PIANO TECHNICIANS
Journal
SEPTEMBER 1990

PTG's Roundup In Dallas

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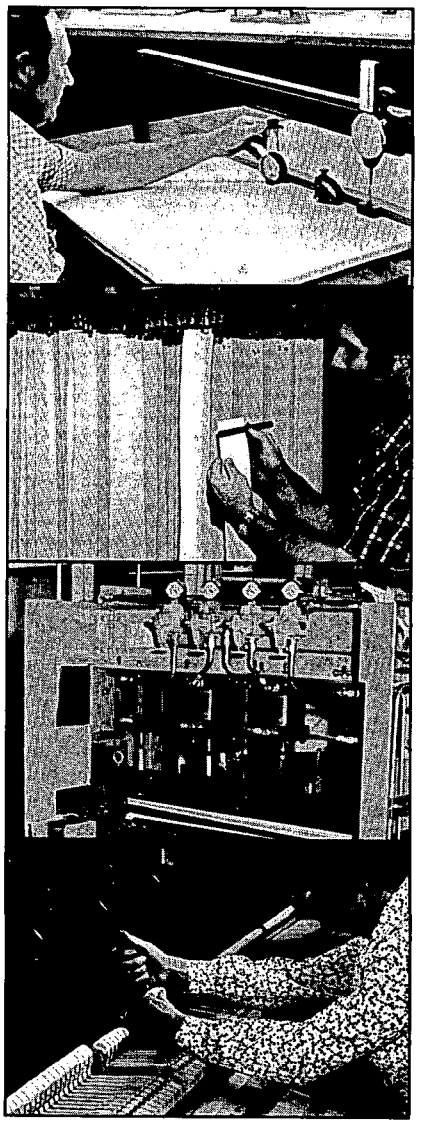

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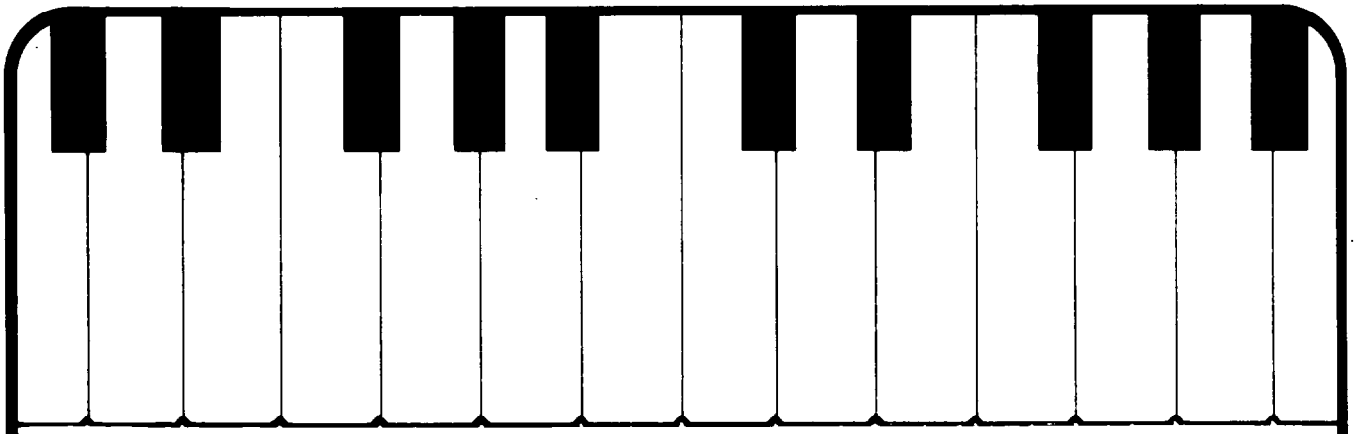
For more information contact Kent Webb, Technical Service Manager; for parts contact Linda Gann, Baldwin Piano & Organ Company, Highway 63 South, Trumann, AR 72472 — Phone: (501) 483-6116



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PIANO TECHNICIANS
Journal

SEPTEMBER 1990 — VOLUME 33, NUMBER 9

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President's Message

PTG Committees

Do you know how many active committees we have in PTG? Have you ever served on a committee? Have you ever thought about serving on a committee? Did you ever wonder how these people who make up the committees are chosen? Have you ever told anyone that you'd like to serve on a PTG committee?

All members, franchised and non-franchised may serve on committees, but only franchised members may be the chairman of a committee.

Nolan P. Zeringue, RTT
President

There have been times in the past when members have been put on committees without being asked if they had interest in the committee or wished to serve on a particular committee.

I would like to have our committees made up of members who have a desire to be serving on a particular committee. Most, if not all, of those members serving this year were contacted before the Board meeting in Dallas, and asked if they would like to serve on a particular committee.

Many of the committee chairmen are helpful in finding good people to serve. If you are interested in a committee, contact the chairman of that committee and ask to be considered.

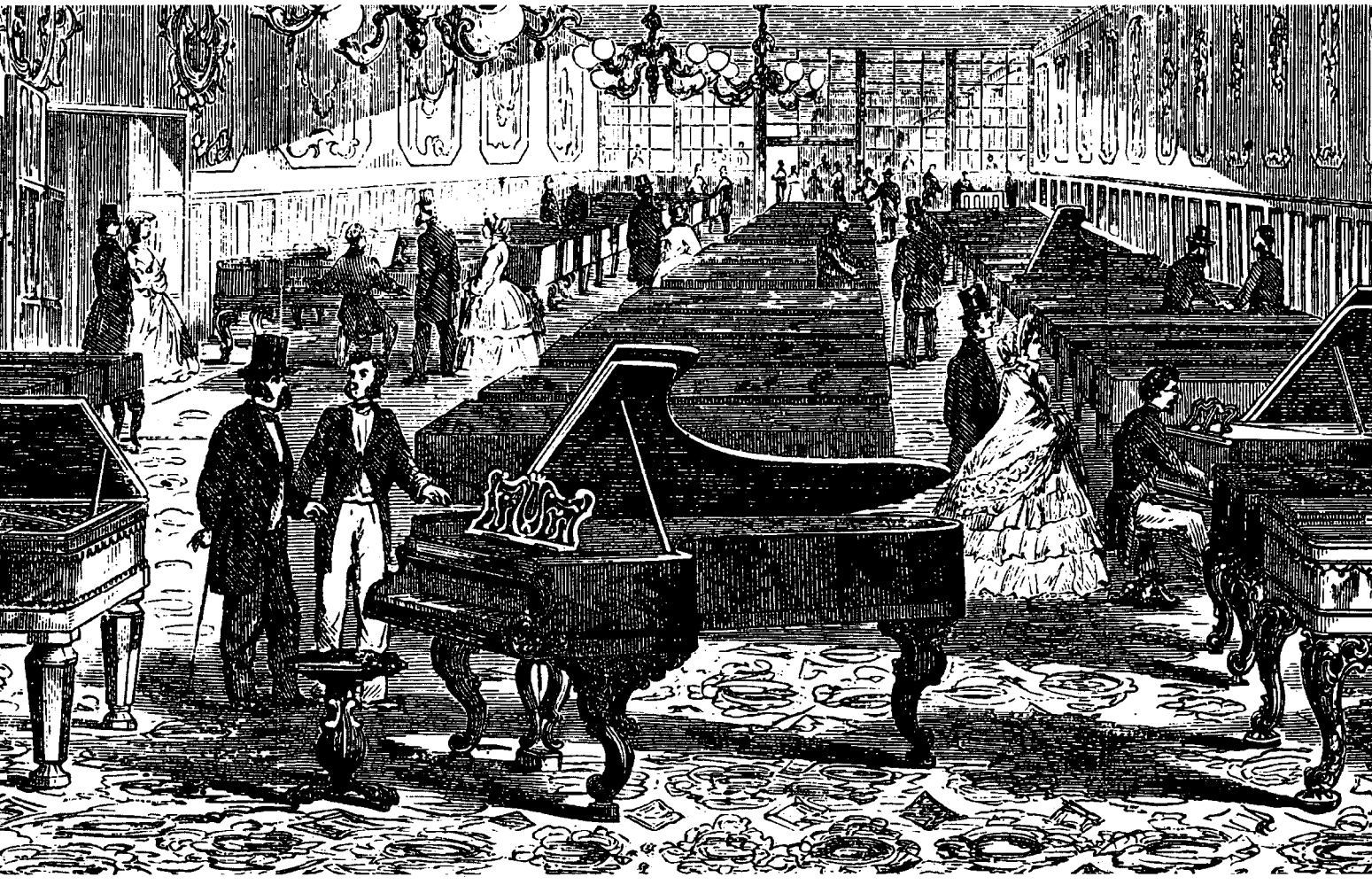
Regional Vice Presidents are asked to submit names of members who they think would like to serve on committees. Contact your Regional Vice President and ask to be considered. You can also call me, the vice president, or the secretary-treasurer, and we will certainly be glad to keep your name on file for the time prior to convention when we are considering committees for the coming year.

Much activity which comes before the Board originates in committees. Much activity which comes before Council originates in committees. Items brought up for discussion before the Council often are sent to committees for refinement before being returned to the Council or Board for action.

Committees could be likened to the arms and legs of PTG, which are important to what keeps our international body moving forward.

Won't you join with us where you have an interest and work with PTG? If you want to do committee work, we will have a place for you.

Some manufacturers ask your customers to invest in their past.



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Some of the most "prestigious" instruments in the world are also the most expensive. At Young Chang, we don't believe a piano's value is limited to the number on its price tag or its place in history.

History isn't restricted to what has happened on the stages of the most famous concert halls in the world. Because history is being made right now in the homes and studios of the people you see everyday. It's the discovery of the joy of music that inspires us to create instruments of extraordinary beauty and remarkable performance. And it's a deep love and commitment to music that requires us to make carefully crafted instruments available at reasonable cost to anyone who shares this love.

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From The Home Office

One Week In Dallas

Larry Goldsmith
Executive Director

When a week includes as much activity as the one we recently spent in Dallas, the mind refuses to consider it as an orderly progression of events. It breaks down into a series of vignettes — mental snapshots of a face here, a gesture there, a meal with old friends, maybe, or an instructor explaining a complex procedure.

We ran into the same problem in putting together the coverage of the convention activities you'll see on the following pages. There was simply too much going on to include everything in the limited amount of space we have here. I hope these words and pictures stir good memories in the minds of those who were there, and a certain amount of envy in those who were not — enough envy to consider attending next summer's convention in Philadelphia, at least.

One very important thing we tried to do at this convention was to give those who attended a better sense of our industry. Because we feel that goal is particularly important, we've devoted space to it in this issue and will continue to do so in the future. The music and piano industries are becoming more active — and just in time. Our support is needed, and it's certainly in our own best interests to contribute.

The National Piano Foundation is actively working to promote the piano in all segments of American society. The National Association of Music Merchants has announced a petition drive that will dramatize the importance of music education in all our lives. Other projects, undertaken on an individual or ad hoc basis, are no less important — be sure to read Harold Smith's letter in this issue.

All these industry activities come together at gatherings like our convention. It is at such events that we develop the will to make things happen, and the alliances that make them possible. From a central point, the energy radiates back into each hometown.

Just as we go to convention to become better technicians, to associate with our peers and to do our profession's business, we also seek out information and inspiration not available at home. When we take it back with us, we energize our own communities.

Ask any dozen of the more than 850 people who were in Dallas. You'll get a dozen different versions of what went on, what was valuable, what was enjoyable and, yes, even what they didn't like. On one point, however, I hope they all would agree: *it was important to have been there.*

Industry News

Steinway & Sons Names Schuyler Chapin Vice President, Concert And Artists

Bruce A. Stevens, president of Steinway & Sons, has announced the appointment of Schuyler G. Chapin as vice president, Concert and Artists, effective August 9, 1990. Mr. Chapin is Dean emeritus of Columbia University's Faculty of the Arts and a former general manager of the Metropolitan Opera Association.

In this new position, Mr. Chapin will oversee worldwide operations of the Concert and Artists program, working closely with the program's three regional directors in New York, London and Hamburg. Steinway's Concert and Artists program services performing artists and organizations.

In addition to being Dean Emeritus of Columbia University's Faculty of the Arts and former general manager of the Metropolitan Opera Association, Mr. Chapin was vice president and director of the Masterworks Division of Columbia Records, vice president of Lincoln Center for the Performing Arts; and executive producer of Leonard Bernstein's company, Amberson Enterprises, Inc.

As part of his involvement in public service, Schuyler Chapin is a vice chairman and co-chairman of the Select Committee on Artistic Affairs of the American Symphony Orchestra League (he was chairman of the organization in the 1980's). He is also chairman of the Artistic Affairs Committee and an executive member of the board of the Lincoln Center Theater, a member of the Artistic Committee and chairman of the Archive Committee and board member of the Carnegie Hall Society and is chairman of the Executive Committee of the Franklin and Eleanor Roosevelt Institute.

National Piano Foundation Video Wins National Industry Honor

The Possible Dream: Make It Come True was named "Best Music Promotion Video" during the fourth annual National Association of Music Merchants Awards Banquet, held June 17 in Chicago. The NAMM Awards are presented in eleven categories to recognize excellence and leadership in the music products industry.

The 12-minute film encourages adults that it's never too late to begin music study, and features beginning students from all walks of life — stockbroker, airline pilot, nurse, teacher, retired homemaker — describing in their own words what learning to play the piano has meant to them.

In accepting the award, NPF project administrator Brenda Dillon said, "People yearn to actively participate in music making, and playing the piano is one of the avenues that satisfies that yearning. The *Possible Dream* videos were conceived in the spirit that we are not old until we replace our dreams with regrets."

The Possible Dream: Make It Come True was produced and directed for the National Piano Foundation by Quin Mathews of Quin Mathews Productions, Dallas, TX, and coordinated by NPF advisors Madeline Crouch, Brenda Dillon, Lynda Garcia and Fred Kern.

For more information or to obtain a copy of *The Possible Dream: Make It Come True*, contact Madeline Crouch, National Piano Foundation, 4020 McEwen, Suite 105, Dallas, TX 75244 (214) 233-9107.

Correction

In coverage of the National Association of Music Merchants Expo in the March 1990 issue of the *Journal*, it was erroneously noted that recording artist Brian Wilson had purchased a Kawai grand piano. In fact, Wilson purchased a piano from another manufacturer. We regret any misunderstandings this may have caused. ≡

Dallas Convention Draws More Than 850 For Week Of Work and Fun

With more than 340 hours of technical classes, Council meetings, regional meetings, two banquets, half a dozen receptions, an exhibit hall crammed to bursting with every kind of piano-related product imaginable, and a full schedule of activities, it's no wonder that several people were caught catching a catnap in a quiet corner of the hotel lobby.

It was definitely an activity-filled week for the more than 850 who attended the Guild's 33rd Annual Convention and Technical Institute in the Hyatt Regency Dallas. The hotel, named for the adjacent Reunion Arena and the restaurant-topped tower that rises above the Dallas skyline, was an appropriate site for our gathering. The convention was truly a reunion of old and new friends, although one saddened by news of the loss of one of our greatest friends, George Defebaugh, immediately before the convention began.

Members of the Dallas Chapter seemed to be everywhere — a corral sprouted in the lobby, complete with action models of all descriptions. Directions, encouragement and help of every sort could be found at their booth in the hotel lobby. And that doesn't count the months of behind-the scenes work and planning that went into making their part of the convention a success.

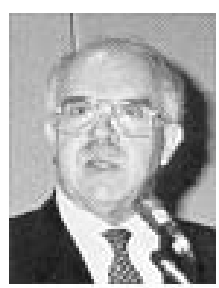
As we gather each year, we take the opportunity to honor those who have made truly outstanding contributions. This year was no exception. Ralph Stilwell and the

Awards

Golden Hammer: McKlveen (with Bill Smith). Hall of Fame: Stilwell, Ginny Russell (with President Berry). Member of Note: Smit, Collier, Matley (with Awards Chair LaRoy Edwards), Crabb. Presidential Citations: Beauchamp, Bessette, Bittinger, Huether.

Don Dillon, right, representing the National Piano Foundation, discussed NPF's activities in support of the industry. Center right, Dallas Chapter President Mike Ello and Host Chairman Thom Tomko headed the chapter's many activities. Voting tellers, below, were all business during the Council meeting, but sometimes, when the pace got too hectic, there was time for a quiet nap in a corner of the hotel lobby.

Staff Photos by Lisa Gray



Steinway artist Peter Nero, above, performed after the Awards Banquet. Baldwin presented Auxiliary Scholarship winners Eric Thompson, center and James Lent, right, in the Opening Assembly.

A skit by Owen Jorgensen, left, and Dean Shank kicked off the Dallas Chapter -Young Chang night.

late Bob Russell were inducted into the Guild's Hall of Fame. Ben McKlveen received the Golden Hammer. Colette Collier, Larry Crabb, Wayne Matley and Bob Smit received Member of Note Awards. Ron Berry presented Presidential Citations to this year's Institute Director, Dick Bittinger, and to Charlie Huether, Roland Bessette and Jean-Mark Beauchamp.

Don Dillon, from the National Piano Foundation, showed us an industry on the move, and Larry Linkin and Karl Bruhn of the National Association of Music Merchants showed us how we could join in the momentum.

A full schedule of activities greeted Auxiliary members, with a tour, classes, a tea, luncheon and more, all coordinated by President Agnes Huether. They also worked with Baldwin to sponsor Eric Thompson and James Lent, two future stars of the keyboard who entertained us during the Opening Assembly.

Receptions abounded: besides Baldwin's Saturday night fete, Young Chang brought us chapter night, Steinway brought us Peter Nero, and Yamaha's traditional last-night-of-the-convention reception brought the social whirl to a fitting close.

At the heart of the convention, however, were the Institute classes. In this issue of the *Journal*, you'll read reviews of several, but like this convention review, our writers can barely scratch the surface.

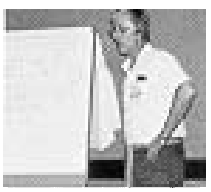
Far left, during the Convention closing luncheon, the gavel was ceremoniously passed from 1989-90 President Ronald Berry to his successor, Nolan Zeringue. At left, goodbyes are sad, but the Philadelphia convention is only a short year away.

Perennial entertainers, Larry Crabb's Barbershop Chorus performed at the closing luncheon. At left, Ron Berry was honored for his service as President.

Spouses kept busy with a full schedule of activities of their own. Past and present board members shown at the Auxiliary luncheon were, from left, Ivagene Dege, 1990-91 Recording Secretary; Phyllis Tremper, 1990-91 Vice President; Agnes Huether, 1989-90 President; Arlene Paetow, 1990-91 President; Judy White, 1989-90 Recording Secretary; and Barbara Fandrich, Treasurer.

Barbara Boone, above, and Randy Potter, top right, entertained spouses with their respective instruments. Newley elected President Arlene Paetow honored 1989-90 President Agnes Huether with a gift.

Institute Classes



Fairchild

Chandler

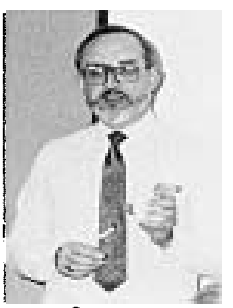
Jackson

Leary

McCall

Gravagne

Marinelli



Garrett

Neblett

Coleman

Class Reviews

Dallas Institute Classes

Susan Graham, RTT
Technical Editor

As has become traditional, the Technical Forum for this month features reviews of classes given at the recent convention. I can't say enough in thanks to my four "volunteers": Jeannie Grassi, Doug Wood, Paul Rice and Mitch Keil. They all came through in stellar fashion to a very last-minute plea from a somewhat harried editor. Class reviews impart both valuable technical information and a feeling of what the convention was all about, and I hope they make for informative and enjoyable reading.

New 1990 Bösendorfer

Bösendorfer used this year's PTG convention as an opportunity to introduce the new Model 213 grand piano to technicians. Denny Burger, head technician for Bösendorfer U.S.A., explained the many new features including some major departures from Bösendorfer's traditional methods and designs. In some ways this model is more conventional than other Bösendorfers. It has, for example, a drilled plate web instead of the traditional open-faced pinblock. It also has, for the first time in a Bösendorfer, a duplex scale treble section for added tonal vibrancy. Gone are the genuine ivory naturals in favor of state-of-the-art plastic. Real ebony sharps remain, however.

Most of the changes are truly improvements and not just concessions to conventional wisdom or manufacturing expediency. There are now three lid props, the shortest of which replaces the hymnal or two by four scrap commonly used for the barely open position. The trap springs have been stiffened for better feel and quicker, more predictable return of pedals. The solid brass hardware is protected from tarnish by a more durable sealer. Leg plates have been completely redesigned using laminated steel for a stronger, more secure connection to the piano. A laminated birch lid provides better strength and resistance to splitting with less weight than the old, solid core construction.

The action has also received considerable attention in this new seven-foot model. Touchweight is now four grams lighter than the old specs, ranging now from 51 grams at note number one to 44 grams at note 88. Relocation of capstans and a change in the wippen rail action helped to make this possible. Front rail punchings are a bit firmer for better keydip stability and a more positive end to the key travel. Backcheck wires are stiffer for better stability of regulation. After a brief experiment with cloth, keys are again being bushed with leather for greater bushing life. Strips of bushing leather are available from Bösendorfer for rebushing if it ever becomes necessary (or for rebushing non-Bösendorfer keys).

Features for which Bösendorfers are famous are still in abundance including an inner and outer rim constructed entirely of soundboard spruce. All strings have individual hitch pins which means a broken string never results in a single string trichord. Tuning pin holes are tapered so a light tap on a loose pin quickly and permanently improves pin torque. The Model 213 also has extra bass notes as in the larger models so that low A is not the lowest note. The result is a very musical low end and improved harmonic color throughout the scale.

After a thorough discussion of features a hands-on demonstration of voicing techniques ensued. Denny pointed out that the better the piano the more noticeable even the smallest tonal differences become. Getting the hammer to the strings is crucial to obtaining optimum results when voicing a large grand while it might be a waste of time on a cheap spinet. Bösendorfer uses Renner action parts and hammers. Hammers are tested using a cleaver shank that holds the unbored hammer. Thus, hammers can be screened for acceptable tone before boring and if found to be unacceptable can be returned to Renner unharmed for replacement.

The Model 213 is certainly a piano that lives up to the Bösendorfer motto *to give the artists and music lovers of the world an instrument that fulfills their highest expectations*. It would be a perfect choice for the discriminating pianist for whom price is no object.

Paul Rice

Ketops, Sharps, and Repairs

Instructor Howard Jackson, RTT, of Monroe, LA, presented a no-nonsense approach to keytop replacement. Using a few simple jigs and fixtures, a drill press mounted rotary planer, and a router table, Howard comes up with a professional quality job with minimal time and effort. The cost of the necessary tools and supplies is also minimal. Your first job should cover the one-time setup costs.

Before removing the keys from the piano make sure they are legibly numbered. Don't rely on factory numbering near the keytop tails. These will almost certainly be obliterated during the resurfacing process. Assess the extent of the work needed (sharps, fronts, key bushings, buttons, etc.) before blurting out a price. The customer may have asked only for new naturals but may be disappointed when the new keytops highlight the defects of the marginally acceptable sharps. Poor bushings may make it impossible to do an adequate leveling job, thus denying the customer full cosmetic benefit of the keytop work. Give the customer all the facts so he/she can make an informed decision.

Old keytops can often be removed with nothing more than a knife blade. If not, apply dry heat with an iron and try again. A damp rag in conjunction with an iron works well on ivory and prevents scorching so old ivories can be saved for repair work. The same techniques also apply for removal of fronts. Sharps can usually be popped off with a knife alone. It was suggested by a class member that slapping the side of a keystick on a bench top will usually pop off sharps without damage. However, when this technique was tried with one of Howard's demonstration keys it resulted in unacceptable damage to the keystick.

Before removing the old keytops, select a few keys that are still in reasonably good condition and measure their thickness with a caliper. This is very important because the new keytop material will likely be thicker than the original and some wood must be removed from the keystick to allow for this differential. A Wagner rotary planer chucked in a drill press is used for this milling process. Don't use a table saw for this operation because keys are rarely square to their sides and a key squaring/leveling nightmare will be the result. Feed keys on the right side of the planer for the cleanest cut, and position a stop block at the rear of the drill press table to limit the length of the cut. Sharp keysticks are prepared for new sharps by simply gang-sanding a few at a time to remove old glue.

New keytops are applied with solvent-based contact cement. Two coats are usually needed for the wood because of absorption. Howard uses keytops with front attached unless old fronts are being retained. If fronts are not being replaced, a jig is used to establish the overhang. After all keytops are on, each key is squeezed in a bench vise to ensure a good glue bond. Don't use metal jaws or you will scratch the keytops! Howard uses a John Ford trick for gluing sharps. Apply Titebond glue to the recess of the plastic sharp, position sharp on keystick, set aside to dry overnight. No clamping necessary!

Trimming away excess keytop material can be time consuming if done with a file, or damaging to the keystick if done with a power sander. Howard's method avoids all chance of damage and requires only minimal hand filing. Two router bits are used in conjunction with simple fixtures and a router table. First, a flush cutting bit with a ball bearing pilot is used to remove material overhanging the sides of the keystick. Then, a 3/8" straight bit is used to square the sharp notches. A couple of judicious swipes with a mill bastard file will then remove the few remaining rough edges.

Final cleanup includes removing glue residue using contact cement thinner or mineral spirits and cleaning the sides of keysticks using steel wool and Formula 409 or ammonia. Keys are then buffed on a flannel wheel with the appropriate grit compound to remove sharp edges and surface scratches.

When reinstalling keys Howard recommends proceeding in this order: ease, remove lost motion, square, level, space. Install naturals and complete all these steps before installing the sharps. In concluding his fine class Howard offers one final tip — replace the fallboard felt if it is missing, moth-eaten, or discolored. The customer will probably notice this detail more than the evenness of the sharp notches.

Paul Rice

Tools And Modification Of Tools

Instructor Joseph Garrett, RTT, of Portland, OR, loves tools but finds many of our standard piano tools hard to love. Most are either too bulky, too awkward, or too ugly to please a true tool nut.

Joe reduces bulk by shortening many of his shafted tools. Unnecessarily large handles are replaced with smaller, ergonomically designed ones. Old ebony sharps make beautiful small tool handles. Some integral handles are removed and the resulting bare shank modified to fit into a combination handle. Additional useless mass can be removed by the judicious use of a file or grinder.

Reducing mass is often a byproduct of improving tool efficiency. One example is Joe's drop screw regulator. Flats are ground on the business end to allow easy access to jack regulating screws located behind dowel-type let-off buttons. The tip is countersunk slightly to ease registration with the screw head. Finally, a bevel is ground on the trailing edges of the tip to allow easier retraction from between those same pesky let-off dowels. Other examples of improving efficiency while simultaneously reducing mass include filing down one jaw of tweezers or hemostats to facilitate paper punching manipulation, filing down the business end of a standard spoon bender to ease insertion between action parts, and filing the ubiquitous umbrella stave to a point small enough to do its intended job of easing damper guide rail bushings.

Tools that look and feel nice are more enjoyable to use. In addition to small, customized handles, Joe uses gun blue to enhance the appearance of plain steel tools and to retard rust. Attractive and efficient tool cases are important, too. Joe uses a cas- within-a-case system. His basic tuning and diagnostic tools are housed in a lightweight, Cordura satchel which fits into his large, palleted attaché case. Both cases are from Jensen Tools of Phoenix, AZ.

Joe does a lot of early instrument restoration including a fair amount of ivory repair. He recommends using one-piece ivory clamping plates rather than the two-piece system currently available through suppliers. A single plate eliminates the chance of height discrepancies where the tail and head meet. Sobo glue with titanium dioxide added as a whitener makes a good ivory glue.

Sometimes it is necessary to create a tool from scratch if an existing tool is unavailable for modification. Joe's tool cases contained many such creations. A true craftsman never uses the inadequacy of his tools as an excuse for his inability to do a job properly and efficiently. Joseph Garrett is a true craftsman and a fine instructor.

Paul Rice

Renting Pianos For Fun And Profit

David Rostkoski, RTT, of Spokane, WA, presented an interesting approach to piano rentals. David's rental business is a sideline to his teaching and tuning work and requires a minimal amount of time and effort. Start-up costs were significant, however. David and his partner each put up $10,000 and their fledgling company then borrowed another $10,000 for a total initial capitalization of $30,000.

Only new, direct blow consoles and studio uprights are used and all are purchased outright from a wholesale distributor. Using new pianos provides a significant depreciation write-off. Thus, the company can show a paper

loss for tax purposes while enjoying a positive cash flow. Ease of maintenance and liquidation of fully depreciated units are additional factors favoring the use of new instruments.

In two years Prodigy Pianos, as the business is known, has increased its rental business to 30 units with another six pianos scheduled to be added soon for the busy fall season. Business has increased steadily through referrals. Major advertising efforts have been unnecessary. Most business is transacted over the phone and no formal storefront is maintained.

Monthly rental charges are limited by what your market will bear. Check out your competition before jumping in with both feet. If there are other rentals available in your area for less than you believe you need to charge to make a decent profit, forget it! Piano renters tend to be very price sensitive and will simply take their business elsewhere or do without if they believe your price is too high.

The minimum rental period is two months and the customer must pay round-trip moving expenses up front. The customer is also required to prove the piano is covered on a homeowner's or renter's insurance policy. All maintenance, including up to two tunings per year, is included in the rental fee. Customers are given the option of buying the piano at any time and up to six months rent can be applied toward the purchase price. Sales are not encouraged, however.

Appearances are important in establishing credibility with your clientele. Quality pianos, good interpersonal skills and professional looking documentation form a vital image triad for rental business success. A good rental agreement is essential and David provided copies of his to class attendees.

The piano rental business is not without risk, but its fairly tangible risks may prove more tolerable than the seemingly arbitrary gyrations of the stock market to technicians with money to invest. This is not a get-rich-quick scheme, but as one T-shirt seen by this writer aptly proclaims, "Happiness is Positive Cash Flow."

Paul Rice

Gluing Grand Hammers — A Factory Method

When one of the Rappaports teaches a class it's guaranteed you will go home with a new slant on the subject and a healthy eagerness to try out their suggestions. Priscilla Rappaport's factory method of hanging grand hammers was not a disappointment in this respect. As with other classes taught by the Rappaports, she drew from her six years of factory experience in Germany. She was aided by her husband, Joel, and their shop assistant, Robin Hoyt. A special thanks is extended to the Renner Company for generously supplying grand action models and small sets of new hammers for each student. A hands-on class is greatly enhanced with the "laying on of hands" and these models allowed that to happen. Each student also had other necessary tools and supplies furnished, including pre-heated glue pots, with fresh glue ready to be used.

No elaborate hammer hanging jig is necessary. In fact, the success of this particular technique has to do with allowing the hammer on its shank to move freely through its arc of travel. Any traveling problems can easily be corrected at this point in the process, perhaps saving some additional time later on. (No more than five minutes should be spent rough-traveling the shanks ahead of time.)

As in other hammer hanging systems, there are some basic principles which always need to be considered: selection of appropriate replacement hammers, proper preparation of the hammers prior to gluing, establishing the correct hammer line, etc. These were all covered in the class, in detail. What was stressed as being unique to this method was getting accustomed to the hand positions and establishing the rhythm.

"The procedure and hand position dictate the *speed* and *quality* of the job done." The true secret to this method lies in reducing wasted movements of hands and tools, thereby improving one's speed and efficiency. Repetitive motions breed consistency in work and economy of motion saves time and allows a rhythm to develop which contributes to the overall expediency of the method. The first few attempts are awkward, but after only a few minutes it becomes easy to form a rhythm and to see consistent results.

Borrowing from Priscilla's handout, the following is a description of the procedure: 1. Hammer is in left hand, held with four fingers and thumb. Glue stick is in right hand. With rotations of the wrist, apply glue into the hole from both sides. 2. Hold the shank and hammer in your left hand. With the right hand, dip stick into glue pot and apply fresh hot glue to the end of the shank. The amount of glue that you apply will dictate the size of the glue collar. 3. While still holding the shank with the fingers of the left hand, transfer the hammer to the right hand. 4. Put hammer on end of shank. Twirl two to three times, forming the glue collar, while pushing the hammer onto the shank. 5. Push hammer onto shank, at first putting the tail in line with the other tails in the section, using a straight edge held in your left hand. With your right hold the top and tail of the hammer with the thumb and third finger. 6. With the straight edge, align the tails, backs of hammers and fronts of hammers. 7. Space hammer with its neighbors. Check the hammer for correct movement between its neighbors. Glue the entire set in one session. With practice, it should take about two hours.

Some rules are important in eyeballing the spacing of hammers: If the hammer moves to the right, twist it to the right so that the "bodies of air" on each side of the hammer remain constant. If the hammer moves to the left do the same steps the opposite way. Always check the previously glued hammer and make the above adjustments.

This class was so well prepared ahead of time that in a one and a half hour session she described and demonstrated the procedure, showed slides as further illustration, and still left enough time for each class member to hang one small section of hammers and get individual help with all questions answered — a true demonstration in economy of time and good work discipline.

Jeannie Grassi

Grand Voicing

The two-period class was over-full quite early. But that was no surprise with Chris Robinson holding forth on voicing. Always entertaining, Chris is a master technician willing to share his best.

The class began with a discussion of piano sound as it might be viewed by an engineer. Power or energy over time and frequency creating the attack, dwell (or sustain) and decay (release) of the tone. Voicing the piano is a matter of maximizing efficiency for greatest power, and then manipulating the shape of the tone to put what little energy there is into the right places at the right time. (With a maximum output of less than 0.5 watts even in the finest concert grand, it is a wonder that we have as much control as we do!) Chris pointed out that we generally want to maximize the total power output of the piano, though sometimes we sacrifice length of the tone for greater attack, or vice versa.

In practical terms, we often think of voicing the piano with needles or chemicals. Chris demonstrated early and often that these are the last techniques to use. Before using any action or tone regulating, it is always best to check the potential of the piano belly: sustain, crown, bearing, bridge caps, strings, etc. It makes little sense to put a lot of effort into a piano that is only capable of a meager tone anyway. The piano available for demonstration obviously needed a lot more help than it would get in two periods. By plucking the strings loudly with a guitar pick, however, we could hear there was quite a lot more tone available than we could produce with the action.

We had a brief discussion of lacquer for hardening; and a hot, barely soapy water solution for radical softening (be prepared for a radical change and to file the hammers again). Sometimes these chemicals are necessary to get the tone required, but they are means of last resort, to follow all the other techniques Chris planned to show.

Chris demonstrated a range of techniques for increasing power, starting with string voicing. Tapping down the strings at all the contact points made a significant improvement in tone on several notes. The lever tool with a nylon roller that Chris developed is particularly effective in "lifting" strings at the capo bar and agraffes. This has the additional benefit of rapidly stabilizing new strings. This was followed by returning the sample notes solidly.

After establishing the best tone potential of the piano belly, we moved on to the action. Proper regulation is essential to careful voicing work, including hammer traveling and spacing, and establishing proper strike point. Hammer shape was the next consideration. Minimizing what is effectively dead weight in the shoulders, and filing the hammer to present the proper shape to the strings made perhaps the most audible difference of all the techniques presented. This job is completed by eliminating "open strings." First the strings are leveled. The hammer crowns are carefully filed so that all strings for that note are damped equally when the hammer is blocked up to the strings. The hammers are sometimes ironed at this point, to increase attack. All this done, we could still hear more power with the guitar pick, so we moved on to needle voicing.

Deep needling in the shoulders can produce a tone charge that ranges from minimal to dramatic, depending on the particular set of hammers. Chris experiments with a hammer or two in the "killer octave": C52 to G71. He has found that what works well on the hammers there usually works wonderfully through the rest of the piano. His deep needling is done very carefully with a single number four glover's needle with nearly 20mm out of the tool. It is driven in starting at about three to eight millimeters off the strike point, depending on the hammer size. The needle tip ends up running parallel to and very near the underfelt as it is driven full depth. Softening the back of the hammer usually makes the tone louder. The softer the front, the more it sings (up to a point!). Three stitches spaced evenly across the back of the hammer usually produce the biggest tonal difference. Some hammers need another three. None need more than six, and some need none at all. The same goes for the front of the hammer, though the front is needled after the back is done, and not necessarily the same amount. Enough is when the hammer produces the same volume as the guitar pick, or when no change is produced (or volume decreases), or when there are already six deep stitches in that side of the hammer. Carefully is the operative word: the glover's needle can do "as much damage as a chainsaw." However, the tonal results were as remarkable as they were desirable. The volume in each case increased noticeably and ended up very close to the plucked sound — without lacquer.

Before the class time was over Chris discussed the more familiar three-needle voicing in the shoulders. He has found that needling in the back of the hammer is most helpful in reducing loud, harsh sounds. Needling in the front shoulder lengthens the tone. Both of these were demonstrated in the piano.

Throughout the class, emphasis was on getting to know the hammers that we work with. Hammers from different sources, while responding generally in the same way to similar techniques, require different mixes. The best way to learn voicing is to experiment, carefully — improve the worst note or two on each piano in good enough condition to respond. Chris knows a lot of techniques, some of which might outrage purists, but he has been in the business long enough to emphasize caution and respect for these wonderful instruments that it is our good fortune to service.

Doug Wood

Hammer Replacement

When I was four years old, I was sent away from my home in suburban Connecticut to spend the summer at the oceanside village of Saybrook with my saintly grandmother, where I played happily building sand castles and chasing waves. Unbeknownst to me, an adolescent Wally Brooks was only a few miles away, learning the piano business from his father.

Nowadays waves chase me and my castle has a 30-year mortgage, but Wally is still in Saybrook fixing pianos. I will go to any class of Wally's at any convention, because he always talks with a tool in his hand. He knows that results are what count, and that this is neither brain surgery nor theoretical physics. This year Wally taught hammer replacement. A slide show of hammer boring and his own shop techniques was fascinating, including the explanation of his prehung hammer service. (Unfortunately, time constraints prevented him from talking about verticals.) He explained the difference between rake (angle of hammer/shank to string at moment of strike) and pitch (angle of hammer to shank). He advised us to take hot hide glue from the side of the glue pot because that's where it's hot-

test. The class then proceeded to ream, fit and glue three hammers on mock-up grand actions at our work stations. Wally teased, modestly admonished beginners, and went to each workbench to check everyone's progress. We left encouraged and enlightened.

Mitch Kiel

Tuning — Do Your Own Thing

In "Tuning — Do Your Own Thing," Kevin Leary gave us some insights on health and aging. Despite his boyish demeanor, Kevin has 20 years in the tuning business, and has gained quite a lot of insight. The body has finite abilities, and small problems add up, he says. Kevin prefers to avoid destroying his elbow, and never have carpal tunnel syndrome appear. He therefore advocates an impact hammer for verticals and a Steve Fairchild-modified metal-handled hammer for grands, as well as standing/sitting sideways facing the bass. He would rather prevent problems today than go under the surgeon's whetted knife tomorrow.

And when he tests his tunings, Kevin listens to triads and arpeggios with roots, fifths, and ninths in various octaves in his treble. This is important advice for tuners who only hear beat rates and have forgotten to listen like musicians.

Mitch Kiel

Troubleshooting The Piano Service Business

Kevin's efficient and wise wife Janet Leary does the phone work and scheduling, and she offered a class on troubleshooting the piano service business. She was asked questions about advertising, computers, group discounts, and attitude. Her answers were, in the same order; minimize, use one and make backups, doesn't and very, very important. She also asked her own pointed questions. Are you avoiding pain or pursuing pleasure? Are you being a complete professional by educating your customers about why and when pianos need to be tuned? Are you offering your valuable services or selling used cars to rubes? Chewy queries by a good cook.

Mitch Kiel

Vertical Hammer Installation

Bob Marinelli from Pianotek taught a class on vertical hammer installation, and had some very venerable tips. Most astounding was that hot hide glue can be slowed down by adding ordinary table salt, up to three percent by weight, with no loss of strength. (Under no circumstances should the ratio exceed five percent.) Urea, the better known slowing agent, is commonly available only in 80-pound bags at the farm supply stores, which is a big pile of, ...well you know. Bob also advocates dry fitting dummy shanks in mounted butts to travel the butts. He showed us a useful jig for premounting hammers square to their shanks that is nothing more than pins on plywood. Bob recommends using an action cradle and tilting the vertical action toward you so you are mounting hammers almost like a grand. Whether that implies that upright hammers could be bored all the way through is a question I forgot to ask.

Mitch Kiel

Dallas

What did we take home from the Dallas Convention? Answers vary. Some of us left with a suitcase full of new tools from the supply houses' booths. Most carried away notebooks crammed with tips and techniques. Quite a few left with awe at how exquisite the brand-new Mason & Hamlin grand sounded (it had been completed less than a week before). Many found new friends. Everyone had lighter wallets.

I flew home with exhaustion. Most piano technicians toil in solitude; a week of crowded hallways and dinners for 800 results in face overload. I have now scientifically proven that two-zone jet lag and closing down the hotel bar requires a four-day weekend and three naps to cure.

Skill and will are why I go to PTG conventions. Skill is the how to, when to, how much is not enough. Most classes at the convention were hands-on workshops for hands-on skills. But will is the more valuable virtue. It was observable if you read between the lines of what the instructors were saying. Who are these successful people, and how do they get that way? The answer is happily contagious, and comes from appetite, discipline, inspiration, and fascination. It is why the learned and the learning spent a week of their lives and a thousand dollars in the humid Texas summer, and why we already look forward to more of the same at next year's 1991 convention in Philadelphia.

Mitch Kiel

Class Reviews

Convention Tuning Classes

Rick Baldassin, RTT
Tuning Editor

The following are reviews of some of the tuning classes held at the Piano Technicians Guild's 33rd Annual Convention and Technical Institute, held July 7-11, 1990, in Dallas, Texas.

Hearing What You Are Tuning

Since Jim Coleman was merely substituting for George Defebaugh in this class, he felt he should bring an update on Mr. Defebaugh. George had suffered from cancer for five years and the cancer had progressed rapidly in the past two months, resulting in his death on the Wednesday prior to the convention. A moment of silence was observed in memory of George and in behalf of his family who was with him to the end.

It was pointed out in this class that there is more to tuning a unison than just listening to one beat and slowing it down to zero. Each note on the piano has a series of partials, each of which has its own beat rate when the unison is not in tune. All of these partials beat at differing speeds. An example was given where, if the first partials of A3 were beating at 0.1 BPS, then the second partials would beat at 0.2 BPS, the fourth partials would beat at 0.4 BPS, and the eighth partial would beat at 0.8 BPS, so that what seemed to be a good unison (one beat in ten seconds) was actually almost one beat per second at the eighth partial, and even 1.6 beats at the 16th partial. In order to hear the higher partials, it is necessary to pound the keys a little harder, which has the additional advantage of stabilizing the strings better.

The C2 unison was tuned slightly out of tune. Next, the key for C2 was held down silently while C3 was given a hard short blow. This caused the second partials of C2 to ring out, and the very slow beat could be heard. This technique is what George Defebaugh coined as "listening to the ghost tones." Next, as C2 was held down silently, G3 was given a hard short blow, and the third partials of C2 could be heard beating a little faster. The fourth partials were excited by playing C4, the fifth partials were excited by E4, the sixth partials were excited by G4, the seventh partials were weakly excited by A#4, the eighth by C5, the ninth by D5, the tenth by E5, the eleventh weakly by F#5, and the twelfth partials were excited by G5. Each of these sets of partials were beating progressively faster than their neighboring partials below. Now when C2 was played loudly, all of these beat rates could be heard at the same time, which is what is very confusing to the beginner. It was suggested that one listen to the highest beating partials that were obvious and then tune that beat out.

The Coleman Beat Locator charts were used to indicate where coincident partials are located on the keyboard. It was next shown that when tuning the A4 with the tuning fork, one can get close, or at least "in the ball park" by holding the vibrating tuning fork on the keyslip while playing and tuning the note. However, when a fork is placed on the piano, causing the piano case to vibrate, it produces true harmonics which will be out of tune with the inharmonic partials which the piano string produces. This is the main cause of confusion in setting the first note of the temperament, and is the cause for some people scoring low on their pitch score when taking the PTG Tuning Exam. The way to clarify the situation is to use some note on the piano which has a partial at A4 and play it in conjunction with the fork held near the ear. This way the fork does not produce harmonics which add to the confusion. A good example is to use F2 which has a fifth partial at A4. Using D3, which has a third partial at A4, is also good if you want to listen to slower beats. Whichever test note one uses, it and the note A4 must beat at the same speed as it and the tuning fork. A word of caution was given not to get sucked into listening at the pitch of A5 when it sometimes is more prominent.

The Defebaugh F-to-F temperament was aurally demonstrated. The notes on this procedure have been previously published, and so will not be given here in detail. It was shown in each step where to listen for coinciding partials, and help was given in how to count or estimate the proper beat rates. At the bottom of the handout notes was a list of metronome settings which could be used to accurately gauge the beat rates of seven, eight, nine, and 10 BPS. Coleman showed what he called the "poor man's metronome." It was a pendulum which was 3.25 inches from the swing contact point to the center of the key lead weight. This swings at 104 full swings per minute. When one says "wa-wa-wa-wa" for each full swing, this will make 6.93 BPS, which is the trial beat rate for the F3-A3 third when listening to the fifth partial of F3 and the fourth partial of A3. The class practiced saying the "wa-wa's" in rhythm to the swinging pendulum. Incidentally, four complete swings of the pendulum will demonstrate the practical beat speed for the F3-C4 fifth, with partials located at C5. A wristwatch was used to gauge the speed of eight BPS by saying two sets of "wa-wa-wa-wa's" for each second. For those who couldn't say wa-wa that fast, it was suggested that "doodle-doodle-doodle-doodle" would be easier.

One deviation which Coleman took from the Defebaugh temperament was to tune the F4 immediately after the F3, so that when he got to the C#4, he would have a foolproof (read bullet-

proof) temperament. He showed how the contiguous thirds F3-A3, A3-C#4, C#4-F4, and F4-A4 were each related to their neighbors in a four to five ratio. The class practiced counting four to a beat and then five to a beat. This helped to determine when the four contiguous thirds were in the proper relationship.

Various suggestions were made for keeping the treble tuning even, and then a brief discussion of bass tuning was given at the end of the class.

Carpal Tunnel And Tuning

The purpose of this class, taught by Virgil Smith, was to discuss and demonstrate how to strike the note when tuning so as to avoid Carpal Tunnel Syndrome, tendonitis, and other physical problems; but strike the note strong enough to establish tuning stability, yet free from distortion, but sounding a pure tone where the beats are easily heard.

There are three main reasons why Carpal Tunnel Syndrome and tendonitis are so prevalent today:

- pianists and piano tuners are trying to project a tone that neither they or the piano are capable of producing
- pianos with hard actions due to poor regulation, poor rebuilding, or some other reason
- incorrect playing technique

It was also suggested that tuners could help their situation by adding more variety to their work by offering complete piano service rather than doing only tuning all day.

Physical problems can result when joints are subject to continuous impact over an extended period of time. When tuning, this can be avoided by striking the note so the energy matches the point of hammer contact to the string rather than when the key reaches bottom. This results in a more efficient stroke with more tone and with less effort. Since the hammer strikes the string before the key hits the bottom, there is time and space to stop the downward thrust, even with a hard blow, so the finger gently settles to the key bottom. Not only does this avoid joint impact, but it also avoids the noise caused by the key hitting bottom, which can distort the tone and make beats difficult to hear.

There is a great similarity in the requirements for the piano action to produce a strong, beautiful sound, and the physical requirements to produce that sound. In the piano, there must be a firm but flexible hammer, attached to a shank to swing for power, swinging from a firm support, and every part moving freely. Physically, there must be a firm but flexible finger, operating as an extension of the arm to swing for power, swinging from a firm, but not tense body support, and every moving part (shoulder, elbow, wrist, and finger) moving freely without tension. It is easy to establish a naturally firm but flexible finger against a hard surface such as a table top or key bottom, but difficult as the key is being depressed. This requires the use of arm weight in the stroke. Any tension at the shoulder, elbow, wrist, or finger can block the energy and arm weight from effectively reaching the finger. Using two or more fingers, as long as they remain loose, can be effective in tuning unisons.

Moving the hammer by tiny jerks puts less strain on the arm than steady pulling, but the situation will dictate which method is best to use. Jerks or small pulls work better for the second tuning when the pitch is changed very little. Using larger muscles (the whole arm) with relaxation and firm body support is the key.

Preparing For The PTG Tuning Exam

Al Sanderson began by covering things to do before the exam. First, check and tune your fork carefully at room temperature. If you tune with a C fork, get an A fork and tune with them both. You will be judged on the accuracy with which you can set A4 to 440 Hz. Aluminum is very temperature sensitive, so you will be better off with steel forks.

Second, if possible, practice tuning a one-string piano detuned alternately flat and sharp by one or two beats. This is the way the exam piano is detuned, and it is different from your normal experience. Find out how long it takes to tune 84 strings once, and try to get this time down to 20 minutes for a quick rough tuning. Otherwise you may have difficulty finishing the exam.

Third, plan how you will use your time for tuning. Plan to do a quick rough tuning of every note first, to restore the piano to some semblance of a tuning. Then start over again, set the pitch again, and do another 84-note tuning. These two passes will get the piano close enough so you can start your final tuning and expect the strings to stay where you leave them.

Fourth, learn the tolerance ranges of the exam so you can spend your time where it will pay off. You must get your A4 set correctly, or lose the ball game in the first inning. Also, remember that the notes of your temperament will be graded very severely. The 24 midrange notes (C3-B4) are next in difficulty, and in all of the above sections, a perfect score requires all errors to be less than one cent. Greater cents errors are allowed in the treble (C5-B6), bass (C1-B2), and high treble (C7-B7). However, whether these sections are easier for you to pass will depend upon your skill levels, as well as the tolerances.

The class next focused on how to take the exam. First, set pitch to an A fork, and use the 17th only as your test interval (F2-A4 beats the same as F2-A fork). This sets the fundamental of note A4 to 440 Hz, which is what is checked. Any other test or fork pitch sets a note or partial to a frequency which will not be checked. This results in extra steps involved in transferring that pitch to 440, with corresponding errors that will add up. If you have to tune with a C fork, be sure to check the pitch of your A4 directly against the A fork whenever you come to A4 in your sequence.

Second, tune your octaves from pure to a little bit wide, but never narrow. For example, most tuning committees will leave the temperament octave third-10th test about 1/4 to 1/2 beat wide. To be more explicit, on a completely tuned piano, the 10th will beat about as fast as the third a semitone above the test third (C#3-F4 about equal to D3-F#3).

Third, going up into the treble (C5-B6), probably the most reliable test is the third-10th-17th. It tests two single octaves and the double octave at the same time. For example, C4-E4, followed by C4-E5, and C4-E6 tests the E4-E5 and E5-E6 octaves, as well as the E4-E6 double octave. At the lower end of the treble range, you can get them close to equal beating. As you tune towards C6, the tenth normally becomes slower than the third, and you can tune the 17th to beat somewhere in between the third and 10th. Matching the third beat rate gives you a perfect double octave, and matching the 10th beat rate gives you a perfect single octave, so tuning in between is a

good way to compromise.

Fourth, the high treble (C7-B7) must be tuned according to the exam committee's instructions. Be sure you know how to tune good single octaves up there. The test is equal beating 10th-17ths, but usually it cannot be heard all the way to B7. Use it as high as it works, however, then switch to some other method. Some like to simply play the single octave repeatedly while tuning until a beat can be located, and then reduced to zero, or nearly so. The tolerance in this octave corresponds to a beat rate of seven to 14 beats, so if you can locate the beat and get it down to a few beats, you should be within tolerance. Another way is to play only the note being tuned, and listen for the power peak that occurs when the note is exciting the second partial of the octave below by sympathetic resonance. When the notes in this octave are tuned as single octaves, they will actually sound flat when tested with arpeggios. Be forewarned, if they sound right with an arpeggio, you are probably going to lose a lot of points for being too sharp.

Fifth, tuning the bass range (C1-B2) does not involve compromises on the type of pianos used to give the exam. You should be able to get all of your intervals to behave all the way down to C1. Tuning only by octaves can lead to an accumulation of errors, and cost you points in the deep bass. Watch your wide intervals such as the octave fifth, the double octave, and the double octave fifth, which will be nearly beatless if correctly tuned. A very useful technique in the deep bass is to hold down the notes of a test interval and strike a sharp blow on the note of the coincident partials. For instance, to tune C1-C2 as a 6:3 octave, use the coincident partial that lies at G3 (sixth partial of C1, third partial of C2). The test for a 6:3 octave is the minor third-major sixth test, and we want to hold down in turn each of these intervals silently, and strike G3. First, holding down D#1-C2 silently, listen to the beats on striking G3. Now hold C1-D#1 down, strike G3, and tune C1 to the same beat rate. If all is well, this beat rate holds for the 10th (D#1-G2) and 17th (D#1-G3) up from the test note, as well. These are tests for the octave fifth (m3-M10), and double octave fifth (m3-M17), which should be nearly pure. (These tests should be equal beating, while the intervals themselves should be nearly pure).

Sixth, now that you have tuned the entire piano starting from setting the pitch at least two, preferably three times over, do you have any time left? Please budget your time so that you can go back to the midrange for a final once-over. This is where small errors count the most. Remember that tuning the bass and treble actually affects the midrange tuning slightly, so it is wise to do the midrange last. Also, you want to do your best work and have it measured by the committee immediately, so you won't have to say, "that's not the way I left it!"

Seventh, polishing the tuning of the midrange is not the same as tuning it from scratch. Do not start over again with setting a temperament as you are likely to repeat any pattern errors you make in your temperament that way. Instead, check it the way the committee is likely to check it, with contiguous interval tests. Pick C3 for instance, and play up and down a fourth from it (G2-C3 and C3-F3 are contiguous fourths). They should balance, neither one should be significantly faster than the other. Also, play contiguous thirds (G#2-C3 and C3-E3) and listen for beat rates that are in the ratio of 4 to 5. This is the time to pound on these notes and check the setting of the pins. These are the 24 notes that the committee will pound and check for stability. When C3 passes the test, go on to C#3 and test it the same way. Continue all the way up to B4, making small tuning changes where necessary, and checking stability. Play ascending fifths over the midrange, and where you find a bad one, test both ends of it with contiguous thirds and fourths. If time permits, repeat the contiguous tests from C3 to B4.

Finally, be sure to leave enough time to reset the pitch of A4 to the fork. This is the first thing the committee will check, and it is very critical, so it should be the last thing you check. Many, many tuners have had their pitch drift out of acceptable limits during the hour and a half of the test, never rechecked it, and failed the exam. You might wonder whether moving A4 will spoil your midrange score. Well, if you have tuned the piano two or three times, resetting the pitch each time, then you won't have to move A4 very far to make it perfect. And if you lose one note in your midrange score but save your pitch score, you'll probably be quite happy to settle for that.

The class concluded by discussing some items to consider after the exam. First, if you passed the exam, congratulations. The scores will show your strong and weak areas compared to the average of the PTG Craftsman membership. All eight sections of the exam are set to be of roughly equal difficulty to that average PTG Craftsman member.

Second, if you passed all sections with scores of 90% or better, you are eligible to start training for our PTG Tuning Examiner pool. This is excellent training, and will sharpen your tuning abilities even more. Many tuners have said that participating in the master tuning of the exam piano and giving the exam has given them a new perspective on their own tuning.

Finally, if you didn't pass the exam the first time, welcome to the club. About half our examinees do not pass the first time. You should now know exactly what to practice in order to pass the next time. We hope the experience has been beneficial to you, and that you have learned some tuning tips that will help you become a better and more efficient tuner. ≡

NAMM Representatives Unveil Plan To Support Music Education

Larry Linkin

With today's emphasis on math and science, the status of music education in our nation's schools is a serious problem. This problem results from the dangerous omission of music and the other arts in national educational priorities, and the lack of understanding by parents as well as decision makers and school administrators as to the vital role music plays in the enhancement of a child's general education and well-being. Clearly, we need to strike a balance.

This problem has not sprung up overnight. It has taken years to progress to this level. Only by joining together can the music community hope to reach large numbers of people and educate them on what is happening to music programs in our country. Our children are the ones who are being affected.

No single organization has the resources for solving the types of problems we're addressing. Only by joing together do we stand a chance of accomplishing our goals. There is strength in numbers. Numbers give us added credibility, support, power and voice.

All of the elements and components of the "Project for the Music Community" are aimed at informing the general public, along with policy and decision-makers at all levels, of the importance of music study at an early age. Without public awareness, understanding and support, music education will continue to be underserved in our nation's schools and communities.

The music community, working together, can help shape the lives of tomorrow's adults and help our nation to become a better and more successful entity. That's a worthwhile cause. I urge each of you to do everything you can to help.

Our credo is simple: just as there can be no music without learning, no education is complete without music. Music makes the difference.

Music Makes The Difference...

During the Dallas Convention Opening Assembly, Larry Linkin, Executive Vice President of the National Association of Music Merchants, and Karl Bruhn, NAMM Director of Market Development, briefed attendees on an industry-wide effort to support music education in the United States. Here's a brief summary of their remarks.

To obtain a petition kit, write to: NAMM, 5140 Avenida Encinas, Carlsbad, CA 92008-4391.

Karl Bruhn

For the first time in history, the music community — educators, performers, retailers, manufacturers, technicians and publishers — have formed a coalition to balance the current national emphasis on math and science, and to demonstrate that children need music and the other arts in order to develop their full human potential.

A year-long national campaign will deliver the message to the American people and decision-makers in government, education and business that music and the other arts are valuable components of a well-rounded education. Beginning in June of 1990, a series of interrelated events will lead up to a national symposium to be held during march 1991 in Washington, D.C.

• **National Symposium** — As the core event of the year-long campaign, this symposium will examine the impact of music and other arts on three major challenges in education today: children-at-risk, cultural diversity, and the future workforce. Policy makers in government, education and business will participate in the symposium.

• **Public Forums** — Preceding the symposium this fall, public forums are planned in three major cities: Los Angeles, Chicago and Nashville, to provide the opportunity for an exchange of local and national information and public opinion. They will examine the influence of music and the other arts on child development and give voice to the grass roots concern about the dangerous omission of the arts in national education priorities.

• **National Commission on Music Education** — Leaders in education, government, business and the arts will participate in the campaign and serve on a commission to prepare a final report, similar to *Nation at Risk*, which will synthesize the forum findings and other research on the value of music and the other arts in the school curriculum. The report will be presented to Congress and the Administration as part of the national symposium. Copies will receive wide distribution to other decision makers in business, government and education.

• **Petition Campaign** — A petition is being circulated to stimulate and document support for the study of music and other arts. The credo is simple, "Just as there can be no music without learning, no education is complete without music. Music makes the difference." The petition, which is truly "a project for the music community," calls on all who care about education to destroy, once and for all, the myth that education in music and the other arts is mere "curricular icing." Because of their work with individual piano owners in their own communities, it is in this area that PTG members may make the greatest contribution. A tremendous tremendous number of petition signatures can be gained through the combined efforts of PTG's 3,600 members.

• **Grass Roots Campaign.**— Following the national symposium in Washington, D.C. next March, a number of campaigns will be carried on in local communities with materials prepared for and during the national campaign, including a videotape, a petition, and a manual on how to strengthen music and the other arts in the school curriculum.

• **Campaign Coordinators** — Joining for the first time to develop and coordinate this campaign are the Music Educators National Conference (MENC), the National Academy of Recording Arts and Sciences (NARAS), and the National Association of Music Merchants (NAMM). The coalition is being supported by other related organizations including, of course, PTG, as well as the Music Teachers National Association (MTNA) and a number of state and local organizations.

1990 Exhibits

OVER VIEW

An Open Letter To Piano Technicians Guild Members To Help Promote The Benefits Of Piano Lessons

Harold S. Smith
President, Baldwin Piano & Organ Co.

We need your help. Today, there is a nationwide concern of parents, educators and business professionals for the improvement of the education levels of our children. We, as concerned citizens, have a great opportunity to make a difference in the educational system in this country.

One way that you, as prominent members of the Piano Technicians Guild, can help, is by joining us in the music community in promoting the benefits of piano lessons as a fundamental way to simulate a child's concentration, discipline and academic performance.

Educators have recognized the fact that piano lessons help develop a child's ability to concentrate, to coordinate his body and mind and to attain a degree of self confidence that can make the difference between success and failure in life. We, in our business, have an obligation to educate parents about these wonderful "non musical" benefits that their children will obtain from the study of piano.

Interestingly, the Japanese have recognized the value of piano lessons as a way to prepare their current generation of children to concentrate better and develop discipline. A recent article in *USA Today* stated that 40 years ago Japanese children had the lowest I.Q. in the world. Then the Japanese started putting pianos in all their schools. Today their I.Q.'s are the highest. A coincidence? Hardly, once you know what educators know — that piano lessons foster significant development of the "three C's" — concentration, coordination and confidence.

In practicing piano a child learns to read two lines of music, use both eyes, ears, arms, feet and legs and all ten fingers, with the brain giving each organ a different assignment to perform simultaneously — all paramount to total concentration. As a side benefit, appreciation for the fine arts is stimulated as is knowledge of math, in the study of tempo, time and dynamics.

What I am expounding in this letter is nothing more than good old fashioned logic. You see, children take to music naturally. A baby is introduced to music through his mother's voice as she sings lullabies to soothe and bring him a feeling of security. During the early years of development, a child's strong desire to please also encourages him to engage in many activities. This makes it the ideal time for a child to begin an acquaintance with the piano.

Many years ago, the Greek philosopher Plato said, "Musical training is a more powerful instrument than any other, because rhythm and harmony find their way into the inward places of the soul." This observation is true today. Performing at the piano gives a child many "hidden" benefits and a feeling of inner worth that carries over into many life situations.

Henry Woodfin Grady, a great Southern editor, prophesied, "The best school is when you have a teacher at one end of a log and a student at the other." When a child begins piano lessons, he immediately has this one-to-one relationship with his teacher. It's a perfect way to bring another positive influence into a child's life to help him reach his highest potential.

Our objective is to open up a whole new "market" and reach the 85% of young parents who have not considered buying a piano. These parents don't realize that the goal is not to have their child play a song to perfection or to develop into a concert virtuoso; the goal is to develop well-rounded human beings capable of accomplishing tasks and feeling good about their achievements. And the earlier a child starts, the easier it is for these skills to become a permanent part of their education and future.

Enrolling children in piano lessons at an early age is an investment in their future. All of us in the music industry need to take the lead and convince young parents that even a few years of piano lessons can help ready children for school and the challenges they face ahead. Setting up piano lessons in day care centers would go a great way in improving learning ability in a child's life. We need to rally behind ideas like this and take our message to parents, educators, business and government agencies.

Learning music skills not only enhances a child's education, it also enhances his or her chance of success. A news report noted that 700,000 children dropped out of school in 1988. Just think how many of these young people might have completed their education had they been given a reasonable amount of preparation and self confidence that both a piano and piano teacher instill. All it takes is one little successful encounter to inspire a child to move on, to succeed again and again.

It is no exaggeration that our nation's future depends on our ability to motivate those uniformed young parents who hold the "keys" to their children's development. You, as distinguished members of the Guild have a wonderful opportunity to be of service in aiding the growth of our children. I am convinced (and I know you are) that the piano is an instrument that can promote keener minds, contribute to sharper learning skills and give our children a healthy dose of the "three C's" — concentration, coordination and confidence.

We need your expertise and guidance. By working together we can shift our focus from being executives and technicians to that of "educators" with

the power to influence a new generation of adults — to insure their children and ours a better education and a brighter future.

Here are four ways you can become fully involved and really make a difference:

1. Write to me, in care of Baldwin, and I'll send you a kit with articles and materials on the "power of piano lessons."
2. Once you receive your materials, share them with others in your chapter and the community to help spread the word about the "hidden benefits" program, especially to those not now in the market for a piano.
3. Join forces with piano dealers in taking a pro-active approach in meeting with PTA's, piano teachers and other community groups to build awareness of this valuable program.
4. Encourage your local chapter to write letters to senators and other prominent civic leaders to start a "grass roots" movement to bring this topical issue to the attention of key government officials. ≡

TUNING UP

Unisons

Rick Baldassin, RTT
Tuning Editor

The unison is by far the most important musical interval as far as piano tuning is concerned. It does not matter how good the temperament and octaves are, if the unisons are not in tune, the piano sounds awful. Unisons are where any signs of out-of-tuneness first show up. Even though the unisons are most important, because of their simplicity, we rarely talk about them. But just how simple are they, really?

You may recall from our previous discussions, that when a piano string vibrates, it not only vibrates as a whole in its entire length (*L*) but also in two parts of length 1/2*L*, and in three parts of length 1/3*L*, and so on. This means that this same string with frequency (*F*) also has frequencies 2*F*, 3*F*, and so on present at the same time. Musically, this creates what we know as the *overtone series*. Since piano strings are inharmonic, these frequencies are referred to as *inharmonic partials*, or *partials* for short, and the *overtone series* is sometimes referred to as the *partial series*. You may also recall that an *interval* comprises two notes, each of which has its own partial series, and that at some point these two series coincide with each other, creating what we know as *coincident partials*. Some intervals have only one set of coincident partials which can readily be heard. The fourth (4:3), major third (5:4), and major sixth (5:3) would be examples of such intervals. Other intervals have two sets of coincident partials which can be readily heard. The fifth (3:2 and 6:4), and minor third (6:5 and 7:6) would be examples of such intervals. Some intervals have multiple sets of coincident partials. The octave (2:1, 4:2, 6:3, 8:4, 10:5, 12:6, etc.) is a good example of such an interval. The unison, however, has the most sets of coincident partials (1:1, 2:2, 3:3, ..., 12:12, etc.), and in this respect is the most complicated of the intervals we tune.

Because the unison has so many coincident partials, it also has the greatest potential for the number of different beats that can be present, as each of the coincident partials has the potential for a beat if the unison is at all *out of tune*. This is why the unison is at the same time so simple and yet so complex. It is the easiest to tune, yet the hardest to make sound in tune. With thirds and fourths we need deal with only one or two beats, while with the unison there may easily be 16 different beats present, all at differing speeds.

I have read in certain publications that we piano tuners deliberately detune unisons because it makes the tone sound longer and better. It is true that a slight de-tuning does make the tone sustain longer, but this longer sustaining sound is in no way better. It just sounds bad for a longer period of time. Every good tuner I know strives to have unisons that are as beatless as possible. Let us examine a few reasons why.

First, if you think about it, the unison is the *only* interval on the piano that is capable of being tuned beatless. Every other interval will have a certain amount of beats present. Even the octave, which we often say we tune beatless, has beats present. Because of the inharmonicity of the piano, only one of the pairs of coincident partials can be in tune at a time. While we may tune the octave beatless at the 6:3 level, it will still be beating on the wide side at the 2:1 and 4:2 levels, and on the narrow side at the 8:4, 10:5, and 12:6 levels. When the octave is as smooth as possible, it is still beating. The other intervals are all beating because of equal temperament. The unison is the only interval with any hope of actually being tuned beatless. Second, if the unison is out of tune at all, you immediately have multiple beats present. To use the example from the review of Jim Coleman's class which appears in this issue, even if you only have 0.1 BPS at the fundamental (or one beat in 10 seconds), you will have 1.6 beats at the 16th partial, not to mention the 1.5 beats at the 15th partial, and so on. As you can see, the unison is tuned beatless out of necessity!

As mentioned above, the strings of the piano are inharmonic. This means the only way the unison can be tuned beatless is if each of the strings of the unison has the same inharmonicity. From a practical standpoint, this means each of the strings of a unison must be the same length, and the same wire diameter. In this case, when the strings are at the same tension (pitch), the inharmonicity of each of the strings will be the same. If for some reason the strings of the unison are not the same length, as was the case for some of the Steinway concert grands built in the 1920s, or if the wire diameters are not the same, as is the case whenever a piano which was strung with metric wire has a string replaced with inch wire, the unison cannot be tuned beatless. This phenomena is easily observed in the case of mismatched bass strings, such as when one string of a two-stringed unison is replaced with a so-called "universal" bass string. Since the universal string has a hexagonal core wire, this core wire has a higher inharmonicity than a round wire of the same diameter, because the "corners" on the hexagonal wire make it stiffer, by about 25%. In addition, universal strings generally have a larger core wire for the same outside diameter than do regular bass strings. For this reason, the universal string has a much higher inharmonicity than its neighbor, and in addition to sounding different than its partner, it cannot be tuned with it either. Other reasons for problems in

tuning bass strings include bass bridges which are not notched, making one string longer than the other, and unwrapped portions at the end of the strings which are of unequal lengths. These cases, while not as dramatic as the case of the universal string, nevertheless make these notes impossible to tune beatless.

It is fortunate for us that the tonal spectrum of the piano is such that in the treble, where minute differences in string length would make the most difference in the inharmonicity, the higher partials are not heard.

Knowing that we must tune the unisons beatless, how do we set about doing it? You may recall from our discussion of temperament tuning that it is more accurate to take the big interval (the octave) and divide it up into smaller intervals (thirds, fourths, and fifths) than to add up a bunch of small intervals to make an octave. In the same light, if we tune the unisons by listening to a high beat and zero it out, we will be much more accurate than listening to the fundamental and zeroing it out. As mentioned above, if we are off by only 0.1 BPS at the fundamental, there can be nearly a beat present at the eighth partial. If, on the other hand, we listen to the eighth partial and are off by 0.1 beats at this level, we will have only 1/8 this amount at the fundamental. Unison tuning requires "wide band" listening, as opposed to the "narrow band" listening that we do when we tune thirds and fourths. This is why it is difficult to tune unisons with an electronic aid, except in the very high treble. Since the aid can only listen to one pitch level at a time, it is difficult to insure that the unison sounds its best since only one pitch level is tested while many pitch levels are present, except in the high treble where virtually only one pitch level is heard.

When I tune the unisons, the second string is tuned to the reference, and the third string, if present, is then tuned to the other two. This is merely for convenience and saving time because of less manipulation of the mutes. When I test the unisons, I first listen to each note carefully to see if I detect any "phase shift" or very slow beating. If not, I move on to the next note. If so, I then need to determine which string(s) need adjustment. By inserting a mute against the right string, the left and center can be tested. Next, by inserting the mute against the left string, the center and right can be tested. I always mute each outside string before I change anything. The reason is that until you have heard both combinations, you can't know for certain what needs to be moved. Say, for example, the right string is muted, and a beat is heard between left and center. At this point, we do not know if the left string or the center string is out of tune. If we then mute out the left string, and no beat is heard between center and right, then we know the left string is out of tune with the other two. If, with the left string muted, we do hear a beat, it is possible that two of the three strings are out of tune, or that in fact none of the three strings is in tune. But it is also possible that with beats between left and center, and beats between center and right, only one of the three strings is out of tune. If the beat rate between left and center is the same as the beat speed between center and right, then there is a good chance the center string is out of tune. If, however, there is a different beat rate between the outside strings and the center string, you will want to test to see which of the three strings is correct before moving the others. Use the same tests you used when the note was tuned initially to determine this.

In the PTG test, the combinations of left and center, center and right, and left and right are all compared, and the points can really add up if you are not careful. If you test the unisons as above, isolating left and center, and center and right, making sure there are no beats in either case, you can rest assured there will be no problem between left and right, which is hard to test, as it is difficult to mute just the center string. Remember, if the note sounds good, the examining committee probably won't even measure it, as they are instructed to measure only those unisons which don't sound good.

Another helpful hint is knowing how to test the unisons by ear in the same way the committee will measure them during the test. Since the fourth partials are measured in octave three, and the second partials are measured in octave four, isolating these partials aurally will help insure that these specific partials are "most zeroed." A simple way to isolate the fourth partial is to play a test interval which employs the fourth partial of the note. Since the major third has the ratio of 5:4, if we test with a note a major third below the note we are checking, we will isolate the fourth partial of this note. For example, if we want to check note C3, we would simply play all three strings of note C3 along with one string of note G#2. If the fourth partials of note C3 are in tune with each other, then one distinct beat will be heard in the major third. If more than one beat rate is heard, or the beats sound kind of "mushy" then the fourth partials of C3 are not in tune with each other. Listen to C3 alone again, and make adjustments as necessary, then test again until a single, distinct beat rate is heard when all three strings of note C3 are played with one string of note G#2. Continue testing with one string of the note a major third below throughout octave three.

Since octave four is tested on the second partial, an interval which employs the second partial is needed. The ratio for the major 10th is 5:2, so if a test note a major 10th below the note being checked is used, the second partial of the note will be isolated. For example, if we want to check note C4, we would play all three strings of note C4 along with one string of note G#2. If the second partials of note C4 are in tune, then one distinct beat will be heard in the major 10th. If more than one beat is heard, or again, if the beat rate is mushy, then the second partials of C4 are not in tune with each other. Listen to note C4 alone and make any adjustments necessary, then test again until a single, distinct beat is heard between all three strings of note C4 and one string of note G#2. Continue testing with one string of the note a major 10th below throughout octave four.

Since it is possible to have a specific partial of all three strings perfectly in tune, and still have the unison sound bad, I am not sure I would recommend this practice for general use. Better to have the unison sound as good as possible. In the case of the exam, however, even if the unison sounds bad, it will measure OK, if the above procedure is followed.

In the tuning exam, unisons and stability are measured separately, but in the real world, unison stability is what really counts. You need to be able to tune the unisons perfectly, and such that they stay tuned perfectly during playing. The trick to this is making sure

the final movements made are very small. You may want to go back and read the material from last month on stability, as much of it applies to unisons. Taking the time to go over each unison carefully after settling everything by loud playing with the damper pedal depressed, can make the difference between your tuning being exceptional and just average. This settling will expose any unisons that would have gone out of tune after a short amount of playing, and careful listening to each unison will insure that the beat rates which were so carefully set in the temperament and octaves will be just as clean and clear with all three strings together as with just one string initially.

False beats eliminate the possibility of good-sounding unisons. Usually, false beats are the result of poor string termination. Make sure the strings have been lifted and leveled, and the strings have been seated on the bridge. Also, make sure the hammer is hitting all three strings at the same time. I remember tuning a piano some time ago which seemed impossible to tune clean unisons. I struggled and tuned them as well as I could. During the voicing process, I fit the hammers to the strings, and after doing so, the unisons sounded perfectly clean. Remember, all I did was fit the hammers to the strings, I did not alter the tuning at all. The reason for this is that if the hammer does not strike the strings at the same time, the strings will be out of phase with each other. This out-of-phase sound is very similar to the out-of-phase sound that is the result of the strings not being in tune with each other. If a unison still will not clean up, check to see if one of the strings has been replaced. If so, check to see if the wire is the proper size. Even if the size is off by a quarter-size (roughly the difference between metric and inch wire) the unison may be difficult to clean up. Difference of a half-size will make a big difference.

In some cases, even after you have done everything, the note will still not clean up. Something in the structure of the piano is causing this problem, and you will have to strive for the best sound possible under the circumstances. Sometimes tuning each of the outside strings individually to the center string produces the best result. Other times, tuning from left to right, or right to left is best. Other times I have found that tuning each string individually to the tuning aid produces a better result than any combination by ear. You will just have to experiment until you have found the best result. Experience will tell you when the note is as good as possible, and to move on. The danger here is to keep fiddling with the note until it sounds good, which then leaves the note in an unstable state. My advice is to pound on notes such as this with extra measure, to insure that your best found compromise will stay that way. These bad apples seem to have the ability to sound extra bad when they go out of tune.

In conclusion, because there are so many coincident partials present, unisons must be tuned beatless. Listening to a higher beat and zeroing it out is far more accurate than zeroing out a lower beat. It is important in the final checking of unisons to compare left to center, and center to right, and making sure both are beatless, thus assuring there is no problem between left and right. In the real world, it is unison stability that counts, and taking a little extra time to settle the unisons and recheck them can make your tuning a cut above the rest. False beats are the enemy of good sounding unisons. After all precautions have been taken, any false beats remaining must be dealt with in the best manner possible. Experience and experimentation are the key here. When the unisons are finally tuned, the beat rates so carefully set with one string of each note sounding, should sound as clean and clear with all three strings sounding.

Until next month, please enjoy Michael Travis' article on tuning unisons, as well as the reviews of some of the tuning classes from the Dallas convention. Please send your questions and comments to:

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PRACTICALLY SPEAKING

Grand Hammers Part 1; Selection And Boring

Bill Spurlock, RTT
Sacramento Valley Chapter

The hammer has a greater effect on the tone and touch of a piano than does any other action part, and we are fortunate that today we have many brands of high quality hammers to choose from when selecting replacements. However, unlike most other replacement parts, hammers require extensive preparation if they are to produce their best results. A new hammer has a certain *potential* for producing tone; to reach that potential it must be properly shaped, correctly installed, and custom-voiced for a given piano. This is challenging work but can be very rewarding because of the enormous improvements new hammers can make in a piano.

This is the first of three articles in which I will discuss selecting, preparing, and installing grand hammers. Skipping sheep raising and shearing, I'll start off this month with tips for choosing the right replacement hammers and discussion of some shop techniques that I use to do my own hammer shaping and boring. Next month I'll continue with tail shaping and weight removal, and in the last article I'll conclude with hammer installation.

First of all we might ask why anyone would want to do their own hammer tail shaping, boring, etc. when most suppliers can provide hammers ready to install. Cost is usually not a factor, since hammer suppliers charge very little for this work. I prefer to prepare hammers myself for several reasons: First, having to bore and shape tails on my own hammers means that I will have to think seriously about how to do this work. I will have to decide how much weight to remove from the hammers and how this will affect touchweight, how to arc the tails for best checking, what bore distance and tail length to use and the resulting effects on regulation, etc. Therefore I am likely to learn more about the effect of hammers upon touch and tone than if I left more of the decision making to someone else. Secondly, having the ability to do my own hammer shaping and boring allows me to custom-select the best hammers for a given job. I can first bore and shape sample hammers only from an unbored set, test them on a piano for appropriate weight, size and tone, and put them back on the shelf if they are not right for the job at hand. (If supplier-bored hammers turn out to be the wrong choice for a job, you might be able to return them to the supplier once, but don't make a habit of it or you may find your supplier's stock of good will running low.) Next, boring and shaping capability allows me to stock unbored sets of hammers for use on rush jobs. Finally, I enjoy doing this work myself. With some common shop tools and a few simple jigs, it is possible to do nice, uniform, neater-than-factory hammer shaping in a reasonable amount of time.

Selecting Replacement Hammers

Replacement hammers are available in a wide range of felt-types, sizes and molding types. Choosing the right hammer is the first step in doing a successful replacement job; listed below are some factors to consider when shopping the catalogs.

Tone: Probably the first feature we would look for in a hammer is its ability to produce the type of tone we think a given job requires. Experience working with a variety of hammers is essential here, as is advice from others who install a lot of hammers. Probably the most often asked question among technicians is, "What kind of hammers are you using these days?" The answer to this question must be weighed against the needs of the job at hand and with our own voicing preferences (are you more comfortable bringing soft hammers up or voicing harder hammers down?). To repeat myself, experience with different hammers is essential; using soft hammers will teach you how to get tone out of them, and vice versa. When someone says that Brand X hammers are too soft (or hard), they may be expressing more about their voicing preferences than about the hammers.

My own preference is for hammers that are close to the desired tone right out of the box, and that respond quickly to light filing and moderate amounts of needling. I feel that such hammers will usually be more stable in tone over their life span than those requiring very extensive voicing treatments, such as a great deal of needling or many repeated applications of hardener. Also, as a practical matter, I much prefer hammers that let me regulate and voice in one or two visits, leaving the customer with a finished piano and instant gratification. Hammers requiring repeated voicing treatments, such as successive applications of hardener, require multiple callbacks; this creates scheduling problems and extra expense for both the customer and the technician.

Number Of Bass Hammers: Replacements must have an adequate number of (longer) bass moldings; many brands come with plenty of extras, and some tenor moldings can always be lengthened if necessary.

Tail Length: Overall hammer length must allow for adequate tail length, as explained further on.

Width: Hammers must be the proper width to allow clearance in the angled bass and tenor sections. If the originals were too wide to clear adequately, your replacements will have to be more narrow, less angled, or more tapered on their sides. Some replacement sets are

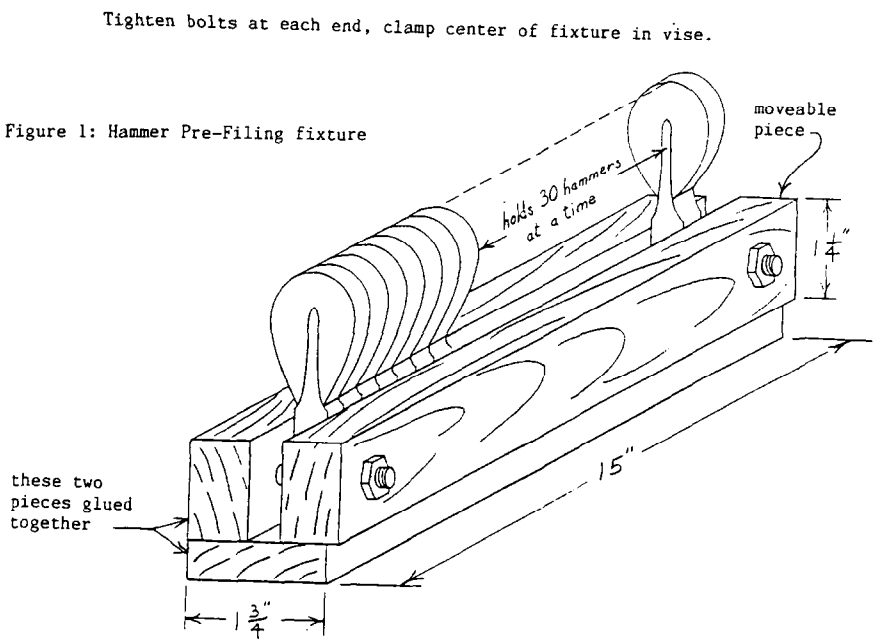


Figure 1: Hammer Pre-Filing fixture

available with the bass hammers cut more narrow than the rest of the set.

Size: Some grands have very little room between the belly rail and the capo bar in the top treble section, requiring a small treble hammer to clear the belly and still strike the string in the correct location. Pianos with agraffes in the top section are especially prone to this clearance problem. In the bass, overly large hammers can sometimes interfere with the damper wires as well.

Weight: The touchweight of an action results from the combined effects of friction, action leverages, and the weight of the various action parts — hammers in particular. To see how drastically hammer weight affects touchweight, measure the downweight and upweight on one note of a grand action or model. Then, with your one-gram weight sitting on top of the hammer, make the measurement again. You will find an increase of five to seven grams in downweight and upweight due to the one gram increase in hammer weight. Replacement hammers that are not shaped to match the molding and felt size of the originals can easily be three or more grams heavier than the originals, causing an unacceptable change in touchweight. Even if shaped to match the originals, replacements can be one or more grams heavier due to differences in felt density and type of molding wood. Therefore hammer weight needs to be considered when choosing replacements.

The "pound rating" of replacement hammers (16 lb., 18 lb., etc.) has little if any relationship to the weight of the individual hammers. "18 lb. hammers" just means that a sheet of felt weighing 18 lbs. was cut up to make approximately 15 sets of hammers. The actual weight of the individual hammers depends upon how much of the felt sheet was left over as scraps, how much underfelt was used, how wide the hammers were cut, what size and type of molding wood was used, etc.

This is not an article about touchweight; however, suffice it to say that adding lead to the keys to compensate for heavier-than-original hammers is treating the symptom rather than the problem in most cases. Such an approach gets your touchweight measurements back to normal, but at the expense of increased inertia (resistance to movement) in the action.

Some judgement is needed when estimating the weight of original hammers, since they are usually worn and therefore lighter than when new. The main factors to look for are estimated original felt size, hammer width, degree of tapering and arcing of the tails, and type of molding wood. Most original hammers on older quality grands were lighter in weight than many of today's replacements, due to very trimmed-down tails and, in many cases, mahogany moldings. Thus a piano manufacturer's current replacement hammers can be heavier than the originals, even if identically shaped, because of different molding wood. (The species of mahogany used in these older hammers was much lighter than that used currently, and saved about 3/4 gram per hammer over birch or maple.) Proper choice of replacements, together with proper shaping, can usually duplicate original weights. Ignoring the weight factor can result in a poor-playing action and betrays the original manufacturer's design.

Speaking of betraying the manufacturer, it is sometimes argued that we should use only the original manufacturer's hammers on their pianos. In this way the originality of the instrument is preserved, and, it is argued, "it will only sound like an Acme if Acme parts are used." In my mind this argument loses some validity in cases where we find that the maker's current replacement hammers are very different from the older originals or when they vary considerably from set to set. My personal feeling is that we should choose the replacements that most readily fulfill the potential of the maker's original piano design.

Preparing Hammers For Installation

Pre-filing and needling: Most sets of unbored hammers will come unfiled and will have cup-shaped edges due to the felt springing up where the individual hammers have been cut apart. To get a smooth surface we need to do an initial filing. This is most easily done before the hammers are hung by clamping them together one section at a time; figure 1 shows a simple wooden fixture that clamps in a vise to hold 30 hammers so they can be filed as one unit. Through experience with some firmer hammers we may know that some initial shoulder needling will be needed, even before we have installed and listened to them. If this is the case, this initial rough "bench voicing" should be done before any filing, because some of the cupping will disappear with the swelling of the felt after needling. Both needling and filing can be done more easily, faster and with no damage to the hammershank centers when the hammers are mounted in a fixture. The danger, however, is that you can go too far; be conservative unless you are sure of what the hammers will need.

Boring: For those interested in boring

Figure 2.

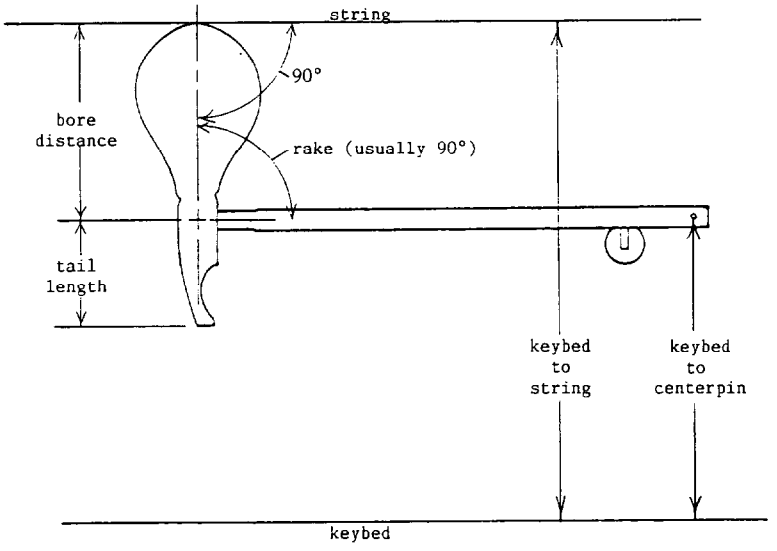
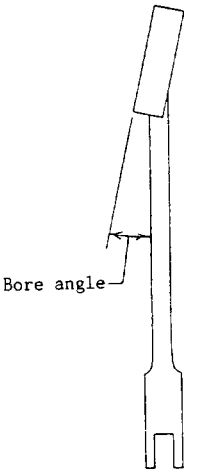


Figure 3.



their own hammers, I recommend Wally Brooks' hammer boring jig. It is easy to use and does a fast, consistent job on both upright and grand hammers.

The critical thing about hammer boring is not so much drilling the holes, but figuring out *where* to drill them. The following is a brief description of how to determine each measurement needed for boring. However, it is important to bore and install samples first to confirm that your bore distance, angles, etc. are correct before boring the entire set. These samples can be any extra hammers; they do not have to be from the set you will be using as long as they are the same overall length. I should also point out that the determinations and checks described below apply equally when ordering prebored hammers. You, and not the hammer supplier, are the one with access to the piano. Therefore you will get the best-fitting hammers if you analyze the action and give specifications to the supplier, rather than having them copy the originals or supply a generic set for a given model piano.

1. **Bore distance** — Most pianos are designed so the shank will be parallel to the keybed and strings when the hammer contacts the strings. Typically the hammer is mounted at 90° to the shank, so the hammer will therefore contact the strings at 90° (see figure 2). Thus to calculate your bore distance, just subtract the centerpin height from the string height in each section as shown. You may wish to add 1/16" or so to this figure to allow for future wear and filing.

Usually the string height will vary within each section somewhat; for instance it is common for strings in the low bass to be at least 1/8" lower than those in the upper bass. In such cases you can use the average string height of each section to compute a bore distance that will be an average for that section. In most cases this will work fine. However, if string heights vary considerably and a single figure for bore distance is used, action geometry will vary across each section as string height varies. This is because, with all hammers adjusted to the same blow distance, those with higher strings will sit higher, and vice versa. This means some capstans, wippens, and shanks will be operating through different arcs than others. To avoid this, and enable the action to be regulated as uniformly as possible, the bore distance can be varied with string height. As a rule of thumb, if I find string height within a section varying more than 1/8", I will divide that section into two or three parts with different bore distances for each part. In this way, all shanks will be level when at rest and level at string contact.

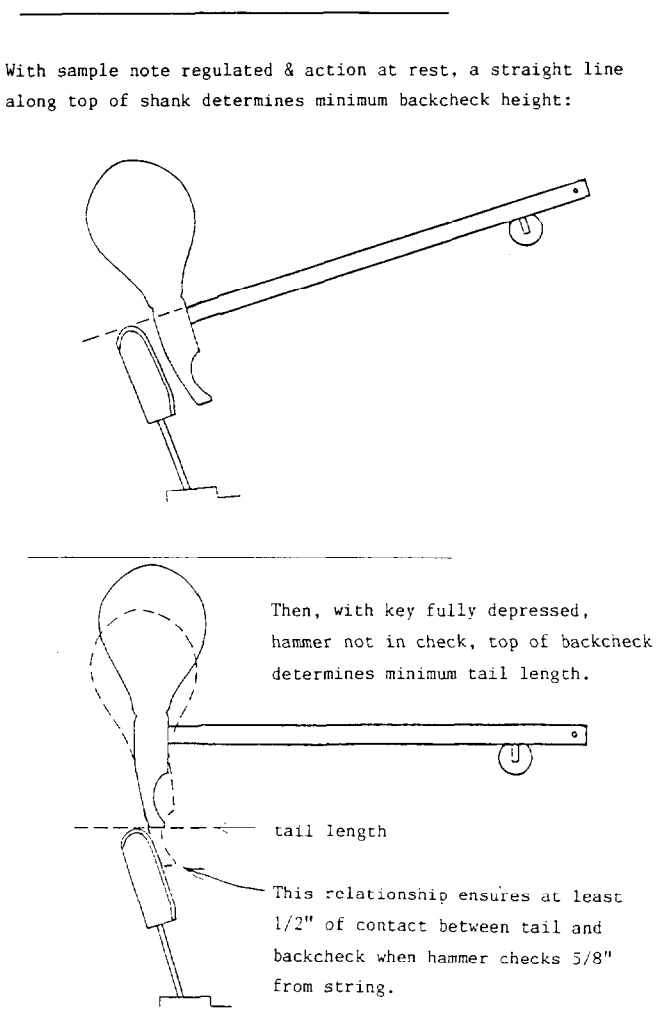
It is important to compare your calculated bore distance to the original; if the original bore distance is much different, there may be a good reason. Actions are full of compromises and practice must sometimes depart from theory for things to work. In some cases boring the hammers so the shanks rise all the way to level will not work because the drop and/or let-off screws cannot be turned upward far enough to regulate properly. In such cases a longer bore distance must be used so the shanks don't come up so high; the hammers are then installed slightly raked, rather than at 90° to the shanks, so they still attack the strings at 90°. Again, always install samples and test to make sure the action will regulate properly before boring a whole set.

2. **Rake** — See figure 2. As stated, 90° is normal, but some actions were designed with less than a right angle here. So far we have assumed the strings are parallel to the keybed. However, they seldom are, especially in the high treble. They may run either downhill or uphill toward the bridges. Therefore if it really is important that the hammers attack the strings at 90°, we need to rake the hammers accordingly. To check, rest a small square on the strings, with one leg hanging down between hammers. Lift a sample hammer up until it contacts the strings, and see whether the square lines up with a centerline on the side of the hammer. Check every octave or so and note the required rake figure on your worksheet to use when boring. Before you get too carried away, though, realize that very few pianos really have their hammers striking the strings at exactly 90°. It is also interesting that many old Steinway uprights had hammers that were raked severely downward for apparently intentional overcentering, and they sound quite good!

3. **Bore angle** — See figure 3. Theoretically, the bore angle should match the string angle, so the hammer strikes all strings of a unison at the same point along their length. However this is not always possible in practice because angling the hammers reduces the clearance between them, and a compromise must be made to allow adequate clearance. Notice whether the original hammers had a clearance problem. If so, and your replacements are as wide as the originals, you will have to use less angle or else do more tapering of the sides.

In most cases you will be duplicating the original bore angles. One easy way to do this is to adjust your boring jig directly off the original hammer/shank assemblies. With the Brooks jig this can be done by placing an original hammer

Figure 4: Determining Backcheck Height and Tail Length



and shank in the jig and adjusting until the shank is parallel to the drill bit. Masking tape can be stuck over the degree marker of the jig and settings for various sections of the piano marked as necessary.

Often the original tenor hammers changed angle abruptly in spots, rather than gradually straightening out with the strings. If so you can improve upon the original job by adjusting the bore angle slightly every three or four hammers, so the hammers fan out evenly. Besides looking nice, this eliminates clearance and spacing problems that can occur where angles change suddenly.

4. **Tail length** — Adequate tail length is necessary for proper checking. For an excellent discussion of hammer checking, see the Chris Robinson article in the December 1984 *Journal*. In that article, Chris discusses the relationship between tail length, backcheck height and backcheck bevel; I have reproduced the principles in drawing form in figure 4.

When evaluating tail length requirements prior to fitting new hammers, *I first determine proper backcheck height as follows*: Install a new sample hammer and regulate that sample note. With the action at rest, extend an imaginary line along the top of the sample shank and out beyond the hammer. This line defines the approximate minimum backcheck height. (I usually set my backchecks about 1/8" above this line.) *This backcheck height then determines tail length as follows*: The sample key is depressed slowly and completely, so the hammer goes through let-off, drop, and the slight rise after drop. (The hammer will be approximately 1/8" below the string height at this point). An imaginary horizontal line extended across the top of the backcheck then defines the minimum tail length.

As shown in figure 4, this relationship between backcheck height and tail length places the working parts of the hammer tail and backcheck in full contact with each other when the hammer checks 5/8" from the strings. Setting the backcheck slightly higher than the minimum and leaving the tail length slightly longer than minimum will ensure plenty of contact area for checking closer than 5/8".

If your replacement hammers have tails that are shorter than you would like, you can sometimes compensate by raising the backchecks. However, there is an optimum relationship of backcheck height to tail length that allows the hammers to check close to the strings without the tail dragging on the backcheck on its way up; the farther you get from this optimum the lower the hammers will have to check. (Another important variable here is the curve of the hammer tail, which will be discussed next month). In other words, increased backcheck height can only compensate for too-short hammer tails within certain limits. Sometimes pianos are seen with the backchecks so high the shoulders of the large bass and tenor hammers bump into the backcheck tops as the hammers fall to rest.

Longer-than-ideal tails will not cause a problem, as long as the tails do not contact the wippen flanges at rest. Excessive length can be removed using a disc sander as will be described next month.

With all of the above parameters determined, you are ready to bore the hammers. The Brooks jig comes with instructions which I will not repeat here. It is most easily used when mounted in a machinist's cross-vise as described in the March 1990 *Journal*, p. 23.

You will find it handy to have a variety of drill sizes so you can get the fit you want. A standard 7/32" (.219") drill will work for most shanks; however, the type of drill point, sharpness of the drill, spindle speed and type of molding wood will also affect the fit somewhat. Also useful are number drills #2 (.221") and #3 (.213").

I prefer a hole such that when testing for dry fit the hammers will slide easily onto the shanks but will not quite flop over when tilted. Later, after all tail shaping is done, I will ream as necessary to give a fit that allows easy installation and alignment when both hammer hole and shank are coated with glue.

Next month I'll continue with an assortment of jigs for arcing hammers tails, tapering sides, and removing excess from tails. ≡

At Large

Leverage

Alan Vincent, RTT
Young Chang America
Los Angeles Chapter

According to the "Technical Reference Handbook" by E.P. Rasis, a lever is defined as "a rigid body that pivots on a fixed body (fulcrum)." Leverage is defined as the location of weights or forces acting on that lever relative to its fulcrum. The greater the distance of a force from the fulcrum, the more effect that force will have on the second force acting on the lever on the opposite side of the fulcrum. A lever is classified as a simple machine along with the pulley, drum and inclined plane. Simple machines transfer force from one point of application to another. These mechanical devices are used to reduce the amount of work required to accomplish a given task.

Levers are grouped into three classes and all three are found in the grand action. The first-class lever (see drawing 1) would represent the piano key and wippen (in the wippen, one lever arm is folded over at the pivot and back on top of the opposite lever arm. This V-shaped lever within the wippen is not a physical lever but instead consists of lines from the wippen center to the capstan/wippen contact point and from the action center to the jack/knuckle contact point. This is the lever which is primarily responsible for the lift of the hammer to the string and only exists from the resting position until the contact of the jack tender to the let-off button and the repetition lever to the drop screw). The first class lever can be used either to change the direction of a force (as in the key) or to change the point of application of a force but maintaining the same direction (as in the wippen).

The second-class lever (see drawing 2) has the pivot at the end with the weight *W* acting on the lever at a point between the fulcrum and force *F*. This would be similar to the grand damper action lever with *W* being the lead weight installed in the lever and *F* the amount of force or weight encountered by the end of the key when lifting the lever.

The third-class lever (see drawing 3) is of the same configuration as the grand action hammer shank. *F* would be the amount of force exerted at the knuckle upon the jack when *W* was the weight of the hammer. The fulcrum point in this case would be the shank flange center with *b* being the distance from that center to the center line of the knuckle and *a* the center pin to hammer molding center line distance.

In each of the three lever classes, the solution to *F*, with a given *W*, *a* and *b*, can be determined by using the formula $F = W \times a / b$. Using this formula, we can trace the effect of a weight through the levers of each action part and also see how this weight is transferred from one action part to the next.

Leverage problems within the grand action can cause poor performance if they are not corrected. As we have discussed, it is important that we do not attempt to correct a leverage problem by applying a weight or friction based solution. Technicians most often encounter leverage problems in the form of the following: compressed action spread; improper strike line (hammers too far out on shank or too far toward the action center); poor knuckle construction and placement; uneven capstan placement.

Several of the above listed conditions can present themselves during the course of a hammer and shank replacement and action rebuilding job. Unless leverage problems are addressed, the performance of the action could be impeded to the point of causing customer dissatisfaction. When performing extensive action work for a customer, it is of the utmost importance that the action perform as intended and that the technician does not "build in" touchweight problems. Work of this type is time-consuming and expensive. If the pianist perceives the action performance as less than expected, then the technician will be forced to deal with a difficult situation and, at best, a loss of profits.

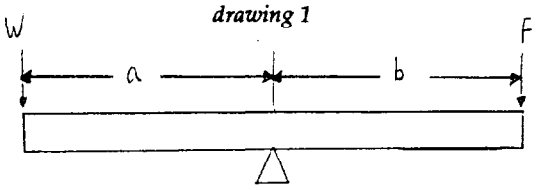
In order to understand piano action leverage, one must have a working knowledge of ratios and how they relate to weight. If a child's see-saw is 20 feet long and has a central pivot (two 10-foot lever arms), the ratio of this leverage arrangement would be 1:1 (read "one-to-one") another way of writing 1/1, one divided by one, or in this case, just one. This leverage ratio tells us that each of the two lever arms are the same length.

Because of the central pivot and therefore the equal length of the lever arms, the see-saw could achieve a state of balance with one person on each end and each weighing 100 lbs. If the ratio was 4:1 (i.e. one arm was 40 feet long and the other was 10 feet long), the see-saw could achieve balance with the 100 lb. person on the 10-foot arm and a 25 lb. person on the longer, 40-foot arm. The mechanical advantage of the increased leverage of the longer arm would allow the lighter weight to do the work necessary to balance the 100 lb. weight on the shorter lever. The above examples are based on a theoretical absence of friction at the pivot. The lower the friction within the pivot mechanism, the closer we could come to actually attaining the balance situations mentioned above. In fact, the given presence of friction would distort the ideal leverage ratios and result in balance weights different than those which we might expect from calculation. The presence of excess friction at the pivot would aid the lighter weight in the counterbalancing of the heavier

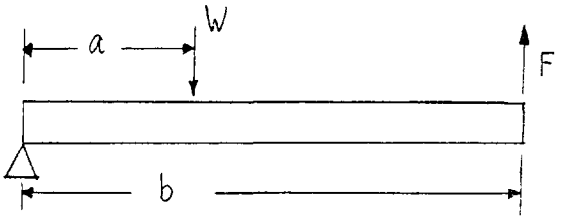
weight. In the 4:1 leverage system and with excess friction at the pivot, a condition of balance could be achieved with an even lighter weight than the 25 lbs. If enough friction were present at the pivot, a lever with a given weight acting on one lever arm could be balanced with little or no weight on the opposite lever arm.

The leverage ratio can also be used to determine the amount of vertical lift, or straight line movement, which the lever would achieve at the end (or some other point) opposite the force acting upon it. In our 1:1 see-saw, if one end moves up and down two feet, then the other end must move this same amount. This is determined by multiplying the leverage ratio by the movement of the first end of the lever (the input). One (1:1 equals one) multiplied by the two-foot movement (or input) would result in the two-foot movement (or output) of the opposite end of the lever.

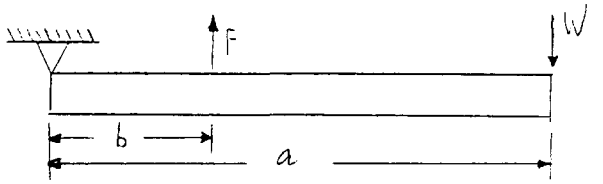
drawing 1



drawing 2



drawing 3



In the 4:1 lever, one unit of movement on the shorter lever would result in four times that amount of movement at the longer end. From a position parallel to the ground or base, if the shorter lever moved two feet before it contacted the ground, the end of the longer arm would then be eight feet from the ground.

Since we are dealing with a rotational movement of the lever, it is apparent that the ends (or any point) of the lever will be moving in a circular attitude. The length of the arc of travel (which is longer than the straight line or vertical movement) can be determined from the following formula:

C = Pi x Diameter x Angular Change / 360°

Where C is the length of the arc, Pi is 3.14 and the amount of the angular change in degrees is divided by 360°.

The length of the travel arcs can be helpful in analyzing the interconnecting circles within the grand action and thereby the frictional components present. The amount of vertical lift achieved by the levers of the action will be our main point of consideration at this time, however, as our intention is to lift the piano hammer up toward the strings (in the case of a grand action) by means of depressing the front of the key.

The keys of most grand pianos are arranged with a 2:1 ratio. The front lever is the distance from the front of the key to the balance rail pin and the rear from the balance rail pin to the capstan. A length of 20 inches would be representative of the average length of a grand key and the 2:1 ratio would mean that the front lever arm would be about 10 inches and the rear about five inches.

If the front of the key is moved .350", then the back of the key would also move that same amount. If we multiply the input (.350") by the ratio (in the case of levers within the piano action, place the output lever length in the front of the ratio; hence 1:2, which is .5), we can see that the vertical lift at the capstan screw is .175", or half of the input. Simple leverage ratio situations should allow common sense to provide the correct answer as to the total vertical lift. However, if the leverage arrangement is more complicated, the following formula can be used to determine the vertical lift: *Input x Ratio = Output*

Input (the distance the input lever is moved) multiplied by the ratio (divide the output lever length by the input lever length to determine the ratio) equals the output (the distance the output lever moves).

In a mechanical system consisting of several interconnecting levers, the overall output divided by the initial input will give you the overall leverage ratio or, in other terms, the mechanical advantage of the leverage system. The action of a grand piano is a 1:5 ratio. One unit of movement at the key will result in five times that movement at the hammer (with approximately 3/8" key travel the hammer will move 1 7/8").

Next month, look for more information on the 5:1 leverage ratio within the grand action.

We will trace a certain key movement through each of the action parts, determine their leverage ratios and our total hammer movement.

Learning To Pass The PTG Tuning Exam; Part 10: Unisons

Michael Travis, RTT
Washington, D.C., Chapter

A unison is the simplest of intervals, and one might suppose it's therefore the easiest to tune. Not necessarily! For the novice, it can be the most difficult to get right, because it involves not only hearing very slow beats and mentally subtracting any noise that might be present in the sound, but also making very small adjustments that stay put. Skill in unison tuning (including as it does good hammer technique and string stabilizing skill, as well as a discerning ear) is essential to fine piano tuning. You should practice and get it right before going on to learn any temperament system.

Poor unison tuning can be painfully obvious. When an electrician installs a light switch and you turn it on and it works, you're ready to pay the bill (shocking though it may be). However, if you flip the switch and the light doesn't comes on, there's obviously a problem. Unisons are something like that; musically, they work or they don't. The most finely crafted temperament won't redeem even a few strategically located wavy unisons. And if you ever had the experience of sitting out in the audience listening to your own tuning, you'd make real sure after that to double-check those unisons. One lousy string on A4 can ruin your day, believe me.

I've heard that piano tuning is on some list as a low-stress job, and compared to some other occupations such as, for example, tightrope walking, I guess it's true. If you can master the art of consistently tuning rock-solid, pure unisons, your stress level should be even lower, since minor defects elsewhere in your tuning are not so easily perceived. Not that you shouldn't worry about them, however!

Let's review how we test unisons in the exam, and consider a few suggestions for improving your unison tuning efficiency and practicing in advance.

Unisons in the Exam

This is the last section of the exam if you're tuning aurally only. At this point we have just finished administering the stability test, and now we're ready to have you tune the outside strings to the previously tuned (and now more stabilized) middle strings of the 24 midrange notes, C3-B4. There is a 1/2-hour time limit for unison tuning, and you must tune your unisons aurally only; examiners are required to remove all visual display tuning aids (VDTAs) from the room for the duration.

An examiner will first check midrange unisons to make sure they are all slightly out of tune for you, if this hasn't been done already during the initial detuning. When your time is up the examiners will re-enter, set up the measuring instrument, and listen closely to your unisons, playing fairly lightly and evenly up through the midrange. Any that sound "suspicious" (out of tolerance) get a mark on the test record for measurement. Once we've located the "suspects" aurally, we go back and measure and record each of their individual strings, using the standard test partials: fourth partials in octave three, and second partials in octave four.

As we progress, we compute cents differences between each of the three two-string combinations per unison and assign whole-number points according to the tolerance of one point per 1.0 cent. Differences of 0.9 cents or less are 0 points, those of 1.0 - 1.9 cents are one point, etc. When we've measured all the suspect unisons and figured the points, we transfer the sum to the score form, where multiplying by two and subtracting the product from 100 gives the final score for unisons. To pass at 80% or better you can have no more than 10 penalty points total in unisons, which is a fairly liberal allowance.

Often, a unison will have a noticeable wave or roll in it, but may still pass, perhaps just inside the tolerance. Very occasionally, a unison will sound objectionable but still be within the tolerance when we measure it. This usually means that either all three strings are not the same wire size, or that there is a termination problem, and such conditions somehow escaped attention in the initial inspection of the piano. In such a case you would normally be given the benefit of the doubt and not penalized. If you run across one of these untunable notes, please do call it to the attention of your examiners and avoid spending an excessive amount of time on it.

Make a Practice Run

You can test a sampling of your own unisons before exam day or have them tested by a cooperative colleague, and make sure they are all within tolerances. There are at least two ways to do this. First, and perhaps best, tune a piano for an RTT, and get a critical evaluation (hint #1). Try to make sure the RTT listens very slowly, closely and carefully to your unisons without playing hard, and points out ones that may need improvement. In addition, you may want to subsequently give all the notes several test blows and then recheck the unisons for stability. Though we don't test the stability of unisons in the exam, you should be able to tune them that way as a matter of course.

The second, perhaps more objective evaluation is one I described earlier, as hint #7: if possible, practice unisons before the exam by measuring each of the three strings in a goodly number of your aurally-tuned unisons (whether

they sound good or not) to be sure you're well within test tolerances. This is a valuable reality-check if you have access to an accurate VDTA. Shoot for unisons whose strings are all within about 0.3 cent of each other.

We will allow you to use the available mutes any way you like for unison tuning, so you might want to insert a strip mute between every other unison ahead of time. This allows you to work more efficiently since you don't have to move mutes as much. For example, assume that you insert the felt between C3 and C#3 strings, but not between C#3 and D3, then again between D3 and D#3, and so on. With this alternate muting pattern, you can rapidly unison tune the left string of C3, the right string of C#3, the left string of D3, the right string of D#3 and so on up through B4. Then you step on the sustain pedal (to avoid tearing the trichord damper felt) and pull out the strip all at once, and start up the scale again from C3, tuning the strings previously strip muted. Once you've done this a few times in practice runs, you'll learn the simple zig-zag pattern of tuning pins to follow, the front tuning pin on one note, followed by the rear tuning pin of the next note. This is one way to save time tuning unisons, which might be important, if like me, you're a member of the "society of slow tuners". In any case, don't forget the following advice, which to readers of these articles should now sound familiar:

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

What Does It Mean?

A good score on the unison section of the PTG Tuning Exam does not necessarily correlate to skill in unison tuning throughout the piano, nor does it necessarily mean that your unisons are stable. The midrange is typically the easiest to tune unisons in, presenting less of a challenge than, say, the top octave. And a lack of stability is most often perceived as a unison that goes out of tune when stressed by loud playing, which we don't do.

Since we only test midrange unisons, and we do not test them for stability, I must caution you about interpreting a good score in unisons. In the real world, as you know, unisons and stability are often "measured" simultaneously, and defects in one are often ascribed to the other. You may be able to tune unisons that meet our exam requirements, but that only shows you can hear what you're doing. The stability portion of the exam shows the degree to which you can tune solidly, irrespective of whether the temperament or unisons are acceptable. The beauty of this exam is that it does isolate unisons from stability and temperament, yet to interpret results in one area without considering the others does not give you an accurate picture of your skill — that's why we require a passing score in all areas rather than just an average. We assume that if you can pass unisons in the midrange, you have at least an "entry level" ability to tune unisons beyond the midrange. If you pass on stability as well, we assume you have the ability to tune stable unisons, even though we don't check this directly.

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

The Unseen Artist in Recital

In your everyday work, the last thing you should do before packing away your tuning tools is to make sure your tuning is stable. This is just a final overall check, since stability is best achieved as you tune. Nevertheless, you might want to try this: press the sustain pedal and either play loud octaves up and down the scale, or use Norman Neblett's technique of non-musically slapping up and down the keyboard, but whatever you do, get those strings shaking and the soundboard quaking. Then release the pedal, and listen to unisons again, correcting any problems that may have arisen.

I must say at this point that if there's anyone around, this test could get them excited, so use some discretion. One time when I was doing a final unison-stability check on a Steinway B at Montgomery College in Rockville, MD, one of the piano professors heard the commotion in the recital hall and poked his head in to find out who was getting such a fine strong sound out of the piano. He complimented me on my technique, said he thought I sounded like a concert pianist practicing some modern music, and for a moment there wondered who the composer was!

Conclusion And Postscript

I'm not sure if I've done this subject justice, since one cannot overemphasize the importance of good, solid unisons to a good sounding piano. Unison tuning is the foundation of piano tuning; one way or another, we always come back to that. Unisons are one of the first things we notice about a piano, and one of the last things we should check before leaving it. Even octaves and other consonant intervals may be considered as kinds of unisons, in this case among one or more of the coincident pairs of partials. Passing the unison part of the exam requires only that you tune clean-sounding unisons over the 24 notes of the exam midrange. Make sure you can at least do that before taking your test.

If you tuned aurally only, the exam is finished upon completion of unison scoring, save for the formalities of paperwork. Be sure to get your reclassification form signed by the CTE in charge if you passed. If you used a VDTA during any of the preceding sections, the piano will again be detuned and you now will have to repeat your tuning of octaves three and four aurally only, with a time limit of 45 minutes. Be sure you have an aural pitch source with you to perform this part. Since my advice for passing the exam in pitch, temperament and midrange appeared in earlier articles of this series and would be the same, I will not be writing a separate article on the aural repeat section.

However, because nearly a year has gone by since this series began, I will be preparing a summary and review article, which I hope to have ready the month after next, taking it one more time from letter A, so to speak. I regret to say that that will be my last *Journal* ar-

ticle for the time being, since other obligations are demanding my attention.

I will always be grateful to Rick Baldassin for giving me this opportunity to write, and also for having himself provided so much of the recent source material I relied upon. We are all indebted to this man of many talents, and should support his continued work as *Journal* tuning editor in every way we can.

I'm sure I've gotten at least as much as I've given in these pages, and though it may all be far downstream and forgotten a few years from now, I think it was worth the effort if I've helped a few people up the ladder.

See you in a few months. ≡

ECONOMIC AFFAIRS

Understanding Workers' Compensation

Janet Leary, RTT
Cleveland, OH, Chapter

To the best of your ability, you must provide for yourself or your employees an environment free from accidental injury or occupational diseases in the workplace. In the late 19th and early 20th centuries, due to changes in the workplace environment (brought on by the Industrial Revolution) traditional tort and contract law did not adequately charge industry with the economic costs of the human injury it caused. The workers' compensation system was developed over time to balance out these inequities.

Workers' compensation is a label given to many systems throughout the United States by which workers who sustain injury due to their jobs are compensated for their disabilities (to the extent that the disability adversely affects the individual's ability to earn a living), medical costs, or cost of rehabilitation. They may also receive scheduled benefits for loss of limbs, eyes, etc., and their survivors may be compensated for loss of financial support and should be paid for burial and miscellaneous death expenses if the worker is killed in a work-related incident.

Most of the types of compensation available in workers' compensation systems are for loss of earnings or earning capacity and are usually paid or accrued on a weekly basis. Disability compensation is calculated generally at 66-2/3% of the claimant's weekly wage at the time of injury.

Death benefits available to a surviving spouse usually end when the spouse remarries. Surviving childrens' benefits end when the child is no longer considered a minor, or when they become a full-time student beyond high school.

The variance of benefits from state to state are considerable. Alaska's maximum benefit is 200% of the state-wide average weekly wage with no ceiling. Mississippi, in comparison offers the surviving spouse and children a maximum benefit of $140 a week.

If you are a civilian employee of the U.S. government, you will be covered by a Federal workers' compensation program. As self-employed business people we will either enroll in a private plan developed in compliance with our individual states' workers' compensation laws, or in the limited number of states where private plans are not permitted we must participate in a state fund. In many of the states which do not allow private insurance plans, large employers are permitted upon approval to self-insure.

Laws enacted by individual states governing workers' compensation plans vary from state to state. Some jurisdictions demand that the *cause* of an injury be accidental to be compensable while other jurisdictions demand that the *effect* be accidental, or that both cause and effect be accidental.

In states (excluding South Carolina and Texas), workers' compensation coverage is required for any employer with a minimum number of employees. Some states' workers' compensation plans cover only employees — not independent contractors, casual or domestic workers earning less than a specific calendar wage. In many states (such as Ohio, Kansas, New Mexico and New York) private workers' compensation plans are elective as to partners, sole proprietors, or self-employeds. While New Jersey chooses to allow workers' compensation as elective to all private employees, and compulsory to all public employees.

In many jurisdictions workers are covered by operation of law even if an employer has failed to obtain coverage. In a situation where their employer does not participate in a plan, the employer may lose their common law defense in a lawsuit, may have to pay back premiums, may be liable for 100% of the workers' rightful claims, and then be subject to various penalties (including the possibility of criminal penalties) depending on the particular state laws.

Most states provide compensation and benefits for scheduled losses due to: 1. temporary total disability; 2. temporary partial disability; 3. permanent disability; 4. permanent total disability.

Accident/Injury Claims

The most common worker's compensation claim is the accident or injury claim. In the past, accidents had to be sudden, unexpected, or out-of-the-ordinary occurrences. These requirements were intended to eliminate coverage for intentional injury and disabilities due to occupational diseases. Presently many plans are eliminating these strict requirements, thus eliminating the distinction between injury and occupational diseases. This broader scope is leading to compensability granted simply on the grounds that the injury or disease was caused by employment. The operative terminology here is, *"in the course of and arising out of employment."*

Besides the obvious, what other situations may be covered "in the course of and arising out of employment?" 1. *Strezelecki v. Johns-Manville Products Corp.* The New Jersey Supreme Court ruled in favor of the defendant in allowing a death claim when an employee was killed in an auto accident on his way to study for university classes that his employer paid for, and that were in furtherance of his career. In our profession, we may substitute PTG conventions for

the university setting depicted in this example.

The above mentioned court ruling and other examples I will refer to may not stand up in your jurisdiction. Why? Generally, the more heavy industrial states have the most comprehensive plans affording workers the greatest coverage, and since every state has its own garden variety of workers' compensation statutes, a claim in one state may be ruled entirely different if tested in another state.

2. Another gray area in reference to compensability is when there is *no fixed site of employment* (continually traveling between jobs), or when the claimant works out of their home. The confusion is in determining when employment begins and when it ends. Until you reach your work place (which may be your first appointment, depending on how you structure your business) your auto mileage expenses for tax purposes and workers' compensation coverage may not be covered.

In our profession, even though the site of work varies, it is important to declare your home (if you do not have a separate shop arrangement) as "the fixed site of employment" from which all your jobs originate, and from which you retrieve your tools and business auto at the beginning of your work day, and drop them off at the end of the work day. This work site is the place from which your appointment schedule is retrieved in the morning and where all receivables and records of the day's activities are submitted.

What about injuries that are the result of safety rule violations, or intoxication? If you recklessly and willfully disregard safety guidelines, some jurisdictions may not compensate the injury or accident. In *Mills v. Virginia Electric Co.* the Virginia Supreme Court disallowed a claim for an injury because the court felt the claimant deliberately disregarded a safety rule that was meant to prevent the type of injury that resulted.

If you intend to make a workers' compensation claim in a small shop setting, obvious disregard for safety precautions such as using power tools while intoxicated, refinishing a piano without proper ventilation while lighting a pipe, or driving your vehicle to appointments under the influence of prescription drugs that warn you not to drive a motor vehicle, may set the scenario for a denied claim depending on the rulings in your jurisdiction. If the only standard applied is that the injury is "work-related" you're home free.

As far as the topic of intoxication is concerned, in the absence of a statutory provision, some jurisdictions may determine that the intoxication was such that it removed the worker from the course of employment because it was an intervening cause for the injury, thus denying the claim.

Pre-Existing Conditions

If you choose to enroll in a workers' compensation program, you may wonder if pre-existing conditions will be covered. Generally if you suffer from an injury that aggravates or exacerbates an already existing medical condition the injury is fully compensable. The underlying principal is that the employer hires its workers as it finds them — medically "as is."

This topic is pertinent to those technicians who suffer from carpal tunnel syndrome, rotator cuff problems (often mimicking carpal tunnel symptoms), or hearing impairment and ringing ears from tuning pianos at dB readings of 90 to 105dB for too many years. In the absence of any special statutory provision, workers' compensation covers these conditions at varying levels with special restrictions applied to hearing impairment.

The most widespread occupational hazard facing American workers is noise. The EPA maximum standard of sound intensity that an adult can be exposed to for eight hours a day throughout a 40-year career without experiencing any hearing loss is 75dB. OSHA estimates that about seven million production workers are exposed to levels of 80dB or higher, and 5.1 million work in an environment exceeding 90dB. If you have the availability of a dB meter, check the levels on your home piano to see what you're subjecting yourself to while tuning.[1]

Occupational Disease

Hearing loss is considered an occupational disease in some states, while Pennsylvania treats it as an injury on a "repeated trauma" basis. New York has separate statutory provisions along with a myriad of restrictions and guidelines, while many states such as Wisconsin do not compensate for temporary total or temporary partial occupational deafness. Ohio honors claims only for total loss of hearing in one ear.

OSHA's Noise Exposure Limits[2]

These are occupational exposure limits for workers with unprotected ears.

Noise (dB)	*Permissible Exposure (hours & minutes)*
85	16h
87	12h 6m
90	8h
93	5h 18m
96	3h 30m
99	2h 18m
102	1h 30m
105	1h
108	40m
111	26m

The ailments that are classified as an occupational disease vary from state to state. Each jurisdiction can include or exclude any occupational disease it so chooses. Some states provide schedules and lists of the diseases they cover while others do not. Examples of typical occupational diseases: pneumoconioses (dust exposure); hearing loss, silicosis (silica exposure); radiation illness; asbestosis; allergies; mental stress-caused illness. In our profession, some examples of occupational exposure may result from refinishing pianos, hernias from piano moving (classified as injury or occupational disease depending on the jurisdiction), or dust exposure from woodworking without dust masks.

The states of Montana, North Carolina, Ohio and Utah provide that those who suffer from occupational disease may receive *"change of occupation"* awards. To qualify it must be medically recommended that the claimant change their occupation, and actually make the change. Awards and/or weekly benefits and restrictions vary from state to state.

The amount of medical coverage available under workers' compensation for an occupational disease is unlimited in every jurisdiction of the United States.

How Much?

All this information is interesting, but you're probably wondering how much it costs for coverage. Since I live in

Total Disability Benefits

The following are some typical benefits for the listed states. Percentage of wages is the maximum you may be eligible to receive. No disability program matches your present wages 100% since it would eliminate the incentive to return to work.

State	*% of Wages*	*Max Wkly Pmt*	*Min Wkly Pmt*
California	66-2/3	$224.00*	$112.00
Connecticut	66-2/3	693.00**	79.40
Florida	66-2/3	362.00**	20.00
Georgia	66-2/3	175.00*	25.00
Iowa	80% of spendable earnings	684.00**	105.00
Kentucky	66-2/3	343.02**	63.31
New Jersey	70	342.00**	76.00

**Nations Business* March 1990, other stats as of January 1, 1986.
***Monthly Labor Review* January 1990, increases during 1989.

Income Benefits For Scheduled Injuries*

State	*Hand*	*1st Finger*	*Hearing One Ear*
Arkansas	$23,100	$5,390	$6,160
Colorado	8,736	2,184	2,940
Connecticut	100,044	21,438	20,644
Washington D.C.	105,335	19,858	22,448
Michigan	80,625	14,250	Based on loss of earnings
Ohio	31,938	6,388	4,563
Utah	36,120	9,030	3,583

**Statistics as of January 1, 1986*

Assessment Chart

1.	Basic Rate	.059387	X	$40,000	=	$2,375.48
2.	Disabled Workers Relief Fund	.001	X	40,000	=	40.00
3.	Administration	.0022	X	40,000	=	88.00
	Total Cost					*$2,503.48*

Ohio, I will use my state as an example. I found the number for the workers' compensation bureau in the state government pages of the phone book. I chose the auditing and underwriting department and gave them a call.

In Ohio, partnerships and sole proprietors must enroll in Plan 116 which separates us from corporate plans. Since there are not specific classifications and information on piano technicians, we are grouped together in the "wooden musical instrument repair and manufacturing" classification. I was told that our rate is one of the more desirable rates — comparatively speaking. We are assessed per $100 of payroll. In the Assessment Chart above, $40,000 is a payroll example, and there are three areas of assessment shown.

As you can see, workers' compensation is quite costly. You can bring down the rate if you show limited claims, but in Ohio the rate remains the same for five years after which your business is up for review with the possibility of decreasing your rate depending on your claim history.

Over time, however, the rates continually increase instead of decrease:

Florida — The state of Florida, for instance, approved as of January 1, 1990, a 36.7% rate hike for workers' compensation which is following a 25.8% average increase just a year earlier.[3]

Maine — Maine's average rates have increased 60% since 1987 and a proposed 26% hike is pending.[4]

Nationwide — Nationwide estimates of costs as a percentage of payroll are expected to double within the next five years. The National Council on Compensation Insurance, which represents workers' compensation insurers in setting rates in most states, proposed rate increases in 1989 in excess of 20% for 14 states and increases of over 10% in 16 states.[5]

One of the major factors affecting skyrocketing workers' compensation rates across the country are medical costs which are 40% of benefit costs — up from 33% in 1980. A workers' compensation client is like a "free lunch" to physicians and occupational therapists since there hasn't been adequate oversight to control medical costs. As long as medical costs keep increasing, so will your workers' compensation premiums.

The average cost of a claim in relation to lost time at work is also increasing. In 1980 it was $6,000, in 1989 it was up to $10,000.[6]

If you become totally disabled you are still expected in Ohio to pay into workers' compensation, even though you have no payroll and are receiving disability benefits. The minimum you must declare is a payroll of $2,600/six months in order to retain coverage.

Since workers' compensation is so costly, my next question was, "Can I take a business deduction for workers' compensation payments on my Federal tax return?" The IRS agent on duty referred me to Publication 334, page 59, which he said excludes workers' compensation expenses as a business deduction for sole proprietors or partners in a partnership. You can deduct the expenses on employees. The agent saw no exclusion listed for a Subchapter S corporation principals.

Why would an employer want to participate in a workers' compensation program? Paying workers' compensation premiums generally allows the employer immunity from lawsuit for an injury. Exceptions are injuries not covered by the program (depending on your jurisdiction), intentional acts of negligence on the part of the employer, or when an employer takes punitive action in retaliation for an employees' filing a workers' compensation claim such as a demotion or discharge.

Since piano technicians are generally owner/operators of one or two-person businesses, the IRS most likely looks at workers' compensation as simply a disability plan because we would not bring suit against ourselves nullifying the advantage of immunity from suit.

In the interest of making best use of your money, a wise business person should call their worker's compensation bureau, find out what it would cost to participate, ask for a detailed summary of benefits, and compare the plan dollar for dollar with a disability plan. Since medical expenses are still an issue, you should then review your hospitalization plan. Many good business hospitalization plans have "24-hour coverage" on principals if they are not required to have coverage under workers' compensation in their state and do not have such coverage.

Footnotes

1. *Science News*, Volume 121, May 22, 1982, p. 347
2. Ibid, p. 348
3. *Nations Business*, March 1990, p. 20
4. Ibid, p. 23
5. Ibid, p. 20
6. Ibid, p. 21

References

Monthly Labor Review, U.S. Department of Labor and Bureau of Statistics, January 1990, p. 57

"Workers' Compensation" by Jeffrey V. Nackley, copyright 1987; Library of Congress Catalogue Publication

Science News, Volume 121, May 22, 1982, p. 347

Nations Business, March 1990, p. 20-26

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Coming Events

Sept. 15, 1990	**Rhode Island One Day Seminar** Narragansett Christian Brothers Center Contact: Kirk Russell; 37 Liberty Street; Wakefield, RI 02879 (401) 783-1966
Sept. 28-30, 1990	**Florida State Seminar** Hilton Hotel, Pensacola, FL Contact: Danny Lyons; 1224 E. Cervantes Street; Pensacola, FL 32501 (904) 438-8969
Oct. 4-7, 1990	**Ohio State Conference** Days Hotel, North Randall (Cleveland, OH) Contact: Bob Russell, 1414 Lander Road, Mayfield Heights, OH 44124 (216) 449-5212
Oct. 15, 1990	**Washington D.C. One Day Seminar** Smithsonian Institute Contact: Colette Collier; 12113 Somersworth Drive; Silver Spring, MD 20902 (301) 649-7330
Oct. 18-21, 1990	**New York State Conference** Holiday Inn, Binghamton, NY Contact: Donald R. McKechnie; 1660 Slaterville Road; Ithaca, NY 14850 (607) 277-7112
Oct. 19-21, 1990	**Wisconsin Days** Yahara Center, Madison, WI Contact: Norman Sheppard; 5715 Cedar Place, Madison, WI 53705 (608) 233-3844
Oct. 27, 1990	**Kansas City One Day Seminar** Meyer Music, 1512 Highway 40, Blue Springs, MO Contact: Lucy Urlacher; 4215 Terrace; Kansas City, MO 64111 (816) 561-2465
Nov. 1-4, 1990	**Texas State Association** El Paso Airport Hilton, El Paso Contact: Guy Nichols; 901 S. Main; Las Cruces, NM 88005 (505) 524-1465
Nov. 9-10, 1990	**North Carolina State Seminar** Brownstone Hotel, Raleigh, NC Contact: Tom Karl; 20 Mayo Street, Apt. F-6; Raleigh, NC 27603 (919) 832-3149
Jan. 4-5, 1991	**Arizona State Seminar** Tempe, AZ Contact: Gary Miles; 3722 W. Port Royale Lane; Phoenix, AZ 85023 (602) 942-2588
Feb. 22-24, 1991	**California State Convention** Radisson Hotel, Sacramento, CA Contact: Patrick C. Poulson; 15474 Airport Road; Nevada City, CA 95959 (916) 265-6739
July 13-17, 1991	**34th Annual PTG Convention & Technical Institute** Adams Mark Hotel, Philadelphia, PA Contact: PTG; 4510 Belleview, Suite 100; Kansas City, MO 64111 (816) 753-7747

AUXILIARY EXCHANGE

President's Message

If every PTGA member could have been present at the 1990 convention in Dallas to hear the two young men who were recipients of the Auxiliary Scholarship this year, you would have been as pleased and thrilled as we who attended both the Opening Assembly and the Auxiliary Tea were.

Eric Thompson and Jimmy Lent demonstrated so well by their musical skill and style at the piano just how important all the financial contributions and fundraising support for our Scholarship Fund are. Not only do we honor and further the careers of these talented young people, but we are promoting and supporting the work of our spouses by showcasing some of the upcoming concert artists of the future.

You can be proud, too, of your PTGA Board and your fellow members who are working so hard to continue to promote and further friendship, education, and good will in the world of music. Phyllis Tremper is performing "good deeds" as our new vice president and membership chairman, while Ivagene Dege has already sent out her first copies of minutes to the Executive Board of PTGA. Barbara Fandrich continues her fine work as PTGA treasurer. Hold Marge Moonan, corresponding secretary, in your good thoughts. Among all her other duties Marge keeps in touch with our Honorary Life Members and chairs the Sunshine Committee. We would be lost without our best supporter and the good words, advice and input of our immediate past president, Agnes Huether. We can all be proud of our PTGA Executive Board.

You should also be aware of recent appointments which have been made. Julie Berry has graciously agreed to carry on as Auxiliary Exchange Editor to replace Agnes Huether, who has done such a splendid job for so many seasons. Julie, a former Auxiliary Exchange Editor, will continue for us until someone with editorial know-how volunteers for the job. Sue Speir, one of our Dallas ladies, will edit the newsletter. Ginger Bryant will continue doing her "Bravo" job as scholarship chairman as well as work on the bylaws committee with Helen Desens and Bert Sierota. Ruby Discon will do the decorations for the Philadelphia Convention, and didn't she do a smashing job of the pretty silk flower table decorations for the Auxiliary Installation at Dallas?

Randy Potter will provide accordion entertainment for the Installation Luncheon at the 1991 convention in Philadelphia. And didn't we all go wild over his accordion music at the Dallas Luncheon? We haven't forgotten our special Ginny Russell who continues to do so many wonderful things for us. Ginny will continue as our archivist, going over and assimilating the tons of material to do with our past history — scrapbooks, photos, articles, etc. Does anyone have any more items of interest for her? I will update you as I add new appointees or fill in any I may have forgotten. If I have done so, please forgive and let me know.

What I am writing about, between the lines, I suppose, is cooperation. With every member and officer of the Auxiliary, the help, contributions, and best wishes of all, this organization works well and will continue to grow. Send us your ideas, even constructive criticism is helpful. Perhaps it is most helpful of all.

Arlene M. Paetow

From Our Senior H.L.M.

Dear Friends and Fellow Travelers,

I hope that all of you have read Julie Berry's article in the June 1990 *Piano Technicians Journal*. It is an article full of meat and substance. Them's my feelings exactly! If you do not keep moving, you're dead!

From the first of the piano technicians' conventions, it was seen that the convention was to be a combination of convention and vacation for the family. If Dad went to the convention, Mama and the kids "saw the town." If there were no kids, Mama sat in the lobby of the hotel and wished for the whole thing to "get over with." In the meantime, she tried to get her husband to go to a movie with her (something she would do by herself if she were home, but was afraid to go out in the big city.)

As a consequence, the convention planners began urging the women to get organized and keep those unhappy women too busy to complain. That was in the American Society of Piano Technicians days. That's where I came in.

Our children, George and Dorothy, were graduating from the University of Houston, and we told them we would give them the trip to the far North for a graduation gift. We would go to the convention in Chicago and then on to Michigan where Allan had some cousins.

Allan attended the convention while the rest of us "saw Chicago." That was 1946. If only I had had my crystal ball! Allan told me the women were trying to have a meeting, but I never had been in Chicago. Probably, never would see it again. That was a "fur piece" from Texas.

That was the year they organized the Auxiliary. I could have been a charter member. I am told there were five women present: Elsa Brasch, Margaret Kingsbury, Ople Oaks, and Milicent Stein. I am not sure about the fifth. Milicent Stein never would take an office. She said Charlie worked for Pratt-Read, and her opinion might be biased. During the meeting, Ople Oaks was called from the room, and the other women conspired to declare her president. She was elected by the time she got back!

Well, we missed the next convention which was in Minneapolis. Harry and Katherine Hughes (Houston) did go.

Katherine's high point for the convention was to be the trip to the Betty Crocker kitchens. Two family cars were going, and there was one too many women wanting to go. All of the women were paid up members of the Auxiliary except Katherine. She was left out! Katherine came home and got our Houston Chapter of the Auxiliary organized. She was not going to be left out again! That would have been 1947.

I realize that this is ancient history and does not immediately concern us today. It does concern us in that it is part of our history. When the National Association of Piano Tuners and The American Society of Piano Technicians merged, Allan Pollard was executive secretary (now known as executive director) for the ASPT, and he just slid over and assumed the job for the new organization. I was elected president of the Auxiliary (NAPT had no auxiliary) and we worked together for the good of the new organization.

By the time of the merger, our Auxiliary was quite well organized with around 200 members, requiring a bus instead of family cars for our tours. We heard little complaint about nothing to do while the men were in classes. I can truthfully say "men" and "women" for technicians and Auxiliary because there were no women technicians. Hannah Grover was the first woman technician and the only one for many years.

By way of parenthesis, did you know that, at one time, the piano servicemen wore top hats and frock coats to work? They were a mysterious, highly respected group.

At the conventions we held craft classes, style shows, and lectures on various subjects. Few women held "regular" jobs outside the home. Friend husband could teach us all we needed to know about putting on butt felts and bridle straps. We wanted to get away from that.

Today, the picture is very different. Either or both spouses may be technicians. Many spouses hold positions entirely unrelated to piano service. It seems to me that puts it on a family basis. Are you interested in how your spouse spent the day? Some piano tuners' experiences are hilarious; some are tragic. Good family conversation. I could write a book!

In the first place, a piano technician is an independent thinker. No nine-to-five job intrigues or satisfies him/her. He wants to figure things out for himself, not just do what the boss tells him. He is a "different breed of cats." We can thank the Lord there are still a few left and we found them!

Ruth V. Pollard

Traveling With Grandkids

In a recent magazine article (*Newsweek*, July 30, 1990), Helena Koenig, founder of Grandtravel, spoke of traveling with grandchildren as "an opportunity for young people to see that getting old isn't so bad—Grandma's having a great time." Koenig's agency specializes in planning trips for grandparents and their grandchildren. Some families in the Auxiliary have already discovered the value of traveling with grandchildren to PTG conventions.

Ginger and Jim Bryant brought their 13-year-old grandson, Bobby Brandeland, to Dallas with them but they didn't see much of him once they arrived. Bobby spent lots of time with an older cousin who lives there. He loved Dallas and is saving for a return trip. When he was in the hotel he enjoyed the waterfall and the atrium lobby as seen from above, and he was fascinated by the lights which delineated and decorated the Dallas skyline at night.

Ivagene and Ernest Dege brought their 12-year-old granddaughter, Catherine Smith. Catherine also enjoyed our beautiful headquarters hotel. At the closing luncheon she told her grandparents she would go again next year if they would invite her. The Deges are pros at taking grandchildren to conventions. Each of Catherine's two sisters had a trip with their grandparents to previous PTG conventions, and a grandson may be coming with them to Philadelphia.

Several new grandchildren have been born into the PTG/PTGA family recently. Fern and Don Morton, and Dorothea and Fred Odenheimer both welcomed new grand additions recently. Leon and Sue Speir took time out to help welcome a grandchild to the world right at the beginning of the convention. We'll be looking for these kids to start attending our conventions with their grandparents around the year 2002!

Scholarship Recipients Liked PTG Exhibits

Ginger Bryant, chairman of the PTGA scholarship committee, relates that Jimmy and Eric, the two gentlemen who received last year's PTGA scholarships, were absolutely, positively fascinated and enthralled with the Exhibit Hall at the Dallas Convention. When they came to perform at our convention they got a closer view of piano technology and piano service.

Ginger is already making plans for the scholarships which will be awarded during the 1990-91 year to two recipients in Pennsylvania. In addition to the Texas awards, PTGA scholarships have previously been given to students in Missouri and Oregon.

As always, if you or someone you know would like to make a donation (large or small) to the PTGA Scholarship Fund, you may send a check (payable to PTGA Scholarship Fund) to the Piano Technicians Guild Foundation; 4510 Belleview, Suite 100; Kansas City, MO 64111.

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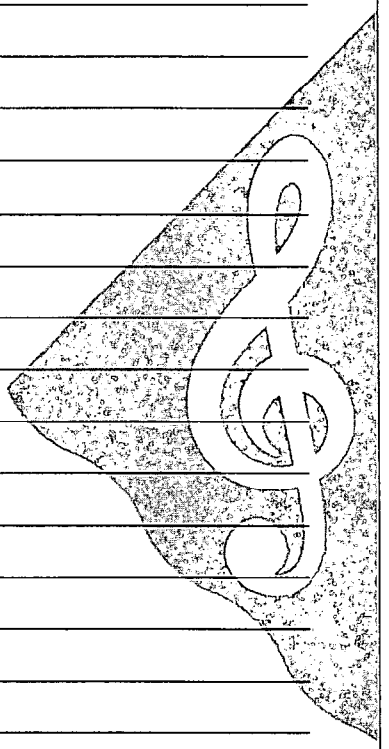

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Tech Gazette

Yamaha Piano Service September, 1990

Grand Action Regulation in 37 Steps... Preparation is Key

SECOND IN A SERIES: GRAND ACTION REGULATION

Many of the steps in grand action regulation have profound influence over other steps. Getting the proper results can demand that you retrace certain steps. It's like tuning; you want the piano in fairly good tune before you start the really fine work.

In grand action regulation, three points need to be checked before starting on the first of the 37 steps. All three will need to be rechecked in sequence, but it's critical that each be in proper position at the start.

1. REPETITION LEVER SPRING TENSION

First check the tension of the repetition lever spring. If it's too weak it won't support the weight of the hammer assembly, leaving the jack as the sole supporting member. This will complicate getting a proper hammer line and keep the jack from returning to rest position.

Adjust the tension as required; see upcoming articles for full details on this procedure.

2. HAMMER-TO-STRING DISTANCE

The average movement of the hammer is 5 times that of the key. It's important that this ratio be set early in the process in order to properly adjust the levers that are between the key and hammer. Also, it is necessary for the weight of the hammer assembly to be resting fully on the whippen, and in turn on the capstan screw, in order to depress the back of the key into the back rail cloth. Failure to insure this results in the appearance of improper key heights, since the front of the keys are lower than they should be. Depending on the type of action, this problem can also occur because the hammer rest rail is too high, and the correction can be made there.

The position of the knuckle (or roller) is also related to the hammer-to-string distance. When the distance is right, the edge of the jack nearest the hammer will be in the same plane as a line extending downward from the core wood of the roller. Improper distance causes a dog-leg bend which makes it difficult to align the jack position with the core wood strip.

So check and adjust hammer-to-string distance, make required adjustments to the capstan, or correct the hammer rest rail height to get a good hammer line.

3. DROP ADJUSTMENT

Finally, check the drop adjustment. The grand action is designed to have the repetition lever stop its upward travel by contacting the drop screw just before the jack fully escapes from under the roller. If the drop screw adjustment is too high, the repetition lever continues its upward travel, carrying the roller with it and pushing the hammer against the string. This makes it difficult to achieve correct let-off.

Having made preliminary adjustments in these three areas, we will, in the next and subsequent issues, cover the 37 steps of grand action regulation.

Tech Tour

YAMAHA PRESENTS TECHNICAL SEMINAR IN MOSCOW

Recently, a score of Soviet piano technicians attended a comprehensive piano technical seminar held at the Music Academy of Moscow.

The 5 day seminar was sponsored by the U.S.S.R. Ministry of Culture, and included lectures, videos and technical demonstrations by Yamaha technicians.

In addition to the Music Academy of Moscow, Yamaha pianos are present and prominent at the Central Conservatory and Bolshoi Hall.

Yamaha will participate in

DISKLAVIER™ SERVICE SEMINARS
October 9-12
November 6-9
December 4-7

LITTLE RED SCHOOLHOUSE
September 17-21

PTG SEMINARS
October 17-20 New York State
November 2-4 Texas State

YAMAHA®

SEPTEMBER **UPDATE** 1990

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

New PTG Board members, shown in the atrium lobby of the Hyatt Regency Dallas, are, from left: Nolan P. Zeringue, RTT, Thibodaux, LA, President; James Birch, RTT, Bethel, CT, Northeast RVP; Ronald Berry, RTT, Indianapolis, IN, Immediate Past President; Bruce Dornfeld, RTT, Northbrook, IL, Vice President; Stephen Brady, RTT, Seattle, WA, Pacific Northwest RVP; Danny L. Boone, RTT, Waco, TX, South Central RVP; Sharla Kistler, RTT, Allentown, PA, Secretary-Treasurer; Michael Drost, RTT, River Falls, WI, Central West RVP; Fern Henry, RTT, Vacaville, CA, Western RVP, Richard Bittner, RTT, Royal Oak, MI, Central East RVP; and Donald Valley, RTT, Spartanburg, SC, Southeastern RVP.

Resumes Of Board And Council Actions

Board

Meeting in Dallas, the Guild's Board of Directors discussed the organization's marketing needs, publications, conventions, and several membership related issues. The 1989-90 Board members were: Ronald L. Berry, RTT, President; Nolan P. Zeringue, RTT, Vice President; Robert Smit, RTT, Secretary-Treasurer; Norman Heischober, RTT, Northeast RVP; Donald Valley, RTT, Southeast RVP; Danny L. Boone, RTT, South Central RVP; Bruce Dornfeld, RTT, Central East RVP; Michael Drost, RTT, Central West RVP; Fern Henry, RTT, Western RVP; and Stephen Brady, RTT, Pacific Northwest RVP.

Following the Council meeting, the newly elected 1990-91 Board met. New Board members are: Nolan P. Zeringue, RTT, President; Bruce Dornfeld, RTT, Vice President; Sharla Kistler, RTT, Secretary-Treasurer; Ronald L. Berry, RTT, Immediate Past President; James Birch, RTT, Northeast RVP; Donald Valley, RTT, Southeast RVP; Danny Boone, RTT, South Central RVP; Richard Bittner, RTT, Central East RVP; Michael Drost, RTT, Central West RVP; Fern Henry, RTT, Western RVP; and Stephen Brady, RTT, Pacific Northwest RVP.

During their meetings, Board members:

- Formed a Marketing Development and Adver-

continued on next page

Council

Editor's note: PTG's Bylaws provide for a Minutes Approval Committee to examine and approve the final draft of all Council meeting minutes. As this is written, that committee has not yet had an opportunity to complete its charges. Accordingly, what follows is only an unofficial resume of Council actions. Official minutes of the meeting will be included in a Journal supplement next month, which also will include updated Bylaws, committee members and their charges.

Discussion of membership categories and related concerns occupied delegates to PTG's July 1990 Council meeting in Dallas.

A proposal to add a new non-franchised "Affiliate" category for retailers, movers, and other non-technician personnel was referred to a committee charged with studying the Guild's membership structure. Also referred to the committee was a proposal to require Associate members to pass the Guild's RTT examinations within five years. The committee will report the results of its findings to the 1991 Council.

In other business, the Council:

- Acted on a Board proposal as an emergency

continued on next page

Board And Council Resumes...

Board

tising Committee to develop a marketing plan for the organization and conduct a search for a suitable marketing firm.

- Moved to ask LaRoy Edwards to serve as "Journal on Tape" reader, replacing the late George Defebaugh.
- Approved Knoxville, TN, as the site for the 1994 Convention and Technical Institute.
- Directed the Home Office to investigate western sites for the 1995 convention, including but not limited to Calgary, Seattle, Vancouver, Salt Lake City and Albuquerque.
- Appointed Gary Neie to the Guild Institute Committee, and named a committee composed of Bruce Dornfeld and Danny Boone to review Institute policies.
- Approved the Southeastern Pennsylvania Chapter as host chapter for the 1991 convention in Philadelphia and Ruth Brown as Host Committee Chair.
- Accepted Lewis Mell of Connecticut as a Chapter Sustaining member.
- Approved Russell Brown, Karl Roeder, Roland Bessette, Mary Smith, and Aiko Porter as Certified Tuning Examiners. Brown, Roeder and Bessette had previously been approved by mail ballot.
- Approved a motion which would require Certified Tuning Examiners to make certain that a prospective examinee has a current membership card prior to administering exams.
- Ratified 1990-91 committees and their charges and directed the Home Office to publish that information, as well as updated Bylaws, Regulations and Codes in a *Journal* supplement as soon as practical.
- Directed the *Journal* editor to expand the scope of articles in the magazine by including interviews with key figures in the piano industry.
- Discussed the issue of member life insurance, and voted, with Council's approval, to continue investigating the matter.
- Passed a resolution thanking Carl Bell of Baylor University for his help in compiling the PTG survey results.
- Voted to sponsor an official PTG tour to coincide with the IAPBT meeting in Seoul, South Korea in June 1991. The tour is to be organized by the International Relations Committee.
- Directed the Code of Ethics Committee to publish a series of ethics-related articles in the *Journal*.

Council

measure to add four alternate members to the Members Rights Committee. Although committee membership is limited to three, the alternates will be available to serve in case of any vacancies.

- Amended to Bylaws to raise the annual minimum contribution to the Emergency Reserve Fund from one percent of gross revenues to two percent.
- Designated the 1990 edition of "Robert's Rules of Order Newly Revised" as the Guild's official parliamentary authority.
- Defeated a motion to terminate the Guild's $1,000 membership life insurance benefit program, and directed the Board to continue investigating more cost-effective alternatives to it.
- Approved revisions to the Guild's Disciplinary Code, effective at the end of the 1990 Council session. The revised code will be published in the October *Journal* supplement.
- Elected new officers: Nolan P. Zeringue, President; Bruce Dornfeld, Vice President; Sharla Kistler, Secretary-Treasurer; James Birch, Northeast RVP; and Richard Bittner, Central East RVP. Ronald Berry will remain on the Board as Immediate Past President.
- Elected the 1990-91 Members Rights Committee: Liz Ward, Chair; Jim Bryant, and Jim Ellis, with Mike Carraher, Francis Hollingsworth, Chuck White and Joe Garrett as alternates.
- Elected the 1990-91 Nominating Committee: Marshall Hawkins, Chair; Vivian Brooks, Gracie Wagoner, Roger Weisensteiner, and Don Mannino, with Jack Sprinkle and Bob Russell as alternates.
- Approved the proposed 1991 budget.

Ruth Brown, representing the newly-chartered Southeastern Pennsylvania Chapter, is congratulated by Northeast RVP Norman Heischober, left, and President Ronald Berry.

CMAC Awards Honor Chapters

Twenty-One Guild chapters were honored for outstanding achievements during the Dallas convention. Second, third and fourth-place winners in the annual Chapter Management and Achievement Awards Competition were honored during regional meetings, and winning chapters in the CMAC Bantam, Small, Medium, Intermediate and Large Chapter categories were presented with plaques during the convention awards banquet.

Also honored during the awards banquet were winners in the CMAC Committee's video contest. Honored for best video of a model chapter meeting were Connecticut, Golden Gate, and Dallas. First-place plaque winners of CMAC awards were: East Texas, Bantam; Oklahoma, Small; Richmond, VA, Medium; Cleveland, OH, Intermediate; and Connecticut, Large. Other winning chapters were:

Bantam Category: South Central Pennsylvania, Second; Hutchinson, KS, Third, and Alaska and Knoxville, tied for Fourth.

Small Category: Monterey Bay, CA, Second; Montana, Third; and Research Triangle, NC, Fourth.

Medium Category: Rhode Island, Second; Buffalo, NY, Third; and Central Illinois, Fourth.

Intermediate Category: Capitol Area, NY, Second; Southwest Florida, Third; and Kansas City, MO, Fourth.

Large Category: Twin Cities, MN, Second; Houston, TX, Third; and Toronto, ON, Fourth.

Council Resume...

- Directed the Home Office to continue publication of an annual report in future years.
- Referred a proposal by the Continuing Education Committee back, requesting that the committee present a detailed implementation program to 1991 Council.

The Council moved into executive session to hear an appeal of the Cincinnati Chapter's trial of Jack and Sally Krefting. Returning from executive session, delegates voted to overturn the chapter's verdict of expulsion, returning full rights of membership to the Kreftings. However, two charges against Sally Krefting and one charge against Jack Krefting were upheld and a reprimand was issued by President Berry on instructions from the Council.

Achievements In Member Recruitment Recognized

Outstanding achievements in member recruitment were recognized during the convention awards banquet. Recipients of President's Club pins for recruiting more than four new members were: Randy Potter, who recruited 12 new members, Christine Lovgren and Dan Skelley, with six, and Larry Crabb and Gary Miles, with four.

Receiving special recognition for sponsoring restored members were Michael MacKinney, Chicago, and Rolf von Walthausen, Cincinnati.

Booster Club members, who each recruited one or more new members were:

Richard Bittner	3	Robert Perkins	2	Ken Bryant	1	Ed Guerra	1	Janet Leary	1	Ed Sambell	1
Peg Browne	3	David Sanderson	2	Richard Capp	1	James Gulino	1	Michael MacKinney	1	John Schmoll	1
William Clayton, II	3	Lewis Spivey	2	Harry Cardwell	1	Hugh Gulledge	1	Dan Malloy	1	Tom Seay	1
Richard V. Dante	3	Virgil Smith	2	Bruce Carter	1	H.L. Gustafson	1	Frank McKowen	1	Paul Simkin	1
Richard Flegle	3	Leon Speir	2	John Cavanaugh	1	Ward Guthrie	1	Francis Mehaffey	1	James Sims	1
Jim Geiger	3	Jack Stebbins	2	Ed Cetrone	1	David Hagberg	1	Robert Mishkin	1	Arthur Nick Smith	1
John Grutzmacher	3	Robert Stephenson	2	Vince Chambers	1	Ed Hilbert	1	David Morgan	1	Daniel Sponenberg	1
Norm Heischober	3	Lou Tasciotti	2	Ken Churchill	1	Jim Hill	1	Robert Morris	1	Sid Stone	1
Tom McNeil	3	Don Valley	2	Tom Cobble	1	Robert Hofstetter	1	Jim Mosier	1	Fred Sturm	1
David Patterson	3	Rolf von Walthausen	2	Alastair Collis	1	Steve Hornbeck	1	Vincent Mrykalo	1	Michael Sweeney	1
Bruce Winn	3	Arthur Williams	2	Diane Cottrell	1	Jim Hudson	1	Douglas Neal	1	Dave Tabachnick	1
Tim Anderson	2	Donn Young	2	George Crawford	1	Merrill Jackson	1	Gay Ornellas	1	Thom Tomko	1
Yvonne Ashmore	2	David Abdalian	1	Neil Davis	1	Steve Jackson	1	Loren Pelkey	1	Lawrence Vogt	1
Dennis Berryhill	2	Eugene Allen	1	Allan Day	1	Dennis Johnson	1	Alan Phillips	1	Sandra West	1
Danny Boone	2	Mark E. Anderson	1	Gary Dunn	1	Christian Johnston	1	Teri Powell	1	Ed Whitting	1
Steve Brady	2	Richard Anderson	1	Daniel Eumurian	1	Joel Jones	1	Ernie Preuitt	1	Larry Wicksell	1
Joe Buscio	2	Mitsuo Azuma	1	Timothy Farley	1	Otto Keyes	1	Carlos Ralon	1	Dana Wiegand	1
Vic Dollahite	2	Charles Ball	1	Bud Fisher	1	Michael Kimbell	1	Ramon Ramirez	1	Art Wilkinson	1
Bruce Dornfeld	2	William Barclay	1	J. Richard Gann	1	George King	1	Dean Reyburn	1	Margie Williams	1
Dale Erwin	2	Don Bennett	1	Don Gilberg	1	Sharla Kistler	1	Fred Rice, Jr.	1	Richard Des Wilson	1
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Terald Howard	2	Ed Bordeleau	1	Tom Graves	1	Joseph Lafuze	1	Lisa Roselinsky	1	Sylvester Zabrocki	1
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Paul Olsen	2	Russell Brown	1								

The Soundboard

To The Soundboard:

For me to go to Dallas this year and receive the Golden Hammer was an astonishing surprise and pleasure. There are so many people to whom I am grateful — the people who nominated me, the committee who chose me as this year's recipient, and the people at the banquet who so graciously applauded that choice. To all of you, thank you! My special thanks, also, to Bill Smith, who designed and crafted the beautiful piano case that carries the Golden Hammer. It is a work of art that I will treasure always.

My tenure with tuning organizations goes all the way back to 1953 and one of the parent organizations of PTG, the American Society of Piano Technicians. My service with them, and later with the Piano Technicians Guild is something that I have never documented. As one of my dear friends often says, "The treasure is in the map." I have enjoyed my activities with PTG as they have unfolded, year by year, and the friendships that I have formed are incomparable. To these friends, I say that I am grateful for their support, their kindness, and the receipt of this great honor.

Ben McKlveen
Cleveland Chapter

To The Soundboard:

In Appreciation... The children and I would like to take this opportunity to thank everyone involved for the "Hall of Fame" award presented to Bob Russell.

It is a good feeling to know that Bob will be remembered in the organization that meant so much to him during his lifetime. Even though Bob never worked for personal glory, it is a comforting feeling to us that he received it. Thanks again.

Ginny Russell and family

To The Soundboard:

This letter goes out to all of you who attended our recent International Convention. After my wife, Crystal, and I spent a day packing for ourselves and our one-year-old, Emily, it was a relief to get on the plane heading for Dallas.

There is always a special excitement upon arriving at the convention center, with great anticipation towards Council, classes, meetings and all the social events. To see so many old friends and to make new acquaintances is one of the intangible benefits of our unique association. We take the hotel by storm, with a flurry of technical and organizational discussions that can last way into the night. We brave the hot sun, to sample what Dallas has to offer. Getting sleep seems of secondary importance.

Managing with our little Emily, however, did eventually wear us down. It was again with relief that we tumbled back onto the plane that brought us home. I was actually looking forward to the next day with it's light schedule of tunings.

Morning greeted us with a rocky start. Jet lag, and then, my wife's car wouldn't start. No problem, I was determined to enjoy this day. Upon arriving at my first appointment, I was greeted by a rather worn mother and her three boys, all under five years. At first, as can happen with a visitor in the house, there was a general confusion and distraction as I prepared the piano for tuning. However, instead of backing off to a manageable level, it became worse.

One child, outfitted in the latest assault gear, began stabbing the case with a Rambo-like fervor. Morse Code emanated from the pedals. Another boy discovered an interesting relationship between his tricycle and my toolcase. The mother had as much control as a referee at a tag team wrestling match. I was reluctant to complain because of the futility in doing so. About this time, a toy was activated which simulated nuclear destruction. Then, loud noises ensued from the kitchen, ranging from the silverware drawer hitting the floor (documented) to moving the refrigerator (subjective opinion). I found myself reciting the PTG Code of Ethics like a litany. Finally, the fourth member of the crew, a little, wet poodle, jumped into my lap. Unless attended to, it barked incessantly.

I really don't remember finishing that tuning, but I believe that I put a little extra "stretch" into it. It was with relief that I tumbled into my car and drove off. Yes, it's good to be back!

Keith Bowman
South Central
Pennsylvania Chapter

To The Soundboard:

Thank you for your Award Committee submissions the past two years. You should know that each year is a fresh start, no nominations are carried forward to the following year.

So get your nomination in early, and please have a short biographical sketch along with your nomination.

I'm certain that there are worthy recipients out there who are low profile and known only to their own chapters. The committee would like to know about these folks, and remember, if you don't tell us, we won't know.

Bob Morris
Awards Committee Chair

Preliminary Results Of PTG Survey In; Analysis Begins

Carl Root
Economic Affairs
Committee Chairman

This is a preliminary report on the results of the PTG survey. Board members will receive it before their July meeting; most other members will be reading this in the *Journal*.

You will notice two numbers following the possible responses to each question. The first is responses from Associates, the second is RTTs. e/r is "error response," n/r is "no response."

I divided RTTs and Associates because the comparison may be useful for discussion of the RT proposal (beyond the responses to question 98). Deciding which other questions apply is part of the debate.

The data in this report is intended to be used as the source of more questions. The following should help clarify how this can be done: How many members marked letters e) in question 4) as well either letter a), b), or c) for question 1)? This will tell you how many technicians over 60 have been doing piano service work for 19 years or less.

A number of members who responded to this survey were confused by the option of five non-zero choices for many of the questions. They were reluctant to leave a question blank if they were not explicitly told to do so. This means that many people indicated, for example, that they had installed one to five soundboards when, in fact, they had not installed any. My failure to anticipate this means that we will not be able to distinguish between "none" and "a few" for several questions.

The number of members who responded, and their forthrightness (as indicated in question 100) and other data in general, is encouraging. We wanted to collect data that would give us a more clear picture of the make-up of PTG. I think we have it.

1. I have been doing piano service work for ____ years. **a. 1-5:** *173/33;* **b. 6-11:** *133/185;* **c. 12-19:** *104/408;* **d.20-29:** *35/204;* **e.30+:** *17/242;* **n/r:** *11/19*

2. I have been an RTT for ____ years. **a. 0 (I am an Associate):** *473/0;* **b. 1-9:***0/374;* **c. 10-19:***0/445;* **d. 20-29:** *0/161;* **e. 30+:** *0/83;* **n/r:** *0/28*

3. My participation in PTG could be described as ____. **a. inactive:** *28/70;* **b. slightly active:** *144/250;* **c. fairly active:** *179/342;* **d. quite active:** *115/405;* **n/r:** *5/20*

4. I am ____ years old. **a. 20-29:** *34/18;* **b.30-39:** *170/308;* **c. 40-49:** *113/276:* **d. 50-59:** *79/177;* **e. 60+:** *71/295;* **n/r:** *6/17*

5. Advertising was ____ important as a source of customers during the first five years of my piano service career. **a. very:** *110/190;* **b. fairly:** *85/247;* **c. slightly:** *96/299;* **d. not :** *161/317;* **n/r:** *15/23;* **e/r:** *6/15*

6. Inherited or purchased clientele from another technician was ____ important as a source of customers during the first five years of my piano service career. **a. very:** *39/75;* **b. fairly:** *37/84;* **c. slightly:** *46/123;* **d. not:** *321/752;* **n/r:** *6/17;* **e/r:** *11/23*

7. Individual referrals from other piano technicians were ____ important as a source of customers during the first five years. **a. very:** *45/85;* **b. fairly:** *64/170;* **c. slightly:** *112/377;* **d. not:** *227/418;* **e/r:** *5/13*

8. Referrals from piano teachers were ____ important as a source of customers during the first five years. **a. very:** *69/210;* **b. fairly:** *104/304;* **c. slightly:** *142/355;* **d. not :** *133/184;* **e/r:** *7/6*

9. "Referrals" from dealers were ____ important as a source of customers during the first five years. **a. very:** *108/393;* **b.fairly:** *66/247;* **c. slightly:** *82/202;* **d. not:** *191/212;* **e/r:** *7/8*

10. Advertising is ____ important now as a source of customers. **a. very:** *77/116;* **b.fairly:** *95/187;* **c. slightly:** *128/325;* **d. not:** *151/414;* **e/r:** *5/20*

11. Individual referrals from other technicians is ____ important now as a source of customers. **a. very:** *44/72;* **b.fairly:** *72/165;* **c. slightly:** *149/424;* **d. not :** *184/383;* **e/r:** *7/19*

12. Referrals from piano teachers are ____ important now as a source of customers. **a. very:** *73/207;* **b.fairly:** *134/356;* **c. slightly:** *133/320;* **d. not :** *112/177;* **e/r:** *6/4*

13. Referrals from dealers are ____ important now as a source of customers. **a. very:** *73/179;* **b.fairly:** *76/204;* **c. slightly:** *104/298;* **d. not :** *192/360;* **e/r:** *8/22*

14. I work primarily in a ____. **a. large city:***140/352;* **b. suburb:***111/207;* **c. small city:** *97/306;* **d. small town:** *53/106;* **e. rural environment :** *62/87;* **n/r:** *10/33*

15. Total business mileage on my vehicle last year was____. **a. 1-8k:***195/216;* **b. 9-16k:***111/410;* **c. 17-24k:** *83/281;* **d. 25-34k:** *33/100;* **e. 35k+:** *20/28;* **n/r:** *31/56*

16. I schedule most appointments for home service ____. **a.at the time of the previous appointment:** *34/81;* **b. using reminder cards:** *86/171;* **c. making reminder calls:** *148/300;* **d. waiting for the phone to ring:** *123/412;* **e. (using a different method):** *50/88;* **n/r:** *32/39*

17. I estimate that about ____ % of my home tunings are on pianos tuned once a year. **a. 1-24:***116/225;* **b. 25-44:** *92/261;* **c. 45-54:** *80/219;* **d. 55-74:** *59/213;* **e. 75+:** *80/131;* **n/r:** *46/42*

18. I estimate that about ____ % of my home tunings are on pianos serviced three or more times per year. **a. 1-4:***308/670;* **b. 5-19:***75/253;* **c. 20-39:** *24/64;* **d. 40-59:** *10/23;* **e. 60+:** *7/18;* **n/r:** *49/63*

19. Roughly ____ % of my home tunings are first-time customers. **a. 1-4:***29/93;* **b. 5-9:** *38/167;* **c. 10-19:** *102/313;* **d. 20-39:** *115/354;* **e. 40+:** *144/121;* **n/r:** *45/43*

20. I average about ____ hours/week driving to and from business appointments.**a. 1-3:** *150/191;* **b. 4-6:** *111/312;* **c. 7-9:** *71/249;* **d. 10-12:** *65/198;* **e. 13+:***36/85;* **n/r:** *40/56*

21. I average about ____ hours/week doing office work. **a. 1-2:***231/473;* **b. 3-4:** *122/295;* **c. 5-6:** *46/146;* **d. 7-8:***16/76;* **e. 9+:** *22/50;* **n/r:** *36/51*

22. I average ____ hours/week servicing pianos in the field (include homes, store, university, etc.) (do not include driving time from question #20) **a. 1-6:** *138/106;* **b. 7-12:***91/148;* **c. 13-18:***71/180;* **d. 19-24:***55/211;* **e. 25+:** *80/396;* **n/r:** *38/50*

23. I average ____ hours/week

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working in a shop (store, university, garage, etc.) doing repairs, rebuilding, etc. **a. 1-8:** *262/611;* **b. 9-16:** *66/196;* **c. 17-24:** *34/104;* **d. 25-39:** *38/69;* **e. 40+:** *34/40;* **n/r:** *39/71*

24. I average ____ hours/week doing other income producing work. (include both non-music and music related work): **a. 1-8:** *201/655;* **b. 9-16:** *52/96;* **c. 17-24:** *31/43;* **d. 25-39:** *42/40;* **e. 40+:** *87/43;* **n/r:** *60/214*

25. I distribute ____. (receipt) **a. the official PTG itemized receipt:** *11/212;* **b. my own itemized receipt:** *148/346;* **c. a generic service form:** *170/192;* **d. my own stationary:** *73/214;* **e. other:** *39/73;* **n/r:** *32/54*

26. I distribute ____. (pamphlet) **a. official PTG pamphlet(s):** *24/256;* **b. NPF pamphlet "Your Piano And Its Proper Care":** *71/94;* **c. my own pamphlet(s):** *140/159;* **d. a and c:** *6/34;* **e. all of the above:** *21/77;* **n/r:** *211/471*

27. I tune most pianos ____. **a. entirely by ear:** *227/711;* **b. with an electronic aid:** *183/300;* **c. with an electronic aid (temperament only):** *28/37;* **n/r:** *33/37;* **e/r:** *2/6*

28. I tuned ____ pianos last year. **a. 1-249:** *266/283;* **b. 250-499:** *90/266;* **c. 500-749:** *49/268;* **d. 750-999:** *16/146;* **e. 1000+:** *12/81;* **n/r:** *40/47*

29. ____ of the pianos I service are small grands. **a. none or almost none:** *162/140;* **b. several:** *192/526;* **c. about a quarter:** *61/257;* **d. about half:** *19/95;* **e. most (or all):** *19/42;* **n/r:** *20/31*

30. ____ of the pianos I service are large grands. **a. none or almost none:** *59/26;* **b. a few:** *216/398;* **c. about a quarter:** *148/529;* **d. about half:** *23/95;* **e. most (or all):** *8/10;* **n/r:** *19/33*

31. ____ of the pianos I service are studio uprights. **a. none or almost none:** *30/34;* **b. a few:** *159/429;* **c. about a quarter:** *178/479;* **d. about half:** *60/102;* **e. most (or all):** *24/13;* **n/r:** *22/34*

32. ____ of the pianos I service are consoles. **a. none or almost none:** *25/49;* **b. a few:** *104/223;* **c. about a quarter:** *214/564;* **d. about half:** *84/190;* **e. most (or all):** *23/30;* **n/r:** *23/35*

33. ____ of the pianos I service are spinets. **a. none or almost none:** *49/123;* **b. a few:** *157/453;* **c. about a quarter:** *194/408;* **d. about half:** *46/64;* **e. most (or all):** *4/9;* **n/r:** *23/34*

34. ____ of the pianos I service are old uprights. **a. none or almost none:** *55/199;* **b. a few:** *205/571;* **c. about a quarter:** *132/241;* **d. about half:** *46/42;* **e. most (or all):** *15/11* **n/r:** *20/27*

35. ____ of the pianos I service are players. **a. none or almost none:** *324/711;* **b. a few:** *112/324;* **c. about a quarter:** *8/14;* **d. about half:** *2/4;* **e. most (or all):** *6/7;* **n/r:** *21/31*

36. ____ of the pianos I service are antiques and/or harpsichords. **a. none or almost none:** *362/814;* **b. a few:** *77/233;* **c. about a quarter:** *5/8;* **d. about half:** *2/2;* **e. most (or all):** *2/2;* **n/r:** *25/32*

37. ____ of the pianos I service are played primarily by children taking lessons. **a. none or almost none:** *28/29;* **b. a few:** *94/144;* **c. about a quarter:** *126/340;* **d. about half:** *144/440;* **e. most (or all):** *62/107;* **n/r:** *19/31*

38. ____ of the pianos I service are played primarily by serious amateur adults. **a. none or almost none:** *43/30;* **b. a few:** *209/490;* **c. about a quarter:** *137/433;* **d. about half:** *44/79;* **e. most (or all):** *17/19;* **n/r:** *23/40*

39. ____ of the pianos I service are played primarily by not so serious amateur adults. **a. none or almost none:** *37/46;* **b. a few:** *182/483;* **c. about a quarter:** *159/413;* **d. about half:** *53/87;* **e. most (or all):** *20/18;* **n/r:** *22/44*

40. ____ of the pianos I service are played primarily by teachers. **a. none or almost none:** *106/94;* **b. a few:** *294/753;* **c. about a quarter:** *41/168;* **d. about half:** *6/29;* **e. most (or all):** *2/11;* **n/r:** *24/36*

41. ____ of the pianos I service are played primarily by performing artists. **a. none or almost none:** *251/334;* **b. a few:** *169/581;* **c. about a quarter:** *16/86;* **d. about half:** *7/26;* **e. most (or all):** *7/26;* **n/r:** *23/38*

42. ____ of the pianos I service are played by hardly anyone! **a. none or almost none:** *143/343;* **b. a few:** *241/606;* **c. about a quarter:** *46/77;* **d. about half:** *9/15;* **e. most (or all):** *13/10;* **n/r:** *21/40*

43. It takes me about ____ minutes to service the typical home piano. (*Typical, not average.* Do not include the time it takes to do "extra" work unless you do it most of the time.) **a. 45-59:** *37/206;* **b. 60-74:** *112/335;* **c. 75-89:** *91/253;* **d. 90-119:** *122/224;* **e. 120+:** *80/45;* **n/r:** *31/28*

Please mark either #44 or #45... not both!

44. My fee for this "typical" service is $____. **a. 20-29:** *9/8;* **b. 30-39:** *53/57;* **c. 40-49:** *179/317;* **d. 50-59:** *121/401;* **e. 60-69:** *51/199;* **n/r:** *60/109*

OR

45. **a. 70-79:** *18/60;* **b. 80-89:** *6/21;* **c. 90-99:** *19/10;* **d. 100-119:** *5/21;* **e. 120+:** *17/21;* **n/r:** *408/109*

46. I ____ give discounts to piano teachers. **a. always:** *51/84;* **b. usually:** *75/145;* **c. sometimes:** *87/216;* **d. rarely:** *88/296;* **e. never:** *132/306;* **n/r:** *40/44*

47. I ____ give discounts to long-time customers. **a. always:** *13/25;* **b. usually:** *37/44;* **c. sometimes:** *98/202;* **d. rarely:** *126/370;* **e. never:** *160/408;* **n/r:** *39/42*

48. I ____ give discounts to stores. **a. always:** *99/240;* **b. usually:** *93/276;* **c. sometimes:** *47/133;* **d. rarely:** *52/139;* **e. never:** *129/250;* **n/r:** *53/53*

49. I ____ give discounts to several pianos in one location. **a. always:** *84/201;* **b. usually:** *131/303;* **c. sometimes:** *90/255;* **d. rarely:** *58/165;* **e. never:** *68/129;* **n/r:** *42/38*

50. I ____ give discounts for pianos serviced three or more times per year. **a. always:** *54/84;* **b. usually:** *71/174;* **c. sometimes:** *81/213;* **d. rarely:** *79/213;* **e. never:** *133/363;* **n/r:** *55/44*

51. I ____ bill for failed appointments. **a. always:** *16/36;* **b. usually:** *27/80;* **c. sometimes:** *51/130;* **d. rarely:** *88/308;* **e. never:** *249/491;* **n/r:** *42/46*

52. My charge to condemn a piano is $____. **a. 0:** *131/231;* **b. 1-29:** *150/367;* **c. 30-49:** *81/298;* **d. 50-59:** *28/75;* **e. 70+:** *11/16;* **n/r:** *72/104*

53. The number of piano buyers who buy new pianos each year on the basis of my recommendations is approximately ____. **a. 0:** *113/93;* **b. 1-3:** *186/395;* **c. 4-6:** *73/271;* **d. 7-11:** *34/128;* **e. 12+:** *32/137;* **n/r:** *35/67*

For questions #54-57, include spouse, subcontractors, salaried and non-salaried apprentices where applicable. EXCLUDE YOURSELF. *If you have no employees, leave these questions blank.*

54. My employees work ____ hours/week doing field service. **a. 1-8:** *44/116;* **b. 9-16:** *11/49;* **c. 17-40:** *9/38;* **d. 41-79:** *7/8;* **e. 80+:** *1/10;* **n/r:** *401/870*

55. My employees work ____ hours/week doing shop work. **a. 1-8:** *37/121;* **b. 9-16:** *9/35;* **c. 17-40:** *19/*

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44; **d. 41-79:** *4/11;* **e. 80+:** *5/15;* **n/r:** *399/865*

56. My employees work ____ hours/week doing office work. **a. 1-8:** *58/169;* **b. 9-16:** *4/47;* **c. 17-40:** *10/35;* **d. 41-79:** *2/4;* **e. 80+:** *1/5;* **n/r:** *398/831*

57. My employees work ____ hours/week doing sales-related work. **a. 1-8:** *50/137;* **b. 9-16:** *5/21;* **c. 17-40:** *8/17;* **d. 41-79:** *1/3;* **e. 80+:** *1/2;* **n/r:** *408/911*

58. The format which most resembles my business name is ____. (If you use <my name> *and* a business name, mark business name.) **a. <my name>: b. <my name> piano service: c. <my name> piano shop, piano co., etc.: d. <other name> piano service: e. <other name> piano shop, piano co., etc.: ; n/r:**

59. I have installed ____ new pinblocks in the last three years. **a. 1-5:** *200/455;* **b. 6-19:** *27/125;* **c. 20-39:** *15/25;* **d. 40-59:** *4/7;* **e. 60+:** *1/10;* **n/r:** *226/469*

60. I have installed ____ new soundboards in the last three years. **a. 1-5:** *151/326;* **b. 6-19:** *3/11;* **c. 20-39:** *4/4;* **d. 40-59:** *0/3;* **e. 60+:** *0/6;* **n/r:** *315/741*

61. I have installed ____ treble bridges (or caps) in the last three years. **a. 1-5:** *178/403;* **b. 6-19:** *11/41;* **c. 20-39:** *3/12;* **d. 40-59:** *2/4;* **e. 60+:** *1/7;* **n/r:** *278/624*

62. I have installed ____ sets of new hammers in the last three years. **a. 1-5:** *232/441;* **b. 6-19:** *62/338;* **c. 20-39:** *25/85;* **d. 40-59:** *8/19;* **e. 60+:** *7/14;* **n/r:** *139/194*

63. I have rebushed ____ sets of keys in the last three years. **a. 1-5:** *232/435;* **b. 6-19:** *59/297;* **c. 20-39:** *21/88;* **d. 40-59:** *7/20;* **e. 60+:** *12/15;* **n/r:** *142/236*

64. I have replaced ____ sets of plastic elbows in the last three years. **a. 1-5:** *256/620;* **b. 6-19:** *74/262;* **c. 20-39:** *11/40;* **d. 40-59:** *1/7;* **e. 60+:** *0/2;* **n/r:** *131/160*

65. I have recovered ____ sets of keys in the last three years. **a. 1-5:** *195/385;* **b. 6-19:** *92/289;* **c. 20-39:** *36/90;* **d. 40-59:** *11/19;* **e. 60+:** *9/21;* **n/r:** *130/287*

66. I have refinished ____ pianos in the last three years. **a. 1-5:** *203/401;* **b. 6-19:** *44/113;* **c. 20-39:** *15/39;* **d. 40-59:** *3/8;* **e. 60+:** *3/12;* **n/r:** *205/518*

67. My *net* profit from shop work is ____ than field service. (Answer only if you did *both* shop work and field service.) **a. much more:** *54/71;* **b. somewhat more:** *26/58;* **c. about the same:** *56/130;* **d. somewhat less:** *69/213;* **e. much less:** *157/455;* **n/r:** *111/164*

68. The amount of rebuilding work I have done during each of the last three years has been ____ than during previous years. (Answer only if you did some rebuilding work prior to 1987.) **a. quite a bit more:** *50/96;* **b. somewhat more:** *73/183;* **c. about the same:** *88/250;* **d. somewhat less:** *22/121;* **e. quite a bit less:** *39/192;* **n/r:** *201/249*

69. I have held a job (paid or unpaid, part-time or full-time) where my work was directly supervised by another technician for the following length of time: ____ hours. (one year, full-time=40 hour/week for 50 weeks=2000 hours) **a. 100-499:** *108/177;* **b. 500-999:** *32/52;* **c. 1000-1999:** *29/51;* **d. 2000-4999:** *33/76;* **e. 5000+:** *24/62;* **n/r:** *247/673*

70. The kind of work I did under supervision was ____. (Answer only one, as with all questions.) **a. mostly tuning:** *45/73;* **b. mostly regulation and minor repairs:** *27/41;* **c. equal amounts of tuning, regulation, repairs:** *79/140;* **d. mostly rebuilding:** *54/74;* **e. everything equally:** *37/103;* **n/r:** *231/660*

71. I have completed/am completing a ____ in piano technology. **a. college curriculum; 2-4 year full-time:** *49/94;* **b. individual college courses:** *61/116;* **c. correspondence course:** *82/150;* **d. factory sponsored class:** *43/153;* **e. (no courses, but I've read at least three piano technology text books):** *137/213;* **n/r:** *101/365*

72. I play the piano (or other keyboard instrument) ____. **a. very well:** *95/183;* **b. fairly well:** *193/450;* **c. poorly:** *120/293:* **d. not at all:** *54/118;* **n/r:** *8/38;* **e/r:** *3/9*

73. I play an instrument other than piano ____. *a. very well: 120/277;* **b. fairly well:** *173/405;* **c. poorly:** *63/149;* **d. not at all:** *94/188;* **n/r:** *11/59;* **e/r:** *12/13*

74. My net piano income for 1989 was $____. **a. 1-11k:** *223/243;* **b. 12-23k:** *107/319;* **c. 24-35k:** *54/264;* **d. 36-47k:** *15/114;* **e. 48k+:** *16/74;* **n/r:** *58/77*

75. My net piano income is about ____ % of "total family" income. / ("total family" may include spouse's income, your other job, interest income, social security, pension, etc.) **a. 1-24:** *187/175;* **b. 25-49:** *72/188;* **c. 50-74:** *58/202;* **d. 75-89:** *35/164;* **e. 90-100:** *83/290;* **n/r:** *37/72*

76. Number of dependents declared on 1040 form ____. **a. 1:** *150/306;* **b. 2:** *119/341;* **c. 3:** *59/134;* **d. 4:** *18/116;* **e. 5+:** *26/69;* **n/r:** *71/125*

77. My gross income for 1989 from field service (tuning only) for private clientele was ____. **a. 1-9k:** *255/298;* **b. 10-19k:** *82/298;* **c. 20-29k:** *35/196;* **d. 30-39k:** *8/98;* **e. 40k+:** *12/73;* **n/r:** *81/128*

78. My gross income for 1989 from field service (non-tuning) and minor shop work for private clientele was ____. **a. 1-4k:** *267/505;* **b. 5-9k:** *56/229;* **c. 10-19k:** *28/115;* **d. 20-29k:** *2/20;* **e. 30k+:** *5/13;* **n/r:** *115/209*

79. My gross income for 1989 from contract rebuilding for general public was ____. **a. 1-9k:** *175/425;* **b. 10-19k:** *34/96;* **c. 20-39k:** *14/39;* **d. 40-99k:** *4/19;* **e. 100k+:** *2/7;* **n/r:** *244/505*

80. My gross income for 1989 from subcontract rebuilding for other technicians was ____. **a. 1-9k:** *135/301;* **b. 10-19k:** *9/21;* **c. 20-39k:** *7/5;* **d. 40-99k:** *3/6;* **e. 100k+:** *0/0;* **n/r:** *319/758*

81. My gross income for 1989 from sales of rebuilt pianos was ____. **a. 1-9k:** *156/326;* **b. 10-29k:** *19/48;* **c. 30-99k:** *5/15;* **d. 100-199k:** *0/4;* **e. 200k+:** *1/2;* **n/r:** *292/696*

82. My gross income for 1989 from sales of new pianos was ____. **a. 1-99k:** *115/233;* **b. 100-249k:** *5/7;* **c. 150-499k:** *2/8;* **d. 500-999k:** *2/4;* **e. 1M:** *1/1;* **n/r:** *348/838*

83. My income for 1989 from sales commissions was ____. **a. 1-249k:** *105/224;* **b. 250-499k:** *14/37;* **c. 500-999k:** *4/24;* **d. 1000-1999k:** *8/19;* **e. 2000+:** *10/45;* **n/r:** *332/224*

84. My income for 1989 from subcontracting work out to other technicians was ____. **a. 1-249k:** *105/224;* **b. 250-499k:** *14/37;* **c. 500-999k:** *4/24;* **d. 1000-1999k:** *8/19;* **e. 2000+:** *10/45;* **n/r:** *332/742*

85. My income for 1989 from salary, contract, etc. with schools, university, or other institutions was ____. **a. 1-4k:** *181/414;* **b. 5-9k:** *34/138;* **c. 10-19k:** *13/67;* **d. 20-29k:** *8/35;* **e. 30k+:** *4/33;* **n/r:** *233/404*

86. My income for 1989 from salary, subcontract, etc. with dealer(s) was ____. (include in-store and field service work) **a. 1-4k:** *156/386;* **b. 5-9k:** *34/96;* **c. 10-19k:** *18/43;* **d. 20-29k:** *6/14;* **e. 30k+:** *1/16;* **n/r:** *258/536*

87. I consider work environment

Survey...

to be one of the positive aspects of piano work. ____ **a. strongly agree:** *192/493;* **b. agree:** *207/439;* **c. neutral:** *49/108;* **d. disagree:** *8/10;* **e. strongly disagree:** *1/1;* **n/r:** *16/40*

88. I consider personal contact to be one of the positive aspects of piano work. ____ **a. strongly agree:** *205/522;* **b. agree:** *194/432;* **c. neutral:** *48/88;* **d. disagree:** *5/8;* **e. strongly disagree:** *4/5;* **n/r:** *17/36*

89. I consider client appreciation to be one of the positive aspects of piano work. ____ **a. strongly agree:** *238/598;* **b. agree:** *191/398;* **c. neutral:** *31/50;* **d. disagree:** *0/6;* **e. strongly disagree:** *0/4;* **n/r:** *13/35*

90. I consider prestige to be one of the positive aspects of piano work. ____ **a. strongly agree:** *78/228;* **b. agree:** *169/374;* **c. neutral:** *158/343;* **d. disagree:** *43/90;* **e. strongly disagree:** *9/20;* **n/r:** *16/36*

91. I consider income to be one of the positive aspects of piano work. ____ **a. strongly agree:** *68/182;* **b. agree:** *192/483;* **c. neutral:** *133/274;* **d. disagree:** *51/100;* **e. strongly disagree:** *11/22;* **n/r:** *18/30*

92. I consider job security to be one of the positive aspects of piano work. ____ **a. strongly agree:** *53/222;* **b. agree:** *154/445;* **c. neutral:** *163/244;* **d. disagree:** *67/113;* **e. strongly disagree:** *19/28;* **n/r:** *17/39*

93. I consider tangible results of work to be one of the positive aspects of piano work. ____ **a. strongly agree:** *204/491;* **b. agree:** *216/476;* **c. neutral:** *35/63;* **d. disagree:** *1/9;* **e. strongly disagree:** *0/1;* **n/r:** *17/51*

94. I consider challenging work to be one of the positive aspects of piano work. ____ **a. strongly agree:** *192/412;* **b. agree:** *218/520;* **c. neutral:** *42/97;* **d. disagree:** *3/20;* **e. strongly disagree:** *1/3;* **n/r:** *17/39*

95. I consider flexibility of work schedule to be one of the positive aspects of piano work. ____ **a. strongly agree:** *281/616;* **b. agree:** *151/369;* **c. neutral:** *21/56;* **d. disagree:** *4/14;* **e. strongly disagree:** *2/1;* **n/r:** *14/35*

96. I have attended national PTG conventions ____. **a. every year:** *48/170;* **b. every other year:** *58/209;* **c. every five years:** 53/264; **d. rarely:** *83/258;* **e. (I have never attended a convention):** *215/152;* **n/r:** *16/38*

97. I would ____ attend a convention in Hawaii. **a. definitely:** *28/76;* **b. probably:** *41/108;* **c. probably, but only if the cost of attending was not much more than other national conventions:** *99/256;* **d. probably not:** *182/375;* **e. definitely not:** *106/238;* **n/r:** *17/38*

98. I believe the that the following PTG membership structure would best serve the interests of the piano service industry and the people who use their services: (Don't get too hung up on membership titles... yet.) **a. Only RTTs are members of PTG:** *2/86;* **b. Entry-level, and non-tuning professionals are Associates; those who pass all tests become RTTs. RTTs vote:** *116/296;* **c. Members join as Applicants, become Allied Tradesmen if they pass the technical exam, and RTTs if they also pass tuning exam. RTTs vote:** *67/239;* **d. Members join as Applicants, become RTTs if they pass a new, more advanced technical exam, or RTTs if they pass the RTT exam. RTs and RTTs vote:** *74/232;* **e. All members have a vote regardless of status:** *169/133;* **n/r:** *45/105*

If you are unfamiliar with the current PTG technical exam, please leave the next question blank.

99. I think the current RTT technical exam ____. **a. should cover a broader range of skills; testing procedure ok:** *16/103;* **b. should cover fewer skills; testing procedure ok:** *4/5;* **c. should cover a broader range of skills; testing procedure should be changed:** *16/20;* **d. should cover fewer skills; testing procedure should be changed:** *22/14;* **e. is fine the way it is:** *144/524;* **n/r:** *271/385*

Please take this question seriously:

100. The statement that reflects my attitude toward this questionnaire is: ____. **a. I was able to give reasonably accurate and honest answers to all applicable questions:** *286/645;* **b. I had to make some rough guesses, but I got through all the questions:** *132/307;* **c. Some questions were just too hard to deal with, so I decided not to answer them:** *33/69;* **d. I bent the truth a little bit on some of the answers:** *5/11;* **e. This is an invasion of my privacy. I bent the truth consistently throughout this questionnaire:** *2/12;* **n/r:** *15/47*

Editor's Note: Future articles will present a more detailed analysis of survey results.

Input Needed For Next Survey

With one membership survey recently completed and the results now being analyzed, work has already begun on the next one, according to Roy Hebert, chairman of a committee charged with that responsibility. Hebert requests that comments and suggestions regarding the first survey be addressed to him at 14772 Brightview Court, Baton Rouge, LA 70819, or call (504) 273-1449.

Directory Corrections

In last April's membership directory, the names of three schools of piano technology were inadvertently omitted from the list of industry contacts. They are:

Niles Bryant School of Piano Tuning; Dept. G, PO Box 19700 Sacramento, CA 95819 (916) 454-4748

The Emil Fries Piano Hospital & Training Center 2501 E. Evergreen Blvd. Vancouver, WA 98661 (206) 693-1511

Aubrey Willis School of Piano Tuning; 1212 W. Camelback Road; Phoenix, AZ 85013 (602) 266-1640