedge to check alignment of the hammer felt at the widest part of the shoulders than to put a dot on the top of each hammer to align strike points. Likewise, since we have set the rake of our guides, it is easier to use a straightedge to align the tips of all tails than to check the rake of each hammer using a square against its shank. Vertical alignment can be checked using a square against the side of each hammer if the sides have not been fully tapered. Otherwise, the bottom edges of the tails serve as an accurate guide; look to see that they sit squarely on a smooth flat surface, as shown in Figure 5.

Various methods can be used to check shoulder and tail alignment dur-

figure 5: alignment points when hanging hammers

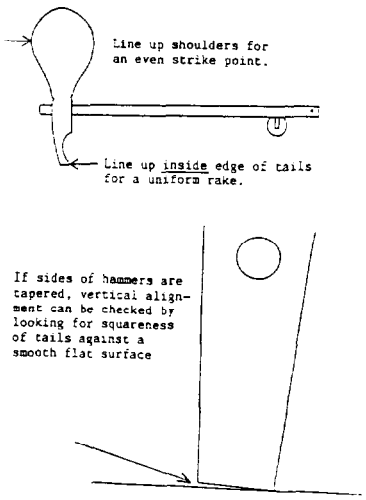
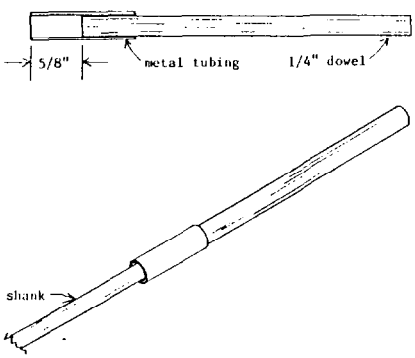


figure 6: hammershank glue applicator



ing hanging. The hammer tails can be supported on a platform spanning the action, and a straightedge held up between guide hammer shoulders and tails as each new hammer is glued on. Or, wood strips can be tacked down to the platform to serve as fixed straightedges for tail alignment, and a ruler held up against the shoulders to align them. Alternatively, various jigs are available which have straightedges that can be adjusted to the guides in each section; this eliminates picking up and setting down a ruler as each hammer is placed.

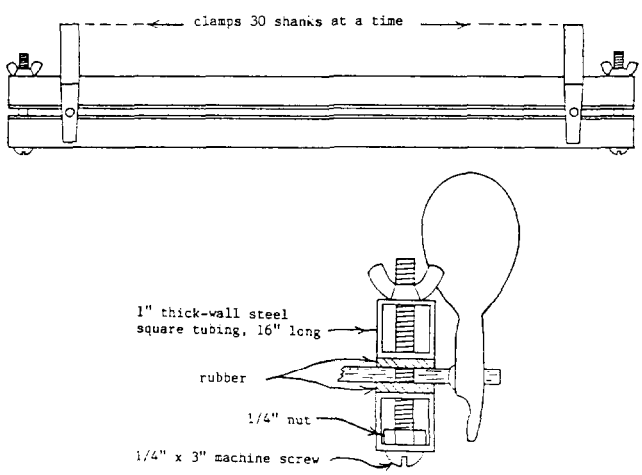
Whatever method is used, the important reference point when checking tail alignment is the *inside* bottom edge of the tail, as shown in Figure 5. After tail arcing, this will be the only remaining original factory surface on the tails, and therefore the most reliable reference.

When installing hammers or assembling any sliding glue joint, it is important to apply glue to *both* wood surfaces. Otherwise, glue applied only to the hammer or shank will be rubbed off when the two parts slide together, leaving a weak joint. A convenient tool for quickly applying glue to the shanks can be made by crimping a short length of metal tubing (upright hammer shank repair sleeve) onto the end of a 1/4" dowel, as shown in Figure 6. Leave 5/8" of tubing overhanging the end of the dowel; this tool can then be placed over the end of each shank and spun, automatically coating the end with glue. After all hammers are hung, they should be left to dry completely before the shanks are trimmed flush.

Final Trimming

The excess shank length can be trimmed off with a small hand saw or with a 3/4" circular saw blade (carefully) in a Dremel or Foredom tool. In either case, the shanks need to be held firmly so the action centers do not get stressed. I like to clamp the shanks together, one section at a time, using the fixture in Figure 7. This is easily made from one-inch thick-walled steel square tubing, which can be purchased cut to length at any welding shop. The stiff steel tubing of this clamp holds the shanks very securely and protects the action pinning much better than do some of the commercial units.

figure 7: shank clamping fixture, to prevent stress on action centers when trimming shanks



After clamping a section of shanks together I cut off the excess using the Dremel saw, then lightly sand the shank ends flush using a flexible rubber sanding disc in a hand-held drill. My tails were arced and textured before hanging, so I carefully avoid sanding any area below the shank during these steps.

For the finishing touch I use a sanding block and medium paper to round the sharp bottom edge of the tails very slightly, then de-burr the sides by stroking the space between each pair of tails with the corner of the sanding block. Note: A common mistake here is to round the lower ends of the tails generously. This effectively shortens the tail length, because this rounded area can never contact the backcheck. (Just as the curved front end of a toboggan does not ride on the snow, a heavily rounded tip on a hammer tail is just long enough for the ride.) Therefore to preserve as much useful length of tail as possible, round only enough to soften the sharp lower edge.

After double checking hammer travel, I burn-in shanks as necessary to correct any tilted hammers.

Conclusion

With the hammer installation complete, you will be ready to regulate, tune, and voice the piano. Here is where you will realize the benefit of the time spent before installation, testing sample hammers for tone, size and weight, and determining the best boring dimensions and tail length. Since you confirmed all these things beforehand, you can look forward with excitement to an action that regulates easily, has an appropriate touchweight, and enables the piano to produce its best tone.

Since hammers are a major factor in the touchweight of an action, I will follow this grand hammer series with a look at touchweight next month.

EXAMINATIONS

Learning To Pass The PTG Tuning Exam; Part 11: Review

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This is the last of my series of articles on the tuning exam, which has appeared in these pages over the last year. A goal was to encourage those interested to go take the test. To this end, I've written about how the exam works, attempted to enlarge upon the available information about tuning techniques as applied to the exam and offered some "test-wise" suggestions for making the best scores your abilities allow. This month I will try to tie together what's gone before, presenting all the hints contained in the articles as well as a listing of titles and subtitles that may help you find previously covered material and sources. But first, I'd like to review some of the ground covered in the beginning.

The PTG Tuning Exam, adopted by the PTG Council in Philadelphia, 1980, and most recently revised in Portland, 1989, is the most complete and objective evaluation of piano tuning skills available. The exam is administered under the guidance of the PTG Examinations and Test Standards Committee (ETSC), and requires the direct supervision of a specially trained and functionally-sighted Certified Tuning Examiner (CTE).

This exam provides both an objective baseline for minimum or "entry level" tuning skills of Registered Technicians and a sufficient challenge for the masters of our craft. Those who pass this test with scores in the low 80s may congratulate themselves on achieving a milestone in their careers, but should not rest on their laurels; they should continue to advance their skills and perhaps try taking the test again at some point to evaluate their progress. Many examiners who have the experience to associate scores on the exam with how the piano sounds have expressed the opinion that high-level tuning skills are generally indicated only when test scores are in the 90s — the higher the better. To my knowledge, no one has ever scored 100% in all categories on any one exam.

Nevertheless, most who have tried have come away with a sense of the fairness and thoroughness of this exam as an evaluation of their abilities. This occurs partly by design: in the exam manual, CTEs are reminded that "The real success of a tuning examination depends on your ability to make it acceptable and valuable to the person who takes it." PTG examiners want you to succeed, and if you're willing to try, you're already halfway there. In this sense, a successful exam does not depend on whether you pass or fail so much as whether you feel your examiners treated you fairly. Whether you pass or fail, however, depends entirely on your performance. You may not perform up to your abilities on a given day, for a variety of reasons. Among these could be your disorientation with the very process of the exam or a nervousness under pressure, as well as a basic lack of knowledge and/or skills.

If you learn about what you're getting into by reading these and other articles ahead of time and by attending tuning classes as well as special classes on preparing for the exam, your disorientation on exam day will be less. If you've put into practice some of the ideas presented, such as trial runs under test conditions, you should be able to perform confidently. Whatever happens, you will get an evaluation that is meaningful, which was not always the case in the past. Before 1980, the scores given on tuning exams were less objective and, while not necessarily arbitrary, were not standardized; a tuning that passed at one test center might have failed somewhere else where standards were tougher. This is much less likely to occur today.

The exam itself has undergone a number of changes and refinements since its inception. In earlier versions, there was a two-hour time limit for the initial tuning if aural, and 1-1/2 hour if electronic (employing a visual display electronic tuning aid). The unison tolerance at one time was 3/4 of a cent, and the stability test blow standard was six ounces from six inches. In addition, for a number of years there was an allowance for tuning fork pitch error, the temperament and midrange point multipliers were more liberal than today, and you could pass the aural repeat portion of an electronic exam by scoring only 60% in pitch, temperament and midrange with a 1/2 hour time limit.

In contrast, the current version of the exam specifies the following: a 1 1/2 hour time limit for the initial tuning if aural and a one-hour limit if electronic; unison tolerance of one cent; a stability test blow standard of eight ounces from six inches; pitch is scored in relation to A440 at A-49, with no fork error allowance; multipliers for temperament and midrange are 2.5 and 1.5 (formerly two and one) respectively; and the passing score for the aural portion (part two) of an electronic exam is 80% in pitch, temperament and midrange, with a 3/4 hour time limit. Exam procedures, equipment and scoring methods have also evolved so that tuning exams may now be given more objectively and efficiently in three to four hours.

The 80% passing requirement for part two of electronic exams took effect the first of this year, but that's the only significant change to exam scoring since 1986 when we simplified pitch scoring and tightened scoring for temperament and midrange.

In retrospect, being involved with the tuning exam over the years since 1980 has improved my own tuning, and I feel that for anyone from the most experienced to the novice who takes the time, "learning" to pass the exam could likewise be beneficial. Don't forget you've already partially paid for it anyway — a portion of your PTG dues subsidizes this exam, (non-subsidized tuning exam fees would be closer to $400) — so you may as well get something out of it! With all the time, effort and membership dues money invested to develop and administer the current exam, I am frankly surprised that more RTTs who were tested before 1980 have not wanted to get back some of that investment and see how well they can do. I feel it's one of the benefits of PTG membership that we keep our exam fees artificially low so that more of our members have access to testing. And besides, wouldn't it be nice to know objectively that you're as good as you think you are? You owe it to yourself and to your customers. Thanks for listening.

The Collected Hints

Note: I unintentionally used "#16" for two different hints, which I refer to here as #16a and #16b.

Hint #1: Tune a good-quality grand for an RTT and ask for a critical evaluation of your work. This opinion should give you an idea of whether your tuning would pass and, though not a guarantee, it could save you some grief (and exam fees) later. Get as many evaluations as you can from different RTTs.

Hint #2: Practice tuning pianos that are completely strip-muted to single strings, especially if you don't normally tune that way. It's not something you want to do for the first time in the exam room.

Hint #3: Tune all the required single strings on the test piano at least once, if only quickly. You are severely penalized when you don't, and simply not tuning a few in the high treble or low bass because you ran out of time can cost you the exam. Spend your first 10-15 minutes or so to quickly go over the piano to smooth out the ups and downs of the detuning. This will also help you get a feel for the instrument. Practice this "quick and dirty" tuning in advance by doing it on pitch adjustments of strip-muted pianos, for which a similar procedure is appropriate.

Hint #4: Practice tuning the top octave by playing just the single octave, both notes simultaneously, especially if you usually tune in that area by playing the notes sequentially (which will drive the single octave too sharp), until you can hear the single octave when it beats as well as when it is clear.

Hint #5: Maintain a professional attitude during the initial scoring so you will be able to finish the entire exam regardless of the results, and be receptive to suggestions for improvement.

Hint #6: Don't use any more forceful test blows during a tuning exam than you would normally use in the field to produce a stable tuning. You can check your own tuning stability by tuning a few midrange octaves on a strip-muted piano as you normally would, and using an instrument such as an Accu-Tuner to make sure that each note withstands three moderately hard test blows within the measurement accuracy of the instrument. Alternately, use contiguous interval checks before and after the test blows to detect any movement. There should be no difference in the before and after sounds of the intervals above and below the note being tested.

Hint #7: If possible, practice unisons before the exam by measuring each of the three strings in a goodly number of your aurally-tuned unisons (whether they sound good or not) to be sure you're well within test tolerances. See also hint #1 — get a critical evaluation from an RTT.

Hint #8: Obtain and use an accurate A440 pitch source. If you tune with a C523 or other non-standard fork, you should always double check to be sure A4 comes out on A440.

Hint #9: Have the fork or other pitch source calibrated at the temperature at which you intend to use it, and bring it to that temperature before using it. Keeping it on the piano plate will stabilize it to essentially room temperature. Keeping it under your arm will stabilize it to near 98.6° F. If you always keep it at room temperature (instead of in your car overnight) temperature-induced pitch errors should not be a problem for you.

Hint #10: Retire your aluminum fork, or if you've been tempted to get one, don't. There are better alternatives available. Aluminum forks are big, easy to handle, and produce a clear tone with exceptional sustain, but are too temperature-sensitive to be reliably accurate. It's not much of an exaggeration to say that looking at an aluminum fork causes it to warm up and go flat.

Hint #11: Insulate the handle of your small steel tuning fork with plastic tubing (should be a tight fit, leaving only the very end uncovered). In addition to assisting with its pitch stability by avoiding direct contact with warm hands, this will allow you to grip the fork in your teeth for hands-free tuning without shaking your fillings loose. It's the next best thing to a good electronic pitch source for convenience, but don't hold it between your teeth longer than necessary.

Hint #12: The hefty 5 1/2" Deagan chrome-plated deluxe pitch-master fork that you would normally keep in a nice fuzzy pouch and bring out occasionally just to impress certain customers has a rounded knob on the end which suggests the following technique. Sound and hang it — fork down, palm up — between the second and third fingers, touching the knob to the keybed below a note you want to hear it with. Then reach around and play that note with the thumb of the same hand, leaving your other hand free to operate the tuning hammer or play a different note.

Hint #13: Borrow a Sanderson Accu-Tuner and practice setting pitch aurally, using the SAT to check your results. Try intentionally de-tuning A4 by one cent and see if you can detect this interval using the 17th test with your A4 tuning fork. Practice until you can set pitch consistently within 0.5 cents of A440.

Hint #14: Recheck your pitch setting after you've tuned your temperament (or about one octave in the midrange), and make whatever small correction might be needed. If you're not satisfied with A4 as to pitch, and you're running out of time, make whatever pitch correction you can without too severely compromising the aural checks with A4.

Hint #15: If you are unfamiliar with aural temperament tuning techniques, you should learn at least one aural temperament tuning sequence and associated aural beat-rate checks and practice tuning until you are comfort-

able and fairly proficient with it.

Hint #16a: Don't experiment with unfamiliar temperament sequences in the exam room. If you achieve good results with your regular temperament procedure, do not be overly concerned when somebody says you can't do it that way, or that your way is somehow deficient. You will not be scored on what sequence you use to set a temperament and tune the midrange, but rather only on the results.

Hint #16b: Practice as much as necessary aurally tuning at least the midrange of a well-scaled grand in advance of the exam, strip-muting and nudging midrange notes alternately sharp and flat to simulate the exam's detuning. Make sure you can do your absolute best work from C3 to C5 in no more than 45 minutes. Be strict with the time, so you will be able to do a good job in the midrange on exam day and still have ample time to finish the rest of the piano.

Hint #17: Practice hearing the 4:5 ratio of ascending contiguous M3s by listening first to the lower M3 counting beats 1-2-3-4-1- 2-3-4-1-2-3-4, accenting the one each time. Then, using the same length of time between ones, see if the upper M3 beat rate can be counted 1-2-3-4-5-1-2-3-4-5-1-2-3-4-5. If not, adjust the "bridge" note until you can count 1-2-3-4 in the lower M3 and 1-2-3-4-5 in the upper M3 in the same amount of time. Soon you will be able to just play pairs of contiguous M3s and immediately know whether the proper 4:5 ratio exists, and what you might want to do if it doesn't.

Hint #18: It may be to your advantage before leaving the midrange to expand the range of intensive midrange checking down to F2 and up at least one note to C5, which will give you a series of double octaves F2-F4 through C3-C5, more notes to check the ends of the exam midrange with, and a head start on bass tuning.

Hint #19: Listen twice, tune once.

Hint #20: If an interval sounds like it needs improvement, apply checks to both ends and try to determine which end is more of a problem in its "constellation" of intervals, and fix that end first.

Hint #21: If you always have these seemingly insolvable problems checking your bass while tuning fine grand pianos, you should practice more on temperament tuning, and/or tuning for stability, which for you are the more likely root problem areas.

Hint #22: Practice the "resonance test" method of tuning the top octave with or without an instrument. First get the note in the ballpark by playing both ends of the octave together and eliminating the 2:1 beats, or by setting the octave to a 2:1 plus one cent width. Fine tune by playing the top note by itself and pushing, pulling and nudging the tuning hammer as you find the "sweet" point of the single octave, the point of greatest excitation of the open string one octave below. Settle the string/pin at that point.

Hint #23: When tuning unisons, be sure to finish all the required unisons at least once, since substantial penalties result from untuned strings. It may be advantageous to tune the unisons completely once in 10 minutes, and then spend the remaining 20 minutes nitpicking them. Don't get stuck on one unison or one string for any length of time; keep moving through the midrange unisons until you either can't find any to improve or you run out of time.

Hint #24: Warning — just because we do not "stress test" unisons for the exam, do not make the mistake of assuming that you can safely get away with merely "springing" the pins to tune unisons. The best advice is to tune unisons as you normally would for one of your more discriminating clients.

Previous Articles In This Series: Titles And Subtitles

Part 1: (November 1989) "Why Bother?" (hint #1).

Part 2: (December 1989) "Take This Test!": behind the scenes with the exam piano; close encounters of the detuned kind (hints #2-3); test order; pitch and high treble instructions (hint #4); scoring tolerances; scoring procedure in a nutshell; aural verification; converting points to scores (hint #5); stability (hint #6); unisons (hint #7); the aural repeat sections; how long does all this take?

Part 3: (January 1990) "Pitch": A440 and us; A440 and temperature; A440 and the tuning exam; tuning fork tips (hints #8-12); the Q & D tuning — prelude to pitch setting; transferring A440 to the piano — the 17th test (hint #13); some common mistakes in pitch transfer; A440 pitch or A440 temperament/midrange? (hint #14); *Journal* references.

Part 4: (February 1990) "Temperament": more on pitch; temperament in the exam; tempering with reality (hints #15-16a); a useful temperament sequence; beyond the temperament — parallel interval bracketing; conclusion; selected *Journal* references.

Part 5: (March 1990) "Midrange": basic midrange tuning checks (hints #16b-17).

Part 6: (May 1990) "Bass": leaving the midrange; the 12ths; the major tonic chords; the double octaves (hint #18); the minor third-major sixth test — workhorse of the bass; the bass in the PTG tuning exam; first pass bass; nitpicking; second pass bass; the outside sixth-inside third test (hint #19); your move; uh-oh! (hints #20-21); taking it home with wider intervals; in conclusion; notes; *Journal* references.

Part 7: (June 1990) "Treble": treble exam specs; first pass treble; goals for treble tuning; instrument tuning the treble; nitpicking the treble; treble octave diagnostics; this is not a test; in conclusion; *Journal* references.

Part 8: (July 1990) "High Treble": the high treble in the exam; a minor correction; high treble tests; (hints #4, 22); in conclusion.

Part 9: (August 1990) "Stability": how to score well on stability (hint #6); what does it mean?; stability factors; the stable condition; getting there; conclusion; *Journal* references.

Part 10: (September 1990) "Unisons": unisons in the exam; make a practice run (hints #7, 23); what does it mean? (hint #24); the unseen artist in recital; conclusion and postscript.

At Large

Action Spread

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Young Chang America
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The piano technician is most likely to encounter a leverage problem within the grand action in the form of a compressed action spread. The action spread is the distance between the wippen flange center and the shank flange center and determines the proper relationship between the two action rails. This dimension varies on several current pianos from 4.406" to 4.484," the difference being .078" or slightly more than 1/16." If the wippen flange rail is constructed of wood, then the screws securing the rail to the action brackets may become loose as the wood of the rail undergoes humidity cycling. Most grand action brackets have a built-in vertical "step" in front (towards the player) of the horizontal wippen rail mounting area. Traditional practice has been to install wooden shims between this portion of the bracket and the forward edge of the wippen rail once the proper spread is established. If this gap is not shimmed and as the piano is played, the rail can be driven forward towards the player resulting in a decrease of the leverage within the wippen (i.e., compressed action spread). As the wippen rail moves toward the shank rail, the length of both wippen lever arms is diminished. This results in the capstan being moved closer to the wippen flange center as is the jack/knuckle contact point.

As mentioned, the loss of leverage resulting from the diminished lever arm lengths requires more force (or weight) at the playing end of the key to lift the hammer.

Actions manufactured with extruded aluminum rails are less prone to compression of the action spread. This is due to the fact that the screws or bolts used to secure the rail to the brackets can be tightened with much more torque without crushing the rail, and also to the higher coefficient of friction present in the metal to metal contact between the rail and the bracket (the coefficient of friction is a numerical representation of the static friction present between two contacting bodies constructed of different or similar materials. If a body is placed on an inclined plane, the friction between the body and the plane will prevent it from sliding down the inclined surface, provided the angle is not too great. There will be a certain angle, however, at which the body will just barely be able to remain stationary, the frictional resistance being very nearly overcome by the tendency of the body to slide down due to gravity. This is termed the angle of repose and the tangent of this angle equals the coefficient of friction. The angle of repose is frequently denoted by the Greek letter Theta. Thus, the coefficient of friction equals the tangent of angle Theta. The total frictional force present between two contacting bodies is the product of the coefficient of friction times the normal, or perpendicular, force forcing the two bodies together. In the case of an action with an aluminum rail, the mounting screws can be tightened with more torque resulting in increased pressure forcing the rail and bracket together). The aluminum rail also does not change dimension due to humidity and the screws will not become loose (it is important to remember that the screws used to mount a wooden rail do not become loose within the tapped holes of the action bracket but instead the rail thickness changes causing the screws to become loose). The wooden action rail is perfectly stable, provided the gaps between it and the action bracket have been properly shimmed.

Before attempting any grand action repair or regulation, the action spread must be checked and corrected if necessary. Any change in the spread after regulation will necessitate that work being performed again. Any change in the spread also changes the function of the lead key weights and renders their placement and number ineffective. Within the factory action assembly process, slight (.030" to .060") discrepancies in the action spread can be overcome with the use of key leads (the weigh-off process) but larger variances encountered in field service should be corrected by establishing the proper relationship between the rails.

When the key of a grand piano is depressed to a point which is halfway through its total travel, the contact point of the wippen heel and capstan screw should be on a line drawn from the wippen flange to the balance rail pin at the bottom of the key. This alignment represents travel of the contact point from a position of half below center to one half above center. The center position of the key should be attained at the half travel point.

To further illustrate this alignment, an arc can be drawn using a radius from the balance point of the key to the wippen/capstan contact point and another drawn from the wippen flange back to the wippen/capstan contact. The two arcs represent the contact of the wippen and capstan and the distance between the two arcs the amount of movement, or sliding action, which occurs at the contact point as the key and action parts move. The half under center to half above center travel allows the contact point to move through its travel arc with a minimum of friction. The correct positioning of the capstan/wippen contact point is determined by the correct action spread, capstan location and wippen rail elevation. If it is necessary to increase the wippen rail elevation (the height of the wippen flange center pin from the keybed), this should also be accomplished

by using wooden shims glued onto the bottom surface of the rail where it sits on the action bracket.

Effect Of Hammer Weight

As we observed in last month's article, the leverage ratio of the grand action is approximately 5:1. An increase of weight at the hammer of one gram will result in an increase in the downweight of at least five grams plus an added quantity of friction. The increased weight of the hammer creates more friction throughout the action part assembly due to the added pressure of the knuckle on the repetition lever, the wippen on the capstan and etc. This increased weight and friction is measurable at the playing end of the key as an increase in the downweight.

During the factory weigh-off procedure, the weight (remember that the effective weight is a product of the actual weight and the leverage) of the hammer and action parts and the frictional components present are counterbalanced to a desired downweight by the use of lead key weights permanently installed in the forward key lever arm. If the weight of the hammer is excessive, or excess friction is present, the number of weights used in the key will also be excessive and will impede the return of the key to the resting position. This is caused by the excess friction within the assembly and the excess weight of the front key lever working against the weight of the hammer which is trying to push the key and action part assembly back to the resting position.

For example, let's say that four key leads are required to weigh off a single note of a grand action to a 52-gram downweight. A check of the upweight gives a reading of 20 grams. Although these numbers fall within an acceptable range, the use of the four leads to obtain these numbers in, for example, the tenor section of an instrument would be an indication that somewhat less than ideal conditions exist within that particular action part assembly. An inspection of the action reveals a slightly tight hammer shank flange center, a poorly shaped and "fuzzy" hammer and a "burred" capstan screw. After repinning the center, filing and shaping the hammer and polishing the capstan screw, the downweight is then found to be 45 grams and the upweight remains about the same at 20 grams. By then removing one of the four key leads, both the downweight and the upweight will increase. To determine how much the removal of a single weight will increase the downweight, multiply the weight, in grams, by the distance of the weight from the balance rail and divide by the length of the front key lever arm. Most 1/2" key leads will average about 18 grams in weight. For example, removing an 18-gram weight which is installed five inches from the balance rail will result in an increase in the downweight of about nine grams (18 grams x five inches divided by 10", (the front key lever arm length), = nine grams). With the downweight now 54 grams with three leads, the upweight would be increased as the hammer does not have to overcome the weight of the fourth lead in returning the key and action parts to the resting position. The reduced friction and reduced inertia of the key/action assembly (because of the lighter hammer and key; the weights at the ends of the leverage train) would now yield a more responsive touch than the 52 gram down/20 gram up achieved initially with the use of four key leads. The upweight is used as a check of the weigh-off and the difference between the downweight and the upweight is an indication of the frictional conditions present. Low friction within the action would normally result in a low downweight and high upweight (for example, 45 down/35 up) and high friction in a high downweight and low upweight (63-plus down/15 up). It is easy to use the example of an extremely tight front rail bushing as an example to the high friction condition where excess force is needed to depress the key and, when released, it stays down; an upweight of zero.

It is possible that a touchweight problem can be traced to excess weight at the hammer and this can be easily corrected. Often, a "heavy touch" complaint will accompany a "dull sound" complaint and the cure to both is to voice the piano "up" (provided the heavy touchweight condition was not being caused by excess friction or by a leverage problem). Any voicing done in this situation would include some filing of the hammers. The removal of dead tension felt from the perimeter of the hammer not only restores a harder and more densely packed surface to the hammer but also makes the hammer lighter (which also reduces friction and inertia). The hammer, now lighter and harder, rebounds from the strings faster. This allows the higher partials of the string to ring, resulting in increased "brilliance" (a softer hammer "clings" to the strings and dampens the higher partials producing a more "mellow" tone). The pianist is now able to produce more sound with less effort and these factors result in the feeling that the action is now lighter. The lower inertia and friction within the key and action part assembly allows for the more efficient transfer of energy from the pianists fingers to the strings.

Most rebuilding technicians will reduce the excess weight of the hammer molding before installing a new set of hammers. When servicing an assembled piano, the hammers should be checked for excess weight if the pianist is complaining that the touch is heavy. In every case where the author has serviced a grand action for a touchweight problem, felt was removed from the hammers and the piano was voiced "up." When this work is performed (along with other rudimentary work to be detailed in our next issue), it will most likely be found that the number of weights already installed in the keys are sufficient (possibly excessive) and the addition of lead is unnecessary.

In our article next month, which will be the last of this series, we will further discuss inertia, key weight placement and a list of items to check when servicing a grand action for a touchweight complaint. ≡

At Large

Fine Tuning A Piano Climate Control System

Robert Mair
Dampp-Chaser Electronics Corporation

The many negative effects of changes in humidity on the piano's pitch and useful life are generally recognized by piano manufacturers, dealers and technicians. After many years of successful use by many technicians, the effectiveness of a piano climate control system in stabilizing the humidity within a piano is also generally recognized.

Not so well understood however, is the extreme sensitivity of the system to the location of the various components with respect to each other in each installation. This knowledge is crucial so that each technician is able to get the most out of the equipment toward achieving tuning stability. This "fine tuning," which qualifies the technician as an expert, and helps justify his fee for making and servicing the installation, is the subject of this report.

The five-part climate control system is designed to produce a constant humidity level within the piano despite considerable variation in the humidity levels that surround the piano. This minimizes the expansion and contraction of the soundboard due to the absorption and desorption of moisture. The net result is less variation in pitch, and less general piano deterioration.

Frequently, a humidity level is desired that is higher or lower than that produced by the particular climate control system and other variables associated with that specific piano or environment. The following statement is provided in the instruction sheet for the Humidistat installation, but this describes only in general terms how to get more or less humidity.

"The amount of feedback the humidistat gets from the humidifier determines the operational range of the system. If you want the system to oper-

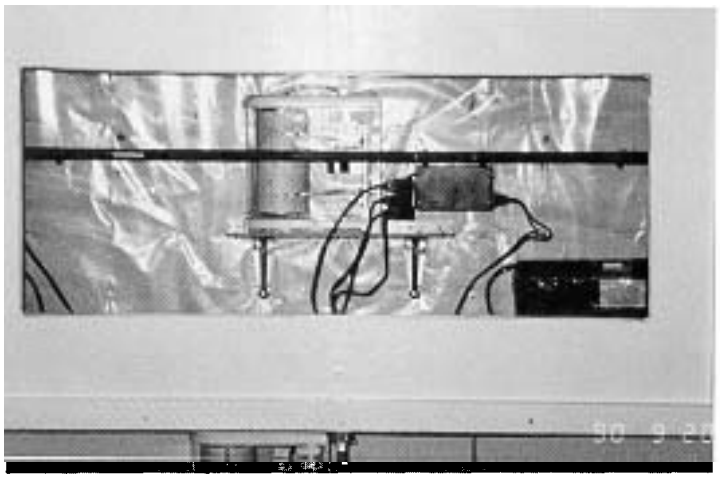
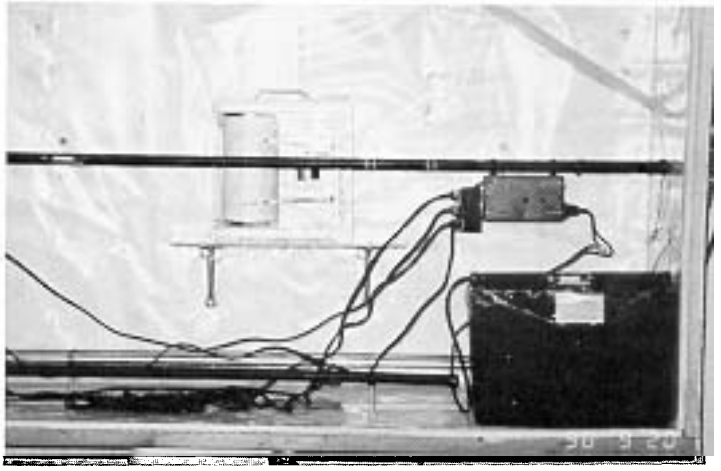


photo 1



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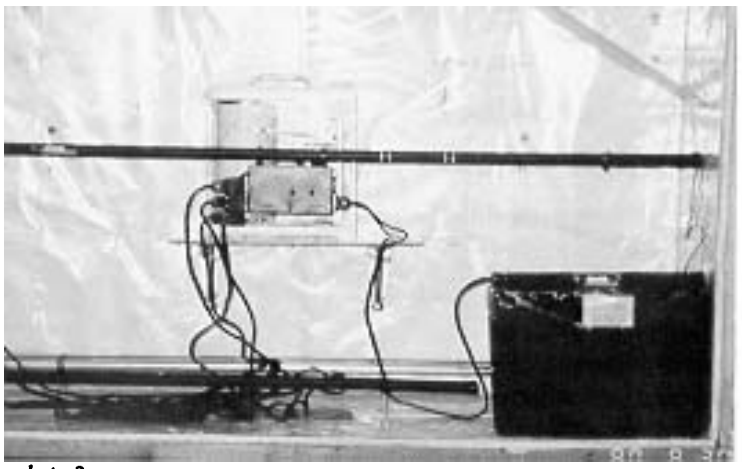

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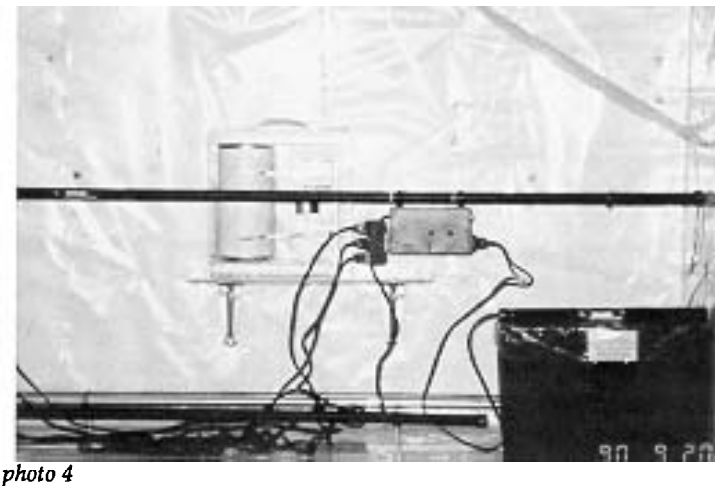


photo 4

ate at a higher humidity level, move the humidistat further away from the humidifier and the moisture distribution shield. Move it closer to produce a dryer environment."

This is more definitively described by the following pictures and the accompanying recording hygrometer chart. These show three positions for the humidistat at different distances from the humidifier. The humidistat receives three different feedbacks and the recording hygrometer indicates there are three distinctly different humidity levels produced.

Picture 1 shows the test vehicle. It is one of the test cases used routinely for testing humidistats. It simulates the lower half of a vertical piano without the plate, strings or trapwork. The recording hygrometer can be noted on the shelf in the background. A standard five-part climate control system has been installed in the case and additional 35 watt dehumidifiers added to improve dehumidification response time.

Picture 2 shows the humidistat receiving maximum feedback. It is directly over the humidifier. The ambient humidity level plus the minute amount of moisture coming from the pads is sufficient to keep the dehumidifier on constantly. The recording hygrometer indicates the humidity level in the case has run from 37% to 39% with a 38% average.

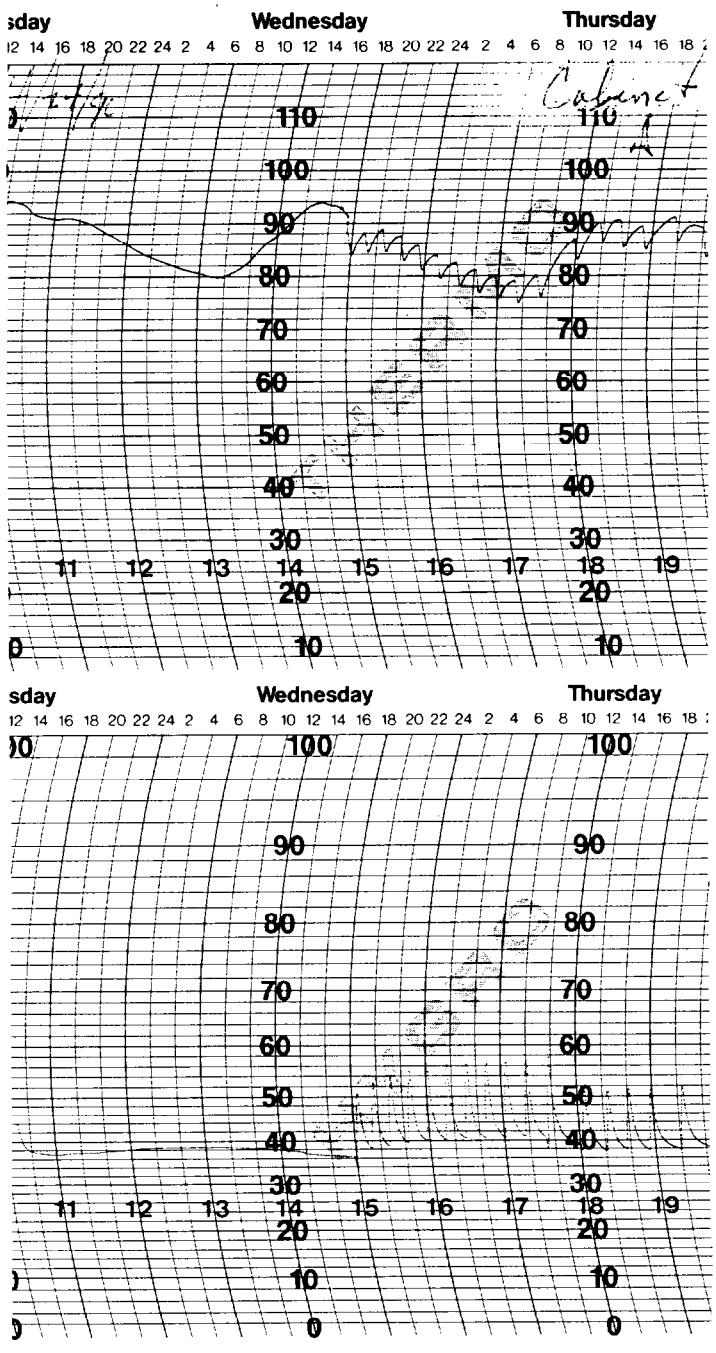
Picture 3 shows the humidistat receiving the least feedback of the three positions. It was 10" from the left edge of the humidifier. Once a settled condition was attained the humidity ran from 40% to 56%. The time weighted average was 44%.

Picture 4 shows the humidistat between the two previous extremes. Its right edge was two inches from the left edge of the humidifier. The low point dropped to 38%. The upper level reached was 52% and the range was 14% as against 16% in the previous situation (picture 3). The time weighted average humidity level in this case was 42%.

Note that the upper portion of the recording hygrometer curve demonstrates overshoot of the system. The humidistat has turned the humidifier off and the dehumidifier on, but it takes time for the humidifier to cool and the dehumidifier to heat. During this transition the system is continuing to produce moisture. Not a great deal of time is spent in this overshoot mode, but it does add several points to the humidity level that are taken away in short order once the dehumidifier becomes hot. The total amount of time spent at the higher levels is sufficiently short that its effect on moisture content is negligible. The time spent in the 47% and lower area of the curve is much greater and produces the systems effect.

Thus the three different humidistat locations provided average humidity levels of: 38%, 44% and 42%.

Similar results can be obtained with a grand piano by employing the same practice. Here however it is more difficult to predict the results because of the added variables created by the open piano bottom. As a matter of fact the following should be added as a caveat to both the grand and vertical installations: Specific exact humidity levels are difficult to attain because of the large number of variables encountered from one situation to the next. Producing a 42% humidity level by placing the humidistat two inches from the humidity depends on many things — ambient humidity, air flow quantity and patterns, amount of dehumidification power, and humidistat calibration to name a few. Going from moist to dry by moving the humidistat toward the humidifier can be predicted, however. This is a fact, and this is how to fine tune the system to attain the desired humidity level. ≡



Thermohygrograph Chart

Economic Affairs

School District Contracts

David J. Barr, RTT
Pittsburgh, PA, Chapter

I have always viewed school district contracts, and some larger church contracts, as the foundation of a solid tuning business. Properly balanced in your schedule and professionally serviced, these contracts can provide a financial base that can be counted upon every year. There is a certain personal security in the knowledge that a base percentage of your work and income is already booked before the new year even begins.

I want to talk about just two general areas of school district contracts here. They are 1. getting the contract, and 2. keeping in the contract. According to the last several *Journals*, the new "Guidelines For Effective Institutional Piano Maintenance" is available from the Home Office which was put together by the College and University Committee. It offers a great deal more specific information than I intend to cover. I am writing this article without the benefit of reading this information, but feel that the information I am offering is timely, beneficial, and proven. I have held several contracts for 15 years and my largest contract for nine years.

Volume tuning requires a good bit of stamina, both mentally and physically. I would suggest that one's tuning time for a solid quality tuning has to be well under an hour in order to make a decent income. I would also suggest, if possible, a minimum of six tunings should be scheduled per trip, particularly if you discount volume contracts. Remember, also, that the last piano tuned on any given day must sound as good as the first or second. Never assume that an elementary teacher won't know the difference. It is possible to lose a lucrative contract over one justifiable complaint. These things being said, let's get down to getting the contract.

One of the most critical steps in acquiring a contract is the first step. That is gathering preliminary information. You need to know at least two people's names. You need to know who will administer the contract, such as the chairperson of the fine arts department, or the head of the music department, or the band or chorus director. You also need to know the director of finance for the district. You should know approximately how many pianos the district owns and how many buildings in which they are housed. You should also know who the most recent tuner has been or still is. If a district is currently satisfied with its tuner, it may be very difficult to win such a contract. If, on the other hand, there is a known problem, a district may be ripe for a change. (Don't push yourself into a position where you must talk down a proven tuner. You won't get the job and you may loose the opportunity for other contracts in the area.)

Once you have gathered all this information, including phone numbers at work, the next step is getting an interview. Let me suggest an orderly method to get in the door. One thing that must be demonstrated to the interviewer is your ability to administer efficiently your part of the contract. You must show yourself to be organized. The first step in this process is to put together a resume. This resume should include your positive accomplishments and acquired skills in the piano service field. It might include prominent customers, concert work, or other contracts. It could include a tuning school, or seminars attended, or classes taught. Now let me say, do not mail out this resume. Take it with you to the interview. The purpose of the resume is primarily to organize your approach for the interview. It makes you much more aware of your own positive attributes. It also provides the framework for a cover letter. I strongly suggest making preliminary phone calls to any district you are trying to acquire. Call the director of finance. Try to find out in this call if there is any interest or not in another technician. If so, the director of finance will suggest calling the administrator of the contract. Follow through. Conclude your conversation with the administrator by suggesting you could mail them a cover letter including information about your credentials as a tuner/technician and as a business person. Suggest that you would also like a chance to meet with them once they have had the opportunity to review the information you are sending them. This will also give you the chance to see some of the pianos and their current conditions, so that you can prepare a more specific final proposal. If there is an opening in the first place, this careful, conservative method should help get you an interview.

The interview itself is critically important. Your presentation of yourself can make or break you. The interviewer will be looking for only a few important details. Do they feel a sense of real confidence that you can do the job? Do they feel at ease with you? Can they work with you? Do they feel that you are reliable and credible? These questions can be worked in your favor by coming in prepared. Your resume will already have helped you focus on your positive attributes as a tuner/technician. Let the interviewer ask questions about you. Be prepared to ask questions about the details of the contract. You need to know exactly how many pianos there are. You need to know how many times per school season they are going to be tuned. You need to know approximately how much money has been in their annual piano maintenance budget. You want to know how many extras are expected. You want

to know how extra work, such as hammer filing, action regulation, etc., is to be bid. You want to know what hours of the day the pianos are available during the school year. You also want to know if the fall tuning round can be done just prior to school opening. There is also the concert/recital schedule. You might need to ask about gaining access to pianos during evening or early morning hours. Obviously, there is a lot of information to be exchanged. I shouldn't have to write that you should arrive at an interview well groomed and clean. It could be said that it would be difficult to overdress by being in a suit, but it would be easy to be underdressed by being too casual. Certainly, you wouldn't go in black tie or formal gown, but don't arrive in jeans and a T-shirt. Equally, try to be balanced between too tense and too relaxed in your posture and attitude. Self-assured is a good word. Be confident, knowing that the interviewer wants to find someone good. You may very well be the answer they are looking for.

You get the contract. What now? Let me share some steps that can help you keep the contract. First, there are the most obvious steps; quality, reliability, and punctuality. These should not need any explanation. Be consistent in your quality, accountable and reliable, and be there when you promise. These are essential in order to keep any contract.

The next step, in order of importance, I would consider is maintaining your visibility. I drop in periodically on the contract administrator, or phone periodically. If I find myself in the particular area with even ten minutes to spare, I drop in to say hello. I also return calls as quickly as possible. Being accessible is an assumed part of these contracts. These steps go a long way after you have held the contract several years.

One of the very next steps in keeping a contract is learning what I call the protocol of your job. All requests need to go through proper channels. If you want to do extra work on a piano, it must go through the proper authority. If a teacher wants an extra tuning, it also has to go through the proper channels. You will find yourself in a position similar to a middle manager in a larger company. Every time I enter a school building, if the office is still open, I report myself in the building to the school secretary. In today's atmosphere of kidnappings and molestings it should be considered more than a mere courtesy. The next person I report to is one of your most important contacts other than the administrator. That person is the custodian. Far too many technicians fail in school district work because they underestimate the importance of the custodians. Most schools now lock every individual classroom for security purposes. You need that custodian to not only unlock those doors, but often to help you locate moved pianos and lost benches. The custodians are responsible for the maintenance of the building on a daily basis. Consider this: if the custodian doesn't do his job for one or two days, it may be necessary to close the school. If you don't do your job, nothing quite that catastrophic would happen. Understand that you are normally interrupting their work routine or lunch break in order to help you. Treat them rudely, and I guarantee they will make your job miserable. Treat them with proper respect, and often times, the right doors will be unlocked ahead of you.

The next step involves dealing with the inevitable problems that come up. If you have held a contract longer than one year, you will have dealt with at least one potentially serious complaint. I believe in attacking problems that I can foresee. If there are humidity control problems due to steam pipes running through classrooms, or classrooms located below ground level, I tell the teacher, the custodian, and the administrator that it will be impossible to actually keep the piano in tune, unless it is done virtually every month. By educating those involved, either a solution, such as humidity control systems, or an understanding between yourself and the primary person playing the piano and the administrator exists. For several years, I carried an inexpensive relative humidity gauge with me, and wrote down the humidity and temperature in the room immediately following the tuning. I was easily able to prove my point by this simple effort. I also document pianos which have sticky actions, etc. and request additional funds to correct the problems prior to any complaints. Then, in their eyes it isn't my fault there is a problem, it is the piano's problem or the piano's environment. One of the most difficult problems you may encounter is a teacher or administrator who uses a different tuner who wants your contract. If the teacher becomes that tuner's ally, you may find yourself in a battle. In that teacher's eyes, you aren't doing as good a job as his or her friend could do. All of a sudden, out of nowhere, you encounter numerous written and vocal complaints. They don't go away. Don't sit back and hope the problem goes away. Attack it at its source. Go back to that piano. Check it. Retune it free, if necessary. Don't if it's as good as it can be. If the complaints exceed the problem, look up the complainer and politely inquire about the problem. Eventually, you will probably hear something like, "My piano at home doesn't have this kind of problem." That's your clue. An outside tuner is critiquing your work second hand. Take the time to show that teacher the extreme conditions that the school piano is exposed to daily and seasonally. Take the time to tell the teacher what your credentials are and why you are perfectly qualified to do the work. Also tell them that the school does not have limitless money to correct every problem they have reported and you have reported. Then report your complete conversation to the contract administrator. Don't be shy about naming the competitor and their ulterior motive. Protect your reputation.

Another related step in keeping the contract is simply taking the opportunities you have to educate your customers. They include everyone from the administrator, to school principals, to teachers, to custodians. Talk to them about humidity and its effects on the soundboard and tuning stability. Talk to them about moving the pianos around all the time. Tell them about regulation, voicing, and tuning technicalities. Talk to them about their kids, too, or their cars, or the local sports team (like the Pittsburgh Pirates!). Part of all of this talk is to establish a working relationship with your customers. Another part is the establishing of your credibility with your customers. This step to keeping your contract isn't much different than normal in-home service.

There are several other important steps to keeping the contract. The next two are interrelated. They are keeping good records and careful, timely, and accurate billings. I keep my service rec-

ords with my computer. I include a complete printout of each piano, its serial number, location, year manufactured, pitch at which it was found, work needed, extra work done (by prior agreement), and the total charge per piano. I also use an extra copy of this printout the next time I do a round of tunings or service. It provides an excellent foundation for locating pianos, comparing seasonal pitch movement, and organizing your schedule. Such a printout also provides the district with a complete record for any insurance purposes they may have. I also use it to make recommendations, such as selling off old pianos, or moving a piano to a more useful position. With this type of record-keeping, it is much easier to be accurate and timely in my billing. Most districts appreciate this sense of detail and timeliness. They can more easily track their piano maintenance budget and know when they have the money remaining in the budget to proceed with periodic maintenance programs.

The final step in the process of keeping the contract that I plan to talk about here is timing your cash flow. According to most modern small business management books, lack of adequate cash flow is the primary reason for most business failures. If you are new to a large contract, you may not be aware that a 30- to 45-day pay period is fairly common. Some districts will take up to 60 days to pay their bills. Few will pay you under 30 days. Do not hesitate to ask up front what the typical pay period might be. You will need to decide, accordingly, what your billing practices will be. If the normal pay period is 45 to 60 days, you may need to bill weekly. If the pay period is 15 to 30 days, you may be comfortable in billing the entire amount upon completion of a tuning cycle. Realize that if you spent two or three, or more, solid weeks tuning only school district work, and then bill the entire amount, without a decent bank account, you could easily end up short on cash as your bills are due. It may be wise to space a number of in-home tunings throughout your flow. Use your common sense in this step to keep your financial balance.

I have tried to outline some practical steps to obtain school district contracts, and, once you have them, some steps to keep them. As in any different type of work, there are pros and cons that I have tried to touch upon. I enjoy this type of work, but I realize it may not be for everyone. If you are in school district work or are moving in that direction, I wish you contracts as fine as I have enjoyed and hope this article is of assistance.

P E T I T I O N S H E E T

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Coming Events

Nov. 1-4, 1990	**Texas State Association** El Paso Airport Hilton, El Paso Contact: Guy Nichols; 901 S. Main; Las Cruces, NM 88005 (505) 524-1465
Nov. 9-10, 1990	**North Carolina State Seminar** Brownstone Hotel, Raleigh, NC Contact: Tom Karl; 20 Mayo Street, Apt. F-6; Raleigh, NC 27603 (919) 832-3149
Jan. 4-5, 1991	**Arizona State Seminar** Tempe, AZ Contact: Gary Miles; 3722 W. Port Royale Lane; Phoenix, AZ 85023 (602) 942-2588
Feb. 22-24, 1991	**California State Convention** Radisson Hotel, Sacramento, CA Contact: Patrick C. Poulson; 15474 Airport Road; Nevada City, CA 95959 (916) 265-6739
March 8-10, 1991	**South Central Regional Spring Seminar** Bentley Hotel, Alexandria, LA Contact: Elizabeth Ward; 1012 Warren Street; Alexandria, LA 71301 (318) 443-0327
March 14-17, 1991	**Pennsylvania State Convention** Allentown Hilton Hotel, Allentown, PA Contact: John J. Zeiner, Jr.; 830 Hanover Avenue; Allentown, PA 18103 (215) 437-1887
March 20-22, 1991	**Pacific Northwest Conference/Convention** Tyee Hotel, Olympia, WA Contact: David J. Stocker; 9324 Littlerock Road SW; Olympia, WA 98502 (206) 786-TUNE
April 25-28, 1991	**New England/Eastern Canada Regional Seminar** Sonesta Hotel, Portland, ME Contact: Joseph Bacica; P.O. Box 6834; Portland, ME 04101 (207) 773-1779
July 13-17, 1991	**34th Annual PTG Convention & Technical Institute** Adams Mark Hotel, Philadelphia, PA Contact: PTG; 4510 Belleview, Suite 100; Kansas City, MO 64111 (816) 753-7747

Auxiliary Exchange

President's Message

I'm not quite sure whether I'm writing in praise of the "two-car" family or bemoaning having to be counted with those who have only one car at their disposal. I am trying to catch the attention of anyone who has encountered similar situations and who may have the perfect solution, other than retiring, for the annoyed RTT and his chauffeur.

Take a lovely, clear, dry, bright, sunny day, for instance, having gotten up before the sun had risen and driven twenty miles to be sixth in line — 7:15 a.m. — at an auto-center which is adjunct to a well-known department store. Then *wait* until 7:30 a.m. for the auto-center to open and *wait* to be written up and *wait* until 11:15 a.m. for the car to be put in the bay, and *wait* until 12:15 p.m. to be on one's way to lunch and a second appointment at 1:30 p.m., having missed the early one. Fortunately, I had called our 10:00 a.m. "piano" the evening before, being of a suspicious nature where auto repairs are concerned. Our tuning "appointees" were amenable to being switched to 4:30 p.m. if things went awry, as by now you know they did.

Since I intend to drive to Philly to help check out the 1991 convention site for our Auxiliary, it seemed the least I could do, for safety's sake, was to have the alignment of the car's wheels corrected. My arms at the steering wheel had been doing a rapid, violent shimmy whenever the speedometer rose a hair over 55 mph; but hours out of our day was a horrendous additional price to pay!

Now I have a fantastic excuse for not having written this or phoned that, or whatever. I did write to our daughter during the wait, and actually got the letter mailed, but the attached department store didn't open until 10:00 a.m., which led to my extracting revenge by only spending $1.50 in the store. We won't mention the cost of alignment, tire-switching, and wheel-balancing!

This diatribe on life's little aggravations may seem like a lot of fuss over nothing, but it is a small example of the many things that go wrong in the life and the times of the tuner, and may help to explain why he or she often arrives home after a long day not always in the best of spirits. Those of us who stay at home or work at another job, as I once did, don't always understand the irritability of our spouses later in the day or evening. This small-scale automotive complaint doesn't even cover the many tense situations, decisions to be made on reluctant, stubborn pianos, discussions held with reluctant and stubborn piano owners, to say nothing of the complexities and problems found with driving from here to there in different types of weather and traffic.

I used to feel superior about making my husband's appointments before I traveled with him. Often, upon answering the phone, he would forget to record many of the items I thought important, and now I find, hurrying to take an appointment, I am beginning to forget to take down the same or similar information. Being harried or in a rush certainly changes the face of things. I wonder if the mechanics were harried or rushed that day?

We all need to take a deep breath and try to understand one another better. This evening I'm going to hurry home, make a quick supper and go off to a church meeting. I wonder whether I'll be able to "keep my cool" this evening? I'm sure you all can and do. Right?

Do we need to be reminded that we all need better appreciation of one another and our special problems, in what can be considered a unique field, where tact and restraint are called for all day in dealing with comparative strangers, where those out in the field are making countless decisions and performing countless delicate operations to provide an often unaware public with the best of service and an art form few even appreciate? Let's all be good, better, best to our hard-working, creative spouses, relations and friends, as long as they are members of PTG!

Arlene M. Paetow

Music No Longer Part Of Daily Life

That headline appeared on a recent Associated Press release from Rochester, New York. The article quoted composer Robert Morris as saying one reason we have trouble understanding and appreciating modern concert music is that few of us participate in music in our daily lives.

Morris went on to say music is becoming a more and more passive experience now that people don't join choirs and play the piano and sing at parties as frequently.

It is interesting to think about these ideas in relation to piano technicians. The technicians are right there helping people participate in music, helping music be part of their daily lives. People who are playing their pianos, people who participate in music at home or church are the ones who are keeping music appreciation alive. And piano technicians are giving them support and assistance.

Sometimes piano technicians underestimate their role in keeping music alive in our society. No bells go off as the technician puts tools back in the bag after a job well done. The stock market doesn't climb and dive based on what piano technicians are doing in the field.

Nevertheless, the music people make in their homes and churches and at their parties sounds better because of the technicians who care for their pianos. In addition, the technician is there talking to all those musical folks and weaving a network among them.

The technicians go from music-maker to music-maker and on to new music-makers the following day. Those who are close to technicians may be talking to those music-makers on the phone. This gives many of us and almost all the

NOTICE

Due to an oversight, the election of the PTGA Nominating Committee did not take place at the Council meeting in Dallas at the 1990 PTG Convention. An attempt was made to correct this oversight at the Installation Luncheon. However, since this was not in compliance with PTGA Bylaws, no slate of officers will be offered, and nominations will be accepted from the floor at the Council meeting in Philadelphia at the 1991 34th Annual PTG Convention.

Arlene Paetow, PTGA President

Part Of The PTG Family

We tend to think of the Guild as being more than simply a trade association. We wouldn't bother to have an Auxiliary for something that was *just* a business group with an insurance plan available. So when the Guild confers its highest award each summer we get excited about it. This year Ben McKlveen received that award and Janet Blees wrote a poem in his honor:

1990 Golden Hammer Award Recipient's Saga, Or: Ode To Ben

Most hearty Congratulations to Ben!
You showed us that you're outstanding
— AGAIN!
As this year's Golden Hammer winner,
You've proven once more that you're no beginner.

With leadership first, in A.S.P.T.,
And later on, teaching for our P.T.G.,
You took pearls of wisdom you had to impart,
And shared them with many, you generous heart!

With humor and grace your classes are taught;
With info, and anecdotes rare, they are fraught.
A look of delight is on everyone's face
You're quite entertaining! (And quite a Nut Case!)

Known for your jumpsuits, and wealth of good stories,
You flirt with the ladies, and sing of their glories.
Your colorful ambience, so debonair,
Makes you stand out in a crowd, anywhere.

As Institute Chairman, with Ernie and Dick,
You've given us programs so smooth and so slick,
Both "upright and grand," without clash or clamor —
For this you deserve the award, "Golden Hammer."

Locally, too, your colleagues all know
How you've served that chapter, and helped it to grow.
Of your great contributions, my story's now told:
You've certainly earned that "Hammer of Gold!"

Janet Blees , July 29, 1990

technicians a wonderful opportunity and, in fact, a responsibility of sorts to support the people who keep music alive. How important can you get!?

A Seasonal Note

Thanksgiving is a wonderful holiday. You don't have to buy presents. You don't do a lot of decorating or have pre-Thanksgiving parties and post-Thanksgiving depression. It brings a handy Friday holiday along with it which many folks are able to use to good advantage. There isn't a lot of guilt involved in Thanksgiving because the celebrating is positive... no atonement, just celebration.

Fortunately, most of us also have lots to be thankful for. Over the years I have heard many of you express thanks that a person you are close to has found a career in piano technology. Many technicians seem to be drawn to their work. Most of them have spent a lot of time becoming good technicians, and they love what they do. Most of them stick with this profession quite willingly even though it is a general trend in society for people to change jobs and even careers on a regular basis.

As we pause to give thanks for the things that are right about our lives this Thanksgiving, let us remember how grateful we are that technicians we know make their living doing something they love. Special thanks go to you, too, if you are reading this because you care about a piano technician. Everybody appreciates having supporters. Happy Thanksgiving!

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Classified advertising rates are 35 cents per word with a $7.50 minimum. Full payment must accompany each insertion request. Closing date for ads is six weeks prior to the month of publication.

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For Sale

PIANOS FOR SALE — Spinets, consoles, studios, grands. One or a carload. Excellent brand names. As is or rebuilt. Lowest possible prices. **Owen Piano Wholesalers; 2152 W. Washington Boulevard; Los Angeles, CA 90018 telephones (213) 732-0103 (818) 883-9643**

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TOOLS THAT WORK! Made for technicians by a technician, to save you time and make you money. Key bushing cauls of high-density polyethylene — the ideal material and most economical on the market, in all common sizes. Also key clamps, gram weight sets, grand hammer hanging jig, soundboard cleaners & more. Order by phone — immediate shipping. For brochure, call or write **Bill Spurlock; 3574 Cantelow Road; Vacaville, CA 95688 (707) 448-4792.**

SIGHT-O-TUNER SERVICE: Repairs, calibration & modifications. Fast, reliable service. **Richard J. Weinberger; 18818 Grandview Drive; Sun City West, AZ 85375 (602) 854-4116**

FOR SALE: Steinway "A" #202055, Louis XV, handpainted composer portraits above legs, painted in London. Beautiful one-of-a-kind piece, good restorable condition — $18,000. Also Steinway "A" #75884, barrel leg — $5,600, excellent restorable condition. Others available. **Richmond Piano; 3133 West Cary Street; Richmond, VA 23221. (804) 358-1929**

RESTORATION OF CARVED WORK, turnings, inlays, and marquetry, including repair of existing work and reproduction of missing pieces. **Edwin Teale; 19125 S.W. Kinnaman Road; Aloha, OR 97007 (503)642-4287**

52 PIANO KEYS RECOVERED — .050-$60.00; .060-$70.00; .075 with fronts—$85.00. New sharps—$35.00. Keys rebushed, felt—$75.00; leather — $95. Return freight paid with prepaid order. **Charles Wilson; 1841 Kit Carson; Dyersburg,TENN, 38024. (901) 285-2516**

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STEINWAY GRAND LOCK ESCUTCHEONS. New duplicates of original part. Available in raw brass for polishing or custom plating @ $10 each, or preplated in polished nickel slightly higher. VISA/MC **Richard Anderson, RTT (708) 464-4500.**

BUMPER STICKER. "Piano Tuners Still Make House Calls." Two-color with graphics. Send $5.00 to **B.S.E.; P.O. Box 93297; Rochester, NY 14692.** NY residents add sales tax. MC/VISA orders, **1-716-473-0300**

HANDCRAFTED SOUNDBOARDS by NICK GRAVAGNE. Ready-to-install crowned boards or semi-complete. Your choice. Ordering and installation instructions $15.00. **20 Pine Ridge; Sandia Park, NM 87047. (505) 281-1504.**

PIANO SERVICE BUSINESS FOR SALE. 18 years in beautiful San Francisco Bay Area. 80% of clients in affluent Marin County. Call or write for details: **Richard Kane, RTT; P.O. Box 1384; San Raphael, CA 94915 (415) 388-3310 PST**

"COMPONENT DOWNBEARING GAUGES (bubble type) give readings in degrees (string angle) and thousandths of an inch (dimension). Available at supply houses. **Box 3247; Ashland, OR 97520."**

VICTOR A. BENVENUTO VIDEO TAPES, PIANO TUNING AURAL/ ELECTRONIC — **$175.** The most accurate approach to fine tuning. KEY MAKING, $124.75. GRAND REBUILDING (two tapes), $225.75. Preparation, pinblock replacement, damper installation, restringing. GRAND REGULATING, $175.75. SOUNDBOARD REPLACEMENT, $94.75. Ship old board — new board comes to you ready for installation. Please specify VHS or Beta. All prices include shipping. **THE PIANO SHOPPE; INC.; 6825 GERMANTOWN AVENUE; PHILADELPHIA, PA 19119 (215) 438-7038**

AUBREY WILLIS SCHOOL — Our home study course in piano tuning, repair and regulating has been used by hundreds to learn the basics. Accredited member National Home Study Council. No cost information. **Aubrey Willis School; 2633 East Indian School Road, Suite 401; Phoenix, AZ 85016 (602) 955-4600**

SANDERSON ACCU-TUNERS from Authorized distributor. Tuning lever note switch for Accu-Tuner: $35/coiled cord, $30/straight cord. Consignment sale of used Accu-Tuners and Sight-O-Tuners for new Accu-Tuner customers. Call for details. **Rick Baldassin (801) 292-4441, (801) 374-2887.**

THE GUIDE **$10.** The Piano Technicians Guide. A job-time study and work guide. Revised and printed to fit a pocket. **Newton J. Hunt, Piano Tuner-Technician; 74 Tunison Road; New Brunswick, NJ 08901. (201) 932-6686**

"LET'S TUNE UP" Hardback 1st Edition only $17.50 per copy. Paperback 2nd Edition *still available* per copy $17.50 *No immediate plans* for another printing. Make checks payable to ***John W. Travis; 8012 Carroll Avenue; Takoma Park, MD 20912.***

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NEW SOUNDBOARDS MADE FOR YOU. Ship old board. New board comes to you ready for installation. Send for instruction on: **Victor Video Tapes; $94.75. Victor A. Benvenuto; 6825 Germantown Avenue; Philadelphia, PA 19119. (215) 438-7038**

NEW! Korg MT1200 MULTI-Temperament Tuner. $275 postpaid (list $360). Hears 8 octaves: A0-C8. Shows note, octave, frequency by LED; pitch by meter (one cent increments). Plays 4 octaves (can shift pitch): 392.0-466.2 Hz. **Korg AT12 Tuner.** $155 postpaid (list $225). Hears 7 octaves. Shows pitch, octaves, note, plays 4 octaves (soft/loud). Calibrate A=430-450 Hz. Both have case, batteries, adaptor, one lb., warranty. **Song of the Sea; 47 West Street; Bar Harbor, ME 04609. (207) 288-5653**

PLATING-PIANO HARDWARE. Stripping, buffing, and NICKEL plating, with hinges up to 60" lengths $125-$225/set, depending on quantity of parts included. Enclose packing list indicating number of screws with description and quantity of items. REFERENCES AVAILABLE. COD delivery in 2-3 weeks. A.R.O.M. throughout the U.S.A.! We will serve you with quality & reliability. **CRAFTECH ELECTROPLATING; #46R Endicott Street; Norwood, MA 02062. (617) 769-0071 days, (617) 469-9143 evenings.**

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SUCCESSFUL PIANO RENTAL STORE FOR SALE. Established 1964, in growing sunbelt city of 550,000. Asking $50,000 down, bank references (or equal), and description of collateral security for balance. Possession April 1, 1991 prox. Ideal for tuner-spouse combination. Send information to: **PIANO STORE AD, P.O. Box 75304; Albuquerque, NM 87120-4725.** Principals only.

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Wanted

WANTED: STEINWAY AND MASON HAMLIN GRANDS. All sizes and cabinet styles. **Ask for Karen Bean at (415) 676-3355. Piano Finders; P.O. Box 23814; Pleasant Hill, CA 94523.**

UP TO $1000.00 FINDER'S FEE will be paid for successful purchase of a Mason and Hamlin Ex-Player. I have mechanism to install. **Please call collect (317) 259-4307 or evenings (317) 849-1469. Jim Brady; 4609 Cranbrook Drive; Indianapolis, IN 46250.**

WANTED!! DEAD OR ALIVE: "Steinway Uprights." Call collect, **Ben Knauer (818) 343-7744.**

WANTED; Halbisch manufactured piano. Build around 1880-1920 in Louisville, KY. Any condition. If you have one for sale or know the whereabouts of one call collect at **(502) 426-4471.**

WANTED — large numbers of pianos. Will pay cash and remove immediately. No large uprights except Steinways, please. **(716) 774-0044 Grand Island, NY**

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TUNER/TECHNICIAN: Experienced. To work in piano shop. Full-time, excellent benefits. Salary commensurate with experience. **Pickle Piano; 104 West Lake Street; Bloomingdale, IL 60108 (708) 894-2992**

WANT TO BUY. Steinway duo-art player grand. Will pay finders fee. Especially want carved (fancy) case. Call Collect, **Jim Brady; (317) 259-4307; 2725 E. 56th Street; Indianapolis, IN 46220.**

Date:	November 1, 1990
To:	Piano Technicians Guild Members
From:	Bruce A. Stevens, President
Subject:	Steinway Factory Technical Announcement

RE: NOTIFICATION OF NEW IMPROVED STEINWAY HAMMERS

Steinway & Sons is proud to announce the development of new improved hammers, which are now available for immediate delivery - with a guaranteed 48 hour turnaround from our Parts Service Department.

Over the last six months, the Steinway factory has achieved significant technical advances both in "state of the art" manufacturing equipment and in the process of hammermaking. The technical improvements summarized below have resulted in a harder more consistent hammer, which will provide overall better sound quality to our valued customers.

Summary Listing of Hammer Process Improvements:

ITEM:	Replacement of hand pressing operation with precisely controllable "state of the art" hydraulically powered prebending and gluing presses.
Benefits:	Total and precise regulation of pressure, depth stops, temperature and cycle time. Greater control of hammer properties including size, shape, and hardness. Improved consistency set to set. Increased output.
ITEM:	New hammerfelt cutting machine to cut the felt sheet into strips for individual hammer sets. The sheet is positioned for cutting with accurately drilled tooling holes and the two sides of the strip are cut simultaneously against a template to insure accuracy.
Benefits:	Improved hammerfelt strip symmetry and consistency of finished hammers.
ITEM:	New hammerfelt reinforcing solution and application method (new dipping system). New colorless solution wicks more evenly with less swelling. New application method (patent pending) insures that each strip receives the same quantity of solution as all others.
Benefits:	More consistent penetration of dipping solution provides a firmer hammer shoulder and improved resistance to humidity effects.

If you have any questions regarding the hammer quality improvements described please call the Steinway & Sons Service Department for more detailed information. Attn: Michael Mohr, Director, Service Administration, (718) 204-3119. To order new Steinway hammers or other Steinway parts please call Glorie Lefrak at (718) 204-3150.

STEINWAY & SONS

Tech Gazette

Yamaha Piano Service November, 1990

Grand Action Regulation in 37 Steps... One at a Time

STEP 1: TIGHTEN ACTION SCREWS

The overall musical performance of a grand piano depends on having a solid foundation for the action. Both the piano's touch and tone are affected by the solidity of the base for the hammers. Tightening the action screws so that all parts are securely fastened will:

- Provide stability for the regulation—insuring that the piano can be played without action parts becoming misaligned.
- Eliminate unnecessary noise caused by loose action parts.
- Assure that various parts are in proper relationship to each other. Especially important is the distance relationship between the center pin of the whippen flange and that of the hammer flange. Since the two parts are on different rails, and the whippen flange is usually adjustable, it is imperative that the screws be tight to maintain this relationship precisely.

HOW TIGHT SHOULD THE SCREWS BE?

Let your skill, attentiveness and past experience guide you. The screws should be very snug, but not too tight. You certainly don't need anything other than the strength of your own wrists.

WHICH SCREWS NEED TO BE TIGHTENED?

A piano has two distinct classes of screws, each with its own separate purpose.

First, there are *regulating screws*. These do not bind parts together but rather adjust or regulate the timing and limits of the hinged units as they are put in motion by the piano keys.

Second, there are *binding screws*. These serve to hold parts together in proper position and are the ones to tighten. Specifically as relates to action regulation, locate and tighten the screws:

- In the brackets
- In the hammer rail
- In the whippen rail
- Under the key frame

Next, tighten those screws in the damper rail which are left inside the piano action cavity after the action was removed. Just center the screwdriver blade in the slot and turn clockwise until very snug. Do not overtighten.

CORRECTING STRIPPED THREADS

You're already well aware of how to correct stripped threads in wooden action rails. But there are pianos with rails made other than of wood. The incidence of stripped threads in, for example, metal alloy action rails is very low. Tests conducted on the metal used by Yamaha in its rails show that it is ten times stronger than wood for resisting stripping of threads.

If, however, you do encounter a stripped thread in a metal action rail, just replace the original screw with one larger in diameter. The screws are self-tapping, and the only tools required are properly sharpened screwdrivers in various sizes.

A FEW WORDS ABOUT SCREWDRIVERS

It remains a mystery why companies that make screwdrivers continue to taper the blades. You will find that proper sharpening, by hollow grinding the blade, produces somewhat parallel sides and a much more useful tool.

A FEW FINAL PRECAUTIONS

When tightening the screws:

- Do not let attached parts shift or move out of position when twisting the screws.
- Do not apply so much force that the wood is compressed or the thread is stripped.
- Do not let the screwdriver slip and mar the screwhead or scratch the surrounding area.
- When tightening the screws on the underside of the key frame, it is necessary to stand the action on the edge of the back rail. If this is done with the action on the key bed, the drop screws are in position to possibly scratch the front beam (the finished beam in front of the running pins). Do not allow this to happen.

Having taken the time to tighten the action screws, you should now have an action that is stable, noise-free and with parts secured in proper relationship to each other. This important, yet commonly overlooked, step assures a solid foundation for other steps in grand action regulation to be covered in later issues.

Yamaha will participate in

DISKLAVIER™ SERVICE SEMINARS:
November 5-9
December 3-7

PTG SEMINARS
November 2-4 Texas State

YAMAHA®

NOVEMBER **UPDATE** 1990

Published Monthly For Members Of The Piano Technicians Guild, Inc.

'91 Convention Theme Set

The theme of PTG's 1991 convention in Philadelphia, PA, will be "Keystone Of Better Piano Service." The theme and other convention arrangements were set during a planning meeting at the convention headquarters hotel, the Adam's Mark Philadelphia, October 8. The planning committee was composed of Nolan Zeringue, PTG President; Sharla Kistler, PTG Treasurer; Jim Birch, Northeast RVP; Ernie Juhn, Institute Committee Chairman; Arlene Paetow, PTG Auxiliary President ; Ruth Brown, Host Committee Chair; and Larry Goldsmith and Sandy Essary of the Home Office Staff.

Fees will be $120 for members before June 10, and $140 after that date. Non-member fees will be $170 and $190. Spouse program fees will be $45 and $55 for Auxiliary members, and $55 and $65 for non-members.

The 1991 Technical Institute, to be directed by Ernie Juhn, will include tutoring on any subject for $60 per 1 1/2-hour session. Here's a summary of the 1991 convention schedule:

July 12	Council
July 13	Council
	Exhibits open
	Opening Assembly
July 14	Technical Institute
	Exhibits
July 15	Technical Institute
	Exhibits
	Awards Banquet
July 16	Technical Institute
	Exhibits
July 17	Technical Institute
	Closing Luncheon

Foundation To Offer Scholarship

The Piano Technicians Guild Foundation will offer a scholarship for one Associate member of the Guild to attend the PTG's 1991 Convention in Philadelphia. The $180 scholarship, which was approved by the Foundation Board of Directors during a recent meeting in Cleveland, OH, will cover member registration fees and the cost of one of the RTT examinations.

The scholarship is designed to assist an Associate member who is in the process of becoming a Registered Tuner-Technician, and to encourage Associate members to upgrade their status to RTT. The winner will be required to take either the tuning or technical examination during the convention.

Scholarship application forms will be available from chapter presidents. The president must also sign the application before it is returned to the Home Office, indicating that the applicant is a member in good standing, an active chapter member, and has completed the Guild written examination with a goal of becoming an RTT. The application deadline is January 31, 1991.

The PTG Survey:
The Composition Of Your Clientele

Carl D. Root
Chairman, Economic Affairs Committee

How many customers do you have in your card file? How many tunings does each customer generate per year? A technician may claim to have a thousand names or more on file, but what we really need to know is how many *active* customers there are. A rule of thumb is that there should be about the same number of clients as tunings per year. The theory is that many are annual customers, and the six-month tunings offset those who are tuned infrequently.

How does this rule of thumb stand up to actual data? The PTG survey reveals that among members who tune, 46 percent of their tunings were for clients on an annual schedule. The second-largest category is a bit of a surprise. Don't many tuners have a low turnover? Some insist that they are not accepting new customers. It turns out that 24 percent of the average technician's tunings are for first-time callers. These two categories, annual and first-time, already account for more than two-thirds of all tunings.

We all have some pianos that require service three or more times per year, but most of us have very few of these customers. Eight percent is the average figure for tunings produced per

Continued on next page

year. (Statistical error is an important factor when the percent response to a question is quite low, as is the case with three-plus tunings. This is compounded by the fact that few technicians keep records on the composition of their clientele.)

We don't have figures for infrequent tunings or six-month customers, but you can see by adding three-times-per-year customers that about three-quarters of your tuning load is now accounted for. Even if we arbitrarily decide that pianos tuned infrequently account for only five percent of your work, that leaves you with less than 20 percent which are tuned twice a year. That doesn't mean that 20 percent of your piano owners are on a six-month schedule. Remember they each provide two tunings per year, so half as many customers are needed to fill that slot.

We are left with a surprising statistic. The six-month customer, supposedly the backbone of a piano technician's business and the focus of manufacturers' recommendations, comprises only about 10 percent of a typical clientele.

These numbers include all tuners. What happens to the statistics if we limit our sample to established tuners who tuned 500 or more pianos last year? The figures change only slightly. Annual tunings increase from 46 percent to 47 percent, first-time calls decrease from 24 percent to 21 percent and three-plus times a year increase from eight percent to nine percent.

To test the rule of thumb, let's find out how many clients are needed to produce 500 tunings according to the breakdown described above? (Infrequent tunings are arbitrarily set at three percent to keep six-months tunings at 20 percent.)

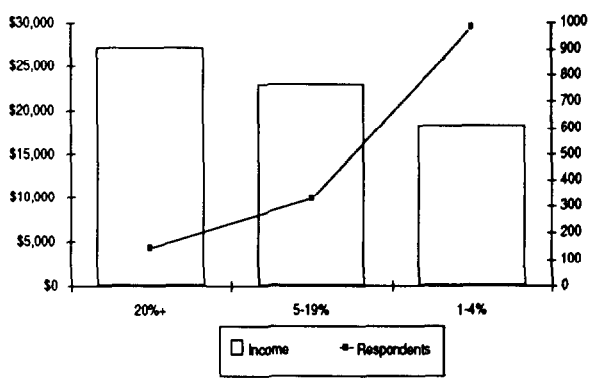
	Customers	*Tunings*	
First-time	105	21%	105
Infrequent	45	3%	15
Annual	235	47%	235
Six-month	50	20%	100
Three-plus	15	9%	45
Totals	450	100%	500

The rule of thumb is valid (See Graph #1). In this example, 450 clients will produce 500 tunings.

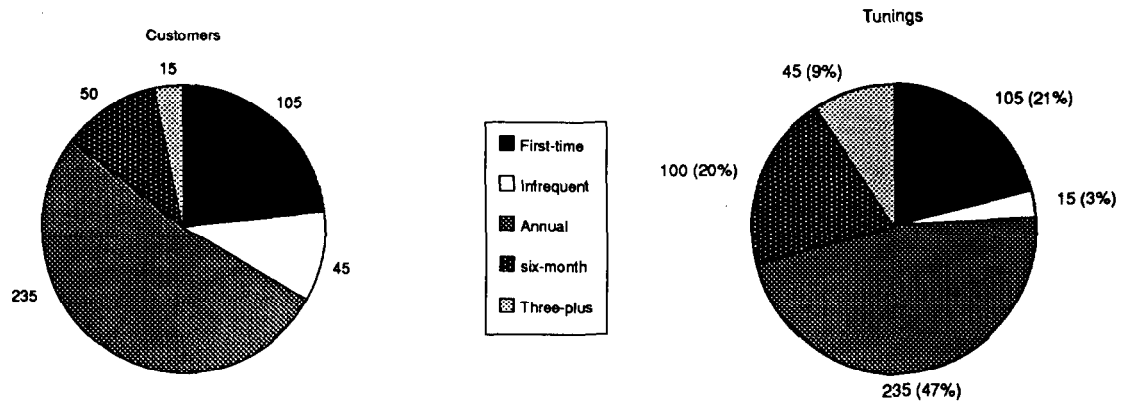
Should we expect a technician with more three-plus tunings to have a higher income? Remember that the average income for all respondents was $21,300 (See Graph 2).

3+ Tunings	*Income*	*Respondents*
20%	$27,100	146
5-19%	23,000	328
1-4%	18,200	978

Graph 2: Income / 3+ Tunings



Graph 1: Clients Needed To Produce 500 Tunings



The Composition of Your Clientele

No mystery here. With more experience comes more of all kinds of clients, including the more desirable ones that produce more tuning fees per year. I suspected that discounts might erode earnings in this group, but the income provided by that segment is too small to have much effect. This is a good example of a strong correlation where a cause-and-effect relationship is unlikely. Notice also that the vast majority of members have only one to four percent three-plus tunings, where the average figure is eight percent. This suggests that most technicians may have 12 percent six-month customers rather than 10 percent.

Every technician ought to know about the role of first-time calls in his or her business. I've added years' experience and number of tunings as variables. Here's the data (See Graph 3):

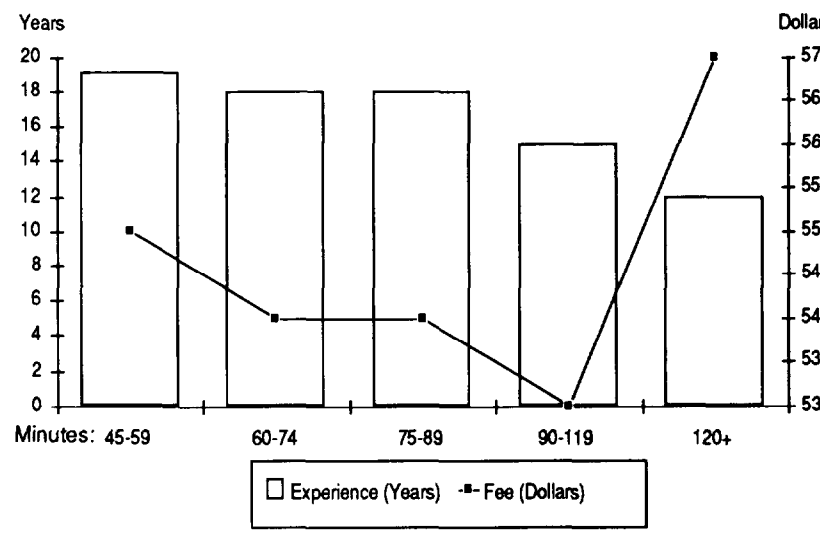
Percent Of Tunings	*Income*	*Tunings*	*Years*
1-4%	$19,600	366	23
5-9%	23,600	487	21
10-19%	22,000	515	19
20-39%	20,400	455	16
40+%	14,700	316	11

The category with the lowest income and the highest percent of new customers has the fewest tunings and noticeably less experience. The technician we wrote about last month who asked about the time it takes to get established in his business should take note. At the other end of the spectrum are technicians with the most experience who accept very few new customers. Their income and number of tunings is also lower than average, no doubt because of the number of retirees and second-career part-time technicians

It is clear that some new clients are needed to compensate for normal attrition, but they should be kept to a minimum.

Graph 3: First-Time Calls

Graph 4: Time / Experience / Fee



The group with the largest income had less than 10 percent first-time calls. I recently reviewed my tunings for 1988. I checked first-time calls to see how many continued with service into 1989 and 1990. I hoped for a 50/50 split, but found, to my delight, that two out of three continued as regular customers. Some of them produced only another appointment or two before dropping out, but the rate of conversion to regular status was still better than 50 percent.

New clients are important to me, even though they only represent 12 percent of my workload each year. They make up for people who drop out, but also are important because they improve the quality of my clientele. Quality means different things to different technicians. I am interested in getting rid of

Continued on next page

poorly designed mini-pianos and old Trasch & Junkett uprights and replacing them with fine musical instruments. But I am not willing to reduce my profitability. Travel time and scheduling are the primary determining factors. A spinet 15 minutes away stays in my clientele. A grand 45 minutes away that can be tuned only on alternate Thursdays gets referred to another technician. Most professionals should make every effort to seek work that is close to home and accessible if an increase in profitability is important.

Another policy that will improve the quality and profitability of your clientele is to favor pianos that don't take a long time to service. Our survey shows a curious relationship between time required to service a piano, years of experience, and average service fee (See Graph 4).

Time	*Experience*	*Fee*
45-59	19	55
60-74	18	54
75-89	18	54
90-119	15	53
120+	12	57

First, we notice that the technicians with the most experience take less time to service a piano. What's curious is that those who take the least amount of time charge slightly more than those in the average time range.

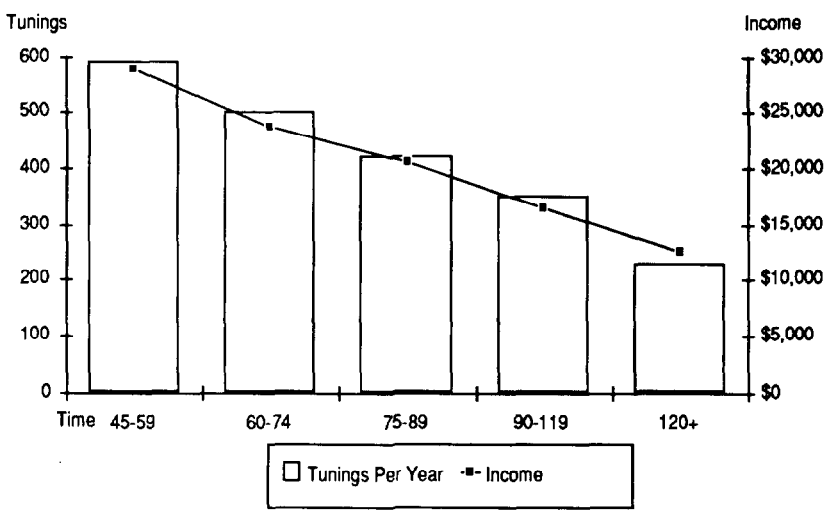
In strict business terms, this makes no sense. We must recognize that as far as the basic fee is concerned, many technicians are not being compensated for additional time spent. It may be that some really need more than an hour and a half just to do an acceptable tuning. On the other hand, some may be doing more than just a standard tuning as a matter of course. Some customers may appreciate the higher level of performance, some may not. If this extra work is being done without charging for the additional time, it must be assumed that some technicians do some work for their own satisfaction rather than as an integral part of earning a living. Taking more time would seem to have little effect on income, since the average technician works less than 40 hours per week. You simply end up with a longer workday. However, the data does in fact show a clear correlation between time spent on a service call and annual income.

Tuning Time	*Income*	*Tunings Per Year*
45-59	$28,800	590
60-74	23,700	500
75-89	20,500	420
90-119	16,500	350
120+	12,500	230

Keep in mind that the first chart shows that technicians who take less time also have more experience and are likely to be more established. Be careful not to assume a cause-and-effect relationship between tuning time and income. It is obvious that the number of tunings per day is limited by how long it takes you to service each one. The question is, do you have the additional clients and interest to do the additional work?

There is a way to reduce time spent without compromising quality of results. It involves making a distinction between putting a piano in tune and keeping it in tune. I'm trying to put together a clientele that will permit me to keep the piano in tune because, first, it is technically satisfying, and, second, it takes less time and is therefore more profitable. The way to do this is to decrease the number of customers who have their pianos tuned infrequently. An effort must be made to keep annual customers on a strict schedule. Nearly all first-time and infrequent calls must be reduced to a minimum. Rates and/or standards can be adjusted to compensate for the condition of the piano. (See October 1989 *Journal*, "First Time Calls.") Six-month and three-plus per year

Graph 5:
Tuning Time / Income / Tunings Per Year



The Composition Of Your Clientele

customers are valuable as long as customers' budgets are consistent with their performance requirements.

For most homes, once a year really is enough from a maintenance standpoint. The piano will be close enough to pitch to do a good job without spending an inordinant amount of time. Installing climate-control systems is as much for your benefit as theirs in this regard. Twice-a-year tunings are really for the benefit of people who play and listen rather than for the benefit of the piano.

Although six-month customers are important, we must recognize that annual customers are the backbone of a piano service business. Unfortunately, 12 months becomes 15 months, becomes a year-and-a-half and two winters, and now we're spending the additional time to put it in tune instead of keeping it in tune. There's only one way to minimize the negative affects of this scenario. You must take the responsibility for contacting the customer. You can pre-schedule, mail reminder cards, or get on the telephone. Why, then, does the PTG survey clearly show that the most common scheduling method is waiting for the phone to ring? I would like to think that those who wait for phone calls work for musicians who are so discriminating that their ears will alert them before any extra tuning work becomes necessary. But the survey also shows that most of us tune more for children taking lessons than for any other group. Children and their parents are not known for being conscientious about timely piano care.

Do technicians who make phone calls earn more money than those who wait? Do technicians who service pianos played by students fare better than those who work for more accomplished musicians? I'll crunch some numbers and report my findings next month.

A survey such as the one we completed in April of last year is best used as a constructive influence on action to be taken by the organization and its members. My interpretation of the data that pertains to frequency of tunings leads me to the following conclusions:

1. Manufacturers should recognize that in making recommendations for service, annual tunings are sufficient from a maintenance standpoint after the first year for many customers, even though the piano may not sound its best during all four seasons.

PTG's popular pamphlet "How Often Should My Piano Be Tuned" quotes representatives of piano manufacturers that contain their recommendations for service. These quotes are occasionally updated when pamphlets are reprinted. A trend in recent years has been to tone down the insistence that pianos be tuned seasonally. Every six months is common now. It would be better still to avoid recommending a specific time interval.

2. All personal recommendations and promotional literature, in the form of pamphlets designed by PTG or by individual technicians, should recognize the validity of annual tunings as part of an array of scheduling choices available to the piano owner.

We all know that how often a piano is tuned depends on climate, heating and cooling habits, age and type of piano, budget, and the player's musical requirements. Each technician should take a personal interest in the needs of the customer and his piano rather than succumbing to a simplistic one-size-fits-all approach. The result will be a higher measure of credibility which is essential to the growth of any business.

'91 Dues Invoices Ready For Mailing

The Guild's annual dues collection process will begin in November, when invoices for 1991 dues will be mailed to the organization's more than 3,700 members.

Many members' invoices also will include their 1991 chapter dues. A total of 87 chapters have arranged to have their dues collected by the Home Office in amounts ranging from $8 to $60.

Dues will officially be due January 1. They will be delinquent on January 31, and those whose dues remain unpaid on March 4 will be dropped from the membership roster. Those who are prevented by hardship or other special circumstances from renewing their memberships must contact their Regional Vice President to make special arrangements before the drop date — no late payments will be allowed without prior arrangements. Registered Tuner-Technicians who allow their memberships to lapse may be required to retake part or all of the Guild examinations before rejoining the organization in their former classification.

Members should pay close attention to their addresses and telephone numbers printed on the dues invoice. Unless corrected, that information will be used to compile the Guild's 1991 membership directory, scheduled for publication in April.

The Soundboard

To The Soundboard:

I would like to congratulate all of the people who put together the questionnaire in our recent poll. I'm convinced that questionnaires that are filled out and returned are the very best way to get very important information that we can all use. It seems to me the single most important area of information in our profession is an area that has been ignored for far too long, and may at last be allowed to take its rightful place. Of course, I am talking about the business of piano technology. After nearly 40 years as a practicing piano technician, I am well aware of at least my ignorance as to what is being done in our profession. I would like to know to what level our profession is supporting its practitioners and what we have to look to in the future. I hope this is just the first of at least a few more information-gathering efforts.

Johnny Blackwell

Focus On Ethics: Selling The Guild

Francis Hollingsworth
Code Of Ethics
Committee Chairman

Imagine, if you will, another tuner has been contacted to give an estimate on a potential client's piano and you know that he or she does poor work. Do you:

a. keep your mouth shut (the idea being that if you can't say anything nice, don't say anything at all),
b. warn the potential customer that they might be throwing their money away, or
c. tell the potential customer about PTG, explain the Code of Ethics and explain that you are a craftsman member and can be expected to follow through on your work, supply references, show previously completed work, etc.

If we reread the Code of Ethics, we know we can't run the other tuner down nor warn the customer that they will be getting inferior work. Still, we should keep the best interest of the client in mind and be fair in what we say. This is a wonderful opportunity to "sell" the Piano Technicians Guild. In a tactful way, we can inform the potential customer that there is an organization dedicated to the betterment of the piano service industry and that as a member, we have the opportunity to go to classes at conventions and seminars that cover every phase of piano work — from tuning, to repairing and even to complete rebuilding. We can meet and talk with representatives of all the major manufacturers and can keep abreast of all the latest technology.

Of course, not all PTG members themselves are aboveboard. There are always a few rotten apples in every barrel. We know that, but the emphasis has to be on the positive. If we are to educate the customer, we tell them of the ideals and the opportunities that are available to every member. For the most part, we don't have to have any qualms about "selling" the Guild.

I realize that this kind of situation calls upon our ability as a salesperson, but it is a skill that we need to sharpen and keep in our tool kits.

In Memory...

John Hutton

John Edward Hutton passed away on Saturday, September 9, 1990, in Fort Worth, Texas. John had been ill for nearly two years and received experimental treatments in San Antonio for his illness. He was born on June 13, 1926, in Nacogdoches, Texas.

A retired R.N. from the Air Force, including time served in Vietnam, John spent 20 years helping other veterans recover from their wounds and ills. After the Air Force he went on staff at Harris Methodist Hospital in Fort Worth. There he became a member of the Association of Operating Room Nurses.

John had a great tenor voice which he displayed for the Dallas Chapter at our Annual Christmas Party. His love for music led him to become an excellent piano tuner/technician. He joined the Dallas Chapter in 1977, and later became an RTT.

John was well-loved and highly respected in the Dallas area. He was very active in the Boy Scouts and as Elder in the Rockwood Christian Church in Fort Worth. He will surely be missed.

John is survived by his wife Gerry and four children John, Jr., Aaron Lee, Cheryle, and Thomas.

Membership Status

Northeast Region	840
Northeast RTTs	538
Southeast Region	602
Southeast RTTs	392
South Central Region	329
South Central RTTs	214
Central East Region	644
Central East RTTs	403
Central West Region	374
Central West RTTs	253
Western Region	617
Western RTTs	402
Pacific NW Region	351
Pacific NW RTTs	236
Total Membership	3684
Total RTTs	2438

Progress Is Not Made By Contented People

Webb Phillips, Chairman, Chapter Management and Achievement Committee

Every year at the international convention I'm asked by several persons, "How can our chapter win an award?" My reply is, "It's easy — just send in all your CMAC reports." This is partially true, but there is a little more to it.

First let me explain how the committee is set up, how it functions, and some if its charges. There is a regional director for each of the seven regions, and a national chairman to direct and coordinate all the efforts at the national level. (Your directors are: Northeast-Ruth Brown; Southeast-Lewis Spivey; Central East-Bob Russell, Jr.; South Central-Leonard Childs; Central West-Paul Olsen; Pacific Northwest-Mike Reiter; Western-Patty Biasca. The national chairman is Webb Phillips. I think the most significant change we have made in the last four years is allowing each regional director to be not only responsible to the chair but mainly to their own region. Instead of the chairperson alone being recognized as the stimulator, motivator, collector of material, and decision maker, much of this now is the responsibility of the regional directors.

The first responsibility of a regional director is to communicate with all chapters in his or her region, to educe a response in any manner possible — preferably via the monthly CMAC report. If your area has specific problems, your regional director can customize his or her basic assignments to fit your area's needs.

If there is a stagnant chapter in your area, it is the RD's job to try to communicate with interested persons in that chapter, contact the RVP, and try to find out what is needed to stimulate some kind of activity, and interest in our CMAC reports. The RD should be in constant contact with he RVP regarding strengths and weaknesses of a chapter.

For officers — we try to encourage them to use the *new chapter management manual* and the *new business meeting films* for guidance, not only in conducting meetings, but in projects regarding all Guild planning. These will help any officer who is presiding over a business meeting, or in any other capacity.

We encourage officers and the entire board to study all three of our new chapter business meeting films. These are extremely educational, for both the business and technical aspects.

What ideally follows from this is more research and support in the form of ideas for better business and technical meetings.

Using the CMAC reports and newsletters, each RD will summarize the reporting chapters' activities at the end of the year. They report their selection to the chairman. The chairman then measures each RD's report against all the other regions to determine who the recipients of the various awards will be. The awards presentations are what we all look forward to at our annual international banquet.

These awards are earned by chapters which have developed a positive attitude, and have built a great belief in themselves and their capabilities. They receive recognition for their good work, leadership, goal setting and upgrading their level of achievement.

Needless to say, none of this could easily be determined without the CMAC reports or newsletters. Participation with your regional CMAC director and chairman is the only way for your chapter to win an award.

Your regional director and your RVP, working together, will surely stimulate more and greater chapter efforts for expanded goals and chapter recognition. Your current regional director is a person with a feeling of responsibility and importance, an enthused significant figure who is a valuable asset to this organization. Our current regional directors play a much bigger role than having their names appear on a list. I feel we have an outstanding committee of outstanding people with mutual interests, dedicated to the growth and improvement of the Guild. Please help them to help you.

To determine the winners of the various awards we do have a master score card with a value on the various bits of information collected from your monthly CMAC reports; however, each RD can set up his or her own system or deviate from the norm to customize for their own area's needs. I will give you an example of the value in points of some of the items on your CMAC report.

Projects — large and small — each project evaluated on: First, its worth to the Guild, then its value to the chapter. *Any number of points could be given.*

- Did you have a meeting? — 1 point.
- New CTE — 5 points.
- CTE in training — 2 points (credit for one year only).
- Did you have a technical? — 1 point.
- Did you give a detailed report on the person giving the presentation? — 20 points.
- New applicants — 3 points.
- The names and addresses that can be added to home office and regional mailing lists of guests and non-members — 5 points each.

This is only a sample of the scoring items and points credited for each. We are in need of any and all kinds of information that

CMAC...

you can give us. We need to know about your public relations, teacher programs, photos, who has a new shop, your social functions, anything you are proud of and would like to share with the rest of the Guild. Anything you share means points, and in some cases there will be many more points than you see listed above.

Because there is getting to be a great deal more competition every year we had to add another category this year. The number of members in each is as follows: *Bantam,* 1-11; *Small,* 12-18; *Medium,* 19-25; *Intermediate,* 26-41; *Large,* 42+. There are four awards for each category — 20 awards in all.

Our charge is to develop good programs to help chapter officers gain management ideas. This challenge is not an easy task, but it is exciting and gratifying to know there are many chapters in our organization which respond. These people are the backbone of the Guild.

Virtually everyone has far more potential for achievement than they ever use. When they use their hidden resources, the result can be amazing. We all develop a more positive attitude as we build greater belief in ourselves, in our own capabilities and our own potential for achievement.

I'm sure that 99 percent of our members are aware that many, many of us spend several hours each week to help all reach various Guild goals, but it sorta knocks the hell out of the enthusiasm to hear of someone who can't take a few minutes a month to fill out a report to help us to help them.

Our greatest asset is each other and our ability to rise to the occasion, and share all information. Remember, progress is not made by idle or contented people. But with team effort, there is no end.

RTT Receives Fullbright Grant

Ramon Ramirez, RTT, piano technician at the University of Texas in Austin, has received a Fullbright grant to present lectures in Mexico from August 1990 through March 1991, probably the first time a Fullbright Lecturing Award has been given to a piano technician.

Ramirez will present seminars and master classes in piano technology and tuning at the Institute of Fine Arts in Mexico City and at other Mexican institutions yet to be determined.

A member of the Austin Chapter, Ramirez came to his present position at UT Austin in 1987 after having held similar positions at the University of Illinois and Ithaca College in New York.

He received a master of music degree in piano technology from Michigan State University, the first to receive that degree from an American university.

Dates & Deadlines

November 16, 1990
Deadline for committee reports for January Board meeting.

November 17, 1990
RTT Tuning and Technical Exams. Austin Chapter Test Center. Application deadline: October 17, 1990. Contact: Bill Cory; 711 Landon Lane; Austin, TX 78705 (512) 472-9358

November 24 - 25, 1990
RTT Tuning and Technical Examinations. Area Examining Board. Gladsboro College, Gladsboro, NJ Contact: Hilbert Felton (215) 482-2000

December 17, 1990
RTT Tuning and Technical Exams. Skyline College, San Bruno, CA. Application deadline: November 17, 1990. Contact: Neil Panton, 5 Cedar Court, Menlow Park, CA 95025 (415) 854-8038

January 1, 1991
1991 dues due.

January 5-6, 1991
RTT Tuning and Technical Exams. Southern California Area Examining Board. Contact: Carl Lieberman (213) 392-2771

RTT Tuning and Technical Exams. Puget Sound Chapter Test Center, Tacoma, WA; Application deadline January 10, 1991. Contact: Wayne Matley, 2502 Harmony Lane, Enumclaw, WA 98022 (206) 825-6921

January 31, 1991
1991 dues delinquent.

February 1, 1998
Deadline for nominations for 1991-92 officers due to Nominating Committee Chair.
Deadline for amendments proposed for 1991 Council to be submitted to Bylaws Committee Chair.

March 1, 1991
Deadline for committee reports for inclusion in 1991 Council agenda book.

March 4, 1991
Members delinquent on 1991 dues to be dropped from roster.

March 25, 1991
RTT Tuning and Technical Exams. Skyline College, San Bruno, CA. Application deadline: February 25, 1991. Contact: Neil Panton, 5 Cedar Court, Menlow Park, CA 95025 (415) 854-8038

April 6, 1991
RTT Tuning and Technical Exams. Austin Chapter Test Center. Application deadline: March 6, 1991. Contact: Bill Cory; 711 Landon Lane; Austin, TX 78705 (512) 472-9358

July 13-17, 1991
34th International PTG Convention & Technical Institute. Philadelphia, PA, Contact: Home Office; 4510 Belleview, Suite 100; Kansas City, MO 64111 (816) 753-7747

October 11-13, 1991
RTT Tuning and Technical Exams. Texas State Seminar — Austin Chapter Test Center. Application deadline: September 11, 1991. Contact: Bill Cory, 711 Landon Lane; Austin, TX 78705 (512) 472-9358.