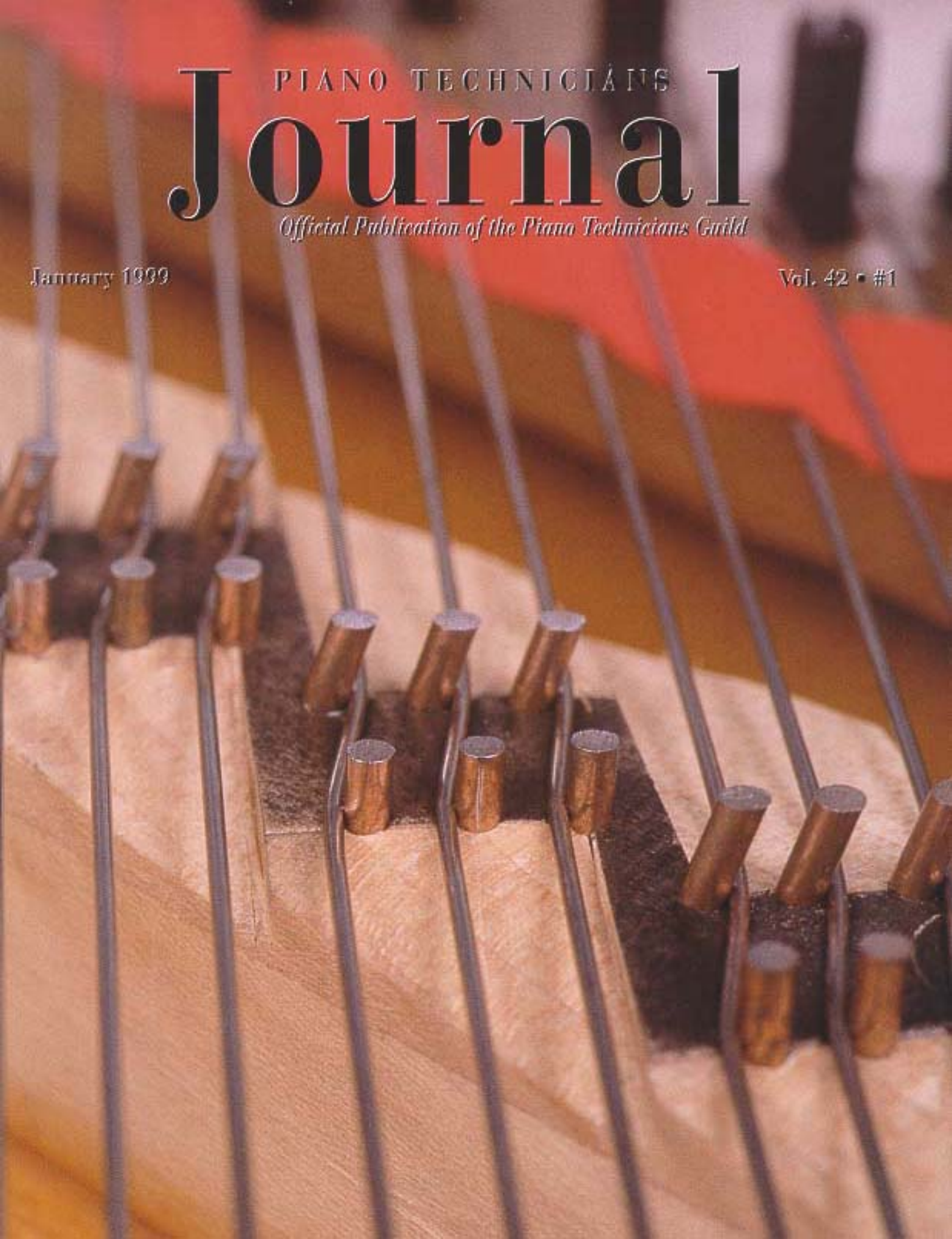

PIANO TECHNICIANS Journal

Official Publication of the Piano Technicians Guild

January 1999

Vol. 42 • #1


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PIANO TECHNICIANS
Journal
Official Publication of Piano Technicians Guild

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Editorial

Piano Technicians Journal will accept unsolicited materials, photographs and ideas, however, unsolicited materials will not be acknowledged unless accepted for publication; it is advisable, therefore, to submit copies of original materials, including photographs or transparencies. Without prior arrangements with the publisher, all materials submitted for publication will be retained by the *Journal*.
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EDITORIAL PERSPECTIVE

The Journal: Different But the Same

Welcome to Volume 42, #1 of the *Piano Technicians Journal*. As we begin a new year of publication, you may notice some subtle changes in the magazine.

First of all, Del Fandrich's tenure as a Contributing Editor has come to an end. I'm sure all of you will join me in recognizing and appreciating Del's unique contributions to the *Journal* over the past three and a half years. Stepping in as a new Contributing Editor is Bob Hohf, who is already familiar to *Journal* readers as the author of several fine articles in past years.

Steve Brady, RPT
Journal Editor

Second, Editorial Assistant Jeannie Grassi, RPT, has been promoted to Assistant Editor of the *Piano Technicians Journal*. Jeannie's primary duty during 1999 will be to produce the "Q&A/ Roundtable" department each month, and her first effort in that regard appears in this issue.

As we assess the input from November's *Journal* reader survey, we'll probably be making changes to reflect that input. For now, though, I'd like to share with you the thinking behind some of the *Journal* staffing changes we've already begun. With this issue I am completing my fourth year as your *Journal* Editor. We've recognized for several years now that this job tends to burn people out, and the reasons for the burnout factor may include the fact that our *Journal* Editors have almost always been working piano technicians who took on the many additional responsibilities of writing, editing, and generally overseeing the production of a monthly magazine – a huge job. Adding to the burden is the fact that they never get to take a real vacation from the inexorable deadlines.

When I took on the job, I did so in full knowledge of the burnout factor, and with the expectation that I would stay with the job of Editor for three to five years. One of my responsibilities, as mandated by our Board of Directors, is to assist in revamping the editorial structure of the *Journal* to help ease transitions between editors and help reduce the forces that sometimes lead to editor burnout. At a meeting with Executive Director/*Journal* Publisher David Hanzlick and PTG President David Durben last fall, I agreed to serve a fifth year as *Journal* Editor, with the proviso that we would begin phasing in an "Editorial Board" structure which would, in essence, divide my job into three smaller jobs by the year 2000. The hiring of Jeannie Grassi is the first step towards a *Journal* Editorial Board. Another of Jeannie's duties in 1999 will be to edit and prepare one complete issue for publication while I take a vacation.

Despite the present and future changes in the *Journal*, one aspect that will always remain the same – as long as I have editorial responsibility, at least – is the policy of open discussion and debate of technical matters. Much of the material in the present issue was generated in response to articles that appeared earlier in the pages of the *Journal*. I feel strongly that such open dialogue is critical to the ongoing health of not only the *Journal* but the profession as a whole. Truth can be an elusive commodity; one person's gospel is another person's lie. It is only by such sifting, evaluation, and re-evaluation of contrary opinions that we can get our minds completely around a subject and come to informed conclusions. And even those conclusions must remain open to new and better information as it emerges.

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

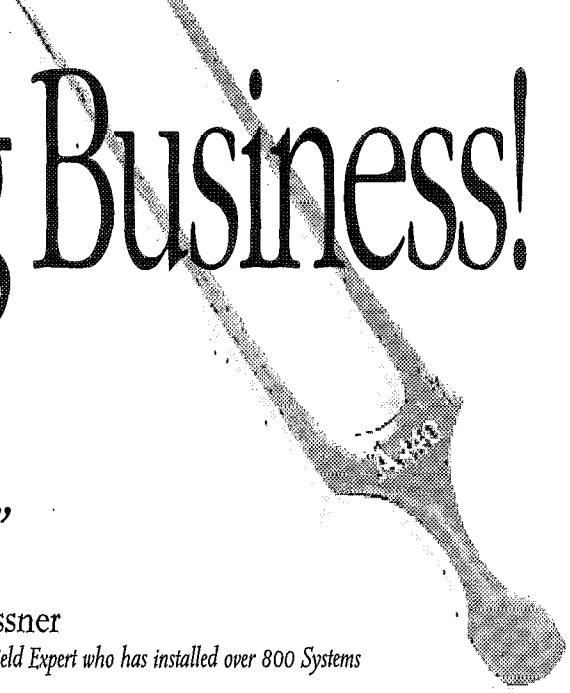
IN ADDITION

COVER ART

Close-up view of the Wapin Bridge (patent pending) in its two-pin configuration. See Bob Hohf's review of the new Wapin CD on page 31.

PIANO TECHNICIANS **Journal**
Volume 42 • Number 1 • January 1999

Build Your Tuning Business!



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

–Wally Meissner
Dampp-Chaser Field Expert who has installed over 800 Systems

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.

Build your referral business with Climate Control!

After you install a Dampp-Chaser Climate Control System in your client's piano, something predictable happens: It Really Works!

How often do we purchase a product that promises improvements but doesn't perform? So, when a product fulfills the promise, we're excited. We tell our friends and family about our smart buying decision. And, piano owners with a new Dampp-Chaser System do the same.

The newly-installed System makes obvious improvements in the piano which your client will notice in two or three days—the tuning holds better, the pitch remains stable, the touch is more consistent, and, because unisons and octaves stay clean, there is more quality in the tone. Now that the piano sounds better, your client is playing more.

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!*

Build your regulating and voicing business with Climate Control!

According to experienced Dampp-Chaser installers, your tuning client experiences a change in attitude toward the piano after the installation of a System—she begins to place more value on the piano as a source of enjoyment.

With a System, the piano sounds better which lends the perception that her playing is better. Or, she observes that her child's playing has improved. And, she is pleased that the child is willing to practice for longer periods. (Children also recognize the enhancement of tuning, touch and tone.)

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!*

Call Dampp-Chaser for unbiased print materials to convince your clients of the necessity for climate control. Also, ask for our FREE Business Building Kit.

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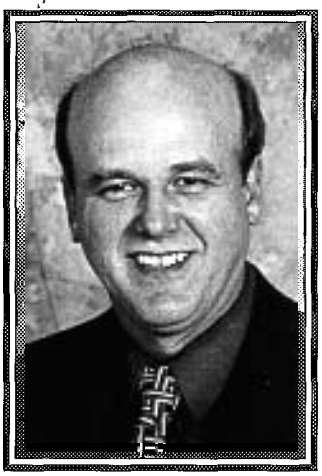
Focusing on the Future

So what's new? A new year, new prospects, perhaps a new focus on the future?



David P. Durben, RPT
PTG President

As I look at the coming year (it seems like a natural enough thing to do in January), I like to speculate about what I can do to make my business more efficient, how I can serve my clients better, how to make more money, etc. And along the way, I'd like to find a way to make my life more meaningful, and perhaps even a bit more fun!

It seems like I am being nagged daily about the benefits of more efficient time-management tools and techniques, though for now I think I'm about as efficient as I can be without driving myself crazy. I'm also concerned about being so focused on being effective that I miss the fun of being alive. I have learned a great deal about time management from the time I've spent on PTG's Board of Directors, but it is altogether too easy to become a workaholic in the process, so time management must include regular breaks. But there are a number of great products and services available to us as piano technicians that simply weren't available until recent years. We have the obvious electronic gadgetry, which is being downsized and powered up daily: from laptop to hand-held data-base, scheduling, even tuning hardware and/or software. There's also the explosion of communications options: digital cellular, voice-mail, caller ID, etc.

One area that shows particular promise for piano techs is that of new products and services for pianos. Imagine that! Today, I can go to a customer's home, and in short order I can diagnose action geometry problems that would have left me scratching my head 10 years ago. I can also order high-quality replacement parts that will solve a very wide range of these and other problems.

Faced with scaling problems a few years ago, I would have to work out all the details of rescaling a piano on my own, where today I have a choice of doing that with the help of a computer program, or simply taking a few measurements and ordering what I need from a supplier. And how about those climate control systems? Customized to virtually any situation I might encounter (which, where I live, covers a very wide variety).

From adhesives to lubricants to string covers, there's something new on every horizon. And our figures show that the more we do, the more diversified we become, the more money we make, and the more value for the dollar we are able to deliver to the customer.

Yes, 1999 looks to me like it's going to be a *very* good year. How does it look for you?

David P. Durben

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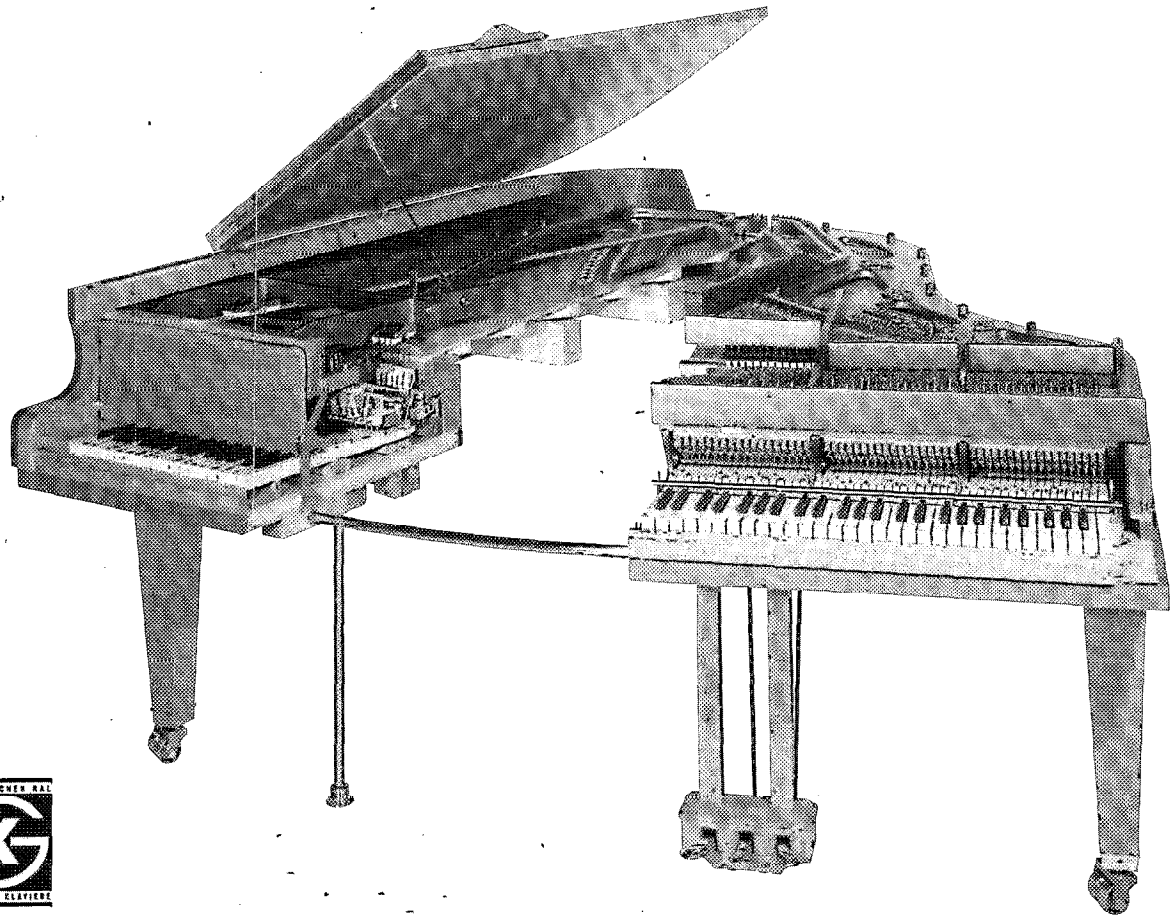

On the way to SEILER's 150th anniversary our piano-makers have continuously perfected the craftsman's art with a string of innovative patents. Which is why we have nothing to hide when it comes to the inner values of our grands and upright pianos. After all, Seiler is the only piano manufacturer to fulfil the strict quality criteria of the RAL "Quality Seal for German Pianos" with all its models. If you would like to learn more about Seiler, simply give us a call or send for our video. Phone +49-9321-9330, Fax +49-9321-36367. Or contact SEILER America Prestige Pianos Tom Kidder. Phone 614 866-2605, Fax 614 759-8573.

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Insurmountable Opportunities

As we begin the new year and reflect on the one just concluded, the wisdom of Pogo seems especially relevant to the piano market, the music climate, and the Piano Technicians Guild. Rarely has the piano world had so much to celebrate or so much to look forward to. The challenge, of course, is how to make full use of opportunities that confront us.

David Hanzlick, CAE
PTG Executive Director

The increase in new piano sales last year and this year leads the list. Those results were, no doubt, the result of many factors, including the hard work of the industry in promoting the piano and piano music.

These trends include:

- The well publicized research on the impact of piano study on children which sparked great interest among the parents. Many parents have been motivated to purchase a piano and enroll their children in piano lessons. PTG members have worked hard to publicize the research results in their communities through the distribution of the 'Keys to Higher Learning' and other methods.
- Media coverage was generated by the research. Feature stories in major newspapers and magazines have cropped up regularly on the positive impact of piano study. The November issue of *Money Magazine* carried just such a story. PTG members are often quoted in these stories and the PTG web page is frequently listed as well.
- Baby-boomers are purchasing pianos to further their childhood interest or to correct their childhood mistake of not fully appreciating the importance of piano study. Boomers also appear to appreciate the development of the computerized playing systems that allow anyone the pleasure of acoustically produced piano music regardless of their ability to play.
- A strong economy produced the consumer confidence necessary to sustain sales. The economy remains strong.

Like the larger piano industry, the Piano Technicians Guild confronts innumerable opportunities. We need to be sure that we are able to surmount each and every one.

Piano 300, a world-wide celebration of the 300th anniversary of the piano's invention, provides an important opportunity for piano technicians to inform their clients and their communities about the importance of the piano to music, to culture and to personal development.

The Smithsonian will open a major Piano 300 exhibit in March 2000. The Piano Technicians Guild has been active in the Piano 300 planning process since its inception. Piano 300 may well add to the renewed interest in the piano and increase piano sales and service activity. Piano 300 is an opportunity for piano technicians, both individually and collectively through PTG, to do good and to do well. This opportunity is not insurmountable.

The climate appears to be ripe for increasing the awareness of the piano technology profession among the portion of the public that is musically aware. This opportunity results from years of work by the Trade Relations Committee that represents PTG at the National Association of Music Merchants show each year, and the Teacher Relations Committee's work at the Music Teachers National Association's annual convention and the PTG Foundation's annual teacher scholarships.

As awareness of piano technology and the PTG grows, so, too, do the opportunities for this organization. Membership continues its slow but steady upward path. The 4,000-member mark is within reach. As membership grows, so, too, does the opportunity to increase the number of Associates who take and pass the examinations to become Registered Piano Technicians. Those numbers have also seen promising increases.

New communications technologies provide an unparalleled opportunity to reach a wide audience at almost no cost. The rich resources of PTG's Piano Page are accessible to everyone, almost instantly. How encouraging that each reader of the *Money* Magazine article on pianos was referred to the PTG Piano Page for more information!

> **"We are confronted with insurmountable opportunities."**
>
> **— Pogo**

Indeed, Pogo is right. Well, at least in part. We are confronted by many opportunities. But are they insurmountable?

The future of piano service and the Piano Technicians Guild is bright as we look forward to the exciting developments ahead. The enthusiasm, energy, and leadership of PTG's innumerable volunteers and other members in responding to these boundless opportunities will make the next few years a time of celebration and growth. I am looking forward to it. I hope you are, too.

Thanks, PTG!

I want to thank the Piano Technicians Guild for their presentation to me of the 1998 Golden Hammer Award. It is sitting here in my office, and I get a deep feeling of wonder and appreciation from it every time I look at it. It means more to me than I can say, especially because you caught me completely by surprise. I really didn't think I was standing in that line!

I want to tell you what the PTG has meant to me, for I feel that I have gotten far more from you than I have been able to give back. My first convention was a small one in Bedford, Mass., in 1974, but it was a revelation to me. I never dreamed the Piano Technicians Guild could be such an open, welcoming group of people. I was a stranger, but you took me in. The amount of information available at this little seminar I found to be staggering. I remember some of the instructors, Ernie Juhn, Jim Hayes, Steve Jellen, Wally Brooks, Newton Hunt, Steve Fairchild, and I remember how amazed I was at their friendliness and their willingness to share their knowledge with all who wanted to know. I soon realized that this was a group of people I admired and wanted to know better as human beings, as well as wanted to hear telling me more about piano technology, of course. I was hooked, so I promptly applied for membership and became a Craftsman Member of the PTG (the exam was easier then).

The years since 1974 have only confirmed and strengthened that opinion, and anything I have done for the Guild has been done in only partial repayment for those things the Guild has done for me. You turned me into a piano tuner, a tuning machine designer, a tuning examiner, a businessman, and finally even a piano string scale designer. May you prosper and grow forever!

Thank you again for the Golden Hammer Award, and a special thanks to Keith Bowman for the very creative design and meticulous craftsmanship he put into it. For those who haven't seen it, it is made of exotic tropical woods and has the shape of an Accu-Tuner, but is about twice the size, and the Golden Hammer lies there in state, visible through a transparent cover panel. It's beautiful, and again, thanks to you all.

— Al Sanderson, RPT
Boston, MA Chapter

In Support of Old Pianos

In a guest editorial in the October 1998 *Journal*, Ralph Long, RPT, said some unkind things about those whom I love — old pianos. I love old pianos. I'm currently working on an 1894 Huntington. I expect it to last another 25 years when I'm done. I may make $1,000 profit if I'm lucky. That's good. There are some I make no profit on. But some people play golf and make no profit. Some claim to learn something from every game played. I learn a lot from every piano worked on.

Some old pianos were made by design, some made by accident, and some by imitation. Some designs are mysterious and some accidents led to superior enhanced musical qualities. Some imitations were better than originals. All are interesting and have a purpose.

Some additional thoughts to consider:

1. There are more old pianos than new. Counting from 1890 to 1940 there are twice as many pianos as those built from 1940 till now. If we were to eliminate those older pianos, we would cut our business by 75 percent. In addition to that statistic (which I don't guarantee to be accurate), pianos built in the 1950s, 60, and 70s had problems as great as those that plague old uprights. There were a lot of cheap spinets made out of plastic. In the 80s, digital keyboards replaced those. Other pianos got larger in size and much larger in price.
2. Is it in our best interests to tell customers to dump that $100 upright or that $200 spinet and buy a $10,000 52" high-gloss, trouble-free upright?
3. I've found it impossible to evaluate a piano I've never tuned. We can't expect our customers to be better at evaluation than we. We may find 15 notes on a piano that don't play at all; the customer may be aware of one or two, but not real critical to what he/she plays.
4. Ninety percent of my customers are still in the first grade musically and are struggling to play "Twinkle, Twinkle Little Star." Will they do better with a $10,000 upright? If so, why not say, "Buy this $50,000 grand and start playing Rachmaninov." Better think before dictating.
5. Uprights can be fixed to meet customers' needs for about the same as spinets cost in the 1970s, that is, $595 to $795. I will make any old upright play well for $500 to $600. (Okay, I'll exclude birdcages).
6. How often do you hear, "I'd buy a piano, I've always wanted one, but I'm not sure little Johnny/Mary can learn to play. Here's my answer:

Here's a $300 upright. Doesn't look like much, but it will play, especially here (middle C up and down an octave). I paid $100 for it, took out some parts here (top octave and bottom octave) and moved them here (middle octaves). You can have lessons on this for a year without knowing anything is wrong with it. If you do well, I'll refund the $300 and sell you this spinet or upright for $700. Take lessons for another year and I'll sell you this one for $1,500 minus the $700. Become a concert pianist and I'll order one from Steinway or Yamaha.

To some customers I say this in answer to the query, "Is this a good piano?" "A bad piano is better than no piano."

— Ken Churchill, RPT
Orange Co., CA Chapter

'It's a thrill to be an *All Steinway School* because I really feel that I'm working with the best.'

– Enrique Rosano
Chief piano technician
University of Arizona School of Music

When Enrique Rosano fell in love with the incomparable Steinway sound as a 7-year-old, he couldn't possibly imagine that 40 years later he would be an important part in the purchase of nearly 100 of these exquisite musical instruments.

But as chief piano technician at the University of Arizona School of Music at Tucson, Enrique, indeed, was a key factor in earning this university the highly valued *All Steinway School* designation.

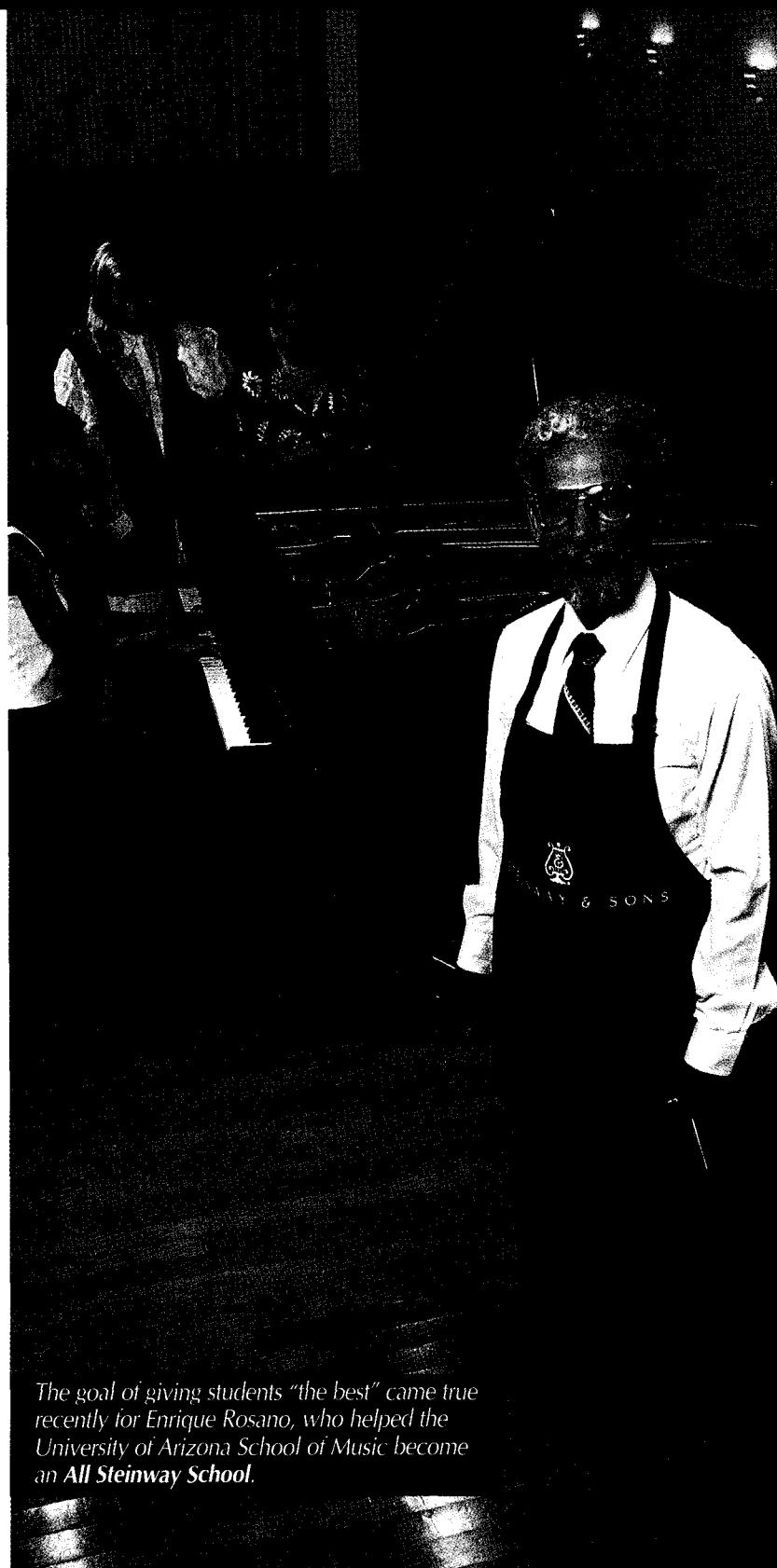
"It's a thrill to be an All Steinway School because I really feel that I'm working with the best," says Enrique, who compares Steinway pianos to finely tuned racecars. "When I prepare a Steinway for a recital, I know its sound will remain fresh and strong from beginning to end. Its consistency and durability are simply beyond compare.

"Each Steinway has its own distinct character that delivers a beautiful, sophistocated, full-bodied sound." And because of his strong appreciation of Steinway quality, Enrique also has become part of history. The university's recent selection of 98 Steinway grand and upright pianos represents the largest single institutional purchase since Steinway & Sons began handcrafting the world's finest pianos 145 years ago.

For information on Steinway & Sons' technical seminars or for a diskette on Steinway's new guidelines for institutional piano service, please contact Gary Green at (800) 366-1853.

STEINWAY & SONS

One Steinway Place, Long Island City, NY 11105.



The goal of giving students "the best" came true recently for Enrique Rosano, who helped the University of Arizona School of Music become an ***All Steinway School****.*

Feeler Gauge as Piano Tool

An automotive feeler gauge makes a very handy piano tool. The very thinnest blades can be used to check for gaps when bedding a grand's keyframe; the thin blades (.003"-.008") are excellent for working glue between a rib and soundboard; and the thicker blades (.020"-.025") can be used in a pinch for regulating Renner drop screws.

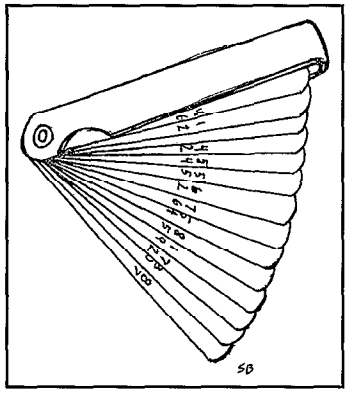


Figure 1 — Automotive feeler gauge.

— Kent S. Burnside
Dayton, OH Chapter

Handy Beeswax Applicator

After successfully fighting the battle with BO, what do you do with the "empty" speed stick? I'm sure most of you think "File 13," but you will be throwing away a valuable tool in the Fight Against Friction....

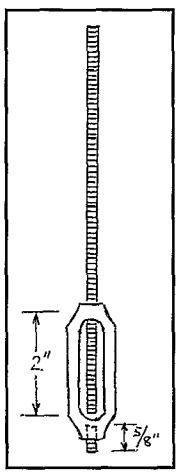
In a ***double boiler*** (I hope the emphasis sinks in — to disregard it would be to court danger, fire, death, and a few other similar nasties) melt beeswax until liquid. Clean out the deodorant casing and return the piston to the bottom position. Pour in the beeswax and allow it to cool. ***Presto!*** A convenient, mess-free way to carry lubricant for keybeds, bottom boards, or any place you can think of to use beeswax lube.

Variations on the theme: Mix into the liquefied beeswax some pure, unscented talc. Mix enough to make the mix practically stiff so you must sorta help it into the mold before hardening. Another handy carrying device for such lubricants is an empty lipstick tube.

— Bob Bartnik
Reprinted from The Richmond Update, *newsletter of the Richmond, VA Chapter*

Measuring Length for New Pedal Rods

This month's suggestion is a continuation of last month's discussion of variable length rods for grand lyre repairs. Missing pedal rods often must be replaced with standard supply-house sets, which are usually not the exact lengths needed; sometimes the three rods themselves are of different lengths. To obtain a precise measurement for the new rods, take a 1/4" all-thread rod 19 inches in length and screw it into the right-handed thread end of a turnbuckle. Cut the eye off the left-handed screw-eye on the other end, leaving a short threaded rod 5/8" long. Insert the short rod into the socket on the rear of the pedal (pedal not depressed) and extend or retract the long rod to the proper length. Cut the new pedal rod to this measurement. Be sure to go through the bushed lyre guide rail holes, and take into account any cushions, punchings, or rubber tips which may be part of the system when taking your measurements. If the pedal does not have a socket at the rear, but a hole that accepts a pin from the pedal rod instead, simply remove the short rod and rest the turnbuckle directly on the end of the pedal. The turnbuckle will yield a variable range of two inches. It is also advisable to scratch or file very small marking near one end of each of the new pedal rods to indicate their placement: 1. Sustain, 2. Sostenuto, and 3. Una Corda.



— Michael Slavin, RPT
Reprinted from NewsLINC, *newsletter of the Long Island/Nassau Chapter*

Magnetic Vinyl Strips

I would not want to be without these thin strips of magnetic vinyl in my tool kit. I cut about 1" x 12" from a sheet of magnetic vinyl I purchased many years ago at a sign supply store (this material is what they use to make those magnetic signs for car doors), these strips originally served as a stick-to-the-strings guide for setting let-off in the piano. Three 1/32" strips used together would give a let-off distance of nearly 1/8" for uprights. Two strips would provide 1/16" let-off for grands.

Although for a number of reasons I rarely use them for setting let-off nowadays, I've found them simply indispensable for sweeping and probing tight crannies under the plate when looking for the paper clip or other object causing an annoying buzz. The strips are flexible enough to fit the tightest spots, even when fed in from the perimeter of the plate in the treble, and they're soft enough not to scratch the soundboard. As an added bonus, their magnetic quality will sometimes aid in actually pulling a ferrous object out from its hiding place.

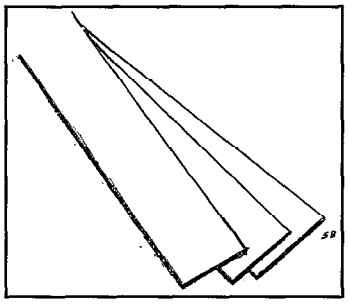


Figure 3 — Magnetic vinyl strips.

— Steve Brady, RPT
Journal *Editor*

What Makes a Piano Truly "World Class"?

Pride

Young Chang, winner of numerous awards and competitions from around the world, is the first piano manufacturer to receive the prestigious ISO 9001 approval for quality manufacturing and design.

Passion

Designer and engineer Joseph Pramberger demands nothing less than perfection in quality, beauty, sound, touch, and value. His passion is reflected in these pianos, and his signature is stamped on each one.

Prestige

There is nothing that compares with the joy of playing or hearing a quality grand piano. We use modern technology to build a classic instrument that will last for generations.

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Young Chang, the world's largest piano builder, uses the finest materials and is the only piano to offer a fifteen year full warranty. Joseph Pramberger's history as a third generation master piano craftsman is legendary.

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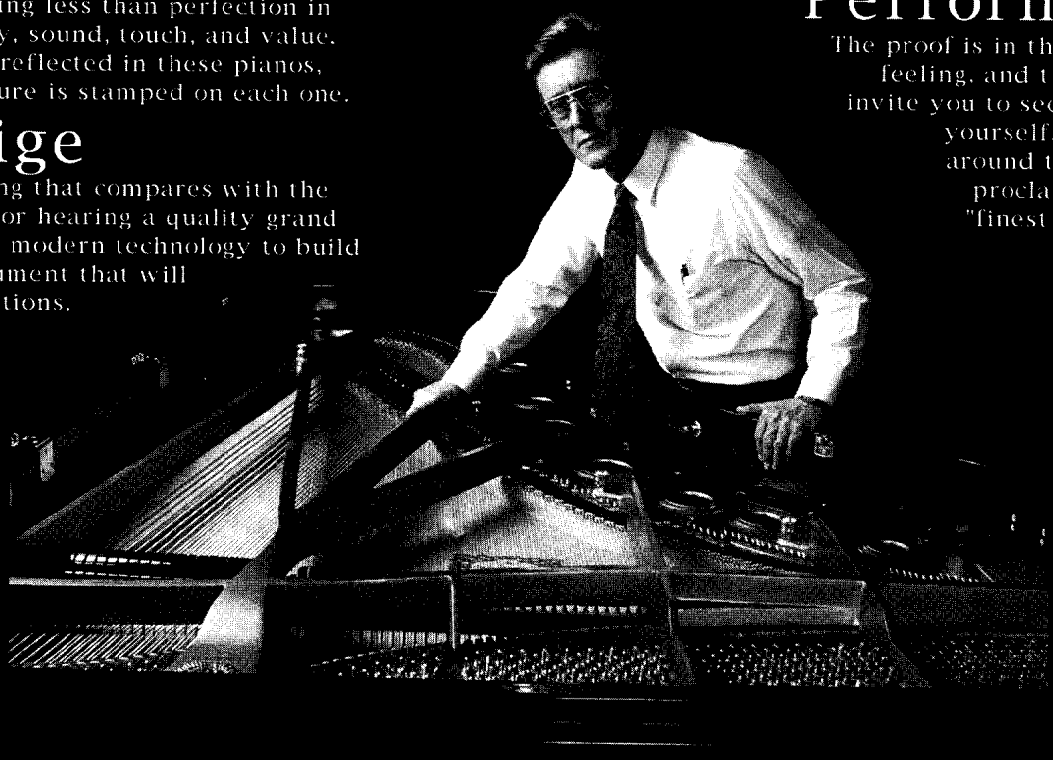

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Taxing Matters

This is the second installment on automobile (and truck) expense, in which I promised to discuss the questions: What expenses can you deduct? And what records do you need to keep?


Bill Mendus, CPA

There are two methods for computing auto expense: the actual expense method and the standard mileage method. Under the actual expense method, you add up all of your expenses for a particular auto and multiply them by your business use percentage. Your business use percentage is a fraction, the denominator of which is your total mileage for the year for that auto and the numerator of which is your business mileage for the year for that auto. The result is your deduction for the year for that auto. If you use a second or third auto, you get to repeat the process.

Under the mileage method, you simply multiply your business miles for the year for the auto by a flat rate. For 1998, the rate is 32.5 cents per mile. You generally may not switch from the actual expense method to the mileage method. You can switch the other way – from the mileage method to the actual expense method. You can use different methods for different autos. But you need to decide up front which method you will use for a particular auto.

Which method is better? It depends on how much expense you incur and how many miles you drive. To explain this, let's look at the actual expense method in more detail. Under this method, you add up your gas and oil, repairs, insurance, cleaning, and all other direct expenses for the auto for the year. To this you add an allowance for depreciation, then apply the business use percentage for the auto to the total.

There are limits on depreciation, the so-called luxury auto rules. For 1998, depreciation is capped at $3,160 the first year, $5,000 the 2nd year, $2,950 the 3rd year and $1,775 thereafter. For leased vehicles there are parallel rules capping the amount of lease payments you can deduct. Since the caps are different for each year, and since you generally cannot switch from the actual expense method to the mileage method, it is important to consider your expenses over the lifetime of the auto in making the decision of which method to use.

The depreciation limits cover most autos, but there is an exception. Vehicles with a gross vehicle weight of 6,000 pounds or more are exempt from the limits. Most pickup trucks qualify, and some sport utility autos qualify. For example, the Chevy Suburban and Tahoe, the Toyota Land Cruiser and the Hummer qualify.

The depreciation caps place something of an upper limit on the amount of expense for any auto. My experience with auto expense over the past several years is that if you drive an auto a substantial number of miles you are generally better off using the mileage method.

For example, the mileage method deduction for 20,000 miles is $6,500. If we are dealing with any but the second year of the auto's life, our depreciation under the actual expense method will be about $3,000 or less. Suppose we have insurance of $1,200, and gas and oil of $1,000. We will have to incur $1,300 of repairs and other expenses to match the mileage deduction. It may be a tossup.

At 25,000 miles, the mileage method deduction is $8,125, and unless you are in a really high insurance state or incur a ton of repairs, the mileage method is going to be better than the actual expense method. And if you keep your auto for a long time, the depreciation for the later years is limited to $1,775, which makes it even tougher to beat the mileage method.

To sum this up, when you buy an auto or truck you should make a projection of your expenses over the life of the vehicle and sit down with your accountant and discuss which method to use to maximize your deductions over the life of the auto.

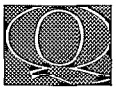
What records must your keep? First you must keep separate records for each auto you use in your business. Second, you must be able to substantiate your total mileage and your business mileage, preferably in writing. Substantiation of your total mileage might consist simply of a notation of the ending mileage at each December 31st for each auto. Personally I walk out to my car right before the ball falls each year and make a note of the mileage.

Substantiation of business mileage is generally tougher because it involves detailed record keeping. You probably don't want to read this, but it is still best to create your mileage records each day as you go along. In other words, my best advice is to throw a notebook in your car or truck and record your mileage in it. Or make a notation of the mileage involved on each invoice you write. However, if neither of these ideas work for you, You can sit down periodically and make a record of your mileage. You could, for example, sit down at the end of each week or month, look over the invoices you have written and compile mileage records. I urge you not to let this job go for more than a month. I know from personal experience how hard it is to tackle this job if you have two or more months to do.

Finally, a couple of record keeping tips:

1. An incidental personal stop in what is an otherwise business trip does not destroy the business character of the trip. For example, if you stop for lunch or to pick up you cleaning in the middle of a day when all of your other stops have been for business, all of your mileage that day is still business mileage. This is true even if you go some reasonable distance out of your way to make the personal stop.
2. If you have what amounts to a continuous business trip, for example, an entire day of business driving, you are not required to record the mileage between each stop. A single mileage figure for the entire day is all that is required.

Pulsating String



My client has a very nicely rebuilt 85-year-old Hazelton Bros. grand. I tuned it last fall and again recently. She let me know a week later that she was not satisfied with the tuning. So I went back. The culprit was a pulse in the left string of the first unison immediately above the bass/tenor break. It turned out that she really was satisfied with the tuning, but she was hearing that pulse. Apparently this problem has been there before, but she thinks that last fall the pulse was gone after I tuned the piano. The string is firmly against the bridge. The other half of the string, which loops back to form the second string of the unison, has a clear, straight tone. Is it possible that tuning the piano to A-441 might have eliminated the pulse last fall? Any suggestions as to the cause? Any suggestions as to the solution?

— Arlie D. Rauch
Glendive, MT

Jim Coleman, Sr., RPT: There are several things that can cause a "pulsating sound" from a plain steel string. They all have to do with contact points. The termination at the bridge is the most usual location. You have stated that it is solid at the bridge. A question may be asked, "Is the bridge pin solid?" "Does the string groove on the bridge surface extend beyond or in front of the bridge pin?" Those are the usual problems at that end. Sometimes an over-sized bridge pin will solve this problem.

Strings can have an insecure termination at the agraffe or V-bar. The better rebuilders replace the agraffes during rebuilding to avoid that problem. But problems can also exist due to an irregular shape of the string. As a string is pulled up and down through the V-bar, a flat can be formed on the string. Sometimes this flat may rotate slightly at its termination and cause what sounds like "pulsating." The other cause of insecurity at the V-bar is when the V-bar surface has a flat spot. This flat spot is created when the string in motion bears upon the front edge of the flat when it is up and bears upon the back edge of the flat when the string is in its downward excursion. Fixing the termination surface is the obvious answer in this case. Replacing the string is the other answer. Of course, any time you change a string, you invite tuning instability for several months.

The third place where problems of this nature can occur is along the speaking length of the string. This can be a drop of glue on the string, or contact of the string with the damper wire. When a string moves in a vertically oriented elliptical motion, this vertical motion can oscillate back and forth over a range of a few degrees so that it might contact a damper wire only two or three times a second. It is simple to check visually for any damper wire contact, just move the damper head away from the string and see if the "pulsating" stops. If so, you need to adjust the strings or the damper wire. Also visually inspect for any foreign matter on the speaking length of the string.

Mike Jorgensen, RPT: Since there are no termination problems, I suspect a defective string. Since replacing it might not solve the problem, consult with the customer as to whether they are willing to pay for labor and return visit(s). In my experience such sounds are often due to wire with excessive twists from poor stringing techniques or once having been pulled beyond elastic limits. Scaling problems often manifest as lack of clarity just above the break, but this is less likely here because the problem is confined to one string.

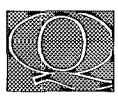
Roger Jolly: More likely if the individual string sounds false by plucking, it will be a faulty agraffe or badly grooved forward pressure bar. Unevenly placed bridge pins or a badly notched bridge can give the same symptom. Finally the string itself could be kinked or rusted.

Newton Hunt, RPT: This pulse could have a few sources: 1) The string itself, which only replacement would solve; 2) a loose bridge pin, which can be tested by placing a screwdriver on the pin and pushing while someone else plays the note. Put some CA glue down the side of the pin until the hole is fully filled and allow it to set for four hours; 3) a small split in the bridge allowing the pin to wave around in the air. Check that the waste end of the string is muted well. Check that the plate screws are all tight. Check the soundboard, bridges, ribs and rim for loose glue joints.

Chris Purdy, RPT: I once had an identical situation on a nice old Steinway D. The string "looked" perfect, but I ran my finger down the length of it and felt a very slight kink in the speaking length. I replaced the string and that was the end of it.

Del Fandrich, RPT: I've found that the most common cause of this type of string malady is a "kinked" string. This far down in the scale it's common enough that this is what I'd check out first. You can't always see this, but if you run your fingers along its length you'll probably find a spot where the stringer bent, twisted or kinked the string.

Strings & Such



I am a budding piano tuner/tech and I am at a loss as to how to replace a string in the treble section of an old upright. This particular string runs under the bass strings and I have already banged up my fingers and knuckles trying to figure out how to get the string looped around the "hitch" at the bottom. This is no fun. Any ideas?

— Patrick Greene

Susan Kline, RPT: Here are two approaches that might be a little easier. First, I take a piece of wire that I know is longer than I need, and I bend it in half. I put both ends under the pressure bar (sending them along an umbrella rib in a handle helps get them under the bar) and I pull some slack up into the tuning pin area. Then:

1. Take a section of a newspaper, and fold it over the doubled string. Insert the whole thing into the space between the treble and bass strings, from the top, and work it down until you can snag the bend and put it over the hitch pin. A stringing hook helps to snag the bend and move it around. The paper keeps the wire from dodging through

Continued on Page 18

Duplex Scaling System by which those portion of strings lying beyond each end of the vibrating portion are left free and tuned so as to correspond with some of the harmonics of the fundamental.
Oxford Dictionary of Music — 1992
Franklin Duplex Slider (212) 677-5760

Continued from Page 16

the bass strings and/or snagging on the bridge pins.

or,

2. Get the gadget from Pianotek (800-347-3954). It's called "The Stringer," and is a telescoping tube with various refinements for handling the wire. "Easy instructions," too. Once the bend is over the hitch pin, it can be secured either with small needle-nosed vise grips or with a small spring clamp. Once it is secured, you can use a stringing hook, your battered fingers, and/or screwdrivers to get the wire through the bridge pins. Then you can go to the top end, and tug on one and then the other end to be sure the wire isn't twisted around itself. Pull hard, cut to length, then make a coil on a dummy pin and move it over to the regular tuning pin; repeat for the other side; space the wire, press in the becket as you pull up the new string, pull up and tap down the coils, etc. Don't forget to turn out the old pins (beforehand) enough that they won't end up further into the pinblock than the rest when you've tightened the new wire. Ideally, the new coil should look just as good as the factory stringing (on a good piano) or better (on junk.)

Then tap the bend down onto the plate at the hitch pin, squeeze the back length above the hitch pin until it doesn't bow out any more, and don't forget to take off your vise grips or spring clamp. Good luck. Patience, practice, and the determination to get it right will win out in the end.

Dick Powell: Get a piece of small copper tubing (three feet) or so. Put one end of the piano wire through the tube and make a loop at the end. Take a small bass hammer and wedge it between the two bass strings that are in the way and twist the hammer so the two strings have a gap between them. Put the tubing with the wire in it down through the top and hook it on the hitch pin. Fasten a small pair of vise grips on the hitch to keep the loop from falling off. Then pray a lot, it's still not easy. I hope this makes sense.

John M. Ross: Take a tube like an extendable curtain rod and drill two holes in the end. Take a double length of the proper size piano wire, bend it in the middle and feed the two ends through the tube and out the end. Thread this behind the bass strings to the bottom, loop the end over the hitch pin, and then just pull the rod off, keeping tension on the string so it does not slip off the hitch pin. Cut the wire three inches above the pin, form a winding with a dummy pin, take it off the dummy pin, put it over the old pin, which was backed out a half turn. Then just tune it, and tap down at the bridge and hitch pin. Hoping this helps.

Joe Goss: There is a tool that fits the combination handle that will aid in placing most strings where they should be on the bridge. I do not know who sells it, maybe Pianotek. It is three inches long and 1/4 inch at the head with a slot for the string. It will not work where the key bed is in front of the bridge. It works by putting the tool on the string and twisting it to match the string deflection of the bridge pins then push it home. I have the tool but never use it, as letting down the tension on a few bass strings usually allows access to get the string on.

Ken Burton, RPT: The secret to this perplexing problem is a section of flat curtain rod. I have a section about 20 inches long that contains two pieces with one telescoping inside the other. I form the bottom loop of the string, then place the whole thing inside the curtain rod with the loop sticking out about two inches. Then, it is easy to slide the whole thing down between the two sets of strings, reach through and hook the loop on the hitch pin. I never leave home without my telescoping curtain rod.

Ted Simmons: You've received some good advice and I'd like to add my method to the list. Go to a party store (the kind that makes those vinyl balloons) and buy a couple of the two-foot long straws that they use to anchor those balloons. They should be of a different color. Tape the two pieces together, side-by-side. Insert one end of your string all the way into one color straw, double back and insert the other end up into the other color straw. The reason for the different colors is so you don't cross-wire the string. Slide the straws underneath the bass strings and the rest is easy. Two feet is adequate for most applications. I have replaced strings in spinets beyond the dampers by cutting these straws to eight inches or so and didn't have to remove the action. I did remove the screws and pull the action forward for more working space. Hope this helps.

"Pully" Keys

What are some favorite fixes for slightly "pully" keys? I've got a new piano in the field with some slight play, but given the hardness and lack of resiliency of the maple insert, its noise problems seem to vary quite a bit with humidity changes. It is difficult to find a fix that will have any kind of longevity. Is maple even the ideal material for these inserts? I've had trouble with this manufacturer before, especially when a player system is involved. Manual playing seems to keep the key in the same relative position on the pin, but the solenoid rails tend to push the key back and forth, magnifying the problem.

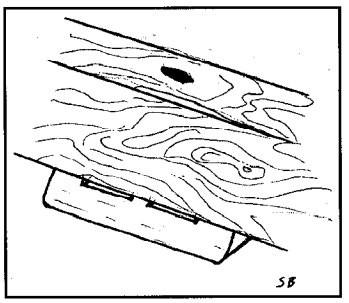


Figure 1 — Bottom of "pully" key, showing elongated balance hole.

— David V. Anderson, RPT
Rochester Hills, MI

Ross: Try wetting the hole with a glue/water mixture. This will swell the wood fibers, and should cure the problem. Be careful not to ease them too vigorously, as they will possibly be too tight then.

Hunt: Ralph Onesti sells a set of tools for installing new inserts of any wood of your choice. I think lemon wood is a good choice because it is hard as well as lubricious. I have also used poplar and maple with good results. Ralph's tool set is about $400. It was one of the tools I hated to give up when I left Rutgers. The set consists of about 20 sized feeler pins, an insert cutter and a key cutter that holds the feeler pins. It's very nice and accurate.

Kline: I wonder if olive would work for this application. It's also very oily and cuts smoothly, and is hard. I don't know if it's as hard as lemon, though. I think I still have some that I picked up in 1992 as I drove north through the Central Valley. Near Corning, Calif., there is a rest stop right in an old olive grove, with huge prunings just lying on the ground. It's a fun wood, though my favorite wood is still Pacific Yew. It is superb for handles, jigs and gauges.

Dave Peake, RPT: Cut a slit in the key where it pulls and glue in a piece of veneer. If you insist on the same material, use balsa or whatever the key was made of. Maple does not seem right for keys. Awfully hard for what it needs. Short of glue sizing, this is the best repair I know of for fixing "pully" keys.

Avery Todd, RPT: If you choose to insert veneer, as Dave suggests, be sure you put the insert on the correct side of the hole so that you'll end up with an even key alignment at the front.

Jolly: I have fixed this problem by inserting the correct size of Accu-Cauls™ to protect the bushing while steaming the balance rail hole. It has worked well with maple-shoed keys.

Bill Simon: Years ago I had a piano with really large holes for the balance rail pins, a case that looked perfect for inserts, but I had experimented with the inserts enough to know I hated them. I did this:

1. I swabbed the holes with a pipe cleaner and 5-minute epoxy, six or seven keys at a time, leaving just tackiness, not a lot of glue
2. I then set them on waxed paper, dropped some coarse pine sawdust (about the size of pretzel salt) down through the top, tamping it into the hole a bit with a tiny rod, and let it fully cure
3. I blew the sawdust out
4. And I eased the holes – Voila!

In the swabbed holes was a layer of pine sawdust adhering to the epoxy, enough that they reduced the size of the hole. Then, with a tapered key easing tool they were either squashed against the sides, or driven somewhat into the soft wood of the key. They then provided a quiet, correctly sized, hole. I also tried this with ground pecan shells that I use in sandblasting, but I did not think it worked as well.

I don't do this all the time, as it is seldom necessary, but then putting in inserts should not be done on every piano! I do know it worked out very well on that, and one or two other pianos. (By the way, I bought out a shop and have four or five cutters and thousands of inserts if anyone wants to buy some, – have had them, brand new, on a shelf for years, and would not consider using them.

Trademark Rights & Piano Rebuilders

A Response

By Morgan Malino, JD

It has come to my attention that an article titled "Trademark Owners Legal Interests in Rebuilt Musical Instruments" was published in the June 1997 issue of the *Piano Technicians Journal.* It seems that the article was nothing more than a marketing ploy for large manufacturers of musical instruments. Throughout the article is the suggestion that rebuilders of musical instruments who do not use replacement parts supplied by the original instrument manufacturer (termed "o.i.m." in the article) may be subject to legal action. I, however, would recommend that rebuilders continue to use factors of price and quality when making their purchasing decisions and not be frightened into making bad choices.

At its core, Trademark law is not about protecting companies, but protecting consumers. If consumers are savvy enough to know that 20th Century Fox has nothing to do with the Century 21 real estate company, then the law will not prevent either from using its name. The gravamen of trademark infringement suits has always been consumer confusion. A rebuilder who has honest advertising and truthful disclosures should not have to be concerned with the threat of a trademark infringement suit. If, however, a rebuilder conducts his business in such a way as to have the likely effect of confusing consumers, he may indeed be guilty of trademark infringement. A showroom, for example, which has both new and rebuilt models displayed without any reference to which is which could be potentially harmful to a trademark owner. The typical consumer may then associate inferior qualities of the reconditioned instrument with the o.i.m., thereby harming the o.i.m.'s reputation.

The June article suggests that to prevent such confusion rebuilders are required to disclose: (1) the nature and extent of the work done; (2) the absence of any association between themselves and the o.i.m.; and (3) dispel any notion that the o.i.m. is the guarantor of the goods. This is merely one commentator's opinion of what is necessary to prevent consumer confusion. The relevant legal standard is that a rebuilder must prevent likelihood of confusion on the part of a typical purchaser as to source, affiliation or sponsorship. In certain markets, this can be done merely with a statement that the product is used and the date of original manufacture. The typical purchaser of a used car, for example, knows that routine maintenance is necessary to keep the vehicle working properly. If you buy a car that is five years old, you might expect the tires and the brake pads to have been replaced. The older the car gets, the more likely it is that the transmission or the carburetor had some work done to it. Similarly, the typical purchaser of a piano recognizes that the routine servicing of the instrument is required for its proper maintenance.

"I, however, would recommend that rebuilders continue to use factors of price and quality when making their purchasing decisions and not be frightened into making bad choices."

The author of the June article, however, claims that although vintage instruments are purchased mainly by educated consumers, "the likelihood of confusion cannot always be eliminated by the degree of care

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taken in selection." He states: "Anecdotal and survey evidence of consumer confusion as to a perceived association between the o.i.m. and the rebuilder will often strengthen this point." The simple reality is that purchasers of vintage instruments know that if the instrument is in good condition, it is probably because a rebuilder has put a significant amount of time and energy into restoring it. Money spent on a survey would be wasted and any anecdotes would certainly fall short of their mark.

Furthermore, the article attempts to use language in *Champion Spark Plug Co. v. Sanders*, 331 U.S. 125 (1947), to support the contention that since a particular component of an instrument might be considered its "soul," the removal of that component would cause the rebuilder to have made a "new construction" on which it would be improper to use the o.i.m.'s trademark even with adequate labeling. There is a paucity of legal authority concerning the new construction language found in the *Champion Spark Plug* case.

Of the few cases which have discussed the "new construction" possibility, I found no case which ruled that a reconditioned product was a new construction. For example, both *Singer Manufacturing Co. v. Brileg*, 520 F.2d 519 (5th Cir. 1953) and *Singer Manufacturing Co. v. American Appliance Co.*, 86 F. Supp. 737 (N.D. Ohio 1949) involved sewing machine rebuilders who bought old Singer sewing machines and retrofitted them with non-Singer parts including: replacing spoke wheels with disk wheels; adding components such as electronic motors, bobbin winders, and reverse stitch devices; re-painting the machines with more modern colors and replacing the portion of the casing which made the machines look older. Although both cases found consumer confusion was likely, the remedy was adequate labeling, not the total removal of the Singer trademark. As one court said, "In other words, after your Mustang has been squashed into a metal cube by the wrecker, you cannot rebuild a Mustang from the scrap and sell it as a 'used Ford Mustang,' even though it was once a Mustang." *In re Circuit Breaker Litigation*, 852 F. Supp. 883, 892 (C.D. Cal. 1994). Short of such extensive repair, adequate disclosure is all the protection to which the o.i.m. is entitled.

Adequate disclosure does not include the requirement that a medallion or decal which states that the instrument has been used or rebuilt be placed on the instrument. The article described a post-purchase situation where confusion may occur downstream of the initial purchase. I know of no authority, either legislative or judicial, which applies post-consumer confusion to rebuilt articles. Even if a court decides to apply post-consumer confusion to rebuilt articles, *Electronic Design & Sales, Inc. v. Electronic Data Systems Corp.*, 954 F.2d 713 (Fed. Cir. 1992) cautions that only users who might influence future purchases can be considered in determining downstream likelihood of confusion. This takes us back to the sophisticated purchaser who recognizes that routine maintenance is required for an instrument's continued usefulness.

The most disturbing part of the article is the suggestion that all of the above imagined trademark abuses could be rectified if the rebuilder uses parts distributed by the o.i.m. There is absolutely no authority anywhere to support this point. If a court ever finds that a certain practice is likely to cause confusion, this confusion will be present regardless of where the replacement parts originated. Merely using a particular o.i.m.'s parts will not negate the confusion a consumer would have as to source, affiliation or sponsorship of the instrument. If a piano is poorly rebuilt, it does not matter whether only o.i.m. parts are used — the o.i.m. will still have an action against the rebuilder if the consumer associates the inferior qualities with the o.i.m. and not the rebuilder.

"The most disturbing part of the article is the suggestion that all of the above imagined trademark abuses could be rectified if the rebuilder uses parts distributed by the o.i.m. There is absolutely no authority anywhere to support this point."

Perhaps the author of the article is referring to the fact that it might not be in the best interest of an o.i.m. to sue a rebuilder who only purchases their parts. I must, however, caution o.i.m.s who plan to engage in selective litigation. There is a strong possibility that such practices would amount to unfair trade practices and antitrust abuses. Both the Sherman Act and the Clayton Act provide strong protections against individuals who restrain trade, improperly lessen competition or attempt to create monopolies. The government takes a dim view of attempts to dominate the marketplace improperly with a product that could not otherwise survive. My advice to original instrument manufacturers is to improve the quality and price of their parts and not look to the trademark laws to strengthen their market share.

First Responses to Richard Brown's
"Some Thoughts on the Design of Bass Strings"

By Del Fandrich, RPT; Al Sanderson, RPT; Joe Garrett, RPT; & Tremaine Parsons, RPT

Editor's Note: Richard Brown's three-part article on wound string design ran in the August, September, and October 1998 issues of *PTJ*. The article provoked numerous responses among readers, and Brown was aware of some of these reactions prior to publication of his article. Offered the opportunity to rewrite his article before publication, Brown declined, stating that he would rather publish his ideas "as is," and let the reactions fall where they may. One respondent, Harold Conklin, replied with a substantial article that appears elsewhere in this issue. Here are the other initial reactions to Brown's article. — SB

Del Fandrich, RPT

1. Tenor String Tension. (*PTJ*, August, 1998, page 23, paragraph 1 under heading "Tension.") There is no "ideal" string tension for pianos. String tension for any given piano design is chosen to match the design characteristics of the soundboard assembly and to yield the specific type of tone characteristic that the designer is after. The scale could be "long" – the scale tension could have been achieved by providing a relatively long string of small diameter, or "short" – a shorter string of larger diameter. Each will give a different sound yet each could have a tension of 160 - or whatever- pounds. I've encountered stringing scales using average tensions as low as 145 - 150 pounds and as high has 195 - 205 pounds. The most recent scales I've developed tend to be a bit long and average about 170 - 175 pounds.
2. Bass String Tension. (Ibid., paragraph 2.) (These strings are better referred to as "wrapped," or "covered," string tensions as Rick is mostly careful to do – except in the title.) There is a lot more to choosing an appropriate transition from plain to wrapped (of any ilk) than simply following a 10:8:7 tension ratio. If I'm not mistaken, Al Sanderson was referring to the unison tension transitions going from tri-chord plain strings to bi-chord wrapped strings to mono-chord wrapped. In other words, if a given scale used 160 lbs./string on the lowest tri-chord unison, it would have a unison tension of 480 pounds. Using Al's ratio of 10:8 for the transition between the tri-chord plain strings and the bi-chord wrapped strings, this would give a unison tension for the adjacent bi-chord unison of 384 pounds, or an individual string tension of 192 pounds. Assuming that the tension of all of the bi-chords was the same, then the mono-chords would then have a tension of 336 pounds. The transition between the bi-chords and the mono-chords wouldn't be too bad, but that between the tri-chords and bi-chords would be clearly audible. Looked at this way, it represents the outside limits of tension change that can be tolerated without serious audible difficulties. By contemporary standards, however, this would not be considered good string scaling.
3. Tension/Length Ratio. (Ibid., page 24, left column tables and accompanying text.) The Walter 6'3" grand has a T/L ratio of 3.95, and the 6'7" design I'm currently working on is 5.03. Both of these fall well outside of the "Universal Rule" of 4.5. It remains to be seen what my latest scale design will sound like, but the Walter has a very credible bass section. (I've not heard any of their recent production pianos, but the first two prototypes were compared very favorably to the Steinway B.)
4. The Steinway B Bass Section. (Ibid., middle column, paragraph beginning "if we examine the Steinway B..." .) In our "Killer B" package, one of the things we change is the bass-string scaling. I'm not particularly fond of the sound of the original. We don't consider the transition between the bi-chords and the mono-chords to be particularly good. Note F-9 has a unison tension of 456 pounds, i.e., 228 lbs./string. Note E-8 has a tension of 284 pounds. That's an awkward transition to voice.
5. The Story & Clark 7' Grand Bass Section. (Ibid., next paragraph.) From the information given, the scaling of the bi-chord section of this piano doesn't sound all that bad. It would be interesting to see the whole scale for this piano, i.e., complete with string lengths for all of the strings. As is common with taking quotes out of context, much meaning can be lost in taking part of a stringing scale out of context.
6. Mono-chord String Tensions. (Ibid., middle column, 1st and 4th paragraphs.) The rule with which to set the tensions in the mono-chord section appears to be based on the statement in paragraph 3, "There does not seem to be a compelling reason to vary tension within this section." This statement appears to be based on an observation that the length of the mono-chords does not change very much – less than 20 percent. The change in length from the highest to the lowest mono-chord doesn't have all that much to do with the string tension required for "best" tone. String tensions for wrapped strings

are best chosen based on an evaluation of their (unison) tensions and their mechanical (or wave) impedance at the required vibrating frequency.

7. The Wisdom of Steinway Scaling... (Ibid., right column, first paragraph.) Some of the Steinway stringing scales are among the worst in the industry. Why would we want to set them up as defining the boundaries of good scaling? Not all of us agree that "the balance of this magnificent instrument is excellent."
8. Tension of Unwrapped Tri-chord Strings. (Ibid., right column, table at top.) The last time I checked, the tension of F-21 on the Steinway B – as originally scaled – was 120 pounds. To bring it up to even 185 pounds would require a 0.056" string in place of the original 0.045". To make this scale work we replace the unwrapped strings of unisons F-21 through B-27 with bi-chord wrapped strings – which brings up the point of where the transition between unwrapped and wrapped strings takes place. Not all pianos have a 20-note bass section. Not all pianos make the transition between wrapped and unwrapped strings at the bass/tenor break. The idea of assigning arbitrary tensions to either unwrapped or wrapped strings breaks down at this point. What are the pitches (frequencies) involved? What are the tone characteristics desired? If we're talking about re-scaling – as opposed to developing a new scale for a new piano – what are the limitations of the original bridges?

   The same problem must be dealt with at the transition between the bi-chord wrapped strings and the mono-chord wrapped strings. Where does the transition take place? Are their eight unisons of mono-chord strings? Or 15? Or 12? This will affect the desired tensions of the strings on both sides of the transition.
9. String Inharmonicity. (*PTJ*, September 1998, Page 17, Paragraph 5.) "To reduce inharmonicity, we must select the smallest core compatible with the required strength at pitch tension." This statement assumes that it is desirable to "reduce inharmonicity." Why? This idea seems to be a very popular misconception among folks re-scaling pianos. Inharmonicity should be controlled as much as is practical so that it does not introduce unnecessary tuning discontinuities across the various scale transitions. (Scale transitions being defined as any discontinuity found in the scaling scheme, i.e., the transition from plain tri-chord strings to wrapped strings – whether bi-chord or tri-chord and whether this transition falls on the same bridge or not – or the transition between the bi-chord wrapped strings and the mono-chord wrapped strings.)
10. Klaus Fenner's Rule. (Ibid., Page 17, Paragraph 6.) This "rule" should be taken as a guide to the maximum allowable tension only. The statement was unsupported by actual evidence when it was made and it is still unsupported by actual demonstration as far as I know. The maximum allowable tension limit of either 66 percent or 70 percent is simply one of practicality. Going beyond this causes damage to the strings, both tonally and physically – strings stretched to this point tend to break a lot – especially wrapped strings. I much prefer an upper limit of around 55 percent for the core wire of wrapped strings. I know of no contemporary factory that would allow a piano design to go into production using wrapped string tensions above this point. They would go broke replacing strings. (Well, perhaps I should rephrase – no contemporary factory that actually has a knowledge of string scale design. Many don't. Their scales simply evolved or were copied from older pianos.)
11. The "Ideal" Scale. (*PTJ*, October, 1998, Page 36, Chart.) Not on my piano, you don't! I'd be interested in knowing if this scale has actually been used on a real-world piano. It would have been extremely helpful if the string lengths were included in the chart. It would have enabled us to calculate some other string parameters that are not included. It would also be helpful if the rest of the scale were included so that the bass section could be viewed in context.
12. Mono-chord Core Diameters. (Ibid., Page 36) The core diameters of mono-chords are not chosen arbitrarily. Gauge 21-1/2 (0.048") is not the largest core wire that can be used with a mono-chord wrapped string. (Steinway scaling wisdom, of course, uses a 0.063" core on the lower mono-chords of their scales. This requires drilling the tuning pin to get the wire in. It is also obscenely thick.)

    Again, the diameter of the core wire used with the wrapped stings must be chosen to blend a number of often disparate characteristics and requirements. They are not chosen to satisfy one specific and questionable "rule." They must allow for a blending of tone qualities across the bass/tenor break and across the scale transitions. They must provide for reasonable tunability across the various scale transitions. They must be sized to ensure a reasonable string life. The proposed "ideal" scale would be weak in all of these areas. It would probably sound "better" in some regards – the smaller core diameters would be somewhat more flexible than the originals (Probably. Without being able to examine the original, it's hard to tell.) – but it's not something I'd want on one of my pianos.
13. Structural Considerations. (Not Discussed.) Without more data, I'm not sure whether or not it would be dangerous to install this "ideal" scale on a specific piano. The possibility certainly exists. The tensions of the bi-chords are somewhat higher that those found in many small pianos. Is the plate adequately strong? How does the

Continued on Next Page

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overall tension of the new scale, i.e., the sum of all of the string tensions in the bass section – compare to that of the original? To apply generalities of this type to pianos of all types is not wise. At least in my opinion it isn't.

Al Sanderson, RPT, PhD

In answer to the request for comments on Richard Brown's articles on Design of Bass Strings, here are what I think are the five most important areas in which I disagree with him:

1. I don't agree that the lower the inharmonicity of a bass string is, the better it sounds. Ever since Dr. Earle Kent's article in the *PT Journal* in April 1972, p. 15, which is entitled "The Irritant in the Oyster," we have known that inharmonicity has a good side as well as a bad side. Too little is as unacceptable as too much, but in a different way. In my classes on wound string design, I explain this concept as a "sweet spot" in the tension vs. inharmonicity graph of a given bass string. Strings that have the right combination of tension and inharmonicity graph inside the sweet spot and have good piano bass tone; those that don't, do not. Of course this is subjective, and another tuner or musician might draw a different sweet spot. This I can accept, and respect, and even try it out. But Richard Brown has not drawn a different sweet spot; he says to ignore inharmonicity, try to get rid of it, the less the better. I disagree. I have designed and wound bass strings with zero inharmonicity as an experiment (before I knew better), and they sound bland and organ-like in a piano – very uninteresting to the musical ear.
2. Another recommendation with which I disagree, and which is related to the above problem, is Brown's recommendation to design all bass strings where possible to have a breaking point percentage (BPP) of 66. This rule guarantees that the inharmonicity of the highest unichord will not match that of the lowest bichord, nor will the highest bichord match the lowest trichord. This means tonal breaks and tuning problems at the breaks. Designing to BPP also creates very low inharmonicity. Whenever I have heard this idea before, my reply has always been that I can't hear the breaking point percentage until it's too late. It does not directly influence the tone, and so has little merit as a criterion for designing bass strings. It indirectly influences inharmonicity through tension and Young's modulus of elasticity, but if we could double the breaking strength without changing tension or Young's modulus, the string would sound exactly the same. Let's use inharmonicity itself as the criterion because inharmonicity can be heard, it directly affects tuning, and it is easily measured on an installed string.
3. Brown has criticized my formula for the elongation of piano wire in a most surprising way. He calls it an "ostensible formula." It's not ostensible; it's real and accurate, and I have been using it for more than 20 years without a problem. It's not entirely my formula either – it is derived from Harvey Fletcher's published figure for Young's modulus of elasticity in piano wire, 28.3 million pounds per square inch (psi). Steve Fairchild has published a formula very close to mine, as has Dave Roberts. Tremaine Parsons uses my formula in his Pscale program and no one has reported problems with it, so I think the formula is correct. Brown's statement implies a Young's modulus of 19 to 22 million psi, which disagrees with all published values. When Brown is able to get strings wound exactly to his specifications from his string winder, the formula should work for him as well. Piano rebuilders have always had problems with inaccurately wound strings occasionally running into an agraffe, but it's not because of the elongation formula. By the way, the problem could also be that the loop fails to hold completely when the string is brought up to tension. Another possibility is that his string winder is using softer core wire.
4. Getting the tension level from the length of the first note as Brown recommends does not guarantee safe results. In setting the tension level on a piano, we must be careful not to load the plate with more total tension than it had originally. Then if the plate breaks, presumably, it won't be our fault. In setting the tension level you can average all the unichords, all the bichords, and all the trichords to get safe levels of tension from the original scale. Then you can proceed with confidence that you are not endangering the piano by making any drastic changes. It is all right to swap some tension around among the various sections to improve the balance toward the 10:8:7 ideal, but I feel the total tension load on the plate should remain about the same.
5. I would recommend that anyone going into scale design these days should have a personal computer with a spreadsheet program, rather than just a programmable calculator. Most piano tuners already have a computer, and once the data is entered for speaking length and string parameters, it only takes a few minutes to calculate a complete 88-note scale design. You can easily calculate the average tension of each section, and then the total tension load in order to compare the original and revised scale designs. Software for this purpose is commercially available, and since Tremaine Parsons uses my formulas (with permission) in his Pscale program, I can highly recommend it. His program also provides printed string specifications in a format that is convenient for the string winder to use.

Joe Garrett, RPT

I was tuning in a kindergarten room recently and spotted the answer to my dilemma – a poster with the title "All I Really Need to Know I Learned in Kindergarten," by Robert Fulghum almost leaped off the wall when I read the following: "Wisdom was not at the top of the Graduate-School mountain, but there in the sandpile at Sunday School." And thus shall I approach my comments regarding Richard Brown's article.

First of all, intellectual pontification, for the sake of itself, is basically an exercise in futility, unless it is tempered with practical application of all the knowledge discussed. In other words, you must first play in the "sandpile" and get a little sand on/in you in order to glean the knowledge that is there. This act of getting sand on you should also be shared with others so that the ***experience*** is enhanced.

The assumptions derived by Brown were basically the same erroneous thinking of the latter 19th century. Because of modern technology we are now able to rapidly analyze and correct that faulty thinking, in pianos, and hopefully correct it. The use of "a $50 scientific calculator" was the weapon of choice 15 to 20 years ago and is an invitation to really turn any interested technician off simply by the sheer bulk of math and button pushing necessary to accomplish a proper scale evaluation. The weapon of choice today is a computer with a comprehensive "scale" program that has graphs, spreadsheets and the ability to show you the whole picture of just one note with a few keystrokes. There are several available, and they can really make a bad piano a whole lot better when properly applied.

A few glaring problems that need to be addressed are:

1. When evaluating a piano's scale, one must first be accurate in the frequency of the period of the piano, i.e., A=535 cps should be the standard for pianos made in the U.S. before 1927. This is a general "rule of thumb," although an entire article could/should be written on this subject. My rule of thumb for pianos made before 1870 (U.S. or British) is a pitch standard of A=425 cps.
2. One should never just change the bass string parameters without a thorough evaluation of the treble scale as well. Along with that, one should also pay very close attention as to the basic intent of the original designer and the overall tension you are subjecting the instrument to.
3. The idea of scaling bass strings to "66 percent of the core wire's breaking strength" is ludicrous! That's the same bad thinking that Olde Mason & Hamlin did on their 9-foot grand that always breaks strings within a few years after manufacture. The "Rule" that I have lived by is "never exceed 55 percent to 60 percent of the core wire's breaking strength." This is a safe approach that is the prevailing thinking and has not gotten me in trouble, yet.
4. The rule of "never experiment on your customer's pianos" is appropriate in this regard. I would further like to add to that rule and say, "never sell your experiments either!" (Oh my! Chickering must be rolling over in his grave!)

Dr. Brown's basic premise for his article(s) was, in my opinion, correct. I have improved the overall musical sound of my "rebuilds," for many years, by doing a thorough scale evaluation on each and every once since around 1976-77. I truly believe that more "rebuilders" should pay more attention to scale evaluations And I believe that every technician who proposes to replace bass strings should avail himself of modern technology and those of us that do this kind of work.

Tremaine Parsons, RPT

I found Brown's articles quite interesting to read. While there are numerous points with which I strongly disagree, the articles are thought-provoking and will certainly succeed in "stimulating further discussion."

I will refrain from a point-by-point (with one exception) discussion of the particulars of this series at the present time, but will urge and caution all technicians who are interested in scaling topics to pursue all resources available to gain a broader understanding of scaling issues.

The exception: The method for calculating elongation as presented by Dr. Sanderson in "Piano Technology Topics" has proven to be extremely reliable for nearly 10 years. Also, I learned the hard way that tail elongation is ***not*** negligible and ***must*** be calculated (Mason & Hamlin AA).

The bibliography included in Part III of Brown's article is an excellent collection of resources. In particular, I will mention *The Calculating Technician*, available from the PTG Foundation Press, as an excellent opener resource. This book includes all of the Dave Roberts articles as well as appendixes that discuss minor differences between varied tension and inharmonicity calculations presented by Dr. Sanderson and other well known contributors, within one single reference. You can also ignore the math, read the book, and gain generally well-rounded concepts of scale design.

I feel the best way to pursue the subject is to gain a good general understanding of the concepts, look at as many different original piano scales as possible (why did they do that – good or bad), carefully formulate possible conclusions as to why different pianos' scales sound better or worse and never assume anything.

I predict that future discussions and debates of this topic will lean towards "optimal tensions within string sections" issues. Of late, this has been one of my primary areas of interest.

The Challenges of Modern Piano Tuning – Part I

By Bruce Winn, RPT
Richmond, VA Chapter

This is the first in a series of articles designed to give serious Associate Members of the PTG information and exercises they will need to tune at the RPT level. No written article, book, class, or tutorial can make you into an RPT-level tuner. You must develop your own tuning skills by studying, by practicing tuning exercises, and by tuning a wide variety of pianos.

This article will give you an idea of what to expect on the PTG tuning exam and an overview of the skills you will need to do well on it. Registered Piano Technicians are frequently asked to tune for high-level musical performances. A performance-quality grand piano 5' 9" or larger is used for the tuning exam and you will be expected to demonstrate performance-level tuning skills.

First, the piano is carefully tuned and verified by aural agreement of a committee of qualified RPTs and Certified Tuning Examiners. This master tuning is then measured and recorded. The piano is then detuned in a controlled manner to preserve the proper overall tension (some notes will be sharp, others will be flat). Strip mutes are inserted in all sections of the piano, and the exam is ready to begin.

Your challenge is to tune one string of each unison on the piano in modern equal temperament with A4 (pitch A) tuned precisely to A=440. In Part I, you will have 45 minutes to tune the middle two octaves of the piano by ear, one string for each note. Your tuning is then measured and compared to the master tuning. You'll be graded on pitch, temperament and midrange tuning. In Part II, you will have one hour to tune the rest of the piano (one string per note) and will be tested on the treble, high treble and bass areas. Next, two octaves in the midrange will be tested for stability. Finally you'll be tested on unison tuning in the midrange area of the piano.

Many beginning tuners have problems with the temperament and the midrange area of the piano. Laying proper bearings in this region is important because the rest of the tuning is built on this foundation.

Q: What is modern equal temperament & how do we tune it correctly on each piano?

A very good answer to this comes from Owen Jorgenson's massive tome, *Tuning*: "Theory dictates that there can be only one equal temperament containing twelve equal-sized semitones within an octave. No variety from this strict model is therefore permitted. Even though all pianos contain a degree of "inharmonicity" which in turn causes most of the octaves to be tuned slightly differently by micro-amounts from exact two-to-one ratios, the 12 semitones within each of these octaves must nevertheless be tempered equally according to the known aural tests used for verification of this equality." (*Tuning*, p. 4)

These are the challenges of modern piano tuning:

1. To establish with accuracy the proper pitch and to prepare the piano for performance level fine tuning.
2. To determine the correct octave size, adjusting the octave ratio by micro amounts to find the best custom fit for each individual piano.
3. To use an orderly procedure to divide that octave into twelve equal semitones, applying a sequence of tests to verify the equality of the temperament.
4. To expand the temperament across the midrange, treble, high treble and bass regions.
5. To set the strings and tuning pins with solid stability so the tuning will hold up to the rigors of professional performance.
6. To tune the unisons clean and true so each note sounds its best.
7. To do all this on less than perfect instruments under less than perfect conditions, always striving to do the best possible job under the circumstances.

In this series of articles, I will try to cover each of these challenging areas, answering appropriate questions and laying out exercises designed to help you develop your skills. We will begin with the first two challenges:

Challenge #1

To establish with accuracy the proper pitch and to prepare the piano for performance level fine tuning.

If the piano is substantially off pitch or if its sections are out of tune with each other, a quick first pass tuning is needed to stabilize the piano and prepare it for fine tuning. If you skip this step, prepare to experience the Quicksand Effect (See ET and the Quicksand Effect). A few minutes spent "pretuning" the piano will usually pay for itself in saved time and trouble.

Standard pitch is A=440 for A4 on the piano. On the tuning test you can use whatever tuning fork or aural pitch source you like, but A4 is the note that will be tested for proper pitch. Remember, the pitch you set is only as accurate as your tuning fork, so check your fork periodically to see that it is properly calibrated at your preferred working temperature.

To establish proper pitch using an A=440 tuning fork, tune A4 on the piano to your fork as accurately as you can. As a test note, use F2 – two octaves and a major third below A4. Sound your tuning fork and F2 at the same time and listen to the beat rate. Now sound F2 and A4 and listen to that beat rate. You want both beat rates to be exactly the same. If F2-A4 is faster than F2-fork, A4 is sharp and must be lowered. If F2-A4 is slower than F2-fork, A4 is flat and should be raised. Keep working until both beat rates are the same. This test is very accurate and used properly will establish A4 extremely close to A-440.

Challenge #2

To determine the correct octave size, adjusting the octave ratio by micro-amounts to find the best custom fit for each individual piano.

Most modern electronic tuners use some form of octave adjustment or stretch calculation. Recent Sanderson Accu-Tuners use the F-A-C system using measurements from three notes to determine a custom stretch calculation for each piano. Performance-level fine tuning requires a similar kind of customized octave size whether you tune by ear or with a machine. Here is one way to tune custom octaves by ear:

You have just tuned A4 precisely to A=440. Now consider three A's — A2, A3, and A4. These notes form two single octaves (A2-A3 and A3-A4) and one double octave (A2-A4). These octaves form the foundation for the temperament and must be tuned precisely.

Tune A3 from A4 as clean as you can striking both notes at the same time. Using F3 as a test note, play the F3-A3 third and the F3-A4 tenth comparing the beat rates. If the third beats faster than the tenth, the octave is narrow. Narrow octaves are almost never acceptable in pianos. If the third beats slower than the tenth the octave is wide.

Adjust A3 so that the 3rd and 10th beat at exactly the same rate. The octave is now pure at the 4:2 level. Beginners should strive for pure octaves. More advanced tuners should try to lower A3 so the third beats about 1/2 bps slower than the tenth.

Now tune A2 from A3 as clean as possible. You may wish to use the minor third-major sixth test (test note C3) to check for a pure 6:3 octave.

Finally, test the A2-A4 double octave. The double octave should sound clean when A2 and A4 are played together. If you have to adjust A2 to make a good double octave, readjust A3 so that both single octaves sound good and test out right.

Exercises and Tips

Unison Tuning

Tuning at the performance level requires a high level of skill in tuning pin and hammer technique. It is necessary to change the pitch on strings by very small amounts in a solid and reliable manner. Tuning unisons is an excellent way to train the ear, arm, brain, and hands to work together to produce a solid tuning. Unison tuning is a permanent exercise — essential for beginners and remarkably useful for the most advanced tuners.

If possible, work with a good piano at a time and place where you will not be rushed. Choose a two-octave region near the middle of the piano. Assume for the sake of this exercise that the middle string of each unison is tuned correctly. Tune the side strings carefully to match the center string in as clean a unison as you can.

When you have tuned the entire two octaves, play each note quickly. Pick out the best sounding unison, and the three worst sounding unisons. See if you can get the worst unisons to sound as good or better than the best one. Keep working until you are satisfied.

Now imagine that a concert artist is playing a beautiful exposed melody in a Mozart piano concerto on the notes you have just tuned. Play each note listening for a singing melody with pure sonorous musical tone. Are you still satisfied? I didn't think so. Even beginners can usually make bad unisons sound better, but most advanced tuners are never entirely satisfied. Now get back to work and clean up those unisons!

Tip #1

Make pre-tuning a normal part of your tuning procedure. Carry enough equipment to strip mute pianos from the tenor break all the way to the top note. Minor pitch adjustments go faster when you practice them in your daily work. Learn how to pre-tune, then it should be no big deal when you encounter an Extra Terrestrial piano on the tuning exam.

Tip #2

Use a test note as a check when setting pitch from your tuning fork. F2 is the correct test note for A-440.

Tip #3

After you've tuned A4 to your fork and A3 down an octave, tune one extra note — A2. Test and adjust the single and double octaves as described above until these octaves are correct for each piano you tune. PTJ

ET & the Quicksand Effect

The piano you will encounter in the PTG Tuning Exam will be detuned. Half the notes will be sharp and the other half will be flat. In the middle, it's not too bad, just a few cents off. The treble and tenor areas will be a little more than 10 cents off. The extreme bass and highest treble will be about 25 cents off, again with some notes sharp and others flat. Folks, that is definitely out of tune, bizarre, and weird. You might call this detuning Equal TAMPERment (groan), but the result will certainly sound Extra Terrestrial.

Notes more than a few cents off pitch are also subject to the Quicksand Effect, where the strings you have just tuned shift and change behind you as the piano adjusts to new notes being tuned. Trying to fine tune a piano that has been detuned in this manner can feel like wrestling with an Extra Terrestrial in Quicksand. Fortunately, there is an easy solution to these problems.

Many pianos we tune in the course of regular work will be just a little off — a few cents sharp or flat or perhaps sections out of tune with each other. In cases like this, give the piano a quick pitch-adjustment-style tuning to prepare it for fine tuning. Set pitch A to 440, tune your favorite quick and simple temperament and pull in the rest of the strings by octaves. Work quickly and accurately, but don't fuss. The idea is to get the piano back from outer space, on solid ground, and into familiar territory.

The tuning exam conditions are a little different. The exam is given in sections, so you will need to go over each section quickly to prepare it for fine tuning. Begin each section with a quick pitch-adjustment-style tuning as described above. Remember, you'll only have to tune one string for each note (the side strings stay muted off throughout the test), so you should be able to make this first pass tuning for a section of notes in just a few minutes. Most of your fine tuning will then involve very small changes in pitch. You'll be on familiar ground and your tuning will be easier, faster and more stable.

Thoughts on "Thoughts"

By Harold A. Conklin, Jr.
Dunedin, FL

Richard Brown's recent article "Some Thoughts on the Design of Bass Strings" was a valiant effort, considering the scarcity of wrapped-string information available to technicians. Speaking as a retired piano engineer and string designer/maker, I found his information often ran counter to my own findings in an earlier (unpublished) study of the requirements for the design and fabrication of high quality wrapped strings.

Designing good strings requires a lot of calculating. It's far better to use a computer than a "scientific calculator." I started with a slide rule and progressed to an IBM main frame, the need for which ceased the instant PC's and spreadsheets became available. My PC performs several hundred string calculations faster than I can blink.

Figure 1 shows the main screen. Parameters such as key numbers, speaking lengths, wire sizes, etc., are entered in Column B. Results appear in Column H.

Should plain strings have a tension of 160 pounds? Is it best to have tension ratios of 10:8:7 for monochords, bichords and tri-chords? The answers have more to do with the number Z_g in Column H, Row 15 of Figure 1 than with the tension. Z_g represents the characteristic impedance of the strings of a note. This is the value for which, if the strings were terminated at the bridge by an equal impedance, string waves arriving at the bridge wouldn't be reflected back to the agraffe. A tone couldn't be produced!

For a piano to work, Z_g for the strings must be smaller than the impedance at the bridge. If there are three strings per note, Z_g will be three times as large as for one. As Z_g is made larger, energy will be transferred more rapidly from the strings to the soundboard, the tone will be louder, and the duration shorter.

If adjacent plain-strung notes all had the same wire diameter and the same tension, they would also have the same Z_g, and their loudness would tend to be equal. But this could only happen across the scale if soundboard response were uniform and bridge impedance were the same at every location. Fat chance! The fact is, in contemporary pianos, Z_g normally increases from the treble to the bass.[1] So do the tension and the mass per unit length. If we hear that the fundamental frequencies sound weak in a certain region, we may want to in-

	A	B	C	D	E	F	G	H
1	NOTE NO.=	1	A0	ENTER DATA IN COLUMN B ONLY			FREQ=	27.5
2	N=	1				SEE PAR FREQS IN COL. I-->		
3	LM CENTS=	4800		**LM PLAIN	1253.92		ACTUAL dw/dc=	0.99
4	L=	79.75		LM NOTE	49	LM	F ACTUAL=	8.1035
5	dc=	0.063		**RQD LM Hz	440	440.49	SQRT F =	2.8467
6	du=	0		SQRT F	2.8498		***CNTS ERR=	1.91
7	dens. u=	8.89		RQD F	8.1214		L-NO ERR=	79.84
8	dw=	0.0625	RQD. dw IF SNGL.=		0.0626		CU du-NO ERR=	0.0001
9	dens. w=	8.89	RESULTANT dw/dc=		0.99	(Lim.=1.25)	>>B=	1.02E-04
10	d/L=	0.1246		d	9.94 in.		***PULL-lb =	353.35
11	PAR. NO.=	16		L-d	69.81 in.	(LM= 440.49 Hz)	PSI=	113352
12	E=	30000000 psi		O.D.	0.188 in.		PULL/BKG=	0.391
13	dens. c=	7.77	dc AREA=	0.003117	sq. ins.		ELONG.(INCHES)=	0.301
14	PROP CON=	100000					SPKNG. MASS-gr=	256.51
15	d=	0		d/L	0.000	pdc=7.77	*** Zg =	14.11
16				L-d	79.75	p5%=7.88	PULL- N =	1571.76
17	mm=	1	0.03937	inches		pCW=8.21	STRESS-MPA=	781.54
18	inches=	1	25.4	mm		pCU=8.89	LM/PAR-cents=	-20.4
19						pBR=8.47	PAR FREQ=	445.7
20	SCALE.2	VERSION	17APR98	HAROLD A.	CONKLIN, JR.		***I-CENTS =	22.29

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Figure 1

crease Zg. One expression for Zg is: Zg = (number of strings per note) x (tension x mass per unit length) 0.5. So we can increase Zg by increasing the tension, core size, wrap size, number of strings per note, any or all. Zg is especially useful in designing transitions between trichords, bichords, and monochords, and at scale breaks. In a preliminary design, Zg should be made the same on either side of a transition. This may not turn out to be the best final answer, but it's the correct place to start and should be close to optimum. Of course, inharmonicity should be kept smooth, and attention should be paid to the tuning of the longitudinal string modes.

Good tones requires live strings. If you want to know what a deadish string sounds like, play a good-sounding note, then place your finger lightly on the string at a point between the agraffe and the beginning of the wrap, and play it again. To quantify liveness in the laboratory, the high-frequency "Q" of a string is measured. Equipment required: A string pickup with a suitable amplifier, a bandpass filter, preferably 1/3-octave wide and centered at 3.15 kHz, a means of measuring tone duration, and a monochord on which to mount the string. The required investment might top $10,000. Alternatively, you could test the string in a piano, using a plucker: Drive a nail into a wooden handle, cut off the head, and file the end to a slightly rounded point. Depress the key to raise the damper for the note to be tested and pluck the string between the agraffe and the beginning of the wrap. Never touch the wrap itself! With practice, most ears can detect insufficiently live strings. These sound dull because too much energy is being lost within the string itself when it vibrates. This reduces greatly the duration of high-frequency partials. Some common causes are age, dirt, poor string design and poor string-making techniques. The following can reduce liveness:

1) **Wrap too large in relation to the core.** For single-wrapped string dw/dc should not exceed 1.2. With larger ratios it is more difficult to secure a low-loss anchorage of wrap to flats. If larger values of loading are needed, double wrapped strings are usually preferable. The 1.2 limit also applies to the outer wrap in relation to the core wire of a double-wrapped string.
2) **Under wrap (du) too big in relation to outer wrap (dw).** For a double-wrapped string, dw/du should be at least 2. This has to do with minimizing relative motion between inner and outer wraps during vibration. It is standard practice to wind underwrap and outer wrapping opposite directions to prevent interleaving of turns. In my opinion, inner and outer wraps of equal diameter would be unlikely to produce optimum liveness. The numbers given were arrived through testing and apply to half-hard copper wrap, a standard material. Anchoring with larger ratios might be acceptable if soft (annealed) copper wrap were used, but its use is undesirable because soft copper is so ductile that it is difficult to maintain a constant wrap diameter as the string is spun, and because the cross-section of the wrap can deform excessively under load, increasing internal losses.
3) **Incorrect wrap tension during wrapping.** The value of tension on the wrapping wire during wrapping affects liveness. There is an optimum value of wrap tension for each wrap size and type; therefore, the wrap feed mechanism should provide adjustable tension and, once it has been set, should hold the tension constant during wrapping.
4) **Improperly made flats.** Flats should be at least 1" long, and preferably 1-1/2". The depth of a flat should be maximum near the outer ends of the wrap, at which point the thickness of the flatted part should be 70 - 80 percent of the diameter of the core wire. The depth of the flat should taper out to zero at inner end. Width of core wire at the deepest part of the flat should be 1.15 to 1.25 times the normal core diameter. 1/16" to 3/16" of flat should be visible before the start of the wrapping. Edges of a flat should be sharp rather than rounded, so that the flat will grip the covering wire tightly. (Bass core wire is drawn a little softer and more ductile than treble wire, so it will have a little less tensile strength. This makes it easier to make flats and to form loops without breaking the core wire.)
5) **Dirty wire.** Core and wrap wire should be clean and free of die lubricants.
6) **Using copper wrap smaller in diameter than about 0.012"** usually compromises liveness. If smaller wrap is required, copper-coated steel (lighter than copper) will give better results. Be sure to program the correct wrap density in calculations.
7) **Too many twists or too few twists** of the string during installation (If the wrap has been spun under too little tension, more twists than normal may be required.) The best strings I have made need no twisting at installation.

Longitudinal String Modes

Most who hear the longitudinal mode demonstration on the CD that comes with *Five Lectures on the Acoustics of the Piano* become convinced that the LM is important to the tone.[2] Any piano will sound smoother and better if the wrapped strings are designed so that the longitudinal modes are satisfactorily tuned. LM tuning is especially important in the lower bass of small pianos. The frequency of the LM is very little affected by turning the tuning pins. So if you were on a desert island with a piano but no tuning fork, and if you knew how the LM had been tuned, you could use the LM to set the pitch – at least to desert island standards. Discussions of LM tuning are in the referenced articles.

Mr. Brown offered a number of rules for designing optimum wrapped strings. Many seem to me questionable, and I've disagreed in the foregoing with several. Other statements with which I disagree are quoted below, with my comments in parentheses.

1) "In the treble ... harmonics are of comparatively little importance." (He apparently referred to treble string partials higher than the fundamental. I disagree strongly. I believe piano lovers would not like to listen to pure sine-wave piano tones in any register).
2) "...core size should be selected for 66 percent breaking point at pitch tension ... Using this principle, we can design a theoretically optimal bass string ..." (I do not believe this would produce optimal tone generally, and I'd bet some of the

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Thoughts on "Thoughts"

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strings so designed would break prematurely).

3) "...actual wrap gauge ... (is) not strictly speaking a scaling decision, but one that the stringmaker chooses..." (He won't be ***my*** stringmaker for long if he does).
4) The expression given for elongation appears incorrect. A correct version is: **e = TL/aE**, where **T** is string tension, **L** is the length of core wire for which the amount of elongation is wanted, **a** is the cross sectional area of core wire, and **E** is the elastic or Young's modulus of the core wire, approximately 30 x 10^6 psi for steel.

Epilogue

Congratulations! You bought a computer and you've spent hours programming all the formulas. You measured the speaking lengths and the core and wrap diameters of the old strings, and you've entered that data into your computer so you can see what the original designer had in mind. Then you designed your new strings. Oops! You forgot to listen to the piano with the old strings to make notes of the things you didn't like. Oh, well, your new design is sure to be better than the original. You e-mailed your data to the Jangly String Works.

Joe, your string technician, had a hard night. He emptied a 12-pack of Red Dog between supper and bedtime. He isn't feeling steady, and his vision is a little blurred. He's used to working from a string stick (a wooden or metal "stick" that attaches to the string machine and has index lines giving the settings for a particular set of strings). What? You sent a bunch of numbers? What? Your design will need a lot of non-standard wrap sizes? What? You ordered only one set? Joe has to hunt out a tape measure to reset his machine from your numbers each time he makes another of your strings. He knows wire sizes by the number on the spool, not by the diameters, so he has to guess which spool has wire that most closely matches your numbers. He craves more Red Dog to help him get through this. His machine spins at about 13,000 RPM, and the string whips around a lot. (A cost analyst convinced Jangly's management that the faster the machines ran, the more money they could make). Joe's machine doesn't have a constant-tension wrap feed, so he has to feed the wrap onto the core by hand, trying to keep the feed angle constant so adjacent turns will be in contact, and trying to keep the tension constant at what he guesses is the optimum amount. Actually, at 13,000 RPM, "optimum" is just about whatever makes the covering wire wrap around the core without piling adjacent turns on top of each other or leaving large gaps between turns.

There's no microscope in the shop, and Joe isn't really good at reading a micrometer, so he doesn't inspect the strings to see if the O.D.'s are constant, end-to-end, or check for space between the turns. You were lucky to find a shop that would accept an order for one set of strings to be made to your design from numbers on a piece of paper. They expect to lose money on your order, and they believe you'll blame them if some of the strings don't fit the piano. After you test the strings, you may decide to phone for a standard set. Or maybe build your own string machine?

References

1. Conklin, Harold A., Jr., "Design and Tone in the Mechanoacoustic Piano. Part III. Piano Strings and Scale Design," *Journal of the Acoustical Society of America*, Vol. 100, No. 3, September, 1996 (See fig. 42, p. 1288.).
2. Conklin, Harold A., Jr., "Piano Design Factors — Their Influence on Tone and Acoustical Performance," in *Five Lectures on the Acoustics of the Piano*, edited by A. Askenfelt (Royal Swedish Academy of Music, Stockholm, 1990). Includes a Compact Disc containing recordings of groups of piano tones having the same fundamental frequency but different tunings of the longitudinal string modes.

Note:

Joe and the Jangly String Works are fictitious entities and are not intended to represent any person or string company, living or dead.

Performance & Innovation: The Wapin Bridge on CD

A Review of Wapin Piano Bridge — *a CD Recording, © Wapin Productions, 1998.*

By Robert Hohf, RPT
Contributing Editor

"Centuries of tradition have developed great skill and understanding among the makers of musical instruments, and they are often aware of subtleties which are undetected by modern acoustical instrumentation for lack of precise technical criteria for their recognition. It is difficult, therefore, for a scientist to point the way forward unless the problem or the opportunity has been adequately identified by the performer or the maker."

— The Physics of Musical Instruments
Neville Fletcher and Thomas Rossing[1]

How, exactly, does one go about improving our venerable old instrument, the piano? Over the past three centuries the piano has inspired hundreds, if not thousands, of new ideas involving its design and construction. As piano technicians we occasionally see examples of unusual construction and design features on old pianos that are still in service. Some, such as the old uprights with five or six pedals, are merely curiosities that never provided any useful purpose and never gained widespread acceptance. Others, such as the Mason & Hamlin screw-stringers and the Sohmer bridges equipped with agraffes, endured somewhat longer, and may actually have been design improvements over more conventional methods, but, for various reasons, they were discontinued after a few years of production. Other design changes, such as the overstrung bass, and the bentwood rim, were just as radical as the Mason & Hamlin and Sohmer experiments were when they first appeared, but they survived the test of time to become widely accepted as standards of piano design. One might well ponder the process of selection that has resulted in the instruments we have today. Who has had the privilege, or the burden, of deciding among the myriad of new ideas the piano has inspired; which ones have become assimilated into the body of the instrument and passed on to future generations of musicians?

These are no small questions, since the sound and musical capabilities of the piano have been a major influence in the development of Western music. A significant change in the standard of tone in the piano, or in the ability of the pianist to control that tone, may change the way the pianist interprets a composer's music. A change in interpretation will, in turn, change the reaction and attitudes of the people who listen to the music. A major change in the piano could also affect modern-day composers in ways that would influence music yet to be composed. The interaction between composers, performers and makers is *synergistic* in the sense that the three work together to create a musical tradition that none could make alone. This interaction was well documented and was especially active during the artistically revolutionary period of the early and middle 19th century. This was also the historical period where the piano saw its most rapid development.

In recent years there has been an intense interest in hearing music as it was heard and performed *at the time of the composer.* This has resulted in a flourishing of interest in historic tuning systems. Old musical instruments that had been languishing for generations in museums and private collections have been dusted off and returned to service. In response to a shortage of serviceable old instruments, craftspeople have studied the old instruments and construction techniques in order to create meticulous reproductions of the old makers' works. In response, performers have relearned the strengths and weaknesses of these historic instruments and adapted their playing techniques and musical interpretations accordingly. These recent developments have all been to the great benefit of listeners, who have been given an unquestionable deepening in their understanding of the music. It has also had the effect of placing modern performance practices in a much wider historical perspective.

Perhaps if we look at some of the differences between the historic fortepianos and our modern pianos, we can gain some insight into the direction the modern piano may continue to develop. The first striking difference upon sitting down at a fortepiano is lightness of the touch and the immediacy of the action response. This makes rapid tempi and subtle nuances of phrasing more easily accessible to the performer. Fortepianos also tend to have a more percussive attack and more rapid

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tonal decay than modern instruments. The player unaccustomed to these characteristics will probably not know how to incorporate them into musical interpretation at first and consider them to be *weaknesses* of the instrument. However, as experience is gained, one begins to understand that the musical possibilities of the fortepiano are not necessarily better or worse than the modern piano, but simply *different*, particularly in the realm of pedaling and articulation.

A famous example where the fortepiano can expand the possibilities for musical interpretation is Beethoven's notation of *sempre senza sordini* at the beginning of the "Moonlight" Sonata. This instruction indicates that the entire first movement is to be played with the dampers lifted. Having tried to play the piece this way on my own modern Mason & Hamlin piano, I can attest to the fact that the sustain of a Mason & Hamlin makes observing this notation impossible. However, an experienced fortepianist informed me that the decay of her instrument allows her to observe Beethoven's instruction literally with profound musical effect. There are many other examples of notations in the piano literature that baffle the sensibilities of the performer on a modern piano, but which can be taken literally on the fortepiano.

There were a number of cultural forces in the 19th century that influenced the development of the modern piano out of the fortepiano. Concert halls and orchestras became so large that the dynamic range of the fortepiano could no longer meet the demand; composers began writing music that required an instrument with more structural strength than the fortepiano; and the Industrial Revolution introduced new philosophies of production that changed the rules of competition for consumer dollars. These forces gradually changed the fortepiano from an instrument produced in limited numbers in small shops, into the piano, an instrument produced in relatively large numbers in factories. The strongest musical influence on the development of the piano were demands for wider dynamic range and longer sustain, as well as the structural strength to support the necessary increases in string tension and more forceful playing.

Regrettably, the subtleties that make fortepiano tone distinct are generally lost when the instrument is recorded. The recording process tends to take the clear attack and the colorful, articulated tone, so apparent in live performance, and transform them into tones that are either dull and wooden, or piercing and strident. As a result one who has heard only recordings, and not live performance, of historic keyboard instruments is unlikely to develop an interest in learning more about them. It is, of course, also true that many of our finest modern pianos sound much better in live performance than on recording or when amplified. In today's world the overwhelming majority of the music we hear is produced by that most ubiquitous of all musical instruments, the loudspeaker. The strengths and weaknesses of *loudspeakers* provide the single most powerful influence on today's musical tastes. Increasingly, "acoustic" instruments are becoming merely *tone generators* for electronic manipulation.

The processes of amplification and recording tend to favor tones that contain many strong, high-pitched partials. In the case of the piano, this translates into bright and powerful tone. While serious students of the piano understand that no one instrument or one character of tone is adequate to do justice to the diversity of music in the piano literature, the preponderance of recorded music in today's world has imposed a bias upon the standard of piano tone. The recorded piano sound represents the majority of what the listening public has heard of the piano. Since a bright-sounding piano is what most people are used to hearing on recordings, when it comes to buying a piano for their home, they most often look for an instrument with that familiar tone.

Given the historical forces that produced the modern piano, and the present-day changes in musical tastes and the marketplace, what direction is the future development likely to take? It appears that the desire for instruments with more "power" and sustain, the same attributes that motivated the development of the piano out of the fortepiano, will continue to drive future development. However, the underlying forces fueling development have changed: concert halls and orchestras probably will not get bigger, and music will not get more technically demanding, but the influence of electronic reproduction will, most likely, only increase in the future.

The flourishing of recorded music in the 20th century has also removed the piano from its position as the centerpiece of music and culture in many households. As a result the market for pianos has been shrinking for most of the last 80 years. The situation where piano makers are grasping for a piece of a shrinking market changes the rules of competition. Design changes that simplify production and lower costs take precedence over innovations that might improve piano performance, especially if the innovations increase production costs.

Enter the Wapin Piano Bridge.[2] Wapin is the brainchild of Michael Wathen and Richard Harris. Wathen is a Staff Technician at the College Conservatory of Music at the University of Cinncinnati. Over the past several years Wathen has taken advantage of the University policy of opening academic courses to staff members by studying Physics and Mathematics. His interest in physics led him, along with Richard Harris, a Physics Instrumentation Specialist, into a study of piano string motion. Their study led to the development of a new system for pinning strings on piano bridges. The essence of the new system is that the bridge pin that terminates the speaking length of the string is *vertical* to the surface of the bridge. There are two configurations of the system, two-pin and three-pin, but the purpose is the same. The non-vertical rear bridge pins are angled to firmly "trap" the strings against the top surface of the bridge. The Wapin system has patents pending both in the United States and internationally.

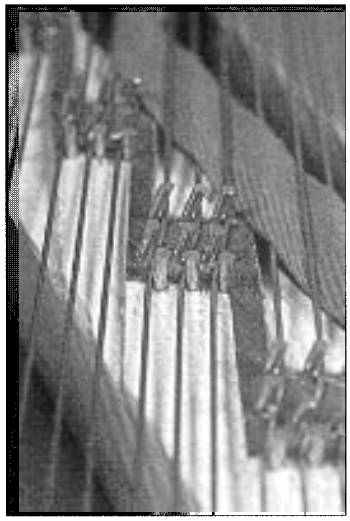

Photo 1 — The three-pin configuration of the Wapin bridge-pinning system.

The significance of the Wapin system lies in the fact that it has a consistent and predictable effect on piano tone. The effect is twofold: it extends the decay time of the tones considerably across the full range of the instrument, and it audibly strengthens the partial spectrum in the range of 3000-6000 Hz. Out of curiosity over the Wapin system, I visited the Conservatory in March 1998 and

had the opportunity to see and play four or five pianos that had the system installed. The pianos ranged from a Baldwin Model M (5'2") to a Steinway Model D (9'). Another Wapin/Baldwin was on display at the PTG Annual Convention in Providence last July. The fact that every piano displayed the same characteristics of tone enhancement was very convincing evidence that the Wapin system was directly responsible.

The recently issued Wapin CD features pianist Richard

Photo 2 — Michael Wathen, RPT, (left) and Richard Harris collaborated on development of the Wapin system.

Morris performing on the Baldwin Model M and the Steinway Model D.[3] While the CD was produced primarily to demonstrate the properties of the Wapin system, Mr. Morris' excellent performance of the diverse program warrants listening in its own right. The CD contains very high quality, and electronically unadulterated, recordings. For those interested in learning about the effect of the Wapin system on piano tone, the CD provides a very accurate rendering of the live characteristics of both instruments.

The disk begins with selections of Haydn and Beethoven played on the Baldwin. Including these recordings of so small an instrument is certainly a daring strategy by Wathen, indicating his willingness to place his system under the close scrutiny of peer review. One cannot help being impressed by the fullness of tone and sonority of the piano. The tone is clear, powerful and well articulated, without being percussive. The dramatic sustain gives the piano a singing quality not often heard on recordings. The tone of the middle and upper registers could easily be taken for that of a much larger piano, and it is not until Mr. Morris reaches into the bass that the listener can say with certainty that this is not a concert instrument.

On the remainder of the CD, Mr. Morris plays selections from Schubert, Chopin, Brahms, Debussy and Rachmaninov on the Steinway concert piano. His artistry is more than a match to the task of demonstrating the capabilities of the instrument. Mr. Morris guides the listener from the delicately blended tones of the Debussy through the huge and sometimes startling fortissimos of the Rachmaninov with ease and grace, leaving no question of the width and breadth of the dynamic range and the raw power this instrument has to offer. The clarity of tone allows the listener to hear every note, even in the most powerful and heavily pedaled passages. With the unfailing sustain of the piano, Mr. Morris presents slow passages giving every note its full value, and the music a wonderfully relaxed and seamless quality.

The question arises: How different are Wapin pianos from those with conventional bridge pinning? Regarding the smaller Baldwin piano, the answer is, "Very different," when compared to pianos of similar size. The increase in the Baldwin's ability to produce tone is dramatic, and, based on the other examples of small- to medium-sized pianos I have seen with the Wapin system, the effect is consistent. This is not to say that Wapin-enhanced tone is the best answer for all circumstances and all musical tastes. But the consistency of the effect that Wapin has on pianos can put a powerful tool into the hands of rebuilders and makers, increasing their ability to provide for the varying tastes of customers.

The contrast between the Wapin/Steinway D and other large pianos is more subtle than with the smaller instrument: there are other fine concert instruments with wide dynamic range, bright, powerful tone and dramatic sustain. Regarding the prospect of making changes in piano design, one must not lose sight of the fact that the use put to concert instruments is very different than that of home pianos. A concert piano cannot deviate from the accepted standard of tone and performance to the extent that a pianist must re-learn technique or re-figure musical interpretation to accommodate the idiosyncrasies of a particular instrument. In this sense, the fact that the Wapin system makes the piano *different* but not *too different* is a desirable attribute.

The issue of increasing the sustain of pianos is one that must be given careful consideration. The length of time it takes for tones to decay, especially in the treble range of the piano where most melodies are played, tends to set the *lower limit* of tempi for which that piano is useful. In order to maintain a sense of connection between notes, one note must follow the previous note before the first note decays. If a piano has a short, clipped sustain, it will tend to push a pianist to play slow passages a little faster, often not allowing long notes to have their full value. This makes the sense of repose, so desirable in slow passages, unattainable. If a piano has a long sustain, slow tempi may be determined by the requirements of the music and the sensibilities of the pianist, rather than by the limitations of the instrument. If a piano has very long sustain, it is likely that a pianist will need some time to adapt the interpretation of the music to accommodate this attribute; it takes some time to gain the confidence that slowing the tempo will not create discontinuity in the music. In an earlier, unpublished recording of Debussy Preludes, I had the sense that Mr. Morris had not yet gained that confidence in the Wapin/Steinway sustain, and his slowest passages seemed a little rushed, the way they would have to be if played on a piano with less sustain. On the new Wapin CD Mr. Morris' slow passages seem somewhat slower and more dramatic. The sustain of the instrument changes the lower limit of tempi to the point that Mr. Morris has no concern other than his own artistry.

On the other hand, it is not desirable to increase piano sustain beyond a certain upper limit. This limit is determined by the notes beyond the highest dampers. If these notes sustain too long, they will contribute unwanted noise to the lower registers of the piano. A solution to this condition might be to extend dampers higher into the treble, but, in most pianos, there are physical limitations that prevent

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installing more dampers.

Whether or not the tendency of the Wapin system to strengthen high partials in piano tone can be considered an *improvement* is somewhat less clear-cut than the increase in sustain. There is no absolute measurement that can separate desirable tone from undesirable, since tonal preference is largely a matter of personal taste. As piano technicians, we are repeatedly reminded that there is no one piano that will keep all pianists happy. In home situations pianists who prefer the bright sound of strong, high partials might be delighted with the Wapin tone, while pianists who like a round and mellow sound might not find the Wapin tone to their liking. However, the situation in the recording studio is quite different: pianos that produce tones with strong fundamentals and relatively weak partials tend to sound dull and lifeless on recording unless the tone is electronically enhanced. This effect of recording tends to occur regardless of how warm and pleasing the piano may sound live. The Wapin CD demonstrates that the tone produced by the new pinning system responds very well to recording. Given the difficulty in producing a pleasing, musical, recorded sound from any piano, the strongest recommendation for the Wapin system may lie in its potential benefit to the recording industry.

The future of the Wapin system, whether it becomes a widely accepted design feature in future pianos, or whether it falls into disuse like so many other innovations in the piano industry, is yet to be determined. Its success, or its failure, does not lie in the hands of any one person, but, rather, in the collaborative attitudes of those who have always influenced the trends of musical development. To the traditional group of trendsetters, the performers, the composers and the makers, we should now add rebuilders and the recording industry. It is my opinion that the recording industry has the single greatest influence on the future development of music, and it is on recording that the strengths of the Wapin system shine.

Regardless of what the future may hold for Wapin, Michael Wathen and Richard Harris are to be commended for their contribution toward the advancement of piano technology. They have combined a high level of scientific training with technical understanding of the piano to help bridge the gap between scientists and makers mentioned by Fletcher and Rossing. Wathen has recently received PTG's "Crowl-Travis Member of Note" award for his efforts.

Notes:

1. Fletcher, Neville H. and Rossing, Thomas D., *The Physics of Musical Instruments.* Springer-Verlag New York, Inc. p. vi.
2. For more information on the Wapin Piano Bridge, visit the web site at www.wapin.com
3. Those interested in obtaining a copy of the CD should see the Wapin display ad this issue.

Trigger Point Self-Massage for Piano Technicians – Part VIII

By Clair Davies, RPT
Bluegrass, Kentucky Chapter

This last article of the series will cover the legs and feet. The feet are especially complex, containing not only dozens of small, overworked muscles of their own, but serving as anchorage for all the tendons from the muscles of the lower legs.

As a massage therapist, I want to be able to name and locate the many individual muscles in the legs and feet – and there are a bunch. As piano technicians, we don't need to know all these muscles individually. When our legs and feet hurt, we just need to know some easy tricks that will make the pain go away. The drawings in this issue probably tell as much as needs to be said about the available "tricks," but the realities of referred pain still need to be talked about.

I learned something invaluable about referred pain at my favorite place in all the world — Natural Bridge State Park in Kentucky. It's about an hour away from my home in Lexington, and I go down there twice a month throughout the year. Natural Bridge is in the foothills of the Appalachians and the whole area looks and feels wild and primeval, with heavy forests, cliffs and deep ravines.

Natural Bridge itself, once part of the ocean floor, is now at the top of a mountain, the sides of which are strewn with huge moss-covered boulders, some with a tree or two growing on top. In Springtime, wild flowers cover the slopes, more varieties than I've seen anywhere. In Summer, the damp heat percolates a scent from the ferns and cedars that nearly intoxicates. In the Fall, the scarlets and yellows of the laurels and maples make you want to come and stay a week and just roam the woods. Winter is no time to stay away. The tourists are gone, the bare trees are starkly beautiful, and the silence leads a man to think long and deep as he winds his way up the pathways to the top. Natural Bridge is so far away from everyday life in time and texture that the place seems to bring clarity.

The top of Natural Bridge is flat and level, 100 feet in length and only about 12 feet wide. When you're on top it seems quite high and you can see for miles over the tops of the surrounding mountains. It makes you wonder what it would be like to just push off and fly like a bird down through the branches of the trees. Climbing up to the top is a challenge for a middle-aged man, but during the many stops to catch my breath, I just stop and relax and look around. I always see something new and the old legs eventually get me there without too much complaint. Coming down used to be another matter. Long before I got to the bottom my knees hurt so badly that I could hardly take the next step. Sometimes I really wondered if I were going to make it. I had visions of the sturdy young hill boys of the park service having to strap me to a litter and carry me back down to the lodge. I got smart before that ever came to pass.

Remembering what I had read in Travell and Simons about referred pain, I stopped one day and searched for the trigger points that were making my knees hurt. I found none in the knees themselves. The trigger points turned out to be in the quadriceps, the front of my thighs, well above my knees. What a revelation! After that, when the pain came I'd just stop for 20 seconds or so and knead my knots, and then go on. The pain was gone that quick. Think of all the people who sit in doctors' offices every week with just that same pain and with the same cause, but without the same knowledge of the simple fix.

The reason why I had pain coming down the mountain but not going up was because of the difference in the action of the thigh muscles. Going up the trail, the quadriceps muscles experience concentric contraction, that is, they shorten as they tighten. Coming down the trail, the leg reaches down to find footing, then lets the body descend. In doing this, the quadriceps has to contract eccentrically — lengthen as it tightens. Eccentric contraction is much more stressful on the muscle fibers than concentric contraction and consequently more likely to generate trigger points.

It's wise to be suspicious of pain in the legs, knees and feet because of the certainty that the pain is being sent from elsewhere. Knee pain is the most frightening. We always fear the worst — the joints are going, arthritis is setting in, here comes old age.

I still have knee pain occasionally. I climb my mountain and I climb and descend a lot of stairs. If it weren't for Janet Travell and David Simons and my good fortune in finding out about their work, I wonder what shape I'd be in. And I wonder what my health insurance would've paid out by now for treatments that didn't work because they focused on the pain and not the ***source*** of the pain.

For pain in the knee, look upstream for the trigger points. If the pain is toward the inside of the knee, examine the thigh a bit inside of center. Toward the outside of the knee, search toward the outside of the thigh. A pain just below the knee will likely be caused by trigger points low on the thigh. A pain in the

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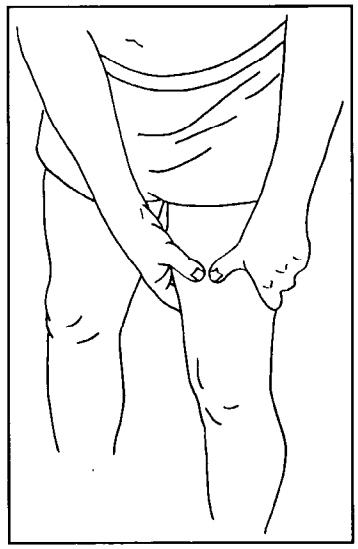


Figure 1 — Massaging quadriceps with thumbs.

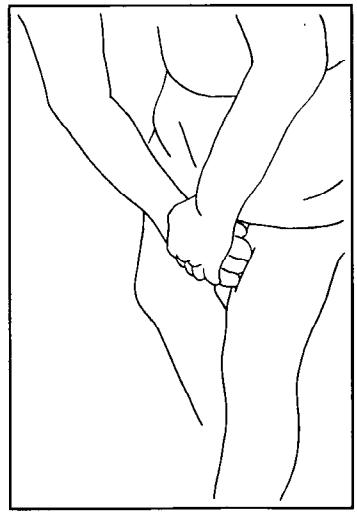


Figure 2 — Massaging quadriceps with supported fingers.

Trigger Point Self-Massage for Piano Technicians

Continued from Previous Page

center of the knee comes from up near where the muscle attaches to the pelvic bone. As with any other hunt for trigger points, just feel around for the knot that is sore to the touch. You will get to know your own body very quickly this way and the connections will become clear. For working trigger points in any of the quadriceps, I like two thumbs or supported fingers — both hands in any case, for the added power and control. (See Figures 1 & 2.)

Intense pain in the groin, a symptom that often leads to hip joint replacement, can simply be a result of referral from knots in the adductor muscles, which are the thick muscles that line the inside of the thigh. This is an odd case where the pain is referred upstream rather than down. Supported fingers or a supported thumb work very well on the adductors. (See Figures 3 & 4.) Go deep and search all the way from the knee to the groin.

The Theracane™ does a good job on the hamstrings (the back of the thigh). Pain is referred up to the buttocks and down to the back of the knee. A chief cause of hamstring trouble is too much sitting, especially with pressure being exerted on the back of the thigh. Sitting for long periods in the car or at work tends to keep the hamstrings shortened. To help prevent the formation of trigger points, stretch a little like a cat does, every time you get up from your chair.

Ankle trouble kept me out of sports when I was young. Running just a block would cripple me for days with sharp pain on either side of the Achilles tendon. Everybody thought I was dogging it, but the pain was real and I felt handicapped and completely without hope. It was embarrassing and humiliating too, in gym class, being the last one left when they chose up sides. All my life I thought I had weak ankles — until I stumbled onto the concept of referred pain. I came to find out my trouble all along was just trigger points in the calf muscles!

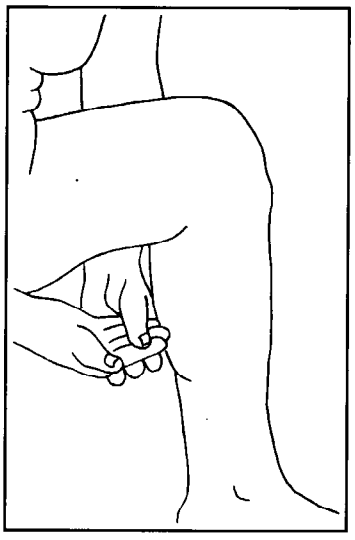


Figure 5 — Applying ischemic compression to calf muscle with supported fingers.

I suppose I can't get mad at my parents or the teachers or coaches for their lack of knowledge. But it's a crying shame no one knew what the real trouble was, because the solution is so terribly simple. When I get ankle pain now, I feel around for trigger points in my calves and the cure is immediate and complete. Supported knuckles work really well for the calves. I rake the muscles from the ankles to the backs of the knees. Supported fingers are even better for ischemic compression — going deep, pressing and holding a trigger point (See Figure 5).

Pain in the big toe and the top of the foot most usually is being sent from the tibialis anterior which is the thick muscle just to the outside of the shinbone. It is believed that many cases of gout, which centers on the big toe, is nothing more than trigger points in this hard-working muscle. The tibialis anterior is best massaged with supported fingers. The bottoms of the feet are a nesting place for dozens of trigger points. Soaking the feet in hot water is very nice, but trigger point "search and destroy" gives better results. I like to use a supported thumb or supported fingers for the feet. (See Figures 6 & 7) When standing a lot in the shop on a concrete floor, or when tuning a lot of uprights, the feet benefit greatly from a few minutes of massage both morning and night.

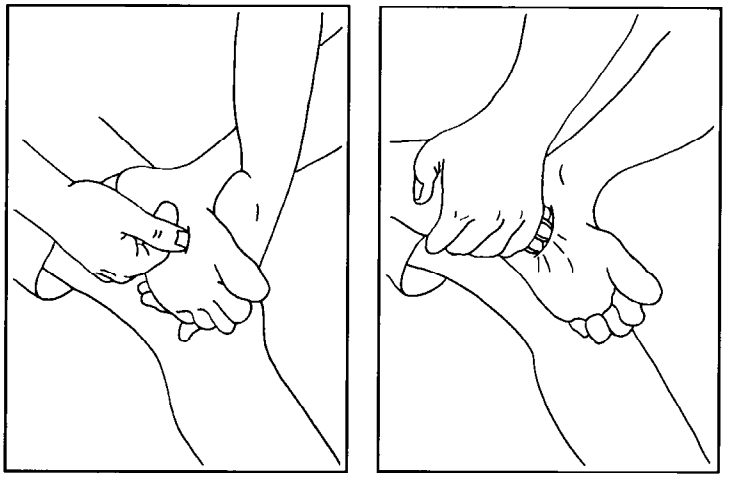
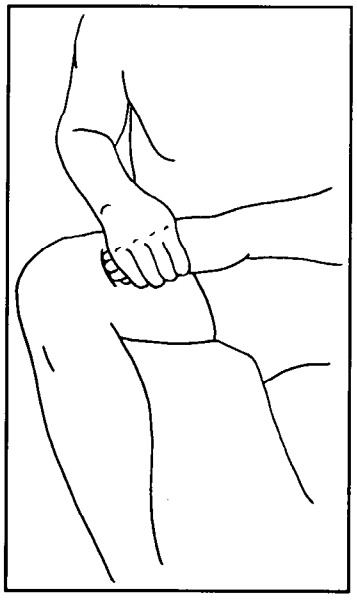


Figure 6 (LEFT) — Massaging foot with supported thumb. Figure 7 (RIGHT) — Massaging foot with supported fingers.



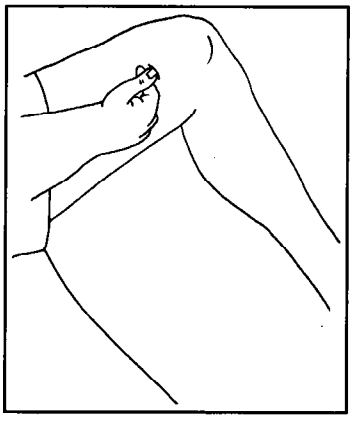


Figure 3 (LEFT) — Massaging adductor muscles with supported fingers. Figure 4 (ABOVE) — Massaging adductor muscles with supported thumb.

In Conclusion

There's much more I could say about Trigger Point Self-Massage. I feel as though I've left out more than I've told. Maybe I'll see you in the classes I hope to be teaching on the subject.

In the meantime, I hope you will follow my lead and seek to make an expert of yourself. Get a good massage to discover just how good it's possible to feel, then find the money for the Travell and Simons books. Teach your family Trigger Point Self-Massage. Tell your tuning clients about it, particularly the players who practice long hours and are afraid they're getting "carpal tunnel." Show them how to massage their own forearms and hands. There's a world of pain out there in need of some simple solutions.

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Warranted for a lifetime to the original owner against cracking or splitting.

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Kiln dried Select Grade High Density Hard Maple provides superior tuning and tone stability.

Tone and Action Regulation
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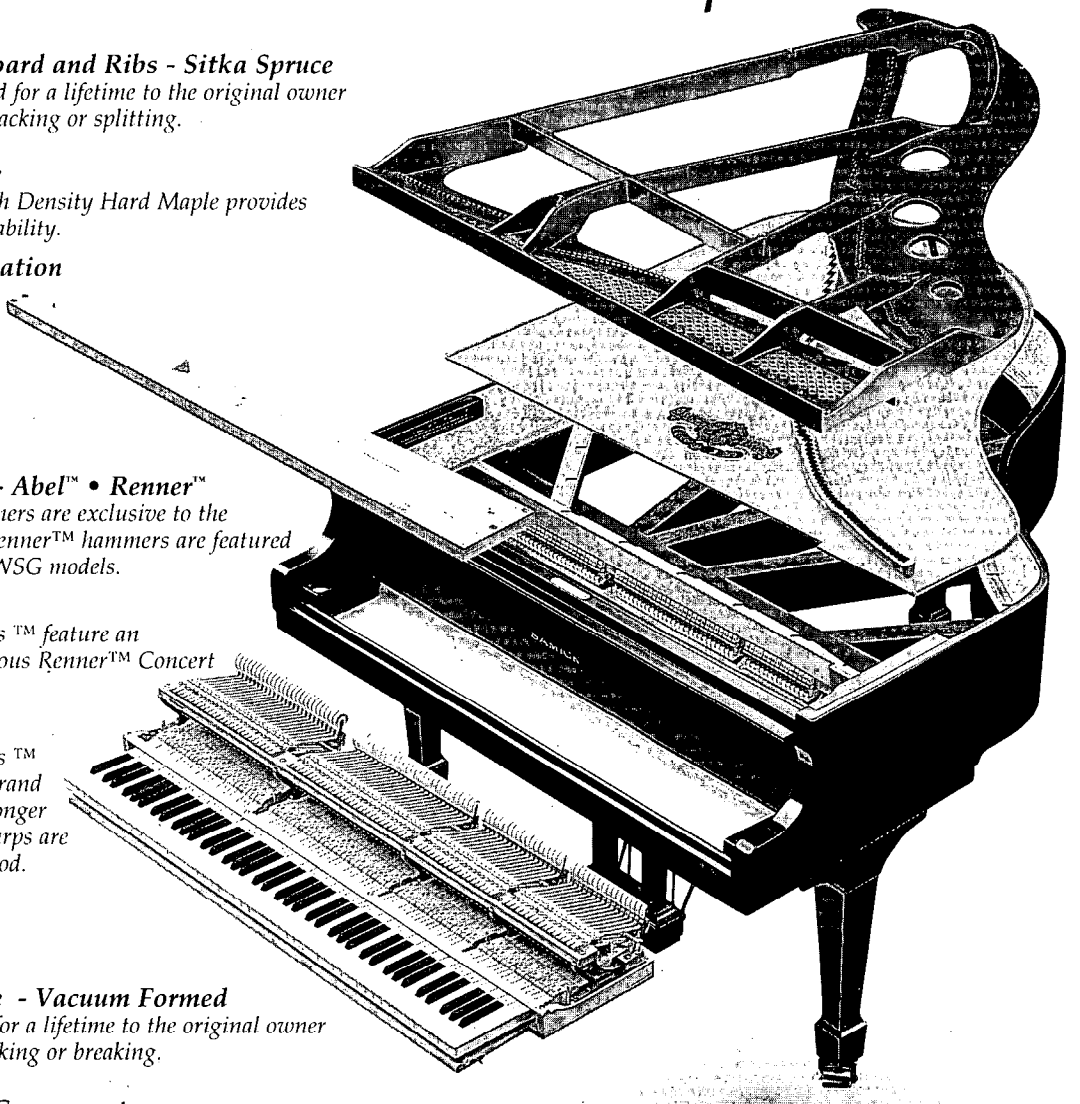

Germany

Hammers - Abel™ • Renner™
Abel™ hammers are exclusive to the WSG 275, Renner™ hammers are featured on all other WSG models.

Action - Renner™
Samick World Grand Pianos ™ feature an improved version of the famous Renner™ Concert type action.

Keys - Kluge™
Samick World Grand Pianos ™ feature full concert length grand piano keys, which are 1/8" longer than industry standard. Sharps are crafted of genuine ebony wood.

South Korea

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From hand notched bridges to specially built 100 ton rim presses, the best techniques of age-old artisans mesh with new world technologies to create an instrument your family will treasure for generations.

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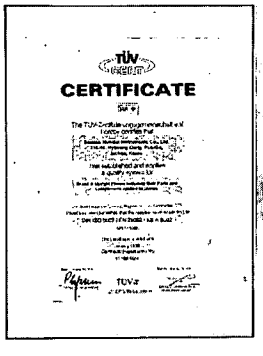
Samick was the world's first music manufacturer awarded the ISO 9002 Quality System Certification (from TUV). That means Samick can* ***guarantee****, through third party verification, that our manufacturing process complies with a globally recognized international quality system standard.*



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By David Patterson, RPT
Toronto, ON Chapter

The Bartolomeo Chronicles

Bartolomeo Checks the Wood

He goes to his favorite note in the historically-troubled octave above the tenor section. Here he plays the note at various sound levels, listening to the type and quality of sound. With a hard blow and the sweep second hand on his watch, he measures the sustain time of the note. He repeats the process, this time plucking the strings as loud as possible. When the two measured times are close, he knows that the action part of the system is transferring energy adequately. When both times are short, the acoustical/case/structure could be weak in its ability to produce sound. When the plucked ring time is longer than the hammer's ring time, this normally verifies that the structure can produce the sound, but the energy is being robbed by inefficiency in the hammer and/or the mechanical system.

A detailed look at the bass bridge can tell Bartolomeo of fractures or splits at the pins, a lifting or improper cap, shifting or separations in the laminates or glue joints at the apron. With his flashlight, he makes the decision on its condition. Then he shines it briefly on the low tenor bridge before checking the top octave down in behind the treble hammers. The flashlight again assists as he illuminates the bridge at the tenor/treble break; at this stage, he will catch any pin movement or chunks of wood splitting out.

A rolled bridge is immediately evident when he finds ragged soundboard cracks that follow the curvature of the bridge. Strictly speaking, a piano such as this is 'not repairable' and he wants to know this before offering comments. Since cracks occur along grain lines or glue lines, they are straight; any ragged crack is immediately suspect. In these cases, this strong piece of maple bridge has rotated into a shape non-parallel to the soundboard. It literally rips the softer attached soundboard as it rotates, and that's exactly what it appears as – a rip.

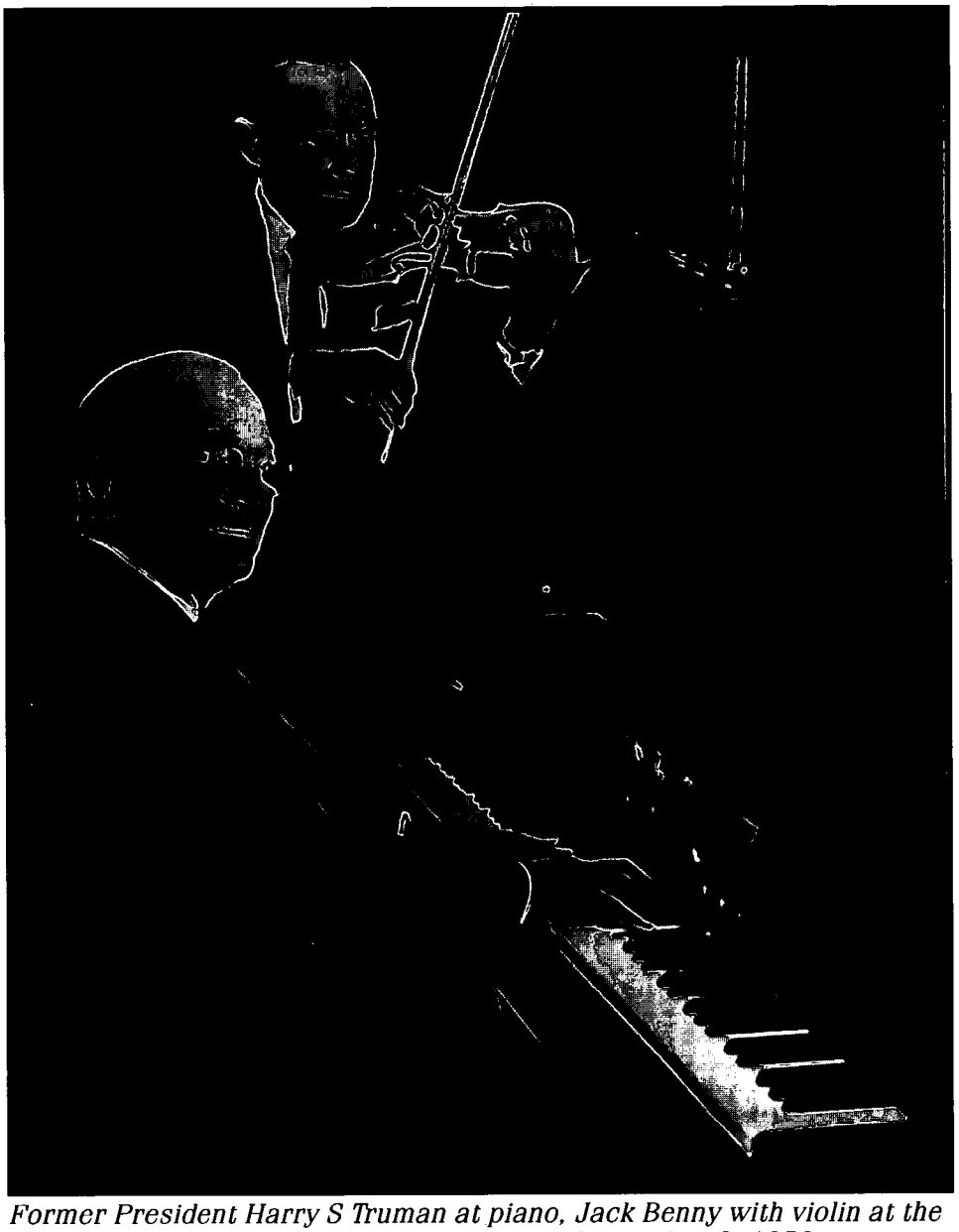
Bartolomeo feels across any soundboard cracks to see if the two sides are absolutely flush. His visually impaired friends have taught him that a finger can easily detect a .001" leveling discrepancy, whereas our eyes are ineffective for this work; we rely on them out of habit. If the two sides of the crack are not flush, it is likely that the rib glue joint has failed. He counts the cracks and shines his light at the back of the piano if necessary. He adds up the total number of intersections at which a crack crosses a rib and records this figure, knowing he can multiply it to give the exact labor expectation. Creating a quotation for soundboard work then becomes simple at that point. From the back, he can also apply pressure against either side of any crack while observing and listening. A small visible gap between board and rib, when pushed on, can reveal that the entire rib is separating and will need to be fastened at every point. With pressure, a crack that is not even exhibiting rib separation may begin to show gaps and repairs needed. But here his ear does most of the work as he listens to the crystallized, crackling sounds that failing hot hide glue joints make. Any faint crackling at a particular point indicates a repair needed, whether damage has yet occurred or not.

Whenever at the back of a piano, he can take note of laminated board pianos by seeing a cross section of the soundboard at the nosebolt hole. Later, when he predicts "anticipated drop" during a pitch correction procedure, he saves time and trouble by being alerted to this stiffer diaphragm, which reacts differently than solid spruce.

He's figured out much of what he would do for this piano.

Next month, Bartolomeo considers the tuning pins....

Harry Truman and Jack Benny played here. You can, too!



Former President Harry S Truman at piano, Jack Benny with violin at the Truman Library in Independence, Missouri, September 3, 1959.

KANSAS CITY

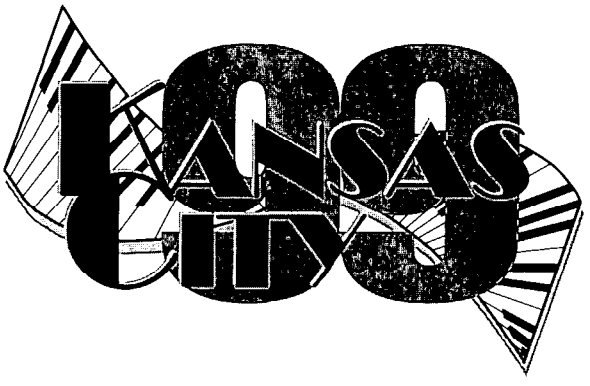
Kansas City. It's a great town with a rich history, a giant in the development of jazz, and an outstanding city to host the 42nd Annual Piano Technicians Guild Convention and Technical Institute, July 21-25. Make plans now to attend!

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

All New — All-Day Wednesday!

As Institute Director, I am happy to announce that a whole new day of classes will be added to the 1999 Institute in Kansas City. On Wednesday, July 21, participants will be able to experience the first ever all-day classes. Seven classes will run simultaneously throughout the day. Many instructors and manufacturers have been coming to me with ideas for all-day classes.

So the proposed all-day classes wouldn't compete with our regular Institute schedule, the Executive Committee has agreed to float this trial balloon and offer participants the advantage of these intensive sessions in addition to the traditional Institute experience. One whole day of classes for no extra registration fee! (Two of the seven will entail a slight extra charge, as explained below.)



Steinway & Sons will be bringing their factory to Kansas City. The Steinway & Sons All-Day will consist of six different programs:

- Warren Albrecht, Director of Materials – Wood technology (Materials construction, structural integrity)
- Andy Horbachevsky, Director Engineering Development – Art case (from design through manufacture)
- Michael Mohr, Director Manufacturing Processes – Steinway construction/manufacturing (patents, belly, fore-finish, action)
- John Patton, Administrator Technical Education & Training – Concert preparation (action, tuning and voicing), voicing the Boston piano
- Stephen Marcy, National Service Manager – Steinway and Boston Damper systems
- Gary Green, Director Technical Services – Special Session for Institutional Technicians – Including "The Steinway & Sons Guidelines for Institutional Piano Service and Modeling Disk."

Instructor David Stanwood will be offering a four-part session, which will include:

- "Mastering Upweight and Downweight" (hands-on workshop)
- Suggested Reading: "Mastering Friction with the Balance Weight System," *PT Journal*, October 1990
- "Measuring with the New Touchweight Metrology" (hands-on workshop)
- Suggested Reading: "The New Touchweight Metrology," *PT Journal*, June 1996.
- "The Touch Designer's Toolkit" (classroom lecture)
- "The Brave New World" (classroom forum).

Instructor LaRoy Edwards will present a training session for experienced instructors on how to teach the Vertical Curriculum three-day class. This curriculum, written by LaRoy and donated to the Piano Technicians' Guild, will be presented by invitation only. We are looking for instructors willing to take this course of instruction home to their regions for the benefit of local Guild members.

Instructor Webb Phillips — ($40 added fee) – Hands-on Refinishing. From novice to engineer – a full day of experimenting with various types of finishing, including water-based, nitrocellulose and urethanes. Spraying demonstrations of HVLP (high volume-low pressure) and conventional air. This class is for those who are seeking to understand fundamentals or to polish existing skills. The slight additional fee will cover the extra materials and equipment needed.

Instructor Clair Davies — ($40 added fee) – This master piano technician has changed professions and now works primarily as a massage therapist specializing in trigger-point self-massage, as written about in his eight-part series in the *PT Journal*, 1998-99. Learn to stop working in pain, from one who has worked on both sides of this issue. This was a tremendous success in Providence, and now we're pleased to give you a full day of instruction to address the various maladies affecting us as a result of our line of work. Clair will also be offering therapeutic massages by appointment throughout the week.

Yamaha Disklavier™ — Several members of the Yamaha team will give you hands-on experience working with these hybrid pianos. This class is for technicians who are currently servicing Disklavier™ pianos and for those who want to learn. Beginner or advanced, the training will be custom-tailored for you. Class size is limited. You must register by calling Judy Naylor at Yamaha, (714) 522-9905.

Renner International — Rick Baldassin, along with other Renner International instructors, will conduct this multi-part series extravaganza. Correct part selection, stack and back damper replacement, and hammer and damper installation. This class will guide you through the action rebuilding process that will restore your client's piano to the demanding specifications that he/she requires.

I'm very excited about this new day of classes. As this Institute comes only once a year, we find it imperative to offer as much training as possible. And now it's happening – on Wednesday!

— John Ragusa, RPT
1999 Institute Director

Baker Recuperating following Treatment

Dear friends,

Nine months ago, I sent out to each Guild chapter a plea for help. My husband, George, was facing expensive treatment for kidney cancer, a rare illness that ten years ago held no hope for survival. With support from headquarters, I was able to mail to each chapter president a packet explaining our situation and requesting that each member who so desired would send the price of one tuning to the George Baker Medical Fund. Through this effort, we received responses from 219 individuals and chapters, with donations totaling $15,324.

It seems so long ago, and so much has happened. George and I want to bring you up to date on his condition. Thanks to PTG members, friends, family, church, and community, we raised a total of $130,000. Tumors from his removed right kidney had spread to the lymph nodes in his chest and to his lungs. For 18 days from February through April, George endured the difficult Interleukin 2 therapy at UCLA Medical Center under the direction of Dr. Robert Figlin and his great staff. During a break in the middle of the treatment, he developed septicemia and nearly died, but after four days in the hospital, was basically back to normal. Six months have passed since the end of his treatment. The IL-2 has had a fairly good, if not typical effect, reducing the size of the tumors and hopefully killing them off. Dr. Figlin's experience had been that when IL-2 works, it works well; with George, it wasn't as clear-cut a response. The drug has only had FDA approval since January for use on kidney cancer.

Then in August, George started having severe headaches. When they started weakening his right side and affecting his ability to read, we knew we needed to check it out. By the time we got to the hospital, he was unable to walk into the hospital because of the severe pain. A CAT scan showed nine tumors in his brain. He was immediately started on steroids to reduce brain swelling, spent two days in the hospital, and started whole brain radiation on the third day. Ironically, the day he was released was our daughter's

Continued on Next Page

Pittsburgh Chapter Catches Up with History

From the Pittsburgh Chapter

The Pittsburgh Chapter was invited to a private evening with history on Sept. 22 courtesy of Trombino Piano Gallerie and Steinway & Sons. The occasion was the arrival of three distinguished pianos owned by some of the 20th century's greatest pianists, Horowitz, Paderewski and Cliburn. A brief piano recital by Franck Van Mastrigt opened the event and an opportunity to play, compare and "pianalyze" the instruments followed. Trombinos expanded their generosity by permitting the music public to have access to the pianos, and finally by hosting a birthday recital and reception for Horowitz on Oct. 1. Using Piano 300 as the vehicle to publicly support the work of Steinway, the Pittsburgh Chapter was able to spread the word to teachers, schools and pianists – intending to initiate an era of greater unity between dealers, pianists and technicians in Pittsburgh. The core of our Piano 300 effort is to improve public visibility and perception of pianos. The bulletins will be distributed as events warrant.

Photo 1 — Randy Mangus, RPT, and his Reyburn Pianalyzer preparing to do aural and digital comparisons of the instruments.

Photo 2 — Tombino's house pianist, Franck Van Mastrigt (seated), and Pittsburgh Chapter members in attendance, from left, Daniel Sittig, RPT; Tom Fleming; Peter A. Stumpf, RPT; Brian Bailey; Randy Mangus, RPT; Ken Hand; and Dan Alberts, RPT. Theodore Mamel, RPT; David Barr, RPT; and Wesley Gill were not present for the photo.

Pittsburgh Chapter Press Release for the Event

Piano300 Bulletin

An Unprecedented Encounter with Historical Pianos

September 1998 — Piano students from the Pittsburgh area have the opportunity to examine and play instruments used by some of the 20th century's greatest pianists. As September is National Piano Month, it is exciting to announce this event hosted by the Trombino Piano Gallerie, downtown Pittsburgh (ph 412-765-0600). The centerpiece of the visit is a birthday celebration/concert featuring the performance Steinway of Vladimir Horowitz on October first. Student wishing to play those pianos must RSVP to the number above. Participants will receive a certificate commemorating the event.

Piano300 is a celebration of three centuries of great pianos, literature and performers. The local effort, sponsored by the Pittsburgh chapter of the Piano Technicians Guild, will focus on providing piano news to music professional and lovers in our area. National plans include a year-long celebration and exhibit at the Smithsonian in Washington, D.C., during 2000. Call Peter Stumpf, RPT, at 412-881-3067 for more information.

Baker Recuperating

Continued from previous Page

birthday and exactly one year from the day of his surgery to remove a 5-pound, 5-ounce tumor and the kidney to which it was attached. Also, as of the previous week, all George's medical expenses had been paid off through the medical fund and our own income.

He finished radiation 33 days ago. A follow-up MRI this week shows fourteen tumors, but the doctor here in Bozeman believes they were there initially and just didn't show up on the tests done at the time. George will get another MRI in three months.

As trying as this has been over the last 14 months, there have been many blessings. We were led to begin a new piano sales and service corporation at the start of 1997 with a great partner, Louis Spencer-Smith, RPT. Because of this and the fact that I can now be an important part of the business, we are no longer solely reliant upon George's two hands for our support. It is a true family business, with our sons Matt and Adam (16 and 13) helping move pianos, and our daughter Elizabeth, 19, also an RPT, providing technical support. George has continued to work during most of the last year. Currently he is struggling with withdrawal from the steroids, which causes unusual fatigue; but the family has pulled together admirably. Three-year-old Joel gives him a special incentive to keep fighting and maintain a good attitude.

We have insurance on George which will begin covering expenses for cancer treatment on February 1, 1999. The bills up to that point are sizable, but not beyond payment, since the hospital is willing to work with a payment plan.

George has had many opportunities to encourage other people suffering from severe illnesses. Everyone at the local hospital knows him, and he has found ways to help in fund raising efforts for the Cancer Treatment Center at Bozeman Deaconess Hospital, which includes the state-of-the-art radiation equipment with which he was treated, in place only since this spring. The local FOX TV station recently did an interview with George, used in their popular Healthbeat segment. In the interview, he said that he knew he would probably die as a result of this cancer, whether it was in six months, a year, or (God willing) ten years or longer. But he has made up his mind that whatever time he has left, he will spend living, not dying. He has learned from Dale Carnegie's experience with his handicapped son, that there is nothing in his life he cannot change, if only the attitude with which he approaches it.

George has always been a special person. I pray he may continue to be an inspiration to his family and others for a long time. We would appreciate remembering him in your prayers as well. Thank you.

Sincerely,

— Dianne Baker and family

Passages

The Southwest Florida Chapter recently lost two of its oldest and most valued members.

Duncan Ritchie, RPT
Sept 23, 1920 — Sept. 28, 1998

Duncan Ritchie died at the age of 78 following a long illness. He was a piano technician in the southwest Florida area for 50 years and an active Guild member for 45, until physical problems forced him to retire. Many young piano technicians got started in the business as a result of his encouragement and mentoring, and his colleagues remember his enthusiasm for piano work, even after he was bedridden.

Duncan was a gifted singer and shared his talent by singing in the Seminole Heights Methodist Church choir for almost 35 years. He leaves behind his wife of 53 years, three daughters, eight grandchildren and many friends who will miss him greatly.

Albert William Henry Hirsch Jr.

Albert William Henry Hirsch Jr., known to family and friends as "Al," died suddenly in October at the age of 76. Al became interested in tuning at age 18, when internationally known pipe organ technician Joseph Schirr took him to the Dupont Estate in Cuba to repair a hurricane-damaged organ. Al was a church choir director and an accomplished concert and opera singer, who was chosen to introduce the famous U.S. Army Air Corps song, "Off we go, into the wild blue yonder..." early in World War II. He sang professionally with many fine orchestras and well-known personalities until a heart condition forced him to change careers in 1967. His love of music led him into many years as a successful choir director and piano technician, and he was a dedicated PTG member who will be remembered for his warm personality.

More than anything, Al will be remembered for his devotion to family and church. His is survived by his wife, Allie; three sons, and many other family members and friends. His wife writes, "Al and I had 55 wonderful years, and I'm sure the Lord has him singing in the Celestial Choir of Heaven; and he's enjoying every minute of it."

— Bob Horton, RPT

In Memory ...

William Fletcher, Sr., RPT
Chuckey, TN

Oscar Gaudette, RPT
New Smyrna Beach, FL

E. Charles Hanson, RPT
Fargo, ND

Industry News

Steinway & Sons Make Personnel Moves

Hoover Named Steinway Training, Promotions Director

New York City — Jim Hoover was recently named director of sales training and promotions for Steinway & Sons. Hoover will conduct national sales training at Steinway & Sons' U.S. factory in New York, as well as overseeing regional sales training at exclusive Steinway dealerships across the country. Hoover also will coordinate promotion summits where Steinway & Sons and its dealers develop the latest marketing programs, and Frank Mazurco, the company's executive vice president.


Jim Hoover

Previously, Hoover was Steinway & Sons' manager of training and marketing development. He earned retail sales, marketing and management experience at Pennsylvania's 32-store Fulton Piano & Organ Co., and at Kimball International in Jasper, Ind., where he earned a number of industry awards.

Losby Appointed London GM

New York City — Ron Losby was recently appointed general manager of Steinway Hall-London, one of the world's five Steinway & Sons-owned Flagship showrooms.

Frank Mazurco, company executive vice president, said Losby will oversee all operations at Steinway Hall-London, including its wholesale and retail sales as well as service and piano restoration.

An 11-year Steinway veteran, Losby joined the company as a district manager responsible for its Midwestern United States and Central Canada regions. Last year he was promoted to the position of senior district manager.


Ron Losby

Steinway Hall, on Marylebone Lane in London's West End, was established in 1875 as Steinway & Sons' showroom for Great Britain.

CALENDAR of EVENTS

February 12-14, 1999
CALIFORNIA STATE CONVENTION
Hyatt Regency, Long Beach, CA
Contact: Peg Browne (714)530-4768
11511 Wasco, Garden Grove, CA 92841

March 11-14, 1999
PA STATE
Holiday Inn Central Greentree, Pittsburgh, PA
Contact: Dan Sittig (724) 266-5497
1209 May Street, Ambridge, PA 15003

March 18-21, 1999
CENTRAL WEST REGIONAL
Sheraton Plaza Hotel, St. Louis, MO
Contact: Wim Blees (314)962-5774
515 Poplar, Webster Groves, MO 63119

April 8-10, 1999
PACIFIC NW REGIONAL CONFERENCE
Provo Park Hotel
Contact: Vince Mrykalo (801)378-3400
694 North 100 East, Provo, UT 84606

April 23-24, 1999
FLORIDA STATE SEMINAR
Ft. Lauderdale Marriot
Contact: Mark Shapiro (561)451-2136
23360B S.W. 53 Ave., Boca Raton, FL 33433

April 30-May 2, 1999
NEECSO / New England Eastern Canada Seminar
Hotel Gouvernears, Quebec
Contact: Isabelle Gagnon (418)822-3550
6769 Royale, L'Ange - Gardien, QC G0A 2K0

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.

Tapping The Value Of Your Life Insurance Today

A Financial Option In Time Of Need

The Piano Technicians Guild offers a *cost-free* member benefit that will change the way you look at life insurance and help you protect against financial uncertainties in the future.

The benefit, called a "viatical settlement," enables individuals facing a severe chronic disease or life-threatening illness, such as cancer, to sell their life insurance policy for cash. The money can be used for many purposes and in most circumstances is *free of Federal income tax.*

Viatical settlements are offered by PTG through Viaticus, Inc., an affiliate of the CNA Insurance Companies—one of the largest insurance organizations in the United States.

Anticipating The Need Today

Each year, more than 2 million Americans are diagnosed with a life-threatening illness. Unfortunately, many of these individuals and their families will experience financial difficulties. While health insurance may pay for many medical expenses, most severely ill individuals will eventually no longer be able to work. Yet these same individuals are still responsible for non-reimbursable medical expenses, mortgage payments, car payments and other day-to-day living expenses.

While a life-threatening illness is not something you want to contemplate, it is important to determine if you and your family will be financially secure in the event of such a circumstance. You have already started the planning process by saving and by purchasing life insurance. However, recent studies show that this may not be enough. According to the *Journal of the American Medical Association*, 33% of families depleted all or most of their life savings as a result of a life-threatening illness. Additionally, the results of another study, sponsored by the Robert Wood Johnson Foundation, on the financial impact of a terminal illness on 2,652 families, are summarized by the graph below.

Another Financial Option

The viatical settlement option is not the only option available to individuals facing a life-threatening illness. Some life insurance policies feature a rider called an accelerated death benefit (ADB) which enables the policy holder to receive a cash "advance" of the policy's face value. This is not the same as a viatical settlement. The table below compares ADBs to Viatical Settlements.

As the table above illustrates, viatical settlements provide individuals with flexibility. Additionally, the viatical settlement benefit can be used to complement the ADB. For example, an individual may receive a cash advance on their policy through the ADB option and sell the remaining net face value to Viaticus.

Learn More About The Service

We encourage you to take time today to consider how you might utilize this service, should you or your family ever need financial assistance.

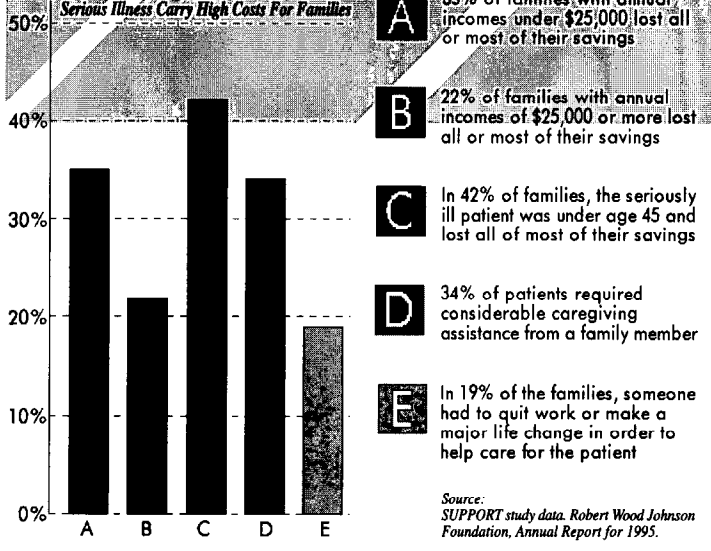
Please call one of Viaticus' customer service professionals at 1-888-200-5204 if you have any questions about this new benefit.

How The Service Works

The process of selling a life insurance policy through Viaticus is simple and non-threatening. Experienced insurance and viatical professionals will guide you through every step of the process.

- If diagnosed with a life-threatening illness an individual may decide to sell all or part of their group or individual life insurance policy in order to acquire necessary funds.
- The process of applying for the Viatical Settlement benefit is simple and completely confidential.
- There are no interviews, just a single application form to complete. Once this form is completed, and the individual authorizes Viaticus to proceed with the application, the life insurance policy and the medical records are obtained and reviewed by Viaticus.
- The amount Viaticus will pay for your life insurance is determined by several factors, including projected life expectancy and premium obligations. As a regulated industry, there are guidelines which have been established in order to ensure that individuals receive a fair price for their policies. These guidelines are established by the National Association of Insurance Commissioners (NAIC).
- Within an average period of 2-3 weeks, Viaticus evaluates the application, the medical records, and the insurance policy and makes a decision. At this point, Viaticus makes an offer and the closing process starts and payment is made. As part of the closing, the following occurs: Viaticus becomes the beneficiary named on the life insurance policy; coverage is assigned to Viaticus; and, Viaticus assumes the premium payment responsibility, if applicable.

VIATICUS



A 35% of families with annual incomes under $25,000 lost all or most of their savings

B 22% of families with annual incomes of $25,000 or more lost all or most of their savings

C In 42% of families, the seriously ill patient was under age 45 and lost all of most of their savings

D 34% of patients required considerable caregiving assistance from a family member

E In 19% of the families, someone had to quit work or make a major life change in order to help care for the patient

Source: SUPPORT study data. Robert Wood Johnson Foundation, Annual Report for 1995.

Viatical Settlement Compared to Accelerated Death Benefit (ADB) Rider

Facts About Viatical Settlements	Facts About ADBs
• Payment generally 50 to 85 percent	• Payout generally 50 percent or less
• Viaticus covers life expectancies of up to five (5) years	• Generally covers life expectancies on one year or less
• Rapid payment	• Hard to administer
• Policies from any life insurance company may qualify	• Only a limited number of policies apply
• No further premium payments	• May need to continue paying premiums

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Phyllis Tremper
PTGA President

AUXILIARY exchange

DEDICATED TO AUXILIARY NEWS AND INTERESTS

Commit to the Future

Since my hip replacement surgery a week ago I've had plenty of time to think and reflect. I am under the impression that the year 1999 is going to get a bad rap. There are those who are convinced that it marks the end of the world. They point to the coming millennium as a time of great depression and the year 2000 as the beginning of the end.

Looking on the brighter side, let us assume we will survive and that we can look forward to another century. Have you ever looked back and consider how far we as a species have come in 100 years -- from my mother's experience with the horse and buggy to her witnessing John Glenn whirling around the Earth somewhere up there.

What will happen in the next one hundred years and how will it affect us? Of course we don't know, but at least we can make plans and look for options. As this month is the beginning of a new year, I suggest that you stop and review your choices for commitment and support.

Fred and I sit down every January and decide which causes and organizations we are going to support during the coming year. We make our selection according to our own priorities and beliefs. High on our list is support of our two local National Public Radio stations. Another is our service to the PTG and the PTGA, and in particular our commitment to the PTGA Scholarship. I would hope that the scholarship fund is one of those causes you seriously consider. Our support of all high school and college student does not go unnoticed. We do make a difference. We may not know the recipients personally, but you will feel better knowing you have nurtured a career and supported the future study of the piano.

Maybe the next century will be better for it.

Have a wonderful and productive 1999.

Happy New Year.

— Phyllis K. Tremper
PTGA President

P.T.G.A. Membership

The Auxiliary of the Piano Technicians Guild is a dynamic group of Piano Technicians Guild supporters. We have many great activities at State and Annual Conventions, and we raise funds to support our Auxiliary Scholarship Awards Program. By encouraging budding talent we make a very significant contribution to the piano industry.

Membership also entitles you to a discount registration at State and Annual Conventions where you may attend some informative classes. At Conventions you will meet other people from around the country who share your interest and will make new friendships.

If you would like to share the fun that we have and at the same time support the Guild by joining the Auxiliary, fill out the form below, and send it along with your check for $15 to the Treasurer, Marilyn Raudenbush. A full year's membership is only $15. (A real bargain.)

Sincerely,

— Diane Hennessy, PTGA Vice President

Please send to:

Piano Technicians Guild Auxiliary
Marilyn Raudenbush, Treasurer
20 North Laurel Street
Millville, NJ 08332-4148

☐ Yes, I would like to be part of the PTGA membership for 1999

Name _____ ☐ New ☐ Renew

Address _____

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Texas State - Really Great

The Texas State seminar was held in Houston, Texas on October 16-18, 1998 with a total attendance of 122. On Friday morning, eight ladies and three children met in the hotel lobby to coordinate our activities. Old Town Spring was decided on as our destination. Spring is a small town located just north of Houston. The "old town" has been converted to a quaint shopping area including a variety of businesses and restaurants. We did not begin to cover all the shops available, but we all managed to find some good buys to our liking. Five of us got together again Saturday to go a little further north to Conroe to check out their outlet mall. We came back to The Woodlands for lunch and shopping at The Woodlands Mall.

My husband, Martin Wisenbaker, has been having so much fun singing with Larry Crabb's barbershop singers at the international conventions that he decided to organize it for the Texas State seminar. A group of nine men, including Bill Yick as the director, entertained us at the banquet on Saturday night. To quote Gary Neie, TSA president, "The barbershop went over with a bang...." It promises to be a regular attraction for the future if we can get Bill Yick to come every year.

At the banquet, Martin Wisenbaker was also presented with the Jimmy Gold Award for his "outstanding service and dedication to TSA." Before he presented Martin with the very nice plaque, Leon Speir called me to the platform to stand with Martin since he knew that I had done much of the work for Martin when he was on the TSB board. So, although my name is not on the plaque, I was recognized as well. You can see why I think the Texas State was really great!

— Beva Jean Wisenbaker

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DISPLAY AD INDEX

Former President Harry S Truman at piano, Jack Benny with violin at the Truman Library in Independence, Missouri, September 3, 1959.

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PTG GAZETTE
YAMAHA
January 1999

The "Rule of Three."

I remember hearing about doing a technical task in a "three step" approach when I was servicing pianos at the Interlochen School of Music in Michigan. This was shortly after finishing my apprenticeship and I had no idea just how valuable this method would prove to be.

The key to using this method efficiently is first a rapid run-through, and then the second time a more detailed study, but yet at a quick pace. The third time is accomplished, either rapidly or slowly, depending on the accuracy of the two previous steps.

I first attempted using the "rule of three" when setting temperament. The first time through, I get the intervals "roughed in". The second pass, I improve on the first and get the intervals tighter. And on the last time, I refine the intervals and their relationships and "voila!" a perfect temperament!

The tuning of a piano can be done very effectively using the "three step" method. Tuning the tenor, treble, and bass octaves, with their appropriate interval tests, can be done quickly. The unisons are brought in, followed by a quick check of the temperament and further refinement of the remainder of the keyboard. The last time through, the temperament is checked again and the octaves and their attendant intervals emerge smooth and agreeable with solid stable unisons.

"...the 'rule of three' can be extrapolated into a wide variety of everyday human tasks."

— Greg Rorabaugh

This method takes getting used to. The need to accelerate speed is very important to make the process develop efficiently.

During my "Little Red Schoolhouse" training, the "three step" method was suggested in reference to action regulation. It works great with setting a hammer line, regulating the key dip, and adjusting the backchecks.

This "three step" system can be cycled repeatedly throughout all the various technical tasks in repairing, restoring, and refinishing pianos. At the risk of sounding philosophical, I have found that the "rule of three" can be extrapolated into a wide variety of everyday human tasks throughout a lifetime and the results will astound you!

Greg Rorabaugh started his career as a piano technician in 1976 after spending a number of years as a child care worker with autistic children. The most enjoyable aspect of his business that he likes is the independence and the great variety of people he can meet. He tuned his first Yamaha piano in 1976 and has been a Yamaha Piano Service Consultant since 1986. Greg and his wife Marilyn currently reside in Southern California.