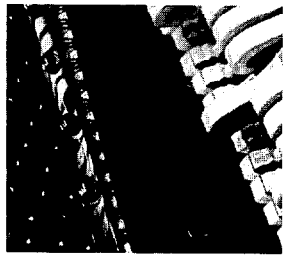
Let There Be PEACE

PIANO TECHNICIANS
Journal
December 1993

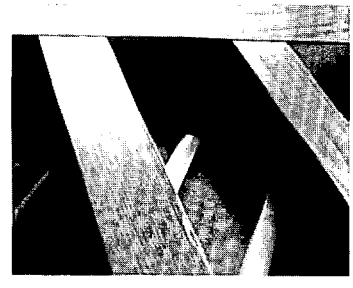
SOUND THINKING

IT'S THE FIRST THING THAT GOES INTO A WURLITZER PIANO.

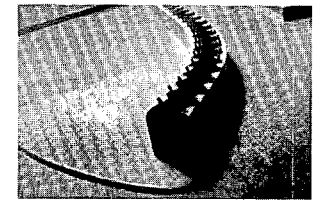
EVERY TIME WE SELECT A MATERIAL OR IMPROVE A MECHANISM FOR ANY ONE OF OUR INSTRUMENTS, WE THINK ABOUT THE SOUND.



THAT'S WHY OUR PIANOS HAVE A GRAND PIANO STYLE PIN BLOCK. SO OUR HIGH-FIDELITY SOUND BOARDS ARE LARGER, DELIVERING ACCURATE, FULL-RANGE TONE. AND OUR BASS STRINGS ARE LONGER, FOR RICHER, FULLER REASONANCE.



ALL SOUND DECISIONS. THE KIND CRAFTSMEN LIKE YOU UNDERSTAND AND APPRECIATE.



PUTTING THE SOUND FIRST IS A TRADITION WE'VE HONORED FOR OVER 135 YEARS. IN FACT, THE REASON THE "T" IN OUR NAME STANDS OUT IS TO REMIND US EVERY DAY JUST HOW IMPORTANT TONE IS.

BUT DON'T TAKE OUR WORD FOR IT. LISTEN. THE SOUND THINKING THAT GOES INTO EVERY WURLITZER SPEAKS FOR ITSELF.

WURLITZER

YOU SHOULD HEAR US NOW.

422 Wards Corner Road, Loveland, OH 45140

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The Piano Technicians Journal (ISSN 0031 9562) is the official publication of The Piano Technicians Guild, Inc., 3930 Washington, Kansas City, MO 64111-2963. The *Journal* is published monthly. Second class postage paid at Kansas City, MO, US ISSN 0031 9562 foreign and domestic. POSTMASTER: please send address changes to: *Piano Technicians Journal*, 3930 Washington, Kansas City, MO 64111-2963.

Annual subscription price: $85 (US) for one year; $155 (US) for two years; $7.50 (US) per single copy. Piano Technicians Guild members receive the *Piano Technicians Journal* for $45 per year as part of their membership dues.

PIANO TECHNICIANS JOURNAL

Official Publication of the Piano Technicians Guild, Inc.

DECEMBER 1993 • VOLUME 36 • NUMBER 12

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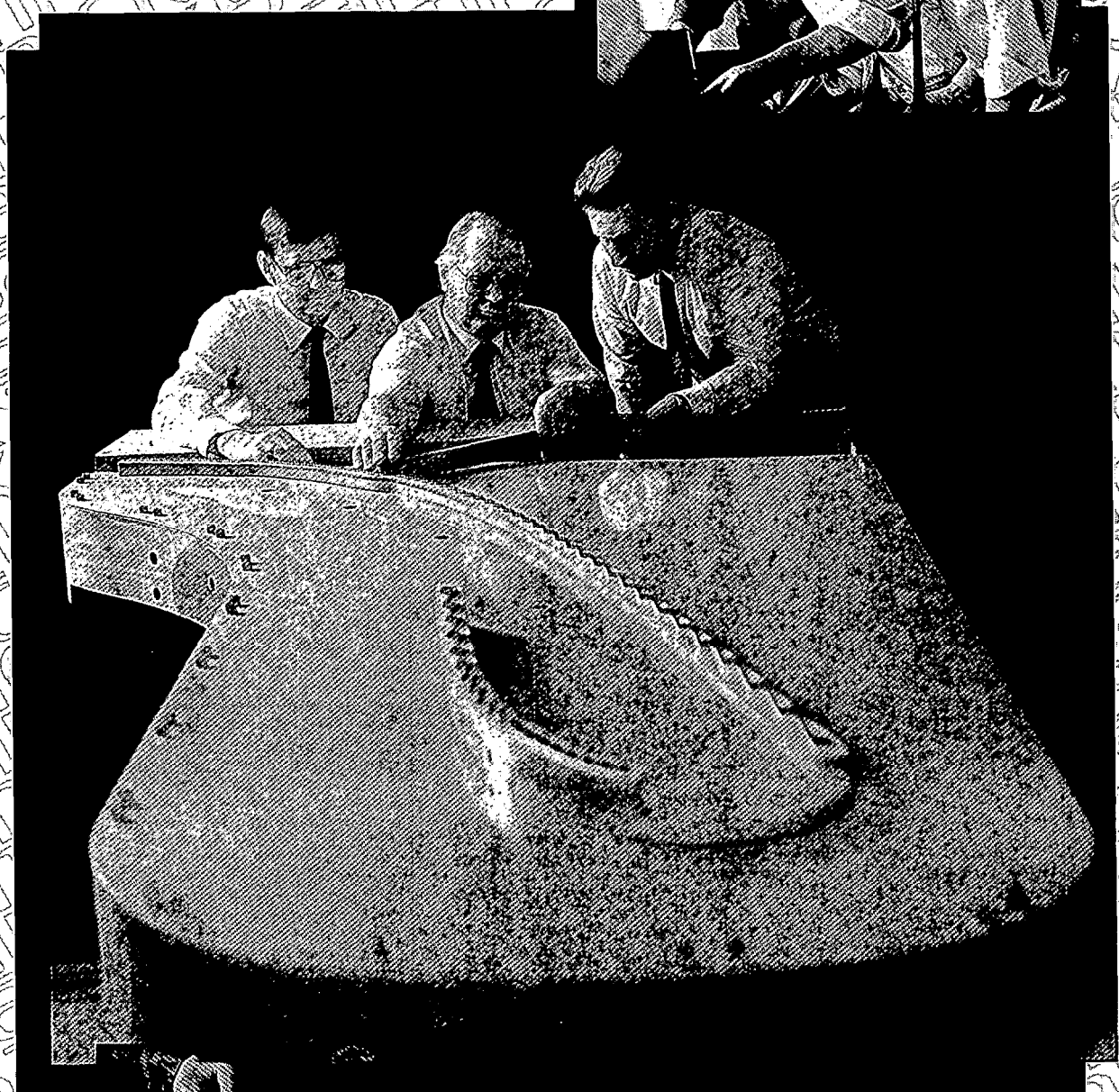

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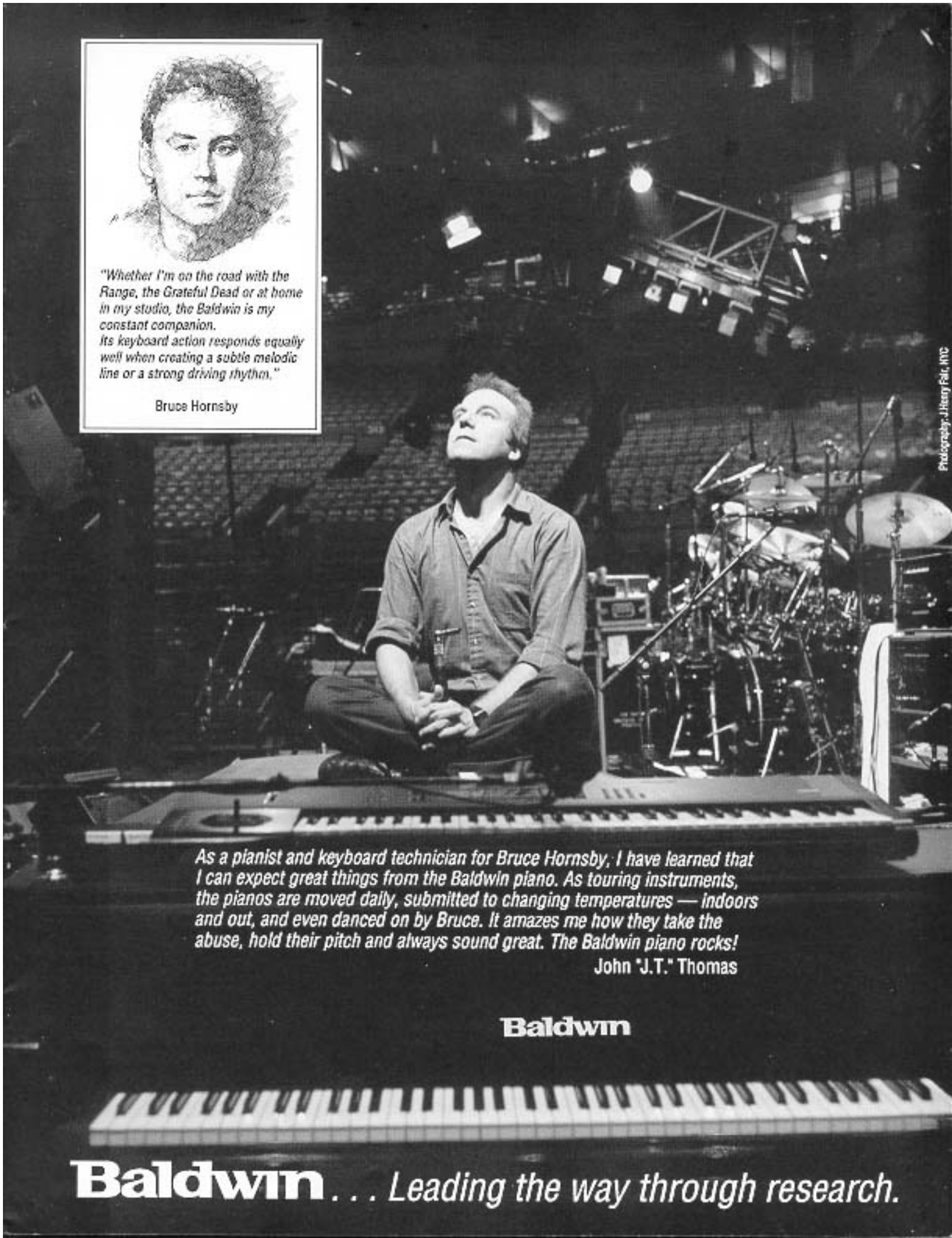

"Whether I'm on the road with the Range, the Grateful Dead or at home in my studio, the Baldwin is my constant companion.
Its keyboard action responds equally well when creating a subtle melodic line or a strong driving rhythm."

Bruce Hornsby

Photography: Henry Fair, NYC

As a pianist and keyboard technician for Bruce Hornsby, I have learned that I can expect great things from the Baldwin piano. As touring instruments, the pianos are moved daily, submitted to changing temperatures — indoors and out, and even danced on by Bruce. It amazes me how they take the abuse, hold their pitch and always sound great. The Baldwin piano rocks!

John "J.T." Thomas

Baldwin

Baldwin . . . *Leading the way through research.*

President's Message

Our Mission Statement says it plainly: one of our goals is to increase public awareness of Piano Technicians Guild. In the past two years we have taken steps to increase our visibility in the community and we can point to some tangible results.

Magazine editors and writers have begun to turn to us with piano questions and to request interviews. *Keyboard Magazine* this month is featuring the piano industry and asked us for input on piano rebuilding; the writer had heard, through Larry Fine, of the role PTG has played in raising standards in piano service in recent years. Accorded this respect, it was easy to offer additional information for the feature article. *The Kiplinger Washington Letter* interviewed PTG in September for details on how the recession and the declining sales in the new piano market are affecting piano technicians. *Parade Magazine* asked for our expertise in answering a reader inquiry on ivory keys and we were able to provide the answers! This past July, *House and Garden Magazine* interviewed six PTG members (and printed their names and phone numbers!) on the costs of maintaining a piano and referred readers to us for more information. *Music Trades* provided coverage of our Chicago Chapter's donation of a piano (rebuilt as a chapter project) to a local music school.

Building on these public relations efforts, we are beginning to do some advertising in selected magazines. Look for PTG ads in *Piano and Keyboard, The American Music Teacher,* and the current issue of *Keyboard.*

P.R.= Public Recognition

"...one of our goals is to increase public awareness of Piano Technicians Guild."

Newspapers have always been willing to feature articles on piano technicians, since our craft appeals to the public interest. In the *Milwaukee Journal,* during the convention, PTG was featured on the front page of the Metro section, complete with a photo of Marshall Hawkins and an interview with him and Gary Neie. Numerous technicians have appeared in local newspapers, among them Larry Caldwell and Mark Haas. The Associated Press distributed a feature article on Yat-Lam Hong regionally in the Midwest; the story of his 20-year quest to earn his Ph.D. while pursuing his career as a piano technician was the highlight.

We have tried something new with newspapers: media releases. We sent numerous newspaper editors information about piano care and offered a free brochure to any reader who sent us a self-addressed stamped envelope. So far, we have had over 3,000 responses to these efforts; we are entering these names into a data base for use in future targeted mailings. Newspapers from Tampa to Spokane have printed the release; and even some newsletters such as *The Bottom Line* and *Career World* have printed our offer. Newspapers need this sort of copy and do not charge us for printing it; our only cost was the investment in distributing the release to them.

Television has not neglected us either. Two prominent PTG technicians, Willis Snyder and Al Sanderson, were taped at our Milwaukee Convention and appeared as the lead story on the local evening news on Thursday of convention week. Jack Wyatt of Dallas went for the big time last year and got CNN to cover the Texas State Associa-

tion Convention; the three-minute spot was aired for several days. We got calls from members and friends in Ottawa, Los Angeles, and many points in between who saw this filmed segment. And even the writers of primetime television shows know our phone number; the staff of "Northern Exposure" called to research piano facts!

Public relations efforts like ours gain momentum over time as the number of media exposures grows. These editors and reporters read each other's publications and our appearance in one place can quickly become a referral for another. Each of these media sources keeps our name on file for future use; and frankly, we'd like to get our name on Rolodexes all over the country! We have press releases ready, and follow up on each contact with a packet of literature for each interviewer. Since we now have high quality literature, our professionalism and credibility are enhanced after the initial contact. This improves our chances of being called again.

This coming year, in your chapter or in your own business, consider the benefits of gaining some public recognition for your own good work. Why not place a media release in a local paper and offer free literature? Chapters can provide rosters of technicians and teachers to the public. If you have an intriguing project or chapter celebrity, consider inviting local media to interview you. PTG will continue to fulfill its Mission at every level in individuals, chapters, committees, officers, staff and our professional marketing firm all capitalize on every opportunity to make the public aware of PTG.

I look forward to reading about you in the papers!

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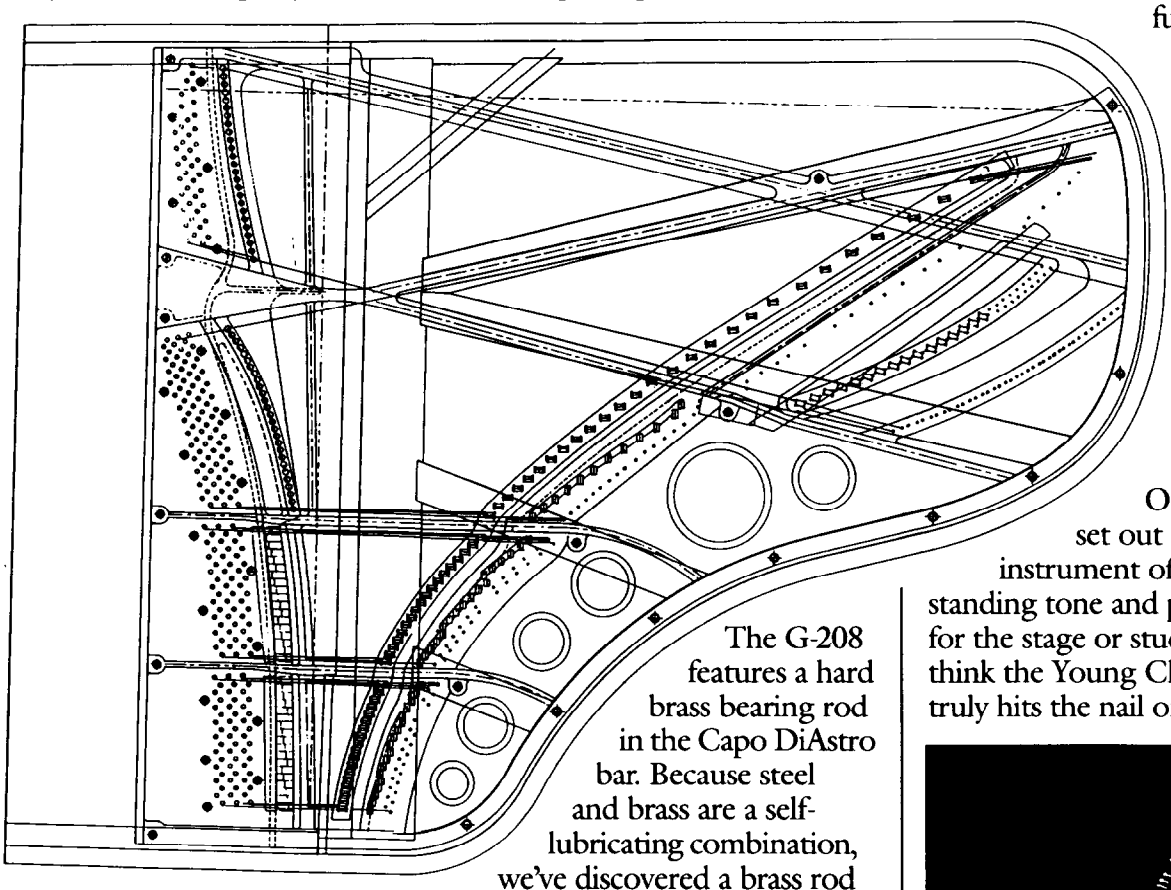
A nuts and bolts guide to the new Young Chang G-208.

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

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

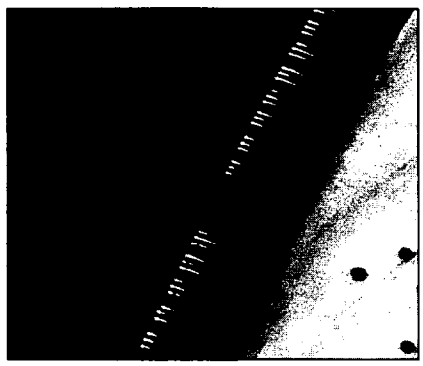


The G-208 features a hard brass bearing rod in the Capo DiAstro bar. Because steel and brass are a self-lubricating combination, we've discovered a brass rod offers better control of strings during tuning. In addition, the brass rod is easily replaced later in the life of the instrument eliminating the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

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

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

Together these innovations create an instrument with a rich, full sound, greatly improved response and a remarkable evenness of tone throughout the entire range of the keyboard. Our engineers set out to design an instrument offering outstanding tone and performance for the stage or studio. And we think the Young Chang G-208 truly hits the nail on the head.



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

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

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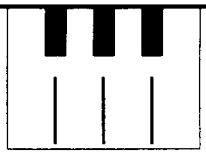
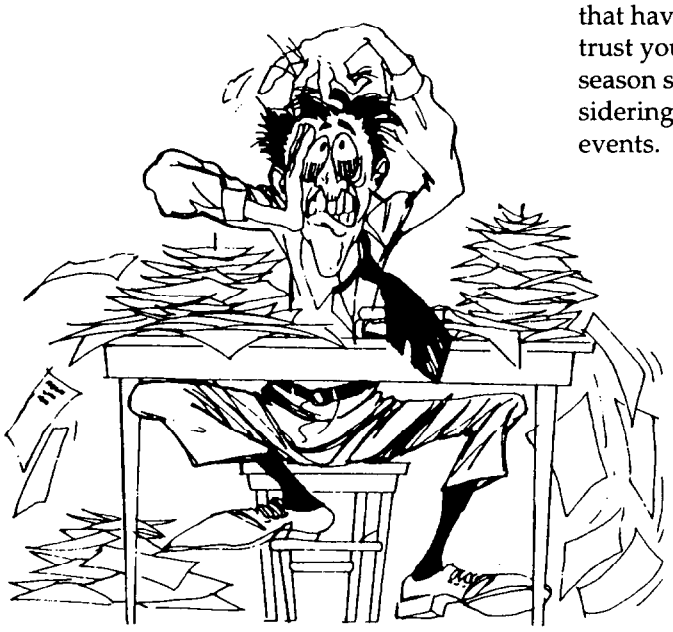


Technical Forum

Closing The Files



Jim Harvey, RPT
Editor

This month's column could well be titled "Other Stuff", "Miscellany", or, as my predecessor would say, "Pieces of String Too Short To Use." In following a tradition that many observe, the idea is to take time at the end of the year to rummage through files and decide the appropriate action to take on various records and documents. Never mind that in this case, I'm doing *Journal* file rummaging in October. The information presented here would not easily tie to prior Forum issues. However, this does not mean that the contents to follow are not valuable — quite the contrary. I'm also concluding the article with a couple of items of humor that have been submitted. I trust you enjoy them — the season seems right considering current national events.

New Genck Case

Note: If this reads like an endorsement, I apologize to other tool case vendors. I'm trying to generate information on a new product, and in this instance, based solely on personal experiences with a single product.

Having done tool classes and service calls all over the country, my Jensen tool case with its home-made pallets was becoming rather — well, unprofessional looking. As a result, I *reluctantly* purchased one of the first Genck tool cases several years ago. I was surprised that, in spite of the disparity of size between the existing case and the smaller Genck case, upon fitting it out with my existing tools and supplies, I only had to omit two or three oversized tools. (A couple of others were modified to fit.)

In spite of unmerciful torture, including airline shredding machines, the Genck case is still surviving through continuing abuse, with only two incidents worth mentioning. The top pallet became unglued. This was repaired (permanently) with 'Goop', a fitting name for slime in a tube that's marketed for the purpose of gluing the bottoms back on sneakers. In another instance, apparently the result of baggage handlers playing "catch the case," two of the corner mortises were broken. Genck (through Schaff Piano Supply) handled the repairs, and also retrofitted the (early model) case with the same brass corner reinforcements as the current cases.

All this time, if I elected to carry my Accu-Tweaker machine, I did so in a camera bag. In Milwaukee I observed (make that drooled over) a new tool case from Bruce Genck. I asked Bruce to send me a few words about the development and merits of the case to share with readers. Here is his reply:

I apologize for not getting back to you sooner about the Accu-Tuner case. I'm in the process of moving to a different location and juggling time and priorities has become a temporary way of life!

After three years of requests for a functional and quality-built Accu-Tuner case I decided to give it another shot. My objective was to make a case to hold the Accu-Tuner and lots of tools, while also achieving an attaché size, professional look, and long lasting quality. The price of $219.00 is very reasonable for a custom-made case in a small market. Judging by the number of orders we took at the convention, this one should be a winner. It's available through Schaff Piano Supply.

The case measures 18" x 13" x 5" and is patterned after my other cases in terms of features, materials, and quality. It has a padded compartment for the Accu-Tuner and other sections of various sizes in the molded bottom. The removable tool pallet and upper lid pockets hold the standard tools of the trade.

Bruce Genck

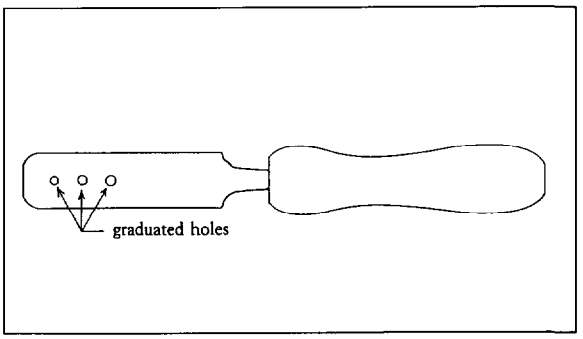
Although I do not have one of these cases, I would like to make a suggestion to "Hoib" and Dave at Schaff. If economically feasible, please make a black Mackintosh cover for this case with a Velcro closure at the top. While you're at it, an outside pocket with a flap and Velcro-ized flap would be nice for holding an invoice book, etc. I can't think of anything else right now, unless you come up with something to do with storage for a coffee thermos.

Genck Case

Don't get all tore up

Dear Jim, In the September PACE Technical Lesson Plan, I described flange rebushing in the spot-repair situation using the Renner flange bushing cloth. Here are a couple of additional tips that might be useful. As noted in the Lesson Plan, the Renner cloth has one end rolled and glued into a pre-formed point that will not tear off when it is pulled through the shank. Well, I've never had the point tear off. However, I had the good fortune to talk to Joel Rappaport while in Milwaukee, who informed me that the cloth can occasionally tear unless run through the Renner "calibrating" tool first (item #1855, Renner catalog).

Figure 1



*This is a flat steel bar with three graduated holes (see **figure 1**). The largest hole is slightly less than 1/8", and the smallest is about 7/64". Pulling the cloth strip once through each hole, from biggest to smallest, pre-forms this very dense and stiff cloth in stages. It can then be easily pulled through flanges with no danger of tearing or parts breakage.*

This cloth also has a thin glue coating on the outside, which allows gluing and initial sizing in one operation — simply wipe a damp sponge across the last 1/2" of the cloth before pulling it into the flange, insert the centerpin and set aside to dry. The moisture will size the bushing while the glue sets. Depending upon temperature and the amount of moisture introduced, complete drying and a stable sizing effect can take longer than an hour. This would be impractical for a quick field repair; however the gluing/sizing method is very efficient for shop work.

Bill Spurlock

Elbow removal tip

Here's one more way to remove the remnants of the elbows remaining in the wippen "slot". I bought a pair of cutting pliers only 3" (maybe 4") long. They're like electrical pliers but I think some call them 'nippers,' or 'nips.' They are not *side cutters. The cutting edge was maybe 1/2" wide (at the nose of the pliers.) A few minutes at the grinding wheel reduced that nose to a size that will fit up into the slot of the wippen. Works great for me. Just be sure that you don't cut into the center pin if you're going to insert the slip-on plastic replacements. Remember to cool the pliers every few seconds as you grind, so you don't alter the metal cutting surfaces.*

Dean Clark

Termite update & swollen bushings

Dear Jim, I thought it was past time I wrote to thank you for publishing my query re: termites and key lead expansion. As you know, Ray La Motta from US Virgin Islands responded in a comprehensive manner. However, I also received replies from W. Magnusson, Louisville, CO, and Fred Scoles, Oswego, NY. I also had a phone call from a tuner in Barbados — Mr. Gibbons. It was very gratifying to see others take the time to write with a purely altruistic motive. Not unlike yourself and the other regular contributors to the Journal. Keep up the good work! I particularly enjoy articles like yours... many-faceted.

Do you think anyone would benefit from this little tidbit? I recently had a case of swelled bushings in a NEW, quality upright that could be detected only by visual inspection. I'm referring to the front rail bushings only. Both sets of key bushings were checked and eased as needed — this was more than once (in fact several times) as I would rather recheck if necessary than over-ease, and the piano is in an area of high relative humidity — 80%, 90%, and up, up, up. After a couple months of use (the piano is used by students and teachers six long days a week) I re-regulated and found, though nothing was sticking, there was a hesitation, especially when played slowly by children's little fingers. All action parts were free — so was the key. It even had enough side play, both at rest and when fully depressed. Finally, I removed the key to take a good look at the front rail bushing to discover this unusual (for me) situation. From a combination of high humidity (swelling) and heavy use, though the bushing swelled slightly, because of the heavy use it remained compressed immediately where in contact with the front rail pin; thus the deceptive side play.

Since I don't want to overease, and side play clearly indicated no tight bushing, I was puzzled: while the bushings weren't tight, they were swelled just enough to be slightly sluggish as the felt moved in an arc past the front pin. Perhaps everyone has run into this before. If not, it may help them to solve the

problem quicker. Remember, more than easing the bushing, the bushing felt thickness needs to be consistent — something normally accomplished through easing, except in the above rare circumstance. Thanks again,

Michael Lipnicki

Those crazy Americans

The continuity of the next item is slightly difficult to follow, as it involves a letter from a member, an article to the editor of yet another magazine from still another person, permission to publish from another magazine, and... well, just pay attention to the cast of credits and enjoy the material!

Enclosed is an article I thought might be of interest to piano technicians. It originally appeared in Nature *(Vol. 346, p 506), was reprinted in the* American Journal of Physics, *which I receive, and* Nature *has now given permission to reprint it in the* PTG Journal. *It is the best statement I know in support of the metric system. In addition to the examples given in the* [enclosed] *letter, consider the following:*

- *Piano wire: Twice the gauge plus 5 gives the diameter in mils, except (of course) when it doesn't, namely for gauges below 12 and above 23, where the above relationship changes;*
- *Brass spring wire: Twice the gauge plus 4 gives the diameter in mils, except for gauge 4 when the relation is twice the gauge plus 5.*
- *Center Pins: Twice the gauge plus 10 in this case gives the diameter in mils, except (again) when it doesn't. For pins of above gauge 23 you must consult a chart.*
- *Tuning Pins: 1/0 pins have diameter .276 inches, add .006 inches for 2/0 pins (diameter .282 inches), add .004 inches to a 2/0 pin for a 3/0 pin (diameter .286 inches), and then .005 inches each for a 4/0 through 7/0 pin. I wonder why the changing increments?*

I guess we can conclude that piano technicians have more of a sense of humor than anyone else.

John C. Bryner, RPT

A Plea for the Metric System

JH note: John Bryner wrote for, and received permission to use the following from NATURE magazine in London. The next item, including "Note by the editor", is from the original source(s) — not John or myself. Thanks for the above additions John, and for getting permission to publish.

Note by the editor — The question of what units to use is one that interests almost every physicist, and some of them have very strong opinions indeed on this subject. There are passionate defenders of the "SI only!" position, whereas others find rather charming the diversity of units that we have inherited. Many of the official reports and recommendations of commissions are, to put it gently, not very stimulating reading. But I found the following Letter to the Editor that appeared in NATURE perhaps the most eloquent statement of the case for the metric system that I have ever read, even though I myself find diversity appealing. It is reprinted here by permission from NATURE, Vol. 346, p. 506; copyright 1990 Macmillan Magazines Ltd.

Sir - As the owner of a hardware store, I feel it is my duty to comment on the letter from C. H. Evans (Nature 345, 658; 1990). The writer waxes sentimental about the British 'system' of weights and measures to which the United States alone so obdurately clings.

Closer examination reveals that we don't have a system, we have a patchwork quilt of systems; systems whose units cannot be added, subtracted, multiplied or divided with ease, and hardly anyone knows how to use them. Learning a new system would come as a welcome relief to those who have actually learned the 'British system' and have to use it for complex operations.

The other day, a customer asked for piece of lumber cut to "five feet two and a half inches and one of those little marks" (a sixteenth). What could be more elegant? A carpenter more familiar with the system could translate that to a more manageable six-two and nine-sixteenths inches. Of course if he has to add the width of a "one-by-twelve" (3/4" x 11-1/4") and deduct the thickness of a "two by four" (1-1/2" x 3-1/2"), he figures 62-9/16 + 11-1/4 - 1-1/2 = 72-5/16. In building a house (or a space shuttle), thousands of these tedious computations are carried out and each one is a potential source of error.

We start to see that within the 'system,' things are not what they say they are. Two-by-fours are not 2/4 and they haven't been for years. The two-by-fours in a hundred-year-old house are 2 x 4, but the two-by-fours in a fifty-year-old house are 1-5/8 x 3-5/8, and in a new house they are 1-1/2 x 3-1/2. Half-inch galvanized pipe isn't half an inch anywhere. The inside diameter is about 5/8" and the outside diameter is about 13/16". Plumbers know what size to ask for, but most others make the mistake of trying to measure the pipe and become hopelessly confused.

Electrical wire comes in gauges. As the wire gets bigger, the gauge number gets smaller. 12 ga. wire will conduct 4/3 as much current as 14 ga.; 10 ga. conducts 3/2 as much current as 12. Crystal clear! Nuts, bolts and wood screws also have gauges. Of course now as the bolt gets bigger, the gauge number gets bigger. What could be simpler than nails? Nails are measured in pennies. The symbol is 'd' as in 'penny.' A 4d nail is 1-1/2" long, 6d is 2", 8d is 2-1/2", 10d is 3". So, it should be perfectly obvious that a 3-1/2" nail will be ... that's right, 16d.

Drill bits cover all bases. There are of course fractional bits in increments of 1/64" where it is immediately obvious that 25/64 is larger than 3/8 but smaller than 13/32. Among the interstices between fractions there are number drills, an inverse system with no. 1 a little smaller than 1/4" going "down" to no. 80 a little larger than a hair. Also interspersed between fractions are the letter drills irregularly spaced from A to Z with A a little larger than a no. 1 going up to Z smaller than 1/2".

Concrete comes by the cubic yard, lumber by the board foot, shingles by the square, yarn by the skein, but a sack of cement is always 94 pounds. The tape in your walkman travels at 1-7/8 inches per second, which adds up to quite a few furlongs per fortnight. It's a Jim Dandy system all right, and any country that would give it up for something as straight

forward as metric has no sense of humour.
Ernest L. Asten
Cliff's Variety
479 Castro Street
San Francisco, CA 94114

[JH note: Hi, it's me again. Will one of our San Francisco area members please call Ernest, tell him he's famous now, and thank him for his insight? Better yet, drop by the store, show him this article, and buy a sack of cement.]

The Barrel

Next, a story that was "modified" by member Dick Beaton to make it applicable for use by piano technicians.

ACCIDENT REPORT — Supplemental information as requested. This is in response to your request for additional information for block #3 of the report form I recently submitted. I put "poor planning" as the cause for my accident. You said in your letter I should explain more fully, and I trust the following details will be sufficient.

I am a piano tuner and had purchased a used spinet which had to be moved from a third floor window. I installed a block and tackle arrangement to lower the piano to the ground. When I had completed my work, I discovered that I had, over the course of several trips up to the apartment, brought up over 200 pounds of tools and other equipment. Rather than carry the now unneeded tools down the stairs by hand, I decided to lower the items down in a small barrel by using the block and tackle which was still in place.

Securing the rope at ground level, I went to the apartment and loaded the tools, etc. into the barrel. I went back to the ground and untied the rope, holding it tightly to insure a slow descent of the 200 pounds of tools. You will note in block number 11 of the accident report form, I weigh only 135 pounds. I found myself being jerked off the ground very suddenly and lost my presence of mind and forgot to let go of the rope. Needless to say, I proceeded at a rather rapid rate of speed up the side of the building. In the vicinity of the second story level, I met the barrel coming down; this explains my broken collar bone. Slowed only slightly, I continued my rapid ascent, not stopping until the fingers of my right hand were two knuckles deep into the pulley.

Fortunately, by the time I had regained my presence of mind and was able to hold onto the rope in spite of the pain. At approximately the same time, however, the barrel of tools hit the ground with a crash and the bottom fell out of the barrel. Devoid of the weight of the tools, the barrel now weighed only about 20 pounds compared with my 135. As you can well imagine, I started a rapid descent down the side of the building. In the vicinity of the second story level, I met the barrel coming up. This accounts for lacerations on my legs and lower body.

The encounter with the barrel slowed me enough to lessen my injuries

when I fell into the pile of tools, and fortunately only 3 vertebrae were cracked. I'm sorry to report, however, that as I lay there on the tools I was somewhat stunned and in much pain. I could see the empty barrel three stories above me. Then I blacked out and let go of the rope... that 20 pound barrel really creamed me. To add insult to injury, someone came along and stole my piano while I was still out.
I hope you will be able to pay the doctor and hospital bills... and don't forget the loss of two month's income please. My TV has been repossessed and the kids need new shoes right away. I've already sold my VCR and Site-O-Tuner and need help right away! Excuse me. Another bill collector is banging on the door and I'm too lame to get out of this chair. I'll just have to pretend I'm not home.

We don't need no steekin' DOC files

Let's digress from pianos for a few paragraphs. While it doesn't hold a candle to the last story, for those of you with computers, this reflects *my* thoughts about computer and software documentation. A user on the bulletin board was having a problem. Knowing the answer to this particular question was included in the documentation, I had suggested that he read the documentation (DOC file) that accompanied the software program. To this he jokingly replied, "DOC file? What the %$#& is a DOC file?" The following is my reply to that user.

There is a tendency for computer users to want to use programs immediately, without wading through numerous manuals with hundreds of pages — every third page of which contains "This page intentionally left blank". Somewhere along the line, software developers lost sight of making programs "user friendly." Some programs would suggest the need for a special post-graduate degree in order to run them.

A DOC file is something that occupies a great deal of room in any given program. DOC files increase the download time of bulletin board programs by approximately four times. DOC files and manuals in commercial programs help keep the diskettes from getting beat up while in the package, while at the same time, making the package larger and heavier. This creates the illusion that you're really getting something special when you take the package to the check-out counter. In the event of shipped or mailed commercial programs and upgrades, DOC files help keep trucking companies and the US Postal Service in business, due to their added weight.

DOC files help support authors, publishers, paper companies and shelving vendors. They also make a joke of the early promises that computers would make us a paperless society.

A DOC file is always obsolete by the time you read it, requiring you

to print out still another DOC file that accompanies the program, complete with incorrect page breaks. A DOC file is always repeated within the program itself, accessible by using the Help function of the program. This way it requires twice as much storage room. A DOC file is a container for any and all information concerning its parent program — except for the particular subject you need assistance with. For that information, you must purchase another, supplemental book for $49.95, attend an $800 seminar, or call Jim Harvey and get the answer for free. I trust this helps eliminate any confusion you may have had on this matter.

Back in serious mode, this pretty well finishes up loose ends and miscellaneous items suitable for Forum use. There is an interesting parallel in the December issue — both the time this is *actually* being written, as well as the magazine's release date, are both typically during our busiest times of the year. So, while your're working hard, think about firing off a DOC file to me about one of your repairs, or even a question involving an unusual situation you run across. Enjoy a safe, happy and prosperous holiday season! J

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LESSON PLAN

Technical Lesson #4

String Replacement With Hitch Pin Loop

By Bill Spurlock, RPT

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

This lesson will present methods for doing a professional job of replacing a single string with hitch pin loop. Participants will learn to form wire into neat, stable loops and tuning pin coils.

Getting started

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

Hands-on session set-up

To teach this job in a hands-on format, obtain the following parts and materials:

- An old piano on which strings can be replaced (preferably one that needs restringing) can be used for only one or two participants. For larger groups, stringing fixtures as shown in **figure 1** and **photo 1** are more practical. These are also useful to have around the chapter for future lessons and as technical exam props.
- Piano wire (approx. size #15 is convenient for the stringing fixtures)
- Stringing tools for meeting leader
- Bandages
- Extra eye protection

Estimated lesson time

45 minutes

Tools & materials participants must bring

Participants must obtain and bring all items shown in **Photo 2**, as well as the following (note instructions for making the hitch pin loop maker in **figure 2**):

- A medium size hammer
- Needle-nose pliers
- A small flat-blade screwdriver
- Tuning hammer
- Eye protection

Assigned prior reading for participants

From PTG Technical Exam Source Book (PTG Home Office, 816-753-7747), pages V.1 through V.21

General instructions

The object of good string work is to achieve tuning stability, good tone, and a neat, craftsman-like repair. With the right tools, techniques, and above all some practice, you can do quality string repairs. In general, neatness and stability go hand-in-hand. Important details are:

- Beckets should penetrate the full tuning pin diameter and be squeezed tightly into the tuning pins; if a loop is left hanging out, it can bend over, causing the string to drop in pitch.
- Tuning pin coils should be level and tight against each other, and the tuning pin height correct so the strings cannot migrate up or down on the pin.
- Hitch pin loop coils should be neat and tight together, tight down against the plate, and the tail flat against the plate so it cannot unwind.
- Strings should be seated at all bearing points and unison strings leveled for best tone and stability.
- When replacing a string on a piano, carefully measure the original wire with your micrometer. Sometimes the old wire will seem to be one half-thousandth inch off from a standard size; measure in several spots and choose the closest standard size replacement wire. Note: Wire gauge size = (micrometer reading - 5)÷2. Thus a wire measuring .031" would be size #13 [(31-5)/2=13]
- When replacing a string, always wind two tuning pin coils on the new string using a dummy pin, back the piano tuning pin out one turn, then transfer the coils to the piano pin and wind the final turn in place as the string is brought up to tension. This minimizes loosening of the pin block by only requiring the pin be backed out one turn, rather than three.

I suggest the following procedures:

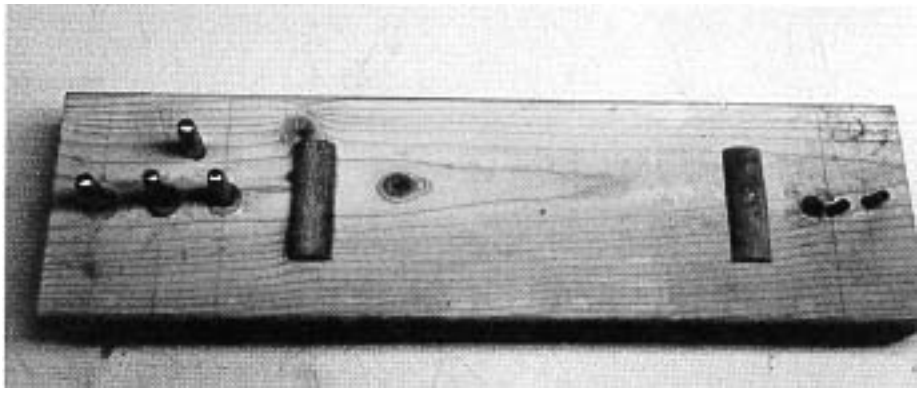

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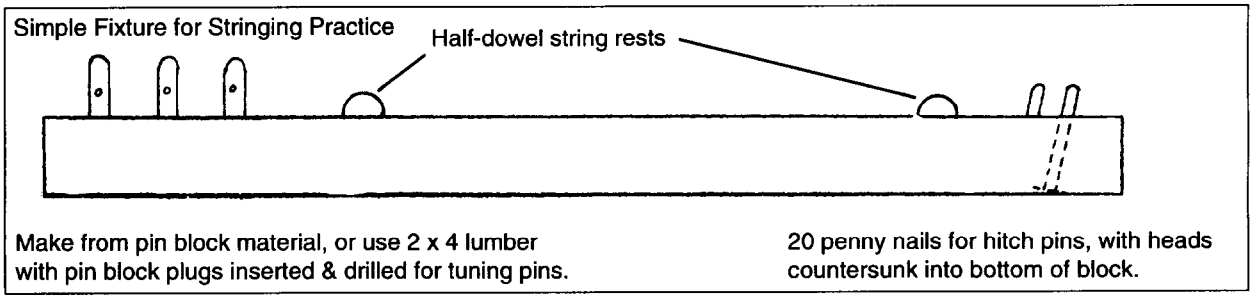
Photo 1 & Figure 1: Stringing fixtures which should be used for larger group participation of this lesson.



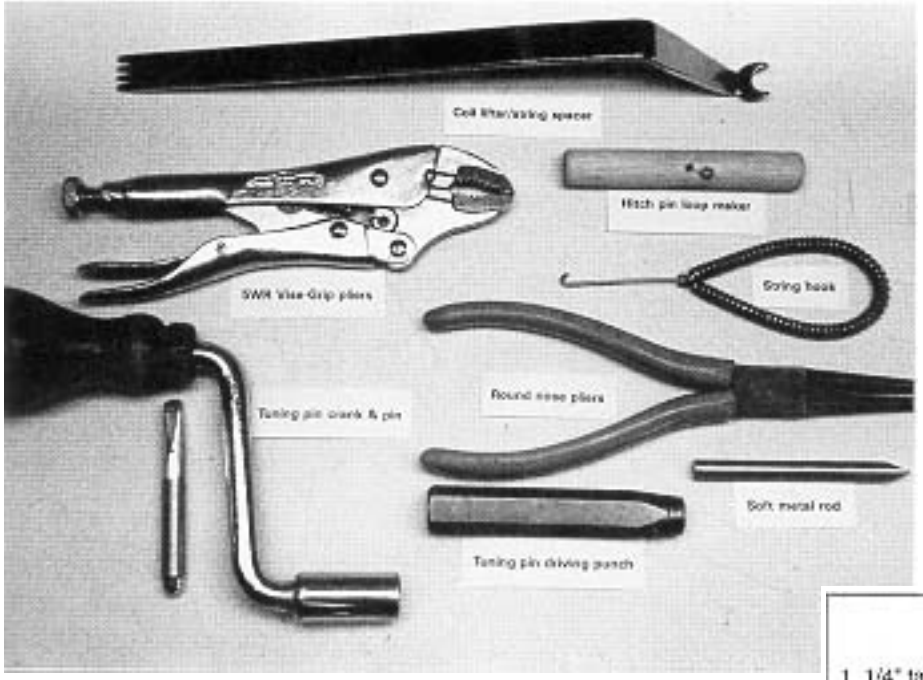
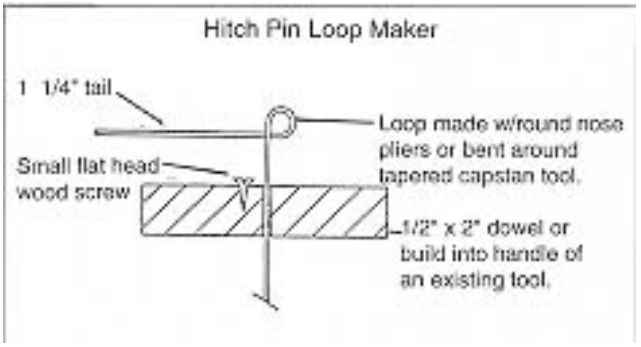


Photo 2 & Figure 2: Participants should bring all items shown in Photo 2 as well as a medium size hammer, needle-nose pliers, a small flat-blade screwdriver, tuning hammer and eye protection. In figure 2 below, you will find instructions for making the hitch pin loop maker for this lesson.



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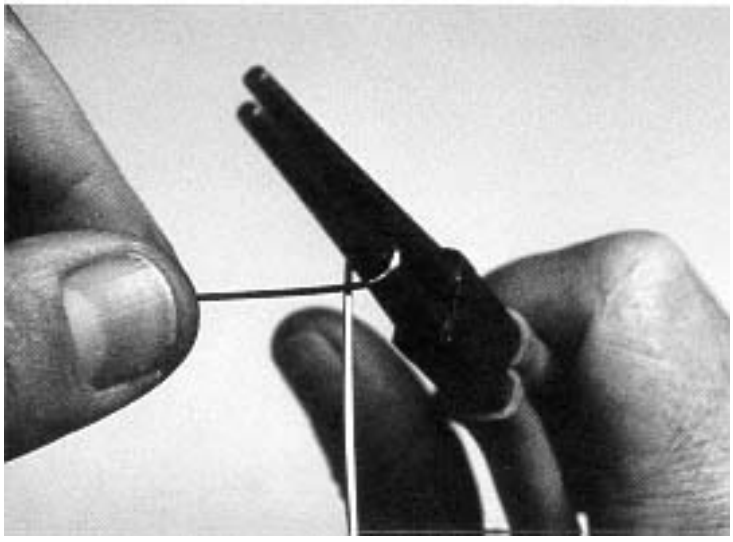


Photo 3: Cut a length of new wire of the correct size. Using round-nose pliers, grasp the new wire about 2" from the end and form a loop as shown.

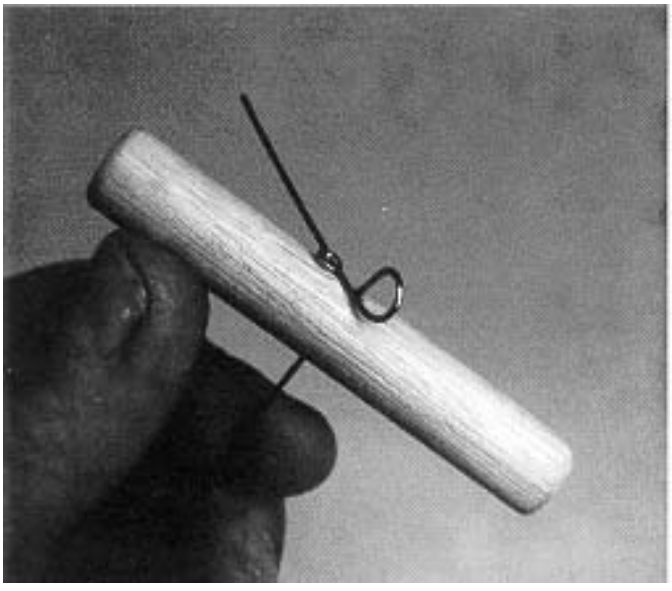
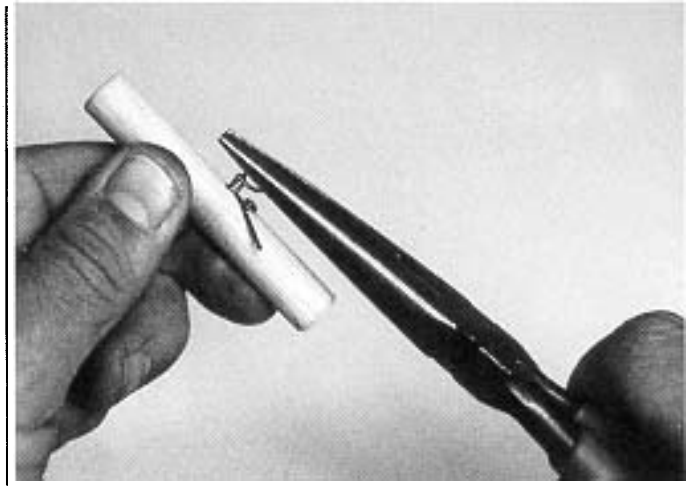


Photo 4: Insert the wire through the hitch pin loop maker, and place the tail of the loop against the screw head as shown.

Photo 5: Hold the eye of the loop with needle-nose or duck-bill pliers, and rotate the loop maker to wind the tail 3-4 turns around the wire. Stop with the eye and the tail in the same plane, either pointing to the same side or to opposite sides.



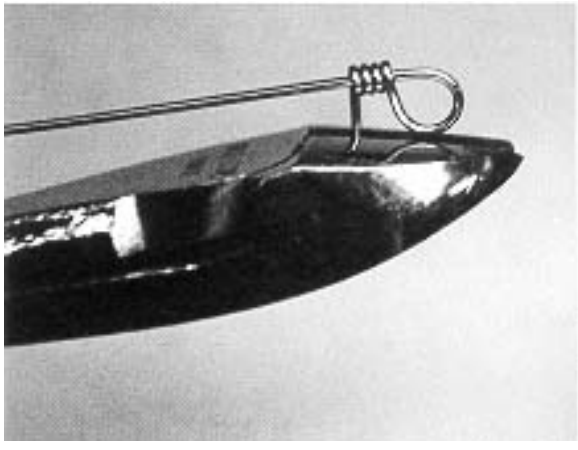


Photo 6: Trim the left-over tail to about 1/4" long.

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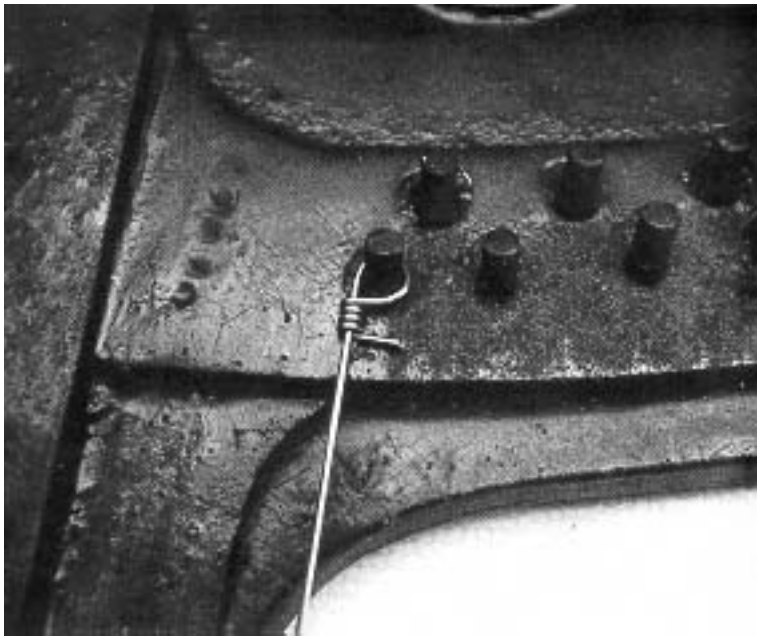
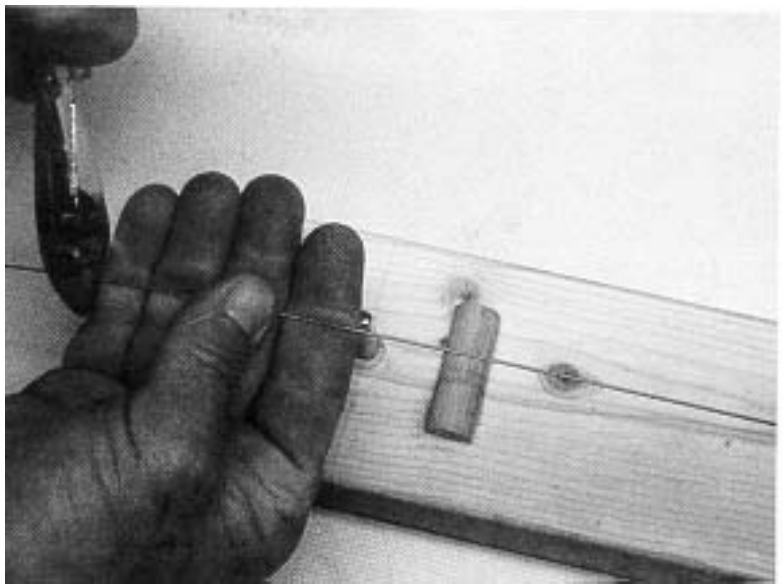
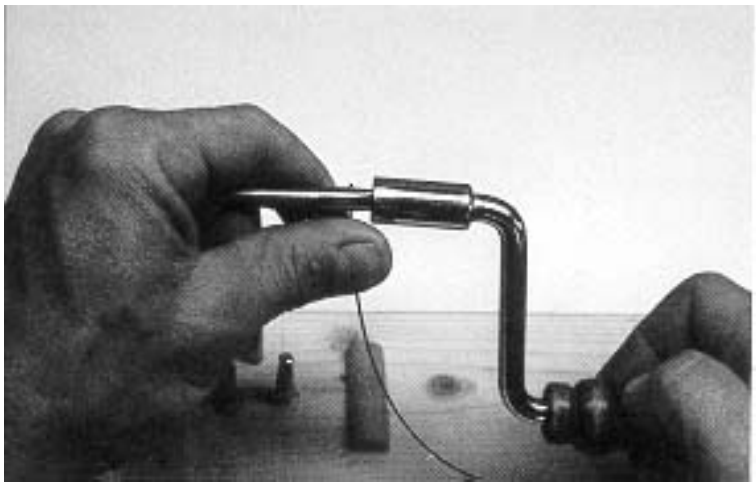
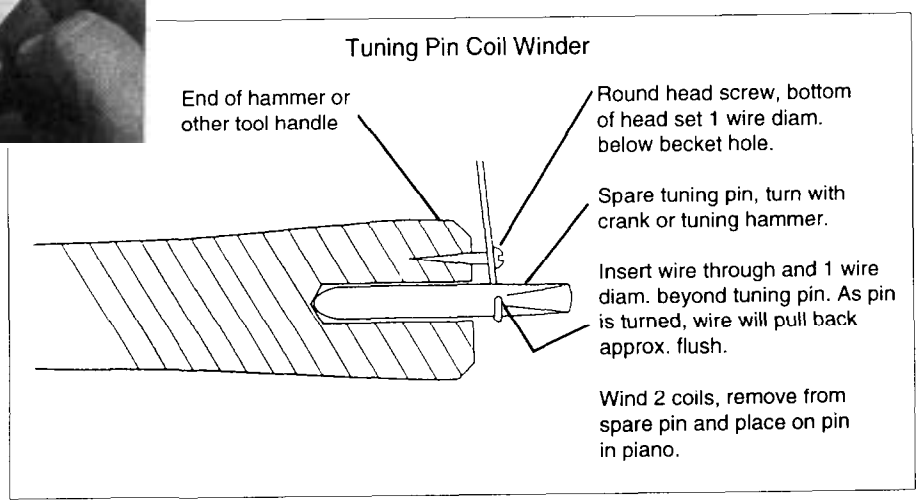


Photo 7: Place the hitch pin loop onto the hitch pin with the tail on the bottom, laying flat against the plate. This assures stability by preventing the tail from unwinding under tension.

Photo 8: Stretch the wire across its tuning pin, using your hand to measure approx. 2 3/4" (four fingers' width for most people) past the center of the tuning pin. Cut the wire to that length.







Photos 9 & 10: Insert the end of the wire through the becket hole of a spare tuning pin, letting it protrude about 1/32" beyond. Using a tuning pin crank and pin, wind two coils on the pin. As you start to wind the coils, hold your thumb firmly against the wire next to the becket hole to form a neat, sharp bend where the wire enters the pin. During this stage the end of the becket should pull back into the hole slightly so it ends up flush with the pin surface. (Another method of holding the pin while winding the coils is shown in **figure 3**. This is easier on the fingers, especially with larger wire sizes. The screw automatically guides the wire onto the pin for neat, tight coils.)

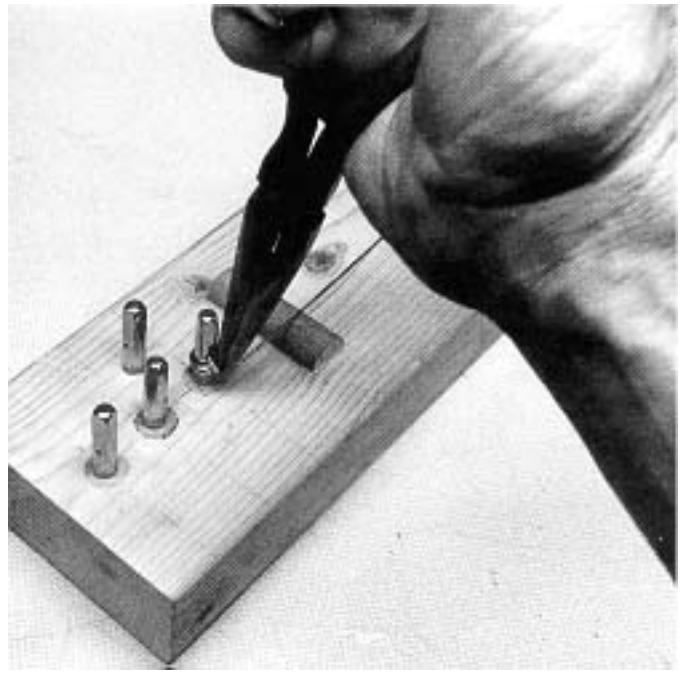
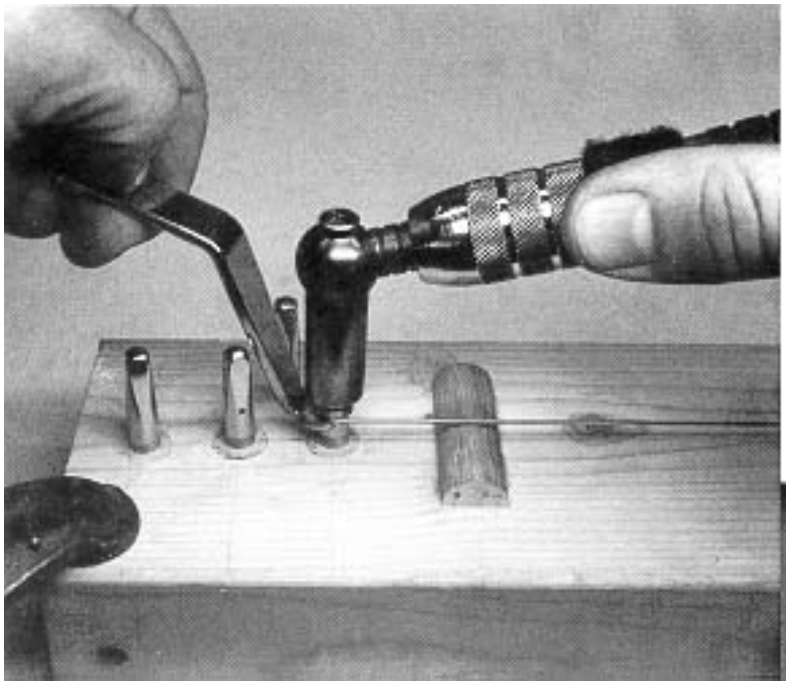
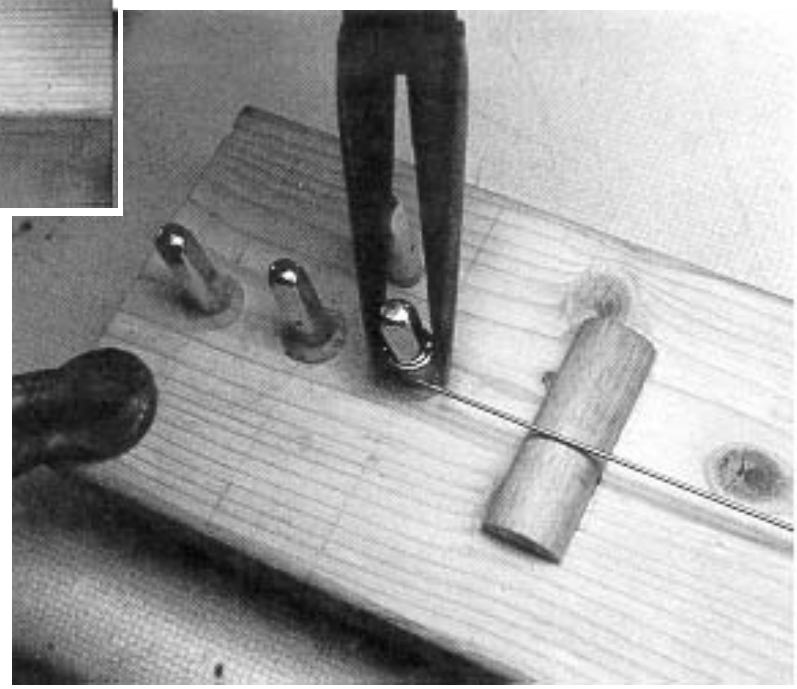


Photo 11: Use needle-nose pliers or a small screwdriver to pry the becket out of the dummy tuning pin. Back the piano pin out one full turn, then place the wire coils over the pin and insert the becket using needle-nose pliers as shown.



Photos 12 & 13: Tighten the string in stages. First pinch the becket in, then use a coil lifter or string hook to lift the coils up snug to the becket while tightening the string slightly. Alternately re-press the becket and add more tension, always keeping the coils pulled up snugly. Also make sure the hitch pin loop is tapped down tight against the plate.



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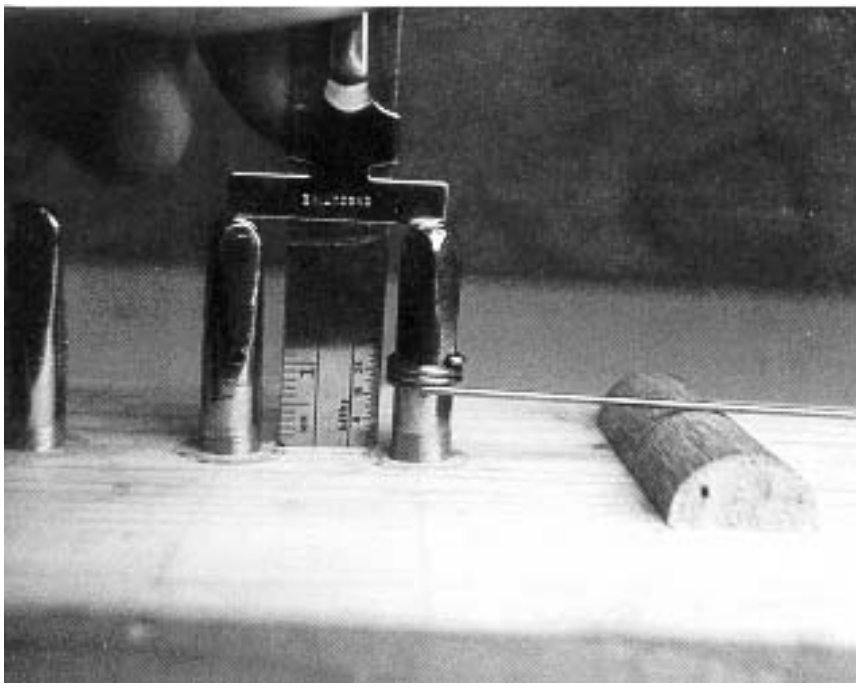
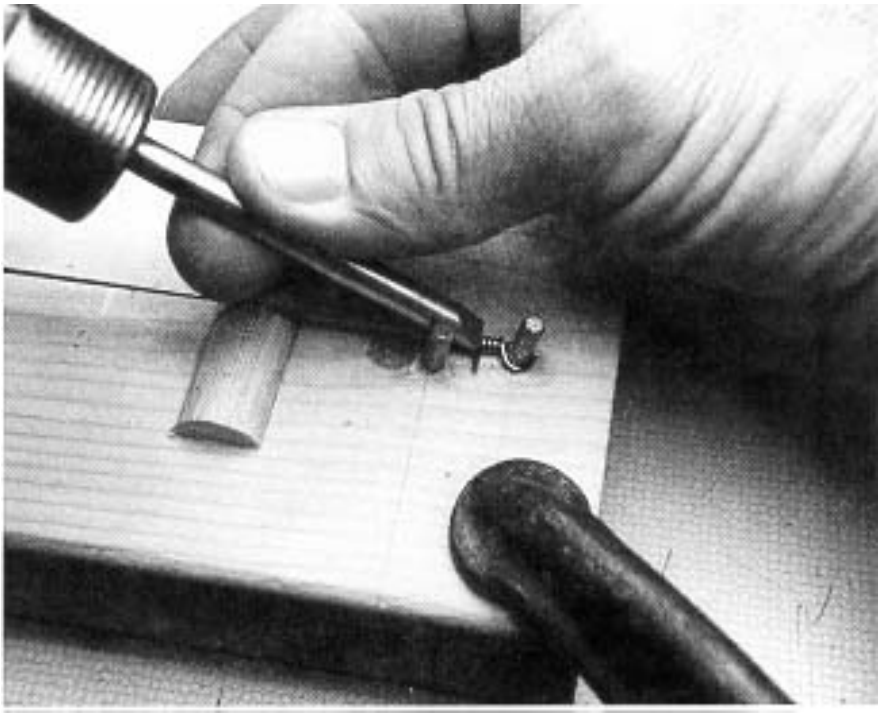


Photo 14: When the string is up to tension, check to make sure the tuning pin height matches that of neighbors. (**Important:** if using a stringing fixture as shown here, tighten the string only until it produces a tone. Avoid high tension.) Look at the tuning pin coils: if the becket hole is covered on the side opposite where the wire enters the pin, tap the coils downward slightly to expose half of the hole (use a soft metal drift).

Photo 15: Tighten the hitch pin loop by gently tapping with a soft metal drift.



Final steps

If doing this repair on an actual piano, tune the string to pitch, then stabilize as much as possible by tapping down at all bearing points, re-checking the becket and hitch pin areas, and levelling the string to its unison mates. You can also rub it with moderate pressure using a hammer shank. Re-tune.

A new string will go out of tune quickly. To prevent having to return frequently to re-tune it, you can insert a piece of felt between the new string and a plate strut or neighboring unison to mute it out. The other strings of the unison will still sound, but the new string will not be a problem and you can re-tune it later when convenient.

Follow-up

As with any new skill, participants should practice this job on their own until they can perform it easily with consistent results. The stringing fixtures are ideal for this, as they can be taken home for further work. Practice, along with obtaining the necessary tools, will reward the technician with the *skill* as well as the knowledge to do the job efficiently for the client.

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Tuning Lesson #4

Identifying Partials

By Michael Travis, RPT

This monthly lesson plan series is designed to provide supervised practice of tuning skills as a supplement to independent study and practice. Chapters are encouraged to use this material as the basis for special associate meetings or for their regular meeting program. Each lesson is designed to take about one hour with about four participants. Participants are assumed to have essential reference materials and tuning tools (see PACE checklist) and access to a well-scaled large upright or grand piano for independent practice.

In brief

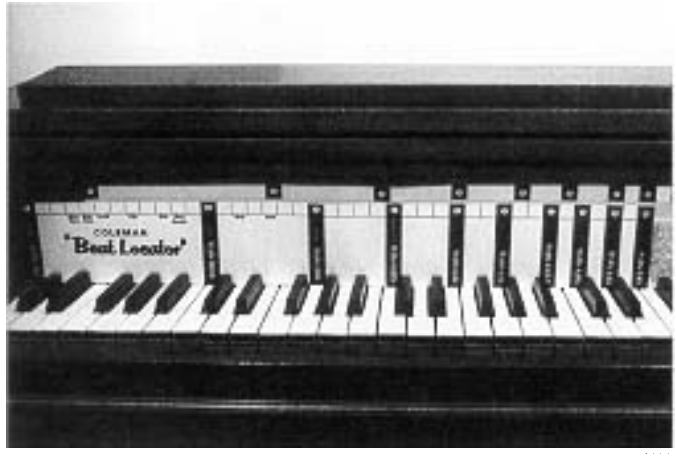
This lesson consists of practice in listening for and identifying partials in piano tones, using the Coleman Beat Locator, strike tones and other techniques. After taking this lesson, participants should be convinced of the existence of partials, and should know the nomenclature for identifying partials, how to locate notes on the keyboard corresponding to partials of a given note, whether a given note is a partial of another given note, and if so, which one.

Chapter meeting set-up

These lessons are most conveniently taught to a small group of four or five. Each group should have its own piano and RPT instructor. Each piano should be in a quiet environment for close listening. Avoid using pianos that present serious obstacles to tuning, such as deeply grooved or misaligned hammers, string termination noises, etc.

Tools participants must bring

Coleman Beat Locator (available from Superior Instructional Tapes). The instructor should have a supply of small self-adhesive labels, such as Avery S-620, 3/8" x 1-1/4", a pen or pencil, a tuning hammer and a few mutes.



The Coleman Beat Locator

Home study assignment for participants

1. Get familiar with the Coleman Beat Locator; use the yellow slide to locate partials for various notes, and both slides to locate coincident partials for various intervals. (Hint: instead of folding the slides as directed, just stand them upright between the backs of the sharps and the fallboard, with the yellow slide in front.)

2. Keyboard practice — the etude of partials: while reciting numbers one through ten, play the notes at the approximate pitches of the partials corresponding to the numbers. Repeat for all notes in the second octave. If necessary, stand the yellow slide of the Coleman Beat Locator behind the sharps with the first partial stripe lined up with your starting note to help locate the higher partials. Practice the etude of partials until you can perform it without the slide, flawlessly and without hesitation, in both ascending and descending order.

General Instructions

The instructor should remark briefly on the complexity of piano sound, and of the human ear which can perceive both the totality of the sound as well as its component parts. The instructor should demonstrate the complexity of a piano tone by playing a note in the second octave, such as C2, and engaging participants to identify what they hear. Have each participant try to identify two pitches in the sound of C2 by finding them on the keyboard. As the pitches are identified, stick a label on the corresponding key. You should be able to easily hear the majority of partials 1-12. Next, introduce the concept of playing a strike note to hear a partial better. While holding the C2 key down silently (without letting the hammer contact the string), play notes chromatically up from C2, both forte and short duration (with a pause after each). Have participants focus on the pauses for a continuation of the pitch just played. Each time the group discerns a resonance from a strike tone, play C2 and see if everyone can hear the strike tone's pitch as part of the whole tone. Proceed up the scale no higher than partial 12 (corresponding to G5, the triple octave fifth above C2). Add labels to keys for any

previously undetected partials discovered this way.

Now place the yellow slide of the Coleman Beat Locator upright behind the sharps, and see if the ten partials on the slide are accounted for by labels on the keys. Demonstrate how to focus the ear on a partial by alternately playing C2 and the note corresponding to the partial. Do this first on any partials whose corresponding keys do not have labels. Have each participant practice this focusing technique on a few partials.

Now introduce the numeric names of the partials. Note that partial numbers 2, 4 and 8 are octave partials (corresponding to notes respectively a single, double and triple octave above the fundamental), and that the note corresponding to a doubling of the partial number is always an octave higher. Two other examples of this are the partial number sequences 3, 6 and 12 (octave fifth, double octave fifth, and triple octave fifth), and 5, 10 (double octave major third, triple octave major third).

To further demonstrate the sound of partials, try the following. While holding C2 down silently, have everyone play a section of the keyboard just up to the end of the damper section, all at once, and then listen to the induced resonance. This is a group participation demonstration. What you want to achieve is to have all keys above C2 up to about C6 played simultaneously with a short duration, fairly loud tone while you hold down C2 silently. On the count of three ... (it may take a few tries to get it coordinated!). This is mostly just for fun, but will demonstrate the chord produced by the combination of coincident partials.

Follow this with a demonstration of the "etude of partials," described in the "Home Study" section above. Remove the labels from the keys. Have each participant perform a two-note part of the etude using two different starting notes, while others observe. Congratulate those who can do it without the Coleman Beat Locator in place. Ask for volunteers to try it in descending order. Encourage participants to practice this etude at home.

As a final exercise, the instructor should ask each participant in turn, for a given midrange note, to identify what other notes it is the 2nd, 3rd, 4th, 5th and/or 6th partial of, while others observe. If time is still available, demonstrate how to use the Coleman Beat Locator to locate coincident partial beats for various intervals, and take any questions participants might have.

Note: *Do you find these lesson plans valuable? Do you have specific suggestions for changes or clarification? Please direct any comments or suggestions to* Journal *editor Jim Harvey, who will forward them to the author.*

Good Vibrations

Hammer Work

A Photo Survey

Nick Gravagne, RPT
New Mexico Chapter
Contributing Editor

As a follow-up to previous months' material regarding hammers and tone, this issue includes several photos that demonstrate some of the techniques we use to "work the hammers." Although the emphasis of this latest series has been on working with hammers in the field, the techniques are applicable to all voicing.

Note that the subject piano in these photos is a 1917 Hamburg Steinway B. The hammers, shanks and flanges had been replaced several years ago by another technician. The replaced parts were Renner's offerings at the time. After several years of use, the customer complained about a thin tone, lacking in depth and character. In short, he used to love the piano, now he hates to sit down to play.

Inspection of the instrument revealed that the soundboard had some crown (not a lot); downbearing was minimal or non-existent. The bridges were basically sound, showing hairline cracks at pins. The bridge pins, however, were not tight enough for solid unisons (they could easily be pulled out with small pliers). The tuning pins were loose. The action was basically in good condition, needing only a touch-up, or "high point" regulation. The hammers were hard and packed but basically in shape.

Considering the above, a simple in-home work strategy was out of the question. So, one day the piano arrived in the shop for the following work and materials:

1. new pinblock and strings;
2. string leveling, setting, etc.;
3. adjust the plate for more bearing;
4. dress the capo bar;
5. pull treble section bridge pins, re-notch front notches with a sharp chisel, epoxy in new pins and file tops, varnish notches;
6. clean soundboard and gild plate;
7. regulate action and dampers;
8. a non-radical hammer filing;
9. voice hammers for a fuller tone.

Of the items listed, those most critical to tonal improvement are resetting plate for more bearing (especially in the first capo section), dressing the capo bar, re-notching and repinning bridges, and string and hammer work.

We lucked out on the downbearing situation. After the old strings were removed, we turned the nose bolts down. The plate followed quite nicely, giving us just enough additional bearing.

Piano preparation

Keep in mind that hammer work and voicing must always follow the usual piano preparation work. With the piano roughly at pitch, this preparation work typically includes the following:

1. Lift *all* strings near the agraffes and capo bar in order to remove the natural curvature of the wire. Use a stringing hook.

2. Assuming that the hammers are properly traveled, spaced and filed, block the hammers (one by one) to each unison. Being sure the damper is off the string, pluck each string of the unison and listen for any "open" strings. Since the level of an open string is *higher* than the muted strings, the muted strings must be lifted with a hook until the open string is silenced according to the blocking test.

3. Strings must be securely seated on the bridges. Using a brass punch or

hardwood stick along with a small hammer, lightly but firmly tap the string down on the bridge and in the direction of the angled bridge pin. Do this on both sides (front and rear) of the bridge. Remember to place the punch near the bridge pin, but on the *speaking* side of the string; i.e., *not* on the bridge top itself.

4. Seat front and rear duplex segments to remove wire curvature. Tap with punch on speaking side of little string segments. Thus there are three places to tap — the front duplex bump (in tuning pin areas); the capo bar bearing surface (done from inside the action cavity); the rear duplex bump.

5. The piano should be tuned.

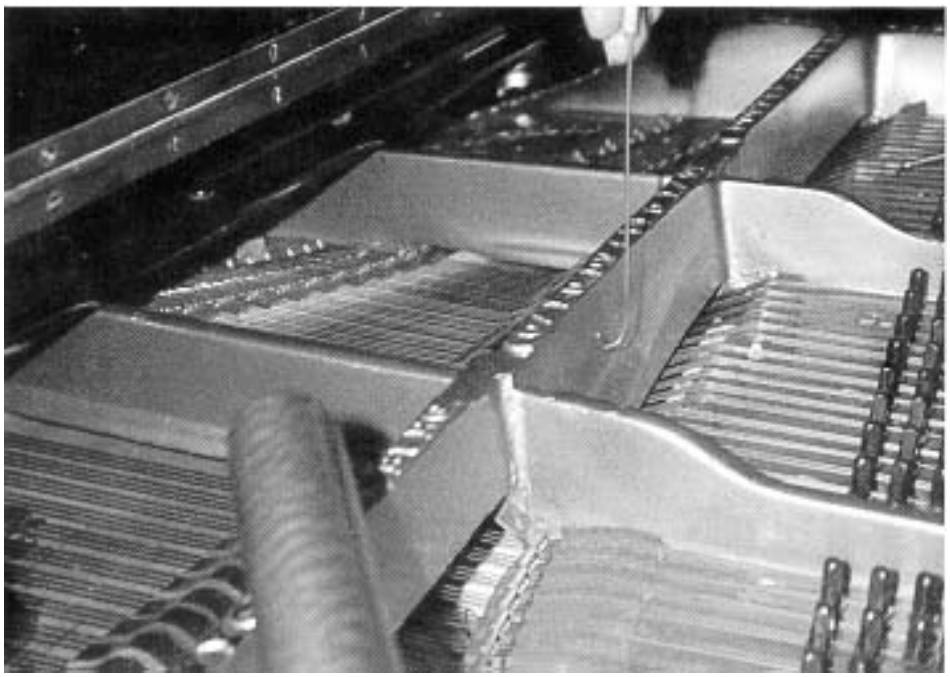
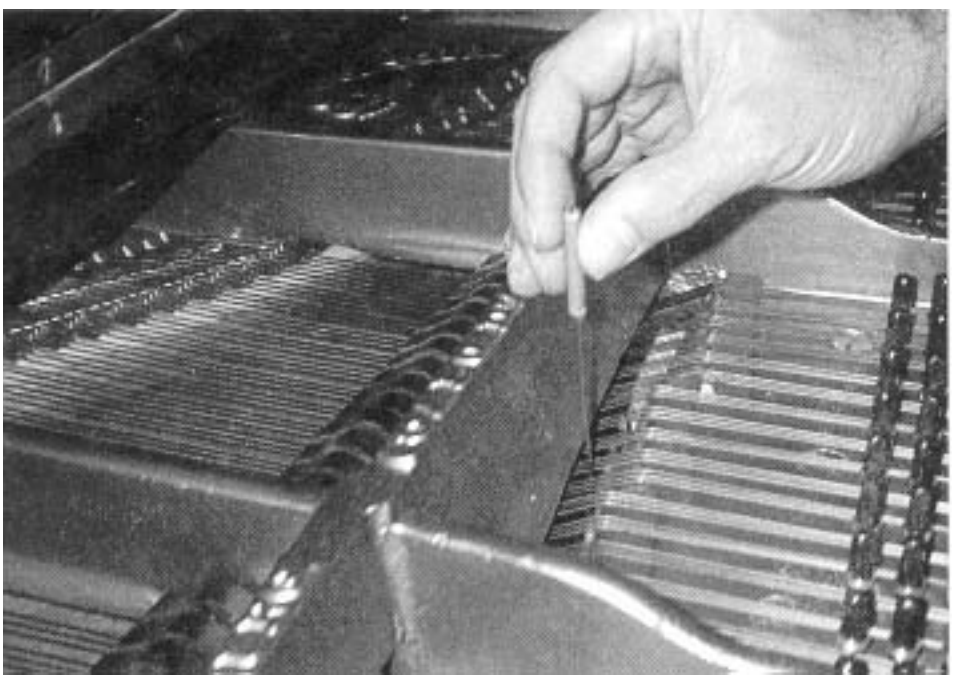


Photo survey

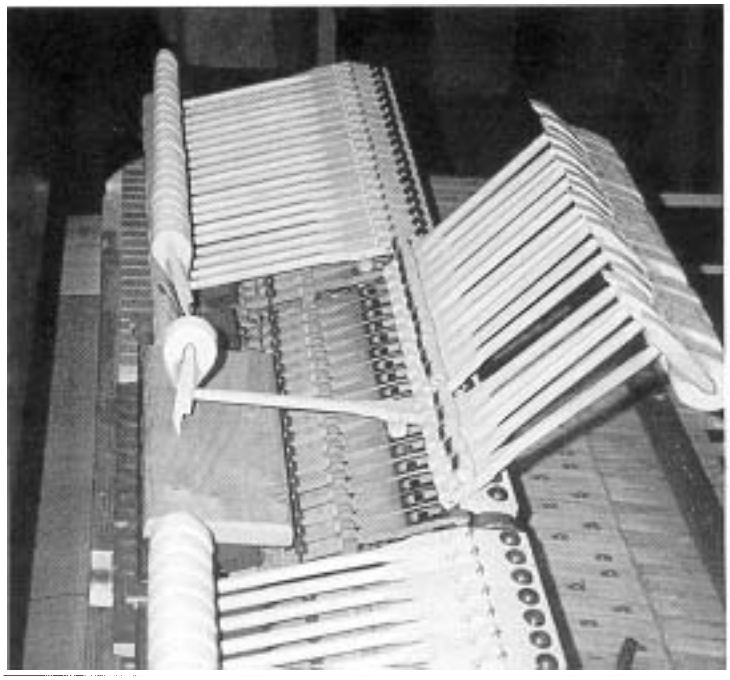
1. Wire hook with dowel handle. The hook is made from heavy gauge music wire such as found as core wires of low bass strings.



2. The hook in place, pulling up a shank in order to block hammer to string. An "open" string unison sounds tinny and unfocused — it cannot be properly voiced. Use only moderate pressure when blocking the hammer to the unison.

3. Eyeing hammer top squareness. Such a visual inspection can often isolate a sloping (right to left, etc.) hammer crown. If this is the cause of an open string unison, then square the hammer and perform blocking test again.

4. When needling hammers, or for certain hammer sanding operations, a support block is required.



5. The support block (which seems to be floating in the blackness of space) was designed by RPT Brian DeTar of Oregon. Notice the routed groove that steadies the block when placed over the backchecks. The dimensions of the block can be perceived by studying the photos.

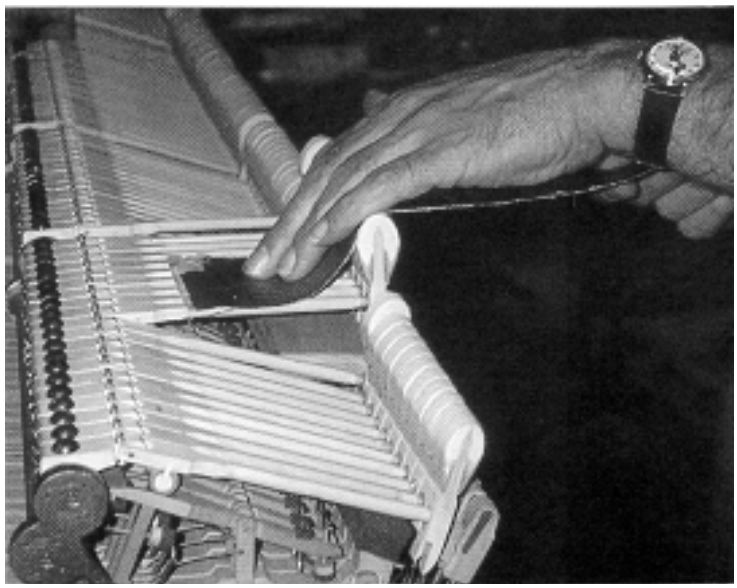


Photo 6—described next page

6. - 10. "Gang" filing groups of hammers with the support block in place. The 100 grit aluminum oxide paper is backed with duct tape, and is about five hammers wide. Although the string cuts are being removed, care must be taken to retain the hammer shape. Note that as one hand pulls the string the other hand, which is cupped over the hammers, allows the strip to be pulled through. Photo 10 is a final "shoe shine" technique. Shoe shining

is followed with lighter grit strips. Keep in mind that, although shoe shining techniques are most effective in the treble sections, they can also be used in the lower sections of angled hammers, but only when a light dressing — a "voicing dressing" — is required. But heavy felt removal in the lower sections will make the hammers look lopsided and misshapen. Gang filing, as with all hammer filing, serves two possible functions. First, as a prelude to a more controlled hammer-by-hammer dressing, gang filing works great for bulk felt removal, and consistency of hammer shape is easier to maintain. The second, and different function of gang filing (or any filing) was hinted at above: it has more to do with tone work rather than shaping work. Many voicers refer to this second purpose of filing as "voicing filing"; i.e., the purpose being to alter the tone, or prepare the hammers for needling. Obviously, a voicing filing should be applied to hammers that are *not* seriously misshapen or grooved. The gang filing demonstrated in the photos is more a voicing filing than a shaping one.

Photo survey continues

"Quick, firm and short strokes are used in order to 'roll a layer' over the top."

11. - 14. These photos also demonstrate a voicing filing, but carried out on a single hammer. A typical sandpaper file or paddle is being used to "skin" the hammer, or, as some say, to "remove a layer." Note that the hammers have already been either bulk shaped, gang filed, or strip filed (narrow strips) for basic shape and smoothness. The tone relative to the hammer in these photos was a bit dull and understated compared to its neighbors. The purpose of the "skinning" is to expose a lower and firmer surface of felt so as to brighten the tone. Also notice that the action is pulled, and is resting on the voicer's lap. A serious felt-removal type filing would be impractical with things set up this way.

As to the technique involved, study the photos. Quick firm, and short strokes are used in order to "roll a layer" over the top. Don't chicken out here! Keep the layer peeling and rolling (you can see it, and even feel it) over the top and down the hill of the other side. Photo 14 shows the hold on the paddle being changed to "feather out" the peeling. It is very important to remember that the peeling does not have to be deep — it may be very shallow.

One trick that makes this technique work is to watch the peeling as it rolls along the surface. In order to insure a uniform peeling, constant attention must be given to how the peeling is oriented: does it appear to be rolling at right angles to the sides of the hammer? If not, adjust the pressure on the paddle to make corrections. This is why the strokes need to be quick, firm and short. Practice on old hammers!

Next month we'll continue with the photo survey as we look at needling. **J**

Tuner's Corner

The Ins and Outs of Beatless Intervals

Michael A. Kimbell, RPT
Contributing Editor
San Francisco Chapter

Last month we explored the names and sizes of all of the commonly used intervals found in the modern twelve-note tuning system. When we actually tune the intervals in this system, however, our ear's point of reference is a set or system of beatless intervals, which is different from the twelve-note "equal temperament" system we are trying to tune. Although the intervals in the beatless system have the same names (perfect fifth, major third, etc.) and sound roughly the same as their counterparts in the twelve-note system, they differ in size by a few cents from the intervals we discussed last month. When we tune the twelve-note system by ear, we start with the beatless intervals and then "temper" or change them slightly; hence the word "temperament." (The word "equal" in "equal temperament" means that all fifths are tempered by the same amount in cents, all major thirds by the same amount, and so on.)

This month's article will explain the system of beatless intervals and show how they compare with the equally tempered ones. At the same time, I shall introduce the closely related subjects of overtones and inharmonicity. Building on the information presented last month, we shall study the consonant (tuned) intervals resulting from simple ratios of string lengths and vibration rates, starting with the octave and then working down in interval size through the perfect fifth, perfect fourth, and major and minor thirds. As always, I shall try to keep things as simple as I can. I shall ignore fractions of cents, and leave the actual calculations of beats and cents to the mathematicians — not that anything should be construed as a put-down against mathematicians, for without their hard work we wouldn't have any sort of information at all to work with. But my aim in these articles is to help you gain an intuitive "feel" for the intervals and how they fit and work together. A good analogue is the repinning of flanges: although we rely on accurately made center pins, our immediate concern is the "feel" of moving up to the next size of pin and not the average diameter in so many thousandths of the pin itself.

Some 2500 years ago the Pythagoreans described the intervals in terms of numerical ratios of string lengths. The simplest of these ratios cover all of the intervals we use in setting up an equal temperament. For our discussion let us start with the low A string on a guitar. (If you happen to have a guitar on hand you can actually do the following experiment; if not, your imagination should suffice.) If we pluck the open, unstopped string, it should sound the same note as A2 on the piano. Next we shall stop the string (by pressing the string down with our finger against the fingerboard) at its exact midpoint, so that we can now pluck only one-half of the string: the new note should be A3, an octave higher than the unstopped string. Continuing with our experiment, we shall stop the string at one-third of its full length, at one-quarter, at one-fifth and at one-sixth, each time plucking the shorter end of the string and listening to the notes produced. As the sounding portion of the string becomes shorter, the notes become higher: after A2 and A3, we should have E4, A4, C#5 and E5, as shown in the left-hand side of **Example 1**.

The interesting part, however, comes when we examine the intervals formed between the notes of the series, taking into consideration the ratio of string lengths for each interval. Our first interval, from A2 to A3 (open string to half-length string), is a perfect octave; since the string lengths are in the ratio of two to one (2:1), we can therefore say that the octave is described by the ratio of 2:1. Our next interval, from A3 to E4, is a perfect fifth; since the string lengths (one-half and one-third of the entire string) are in the ratio of three to two (3:2), we can say that the perfect fifth is described by the ratio of 3:2. Continuing

STEP:	STRING LENGTH:	NOTE:	FROM-TO:	RATIO OF LENGTHS:	INTERVAL:
1	Entire	A2			
			A2 - A3	2:1	Perfect Octave
2	One-half	A3			
			A3 - A4	3:2	Perfect Fifth
3	One-third	E4			
			E4 - A4	4:3	Perfect Fourth
4	One-quarter	A4			
			A4 - C#5	5:4	Major Third
5	One-fifth	C#5			
			C#5 - E5	6:5	Minor Third
6	One-sixth	E5			

Example 1-Intervals on a guitar string

further, we can see that the perfect fourth is described by the ratio of 4:3, the major third by 5:4, and the minor third by 6:5, as shown in the right-hand side of Example 1. Notice the pattern of numbers in the ratios: 2:1, 3:2, 4:3, 5:4, 6:5. The numbers within each ratio differ by one, and both numbers of the ratio increase by one as we reach the next ratio in the series. Notice also that all of our tuning intervals are presented in decreasing size, with the omission of the sixths.

Instead of the guitar, let us now experiment with a hypothetical piano strung entirely with plain wire — not your ordinary, garden-variety wire, but a special, magical wire of infinite strength giving absolutely perfect response (no "inharmonicity" or other error factors whatsoever). Moreover, we shall simplify the design by using the same wire diameter and the *same wire tension* throughout the entire piano. (Never mind that this piano is actually impossible to build or maintain!) Since we cannot change the tension, the only way we can tune this piano is by carefully setting the lengths of the strings for each note at the factory. Don't worry: we are not going to attempt to set an entire temperament on this piano — we are only going to tune the same few notes and beatless intervals that we played on the guitar.

Let us begin by tuning a few octaves, starting with A2. If the speaking length of A2 is eight feet, and if the ratio of 2:1 describes the octave, then the speaking length of A3 will be half of A2, or four feet; likewise, the length of A4 will be two feet and the length of A5 will be one foot. (That's about right for A5, but if you can figure out the length of A1 you will see what a preposterous impossibility this piano is!)

As an extension of these observations, modern acoustical studies show us that the vibration rates for strings of an interval are in ratios essentially identical to the string-length ratios we have seen thus far. For instance, if the strings in the piano for the note A2 vibrate at 110 cycles per second (110 Hertz), the strings for A3 (an octave higher) vibrate at 220 Hz or twice the rate. Thus the ratio of 2:1 describes not only the string lengths, but also the vibration rates of the two notes forming an octave. Applying this ratio to the octaves A3-A4 and A4-A5, we see that if A3 vibrates at 220 Hz, then A4 must vibrate at 440 Hz and A5 at 880 Hz. Moreover, this is true not only for our hypothetical piano, but for any real musical instrument. (The small error factor of inharmonicity, which I shall explain later on, modifies the vibration rates and ratios very slightly.)

Returning to our monster piano, let's tune a perfect fifth, from A3 to E4. From here on we shall consider both the string lengths and the vibration rates. If the ratio of 3:2 describes the perfect fifth, and if A3 is four feet long and vibrates at 220 Hz, then E4 must be two and two-thirds feet long and vibrate at 330 Hz. (The string lengths *decrease* by the ratio while the vibrations *increase* as we go higher up the piano.)

Since we have already tuned A4, the perfect fourth E4-A4 is now in tune also, and for E4 to A4 the ratios of string lengths and of vibration rates are both 4:3, just as we would have expected according to our experiment with the guitar.

Similarly, we can tune the major third A4-C#5 (ratio 5:4) by setting the string length of C#5 at four-fifths of A4; if A4 vibrates at 440 Hz, we can confidently predict that C#5 will vibrate at 550 Hz. The string length of E5 (660 Hz, a minor third above C#5 and also a perfect fifth above A4) can be set either at five-sixths of C#5 or at two-thirds of A4; the results of the two methods should be identical.

All of this information about our grand piano is gathered together in **Example 2**, along with information about the resulting major and minor sixths. Except for the fact that guitar strings would be relatively shorter, this table is merely an expansion of

P:	NOTE:	STRING LENGTH	FREQ:	FROM-TO:	RATIO:	INTVL:	FROM-TO:	RATIO:	INTVL:
1	A2	8 Feet	110Hz						
				A2 - A3	2:1	P8			
2	A3	4 Feet	220 Hz						
				A3 - E4	3:2	P5			
3	E4	2.7 Feet	330 Hz						
				E4 - A4	4:3	P4			
4	A4	2 Feet	440 Hz				E4 - C#5	5:3	M6
				A4 - C#5	5:4	M3			
5	C#5	1.8 Feet	550 Hz						
				C#5 - E5	^:5	m3			
6	E5	1.3 Feet	660 Hz				C#5 - A5	8:5	m6
8	A5	1 Foot	880 Hz						

Example 2-Intervals on a hypothetical piano

Example 1 and follows the same pattern.

At this point we can take an introductory glance at overtones, which are closely related to the intervals and ratios we have studied thus far. You will remember that we stopped the guitar string so that it vibrated along one-half its length, one-third its length, and so on. However, modern acoustical studies show that the UN-stopped string vibrates not only along its entire length, but also simultaneously in halves, thirds, and so on, all by itself. These smaller vibrations, which are generally much weaker than the fundamental vibration of the entire string and which usually cannot be heard as separate entities by the ear, are known as *overtones* or *partials*. Returning again to our grand piano, we see that Example 2 serves a dual purpose: it not only summarizes the relationships between several different strings, it also contains information about the way that the A2 string behaves in and of itself. A2 not only vibrates along its entire length at 110 Hz, but also in halves at 220 Hz, in thirds at 330 Hz, in quarters at 440 Hz, in fifths at 550 Hz, and so on. The numbers in the first column of Example 2 can be understood as "first partial, second partial," and so on. In a subsequent article I shall show not only how overtones explain the "beats" of tempered intervals, but also how they can help us hear those beats more clearly.

The one "error factor" that impinges most upon piano tuning is an intrinsic, slight out-of-tuneness of the partials themselves; this is known as *inharmonicity*. In the piano, the second partial is approximately one or two cents higher than it should be theoretically, the third partial is perhaps 5 cents sharp, the fourth partial 8 or 9 cents sharp, and so on, the actual values varying not only from piano to piano but also from register to register and even from note to note within the same piano. In terms of frequencies, if the first partial of A4 vibrates at 440 Hz, then its second partial vibrates at something like 881 instead of 880 Hz, and we have to tune A5 at about 881 in order for the octave to be perceived as being "in tune." A further discussion of how inharmonicity affects the tuning of octaves will appear in a subsequent article. For the moment, suffice it to say that the frequencies and string lengths for a piano in the real world differ somewhat from those of our hypothetical piano due to a variety of factors we have conveniently ignored, but the differences amount only to minor modifications of the basic patterns shown in Example 2.

It now remains to compare the sizes of the beatless intervals presented above with the sizes of the intervals found in the twelve-note system know as equal temperament. This will give us a clear idea of how much we need to modify the beatless intervals in order to arrive at the equal temperament we are trying to tune. Imagine, if you will, an acoustical "ruler" marked off in cents. If we hold the equally tempered intervals up against our ruler, we see that they fall neatly against the 100-cent markings: the major third is 400 cents in width, the perfect fifth is 700 cents in width, and so on, as shown in **Example 3**. On the other hand, when we measure the

From C to	Eb	E	F	G	Ab	A
Interval	m3	M3	P4	P5	m6	M6
Beatless ratio	6:5	5:4	4:3	3:2	8:5	5:3
Cents equal	300	400	500	700	800	900
Cents beatless	316	386	498	702	814	884
Beatless to equal	-16	+14	+2	-2	-14	+16

Example 3-Difference between beatless and equally-tempered intervals

beatless intervals we find that they are either a little narrower or a little wider than their tempered counterparts: the beatless major third, for instance, is approximately 386 cents in width, the beatless perfect fifth approximately 702, and so on.

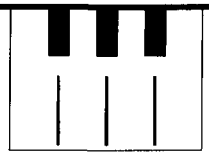
The directly applicable part of this information is found in the bottom row of Example 3, which shows us exactly how much we have to widen or narrow a given beatless interval to arrive at its equally tempered counterpart. The chart shows us that a beatless minor third has to be narrowed 16 cents to produce an equally tempered minor third, a beatless major third has to be expanded 14 cents, a beatless fourth expanded 2 cents, and a beatless fifth narrowed 2 cents. In practical terms, the intervals with a minus sign (m3, P5, m6) need to be narrowed, while those with a plus sign (M3, P4, M6) need to be expanded; 2 cents means "just a little," whereas 14 or 16 cents means "quite a lot but not excessively." Translation of these subjective terms into actual beat rates is of course a bit tricky: in equal temperament F3-A3 beats at about 7 beats per second, but F4-A4 beats about twice as fast, and F5-A5 twice as fast again. Notice how our 2:1 ratio for octaves operates here. However, within a narrow range on the keyboard the comparison in cents makes some intuitive sense: the 2-cent fifth F3-C4 beats at roughly a half a beat per second, while the 14-cent major third F3-A3 beats at approximately 7 beats per second. Because the "error factor" of inharmonicity differs from piano to piano, the actual beat speed of F3-A3 will also differ slightly from piano to piano; it might be 6.7 beats per second on one piano, 6.9 on another. Thus a careful yet intuitive comparison of *relative* beat speeds is our best tool in arriving at a good temperament.

It is also interesting to note that as we progress down the series of beatless intervals and ratios (octave, fifth, fourth, major third, minor third), the relative beat speeds of the corresponding equally tempered intervals increase from slow to fast, as shown in **Example 4**. The musical effects of the various intervals in the twelve-note equal temperament system vary according to these beat speeds: whereas the beatless or slowly beating octaves, fifths and fourths are calm and bland, the rapidly beating thirds and sixths are active and colorful.

All of the concepts and information presented here will be useful as we explore beats and overtones further next month. J

BEATLESS RATIO:	INTVL:	BEATLESS TO EQUAL:	BEAT SPEED:
2:1	Octave	0 cents	beatless
3:2	Perfect Fifth	-2 cents	very slow
4:3	Perfect Fourth	+2 cents	slow
5:4	Major Third	+14 cents	fast
6:5	Minor Third	-16 cents	even faster

Example 4-Relative beat speeds of equally-tempered intervals



Everyday Voicing

File It Away...

Bob Davis, RPT and Dale Erwin, RPT
Modesto Chapter

It is early October as this is being written, and the piano season has begun. The authors are industriously tuning, rebuilding, and of course voicing, so this article will have to appear in two pieces. Just think of this as half of next month's article appearing early.

In previous articles, we have maintained that the result is more important than the method, but have suggested many methods anyway, both traditional and non-traditional. Why?

For a tool, a material, or a method to become a tradition, many users must find it both effective *and* efficient. For instance, we use a screwdriver with parallel sides for two reasons. The tapered kind slips out of the screw slot at the very worst time: just as we are applying the most torque. Not only do we spend hours repairing the long ugly gouge in our newly refinished what-have-you, a touchup is not the same as an unblemished surface. Not only is time lost, the end result is simply not as good. As another example, hot hide glue not only makes a fine, reversible joint, it is fast to use and quick to tack up. It is appropriate (effective) for some joints, and less so for others. It is efficient in some circumstances, and not in others, like when the glue pot is cold or when the joint must be pressed into service soon.

Sometimes quality is more important than speed, of course. A fine tuning takes its own time, although even there, speed can be an advantage in keeping the whole tuning tied together. Sometimes speed is uppermost, such as in a pitch raise. We all strike our own balances daily. A voicer who is not feeling very frisky one day can sometimes do as good a job as the day before, just by doing things in a different order, or by using different tools.

No one will be surprised if we say that paying attention to the way experienced people work is the quickest path to both speed and quality. However, even though there are usually more similarities than differences in the way people do common operations, there is still more than one way to tune a piano or voice a hammer, and there are still non-traditional methods. The reason for these is personal preference, and the reason for personal preference is that we all have different rhythms, both from person to person and from moment to moment. A method that works for one technician may not be as fast for another, and/or may not be producing as good a result.

It is vital that we pay attention to these internal rhythms, not just for speed but for good work as well. They are the reason one should use more than a single source for learning a skill, and the reason we have included experiments in these articles. While experimenting, one should pay attention not just to the results, but also to how the tools and methods feel. In these articles we suggest many different tools, materials, and methods, and other writers might name still more. In the end, we're just taking felt off a stick, so if you can achieve consistently beautiful work as quickly as you want by using a flame-thrower or an electric razor, that's that. Nonetheless, the traditional methods usually make the best starting point.

Why reshape?

There are several reasons why hammers need to be reshaped. Even for the very brief time the hammer is in contact with the string, the grooves, which are pounded and cut into the hammer by the strings, damp the strings' free side-to-side motion, distorting the sound. The constant blows pack the felt near the surface, causing the tone to be brighter than it was originally. The packing also widens the strike point, changing the way the string is set into motion, as well as the damping relation between the hammer and the nodal (or non-nodal) points on the string. This also affects the spectrum. In grands, the pianist often compensates for the now-harsh tone by riding the shift pedal, thus losing its special effect as the rest of the hammer packs and wears. In these cases, reshaping can correct the profile, restoring something like the original tone.

It won't be the original tone, however, for two reasons. First, the inner felt may be more dense, causing the overall tone to be brighter. This can be an advantage in new hammers, as the outer layer of felt may actually be too soft. If filing creates excess

brightness, though, a little needle work can usually take care of it. The other reason is that removing felt changes the mass of the hammer. This is neither good nor bad intrinsically, just something we have to be aware of. The lighter hammers will naturally produce a brighter spectrum, and inertia will be removed from the action.

Preparing to voice

We had intended to write an article on pre-voicing action preparation. We are delighted to say that now we don't have to, as Don Mannino is covering the subject admirably in his series that is running concurrently. Because of the importance of level strings and hammer tops, we will touch on that next month after the initial filing is done. For now, we will assume that our piano has had its final rough tuning, and that the action is perfectly bedded, aligned, and regulated.

Both grand and vertical hammers are easiest to file with the hammers pointing up. For a vertical, this means an action cradle or some kind of action bracket props which allow it to be laid back, with the hammers next to you. A table that is not too high makes it easier to keep track of events on the far side of the hammer. For gang filing, the hammers are going to need to be blocked up so that they are at their striking position. This is to ensure that their tops are parallel to the string line, and to make it easy to file off uniform amounts. On a grand, a piece of two-by-two can be placed between the wippens and the shanks, or a piece of plywood can rest on the wippens and the backchecks to support the tails. Some technicians, especially when doing concert preparation, place the inverted keyslip in front of the backchecks, to serve as an expedient, available platform. Even with a piece of cloth under it, however, the keyslip can be damaged by the wippens, the hammer tails, or the action brackets. On vertical piano actions, the hammer rest rail is not necessarily parallel to the string line, so it is better to prop the hammers to their striking position by putting a board between the shanks and the tabletop, and rotating the action downward until the shank angle is right. More about this next month.

An old bed sheet can be put between the hammers and action, and draped over your lap or under your chair to catch the filings. These filings are bad for your lungs, and a good mask is necessary, along with good ventilation and/or dust collection.

Layers?

Felt is usually described as having layers, with filing to be a matter of following them. Anybody who's shaped a hammer knows there *is* a certain layering to the felt. This is created as the wool is laid down in the felter's tray. The wool fibers, being long hairs, are more likely to lie down rather than stand up, especially as they are packed together. Because of that the felt's internal adhesion is stronger in the horizontal plane and weaker in the vertical plane. Pack a little, add more wool, pack some more; you get the idea. Imagine holding a piece of white, un-backed grand treble damper felt in your hands, the type that is 3/8" thick, 2" wide and about 15" long. If you hold one end or one side in each hand and tug, it's quite strong. The linking holds it together side-to-side and end-to-end. But if you pull up on its thickness dimension it will easily come apart. The same type of orientation is present in a sheet of hammer felt. As it is pressed onto molding it is the end-to-end and side-to-side linking that allows the felt to do all that bending and stretching to produce the desired compression without disintegrating under the immense forces in the press.

It is also useful to think of the

felt as having grain, rather than layers. In hammer felt there is much random orientation of the fibers, causing the felt to act like three-dimensional Velcro. This produces considerable linking strength vertically, although there are planes of weaker linking, probably where the new addition of felt started after an episode of packing. Try pulling apart a piece of hammer felt. It is easier to pull apart in one direction than the other, but nothing like damper felt.

Filing

There are two ways to file, one being "with the layers," and the other not. For the first example, take any hammer mounted on a shank. This can be in a grand or vertical action on the bench, or simply a single shank and hammer assembly clamped in a vise. For a paddle, take a piece of scrap wood about an inch and a quarter wide by maybe eight inches long by about a quarter of an inch thick. Cover both sides with 100 grit garnet or aluminum oxide paper. Any kind of adhesive will hold it on. It doesn't have to be an extremely tight bond. In fact, if you want to strip several layers of paper off later, it is convenient to have a fairly light bond. 3M makes a spray adhesive, available in art supply stores, that is worth a try.

Hold the paddle in any way that feels comfortable. If you are using a pull stroke, you can try holding it by the top, in your fingers or in your fist. If you are pushing up, keep your body low so you can get a full, unrestricted stroke while keeping your elbow and wrist relaxed. Try holding the paddle with your fingertips on the sides, with the bottom of the paddle resting against the heel of your hand, or just grab it at the bottom with your index finger extended. As soon as you stop thinking about it and start trying to crank out work, you will hold it the best way, but it helps to focus on it for a while at this point.

Find a way to hold the hammer in your non-paddle hand firmly enough to protect the flange bushing. Take a few light, vertical strokes on the shoulder. Two things should happen. You should hear and feel the paddle "bite" as it goes through a "layer" or two, and you should see a straight horizontal line across the shoulder where the cut has started. You will actually see two, but the upper one will be more noticeable. If the line is diagonal, the paddle was rotated with respect to the hammer, and as you go on around, the top will not be level.

Now move up the hammer, pulling the little tuft toward the tip. This will take a little less pressure than it took to get the cut started, and the pressure can be decreased further as you approach the tip. Watch the horizontal line, and keep it horizontal and regular. If you get more than one line, you have lost your hold on the layer. Maintaining that hold is as much a matter of feel and sound as of sight. Remember that the force of pressing the molding into the felt causes the layers to be closer together over the tip of the molding than at the shoulders, so any attempt to take off a layer of uniform thickness will actually cut through layers. Some filers go clear around the hammer; some go just short of the tip on one side, and go up and over from the other side. Try both; some hammers respond better to one than to the other.

See how thin a layer you can remove in one neat pass, then how thick. Try a different style of hammer — different felting causes hammers to peel differently.

Next month we'll talk about ignoring layers, and other techniques.

Guest Feature

Ninth-partial Intervals

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"The next [over tone of C4]...is D[7] and a positive discord. This being the lowest in pitch of all the discordant overtones, and having a node at one-ninth of the string's length, is naturally the one the destruction of which should first be sought." Samuel Wolfenden, *A Treatise on the Art of Pianoforte Construction*

"We need interest ourselves very little, and that negatively, in partials above the seventh. These are overtones which your tone regulators are engaged in eliminating." F.W. Morton, *Piano Tone Building*

In the passage quoted above, F.W. Morton suggests that one of the principal jobs of a tone regulator is the elimination of upper partials. What if a tone regulator, following his advice, were actually able to eliminate from a piano every partial above the seventh? This, for us tuners, might be an alarming state of affairs. After all, we do our work by listening to the beating of upper partials. Would we still be able to tune a piano if it had no partials above the seventh?

As it happens, we'd have very little trouble tuning a piano even if it had no partials at all above the sixth. In such a piano we'd still be able to hear beats in almost every interval that is commonly used in tuning:

- the unison (beating at the level of each of the six partials)
- the octave (beating at the 2:1, 4:2, and 6:3, but not the 8:4, levels)
- the double octave (4:1)
- the fifth (3:2 and 6:4)
- the 12th, or octave-fifth (3:1 and 6:2)
- the 19th, or double octave-fifth (6:1)
- the fourth (4:3)
- the major third (5:4)
- the major sixth (5:3)
- the major tenth, or octave-major third (5:2)
- the major 17th, or double octave-major third (5:1)
- the minor third (6:5).

Being restricted to the use of these intervals would, for most of us, be hardly any restriction at all.

In reality, though, we know that every piano, no matter how it has been voiced, has plenty of partials above the sixth. These higher partials, while they may not be essential to tuning, can make a valuable addition to our tuner's tool kit. The eighth partial, for example, lets us check triple, or 8:1, octaves. The seventh partial lets us check the 21st, or double octave-minor seventh (7:1), which many tuners play chromatically to test the consistency of octave tuning in the low bass. The tenth partial lets us check the major 24th, or triple octave-major third (10:1), which is very useful in checking for consistent octaves in the high treble.

In this article I'd like to describe one of my favorite of these upper partials, the ninth, which has a variety of uses in tuning over the whole range of the piano. First I'll list the intervals that beat at the level of the ninth partial, and show how to hear them; then I'll point out some of the instances in which knowledge of these ninth partial intervals may make your tuning more flexible, more accurate, and faster.

The ninth-partial intervals

Here are most of the ninth-partial intervals that can be easily found on the piano, along with suggestions for how to listen to them. Familiarity with the first six of them will prove useful later on when I describe various tests that use the ninth partial. When you're trying to locate the beats in one of these intervals, keep in mind that, since the frequency of the ninth partial is relatively high, the beat rate of a ninth-partial interval is very sensitive to slight changes in pitch. (By the way, you'll find that this sensitivity is one of the things that makes ninth-partial tests so useful in refining your tunings.) If the interval appears not to be beating, it may either be close to pure or be so far from pure that the beats are too fast to be heard. Even if it is beating, the interval may be wide instead of narrow, or narrow instead of wide.

The major whole tone (9:8)

Many tuners are surprised to learn that the major second in the temperament area beats at about half the speed of the major third in the same range. The beats usually go unnoticed, probably because they are rather faint to begin with and because they tend to be swamped by other, more rapid, beats which are also heard when the second is played. But the fact remains that, in equal temperament, the major whole tone is narrow from pure by only about 3.9 cents — in other words, the major whole tone is twice as

tempered as the equally tempered fifth, but less than a third as tempered as the equally tempered major third! Its beat rate falls somewhere between the beat rates of these two intervals as well. For example, the tempered major whole tone, C4-D4, has a theoretical beat rate of 5.3 beats per second; compare this with the tempered fifth, C4-G4, at 0.9 bps, and the tempered major third, C4-E4, at 10.4 bps. As a practical matter, the major whole tone is fast enough to be clearly audible, yet slow enough to be easily measured, from somewhere around C2 (1.3 bps) up to F4 (7.1 bps). (Due to inharmonicity, these rates tend to be faster in a real piano.)

Strictly speaking, the major second in equal temperament represents two intervals: the major whole tone (9:8) and the minor whole tone (10:9 — see below). When a major second is struck, beats can be heard at both these levels, as well as at the 8:7 level, which is an octave contraction of the minor seventh (7:4). These more rapid beats make it difficult to pick out the slower beat of the 9:8 major whole tone. Over most of the piano, however, it is only the beats at the 9:8 level that are slow enough to be useful. For this reason, I will from now on refer to the tempered major whole tone simply as the major second. (In a similar way, what we call the minor third in equal temperament is actually just that minor third that beats at the 6:5 level; there is another minor third, at the 7:6 level, which we ignore because it beats much too rapidly to be useful in the temperament area.)

As I've mentioned, interference from the rapidly beating 8:7 and 10:9 major seconds makes it difficult to isolate the beating major whole tone when a major second is struck. Its beating can be best heard by "ghosting" it at the coincident partial. Here's how to do it: First, lift the dampers from the two notes of the interval — for example, A#2 and C3 — by silently depressing their keys. Now strike the note that corresponds to the coincident upper partial — in this case, C6 — a staccato blow, forte or mezzo-forte. This will excite the partials at that pitch on the open strings into vibration, and their beating will be heard without interference from other partials. If the coincident partial is above the range of the damper action, the note that has been struck will have to be damped immediately to allow the beating partials of the notes being depressed to be heard. (On an upright, this is most easily done by pushing the hammer up to the string.) The better the piano and the quieter the environment, the easier it will be to hear the beating of the major second.

The major ninth (9:4), the major 16th (9.2), and the major 23rd (9:1)

These three intervals can be thought of as octave extensions of the major second, just as the tenth, 17th, and 24th can be thought of as octave extensions of the major third. They expand the usefulness of the major

second up to the top of the piano. Like the major second, they are narrow intervals. The beating of the 23rd can be heard by simply playing the interval; e.g., A#2-C6. The beating of the ninth and 16th can usually also be clearly heard when the interval is struck, particularly if one's ear is directed to the coincident partial; but ghosting the coincident partial may sometimes be necessary. To ghost the ninth A#2-C4, for example, depress those keys silently and strike C6. Similarly, depress A#2-C5 silently and strike C6 to hear the major 16th.

The fifth (9:6) and 12th (9:3)

We are all familiar with the beating of the fifth at the 3:2 and 6:4 levels. The fifth also beats quite audibly at the next higher level, 9:6. Like the other fifths, the 9:6 fifth is always narrow. To hear the fifth A#2-F3 beat at the 9:6 level, depress the interval silently and strike C6.

The 9:3 twelfth is also narrow, just like the more familiar 3:1 and 6:4 twelfths. The 9:3 12th is the most awkward and complicated of the ninth-partial intervals to ghost. I know of three ways it can be done. To hear the 9:3 12th A#2-F4 in a piano with a working sostenuto, depress those keys and hold the dampers up with the sostenuto while striking C6. If there is no sostenuto, hold the key F4 down with a rubber mute inserted between it and the key F#4, then depress A#2 and strike C6. Or, begin by playing C6 to direct your ear to that pitch. Then, while depressing A#2 and F4, strike the octave C4-C5 with any free fingers and listen for a beat at C6. Both C4 and C5 have prominent partials at C6, and that will usually be enough to start the 12th beating at that level.

The beat rates of the 9:6 fifth and 9:3 12th, like the beat rates of these intervals at lower levels, depend on the location of the fifth, the degree of inharmonicity in the piano, and the octave size chosen for the temperament. The narrower the fifth, the faster it beats at all its levels. The 9:6 fifth will often be found to be usable up to the top of the temperament area.

For the sake of completeness, I'll also mention the following ninth-partial intervals, though they beat so quickly that they can only be heard in the low bass. Their practical use in tuning, as far as I know, is minimal.

The minor whole tone (10:9)

In equal temperament, this interval looks the same as a major whole tone, but it beats at a higher level. It is a wide interval, and beats slowly enough to be heard only in the low bass. To ghost the minor whole tone D#1-F1, depress the interval and strike G4.

The fourth (12:9)

Here is the fourth beating two levels higher than the usual 4:3 fourth. The fourth at this level is most easily heard in the low bass. To hear the fourth D#1-G#1 at the 12:9 level, depress the interval and strike A#4. (Incidentally, inharmonicity makes a fourth that is wide at the 4:3 level narrower and narrower at higher levels. In the extreme bass fourths are almost always narrow at the 12:9 level.)

The "major third" (9:7) and "minor seventh" (9:5)

Although we usually think of the major third as beating at the 5:4 and 10:8 levels, when a major third is played on a piano, the ninth partial of the lower note is close enough to the seventh partial of the upper that they will beat. At the 9:7 level, the major third is narrow. Its beats are so rapid that they usually go undetected, but they can be heard in the low bass. To ghost the major third A#1-D1 at the 9:7 level, depress the interval and strike C4.

Similarly, the minor seventh, which we think of as beating at the 7:4 level, does also beat at the 9:5 level. In equal temperament, the 9:5 minor seventh is a narrow interval, while the 7:4 minor seventh is wide. To ghost the minor seventh D#1-C#2 at the 9:5 level, depress the interval and strike F4.

Using ninth partial intervals

The best way to understand the usefulness of ninth-partial intervals is probably through an analogy with the more commonly used fifth-partial intervals. For this reason, I'd like to review in some detail the fifth-partial intervals and the reasons they are so useful in tuning before I go on to describe ninth-partial tests.

Take a look at the list of intervals in the second paragraph. Notice that the sixth, both the thirds, the tenth, and the 17th all contain one note that beats at the level of the fifth partial. None of the other intervals on the list contains a note that beats at that level. (To put it another way, if Morton's tone regulator had eliminated all partials above the fourth, none of the thirds and sixths in his piano would beat at all.)

It would be difficult for a modern tuner to tune without listening to any fifth-partial intervals. Over much of the piano, thirds, sixths, and their octave expansions beat at a rate that is slow enough to be counted, yet fast enough to be accurately compared with neighboring intervals. The slowly increasing beat rates of these intervals are one of the hallmarks of good temperament and octave tuning.

Thirds and sixths, beating at the level of the fifth partial, also make possible convenient tests of the other intervals on our list — the octaves, fifths, and fourths. An understanding of why this is so will make the usefulness of ninth-partial intervals easier to understand.

Let's say that we are tuning the fourth, F3-A#3, which beats at F5, the fourth partial of F3 and the third partial of A#3. In order to determine the precise beat rate of the fourth, as well as to establish whether it is narrow or wide, we choose another note, C#3, which has its fifth partial at F5, and check it against the two notes of the fourth.

Why don't we use as our test note F4, which has F5 as a second partial? Or A#2, which has F5 as a sixth partial? Because each of these notes contains, in addition to F5, a number of other partials that coincide with other partials of F3 and A#3. The beating of these other coincident partials would confuse the ear.

By choosing C#3 as our test note we avoid this problem. The next partial of C#3 that coincides with one of F3 is the tenth, F6, high enough and faint enough that its beating is not likely to be confused with that of F5. For this reason, test notes for octaves, fifths, and fourths tend to use the fifth partial, and so they tend to form sixths, thirds, tenths, and so on with the notes of the interval to be tested.

It's quite possible to choose a test note that uses a ninth, rather than a fifth, partial to test the tuning of a fourth, fifth, or octave. In fact, ninth-partial intervals often beat more slowly than the thirds and sixths of the fifth-partial tests. In addition, ninth-partial intervals can be used in parallel, just like thirds and sixths, to check the consistency of temperament and octave tuning. Because they are faint and sometimes cumbersome to use, however, these ninth-partial tests usually work best as a supplement to, rather than as a replacement for, fifth-partial tests.

Octave, fifth, and fourth tests using the ninth partial

The ninth-partial intervals listed above can be used just like fifth-partial intervals to create tests for octaves, fifths, and fourths. The value of most of these tests is academic, but they do come in handy on occasion. Here, then, are all the ninth-partial tests for octaves up to the 8:4 level, for double octaves up to the 4:2 level, for the 8:1 triple octave, for fifths at the 3:2 and 6:4 levels, and for fourths at the 4:3 level.

- An octave is pure at the 2:1 level when the major 16th below the lower note beats at the same speed as the major 23rd below the upper note.

• An octave is pure at the 4:2 level when the major ninth below the lower note beats at the same speed as the major 16th below the upper note.

• An octave is pure at the 6:3 level when the 9:6 fifth below the lower note beats at the same speed as the 9:3 twelfth below the upper note.

• An octave is pure at the 8:4 level when the major second below the lower note beats at the same speed as the major ninth below the upper note.

• A double octave is pure at the 4:1 level when the major ninth below the lower note beats at the same speed as the major 23rd below the upper note.

• A double octave is pure at the 8:2 level when the major second below the lower note beats at the same speed as the major 16th below the upper note.

• A triple octave is pure at the 8:1 level when the major second below the lower note beats at the same speed as the major 23rd below the upper note.

• A fifth is narrow at the 3:2 level when the 9:3 12th below the lower note beats more slowly than the major 16th below the upper note.

• A fifth is narrow at the 6:4 level when the 9:6 fifth below the lower note beats more slowly than the major ninth below the upper note.

• A fourth is wide at the 4:3 level when the major ninth below the lower note beats faster than the 9:3 12th below the upper note.

Tuning with partial intervals

Now let's go through a tuning and look at some of the occasions when the use of ninth-partial intervals might make our work better, faster, or more accurate.

Setting pitch: Most aural tuners use F2 as a test note when setting the pitch of the fundamental of A4 to the fork or other aural pitch source. This fifth-partial interval, the 5:1 17th, is indeed often the best one to use, as it is easy to hear and usually beats at a usable rate if the piano is roughly in tune.

On most pianos, however, there is another beat created between F2 and the fork or the piano's A4 at the level of A5. Now don't ask me why an A-440 tuning fork, which has no harmonic partials, and which gets no response from a tuning scope set for A5, can seem to beat at A-880. But anyone who has listened closely to one can attest to the fact that it does. Many times this higher beat poses no problem, but on other occasions it can make the precise beat rate at A4 very difficult to hear, at a moment when we are trying to be as precise as possible. It wouldn't be so bad if the beat at A5 were twice as fast as that at A4, which it would be in a piano with no inharmonicity. But the A5 produced by the string at A4 in a real piano is a hair sharper than twice the fundamental, and, more significantly, the A5 produced as the tenth partial of F2 is a good deal sharper than twice the A4 produced as its fifth partial. As a result, the beat at A5 is always something more than twice that at A4, and if you're trying to concentrate on the exact beat rate speed at A4 these two beats going on simultaneously can make your head spin.

The next time you're having trouble getting a good clean beat at A4 using F2 as a test note, try using the ninth-partial test note instead. You'll probably have to raise the pitch of the test note, G1, just a little bit. Strike your fork, or get your other pitch source going, and play G1. If you hear no beats, raise G1 just a hair, until you get some beats at a comfortable rate — for me, about 4 bps. There are some pianos where you won't be able to get a good beat going at the ninth partial of G1, no matter how hard you try, probably because the hammer line is striking G1 at one of the nodes of the ninth partial at that point in the scale.

However, in most pianos you'll be able to find a nice clean beat, with very little interference from A5. G1 would have to have a very loud eighteenth partial to cause this sort of interference, and that rarely seems to be the case. I like this test note better than another commonly used test note, B1, which uses the seventh partial, because I often find that I still hear interference at A5 from the 14th partial of B1.

In the temperament: The major second is a powerful tool for fine-tuning an already well tuned temperament on a high-quality piano. In a temperament octave F3 to F4, for instance, try ghosting the adjacent seconds, F3-G3 up to D#4-F4. On a good-quality grand, beats will be heard clearly throughout the temperament, but on a lower-quality piano, it may be difficult to hear beats towards the top. In a piano with very low inharmonicity, the beat rates of the seconds in both sequences will increase smoothly in speed. Ninth partials are so high that they are greatly affected by inharmonicity, however, and in some pianos with high inharmonicity, depending on the details of the scale, the seconds will be found to decrease in speed towards the middle of the temperament and speed up again towards the top. For the most part, you should just look for a break in the progression, which indicates a problem area. For instance, two contiguous seconds — for example, F3-G3 and G3-A3 — in which the lower is slower than the norm and the higher is quicker often serve to indicate that the common note — G3 in this case — needs to be flattened.

The seconds can help identify problem areas in an already well tuned temperament; but before retuning any notes, it's wise to check the usual tests for confirmation of the problem. I don't usually check seconds as I tune a temperament, but I do value them for their ability to provide a fresh, objective look at the temperament after it has been set.

By the way, for those who use the Baldassin-Sanderson temperament, the major second makes an excellent test for the correct placement of the key note B3 between A3 and C#4 — assuming, of course, that A3 and C#4 have been correctly placed between F3 and F4. If B has been correctly tuned the two major seconds, A3-B3 and B3-C#4, should be roughly equal.

Below the temperament: I sometimes wonder if we tuners tend to set 4:2 octaves in the midrange and low treble and 6:3 octaves in the upper

bass just because the fifth-partial tests for those octaves happen to be easy to hear in those areas. I find there are occasions when I would rather tune 8:4 octaves just below the temperament, or in the upper bass, and on those occasions the M2-M9 ninth-partial test is usually more useful than the m6-M3 fifth partial test, which beats very rapidly in this area of the piano.

Now, why would anyone want to tune an 8:4 octave just below the temperament? Here's just one possibility: Let's say it's early May, and you're tuning a piano in the Northeast with no climate control that has plain wire strings down to C#3. You've tuned a good temperament between F3 and F4, and you're heading down into the bass. You've got a sinking feeling that however you tune the next four notes, they're going to sound pretty miserable in a couple of weeks. You know that over the next month humidity is going to rise sharply, the soundboard is going to swell, the piano is going to go sharp, and those strings in particular are going to go very sharp. It would seem that if you were to make those octaves as wide as possible now, you'd be giving your tuning a better chance of sounding decent longer. So go down to the very first plain wire string and see what it would sound like tuned as an 8:4 octave: Make B2-C#3 beat the same as B2-C#4. On some pianos, this octave tuned 8:4 will be too wide to leave as is and still keep your reputation intact. But on some pianos, it will have a little more roll than you might like but still be perfectly acceptable. If so, tune all four plain wire notes below the temperament as 8:4 octaves. Tuning them all pure at the same level will remove one source of beating entirely, and will give the octaves a consistency that will make them that much more acceptable. And you will probably get a few more weeks out of that tuning.

Above the temperament: Let's say you've just tuned an F3-F4 temperament and are beginning to tune into the treble. You're testing octaves using the M3-M10 test, but you're setting them slightly wide. You're testing them at the 4:2 level; how wide are they at the 6:3 level? You may not care; they sound good, and that is what matters, after all. But you may be curious, and you just won't be able to tell by using the m3-M6 test; it's beating too quickly. If you really want to find out without detuning your test notes or getting an Accu-tuner, you can check easily and quickly using ninth partials. For example, you can test the 6:3 octave C4-C5 by comparing the 9:6 fifth, F3-C4, and the 9:3 twelfth, F3-C5.

You will probably find the ninth partial most useful in the high treble. If you like pure 8:1 triple octaves up there, the major second-major 23rd test is indispensable for you. If used simply as a check for the consistency of octaves, parallel 23rds are an invaluable partner to the more commonly used fifth-partial intervals, the M24ths. (Strictly speaking, these are tenth-partial intervals, but they are in the fifth-partial family of tests.) As octaves are stretched in the high treble, the M24ths, which are wide intervals, begin to beat so rapidly that they can be hard to compare with each other, particularly in the last octave to octave and a half. However, the ninth-partial M23rd, a narrow interval, beats more and more slowly, and thus becomes even easier to hear as octaves are stretched. Conversely, if narrower (4:1 or 2:1) octaves are being tuned, the M24ths tend to beat more slowly at the same time that the M23rds become too quick to be useful.

Parallel major 23rds and major 24ths complement each other in the high treble in yet another way. Both usually show a dramatic break in speed as the lower note of the interval crosses the break from wound strings to plain wire. Being able to use both intervals means that one can be used to check consistency while the other is out of commission crossing the break. The major 24th usually slows down as it crosses the break, while the major 23 speeds up.

A familiarity with ninth-partial intervals adds to the repertoire of tests that you already use to give you information about the way you're tuning a particular piano — whether you use that information to get

through an area that's difficult to hear, to expand your options, to refine your tuning, or simply to satisfy your curiosity. Understanding ninth-partial tests is like having a set of specialty tools in your kit, tools that take up no space and don't weigh your toolbox down. Having them at your command can give you, when the occasion demands, some extra speed, flexibility, and accuracy. Like other specialized tools, you may not use them every day, except when you're first learning how they work. Clearly, you'll always be able to tune at the highest levels of accuracy without them. But on many occasions you will find that a ninth-partial test simply provides you with the clearest and quickest route to a fine tuning in a particular area of a particular piano on a particular day. I hope you will agree with me that the deeper your understanding of *all* the intervals of equal temperament, and especially of how those intervals sound on the piano, the better tuner you will be. J

Industry News

Baldwin Piano and Organ Company recently hosted a piano technical School in Jonesboro, Arkansas. Classes focused on advanced levels of piano service including regulation of touch, voicing, damper adjustments, troubleshooting, and concepts of piano design. Kent Webb, Baldwin Piano Technical Service Manager and Technical School Coordinator, stated that Baldwin normally hosts one school per year. Advance notices for the 1993 school, sent out to Baldwin's U.S. and International dealer network, drew technicians this year from as far away as Vancouver, B.C., Florida, California and Washington, D.C.

Three days of classes were taught at the Holiday Inn in Jonesboro and included a tour of the Baldwin plant in Trumann. The classes began Thursday, September 30, and ended in a banquet with presentation of Certificates of Achievement on Saturday night, October 2. Kent Webb commended all of the attendants for their desire to excel in their craft and thanked the technicians for their support of Baldwin pianos in their local markets.

Webb stressed that well-trained and conscientious technicians have long been an integral part of Baldwin's tradition of quality. Baldwin pianos are played by many professional musicians—customers that demand excellence in the instruments they play and the services performed by technicians. Baldwin's activities to advance piano technology education include the yearly technical schools and teaching commitments with the Piano Technicians Guild at conferences located in the United States and Canada.

Articles, information or industry product releases may be submitted for "Industry News" consideration by sending them to: PTG Home Office, 3930 Washington, Kansas City, MO 64111-2963. All inquiries are subject to deadline schedules and space availability. Please, no product advertisments. Publisher reserves the right to decline any information submitted.

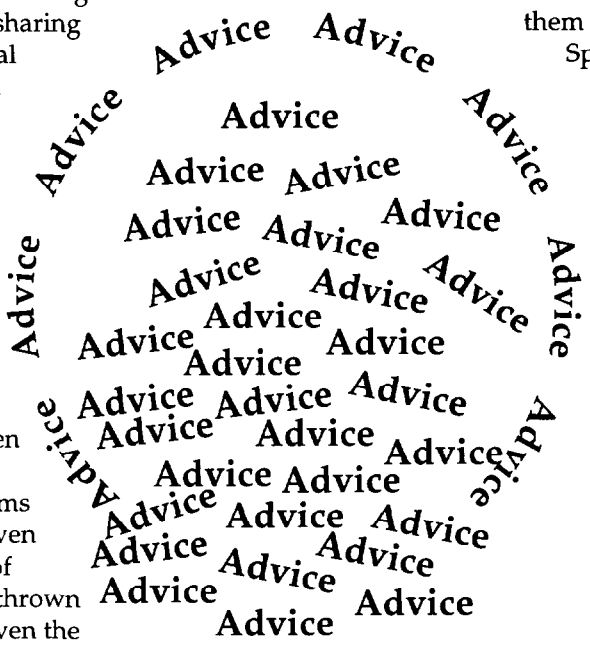
Left Fork

Ron Nossaman, RPT
Wichita Chapter
Feature Writer

When, in the course of human events, it becomes necessary to suffer the slings and arrows of outrageous suggestions we are obliged to pause and ponder... Where does untaken advice go?

"Always wear clean underwear in case you are in an accident." I have been in several accidents to date and, as yet, nobody has checked. This doesn't make the advice bad, just the reason. This also doesn't mean that there is any inherent connection between the state of your underwear and the likelihood that disaster may befall you. Well, then again... Never mind, the point is that from your first day on the planet, and nearly every day since, you have been barraged by incoming gobs of largely unsolicited advice. Regarding pianos, you hear such pearls as "I moved it across the room so now it needs tuned again," and "I heard you shouldn't put them in basements." There is so much conflicting advice floating about on any given subject that most people have developed an automatic advice squelching input filter that presorts most of this random tripe at the unconscious level. That way they don't have to deal with the possibility that they are harboring any misconceptions or invalid data. It also relieves them of the burden of consciously evaluating every bit of the vast quantity of dubious reality we all wade through daily. Call it intellectual auto-pilot. The danger here is that, on occasion, a truly, and against all odds, useful thought is overlooked. We, it seems, are far too intent on reconciling what we think we see and hear with what we think we already know to take the time to re-evaluate our positions on everything on a day-to-day basis. Good advice, then, is that which most firmly supports our existing misperceptions. Bad advice would then be defined as anything contrary to your present intentions. Are you with me? It's all in the timing. That's the incoming advice, what about the outgoing?

The automatic tripe filter in the advice receiver is curiously missing in the advice broadcast section of our internal circuitry. It's not even vestigial. There is no trace of any type of mechanism for damping or tempering the instant and total dissemination of opinions. This being the case, we automatically inject our own true and correct opinion into any conversation we were unsuccessful at avoiding in the first place, thereby endearing ourselves to everyone we have ever met through the spontaneous sharing of our personal gems of truth. Our own advice is, after all, golden. Thus, we finally arrive at the point of all this. Where does all this untaken advice go?

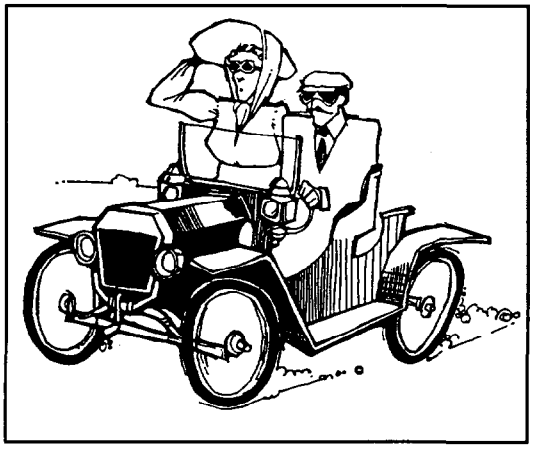


It seems to me that, given the quantity of advice being thrown about, and given the infinitesimal quantity of proffered advice that is actually taken, there must be one heck of a big pile of unclaimed advice out there somewhere. Where do you suppose it is? Do you suppose the Government is hoarding it for some incomprehensible purpose? Maybe it's not all in one place, but scattered around in numerable smaller piles. Maybe it's not in piles at all. Is bad advice heavier than air? Than good advice? At times I have this creeping suspicion that most of the truly idiot things we all do at times are the result of blundering into an invisible cloud of rancid advice and not getting it scraped off in time. Realistically, I think the truth is much simpler than that. The planet's biosphere will only support so much advice, the supply is limited. Therefore what you are receiving, and disseminating, is just recycled *used* advice.

Yes folks, it's true. You see, advice adheres to the experience which is a natural consequence of having taken advice in the first place. This process is called "Learning From Our Mistakes" and is the only valid means of accumulating a backlog of experience and "advice points." Experience qualifies you to give advice, good or bad. Ask anyone. So the next time someone calls to ask if they can put their old upright on an outside wall, you can tell them where to put it. Spend a few of those points, recycle some of that good advice.

Maybe this time they'll hear it... Nah!

International Relations



The 1993 PTG European Tour

Continued From October, 1993 Journal

By Yat-Lam Hong

To make things worse, one technician walked out of the class in the middle of it. A few others, who obviously had been thinking of doing the same thing (as a protest perhaps) followed suit. That made the class look really bad. As it turned out, the first person who walked out did return. He simply had to use the bathroom, and he told me afterwards he had too much coffee at breakfast, but that didn't matter: the damage was already done.

What was it like to play the IPAS actions? I had a chance to find out for myself after the class. They have a rather light touch, and the slightly jerky movement of the jack escaping from under the knuckle or hammer butt was a lot less noticeable than in traditional actions. Without hearing the tone, it was hard to judge the power imparted by the hammer. That's all I could tell from the action models, which wasn't much.

At lunch that day, Petersen ate alone, which gave me a chance to talk to him. He told me that, knowing this was the public introduction of his IPAS action, he'd expected a certain amount of skepticism from the class, but the violent reaction he received really surprised him. He said he had a Pfeiffer vertical piano (from Stuttgart) in the classroom already outfitted with the IPAS, but he couldn't get the action to work, because the machinist had made the parts wrong, and there was no time to start over before the Convention began. Rather than showing the first piano with IPAS that didn't work (and thus prove his critics right, though for all the wrong reasons), he decided not to show it at all. That was the most unfortunate part, as he was a victim of the machinist's mistakes, assuming there was nothing else amiss. Supposing the machinist had made the parts right, and the IPAS-equipped piano worked exactly the way it's designed to, he could've silenced his critics right then and there, because action speaks louder than words, and piano technicians ought to know this better than anyone else. But it was not to be.

Frankly, I don't understand the IPAS action. Is it the first step in a new revolution in action design? Or is it just another brand of snake oil? I don't know, and I don't feel qualified to judge. But I told Petersen that, when the Wright brothers were experimenting with their flying machines, people thought they were nuts, because nobody had ever heard of such a thing. Now, 80 years later, if you say to people, "Look at that airplane. It can fly." They'd say, "Of course it can. It's supposed to. What's wrong with you?" Petersen appreciated my remarks, as I was perhaps the only sympathetic voice in the bunch. Maybe the IPAS action will never work in its present form, but it could be the first step in a totally new direction the piano is going. We'll see.

The last session of the Europiano Congress was for all participants. Ominously entitled "The Future of the Piano," it was a panel discussion, with simultaneous English/German translation, led by three experts: Leo Duricic (Germany), Max Matthias (Germany), and Ed Hilbert (U.S.A.). This happened to be the time when Ed, our tour director, had to make some last-minute changes in our travel plans, so I was asked to fill in for him. These three speakers talked about what they thought would happen to the piano business and how it would affect piano technicians. Even though partly based on fact, it was still a bit like fortune-telling. What emerged was not a pretty picture.

Leo Duricic, speaking in English and translating for himself in German, talked about the direction of the piano business. "In 1900," he said, "there were 300 piano makers in Berlin alone. Now, there's only one in Berlin and 20 in the rest of Germany. The piano business is difficult, partly because of the inexpensive pianos from Japan, Korea, China, and Russia flooding the market. But in Germany, the problem is high wages

and high production costs, which keep pushing prices upward."

Duricic predicted that, within a few years, the 20 German piano manufacturers will be reduced to about 10, and only the ones with the best quality and best reputation will survive. However, he's convinced that enough pianos will be around to keep this generation of piano technicians busy until they retire. He said he'd be happy if the present downward trend turns out to be temporary.

Max Matthias, our next speaker, recently retired as plant supervisor at Hamburg Steinway, where he'd worked for many years. "When radio was first invented," he said, "the piano was threatened, but it has not only survived, but prospered since." He acknowledged that piano sales are now down worldwide only due to the recession. He believed that the decline of the piano is cyclical, and we just happened to be at the low end of the present cycle. When it can go no lower, the upturn will begin. He feels the future of the piano is in the hands of piano technicians. They're the ones consumers trust far more than piano salesmen, as they have the consumers' confidence. Matthias gave the most optimistic view of the industry. Let's hope he's right.

Filling in for Ed Hilbert, I presented a composite view of the industry of the American technicians in attendance. The number of piano manufacturers remaining in the United States tells its own story. Not counting foreign-owned companies, there are now only eight piano manufacturers in the country: three big ones and five small ones. While business is down for all of them, the big three have not suffered as much as the small ones, which are in varying stages of financial shakiness. I wouldn't be a bit surprised if a few of them would go under.

Another American technician expressed the view that nothing lasts forever, not even pianos. Just look at what happened to the harpsichord, clavichord, and fortepiano. Someday, he believes, the modern piano will join their ranks and become an "historical instrument." People who are in the habit of neglecting their pianos already prefer the electronic keyboard, which requires no maintenance and takes up less space. Today's young people are getting very accustomed to the sound of electronic instruments, and if Mozart were still around, he'd respond in horror to the sound of a modern concert grand. All that piano technicians can do now is to maintain what pianos we still have in their best condition, and hope the decline of the instrument doesn't go any further.

I brought out the point that the decline of the piano is readily reflected in the concert hall, where even internationally known "big-name" pianists in solo recitals can't always sell out the hall, and for lesser names, having more empty seats than occupied ones is typical. Perhaps the future of the piano lies in the Orient, where the piano is not in decline. Just take a look at the students enrolled at any of the major music schools in the United States, and you'll easily find a third to a half of them is either from the Orient or of Oriental parentage. Looking further down the line, the many programs for training young musicians, such as the Suzuki, are providing performers (or at least audiences) for the future. Public schools may be eliminating, or cutting back on, their music programs, but for many families, especially the better educated ones, music lessons for their children are still considered part of their necessary upbringing, not "frills." Or, look at prize-winners at piano competitions big and small. You'll find more and more Orientals winning them. So far there are no Chinese Horowitzes yet, but that also remains to be seen. Maybe here's a glimmer of hope in the desolate landscape of the piano world.

Klaus Fenner (Germany) added to the discussion his experiences with Russian pianos, which he'd been helping re-design. Russia had been making around 120,000 pianos a year until recently. Now, the annual production is down to between 40,000 and 60,000. With the drastic devaluation of the ruble, it's hard to come up with the money for the materials needed for piano-making. Fenner said nobody knows the exact number of piano makers in Russia today, but European Russia has about eight, and the biggest one is in Minsk. All aspects of piano-making, such as design, size, style, features, etc., are controlled by the Russian government. Normally, Russia produces two sizes of vertical pianos: 110 and 120 cm (43" and 47", respectively), and the touch-weight specified by the government is 63 grams.

Some Russian factories import their actions while others make their own, and their quality ranges from bad to worse. Some of the Russian actions are so bad that they can't be regulated at all, and the finished pianos are just that: finished. For instance, the damper wires they use are so stiff that they can't be bent for regulation, and attempts to bend them will only loosen them in their housing. That's because the action-making machines are all old and worn-out, and the country can't afford new ones to replace them. Fenner said Russian pianos are not pianos; they only look like them. With materials and workmanship equally atrocious, Russian pianos, regardless of their low price, are simply not worth buying. The future of Russia's piano industry is bleak.

So, here we have an insider's view of the piano industry in a once mighty country. The Russians probably would be glad to trade their problems for ours, and we thought our situation is tough. It just goes to show that everything is relative.

In my casual conversations with some German technicians at Skallerup Klit, I also learned a thing or two about how hard recession has hit Germany's piano industry, although its problems are nowhere nearly as severe as Russia's. In Germany, a company cannot just lay off any number of employees it chooses when business is slow, because the workers (and their families) are protected by laws that regulate such things. For example, a company cannot lay off more than 10% of its employees in any single year, and this is permissible only when the company meets certain stringent requirements. There are numerous other restrictions from the employees' unions to contend with, too. If a reduction in the work force is expected to be permanent, the company has to pay the employees off in the form of generous severance packages, early retirement bo-

nuses, etc. Those willing to accept, and eligible for, such offers are usually the older workers. As they leave, the companies have lost their most experienced employees, and the quality of their pianos suffers. In a few cases, the decline is already beginning to show. Some companies have chosen an easier(?) way out, and simply sold out to their stronger competitors. Thus, their pianos are still being made, but by someone else now, and they have no more control over the business.

One major German manufacturer is forced by circumstances beyond its control to operate on the "three-two" schedule. This means that the company will run at full capacity for three weeks at a time, followed by two weeks when everyone (except the most essential employees) is laid off and goes on unemployment. This cycle repeats every five weeks. The source of the problem is plain and simple: inspite of its international reputation, orders for its pianos simply don't come in fast enough to keep the entire work force employed continuously. Therefore, the compromise schedule.

Why doesn't this company store its excess pianos in its warehouse? This is not a realistic solution either, because when these pianos come out from storage, they have to be re-tuned, re-regulated, re-voiced, re-polished . . . which only adds to the production cost, and makes this very expensive piano even more so. Besides, the warehouse is not really an option: it's already filled with unsold pianos.

Compared to the United States, Denmark is a very expensive place to live. A consumer typically pays about US$125.00 to have his piano tuned, and that's just for tuning alone, not including any repairs, adjustments, or pitch changes. Out of that, $25.00 is the Value Added Tax (VAT) which the technician collects for the government and turns in every two months. The actual tuning fee is only $100.00. Out of that $100.00, the government takes between 50% and 60% for the technician's own taxes, leaving him less than half of his earnings to live on. It's hard to get filthy rich in a system like that, but the Danes pay their taxes without protest, because they get much in return. For such heavy taxation, the government pays all their expenses for health care, medical needs, child care, education from nursery school through university, unemployment benefits, nursing homes, etc. For example, the Danes would find totally incomprehensible the American practice of parents saving and scrimping to send their kids to college. The same goes for the non-smoking laws sweeping across the United States.

Tourists in Denmark get hit hard, because they pay the same prices as the natives, but usually don't get to enjoy any of those benefits. After all, this is a country where a Whopper at Burger King costs $4.75, a gallon of unleaded gasoline is $3.75, and the minimum wage is $12.00 an hour. According to my unscientific survey, $1.00 in terms of purchasing power is worth about 45 cents there. After a week there, I was getting used to paying such prices, if that's possible, and money didn't seem to mean anything any more. How expensive it is there didn't hit me until I returned home, where everything seemed incredibly cheap. The things I always bought (groceries, for example) suddenly seem like super bargains. This was, of course, only an illusion, and reality set in soon enough. Now I can understand how some foreigners could fly to the United States, do a big round of shopping, and save enough on the bargains to pay for their plane fare and a nice vacation, too.

From Skallerup Klit, we headed south toward Copenhagen, stopping in Egtved to visit Denmark's only piano maker, which is named after the town where it's located. The Egtved (pronounced just as it looks) factory is owned by an American technician, Kevin Gouldmann, who was also one of the instructors at the Europiano Congress. A native of Baltimore, Maryland, he came to own the company in a roundabout way. After spending many years in Germany studying piano technology and working in various factories, he married a very attractive German woman, and came to Egtved to work as an instructor, since Egtved is also a school for training piano technicians. Four years later, together with a partner, he bought this factory/workshop/school complex. This also explains how he became fluent in German and Danish, in addition to his native English.

The Egtved makes only one model with some unique features: a 45" vertical piano with an 85-note keyboard, two pedals, and removable castor blocks. The case is made of solid maple. Instead of the usual backposts and built-in handles, its back is reinforced with a large oval-shaped "ring" made of laminated wood that goes around the entire perimeter. The strings have duplex bars at both ends of their speaking lengths. The piano has a big sound for its size, and was used extensively at Skallerup Klit.

Egtved, the piano maker, is a very small operation to begin with, and it has become even smaller. Last year, it produced about 20 pianos. The slow sales have to do with the price: this piano sells for about $10,000.00. "Piano-making on a small scale like ours is very uneconomical," Gouldmann explained. "Now we only make it to order."

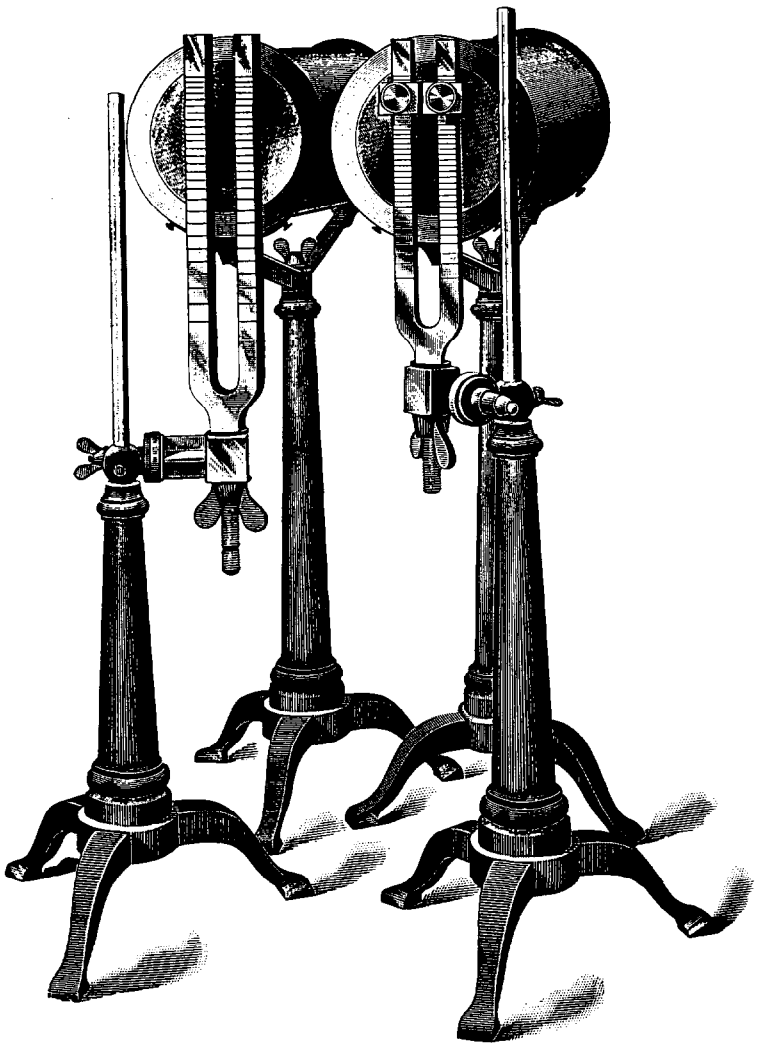
While the piano-manufacturing portion of the business and the technician-training school have declined, the workshop has expanded its activity dramatically since Gouldmann took over. Pianos of all kinds, some with obsolete actions, are shipped to this small Danish town for rebuilding. Some come from as far south as Switzerland. The rebuilding work is what keeps most of his seven employees and one apprentice busy. With the slowdown on the piano-manufacturing side, Gouldmann has diversified into making loudspeaker cabinets and modern designer furniture. I especially like the three-legged contemporary piano stool Egtved makes; it's solid, sturdy, and comfortable to sit on.

Our tour ended on somewhat of a low note (not A-440). Earlier in the trip, one of us caught a cold, and it'd been spreading. By the time I left the group in Copenhagen, four others had come down with it. Often travelling day after day in the confined atmosphere of the bus, cold germs were flying all over the place and hard to escape from—the only protections being one's immune system and mental attitude. It was unfortunate, but on the other hand, it may

be no worse than being seated next to someone on the airplane with a contagious disease. This was just one of the many things in life that we have no control over.

In closing, I must thank Ron Berry and Ed Hilbert, of PTG's International Relations Committee, who had worked tirelessly to make this trip a reality. It was enjoyable and educational in many ways. If you've never been on one of these PTG trips, it's not too early to start thinking about the next one. The next Europiano Congress will be in Berlin in 1995. IAPBT will have its 1995 Convention in conjunction with the PTG Convention in Albuquerque, New Mexico, and it's possible that another tour will be arranged to coincide with this double Convention. If you like to plan ahead, IAPBT will meet in Taiwan in 1997, Japan in 1999 . . . $tart $aving!

Foundation Spotlight



"Two of the large forks and resonators of Koenig's grand universal tonometer...arranged for experiments on beats" — from the book "Sound and Music" by the Rev. J.A. Zahm, C.S.C. (A. C. McClurg and Company, Chicago 1892). This volume, part of the library of William Braid White, was donated to the Piano Technicians Guild Foundation Museum and Archives by Fred Odenheimer.

As part of its adopted mission — "...to participate in the preservation of resource materials..." — the PTG Foundation has taken on the challenge of accumulating an archive of materials in piano technology, as well as a facility in which those materials can be displayed and used. If you have historical materials that you would like to donate to the Foundation, please contact Foundation President Bruce Dornfeld, RPT, 2134 Walters Avenue, Northbrook, IL 60062.

If you wish to support this important effort financially, please send your contributions to the Piano Technicians Guild Foundation, 3930 Washington, Kansas City, MO 64111-2963.

1994 Events Calendar

January 7-8
Arizona State PTG Seminar
Tucson Chapter—Aztec Inn
Contact: Bob Anderson
5027 E. Timrod Street
Tucson, AZ 85711
602-326-4048

February 11-13
California State Conference
Cathedral Hill Hotel—San Francisco
Contact: John Schaecher
2015 Divisadero Street
San Francisco, CA 94115
415-567-1800

March 3-6
PA State Conference
Harrisburg, PA
Contact: Keith Bowman
210 Hamilton Street
Harrisburg, PA 17102
717-234-4475

March 10-12
Pacific Northwest Conference
Seattle Chapter—Bellevue Red Lion
Contact: Randy Rush
2627 NE 86th Street
Seattle, WA 98115
206-525-7601

March 12
Bluegrass Tuning Seminar
Transylvania University—Lexington, KY
Contact: Russell Schmidt
311 Desha Road
Lexington, KY 40351
606-269-4293

S	M	T	W	T	F	S
				January		1
2	3	4	5	6	Arizona State Seminar	
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					
February		1	2	3	4	5
6	7	8	9	10	California State...	
Conference	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					
March		1	2	PA State Conference		
	7	8	9	Pacific NW Conference		Bluegrass Tuning Seminar
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

AUXILIARY EXCHANGE

Dedicated To Piano Technicians Guild Auxiliary News and Interests

Greetings and Happy Hanukkah, Merry Christmas and before we meet again, a very joyous New Year. This has been a very exciting and action packed year. But where did it go!

As I am writing this, the country is debating a health care package for all citizens, our soldiers are dying in Somalia, but Israel and the PLO have signed a peace agreement so just maybe there will be peace on earth this season.

It seems, however, that every time you take in your mail one organization or another is asking for your money: heart fund, cancer, AIDS, MS, March of Dimes, Animal Rights, environmental groups, political groups, church & school groups and of course, PTGA asks for help too.

At the beginning of each year, I sit down and make my budget out for the year and if groups aren't on my list on January 1, they stay off until next year. I do hope that PTGA is on your "help" list for the year. You have heard some of the talented young musicians we have helped and they do appreciate it. They provide us with an excellent program at convention time.

As I write this message to you, I have heard of the death of Ruth Pollard, our first president. I am so happy that I started that audio tape program last year. As I am writing this I am listening to Beva Jean Wisenbaker interview Ruth. The body may have been slow but the mind was still quick and alert with dates and events brought forth from forty years age. She would have been 97 on November 9 1993. Bless her for starting this organization and bringing us all together for a propose.

I am asking that each chapter make a donation to the scholarship fund in her honor this year. Those members-at-large, please consider adding $10, $15, $20 more dollars to your dues for 1994 in memory of Ruth Pollard, Eleanor Ford, or anyone else whom you choose. That way their memory will live on.

Enjoy being with your family for the holidays and have a wonderful, joyous new year.

Yours Truly,
Phyllis Krahmer-Tremper

In loving memory of Ruth Pollard

PTGA Merchandise

A great way to say Happy Holidays

There's still time to order your holiday gifts from the Auxiliary. Contact Phyllis Tremper.

Don't forget we have...

Greeting Cards
Cookbooks
Suncatchers

Music In Our Lives

By Ginny Russell

Have you ever paused long enough to wonder how old this wonderful form of art, this MUSIC is? It is recorded in the Old Testament, which goes back more than just a few years, where God said, referring to the moment of the creation, "The morning stars sang together and all the sons of God shouted for joy." Imagine what Adam had heard when he had been created; birds, the babbling brooks, and all the different night sounds. What a surprise that had to have been for him!

We all know music can paint pictures in our minds. The *Flight of the Bumblebee* by Rimsky Korsakov really is a picture of a bee in motion. Just about everybody remembers Leroy Anderson who wrote such picturesque music as *The Typewriter, The Syncopated Clock, Sleigh Ride,* and the list goes on and on. Music, as an art, is the watercolor, the crayon, the piece of charcoal, or the feathered wisp of oils.

How keen is your imagination? Close your eyes. Picture a bowl of fruit in front of you. In the bowl is a lemon. With a large cutting knife you cut the lemon and the juice flows out. If you feel the sting in your glands in the side of your neck the experiment worked.

You see, music is just like that lemon. With your eyes closed as you listen, you can see a picture, the shimmering moonlight as it cascades across the landscape in Debussy's *Claire De Lune,* or the rushing water of the river *The Moldau* by Smetana.

Music has been a strong entity for man since the first song in all of history was sung. In these first several centuries, "plain song" was the main music and was passed from person to person, generation to generation. People who study music history have found many things that were written earlier than 500 B.C. The Greeks held competitions in music much like their athletic Olympics. The Greeks organized music very scientifically. A man named Pythagoras who lived in the 6th Century B.C. was the founder of the mathematical system used by the Greeks. The basic musical system we have today is a descendant from the Greeks. Pythagoras discovered how a vibrating string could make music. He also determined that something tubular could hold air and make pitches. Students of Pythagoras continued their scientific research to discover harmonies and notes. Songs were sung at the Greek gatherings and some during threshing times. They found that the string and their singing had certain rhythms. We are aware that rhythm exists everywhere. We walk to rhythm. There are laws of rhythm with: day and night, low and high tide, and the rhythmic changes of the seasons.

As the years passed, music developed. Gregory the Great, who was Pope from 590-604 A.D., started the liturgical chant which at that time was the only form of church music. They used symbols called "neums." There were about 30 neums indicating pitch, notes, rhythms, tempos, embellishments, just to name a few. Many ornaments of today's music were 'relics' from neums. Music continued to develop. Guido, born in 995, invented the 5-note scale with syllables to facilitate learning the chants in church. Music grew and changed because style seldom repeats itself. We have definite periods of musical styles: baroque, romantic, jazz to name a few.

We will never have another Johann Sebastian Bach or a Wolfgang Amadeus Mozart or another Peter Tschaikowsky, let alone another George Gershwin. Music changes with our changing world. Some composers made music from the way they found it. Others who didn't change it much, made it richer by their compositions.

Music can do all sorts of things with your emotions. It depends on what it represents to your life, the when and the where you have heard it first. There are certain pieces that tug at your heart strings when you hear them. Some have significant meaning that create nostalgia. I know that everyone has "their song." Some music brings terrific joy just because of the sheer beauty of the music itself. This famous quote by Martin Luther says a lot: "I place music next to theology and give it the highest praise. For if you want to revive the sad, startle the jovial, encourage the despairing, humble the conceited, pacify the raving, mollify the hate-filled, what can you find that is more efficacious than music?"

The late Lynn Olsen said, "Performing music is the ability to move people, to make it sing. We must be able to look at a piece of music and see it as more than note after note. Notes are not music, one makes music from these symbols."

So we must understand from this statement that music is a disciplined assortment of sounds. It is an art of these sounds in time that expresses ideas and emotions in significant forms through the elements of rhythm, melody, and color.

We know we are always in need of moving ahead, of progressing. When a tree stops growing it is ready to die. It is the same with organizations. We must always reach out, extend ourselves, keep growing. If we pull together we can make our own composition with a steady growth of rhythm: a uniform and diversified melody; perfect harmony and a dash of color.

Be a part of the Piano Technicians Guild Auxiliary...I am!

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130 N. MAIN STREET
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381-MEMPHIS, TN

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Correction

An article in the October 1993 issue of the Journal noted the passing of Dr. William Braid White during the late 40s. The actual date of Dr. White's death was April 10, 1959.

Our apologies for any confusion this may have caused.

Display Ad Index

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1A. Title of Publication, **Piano Technicians Guild.** 1B. Publication Number, **00319562.** 2. Date of Filing, **9/29/93.** 3. Frequency of Issue, **Monthly.** 3A. No. of Issues Published Annually, **12.** 3B. Annual Subscription Price, **$85.** 4. Complete mailing address of known office of publication (Street, City, County, State and Zip+4 code) (Not printers), **The Piano Technicians Journal, 3930 Washington, Kansas City, MO 64111-2963.** 5. Complete mailing address of the headquarters of general business offices of the publisher (Not Printer), **The Piano Technicians Guild, 3930 Washington, Kansas City, MO 64111-2963.** 6. Full names and complete mailing address of publisher, editor and managing editor (This item MUST NOT be blank), **Publisher-Larry Goldsmith, Executive Director, The Piano Technicians Guild, 3930 Washington, Kansas City, MO 64111-2963. Editor, James Harvey, 205 Parker Avenue, Greenwood, SC 29649-2629. Managing Editor, Jami Henry, Director of Communications, The Piano Technicians Guild, 3930 Washington, Kansas City, MO 64111-2963.** 7. Owner (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual must be given. If the publication is published by a nonprofit organization, its name and address must be stated.) (Item must be completed.), **The Piano Technicians Guild, 3930 Washington, Kansas City, MO 64111-2963.** 8. Known Bondholders, Mortgagees, and other Security Holders Owning or Holding 1 percent or more of total amount of bonds, mortgages or other securities (if there are none, so state), **None.** 9. For completion by Nonprofit organizations Authorized to mail at special rates (DMM Section 424.12 only) The purpose, function, and nonprofit status of this organization and the exempt status for Federal Income Tax purposes (Check one), **1, Has not changed during preceding 12 months.** 10. Extent and Nature of Circulation, Average No. Copies each issue during preceding 12 months, Actual No. Copies of single issue published nearest to filing date; **A. Total No. Copies (Net Press Run), 4,577, 4,357.** B. Paid and/or Requested Circulation—1. Sales through dealers and carriers, street vendors and counter sales, **0, 0** and 2. Mail subscription (paid and/or requested), **4,064, 4,036.** C. Total Paid and/or Requested Circulation (Sum of 10B1 and 10B2), **4,064, 4,036.** D. Free Distribution by mail, carrier or other means, Samples, Complimentary and other free copies, **33, 31.** E. Total Distribution (Sum of C and D), **4,097, 4.067.** F. Copies not distributed—1. Office use, left over, unaccounted, spoiled after printing, **480, 290.** 2. Returned form News Agents—**0, 0.** G. Total (Sum of E, F1 and 2—should equal net press run shown in A) **4,577, 4357.** 11. I certify that the statements made by me above are correct and complete, signed, **Larry Goldsmith, Publisher.**

Piano Discussions™
December 1993
News From The World Of PianoDisc

Tech support goes international

Training and tech support staff take their act on the road

PianoDisc has come a long way since 1989, the year we first began making reproducing piano systems. Back then we started with a handful of dealers in a few US markets, a staff of barely a dozen and a few loyal techs.

Four years later PianoDisc systems can be found in almost every acoustic piano retail store in the US, as well as a significant portion of the world (see "Where in the world is PianoDisc?"). Also, the roster of authorized dealers and certified technicians has grown tremendously in this short time.

All this growth has meant a considerable increase in international activity for PianoDisc's installation training and tech support divisions. "Of course, we have installation training seminars here in Sacramento," says Kirk Burgett, president of operations, "but we also send our instructors and technicians out to other countries if the demand is there. It's less expensive to send one of our staff there than to ask ten installers to fly in from, say, Austria."

PianoDisc's senior installation technician **Mark Burgett** is introduced by PianoDisc's Taiwan distributor **Oliver Chang**. Mark went to Taiwan to conduct this installation training seminar in August 1992.

PianoDisc technicians have logged countless thousands of miles answering questions and training techs in North America, South America, Asia and Europe. "I went to Taiwan last year," recounts Mark Burgett, senior installation technician,"I was in Spain last spring, Brazil this summer. It's a lot of traveling, but it really helps the techs."

Recently PianoDisc tech Don Dusenbury returned from a sweep through Europe, which included a training seminar for Bosendorfer technicians at the factory in Vienna. "European techs are excited about PianoDisc", says Don. "I conducted seminars in England, Denmark and Austria. The response was really overwhelming." Don also visited Egtved PianoFabrik, PianoDisc's strongest European distributor. "Egtved has done a lot to promote PianoDisc in the European marketplace", says Don. "I'm sure that they will be instrumental in creating a dealer and installer network throughout Europe". We think so, too, Don - so make sure your passport stays up to date!

PianoDisc Installation Training 1994

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* Revised schedule

Where in the world is PianoDisc?

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PIANO TECHNICIANS Journal UPDATE
FOR MEMBERS OF THE PIANO TECHNICIANS GUILD, INC.

Honing Your Nose For News

Have you ever picked up a newspaper and read a story about a doctor performing a routine physical on a patient? Or seen a building on the evening news that is not on fire? No...of course not, that isn't news. You would, however, be likely to read about a new drug that a local doctor is testing, or see firemen putting out a blazing warehouse.

The point is that reporters are looking for something new, different or impactful. Television reporters desperately need a good visual and radio reporters must have an excellent sound bite.

During the past few years, we have been focused on generating more media coverage for the PTG. And it's working! PTG has been featured on CNN, Parade Magazine, and House and Garden, and several newspapers including the Milwaukee Journal. When Parade Magazine wrote about the availability of our brochure, it was seen by 111 million readers! If we had purchased the CNN segment as advertising, it would have cost about $20,000 (each time it aired).

Many PTG members understand the value of generating press coverage. It has helped their businesses grow and increased awareness in their communities about the importance of piano tuning. It's amazing that one newspaper story can bring PTG to the attention of millions of people.

There are two principles we need to remember as we proceed in our goal to get press coverage: 1. Don't bother the media with something that is not newsworthy; 2. Think about interesting situations, clients and events that would be newsworthy. Don't let a great angle go unnoticed!

We want you to be our eyes and ears for interesting stories about PTG members. Knowing what the press likes will help your thought process. Here are some elements that typically elicit press interest.

Celebrities—the media loves noteworthy people.

Heartwarming—helping someone; donating your services; assisting kids or puppy dogs always tugs on the heart of even the most curmudgeony editor.

Good Visual—print photographers and television reporters cover many stories that are not necessarily the most important news of the day, but that have great visuals. We're lucky that a piano is very visual. Events like trying to assemble a piano in record time are very visual—so is taking apart a piano for a group of school children.

Charity—significant efforts for a worthy cause usually garner media coverage. Restoring a piano for a senior center resulted in a major TV news segment for the technicians associated with a National Piano Foundation SPELLS group in Las Vegas.

Unusual Career—while the life of a tuner-technician is considered unconventional, it may not be enough to be newsworthy on its own. But if you are self-

Continues—page U2

A Good Deed

With the help of Kent Webb-Technical Service Manager, Baldwin Piano & Organ Company donated a new set of piano hammers for the SD 10 Baldwin Concert Grand in the Playhouse of Mt. Gretna, PA.

"Music At Gretna" is a summer season full of small music festivals primary of chamber music and jazz. Mt. Gretna is non-profit and this donation will surely help the cause.

Thank you Baldwin Piano & Organ Company and Kent Webb!

Dick Bittinger, RPT

Dues Invoices Mailed

Invoices for 1994 dues have been mailed to a total of 3,811 PTG members—2,183 Registered Piano Technicians and 1,427 Associates.

Dues are officially due January first, and will be delinquent January 31. Those unpaid by March 2 will be dropped from membership.

Annual PTG membership dues are not tax-deductible, except as ordinary business expenses. Only contributions to PTG Foundation activities such as the Museum Fund are deductible as charitable contributions.

Members should verify the address and telephone information shown on the invoice form, as that data will be used to produce the 1994 PTG membership directory.

Nose for News—from U1

taught, have overcome a physical disability or do something beyond the ordinary in your work, there might be an interest by the press.

Timely—sometimes just catching the media at the right time means coverage. National Piano Month (September) is always a good hook to interest reporters.

We know that there are many great stories out there about our hardworking PTG members, and we need your help to pass these nuggets of knowledge on to us. The attached form (to the right) will enable you to pass newsworthy ideas on to us. Mail or fax the form to the PTG office, or if it's timely, give us a call. Our goal is to follow up on these great ideas to generate more press coverage for PTG.

And each year we will award a prize to the member who contributed the best story idea that resulted in press coverage. So take the time to look around and find the news in your community!

Piano Technicians Guild PR Alert

YES...I think this would be interesting to the media:

WHAT: _____

WHEN: _____

WHERE: _____

WHO IS INVOLVED: _____

WHY WOULD THIS MAKE A GOOD NEWS ITEM? _____

_____

ARE THERE ANY GOOD VISUALS?

_____

IDEA SUBMITTED BY: DATE:

_____

PERSON TO CONTACT: _____

PHONE: _____

Send To: Piano Technicians Guild, 3930 Washington, Kansas City, MO 64111-2963, Phone: 816-753-7747, Fax: 816-531-0070

In Memory

Donn G. Foli
May 24, 1905
October 9, 1993

Donn G. Foli, President Emeritus of the Vancouver B.C. Chapter, passed away quietly in his sleep on October 9, 1993. On behalf of my family, myself and all members of Piano Technicians Guild, I want to express our deep felt sympathy to Lee Foli, Karle Foli and their families.

Donn Foli was my friend. He was also my mentor, advisor, critic and booster. Donn was a brother technician always willing to give a helping hand to anyone interested in piano technology. He was a man who held strong views on all aspects of our life and times and he could be counted on to explain in logical detail just how he had arrived at that point of view.

Donn, Doug Brooker, Walter Wehren and Al Woodruff were founding members of the Vancouver Chapter of Piano Technicians Guild. In fact, Donn was there when the Guild was born. He worked tirelessly to bring other piano men into PTG and was particularly delighted when the Lower Mainland group joined in. Donn made a point of attending as many national conventions, area conferences and local meetings as was possible. For all of us, Donn was Mr. PTG Canada!

Early on, Donn's wife, Dayle, whom he almost always called "Toots," suggested that if I wanted to call Donn by the more affectionate term "Pop," she thought Donn would like that. I feel very honored to have been referred to by Donn as his "third son."

Spending time in Donn's workshop was an awesome experience. Tools—usually three of everything—were all in their special places along with charts, diagrams and gadgets. What a treasure! He took particular pride in Lee's graduation certificate from William Braid White's school of piano technology. I was impressed.

Donn was a man of great musical and technical gifts and had innovated tuning schedules and temperaments years ahead of his time, to the chagrin of those who thought they had found something new.

Pop didn't suffer fools or mistakes easily and when someone hadn't conducted himself or herself properly they would hear from Donn. On more than one occasion I got my tail feathers

burned. I remember Pop when he had red hair!

I guess you could say Donn was a man who wore may hats and it was to my great amusement when he changed visor caps three times between his home, the old VW bug he drove and the customers' house—it all made sense.

If I arrived at Pop's home, before his breakfast, I was treated to the sight of two eggs swimming in beer. That was his breakfast. Oh, he loved his beer—no tins, no glasses—just the bottle please.

There were so many great moments that his presence will stay with me always and I guess, were he standing here now and I asked him if he'd like to do it again, I can hear him say..."Yes Gerry, the sample was good."

I'm going to miss my friend. Toodle—ooo Donn!

Gerry Caunter

Publisher's note: I first met Donn at a convention several years ago. He told me he had attended almost every convention to date. He always attended all the tuning classes, and he said he always learned something important, even after all those years. "You can never quit learning!" he told me. That made a great impression on me, and it certainly illustrates Donn's approach to life. —LG

Ruth Ellen Vertrees Pollard
November 9, 1896
September 26, 1993

Ruth Ellen Vertrees Pollard was born on November 9, 1896, and passed away September 26, 1993 in her home after a brief illness—she was almost 97 years-old. Ruth is survived by a son and daughter-in-law, George and Mimi Pollard; a daughter and son-in-law, Dorothy and Hank Ploeger, one sister, one niece, five grandchildren and three great-grandchildren. She was a member of Heights Presbyterian Church in Houston.

Ruth came from Kansas to Texas as a young girl with her parents in an ox drawn covered wagon. As most girls of her day, she had only two everyday dresses and one Sunday best dress. Having lived in the neighborhood of a whole century, she saw many advances in technology—trains, cars, airplanes, telephones, radios, electronics, refrigerators, microwave ovens, computers, etc. She was a very active person until recent years. Always eager to hop in a train, car or plane for vacation sight seeing trips or to attend PTG conventions, her family lovingly nicknamed her "The Roadrunner."

At 84 years of age, she walked all over the historical district of Philadelphia with Martin and me—and we didn't even slow down! She could keep pace with those even younger! Ruth attended her last PTG convention in Dallas, Texas, in 1990. Prior to that time she had missed only six conventions starting back in the '40s with the American Society of Piano Technicians (ASPT). Her continued faithful attendance at conventions almost 20 years after her husband Allan's death is testimony to her dedication and devotion to PTG.

The first home office of PTG was in the downstairs portion of their home for many years. One of the ways she helped Allan in his business was by leveling keys on one end of the piano while he tuned on the other end. Allan was the first National Director and Executive Secretary of PTG. Ruth was the first president of the PTG Auxiliary. With her varied background and knowledge of PTG and her long years of association with PTG, she had many experiences on which to draw when writing about her recollections of the way things were back when. She wrote several articles for the Piano Technicians Journal. Most of the time since the early 80s she traveled with us to the PTG conventions—booking on the same flight as ours or riding with us when we drove. Her room was next to ours or across the hall. In 1984 the Texas State Association seminar was in Waco, at the new Waco Hilton. We had rooms on the 8th floor.

Danny Boone later wrote this about the event: "At 1:30 a.m., Saturday, the alarm system in the hotel rousted everyone out of bed and everyone in the hotel was evacuated into the parking lot. Vandals had caused the second floor sprinkler system to activate and the water was pouring down into the first floor."

I helped Ruth down those eight flights of stairs to the parking lot and after about an hour in the cold, everyone was allowed to return to their rooms. We got to ride the elevator this time although some people were impatient and took the stairs again. I think it was Nolan Zeringue who later quipped that it had been a fashion show of the latest Texas night wear!

Until just two years ago, I picked Ruth up to take her to the Auxiliary meetings held at the same time as the technicians meetings. When she became unable to get out, I began going to her house for the Auxiliary meeting. The last PTG function she attended was the Houston Chapter Christmas Dinner last year.

Over the years we have grown to love her as family. She was family—PTG family. She was an inspiration to me as well as others. I sorely feel the loss of a dear friend and know that a great many feel the same way.

Beva Jean Wisenbaker
PTG Auxiliary, Houston Chapter

In Memory continues—page U4

Philip Kahn
October 13, 1911
July 22, 1993

Philip Kahn of 1401 W. Holly Street died Thursday, July 22, 1993. He was 81.

Graveside services were held on Sunday at Beth Israel Cemetery at Bayview Cemetery with Rabbi Scott Sperlinge officiating.

Born October 13, 1911, in Chicago, Mr Kahn worked as a piano technician. He was a member of B'nai B'rith and was past president of Rodsei Zedek Men's Club in Chicago. A Bellingham resident the past two years, Mr. Kahn was a member of Beth Israel Synagogue.

Survivors include his wife, Esther J. Kahn of Bellingham; son Eugene B. Kahnof Rockport; daughter Donna R. Solomon of Bellingham; sister Ellen Libanoff of Florida; and three grandchildren.

MEMBERSHIP PTG STATUS

Northeast Region	843
Northeast RPTs	514
Southeast Region	632
Southeast RPTs	375
South Central Region	314
South Central RPTs	198
Central East Region	627
Central East RPTs	386
Central West Region	385
Central West RPTs	246
Western Region	633
Western RPTs	379
Pacific NW Region	398
Pacific NW RPTs	237
Total Membership	3,832
Total RPTs	2,335

Cedar Rapids Piano Dealers Work Together For Common Goal

COMMITTEE BULLETIN BOARD

Trade Relations

Moving into their second year of mutual cooperation, the "Piano For Life Association" of Cedar Rapids, Iowa is making a positive impact on the local scene. In cooperation with the National Piano Foundation and Piano Manufacturers Association International, the Cedar Rapids dealers are promoting a program called SPELLS, an acronym for The Study of Piano Enhances Life and Learning Success. National facilitator Brenda Dillon has worked closely with dealers Carma Lou Beck of Carma Lou's House of Music, Steve West of West Music and Dan Malloy of Malloy Custom Pianos to promote the playing of the piano not just with children, but with adults from total beginners to advanced proficiency.

Malloy, an RPT, has enlisted the local PTG members to a promotion in November at a local mall where students will perform publicly and PTG members will promote maintenance and service needed for pianos.

The first year's activities included a two-pronged television commercial approach along with a piano "play-a-thon" in the mall. The dealers spoke to service clubs and presented the SPELLS message along with an entertaining video narrated by Dudley Moore. The video promotes piano playing by several prominent personalities who are not generally known as pianists, but who play very well.

The year was capped off by having a brunch at a local country club. Area piano teachers were invited to this event with Brenda Dillon as guest speaker and the dealers conducting a question and answer session. The result of this was that several teachers and other related music retailers wanted to have information on how to join the "Piano For Life" Association.

One of the prime benefits of the year's activities was the fact that competing retail dealers were able to come together and work toward a common goal. We are currently meeting for a monthly business breakfast where we discuss our activities for the upcoming months. Again, our goal is to get as many people as possible playing the piano and the side benefits of this will be the sale of new pianos and more work for our PTG technicians.

Dan Malloy, RPT

At Your SERVICE

Bob Stephenson
Chapter Services Committee Chair

There's good news, so...

STAY TUNED

Newsletter of the Modesto Chapter—October 1993: Dale Erwin led us through a presentation and discussion of the new PACE prgram. How this can help everyone participating in it was explored from various viewpoints. It seemed all had positive comments to make on its virtues. It was the general consensus that we would build in a "hands-on" PACE skills segment into our monthly meetings with as many participating as want to. Hopefully this will be everybody, but even if you just watch the rest of us having fun, it will be a great source of learning. You can read all about the PACE program in your Journals.

And from the Chicago Chapter: look at their offerings! First, for the associates, they have good ideas to implement the PACE program. Second, note their fine curricula for advanced skill augmentation.

THE WHIPPENPOST

Mini-Technical/Tuning Evaluation chapter Meeting—Associates! If you don't know how well you are tuning, if you want to now what you need to do to improve your tuning skills generally or for the tuning test, Chicago PTG is going to provide you with the opportunity to find out in January, 1994. The chapter meeting that month will be devoted not only to "mini-technical" subjects (including most of the topics found in the technical tests), but those who are interested will be able to get their tuning evaluated in a "non-test" atmosphere. The meeting will be held (tentatively) at North Park College on Foster Avenue and a multitude of studio and practice pianos will be available. If you are interested, you will need to let us know at the time of sign up. It will be first come, first served, and there will be only ten slots available. Teams of RPT's will evaluate your tuning anonymously, and then you will have the opportunity to talk with the evaluating team about problems, strategies, checks, etc.

New Master Class Offerings
The following is a preview of the upcoming Master Classes being offered by the Chicago Chapter. Contact instructor for details about dates and registration.

***Installation of new hammers—Jim Houston, RPT.** This master class is a three-day procedure using the Steinway factory assembly (new hammers pre-hung on shanks and flanges). Day one involves: (1) measurement, comparisons, and samples, (2) disassembly, (3) installation, traveling, and twisting. Day two involves: (1) hammer shaping and fitting, (2) regulation, (3) juicing. Day three involves (1) tuning, (2) voicing, (3) the final check of tuning, voicing and regulation.*

***Rebuilding—Richard Anderson, RPT.** This Master Class will consist of rebuilding, stringing, soundboard repair, pinblock replacement and damper installation. The class will start in January and will run one day a week for six consecutive weeks.*

***Action Replacement & More—David Graham, RPT.** This Master Class will deal with comprehensive action replacement in a Steinway grand from the key felts through all the action parts. It will include complete regulation procedures of the new action parts as well as re-regulation and final voicing of the piano after it has been played for a couple of months. This will be a multi-sessioned Master Class to be arranged with the students.*

***Practical Voicing—Virgil Smith, RPT.** This Master Class will be offered on three or four successive*

Continues—page U6

IN BRIEF PTG

TESTS! TESTS! TESTS!

The tuning and technical test will be offered on January 14, 1994, at Fredonia State University, New York.

Contact Chuck Erbsmehl, 335 Chestnut, Fredonia, NY. 716-679-4530, for more information.

1994 EXHIBIT CONTRACTS TO MAIL

Contracts for exhibit space at the 1994 National Convention will be mailed December 3, 1993. If you have not exhibited within the past two years, but would like information on costs and space availability, contact the PTG Home Office at 816-753-7747.

MARKETING TOOLS NOW AVAILABLE TO ASSOCIATES TOO!

PTG marketing brochures and technical bulletins are now available to both RPTs and Associates and can be obtained by contacting the PTG Home Office, 3930 Washington, Kansas City, MO 64111-2963 or calling 816-753-7747. Reminder cards will still be sold only to RPTs.

HOLIDAY OFFICE HOURS

The Home Office will be closed December 24, 27, 31 and January 3 for the holiday season.

Insurance Coverage
Up-To-Date Information For PTG Members

Tool • Bailee • Liability Insurance
Jerry Kiser, our insurance representative for Tool, Bailee, and Liability Insurance has joined:

Potter, Leonard & Cahan, Inc.
PO Box 82840, Kenmore, WA 98028
206-486-4334

Jerry will continue to represent our group through Great American Insurance as of the November 1, 1993, renewal.

All questions and inquiries concerning tool, bailee or liability insurance should be directed to Jerry at the address above.

Life Insurance
Lupe Sherman will handle your questions concerning any life insurance coverage above and beyond the $1,000 life policy which is part of the member benefits package.

Eye Care Insurance
Maureen Gentry will handle your questions concerning the eye care plan.

Lupe and Maureen may be reached at the address below:

Benefit Management Corporation
4333 Madison, Kansas City, MO 64111
816-756-1410 or 800-821-5401

Optional Health, Disability or Mail Order Prescription Coverage
Questions concerning these particular needs should be address to:

Ralph Passman
Acorn Underwriters, Inc.
4200 Somerset Drive,Suite 100
Prairie Village, KS 66208-5267
800-255-6029
Phone 913-383-3883 or Fax 913-383-9632

For additional questions about insurance, contact the PTG Home Office.

At Your Service—from U5

Saturdays in February of '94 and will include hammer filing, action regulating, fitting hammers to strings, tuning and voicing—all important aspects of tone regulating. Each student will have his or her own piano to work on.

These are outstanding examples of the Guild—wide enthusiasm for PACE! Continue the good work, and let the Chapter Services Officers in your region know about your successful efforts.

New Marketing Products To Be Released Soon—

Three new business aid products are nearing completion and will be offered in the next few weeks.

Service Record
This small (5 1/2" x 4 1/4") booklet is designed to remain with the customer's piano. The technician can record the dates of service, what was done, and the temperature and relative humidity at the time. It can also be used to record what buisness aids have been left with the customer.

Bookmark
This small (1 7/8" x 8 1/2") leave-behind says, "Thank you for this opportunity to service your piano. I appreciate your business." The back explains RPT membership.

Dealer Hangtag
This product commends the piano retailer for hiring an RPT to prepare showroom pianos.

Watch for future announcements in the Journal about product availability and prices.

PTG Marketing Tools Review

How Should I Take Care Of My Piano?
Written with the average piano owner in mind, this brochure covers such topics as problems and tuning needs. Basic rules of piano care are spelled out, along with advice to seek professional piano care from an RPT member of the Guild. This is an excellent brochure for individual clients and for bulk displays in piano stores and music studios.

How Often Should My Piano Be Serviced?
This brochure begins with a brief description of factors affecting maintenance frequency (climate swings, placement in the home, quality of manufacture), then presents quotes from ten piano manufacturers outlining their specific service recommendations. This is an essential tool when answering the perennial question, "How often should my piano be tuned?" The manufacturer quotes lend credibility to your advice.

The Special Care and Maintenance of the Teaching Piano
Proper maintenance is especially important to piano teachers who must provide their students with a responsive action and a musical tone to correct pitch. This brochure describes tuning needs, regulation and voicing as well as their relation to the student's ability to perform. An excellent business builder with teachers, it includes such topics as "What should my regular maintenance program consist of?", "How should I go about selecting a piano?" and "How do I find a qualified person to service my teaching piano?"

All brochures are $150/500, $35/100, $20/50

Bulletin #1: Pitch Raising
This bulletin emphasizes the importance of keeping a piano tuned to A-440 for best sound and proper ear training. It explains how climate and neglect affect pitch and why the technician must perform a pitch raise before doing a fine tuning.

Bulletin #2: Regulation
Topics covered are "What is regulation and how does it affect my piano's performance?", "How often is regulation needed?", "What are the signs that my piano needs regulation?" and the difference between regulation and tuning and information on reconditioning and rebuilding. Space is included for your comments. This bulletin features a detailed diagram of a grand and vertical action.

Bulletin #3: Climate Control
Topics include, "How does humidity level affect my piano's tuning?" "What is relative humidity?" "What can be done to minimize humidity problems?" and "How will humidity control benefit my piano?" A chart is provided for recording relative humidity levels and pitch data. Together with an accurate hygrometer, this bulletin helps you in diagnosing climate-caused stability problems and recommending solutions. Clients receive educational material on the effects of climate as well as documentation of their specific problem.

Bulletin #4: Voicing
This edition describes voicing, explains the difference between tuning and voicing, what is good tone, how the technician voices a piano and also explains to the customer indications that their piano may need voicing.

Bulletin #5: Finish Care
This bulletin discusses common-sense finish care tips, as well as information on various types of products and piano finishes. It also includes a section on cleaning keys.

Bulletin #6: Rebuilding and Reconditioning
Bulletin #6 defines the terms rebuilding and reconditioning and how the two terms differ. It also explains "What happens to a piano as it ages?" "When does a piano need reconditioning or rebuilding?" "What work is included in rebuilding or reconditioning?" and goes on to confirm how to decide if major repairs are appropriate.

All technical bulletins are $90/500, $20/100, $12/50

Place your order by phone by calling 816-753-7747 or use the convenient order form on the next page to place your order by fax: 816-531-0070 or by mail: 3930 Washington, Kansas City, MO 64111-2963. Visa and Mastercard accepted.

Marketing Brochures & Technical Bulletins available to RPTs and Associates

The six-page, stapled brochures are 2-color, printed on glossy-coated paper, and measure 9" x 3 3/4".

Formats are consistent among all brochures. The three brochures intended for customers feature a description of PTG and RPTs on the final inside page.

The technical bulletins are written for the customer who is considering a particular maintenance option. They provide detailed information on specific topics in a question-and-answer format. The attractive, single-page documents are printed on heavy ivory card stock in 2 colors, punched for a three ring binder, 8 1/2 x 11.

These brochures and technical bulletins educate the public about a wide range of piano services and the benefits of proper maintenance. They promote PTG as a source of qualified technicians, and their professional appearance projects quality onto your business. All products provide a space for your business stamp or label.

a fax order from...

Name _____

Address _____

City, State, Zip _____

Daytime Phone _____

RPT or AssociateGuild Member # _____

Visa _____ Mastercard _____

Account # _____ Expiration Date _____

For Office Use Only

Date Received _____

Method of Payment _____

Check # _____

All publications now available to both RPTs and Associates

Item Description	Quantity	Price per unit	Total
How Should I Take Care of My Piano?			
How Often Should My Piano Be Serviced?			
The Special Care & Maintenance of the Teaching Piano			
Bulletin #1: Pitch Raising			
Bulletin #2: Regulation			
Bulletin #3: Climate Control			
Bulletin #4: Voicing			
Bulletin #5: Finish Care			
Bulletin #6: Rebuilding and Reconditioning			
Subtotal of cost of items			
Add $2.00 per 100 count—shipping & handling			
Total cost of order			

Once you have completed this form, fax it to 816-531-0070, 24-hours-a-day—7-days-a-week
If faxing is not convenient for you, simply complete the form and mail it to:

Piano Technicians Guild Home Office
3930 Washington
Kansas City, MO 64111-2963