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Journal
Official Publication of the Piano Technicians Guild

August 1999 Vol. 42 • #8

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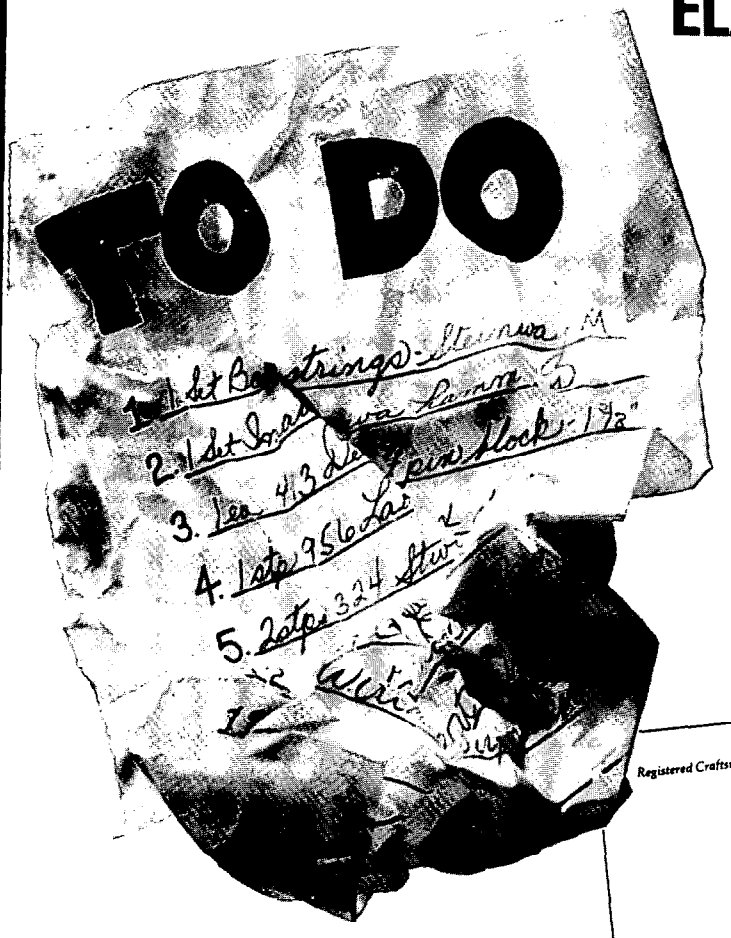

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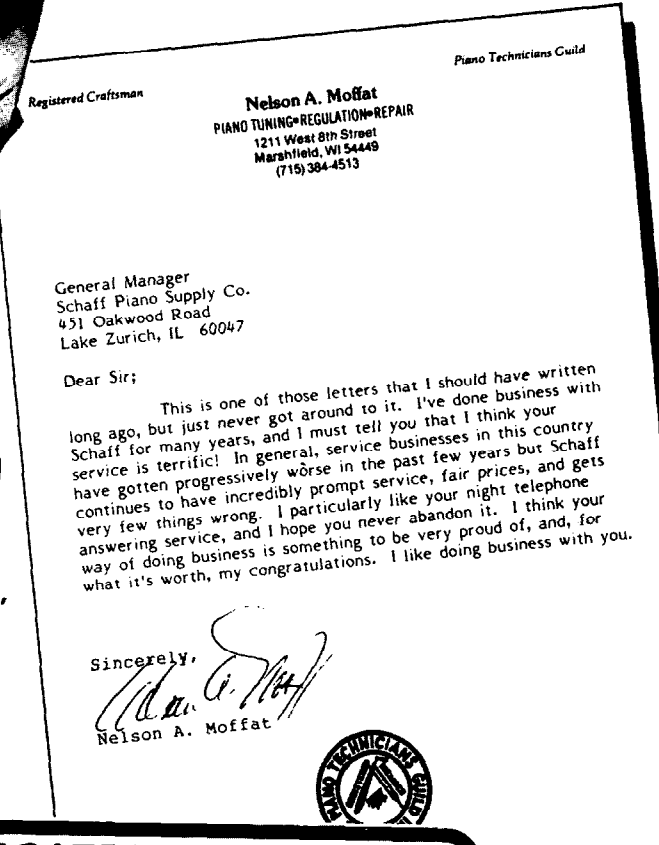

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Pris Chansky, CAE
Interim Publisher/Executive Director

Steve Brady, RPT
Editor

Jeannie Grassi, RPT
Assistant Editor

Robert Hohf, RPT
Ed Sutton, RPT
Contributing Editors

Susan Kline, RPT
Anita Sullivan
Feature Writers

Joe Zeman
Director of Communications

Sandy Roady
Director of Member Services

Catherine Wilane
Director of Finance and Administration

Midge Sheldon
Assistant to the Executive Director
Advertising/Merchandising Coordinator

Aaron Lasley
Office Assistant

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

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GUEST EDITORIAL

The More Things Change ...

By Jeannie Grassi, Journal Assistant Editor

Passing into the next millennium seems be making almost everyone a bit more reflective these days. While tuning I muse about the changes and trends our craft has seen recently. William Braid White would be amused at how technicians have progressed through the decades. I like to think of him smiling down upon us as we go through our paces.

Piano technicians are confronted daily with a unique blend of contrasts between old and new. In this fast-paced world, where a computer can become out-dated in a matter of months, we specialize in a machine, if you will, whose basic design hasn't changed a great deal in over one hundred years. While the instrument itself has matured to the point where only minor differences are made from year to year, the rest of life around it is growing and changing at a rapid pace.

Our new tools, for the most part, are variations on old themes. Many new techniques have evolved as a result of progress and innovations in other industries. And then there are those changes that could not have been imagined even 25 years ago.

We have become aware of just how hard this work can be on our bodies and how to better maintain them ... our most precious of tools. In the past few years I have learned about key pounders to protect my fingers and hands, and seat cushions to correct my posture and spare my back. My tuning hammer is ergonomically correct. I have attended classes and read articles that demonstrate the Alexander Technique and Trigger Point self-massage. I dutifully carry and sometimes even remember to use my custom made earplugs.

And we're not only turned on, but we're plugged in. Thanks to Al Sanderson, RPT, and Dean Reyburn, RPT, electronic tuning devices are no longer scoffed at nor considered crutches for amateurs. They commonly are used and accepted as highly professional options in all arenas of our work. In fact, many now wonder why their colleagues have not yet taken the plunge.

The average piano technician now understands well what this age of information technology offers. One can even log on to the Internet from a client's home and receive immediate assistance from other technicians while on the job. If we want, we can be reached at any time, day or night, with our pagers, cell phones and fax machines. Many use computerized maps and navigation systems in their cars to help them travel from job to job. My guess is that William B. White never even owned a car.

So, are we more skilled today? Are we better technicians? The potential is certainly there, but there is no substitute for experience. I enjoy taking advantage of many of the new resources, techniques and tools to help me execute my daily tasks, but if I chose not to I could still do a respectable job. The challenge is to remember the basics and not to be more in love with the tool than the task at hand. And let us not forget that what was old soon may be new again. I feel more prepared and equipped than ever to step into the next millennium with my ETD of choice to try tuning Thomas Young's Representative Well Temperament of 1799.

Happy New Century!

Please submit tuning and technical articles, queries, tips, etc., to me:
Steve Brady*, Journal *Editor
205 McGraw Street • Seattle, WA 98109
Fax: 1-206-285-7610
E-Mail: sbrady@u.washington.edu

FEATURES

COLUMNS & COMMENTS

DEPARTMENTS

IN ADDITION

COVER ART

This month's cover features the art of LA Chapter member Marlene Marston. This mixed-media sculpture features piano parts and a gourd on a stained wood base.

PIANO TECHNICIANS
Journal
Volume 42 • Number 8 • August 1999

Build Your Tuning Business!

"Now that I'm installing Dampp-Chaser Systems, I'm tuning twice the number of pianos."

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Technicians who install Dampp-Chaser Piano Climate Control Systems report that their tuning business is thriving. By advocating climate control, they feel they are doing the best thing, the Right Thing, for the piano. In return, their clients reward them with referrals and greater receptivity to other improvements.

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The circle of shared information about the System then widens. Your client tells her fellow choir members and symphony volunteers about the positive change in her piano (music lovers associate with *other* music lovers). Her confidence in you is greater than ever. She freely recommends you to others, knowing you will do a great job for them, too. And, as you protect more pianos with climate control, *the referrals multiply!*

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Each time your client notices the System's light panel under the keyboard, she is conscious that the System is working, constantly protecting her piano. When the blinking light calls for more water in the humidifier, she reaches for the watering can immediately. As she pours in fresh water, she is aware the System has used, to good purpose, the water she added two weeks ago. Each time she "waters the piano," the emotional bond with the piano is strengthened.

Meanwhile, her regard for you as a professional has grown. In her eyes, you have taken her average-sounding piano (or highly unstable piano) and converted it to an instrument of which she is proud, an instrument that is dependable and predictable.

More than ever, she trusts and respects your opinion. So, when you suggest ways you can make even more improvements through regulation and voicing, she is more receptive to your proposal. (A written proposal is more effective. For a proposal example, buy the PTG's *Business Resource Manual,* $20.)

Remember, the Climate Control System you recommended did just what you said it would do. When you explain how voicing or regulation will make a noticeable improvement to the sound and yield greater enjoyment, *she will follow your advice again!*

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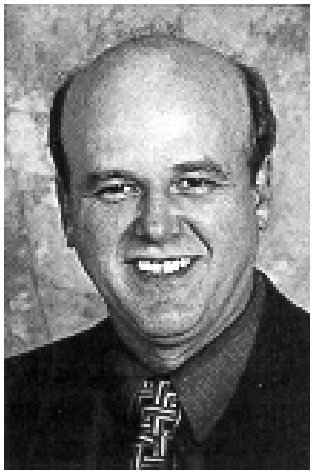
Falling Short in Planning Doesn't Mean Failure

In August of last year this column was concerned with the concept of planning – how it can be used to further our goals and how it has been employed in the various facets of PTG, from our annual convention and institute to the chapter meetings we enjoy regularly. This August I'd like to look at what happens when the plan doesn't work out the way we had expected.

After all, planning is a concept that is alternately scorned for its imperfection, derided for its direction and ridiculed for its presumptuousness; it often is seen as a waste of time and money. While I don't subscribe to the idea that planning is an exercise in futility, I recognize that we also must be prepared for the many times that our plans fall short of our goals. For those times a more fundamental set of skills must be relied upon, those involving the survival instincts we often take for granted.



David P. Durben, RPT
PTG President

When a plan fails, how do you react? What is the first question you ask yourself? Do you try to figure out how this happened, or why it happened? Do you try to find a way to protect yourself from the consequences of the failure? Do you (heaven forbid!) try to place blame for the failure? I think we can all recall times when we might have reacted with one of those questions.

But a truly effective reaction to a failed plan is to look beyond the failure and try to see what the outcome is going to be. Very often we will find that the outcome of the failure is the fruition of the goal, or perhaps something that is completely unexpected, but nonetheless a good thing. Some of the most pleasant surprises of my life have come from the failure of a plan! Does that mean that I shouldn't plan? I don't think so.

I believe that the reaction to failure is one of the true measures of the quality of a person. It takes us to our most fundamental talents, to our most basic training and tests the mettle of those things. This is where we find out what our limits are, and where we need more tempering to bring us up to our best form. When a plan fails, we need to look for the benefits of the failure and capitalize on those. It is precisely at such a time that we can least afford to look for excuses, because it seems that at such a time we have only a brief moment wherein we might act positively. After that the moment is gone forever and the failure has become the end result, with no possibility for redemption.

So I believe that we needn't fear the failure of a plan, but that we should always be ready for it, because it will provide us with some of the greatest opportunities of our lives.

David P. Durben

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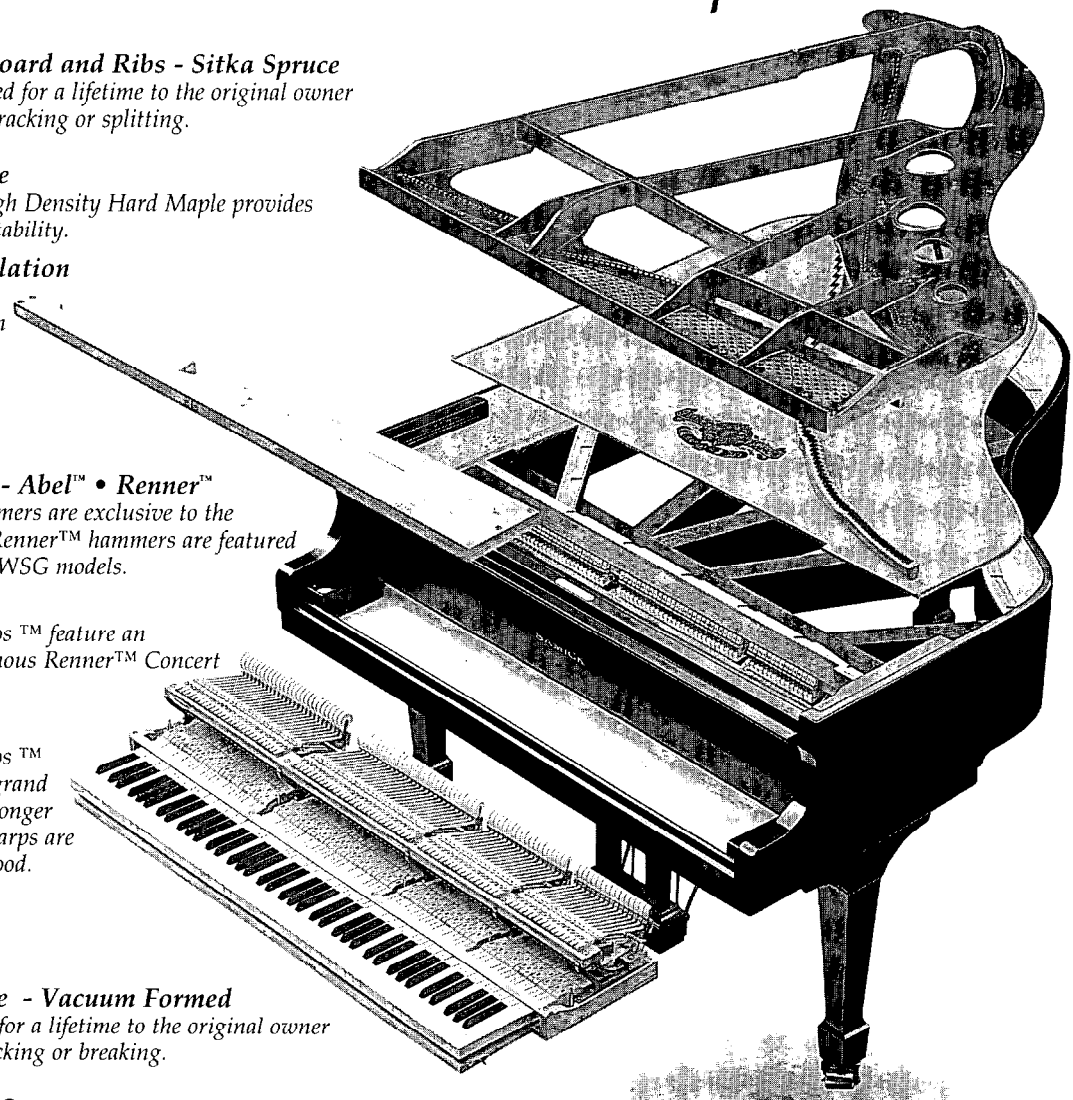

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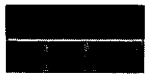

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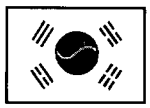

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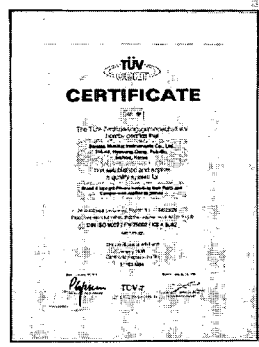

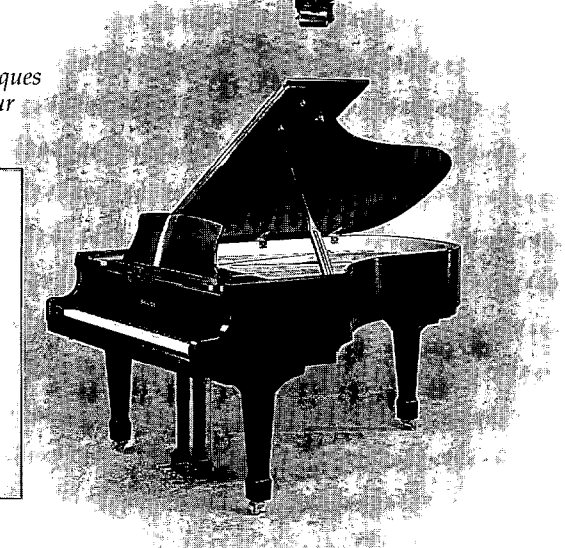

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Letters to the Editor

Response to Virgil Smith's Temperament Festival Commentary

I enjoyed reading and was flattered by RPT Virgil Smith's account *(Journal,* May '99*)* of the Temperament Festival at the Providence Convention. I would like to add my own comments.

Whenever there is a comparison between temperaments at an event like this, there always are some factors that make the comparison somewhat invalid. In this case, I know that both Virgil and I had more time to spend tuning our pianos than the other contestants did. I've heard many people comment that a perfect temperament is not nearly as important as good, solid unisons, properly stretched octaves and good stability overall. If this is true, it is perhaps one reason for the outcome.

Karen Hudson Brown, RPT, is a very accomplished and sensitive pianist and she certainly was able to adapt her playing to display my temperament and tuning at its very best. I also had a very fine instrument to work with, a new Walter grand. Did I have the best piano, too? Perhaps I did. Indeed, Karen and others remarked that they couldn't decide whether it was the Walter grand that they liked so much or the way it was tuned. It was a nice question to have.

Personally, I liked RPT Paul Bailey's Meantone Temperament the best. I believe that of all the temperaments displayed, it was the most interesting, the most innovative and had the richest array of tone color. I personally would have preferred to tune the 1/7 Comma Meantone Temperament (7MT) which would have had a similar sound. However, I knew what kind of audience I would be tuning for, one that is used to hearing Equal Temperament (ET).

Virgil's comments reflect what I expected the inevitable perception to be: something that "doesn't work." This was in spite of the fact that Paul's temperament and the 7MT currently are used as universal temperaments, that is, a temperament that is useful and applicable to all kinds of music the way only ET often is thought to be.

Most contemporary piano technicians have been rigorously trained to perceive and execute ET and ET only. They have been taught and have disciplined themselves to perceive the quality of sound that ET produces as being the only way that the modern piano sounds correct. The Meantone Temperaments produce sounds that are distinctly different from what most of us are used to hearing. They are effectively an acquired taste.

You don't win a competition by doing something you already know the judges won't like. Paul had the option of presenting something that might have been more palatable. He showed the greatest courage by adhering to what he knew was his most advanced state of the art.

Although Paul's tuning skills are extraordinary, he wasn't able to be there to tune his own piano. It had to be quickly done by someone else. Karen fell in love with the new 7/8 keyboard and did very well, but she could not have been as fully at ease with it as she was with a standard keyboard. His tuning deserves to be heard again at a future convention under the best of circumstances.

The temperament I used was not really a "modified ET" as Virgil called it. In my view, you cannot modify or alter a state of equality, you can only make it unequal. It is only equal if it is truly equal, otherwise it is not equal. There is a name for those kinds of temperaments that are only very slightly unequal, they are called Quasi-Equal Temperaments ("quasi" means almost).

His idea is that when you play chromatic 3rds, 4ths and 5ths of my scheme, (which is not really a valid way of demonstrating or analyzing the temperament), it sounds like a kind of wobbly or somewhat inaccurate ET. But it is not one of those Quasi-ET's even if it might sound like it to some. Numerically, however, it never does stray very far from theoretical ET and this is done on purpose. That makes it compatible with ET but does not make it a modified ET.

The Equal Beating Victorian Temperament (EBVT) is a modified version of the Rameau-Rousseau Hall 18th-century Modified-Meantone Temperament. I believe that the reason my EBVT is so well accepted is that it has been specifically designed not to go beyond the bounds of the variances from ET that we typically experience today. This leeway that many ET practitioners say is acceptable is very neatly and tightly focused into a temperament which abides by historical precedents, logic and values. Although it varies in only subtle ways from ET, it manages to evoke very clear distinctions from key to key. The piano sounds as if it has been tuned "normally," but it has a kind of tonal magic that is achieved only through a very carefully calculated process.

More than just sound has been lost by the standardized use of ET during the past century. People have lost the concept of Cycle of 5ths-based tonality. As they do today, composers of the past used the keyboard when composing. The way the keyboard was typically tuned directly influenced their idea of what a particular key should sound like.

If the ET advocates are right, there is no particular reason to play or write anything in any particular key. All keys must have the same properties so that anything may be played in any key. They do not understand the logic that a harmonious kind of sound should only come from the top of the cycle of 5ths and a brilliant or highly energized sound should only come from the bottom.

It seems to me that musicians and composers somehow still follow the Cycle of 5ths tonal logic but many piano technicians seem to think that all kinds of tonality should be possible in all keys. The truth is that ET literally homogenizes both extremes into one neutral sound that cannot express anything else but that neutrality.

Virgil seems to think that there is still some kind of "color" or distinction between the keys of an Equal Temperament when there clearly is none. Both Helmholtz and Dr. William Braid White were very specific and purposeful about the advantage ET has in providing no distinction whatsoever. Braid White says in his book, *Piano Tuning and Allied Arts,* when describing what he calls, "Mean-Tone" (presumably 1/4 Syntonic Comma Meantone): "Within its limits, it is really lovely, especially in giving as it does, so definite a character to each and every tonality, characters merged by the ET into one."

Virgil is not the only person who says that ET still has color. I have heard and read several other people's beliefs on this. It simply cannot be both ways. There is either ET with one major and one minor tonality or there is anything and everything but ET which does have tonal distinctions.

The Chicago Chapter is planning to have another Tune-off in September 1999. I have been honored, flattered and exalted, to say the least, to be the one asked to challenge

Continued on Page 16

Tips, Tools & Techniques

Mutes and Muting

To make your wedge mutes stay in place better, run them across a belt sander, perpendicular to the direction of the belt. The roughened surface bites the string well and they stay in place much better.

To mute those pesky strings alongside grand plate struts, try hooking two mute handles together as in Figure 1, and insert them both between the strut and the nearest strings on each side. I haven't found a piano I couldn't use this on.

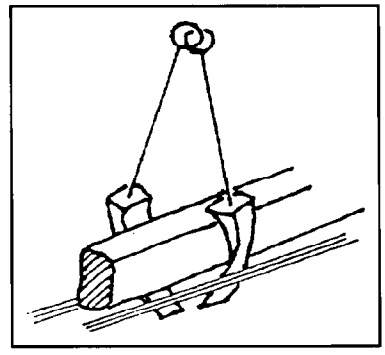

Figure 1

Do you want to carry only one felt strip for the whole piano? Cut a wide piece down the middle and leave it connected on one end giving you one long strip as shown in Figure 2. Or, cut it off-center so that it forms a wide strip for the bass/temperament and a narrow strip for everything above that.

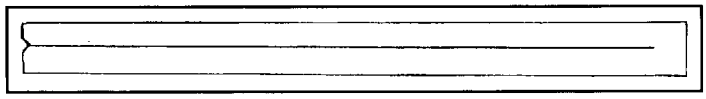

Figure 2

Handles on wedge mutes can be a nuisance at times when the weight of the handle causes the wedge to flop over or come out entirely. Try shortening the wire on a few wedges, as in Figure 3, and see how handy they are. Try rounding the tops of the wedges on a belt sander, making them more comfortable to use. Trim the front corners, too.

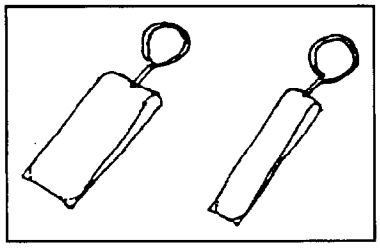

Figure 3

Using correction fluid (also known as White Out™) paint about 1/4 inch of the tips on both sides of all your rubber mutes. Then, in low light conditions it is much easier to insert the mute in the proper place.

— Michael J. Kurta, RPT

reprinted from Capstans Courageous, *newsletter of the Northern Michigan Chapter*

Take a Tip and Sharpen Your Axe

There is a well-known saying that goes something like: "It's never a waste of time to stop to sharpen your axe." The point is that having a good and right tool for the job is worth the effort and money.

This truth was brought home to me recently. Over the last months I found myself more frustrated with tuning. It seemed such trouble setting strings and then they weren't holding well. My tuning time was lengthening and my work mood deteriorating. Finally, during one tuning I happened to be staring at my tuning lever head and noticed motion where there should not be any. I discovered that over time the threads on the extension shaft of my hammer had worn and the head was slopping around like a flag in the breeze! No wonder I couldn't control the pins. A new extension shaft brought much needed relief.

I also discovered something I wish someone had told me long ago. When ordering the new extension I also ordered new tips: a #1, and a #2. While tuning, I found the supplier had sent me a #3 instead of a #2. Oh well, I put on the #3. It was heaven. I have never had such a good grip on a pin. I had thought a #1 tip was for a 1/0 pin a #2 tip for a 2/0 pin, etc. but that just isn't so. That #3 has improved my tuning experience and tuning time like a dream come true. Finally, a sharp axe. I didn't know such control was possible. Don't hesitate to spend a few dollars and try some different tips. You might find a sharper new axe to work with.

— Lyn Nelson, RPT

reprinted from the West Michigan Chapter newsletter

Foot Switch becomes a Hand Switch

While tuning, the foot switch for the Accu-Tuner™ can be held in the palm of the same hand that is used to strike the keys. It is cheaper than a note switch and just as fast.

— Jim Cox, RPT

Northern Michigan Chapter

Buzzy Babies

Don Mannino, RPT, has come up with a clever way to eliminate extraneous sound coming from the front and back parts of the strings during tuning. He calls them Buzzy Babies and they are long, filled fabric tubes which are placed on the aliquot or duplex scale of a grand piano.

Continued on Page 16

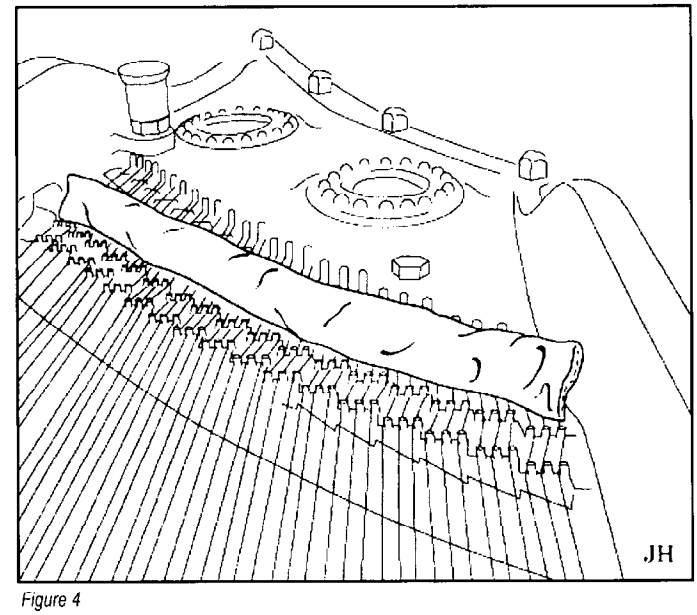

Figure 4

Cleaning the Plate

I am reconditioning an old upright at the present time. The plate is very dirty and I am looking for methods of cleaning it before re-gilding. Any suggestions would be much appreciated.

— Terry Beckingham
The Pas, Manitoba, Canada

Wim Blees, RPT: There is a very good cleaner called Simple Green™, available in most hardware stores, that does a very good job of cleaning. You can use it straight for bad spots, or dilute it with water for general cleaning. After you have washed the whole plate, and especially around the hitch pins, use an air hose to blow the dirty water out from under and around the hitch pins. This will keep them from rusting.

Robin Blankenship: Wash the plate thoroughly with a common household cleanser. Sand it with 400-grit paper. Clean it again with a de-greaser. Prime it and shoot it.

Mark Potter: TSP (tri-sodium phosphate) works real well and is available at hardware, paint and grocery stores. Rinse with water, dry well, including Wim's suggestion of air. A maroon or gray 3M Scotchbrite™ pad does a good job of smoothing and de-glossing for better adhesion of the new material. If there is contamination (fish eyes, etc.) shellac is a wonderful barrier coat between the contaminants and your top coats.

Ed Mashburn, RPT: For plate cleaning we use a product called Soilex™. We like it because it dissolves oils. We get it at Porter Paints but any hardware store may have it.

Beckingham responds —

Thanks for your suggestions regarding cleaning the plate. I had another suggestion to use Fantastik™. I had some on hand, so I gave it a try. It worked very well. The only other product available up here in no-man's-land would be the TSP. I will try it next time.

Dancing Dampers

I'm wondering if anyone might have a suggestion for a recurring problem that I've been having with a small, fairly new grand. Several times now, I have adjusted the dampers. I have determined the proper length and alignment of the damper lever wire and *carefully* tightened the screws so as not to let things move out of alignment. I've tried to leave the screws tight. When I return they are loose! Either the heads are twisted or the damper wire has slipped or both. One thing I was thinking about trying is to regulate them yet again, and then put a tiny dab of thick CA glue where the damper lever wire goes into the damper lift flange. Could it hurt? I'm open to suggestions.

— Brenda Mamer, RPT
Merrill, WI

Avery Todd, RPT: I frequently have the same problem. All that's wrong is that the screws are not quite tight enough. Moreover, as far as I am concerned, that is *not* a place for CA glue. That's treating the symptom, not the problem. The next technician behind you, or maybe even you yourself, will develop some new words to describe how he/she feels when those wires need to be taken out again after you've glued them. Don't go overboard but don't be afraid to tighten down on the screws a little more. If the dampers twist a little, and they usually will, get a pair of pliers, place them on the wire right above the underlever top flange and twist in the direction needed to make them travel straight.

Paul Dempsey, RPT: This piano may have brass barrels in the top flange. If it doesn't, the damper set screw goes into the wood and bears against the damper wire. It can be very troublesome. Really tightening the screws risks splitting the top flange. You might consider either replacing the top flanges with ones that have the barrel inserts or installing the barrels in the existing parts. The problem with gluing them in place is that at some point you might want to regulate the back action again. This is hard work if the wires won't move.

Guy Nichols, RPT: A more permanent fix is to pull the set and roll the end of the wire between a piece of hardwood and a large mill file. It is quick, painless and unless the lifter screws are totally screwed-up, will be the last slip you'll see from that piano.

Contracting Work

I thought I was going to need some surgery and would be restricted in my tuning and heavy lifting for several weeks. That hasn't been necessary, but it got me thinking that I would have liked to have another technician take care of my accounts without the hassle of actually having an employee with all the regulations and tax consequences that entails. Has anyone any experience with this kind of situation? How does one keep an independent contractor status without falling afoul of the IRS?

— Larry Messerly, RPT
Phoenix/Prescott, AZ

Gina Carter, RPT: I have been subcontracting for years. It's a great way to increase your own business while helping another technician earn additional income. Briefly, the IRS allows you to subcontract. If you pay anyone over $600 in a calendar year, you must file a form '1099 Misc.' showing the amount you paid that individual. The '1099 Misc.' must be filed with the IRS with a copy sent to the individual by the end of February of the tax-filing year. Be sure to get his or her social security number when you set up the subcontract agreement. Work out the financial arrangements and subsequent work so that you both are comfortable with the details.

Continued on Page 14

Continued from Page 12

When you subcontract, you are not required to pay anything except the amount upon which you both agree. The IRS says a subcontractor must be employed in some other business as a piano technician or anything else, just as long as they are employed elsewhere. If this requirement is not met, then the person becomes your employee and you are required to go through the hassle of tax deductions, workers comp and the like. If the requirement is met, you can subcontract as much as you want with no problems, as long as you let the IRS know how much you paid that person.

Applicable laws vary from state to state. Check with your accountant just to be sure. Good planning on your part for when you're going to be out of work.

Wim Blees, RPT: Here are two ways this can be done:

1. You can give the names of the customer to the person doing the work. He can contact the customer and collect his fee. At the end of the week, he gives you a check for x number of dollars as a "commission." (Obviously, this needs to be an agreed amount, either a percentage of the fee he collects, or a set fee for each customer). He keeps a record of that and if the total amount of commission is more than $600 at the end of the year he needs to send you a 1099. He records his income and pays his own taxes on it. You report your income from him and pay your taxes on it. No other paper work is required.

2. The customer makes out the check to you, and you give the subcontractor a "commission" (again, an agreed upon amount). Then you keep track of all of that and send him a 1099 if you pay him more than $600. There is no problem with this. The IRS allows businesses to use outside labor, and calls it contract labor. They may not earn more than $600 when they work in your place of business.

Dale Fox, RPT: Actually, to take this a step further, you are only required to issue a 1099 if the subcontractor earns $600 or more. In addition, the subcontractor must furnish his own tools and must schedule his own work. In other words, the sub must act as an independent business that already derives income from the profession for which you are paying them for their work.

Estimating Stringing Material

I wonder if some of you with restringing experience would care to explain how, when you're writing up a job estimate, to figure out how much string you're going to use in a given wire size. Do you base your guess in terms of how many one-pound coils you'd use or do you figure by the foot, anticipating that one-pound and five-pound coils have a certain amount of footage per reel? Then, when you're figuring materials costs, do you figure a specific charge per unison or do you just estimate the footage used and charge by the foot?

I've often wondered if one of those foot-counters (like what is used in the hardware store for measuring out small tubing) would be a worthwhile investment to keep tabs on how much wire actually is used.

Owen Jorgensen used to joke that he thought it wouldn't be too off-the-wall to charge for the mileage you put on your shoes when stringing pianos. On a nine-foot grand it can really add up!

Thanks for the replies.

— Ron Torrella, RPT
Piano Technician, University of Michigan

John Ross: Since I buy it by the pound, I weigh it before and after. Then I take my normal mark-up. Going by length is too tedious. It is a small part of the restringing price so it doesn't matter if you are off a bit.

Roger Jolly: If you allow for two to three pounds of music wire you will be in the ball park. The cost of the wire is minimal compared to bass strings, tuning pins and labor. It would be a real hassle trying to be exact, the time spent calculating the amount of wire used would pay for the wire, therefore an exercise in futility.

Conrad Hoffsommer, RPT: I never itemize it. It just comes out of "supplies." However, I just played with my little calculator and figured that if the longest plain wire string on a concert grand is 72 inches, the total from hitch through becket could easily be around 90". The shortest would be about 15 inches. Average 52.5" times trichord times 68 unisons is almost 900 feet. Assuming 16-guage is the average size wire, then at 260' per pound you'd be adding more than three pounds. This, of course, assumes no waste.

Ron Nossaman, RPT: I operate on the premise that the plain wire in a stringing job is the cheapest major part in a piano rebuild, whether that happens to be true or not. It's the installation that is expensive. Therefore, I charge by the length of the piano and the number of ties and other back biters, rather than the string length. It's the miles walked stringing a nine-foot piano that I take much more personally than the use of an extra few feet of wire.

Jim Coleman, Sr., RPT: I can't imagine that any restringer except at the factory level would be very concerned about the number of feet of wire that is being used. Just keep an extra five-pound package available at all times. It is not worth your time or effort to keep track in such detail. A manufacturer, of course, must know because he buys in large volume and uses wire in large volume.

Brian Trout: I had to keep track of costs on a particular grand reconditioning a few years ago that included a restringing. I calculated every inch of piano wire, being mindful of wire size and price. It was a five-foot, two-inch Haines Bros. grand. If I remember correctly, the total price (actual cost) of the plain wire used to restring was $10.72! Perhaps that will give you a feeling of actual costs. It probably cost me three or four times that just keeping track of it, but now I know.

Dave Peake, RPT: I had to give a cost for a Steinway A I restrung for a local dealer. Since I do rescaling, it was easy to calculate how many feet I used throughout the piano. Then I looked in my supply book and averaged the amount per foot. PJ

Letters to the Editor

Continued from Page 8

Virgil Smith in this event: ET vs. EBVT. Virgil actually has been one of my many mentors as have many other great PTG technicians such as George Defebaugh, Jim Coleman, Franz Mohr, Steve Fairchild, Bill Garlick, Ron Berry, Fred Tremper, Owen Jorgensen and my own chapter members, Tim Farley and Norman Sheppard. What I know how to do is a result of combining the skills taught by all of these people.

My hypothesis is based on a perception that I often have heard expressed: a tuning actually sounds a little better, a little richer or more colorful after it has gone slightly out of tune. Another version of this is that a hastily done tuning actually sounds better than one that has been very carefully done. Now, I don't believe in either of these perceptions, but what I do believe is that once the temperament has been totally and truly equalized, it has been deprived of a certain character that we really would rather not eliminate.

I assert the premise that a very slightly unequal temperament that is Cycle of 5ths-oriented, coupled with tempered octaves that take advantage of inharmonicity rather than fight or ignore it, will produce a superior sounding piano. Virgil's tuning represents the absolute epitome of standard practice in ET. This challenge will serve to confirm that his approach is the very best or open the door to other ideas that eventually may lead to an entirely different perception of what standard practice can encompass.

— Bill Bremmer, RPT
Madison, Wisconsin

Tips, Tools & Techniques

Continued from Page 10

Mannino says, "They look and feel like long thin bean bags. The mutes come in sets of three, in lengths to fit the back scales of most grand pianos. The benefit of using the mutes is allowing one to hear the high treble strings much more clearly for excellent octave and unison tuning.

"They are especially effective in pianos which sound false in the high treble because the duplex or aliquot scales are very live and active. The tone is cleaned up instantly during tuning, making the tuner's job much easier."

The tubes are made from dark blue corduroy fabric, which gives excellent string dampening. They come filled with either PVC pellets for washability or silica gel to serve as a tool case dehumidifier. Contact Don Mannino directly to order a set.

— Jeannie Grassi, RPT
Journal *Assistant Editor*

A Guide to Bridge Recapping – Part VI

By Bob Hohf, RPT
Contributing Editor

Setting Downbearing

Last month we peered a little below the surface on the topic of downbearing in order to gain some insight into what we might want to achieve when creating downbearing in a real piano. This month we will discuss a method of setting downbearing based on last month's theoretical discussion. Let us review the important parameters that should be taken into account by the method used to set downbearing. First, since an individual string exerts downward force on the bridge top primarily at the front and rear termination points, attention should be paid to the distribution of the force between those two points. Second, the downward force of the strings *per unit of bridge length* should be distributed in a way that is intentional. The distribution of the force exerted by the strings both front-and-rear and along the length of the bridges will determine what shape that the soundboard must assume in order to provide upward force in opposition to the string force. Along this line of reasoning, I *hypothesize* that the ability of the soundboard to resonate is related to the shape it assumes when loaded. I further hypothesize that twists and other more complex contortions imposed upon the soundboard introduce stresses that inhibit resonance.

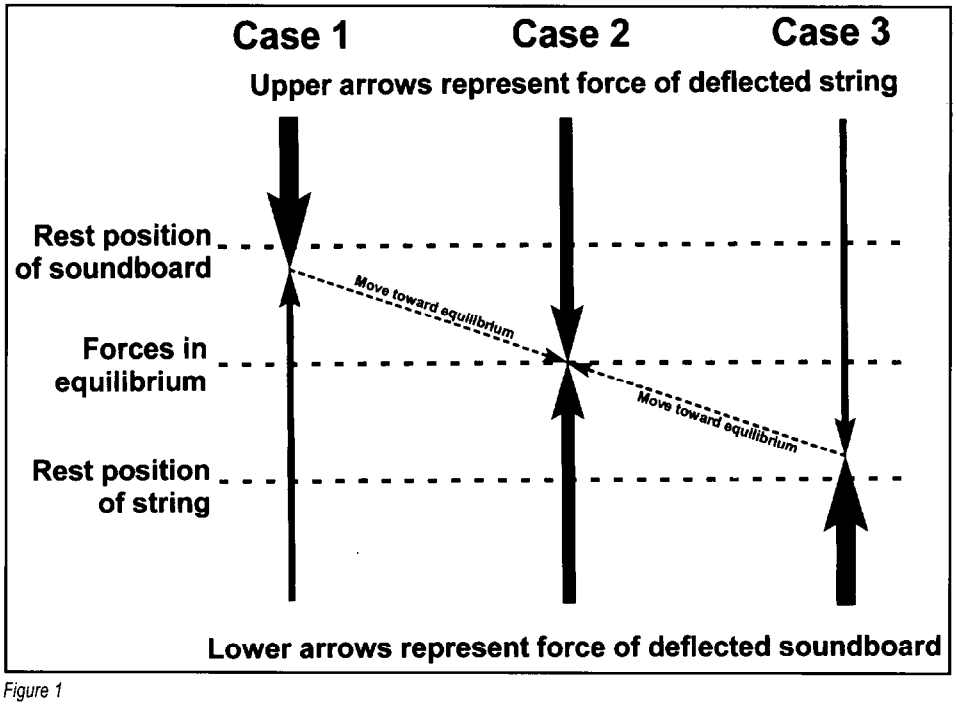

Figure 1

Taking the discussion a step further, a third important parameter relates to how the position of the bridge changes relative to the undeflected rest position of the strings as the soundboard moves from its unloaded to its loaded position. Most technicians probably will not have much trouble accepting the idea that as load is applied to the bridges they do not simply move straight up and down relative to the horizontal plane of the strings. In fact, bridges *rotate* along their length in one direction or the other as the soundboard moves downward from its rest position.

Reviewing Figure 1 from last month's discussion, this illustration shows the rest position of the soundboard, the rest position of the string and the point of equilibrium. It also shows how unbalanced forces of the deflected string and soundboard tend to equalize themselves by finding the point of equilibrium where the forces are equal and opposite.

Figure 2 is an idealized drawing of a bridge and soundboard in the high treble. The purpose of this drawing is to show what happens to the bridge position as load is applied. The three cases in Figure 2 correspond to those depicted in Figure 1. The proportions have been grossly exaggerated for clarity. In the high treble the soundboard is immovable on both edges due to its attachment to the bellyrail and the rim. This means that the soundboard is far less flexible and far less able to move at the edges than at the center. Since the bridge in the high treble is attached close to the bellyrail, the speaking length side of the bridge has significantly less freedom to move than the string tail side.

In Case 1, where the soundboard is in its rest position, the top of the bridge is parallel to the rest position of the string. But as the soundboard deflects in response to load applied to the bridge as in Cases 2 and 3, the bridge *rotates* rela-

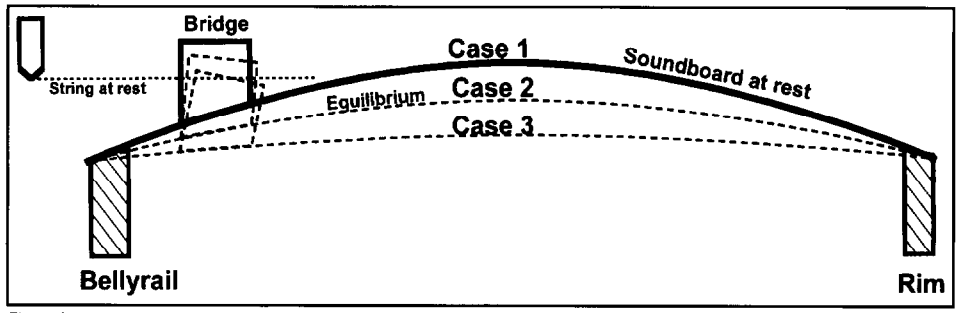

Figure 2

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A Guide to Bridge Recapping

Continued from Previous Page

tive to the rest position of the string. As more load is applied, the top of the bridge becomes *less and less parallel* to the rest position of the string. Figure 2 gives one possible explanation of how the imbalance of downbearing between the front and rear terminations on the bridge described in last month's article can come into being. The danger of creating unbalanced front and rear downbearing is inherent in procedures where the bridge cap is shaped with the soundboard in the unloaded rest position.

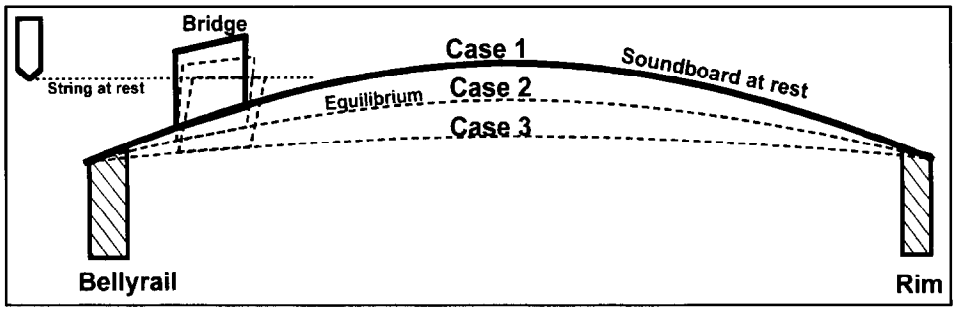


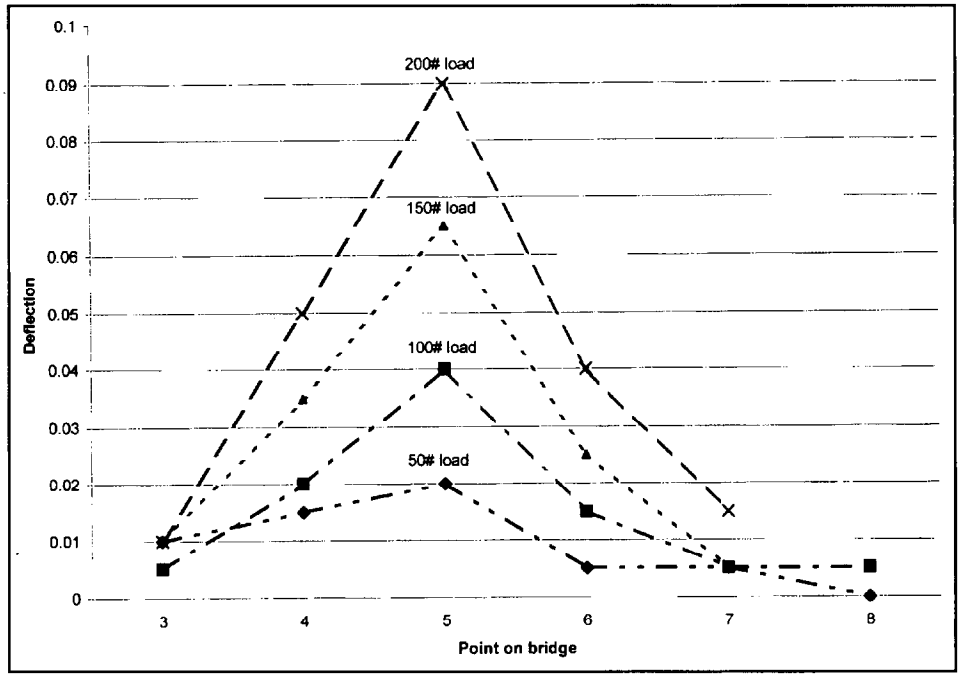
Figure 3

Figure 3 is the same as Figure 2 except that the top of the bridge is set to the rest position of the string in Case 3. As described last month, this means that the front and rear distribution of the force exerted by the deflected strings will arrive at zero at the same point of soundboard deflection. As the deflection of the soundboard *decreases*, the top of the bridge becomes *less and less parallel* to the rest position of the string. In Case 1, with the soundboard unloaded, the position of the top of the bridge bears little relation to the rest position of the string.

The bridge and soundboard in the center of the tenor section are shown in Figure 4. The bridge is near the center of the soundboard and far from the immovable belly rail and rim. This means that the soundboard is very flexible in this area and capable of much more movement than in the treble sections. How the bridge and soundboard will move in response to load applied to the bridge is very hard to predict in the tenor section.

Many factors will contribute to the movement, among them are: the design of the particular piano and the distribution of the forces both front and rear and along the length of the bridge. As load is applied to the bridge in this section, the soundboard will deflect much more easily than in the high treble and the bridge might rotate in either direction or not at all. In any case, there is probably no *predictable* relationship between the orientation of the top of the bridge in the unloaded and loaded position. This implies that it is very difficult at best to control the results if downbearing is set with the soundboard in the unloaded position.

Another important consideration when deciding upon a method of establishing downbearing is the flexibility of the bridge along its length. We tend to think of the treble bridge as rigid and incompressible because of its large cross section and hard maple construction. Yet, under the influence of the forces of downbearing the bridge itself can flex and twist to a significant degree. We also tend to consider the bridge a *passive* member of the resonant system of the piano in the sense that it is sandwiched between the force-producing members. However, a bridge that is flexed or twisted under the influence of the forces generated by the strings and soundboard generates its own forces due to its tendency to spring back into its unflexed shape. A flexed bridge becomes an active, and I presume, a detrimental participant in the transduction



Graph 1

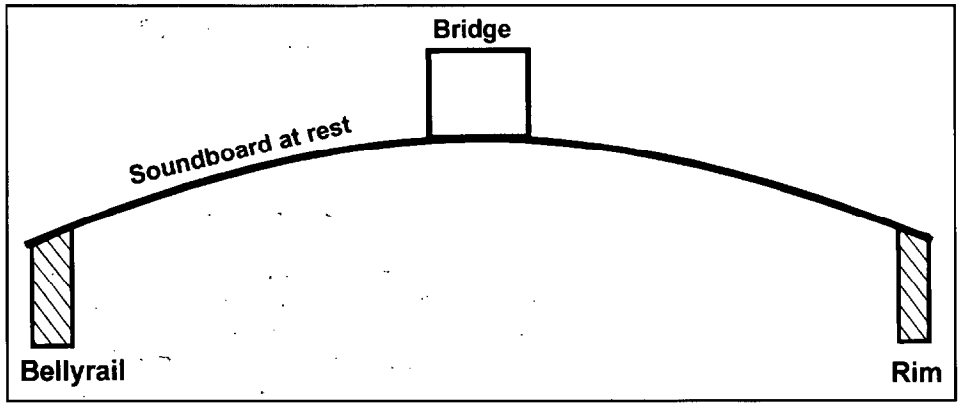


Figure 4

of energy from the vibrating strings to the soundboard.

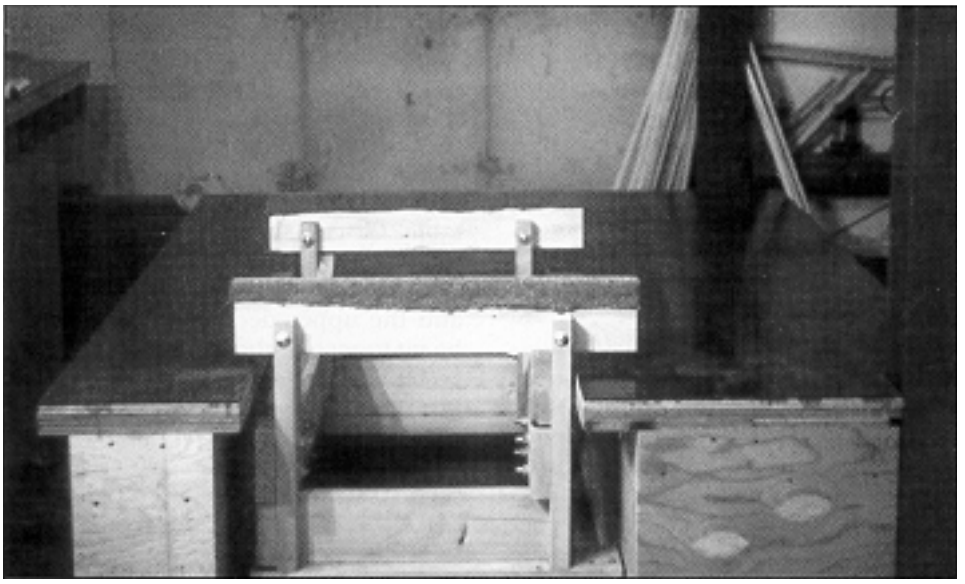


Photo 1

Graph 1 demonstrates the flexibility of a bridge in a real piano. The treble bridge on this piano was labeled with six points. Point 3 was at the bottom of the tenor, point 8 was at the top of the treble, and point 5 was near the center of the soundboard. Different loads were applied to point 5 *only* and the deflections at each point along the bridge were measured. The "zero" position on the Y-axis represents the position of each point on the bridge with the soundboard at rest.

If the bridge were perfectly rigid, the deflections under each load would be uniform along the length of the bridge. However, due to the flexibility of the bridge and the support of the underlying soundboard and ribs, the greatest movement occurs right at the point of the applied load. Perhaps of greater significance is the fact that, regardless of the load at point 5, the adjacent points 4 and 6 deflect only about half as much, and the ends of the bridge deflect very little at all. This reaction of the bridge to an unbalanced load further indicates the importance of load distribution along the length of the bridge.

So What?

At this point, it might be prudent to step back for moment and try to see what direction this line of inquiry is taking us. Since starting the discussion of downbearing last month, we can begin to see that our inquiry is starting to follow certain patterns. First, it is very easy to think of interesting questions to ask ourselves about downbearing. Second, investigating the questions is fascinating in itself. Third, any useful information gained comes at a high price in terms of time and energy, as well as materials and equipment. And fourth, although every stone we overturn reveals a tantalizing morsel of information, the information tends to be incomplete and indecisive, and mostly what we find beneath each overturned stone are more stones.

While there are many institutions in the world today that support "pure science" at great expense to both taxpayers and our natural resources, to my knowledge there is not one institution in existence today that supports "pure piano technology." One can very easily become intoxicated by the number of stones, not to mention boulders, in the field of piano technology that remain unturned, but this sort of exercise does not get the job out the shop door. As piano technicians carrying out independent investigations, simply generating data for the sake of "pure piano technology" is not enough. Somehow, we must learn something that has some real use in practicing our profession. This is where much of the piano research that has been carried on by physicists is lacking: they have produced results that are interesting, and in some cases startling, but that are of little or no practical use to the technician and the maker who are actively involved in building and repairing real-world pianos.

At some point in the investigation of downbearing, we need to accept the fact that we will never gain complete understanding by experiments or any other means. At least, not complete enough to provide us with a basis for drawing *rational* conclusions. Fortunately, rational thinking is not the only tool that we carry in our mental bag. I am happy to throw out the rational process in favor of the *informed intuitive.* Recognizing that the information at our disposal is incomplete, this is a good

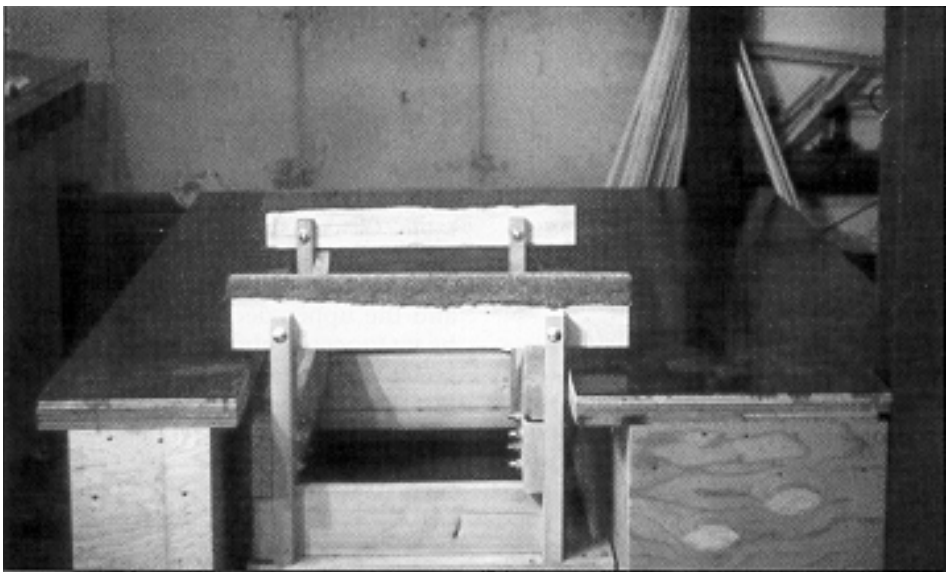


Photo 2

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A Guide to Bridge Recapping

Continued from Previous Page

point in our discussion to use what we have and give it our best shot in determining our method of setting downbearing. In spite of the obvious overwhelming complexity of downbearing, the intuitive method can be used here very effectively because there are not that many possibilities from which to choose. This is another example of *process-orientation* mentioned in the Introduction last March. Indulging our curiosities is fine, but we must never lose sight of the necessity of expanding our repair repertoire.

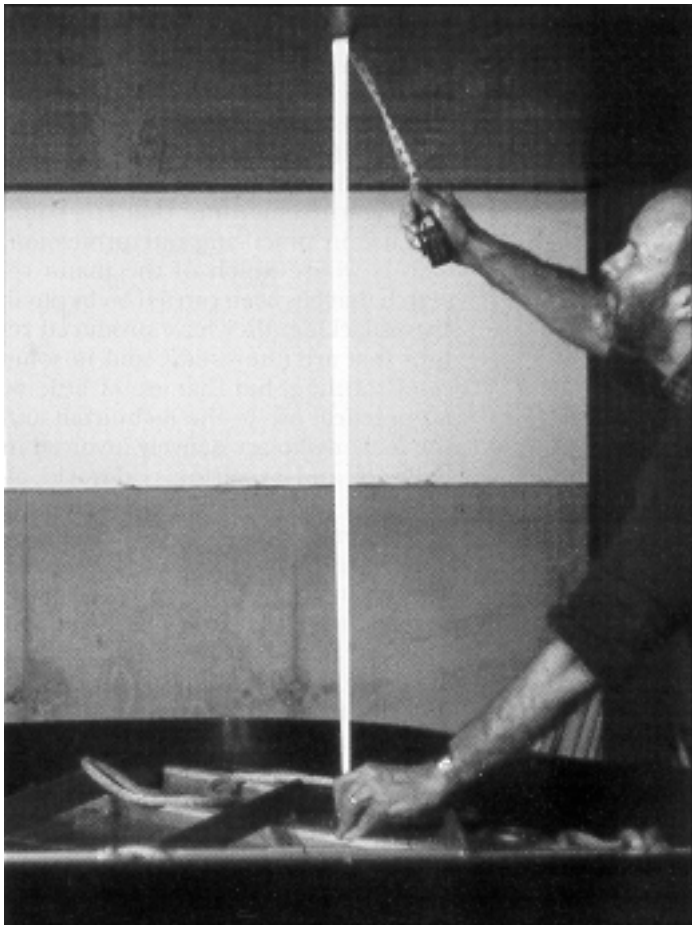

Photo 3

A Method of Setting the Downbearing

As some of you may already have guessed, I believe in setting downbearing with the soundboard loaded. This means applying force to the bridges to simulate the downward force of the deflected strings. Loading the soundboard frees us from the immense task of quantifying the effects of the parameters we have discussed. The very nature of soundboard construction and the irregularities of the materials implies that each soundboard is unique and will deflect in its own special way when downward force is applied to the bridges. We do not have to fully understand the idiosyncrasies of soundboard and bridge movement in order to account for them in our method of establishing downbearing. All we need to do is push on the bridges in a controlled way, letting the soundboard and bridges to move, as they will, then set the downbearing in this deflected position.

In order to implement this idea, I have built a go-bar press in which I can put the entire piano.

Photo 1 shows part of this press. The table in the press is mounted on the lower deck and shaped to receive a special piano cart. The table has a 1 1/2" thick plywood top and is heavily reinforced on the inside to give it the strength to support the piano. Photo 2 shows a piano on the cart and over the table. Of course, the plate must be in the piano when setting downbearing.

The distance between the bridges and the upper deck of the press must be set to accommodate the length of the go-bars. My go-bars are 48" long so I adjust the height of the piano using three scissor jacks between the piano and the table until the distance is 46 1/2." Measuring the distance between the bridge and the top deck of the press is shown in Photo 3.

Once the height of the piano is set, the rim must be firmly supported to prevent the force applied to the tops of the bridges from distorting the rim of the piano. This support is accomplished using wooden wedge jacks such as the one pictured in Photo 4.

The wedge arrangement gives the support plate of the jack 3/4" of travel. The thickness of the plate can be adjusted by 1/2" increments using spacers, such as the one shown standing up on the support plate. The short dowels on the bottom of the spacers fit into holes in the plate and keep the spacers in place. With the 3/4" travel and the 1/2" spacers, the jacks can span any distance that may occur between the tabletop and the bottom of the piano rim. The jacks are simple, adjustable and effective. Photo 5 shows the jacks in place under the piano rim.

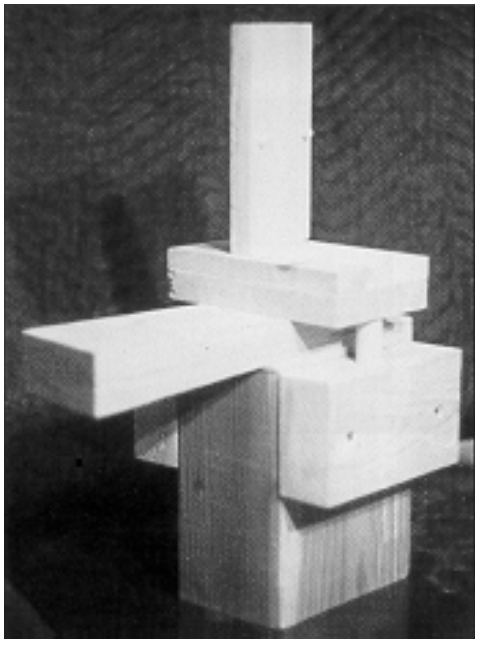

Photo 4

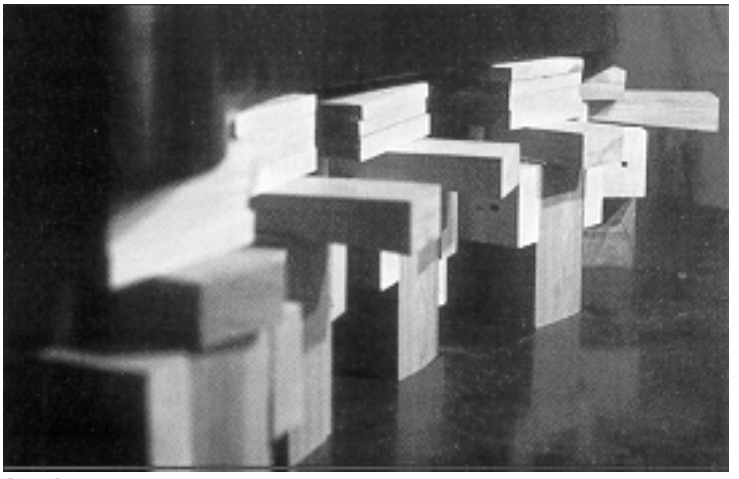

Photo 5

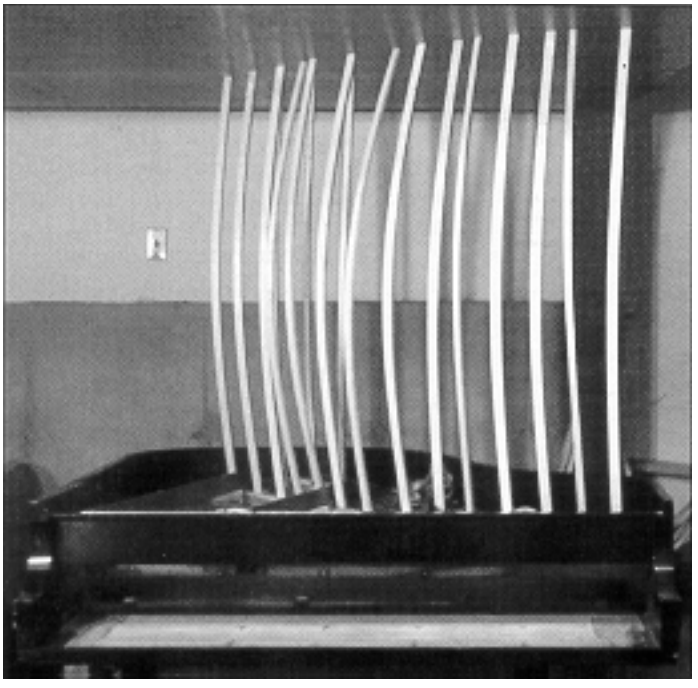

Photo 6

Once the piano is in the press and the jacks are in position supporting the rim, force can be applied to the bridges. Photo 6 shows the go-bars in place. These go-bars are made of ash and each exerts a force of 50 pounds. I prefer ash to hickory for this purpose because ash is lighter in weight, easier to machine, and less prone to becoming set in the bent shape.

How much force to apply is a matter of discretion. I use 750 - 900 pounds depending on the size of the piano. The go-bars are spaced close enough together to avoid creating localized forces by flexing the bridge, and as evenly along the length of the bridge as the location of the plate bars will allow. I do not apply force to the bridge body of cantilevered bass bridges. Force here would only create a levering action at the joint between the bridge apron and the soundboard. This levering action can be very destructive to the wood of the soundboard at the joint. The deflection of the soundboard caused by the go-bars on the tenor section of the treble bridge is enough to assure adequate downbearing in the bass. On larger pianos where the bass bridge is attached directly to the soundboard, I apply the same distribution of force as on the treble bridge, only with shorter go-bars to account for the height of the bridge. Note that the scissor jacks mentioned earlier are visible under the keybed in Photo 6.

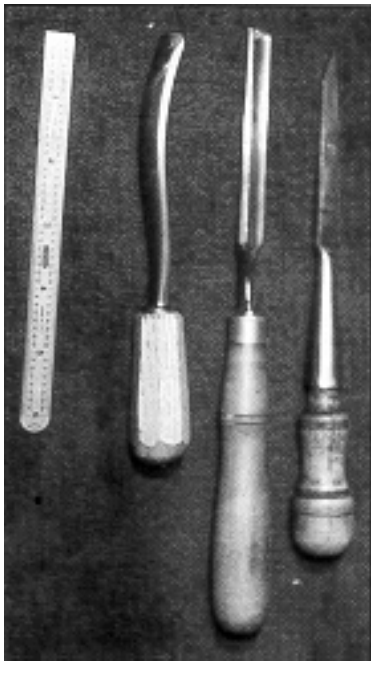

Photo 7

Thicknessing the New Cap

With the go-bars in place to simulate the downward force of the strings, the soundboard will be deflected to the level that is determined by the amount of force exerted by the go-bars. How this level of deflection is related to the "rest position of the string" in Figures 1-3, is determined by how the bridge caps are thicknessed. Remember that the blank caps were glued on to the bridge body with extra thickness so that the final thickness could be set later. My preference is to set the thickness of the new caps in such a way that the soundboard deflection imposed by the go-bars corresponds to the level of zero deflection of the strings as is shown in Case 3, Figure 3.

This is done by stretching fishing line, or some other cord, between the front termination of the speaking length of the string (agraffe or capo bar) and the rear string rest or aliquot bar in front of the hitch pins. The line should be deflected upward by the extra thickness of the new caps. With the line as a guide, grooves are cut into the top of the bridge cap to the level that the line can be stretched straight through the groove with no deflection. This process is repeated at intervals through each section until there are enough grooves to clearly define the final contour of the new caps.

Photo 7 displays the tools I use to cut the grooves in the bridge caps. The ruler on the bottom is used to draw the locations of the strings on the bridge caps by aligning the ruler with the fishing line as it is stretched across the bridges. The grooves are roughed out

Photo 8

using the 18mm, #8 sweep bent gouge pictured second from the bottom. I no longer use the straight gouge shown. On top is a 1/8" mortising chisel used for fine adjustments in setting the final depth of the grooves.

Working on bridges with the plate in position creates all kinds of clearance problems. Because of this the handles of the chisel and the bent gouge have been shortened. Several other modifications to the stock tools must be made so that they will work effectively in tight places.

Figure 5 shows the bent gouge in

Continued on Next Page

A Guide to Bridge Recapping

Continued from Previous Page

lengthwise section to demonstrate how this tool is modified for the task at hand. The top drawing shows the stock gouge as it arrives from the tool supplier. Note the way that the bevel is ground. I believe the stock tool is next to useless since the bevel will only cut when the tool is raised to a very steep angle. The two modifications shown in the middle drawing make the gouge very effective for bridge work. First, the bevel must be ground in the reverse of the original, and, second, the scoop of the stock gouge must be ground flat on the back surface. The bottom drawing shows how this tool is sharpened. The secondary bevel is set on a coarse stone, then the primary bevel is created on a fine stone. Finally, the flat back is polished with the fine stone, aligning the wire edge with the back. The flat-backed gouge sharpened this way will tend to cut a straight rather than scooped groove. A straight groove is what we want since the finished bridge cap must be flat from front to back.

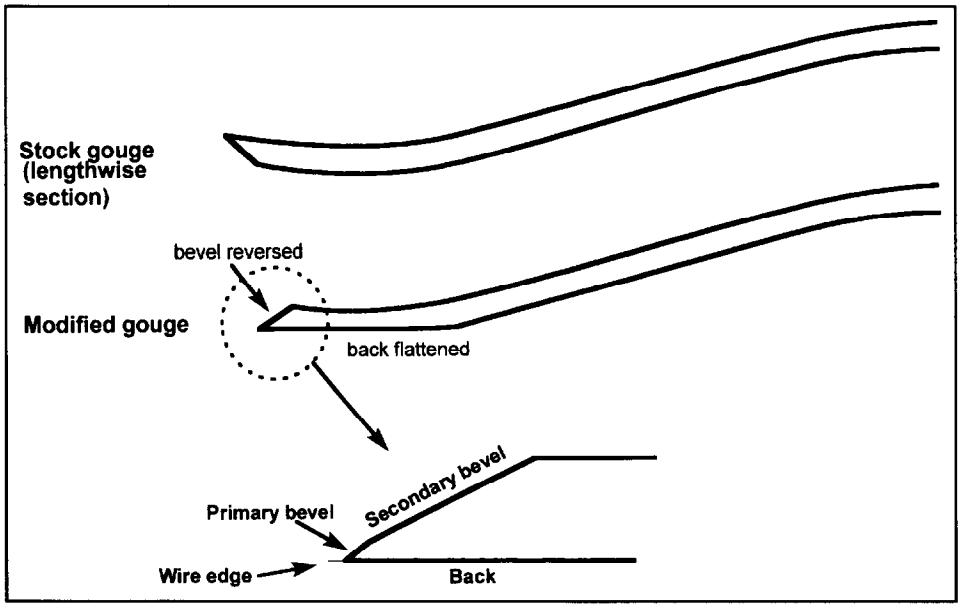

Figure 5

Figure 6 shows how a 1/8" stock mortising chisel can be modified to make fine depth adjustments to the rough groove cut by the bent gouge. The secondary bevel is lengthened by grinding a more acute angle with the back. Once the secondary bevel is ground flat and perpendicular to the sides of the chisel, the primary bevel is created with a fine stone by removing material from the *back* of the chisel. This is the reverse of the normal procedure for sharpening chisels. Then the secondary bevel is honed on the fine stone. This turns the wire edge in line with the secondary bevel. The chisel ground and sharpened this way will cut straight and flat.

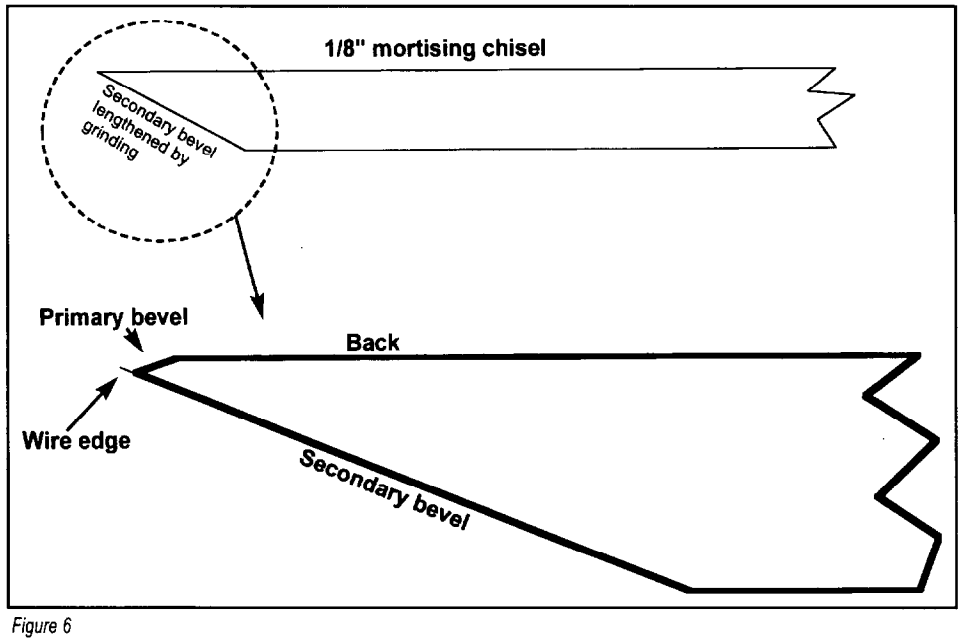

Figure 6

Photo 8 demonstrates aligning the ruler with the fishing line stretched across the top of the bridge. While holding the ruler firmly in place, release the line and draw in the string location. Then stretch the line back into position and raise it off the rear string rest until it just touches the bridge cap. The amount that the line is raised off the rest provides an estimate of the depth to which the groove must be cut. Be conservative when cutting the grooves; removing too much material from the bridge cap at this stage can be a bad mistake. If there is more than about 1/8" of bridge cap to be removed, the bulk of the work is done with the gouge; the curved blade can remove material quite quickly and more easily than the chisel.

Begin roughing out the groove as in Photo 9. Check your progress frequently by stretching the fishing line back through the groove. When the depth of the groove has been cut to within about 1/8" of the final depth, switch to the mortising chisel and make the final cuts as in Photo 10. Photo 11 and Figure 7 show a finished groove. With practice, these tools can cut grooves with great precision. Accuracy in this step is of critical importance in gaining control over the end result of bridge recapping.

Enough grooves must be cut along the bridges to clearly define the finished height and contour of the top surfaces. This amounts to two grooves in short sections and three or four in the long section, or nine to ten grooves all together. In sections that have removable string supports or aliquot bars, be sure to have the bars in place when setting downbearing. In addition, if the plate is to be refinished after setting downbearing, care must be taken not to build up so much finish in the area of the string rests that the downbearing is changed significantly. The description of cutting the grooves here is, of necessity, a simplification of the actual process because there are always obstacles to performing this operation. In most cases, grooves can be cut working from the back of the bridge, but sometimes plate configuration or the location of the go-

bars on the bass bridge may require working from the front. Individual pianos may present their own particular difficulties due to irregularities in the plate casting, etc. These difficulties must be recognized and dealt with using whatever means necessary.

Once the grooves have been cut, the go-bars can be removed. Then the piano can be lowered back onto the dolly with the scissor jacks, the piano removed from the press, and the plate removed. The next step is to plane the excess cap thickness down to the bottom of the grooves. The planing procedure is similar to that described for removing the old caps and preparing the top surface of the bridge body for gluing.[1] Since there will probably be considerably less stock removal than when removing original caps, using the scrub plane should not be necessary. Start with the curved-iron smoothing plane and then use the flat-iron smoothing plane set to a very shallow depth of cut until the grooves are erased from the cap.

There is an important principle of successful planing that I failed to mention in the earlier article: the piano must be *absolutely immobile* while planing the bridges. When starting a cut with a plane there is a moment of impact when the iron strikes the wood. If there is even the slightest recoil of the bridge cap from the impact, the force required to start the cut increases greatly. This greater force translates into less control of the tool. If the piano is immobile, the iron is sharp, and the sole of the plane is slick, very little effort is required for planing, and planing can be done quickly and accurately.

I have gone to considerable effort to describe the reasoning behind this method of establishing downbearing. However, by necessity I have been describing *idealized* pianos. In reality, no piano will ever conform exactly to the parameters we have discussed. The contour of the finished bridge cap defines a very complex shape. It is very difficult to describe this shape, but it is easy to feel while sliding the plane along the surface of the cap. Unfortunately, reality dictates that *there is frequently no single contour that will include all of the sample grooves cut into the cap.* This is true no matter how carefully the depths of the grooves are matched to the string positions as simulated by the fishing line. Therefore, it is prudent to leave a little extra material on the caps when cutting the grooves. How much? Enough that, when all the grooves are erased, you can take one final pass along the length of the bridge with the plane. Perhaps the most important factors in successfully accomplishing this and many other repairs are mastery of the tools and judgment. These are the most valuable attributes a craftsperson can possess, and can be gained only by dedication and experience.

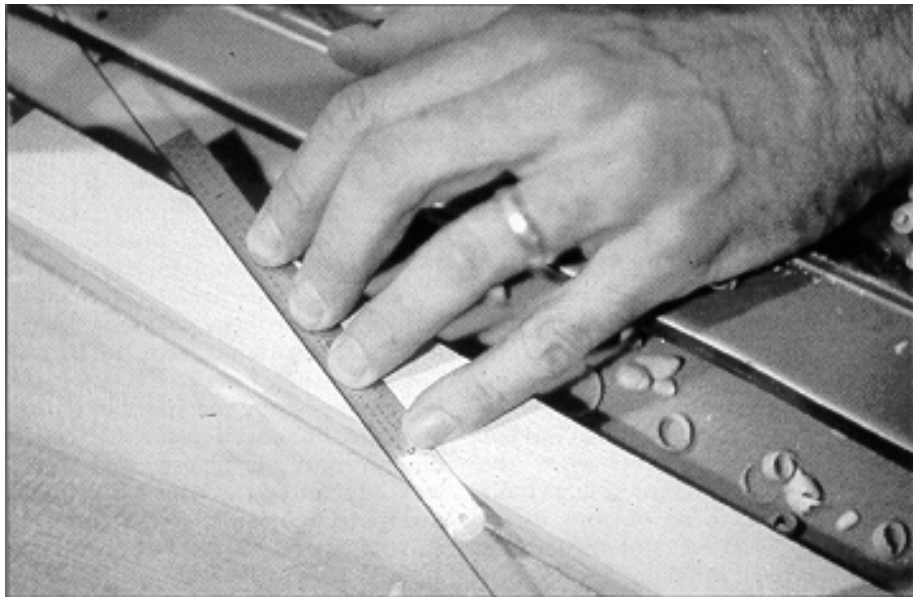

Photo 8

It is important to remember that the amount of soundboard deflection created by the force of the go-bars is greater than the deflection that will exist in the strung piano when the downward force is provided by the deflection of the strings. The go-bars deflect the soundboard to the level that we establish as the point of zero string deflection by the way we cut the sample grooves. However, zero string deflection means zero downward force exerted by the strings. As shown in Figure 1, Case 3, this is a state of dis-equilibrium because the upward and downward forces do not match. The soundboard will rise, increasing the deflection of the strings until the forces are in equilibrium. This level of equilibrium will be higher than the soundboard deflection created by the go-bars, but lower than the height of the undeflected soundboard. We

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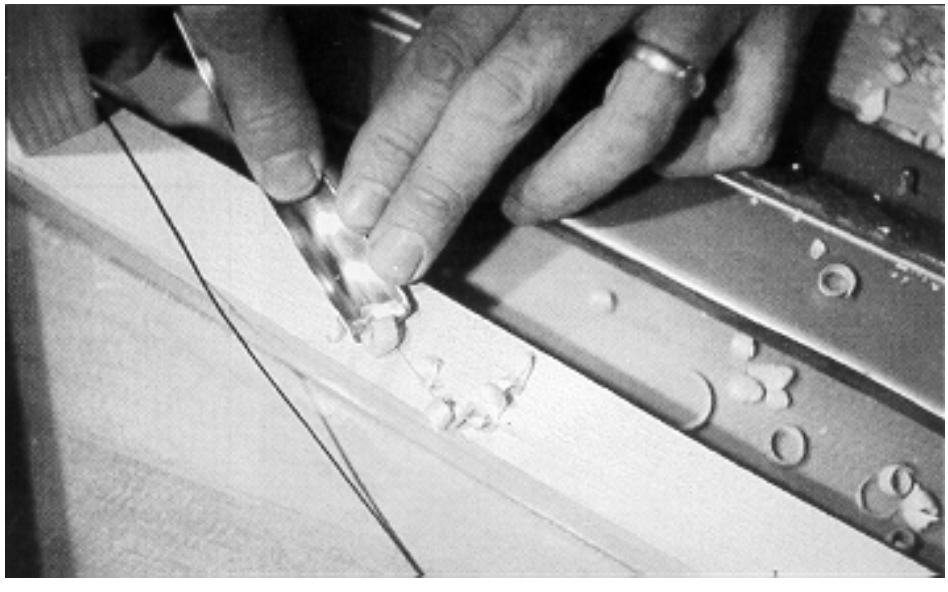


Photo 9

A Guide to Bridge Recapping

Continued from Previous Page

know how much force we applied to the soundboard with the go-bars, and we know the distribution of that force. But we do not know what the downbearing will be in the strung piano.

Setting the downbearing using the method outlined here does not duplicate the configuration that I have ever seen in any piano. This method creates *much more* soundboard deflection in the tenor area of the piano and *much less* in the high treble *in the strung piano.* After tuning and closely inspecting several thousand pianos, one develops an accurate picture of what configurations are conventional. A piano that has had the downbearing set with the soundboard deflected by go-bars is different enough to be obvious to the trained, unaided eye. Not only are the finished caps in the tenor section considerably thicker than the originals, but the front bridge terminations in the top two treble sections are visibly lower than the norm. My purpose in describing this method is not to convince anyone to do anything unconventional. Let it suffice to say, however, that I have set the downbearing this way in many pianos, I have heard the result, and I am continuing to do it.

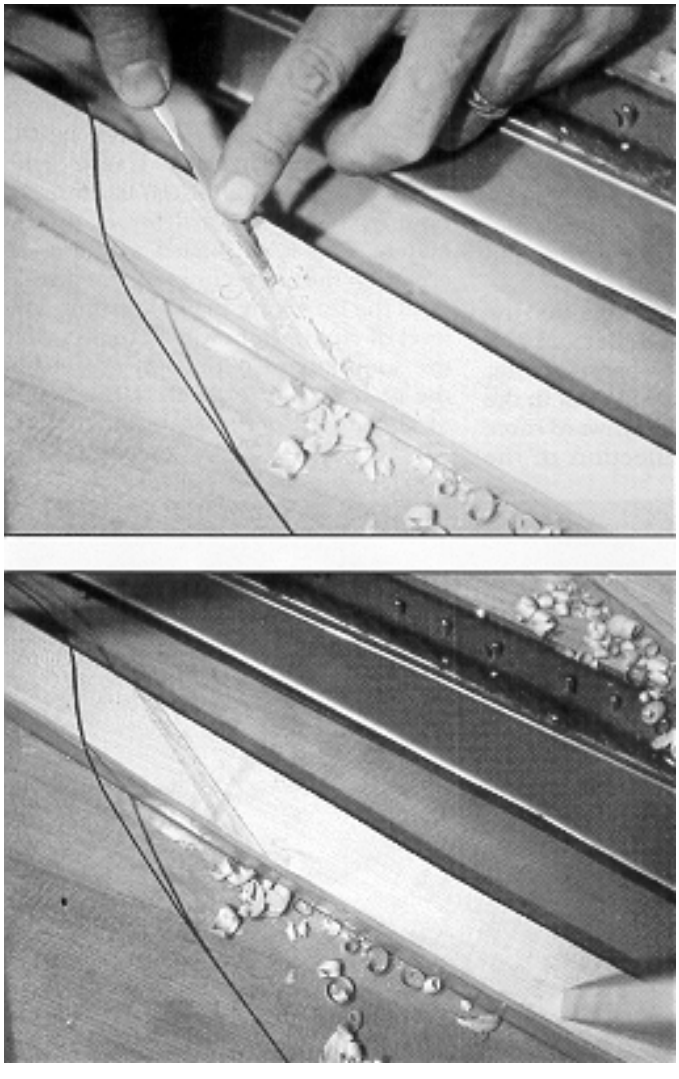
■ ■ ■

Boyd was feeling much better again.[2] The "disaster" he had created by installing a new bridge cap that was too thin for the tenor section was just a memory. He should have learned by now that, when you do something different, expect the unexpected. Recapping the tenor section for the second time with thicker material had been a very educational exercise. He found that his technique was greatly improved and planing off his own bridge cap had allowed him to evaluate his first glue joint. It was solid, but the second one was better.

What baffled him was the lore concerning downbearing that he had been listening to since he had first put a hand on a tuning hammer. Regarding the optimum total downbearing that should be established in a piano, he had often heard 800 pounds mentioned. On occasion, he had heard downbearing estimates as high as 1500 pounds. Then when he had loaded a soundboard with 800 evenly distributed pounds using go-bars, the tenor area of the soundboard had deflected far more than he had expected. It had deflected so far that his first over-thick blank cap was below the level of the undeflected strings. The soundboard had obviously never been deflected to that level. Boyd was fully aware that the deflection created by his go-bars was greater than it would be in the strung piano. True, the deflection he had created in the treble was clearly less than original; he could tell by the thickness of his finished bridge caps. However, since he knew the thickness of the original tenor caps, he hated to think of the imbalance of forces between the tenor and treble that would be necessary to produce an *actual* total downbearing of 800 pounds. His own investigations had shown him how difficult it was to estimate the total downbearing in a strung piano, and he was inclined to believe that methods used to arrive at the conventional beliefs were just plain wrong. One thing he did know for sure: do not trust any lore without testing it first. But then wasn't this one of the challenges that kept his interest in pianos?

Notes

1. Hohf, "A Guide to Bridge Recapping, Part III." *Piano Technicians Journal,* May 1999
2. Hohf, "A Guide to Bridge Recapping, Part I." *Piano Technicians Journal,* March 1999



Photos 10 (TOP) and 11 (ABOVE).

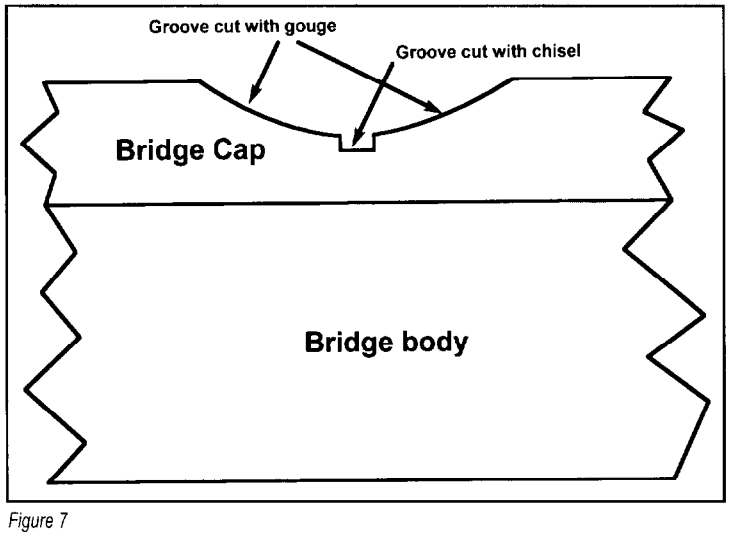


Figure 7

Ear Training: The Overtone Series

By Ed Sutton, RPT
Wichita, Kansas Chapter

If you don't know the overtone series go and learn it now. It always surprises me to meet a piano technician who doesn't know the overtone series. It is virtually the whole book of our profession. It must be hard to work on pianos without knowing and understanding the sound a string makes. Get help if you need it. Get a set of Coleman Beat Locator Cards.* These cards tell you almost everything you need to know to tune a piano and live a good life. As piano technicians, we spend our workdays in the same place, every day: Overtone Series, Earth, Solar System, and Universe.

End of Sermon

Once you do know the overtone series, I encourage you to enjoy it regularly. Think about this: the tonal identity of a piano consists of its unique way of making the overtone series of its strings audible. When tuning take a little time to listen to what the piano is doing with the overtones. Pick a note in the mid-range and play it forte. See how high up the series you can hear the overtones. Gently tap a partial higher than you heard, to focus your ear at a new pitch level, then play the note again and see if you can hear it. Listen up and down the overtone series as the note dies out and notice where the sound lingers longer, and where it dies out sooner. Play the same note softer or louder and hear what happens. Do the same with a bass note and a treble note.

"If you are a piano technician and you don't know the overtone series, you're not alone. But please believe me, it's a lot easier and a lot more fun if you do."

Please notice the wonderful way your hearing alternates between being "outer" and "inner" driven. When you know "where" to listen, your ear becomes miraculously sensitive. There are feedback loops between the ear and the brain, and noise inhibiting circuits in the auditory centers in the brain. They appear to work by adjusting the inner ear to be more sensitive to a frequency range and by blocking the processing of unwanted sound components in the brain. It is possible that when we imagine a sound in our mind we are actually increasing the sensitivity of our ears to that sound. Our experience certainly seems to confirm this.

Perhaps it's even more amazing that we hear this very complex chord coming from a string as a "fundamental pitch." If we were to really hear just a simple sine wave at the fundamental pitch, we'd know immediately that something was wrong. As piano technicians, we are paid to listen to this recurring miracle! Close your eyes and listen again.

I believe you should practice the overtone series until you can hear it, like a familiar melody, on any given note. It isn't that hard to learn; it's just one melody over and over, and the string is always giving it away! First get comfortable with learning to hear it up to the eighth partial. This will get you through general tuning work. Have as a long-term goal to be able to hear up to the 12th partial of bass strings. These higher partials can be the cause of many little noises in the bass. Recognizing them will make you a better diagnostician.

Don't be shy about going much further. Notice that once a pitch class occurs in the series, each doubling of the partial that produced the pitch will produce the pitch at the next octave level. Thus, if C1 is the first partial, the second partial is C2, the fourth partial is C3, the eighth partial is C4, the 16th partial is C5, the 32nd partial is C6, and so on up to C8. Similarly, if C1 is the first partial, then the third partial is G2, the sixth partial is G3, 12th partial is G4, the 24th partial is G5, the 48th partial is G6, and the 96th is G7. I'm not writing this just to play with numbers. On a good piano, you may be able to hear many of these partials in the tone of the string by first playing the note pianissimo at the pitch level. Then play the fundamental note forte and focus on the high pitch level as the tone dies away. A bass note

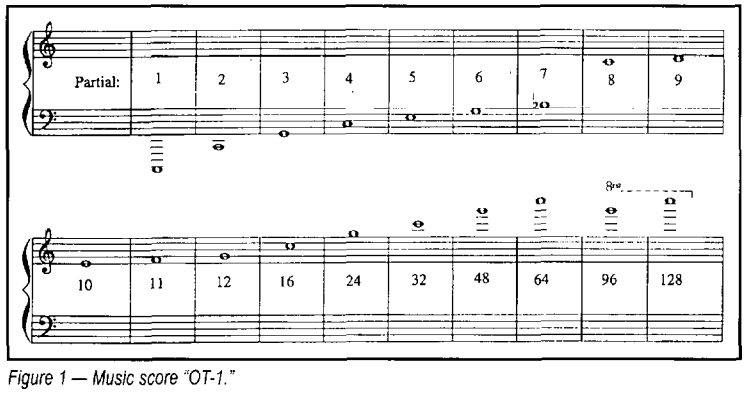


Figure 1 — Music score "OT-1."

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Ear Training: The Overtone Series

Continued from Previous Page

without these partials sounds dull; it has no "sizzle" or "edge."

Being conscious of the piano's individual response will help you tune the best possible unisons without wasting effort on the impossible. It's a very good practice to include some overtone diagnostics in your unison tuning both as a way to understand the potential of the piano and also to keep your ear focused where it needs to be. When I begin tuning midrange unisons, I pick one or two of the lowest notes, and listen to overtones, to see how high up I can hear them. I quickly decide how far up the series I'm going to check for beating overtones, and try to maintain that standard throughout the section. (Checking for beating overtones is somewhat misleading. As I tune the unisons, I pick up the overtones and "clear them" up to the level I've chosen. It is an integral part of tuning the unison, not something I go back and check later.) If the bass doesn't give me more overtones to work with, I wonder what's happened to the piano. As I work through the treble, I seldom hear overtones higher than note 88.

Working with overtones in this way will help keep your skills honed while doing a good job on the instrument at hand without trying to do the impossible. Some instruments display the spectrum beautifully up and down the overtone series. You can hear the unison "locking in" as you follow the beat up through the series. On an instrument like this, you can probably hear audible overtones from every note on the piano in octaves six and seven. You might try tuning unisons just by listening in the top octave, and see how far down you can tune. Knowing where an overtone is expected is an important part of this exercise. Play the note where you expect the overtone *pianissimo* and remember the pitch. Now play the note you are studying and listen for the overtone. This exercise improves perception quickly.

And, of course, there are instruments, which for many reasons, just can't deliver such fancy results. Chances are, listening at the third and fourth partials will give you a passable unison in a bad situation, and help you to finish the job on time with minimal suffering and maybe even a small triumph.

* To buy a Coleman Beat Locator Card, send $5 to Superior Instructional Tapes; 4 W. Del Rio Drive; Tempe; AZ 85282

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Bedding The Keyframe — Part I

By Brian De Tar, RPT
Portland, OR Chapter

Parts/Supplies Required:

- None

Tools Required:

- Long (12") Phillips or straight screwdriver
- Glide bolt wrench

Time Required:

- Approximately 10 - 20 minutes

Welcome to the first of a three-part series on bedding the keyframe. I will explain a very simple procedure that I learned – while working with Yamaha – to establish the foundation upon which all other action regulation will be built. Included in this series are some special notes to keep in mind when working with Yamaha Disklaviers, which may also be helpful for PianoDiscs.

I believe we can all agree that in order to achieve stability and consistency in action regulation we must first establish a solid foundation. Some of the ramifications of an improperly bedded keyframe are: excessive action noise, loss of power and dynamic range, poor tone quality, inconsistencies in hammer height, let-off, checking and repetition, and an action that "fights back" or feels "spongy" to the pianist. In the Yamaha Disklavier, a solidly bedded keyframe is also critical to ensure accurate playback of recorded material.

Although this procedure can be used on most grand pianos, it was primarily developed for high quality, relatively flexible keyframes. Some of the manufacturers that use relatively flexible keyframes are Yamaha, Kawai, Steinway (with Kluge keyframes), and Bösendorfer. Ah, yes, you've probably heard "cheap" or "flimsy" or "cost cutting" in conversations about flexible keyframes so let's nip that in the bud and explore why it might actually be advantageous to have a relatively flexible keyframe.

Using a relatively flexible keyframe makes it possible to easily adjust each glide bolt so that it supports the keyframe with exactly the same pressure as its neighbors. This allows the shift lever to operate much more efficiently and with less wear on the keybed. It also enables the technician to slightly increase or decrease aftertouch very quickly and precisely. This aspect alone is worth its weight in gold. How nice it is to be able to customize the aftertouch feel of a piano to accommodate the different tastes or familiarities of individual pianists. So next time we hear someone make a questionable remark about why a manufacturer chooses a particular path, we might look at it from a solution perspective rather than a cost-cutting perspective.

To have a concept of the big picture, let's quickly outline the steps we will follow to achieve our goal.

On Disklaviers:

1. Turn off the power at the control unit, and/or unplug the Disklavier from the wall.
2. Remove the control unit (except Wagon Grands).
3. Remove the fallboard, cheekblocks, and keyslip.
4. Disconnect the keyboard connector (bass end on Wagon Grands, the treble end on all others).
5. Slide the action out.
6. On Disklavier Wagon Grands, remove the hammer sensor rail.
7. Proceed to step 3 below.

On all other actions:

1. Remove the fallboard, cheekblocks, and keyslip.
2. Slide the action out.
3. Loosen the action bracket screws approximately 1/4 turn.
4. Tilt the action up and turn any hidden glide bolts approximately 1/4 turn clockwise.
5. Slide the action back into the piano.
6. ***With the action in the piano***, use a long screwdriver to tighten accessible action bracket screws.
7. Slide the action out just far enough to tighten the remaining action bracket screws.
8. Slide the action back into the piano.
9. Check key height and key dip.
10. Check for any knocking glide bolts and consistency in glide bolt pressure with the "Lift and Tap" method.
11. Adjust the glide bolts.
12. Adjust the (two) hidden glide bolts.
13. Tap along back rail and check for any knocking against the keybed.
14. Tap along front rail and check for any knocking against the keybed.
15. Recheck for consistency in the glide bolts with the "Lift and Tap" method.
16. Replace the case parts and screws (and control unit on Yamaha Disklaviers).

Pretty straightforward, isn't it? After a couple of times through, you will be an expert. You will find it's quick, easy and *very* accurate. It's one of those many things that takes longer to think about doing than to "Just Do It."

Next month, we will dissect each step and get to the nuts and bolts of bedding the keyframe. We'll delve headlong into what to do and, more importantly, some of the rationale behind *why* we do it.

Now, take this article and go to your nearest grand. Once there, play around with some of the steps to see where you think we might be going next month! With a bit of practical exploration mixed in with a generous helping of curiosity, and a smidgen of anticipation, you will arrive next month with a fine recipe for optimal learning. Another helpful trick is to take all the steps above and draw them in diagram form. This is called "Mind Mapping" and brings into play several different parts of the brain to facilitate the learning process and memory retention. Try it.... It just might surprise you. So, until next month, here is your first "De Tarism": What you lose by *not* trying something is ***success***!

The Restoration of Historical Temperaments

By Owen Jorgensen, RPT
Northern Michigan Chapter

Without a restoration of the classic temperaments, our music experiences are rendered incomplete. To rectify this situation, the concert pianists Susan Halligan and Enid Katahn have each recently completed CD recordings done in Historical Temperaments (HT). Professor William Carragan wrote a positive review of Halligan's CD in the November/December 1997 issue of *American Record Guide,* p. 99, that included a clear explanation of the temperament used and its value. Piano technician Edward Foote published an excellent article entitled, "Old Tunings on Modern Pianos" in *Piano and Keyboard,* January/February 1998, pp. 52-55. The article included a most interesting and informative essay written by Katahn, describing the value of Historical Temperaments. *(Editor's note: Katahn's essay is reprinted in its entirety immediately following this article.)*

Except for a few pianists like Halligan and Katahn, most professional musicians have little understanding of keyboard temperament. Consequently, piano technicians who have mastered this understanding are the true supporters and preservers of keyboard temperaments. The sounds and effects of keyboard music are their responsibility and they are in a position to educate pianists and the public in these matters.

For those tuners who are uninformed or inexperienced in HTs, the best starting point is to learn and practice the 1/4 Syntonic Comma Meantone Temperament published by Pietro Aron in 1523 and also the representative Well Temperament of 1799 by Thomas Young, published in 1800.

A critic of HT restoration said, "A proposal to reintroduce the production of an obsolete antique model of a car to replace the current manufacture of our wonderful late model cars is ridiculous. To reintroduce any Historical Temperament into common practice to replace Equal Temperament is equally as ridiculous and absurd. The old temperaments might be interesting historically, but they can't compete with Equal Temperament, which is the most accommodating and perfect temperament ever developed in history. A Ford Model A cannot compete with the newest Buick, and Meantone Temperament cannot compete with Equal Temperament."

By equating the history of the automobile with that of temperament, this person assumed that Equal Temperament (ET) is superior to all others and therefore Meantone Temperament is inferior. This assumption is based on an invalid premise. The history of the automobile cannot be compared adequately with that of temperament. Specifically, the automobile experienced a steady evolutionary development from poor primitive models of cars to the superior sophisticated automobiles of today. As development progressed, engineering accomplishments from the past that were still considered valuable did not need to be discontinued. The latest models of automobiles are superior because they are summations of the best qualities from the past.

Contrary to this, the history of temperament contained no evolution from primitive to superior. More clearly, temperament has never improved in history, it has only gone through a series of changes. There is an acoustic law stating that for every change that is made within a temperament system a new quality, effect, or virtue will be created. Without exception this is always accompanied by a comparable loss of some other good quality or effect. Thus, for every gain there is a comparable loss. The limitations of the standard keyboard (only 12 different keys within an octave) created this law along with the existence of all the commas.

"Piano technicians who have mastered this understanding are the true supporters and preservers of keyboard temperaments. The sounds and effects of keyboard music are their responsibility and they are in a position to educate pianists and the public in these matters."

Acoustic law determines that ET is no better or worse than all the previous temperaments developed from the 15th century onwards. The only situation whereby ET is considered superior is when it is used for modern music. Such music written in the spirit of atonality, serialism, impressionism or other abstract techniques requires that there should be no key-coloration or differences of effects from one key to another.

Meantone Temperament is not practical for most 20th-century music because of its restrictions caused by wolf intervals. However, when Meantone Temperament is used for Renaissance and early Baroque music, it is considered vastly superior to all other systems because of its harmoniousness. When ET is used for Renaissance and early Baroque music, it sounds abrasive. All of its 3rds and 6ths sound like wolf intervals to musicians accustomed to the qualities of early music including that of voices and other instruments.

Continued on Next Page

The Restoration of Historical Temperaments

Continued from Previous Page

Any temperament is superior when used for the proper music but inferior when used for music out of its historical period. Music sounds best and most effective when it is performed in the style of temperament that was in use when it was composed. Composers instinctively absorb and transmit to their compositions the best qualities that are inherent in the temperament in which they might be working.

"Any temperament is superior when used for the proper music but inferior when used for music out of its historical period. Music sounds best and most effective when it is performed in the style of temperament that was in use when it was composed."

Equal Temperament did not and could not retain the treasured qualities such as key-coloration supporting tonality and the characters of the keys that once existed in the previous temperaments. In addition, a variety of just intervals other than the octave, equal and proportional beatings and greater harmoniousness in the common keys are all qualities that are lost in ET. Therefore, ET depreciates the quality of the music of past centuries which depends on the characteristics previously available from the older temperaments. Regardless, all temperaments, whether historical or equal, are valued the same.

There were countless varieties of Meantone Temperament in the past, but for the purpose of simplification and comprehension, readers are usually referred to Aron's 1/4 Syntonic Comma Meantone Temperament. In this, a little more than two-thirds of the harmonies have effects that are very close to that of Just Intonation. This is possible because eight out of every 12 M3rds are in complete Just Intonation. Three of the augmented 2nds serve as 6:7 m3rds that are almost in Just Intonation. In addition, the good major and minor triads contain sets of beats that are in exact simple proportions to each other. It contains the ultimate in harmonious sound of any temperament while at the same time it is practical and easy to tune. These qualities render Meantone Temperaments to be as valuable as ET.

During the several centuries that Meantone Temperament remained popular, composers were content to compose within the limitations of only two-thirds of the possible harmonic resources. Compositions remained simple in scope because the goal was to write music for the glory of God and not man. The closer that one could produce music to sound as if it were in Just Intonation, the closer one was to following God's laws both natural and spiritual.

Octave stretching demonstrates the acoustic law that for every gain in temperament there is a comparable loss. When an aural tuner tunes treble octaves so that a M3rd, a M10th, and a M17th sharing common lower tones all beat at exactly the same speed, the tuner believes that his octaves are not stretched at all. Electronic verification demonstrates that inharmonicity is present. Thus, when the octaves sound just or unstretched, they nevertheless are stretched by inharmonicity. This is natural stretch. When M3rds share common lower tones with M10ths and the 10ths beat faster than the 3rds, and when M10ths share common lower tones with M17ths and the 17ths beat faster than the 10ths, the octaves are stretched more than by their natural amounts. This is defined as extra octave stretching in this article. Extra octave stretching also exists in the tenor section when during the 6:3 octave test the m3rd beats slower than the M6th.

During recent years, instructors at PTG conventions and writers in the *Journal* have been stressing that we should accept as much octave stretching as possible. This solves many problems of inharmonicity resulting in the following: a) The 8:1 intervals are favored over the internal harmony including the octaves; b) the piano is more brilliant because of sharper high notes; c) the M3rds, 4ths, M6ths, M10ths, and M17ths all beat faster; d) and fast beatings of M10ths and 17ths add tremendously to the singing tones and resonance of pianos when the damper pedal is used during musical performances.

"Compositions remained simple in scope because the goal was to write music for the glory of God and not man. The closer that one could produce music to sound as if it were in Just Intonation, the closer one was to following God's laws both natural and spiritual."

The ultimate in extra octave stretching is clearly described in the article "Equal Temperament by Pure Fifths" by Jim Coleman Sr. in the *Piano Technicians Journal*, August 1997. This tuning is based on the ET within a Just Fifth (not the octave) which was published by Mieczyslaw Kolinski in 1959 and by Lucas Mason in 1985 in his book *The New Tuning*.

The ET within a Just Fifth is compared in the following chart with two other theoretical temperaments: ET within a Just Octave (the standard ET), and the ET within a Just Fourth. The intervals used in the chart are the first five intervals out of the harmonic series. These are the intervals that are most

	Equal Temperament within a just fourth	Equal Temperament within a just octave	Equal Temperament within a just fifth
Octave	4.69 cents narrow	0.00 cents	3.35 cents wide
Fifth	4.69 cents narrow	1.96 cents narrow	0.00 cents
Fourth	0.00 cents	1.96 cents wide	3.35 cents wide
Major Third	12.12 cents wide	13.96 cents wide	14.80 cents wide
Minor Third	16.81 cents narrow	15.64 cents narrow	14.80 cents narrow
Total Deviations	38.31 cents total	33.25 cents total	36.30 cents total
Results	15 % increase in tempering	Standard amount of tempering	9 % increase in tempering

significant in tuning and temperament. Compound intervals like the M6th (a 4th plus a M3rd) and likewise the m6th, the 7ths, the 10ths, etc., are not included because they duplicate the effects of the basic intervals and therefore distort the calculated results. The 2nds and the tritone are not included because of their impracticality in temperament considerations. The chart lists the deviations in cents from Just Intonation for each of the five basic intervals in the three temperament systems.

The calculations in the chart reveal a perspective that reflects what happens to the total amounts of the beatings of all these intervals throughout the whole piano. The chart proves that the more tempering of the octave that is done, the greater is the total number of beats of all the intervals added together. Thus, if one either narrows the octave or widens it from the best aurally acquired Quasi-Just Intonation condition, the piano will become noisier and less harmonious because of the extra beats.

According to acoustic law, by doing extra octave stretching, brilliance and resonance is the gain while reduced harmoniousness is the comparable loss. Also, the extremes of the keyboard are favored over the middle section. A special gain for ET within a Just Fifth is that the m3rds are slower and the root position minor and Major triads are simply proportional in their beatings. (For example, in the minor triad A-C-E, the A-C m3rd beats exactly the same speed as the C-E M3rd). The comparable loss is an increase in beating from the M3rds, 4ths, M6ths, and octaves.

Since brilliance versus harmoniousness is the basic consideration, it should always remain optional for every tuner whether or not to apply any extra stretching in his or her work. The harmonic series is an element of nature. Without it, harmony would not exist. Music is based on the philosophy of justly intoning the harmony. The goal of keyboard tuners throughout history has been to reduce the amount of clashing dissonance (the beatings) within whatever temperament systems they were using. The smoother and more harmonious the tuner could make the instrument sound, the more professional he was judged to be. The recent trend for extreme extra octave stretching is pointing toward erosion of these principals and values.

Extra stretching creates a wonderful resonance that is especially noticeable from M17ths and 10ths in the bass and lower treble sections during performances. During the 19th century, when the Victorian and Well Temperaments were in use, this resonance existed among the black keys of pianos even though no extra octave stretching was done. The present-day musicians who are praising the current trend for extra octave stretching evidently feel the need for recapturing this lost resonance.

In the extreme octave stretching of the new ET within a Just Fifth the M17ths are exactly the same size as the black key Pythagorean M17ths in the Well Temperaments by Werckmeister, Vallottii, Kirnberger, Young, Stanhope, and Prinz. By using the ET within a Just Fifth, Jim Coleman Sr. is thus preparing the way for musicians to accept and appreciate these resonant sounds from the era of Well Temperaments.

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In the past, this resonance was available only among intervals involving the black keys. Therefore, when a composer like Chopin needed resonance, singing tone or power he instinctively placed the bass notes on black keys. In turn, this indicates that when performing classical compositions, the extra resonance that is desired will still be needed only among the black keys. By restoring HTs, pianists will have access to resonance without having to resort to extra octave stretching.

This restoration into modern tuning practice is not a threat to the continued use of ET. Instead, it is an addition to our music resources. HTs should be made available to any pianist who is specializing in tonal classical music composed before the 20th century in general.

For professional piano technicians, tuning HTs can mean increased business. Offering the customer a repertoire of more than one temperament is a definite enhancement of his or her professional image.

Becoming a Well-Tempered Pianist

By Enid Katahn

Reprinted, by permission, from Piano and Keyboard, *January/February 1998.*

Most pianists learn how *not* to listen. Forced by circumstance to play on a wide range of instruments in varying sizes and stages of disrepair, pianists — if they really listened — might cease playing altogether.

In my own case, I am driven by an almost religious compulsion to take music to where people are rather than waiting until they came to me. Moreover, I am burdened with an abnormally nervous nature, with the consequent need for many tryouts of my programs before I feel the control I want in my formal recitals. It has been my custom for many years, therefore, to preview my concerts for schools, retirement centers, hospitals, and the like, to be sure I was emotionally ready for my public appearances. This has been a wonderful relationship between me and my home city, Nashville. But, the pianos!

How many times have I been shown to a grand piano which "was just tuned last year." How many times have I prayed that my fingers stroking the keys would act as a fairy-tale kiss to change my frog of a spinet into a prince of a concert grand. I have heard of pianists who refuse to play on such monstrosities. But could I reasonably expect these institutions to ante up and buy new instruments, when they didn't even have a budget for tuning what they had? No, in a sense, I needed them more than they needed me.

Accustomed as I was, therefore, to listen inwardly for emotional inspiration, and — in desperation — try to take pride in the fact that I was probably the world's greatest Out-Of-Tune-Spinet player, I was certain that my ears had been far too numbed to hear any difference in a change of tuning.

Enter Ed Foote, the "well-tempered" piano technician. Ed had begun talking to some of us several years ago about tuning methods other than Equal Temperament, and the musical possibilities this might offer. He put one of these tunings on a piano in his workshop and urged me to come and try it. Even though I expected little or nothing from this trial, sometimes — with Ed — it's better to give in immediately because you know he'll wear you down. I went. I played. I was conquered.

The contrasts inherent in Well Temperaments, have caused me to re-evaluate my entire approach to the Classical and Baroque literature. Suddenly, complex chord structures, changes of key, modulations, and returns to the home key have taken on immeasurably more significance.

Imagine my amazement at discovering that I could hear these chord-quality differences, and that they generated an excitement simply not present in Equal Temperament. I could actually hear the contrast between the serenity of the more pure, calm chords, and the wavering, pulsating activity of the more tempered ones. It was then that Ed and I banded together with Amy Dorfman, a colleague of mine at Vanderbilt University's Blair School of Music, to present a program demonstrating and performing in several of these tunings. It was then, too, that I decided that at least one of my own pianos had to be in a Well Temperament because I found that the quality of the sound stimulated so many good musical ideas. (At present, recording has been completed on a CD, *Beethoven in the Temperaments* [Gasparo].) Now, both my home and studio pianos are tuned in Well Temperaments.

The contrasts inherent in Well Temperaments, have caused me to re-evaluate my entire approach to the Classical and Baroque literature. Suddenly, complex chord structures, changes of key, modulations, and returns to the home key have taken on immeasurably more significance. As an educated musician I had, of course, been aware previously of all this harmonic activity, but had never fully realized the drama with which these events can occur. And this drama takes place in sound. It is audible in the chords played, as well as in the overtone series. Not only do certain keys have an overall aura or character, but within each key, every chord seems to have its own hue. It is as though one mingles with a cast of colorful personalities in exploring the changing chordal landscape. Some keys or chords, such as F-sharp major, are quite raucous in effect while others, such as C major, are suddenly pure and calm to a degree not possible in Equal Temperament.

Many musicians, among them Alfred Einstein,[1] Glenn Gould[2] and Alfred Brendel[3] have speculated on the reasons for composers' choice of keys. Many others have professed

themselves drawn to this or that specific key. My feeling is that, in the Classical era, choice of key, sonata-allegro form, and the expansion of the development section within that form was directly influenced by the wide range of key "character" available on instruments tuned in a Well Temperament. It is this character that I would like to see available once again on our modern instruments, which in my opinion, are better suited to the large spaces of today's concert halls.

I practice all kinds of music on Well Temperament with no difficulty. Can you use it for chamber music? Absolutely. Vocalists report that the first time through is somewhat unsettling, but by the second time, it's even easier to stay in tune with the piano because adjustments normally needed for Equal Temperament are not longer necessary.

Does Well Temperament offer the same enhancement to *all* musical periods? Not to my ears. For Baroque and Classical music, it is ideal. Schubert sounds spectacular. The B-flat-Major Sonata, DV960, for example, has a C-sharp-minor second movement that becomes positively chilling in its effect when played on a Well-Tempered instrument. Beethoven's "Waldstein" has a pure ring that makes the controversial long pedalings in the last movement perfectly possible, and "fluttering" of the pedal becomes unnecessary.

As for the Romantics, much of Chopin, Schumann, and Brahms seems more singing in these tunings. In this regard, I think particularly of Chopin's D-flat Nocturne, or the first appearance of the second theme of the G-minor Ballade. Schumann's C-Major Fantasia has far more natural resonance than you will find in an Equal Temperament, and the last A7 chord of *Papillons* actually lasts long enough to do the required release of each note in turn until you are left with an A that your audience can still hear. I love the sound of Brahms in a Well Temperament, but I also feel that through greater exposure to the sound of these tunings, my musical taste has changed.

A full century separates Beethoven's "Moonlight" Sonata from Ravel's *Jeux d'Eau*. Ravel was already experimenting with bi-tonality, and I don't believe he had the same desire or need for the exploitation of key character as did Beethoven. Even though I can certainly practice impressionist works on my Well-Tempered pianos, I much prefer Equal Temperament for these and other 20th-century music because distinctive chord characteristics begin to seem an unwelcome distraction.

I urge you investigate these tunings. I think you will be surprised to find how wonderful your piano sounds — especially in Classical and Baroque literature, since the purer keys really ring, the calm places are more tranquil, the agitated ones even more turbulent, and the expression and power of the modern grand is heightened. At the very least, you owe it to yourself and your students to experience playing in these tunings. Nothing makes the harmonic structure as apparent, and the harmonic modulations clearer and more evocative.

I believe you will experience, as I do, a deepening of your own emotional intensity as you play. Your imagination will be prodded by the changes in key-quality to extend your tonal palette, and to make these changes even more obvious to the listener. For me, this is the best of all possible worlds.

Notes

1. Alfred Einstein, *Mozart: His Character, His Work* (Oxford University Press, 1945); see Chapter 10 "Mozart's Choice of Keys" (pp. 157-163).
2. According to a letter to a fan and to the editors of *Glenn Gould, Selected Letters*, John P.L. Roberts and Ghyslaine Guertin, (Oxford University Press, 1992) the matter of key and key association was a most important one for Gould throughout his life (pp.99-100).
3. Alfred Brendel, *Music Sounded Out*, The Noonday Press, Farrar, Strauss and Giroux 1990. Chapter called, "A Mozart Player Gives Himself Advice" (p.5) "Mozart, more than most other composers, expresses himself differently in minor and in major keys."

By David Patterson, RPT
Toronto, ON Chapter

The Bartolomeo Chronicles

Bartolomeo Examines the Keys

Bartolomeo has spent many an hour traveling down blind alleys while diagnosing or working on the keys themselves. He studies the brand new instrument in front of him and is struck by the simplicity of the keystick. It's a simple pivoting motion. It moves up and down. There's a front, middle and back contact point. It's all deceivingly simple. But this piano plays poorly and has slow keys.

He first isolates sticking keys being caused by tight front rail bushings. The technique takes only a few seconds and tells him immediately if a full easing of the keys is called for. Both pedals are depressed at one time while his fingers run over the keys glissando-style with the palm down. The right sustain pedal disengages the damper and spring so that they are unable to push the wippen and key back to rest position. Many faulty key and high friction situations are masked or hidden altogether by this artificial assistance caused by the damper return. Eliminating it from the equation assures a truer picture of what the keystick itself is doing. The left, or soft pedal is used to lift the hammer butt and wippen as high as possible. With the wippen now unable to push back on the key, the same purpose is served as in the damper example. The result with both pedals down? – a more accurate picture of the behavior of the key itself. When the keys are "played" from end to end, the sluggish ones generally stay down and clearly indicate the need for easing at the front rail.

After easing, Bartolomeo notices that the balance rail bushings are squeaking. Liquid lubrication is an option, but he still carries an oval-shaped graphite pencil for this particular malady. Although skeptical at first, Bartolomeo now accepts the proof that graphite applied to each of the 176 bushings will be a permanent repair. Any regular pencil will work. However, the large, soft-lead, oval pencil has two flat sides that are over 1/8 inch long. Thus, they are quick and easy, custom-made for this repetitive task.

He checks the cloth itself to see if the squeaking is caused by poor material or wicking glue. With glue-impregnated cloth, thin glue or poor cloth allows the liquid to penetrate further than is necessary for adhering of the cloth to the wood. Touching or tapping a tool against the bushing reveals a hard surface because the glue has ended up close to the exposed area of the cloth. In these cases, Bartolomeo does what he can for squeaks or noises, with the awareness that only rebushing will be a permanent solution.

Sharp key angles are suspect areas where worn balance rail bushings will impede the normal functioning of the note. A key not traveling in a straight line at the balance pin exhibits a bushing worn on one side only. Typically, the pin has worn a deep semi-circle down close to the wood. It is surprising how often a zero-repetition note can be caused by this one condition alone. The only real solution is to rebush periodically.

The balance hole is definitely one of the most important areas in the entire piano. Bartolomeo knows that many new pianos are inadvertently ruined by technicians' procedures at the balance hole and he strives to be a non-member of this group. Small amounts of material are removed or compressed at the sides of the hole in tiny increments. For this, the key must be placed into the piano each time for testing before further removal of material. Only then can the accurate result be achieved. Lifting up on the key and letting go allows a properly-fitted key to slide slowly but firmly back into position.

The job requires either delicacy or experience. For success, it is mandatory that one of the two be utilized.

Next month, Bartolomeo puts a damper on things.

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

Baldwin Builds Custom Keys for Platinum-Selling Pop Artist Ben Folds

Industry News

Mason, OH — Certainly, one of the best pop music acts of the latter 1990s is Ben Folds Five. The group's winning combination of clever lyrics, catchy yet sophisticated songs and piano-driven arrangements has earned platinum album sales and a loyal fan base around the world. Baldwin is proud to announce that Ben Folds — the group's pianist, vocalist and principal songwriter — will now tour and record with two new Baldwin Artist Series grand pianos that have been handcrafted especially to meet his unique preferences.

Folds became a Baldwin Artist in 1998, but has played Baldwin pianos since his childhood. For the last few years, his battle-scarred Baldwin Model R has been lugged around the country and was, so to speak, on its last legs. Enter Joe Vitti, Director of Baldwin Concert Grand Operations. After meeting with Folds to better understand his approach to his music and instrument, Vitti offered to build custom Baldwin pianos for Ben at the company's Conway, Arkansas, facility.

Ben Folds of Ben Folds Five with his custom pianos at Baldwin's Conway, AR, facility. (Photo by Mike Kemp)

Baldwin has always valued the opinions of professional pianists. For decades, their input has been reflected in ongoing refinements to the company's product line. According to Folds, his pianos must combine superb performance qualities with an appetite for the road. "What we were going for, first, was a piano that could truly be played in a rock band in 1999," said Folds. "It has to keep up from venue to venue with a loud rock band and a tour bus. It takes some stamina in the instrument. And I've gone through a few!

"It also needs acceleration — to be extremely dynamic and responsive — the words that people use when they're talking about cars! (laughs) It needs to go from extremely quiet to as loud as the instrument can get in a second. Some pianos are slower at this than others."

When it came to sound quality, Folds requested the classic, full-bodied Baldwin tone. "That's one difference between me and some rock piano players," explained Folds. "I prefer a tone that has some substance and meat under it. I believe that the place where the tone should cut through is in the meat of the note. Also, when the band stops playing, leaving just the piano, you still get a big sound. The piano is still taking up a large amount of space rather than just being a "tinkly" sound."

Armed with Ben's requests and the expertise of the Baldwin Concert Grand Production Staff, Vitti began his assignment. First, he hand-selected the materials, then determined the necessary processes and ultimately, oversaw the construction of the special instruments. At specific times, Vitti stopped the work for evaluation and to provide additional comments to the craftspeople, many of whom have been building pianos at Baldwin for decades.

The result was two, ebony-finished, 7-foot Baldwin SF10 Artist Series Grand Pianos. Vitti is quick to point out that the difference between a Baldwin production model and a custom instrument is that the latter is prepared for a specific purpose rather than general use. "Ben has a real good sense of music in general and what he is trying to get from his music specifically," said Vitt. "It's my job to interpret what an artist wants and translate that into technical terms."

Folds intends to use one of the new Baldwin grands as his primary touring instrument. The other will be kept exclusively for recording sessions. When asked if a specific piano can influence his songwriting, Folds responds, "I'm embarrassingly picky. I almost feel like there is a certain number of songs in any given piano, if it's inspiring. There are some pianos that are either sterile or just not happening for some reason and I probably won't be inspired to

Continued on Next Page

Continued from Previous Page

do anything on those. But with a really good piano in a really good room, I'm into it. These new pianos are one of the best things that has happened for me in our band's career."

Winner of MTNA-Steinway & Sons Collegiate Artist Piano Competition Will Receive Steinway Grand

Cincinnati — A historic agreement was formalized at Steinway Hall, in New York City, on Monday, May 10, 1999 between Music Teachers National Association (MTNA) and Steinway & Sons when the piano manufacturer officially agreed to be the new sponsor for the MTNA Collegiate Artist Piano Competition.

As sponsor of this competition, Steinway & Sons will award the winner a new Steinway Model M, 5'7" grand piano in an ebony satin finish with matching artist bench — a retail value or $35,900. Steinway's partnership takes effect with the 1999-2000 competitions. The first award will be presented at the 2000 MTNA National Competition in Minneapolis, Minn., on March 27, 2000. This competition is the only Steinway & Sons-sponsored competition where Steinway provides a grand piano as a prize.

Representing Steinway & Sons at the May 10 ceremony were President Bruce Stevens; Executive Vice President Frank Mazurco; Vice President of Concert & Artist Activities Worldwide Peter Goodrich; and Director of Institutional Sales Sally Coveleskie. Executive Director Gary L. Ingle represented MTNA.

"Steinway & Sons is proud to sponsor this prestigious MTNA competition," states Steinway's President Stevens. "Steinway & Sons is committed to supporting excellence in music education. As national winner, a student has reached a level of mastery that should be highly rewarded. For that reason, a Steinway grand piano is a fitting prize for that accomplishment."

Executive Director Ingle praised Steinway's dedication to excellence in piano making as well as its commitment to the collegiate performers who participate in the competition. "MTNA is delighted that our flagship competition — the Collegiate Artist Piano Competition — will be sponsored by such a distinguished piano manufacturer as Steinway & Sons. The students who compete at this level are the very best in the nation. It is fitting that they receive one of the best instruments in the world as they begin their teaching and performance careers. We are indeed grateful for Steinway's generous support."

The MTNA-Steinway & Sons Collegiate Artist Piano Competition is open to high school graduates who have not reached the age of 27 by March 27, 2000. Entrants need not be enrolled in college. Students must play one complete major work for piano and orchestra and present a solo recital program. Recital pieces should include significant representative selections from at least three of the five following periods: Baroque, Classical, Romantic, Impressionistic, and Contemporary. The total program must be memorized and may not exceed 50 minutes.

To enter, students and teachers must send a completed application form — with entry fee — to MTNA by their state deadline (most are in September). For applications and additional information about MTNA-Steinway & Sons Collegiate Artist Piano Competition and other MTNA competitions, please contact MTNA national headquarters at (513)421-1420, mtnanet@mtna.org or www.mtna.org.

The MTNA National Student Competitions take place on three levels—state, division, and national. Categories include composition for elementary through collegiate students and performance competitions for junior high through collegiate levels in piano, strings, woodwinds, brass, percussion, voice, chamber music, organ and guitar. Competitions are administered by Music Teachers National Association (MTNA), and sponsored by the MTNA Foundation and various other corporate supporters.

Peter Goodrich, Steinway and Sons vice President of Concerts and Artists Activites (FROM LEFT); Gary L. Ingle, MTNA executive director (seated); Bruce Stevesn, Steinway & Sons President (seated); Sally Coveleskie, Steinway and Sons Director of Institutional Sales; and Frank Mazurco, Steinway & sons Executive vice Presidnet, pose around a Steinway Model M grand piano like the one to be awarded to the first-prize winner of the MTNA-Steinway & Sons Collegiate Artist Piano competition.

New Members Join In June

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Astoria, NY 11105

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2971 Park Avenue
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St. Louis, Mo 63130

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Alan L. Meyer
2470 Sunset Mesa Court
Las Vegas, NV 89142

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Dan S. Cragun
1165 Buff Way
Eugene, OR 97401

996.. Alaska
Henry W. Hartman
125 Gail Drive
Wasilla, AK 99654

Calendar of Events

September 24 - 26, 1999
NYSCON
Days Inn, Kingston, Ontario
Contact: John Hall (613)353-6175
Box 41, Battersea
ONT, K0H 1H0 Canada

October 2, 1999
Ohio State/Central East Regional
Grave Piano & Organ, Columbus, OH
Contact: Kim Fippin, (614)890-2197
275 Foxtrail Pl
Westerville, OH 43081

October 8 - 10, 1999
Texas State Association
Waco Convention Center, Waco, TX
Contact: James Geiger (254)867-9589
3924 Kendall Lane
Waco, TX 76705

October 29 - 31, 1999
North Carolina Regional Conference
Radisson Hotel, High Point, NC
Contact: Dave Feeny (336)697-2646
3455 McConnell Rd
Greensbobo, NC 27405

February 18-21, 2000
California State "Tune-In 2000"
Santa Clara Marriott Hotel, Santa Clara
Contact: Roland Kaplan (408)927-0620
6528 Leyland Park Dr.
San Jose, CA 95120

All seminars, conferences, conventions and events listed here are approved PTG activities. Chapters and regions wishing to have their function listed must complete a seminar request form. To obtain one of these forms, contact the PTG Home Office or your Regional Vice President.

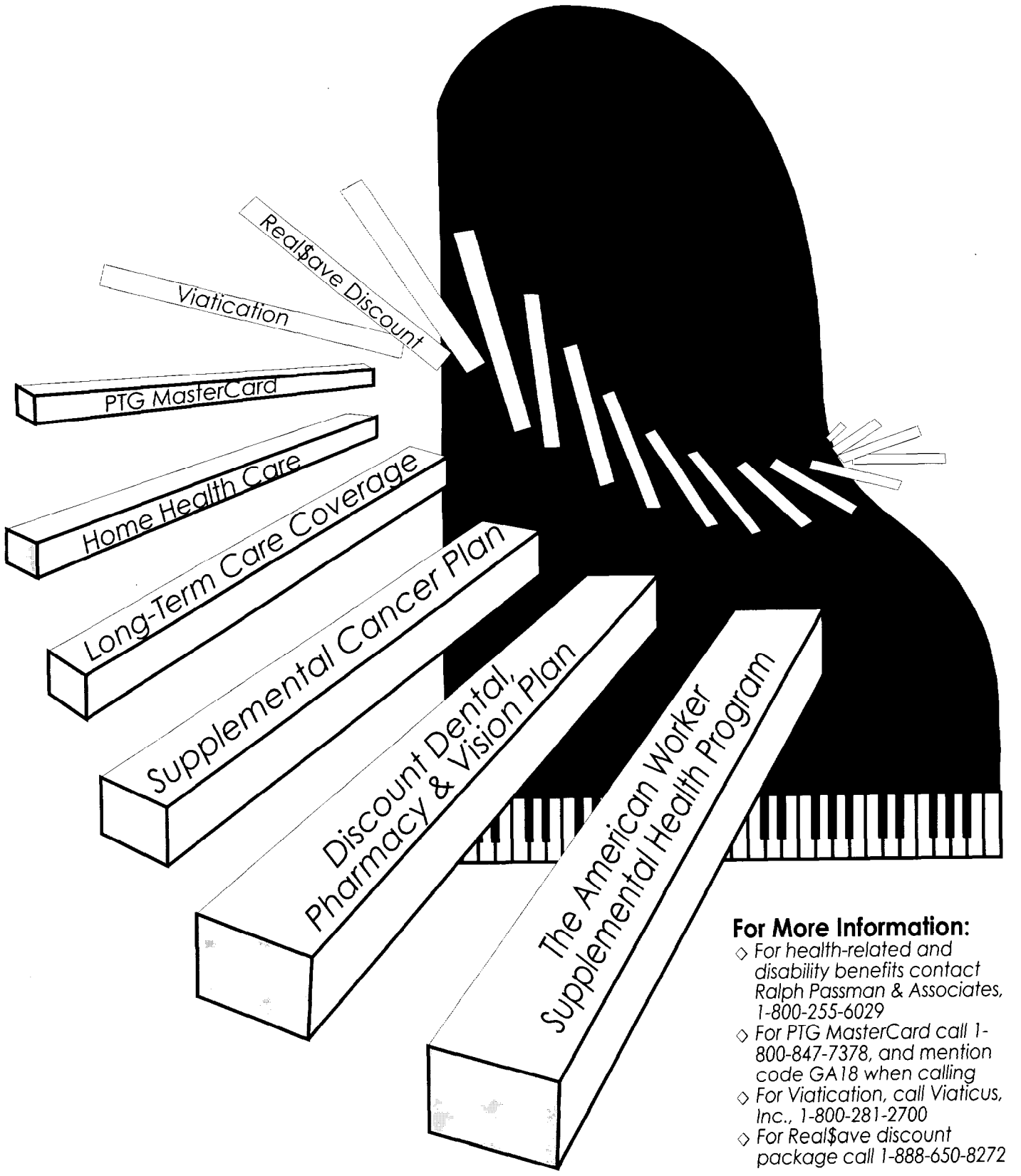
Once approval is given and your request form reaches the Home Office, your event will be listed six-months prior and each issue until the month in which it is to take place.

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

MEMBER BENEFITS

The Privileges of Membership

Because members' personal and professional circumstances change over time, the products and services offered by PTG must change as well. The number of membership benefits available through PTG recently expanded with one idea in mind: to meet members' needs by providing quality products and services at a competitive cost.



For More Information:

- ◇ *For health-related and disability benefits contact Ralph Passman & Associates, 1-800-255-6029*
- ◇ *For PTG MasterCard call 1-800-847-7378, and mention code GA18 when calling*
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After KC, a Time to Look Ahead

The PTGA had another exciting time in Kansas City. I renewed friendships from the past and made valuable new friends that I'm sure I will always treasure. Being a part of the PTGA has enriched my life, and I am pleased to be part of the PTGA

Already we are planning for next year's programs. It is not too early to schedule next year's convention in Washington, DC.

Welcome to the new members that joined us recently. Remember you get a discount on registrations by being a PTGA member. There are still some state convention coming in the fall, and I'm sure you will want to be a part of them. Those conventions can be as pleasurable as the national one.

You can still send your membership dues for 1999 to me. It is not too late. I'll be looking forward to meeting you at PTGA activities during the year.

— Marilyn Raudenbush
PTGA Treasurer

AUXILIARY exchange

DEDICATED TO AUXILIARY NEWS AND INTERESTS

Read Any Good Books Lately?

Phyllis Tremper
PTGA President

Read any good books lately? August is the month to sit in the shade (that's the air conditioner to you) and catch up on all those books, magazines, and newsletters you subscribe to. I belong to five book clubs, fifteen newsletters, mostly on health, and about twenty magazines a month. Oh, yes, I forgot my classical CD record club. It's a good thing I don't have a full time job outside of the home or there would be more piles in my office than there already are! You see, I love to read. Then why do I go to the country library every month and take out more books? I guess there's something about borrowing a book and having a deadline; i.e. as in presidential monthly columns, that makes you read those books faster than the ones you own.

It's a good thing that I don't take the local paper and several major ones too. I used to take the *New York Times, Chicago Tribune, Wall Street Journal* and *Investor's Daily.* I read them all from cover to cover several days or weeks later! I gave that up and now I get my daily news on NPR at eight o'clock in the morning, 5 p.m. in the afternoon and on a New York satellite television station at 11 p.m. Do I know what's going on in the world or what??

Back to my original question. If you haven't read any of the *Chicken Soup for the Soul* books, you should start this month. The stories are short and you can read one or two while dinner is cooking. But be sure to have a box of tissues close by because the *Chicken Soup for the Woman's Soul* is a tear jerker. Those poems and stories certainly brought back memories for me.

Mary Higgins Clark is a fast read also. Her stories are short and sweet and can be read in one sitting. Stories such as *All Through the Night* or *Pretend You Don't See Her.* She has written twenty or more books by now and many are good for an August night when you can't sleep because it's too hot. Oh, did I mention I have a new, stronger pair or glasses by the time you read this? First change in my prescription in twenty-two years. Maybe I'm over working my eyes, but I just can't stop reading. Must be an addiction! At least it's not the worst one! Do I like reading? Ask me if I like breathing.

So put your favorite music on and read a book. ***Music is the Spice of Life*** and reading is the meat and potatoes!

A good book is the best of friends, the same today and forever. — ***Martin Tupper***

— Phyllis Tremper
President, PTG Auxiliary

NCRC Activities a High Point

Our activities for the spouse program for the 1999 North Carolina Regional Conference in High Point, NC, will begin on Friday, October 29, 1999 at 9:30 a.m. We will meet in the hotel lobby and travel by van to see a furniture factory in operation. We will be guests of the Thayer Coggin Furniture Company, manufacturers of fine contemporary leather upholstered furniture.

Mr. Thayer Coggin opened the plant in 1953. They are one of a very few surviving family-owned furniture companies in the United States. It is now operated by his daughter, Mrs. Royal Wiggin, who will give us a tour of their facility. For additional information on Thayer Coggin Furniture, check out their web-site at www.ThayerCoggin.com.

Following the tour of the factory, we will enjoy a lunch at the Atrium Cafe, four blocks south of the hotel. At 2:30 p.m., we will visit the Furniture Discovery Center and have a guided tour of the Angela Peterson Doll Museum.

Saturday and Sunday will be at your leisure. There are a variety of area activities you can enjoy. You can shop at some of the worlds finest retail furniture showrooms, hike the trails at the Piedmont Environmental Center, or even visit the nationally acclaimed natural-habitat North Carolina Zoo, located about 45 minutes south of High Point.

We hope to see you in High Point!

— Renee Duncan

Nobody can go back and start a new beginning, but everyone can start today and make a new ending.

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DISPLAY AD INDEX

TECH GAZETTE
YAMAHA
August 1999

A Word (or Two) About Voicing.

Voicing seems to be the magic word whenever piano tone is discussed. As much as the hardness of the hammer felt is significant and important, I consider well-prepared hammers a must before we actually use needles. We must always assure that the hammers strike the strings squarely and all strings simultaneously. With used pianos, grooves in the hammer heads must always be removed by filing and with a new set of hammers it is of utmost importance that the hammers are filed lightly.

Before working on the hammers I always check to make sure that all strings of the individual unisons are level. After the strings have been leveled, the hammers filed squarely, and the travel adjusted by using travel paper, there is a neat little trick I have been using for many years.

I push the hammer against the strings and apply slight pressure. I then pluck each string of the unison. The strings should be muted equally. If a string keeps on ringing, the unison needs leveling. With grands, I use a simple hook made of coat hanger wire to pull the hammer toward the strings. On upright pianos, I simply push the hammer to the strings with my finger.

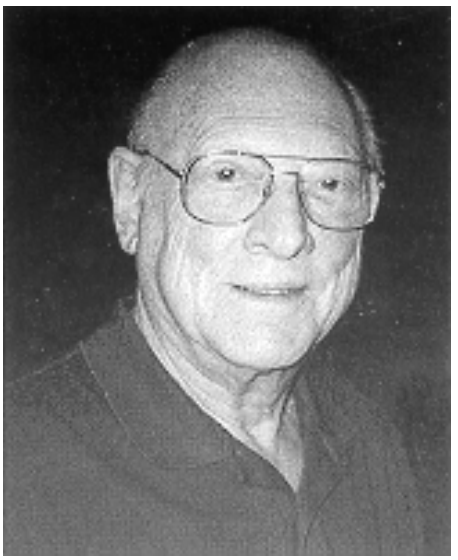
Here are a few items I consider to be most important and are part of what we generally call voicing:

- A fairly well tuned piano
- A well regulated action
- Pedals in working order
- Hammers filed to proper shape (when working on a used piano) and properly spaced and traveled hammers.

Only after everything else has been done, the actual needling (acupuncture) should be performed.

A Tip

Remember how convenient it used to be to remove Yamaha grand cheek blocks? The wing screws did the trick. Later, these convenient little friends of the technician gave way to the more "eye pleasing" regular wood screw. If you service instruments in recording studios or other places where the cosmetic value is not of prime concern, you can order the "old fashioned" wing screws from Yamaha Piano Parts and enjoy the convenience. Order Part #KGPWN.



Ernest Juhn

"Ernie, you did a great job. Now it's my turn."

— Count Basie

Ernie was born in Vienna, Austria and educated in Prague, Czechoslovakia. After apprenticing in Prague he continued to gain more experience in Israel and later returned to Vienna, Austria to gain more knowledge. His greatest enjoyment in servicing pianos comes from the calls of a perplexed customer who can't explain the situation and he has to go out and trouble shoot to find a solution. Ernie has serviced pianos for many great pianists, but one of the great responses came from Count Basie after Ernie had serviced a piano at Radio City Music Hall. The Count simply said, "Ernie you did a great job. Now it's my turn."

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