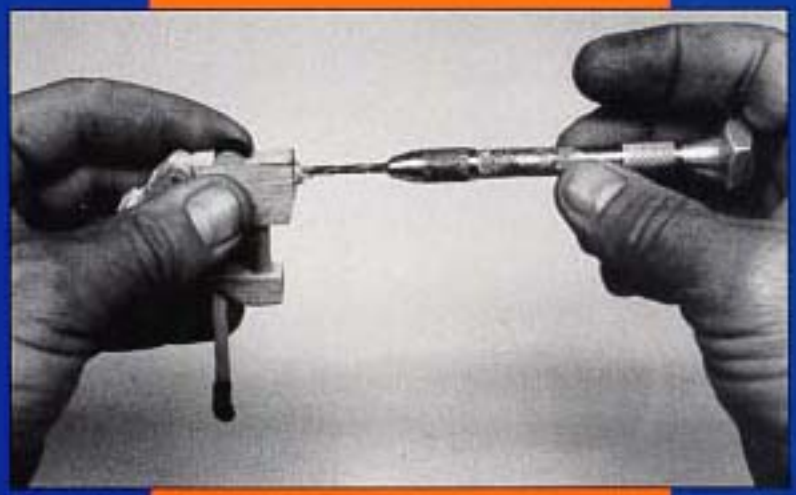
PIANO TECHNICIANS
Journal
November 1993



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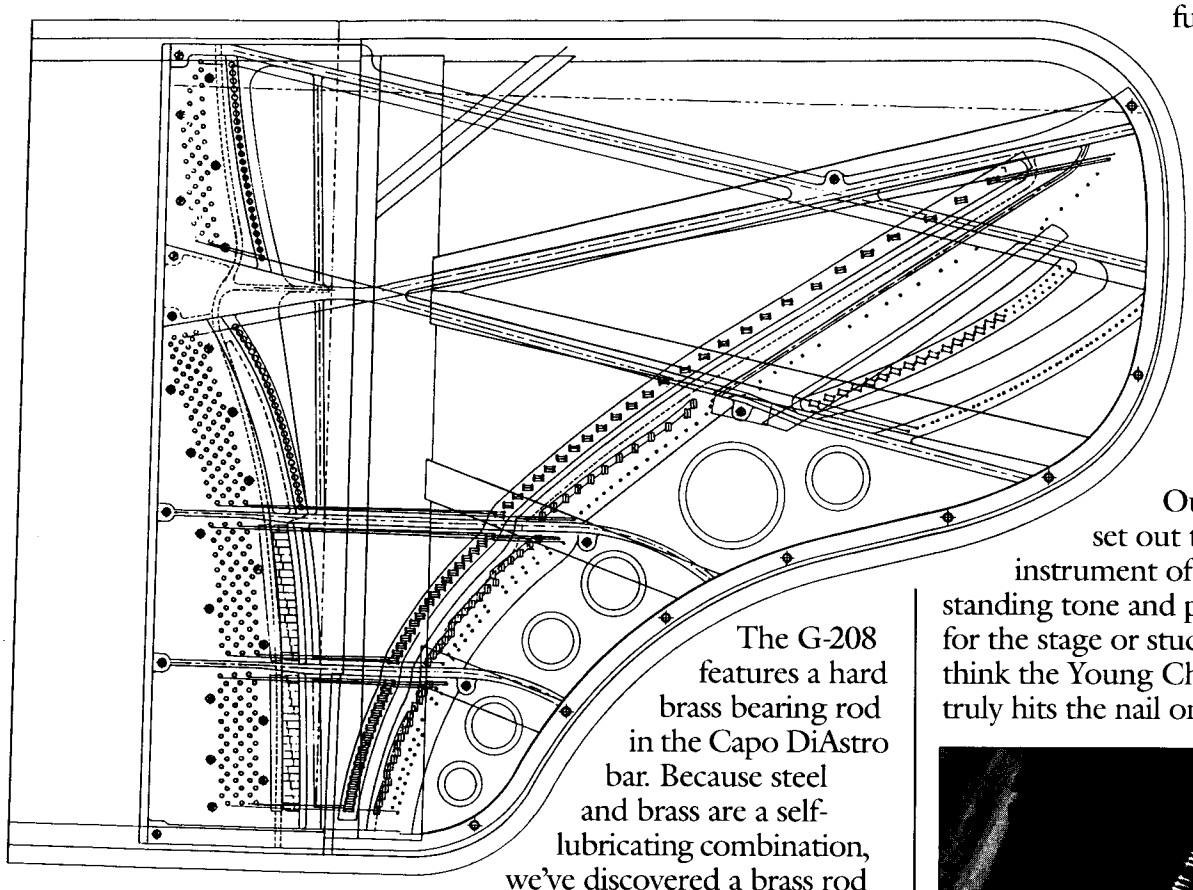

The G-208 features a hard brass bearing rod in the Capo DiAstro bar. Because steel and brass are a self-lubricating combination, we've discovered a brass rod offers better control of strings during tuning. In addition, the brass rod is easily replaced later in the life of the instrument eliminating the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

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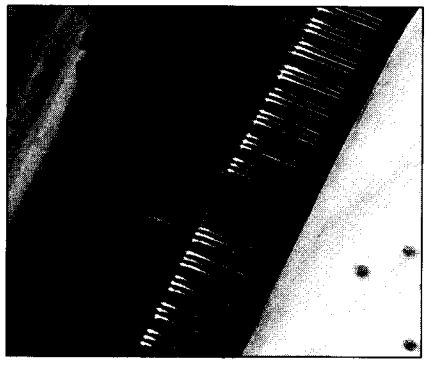

Because strings bear against a replaceable brass rod, tuning control is improved.

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

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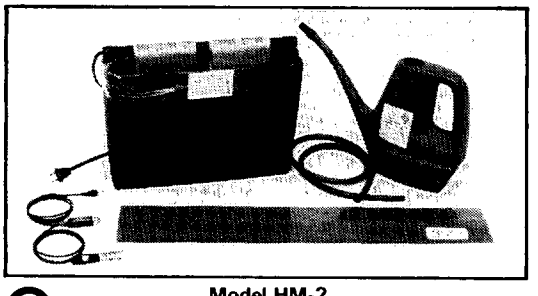

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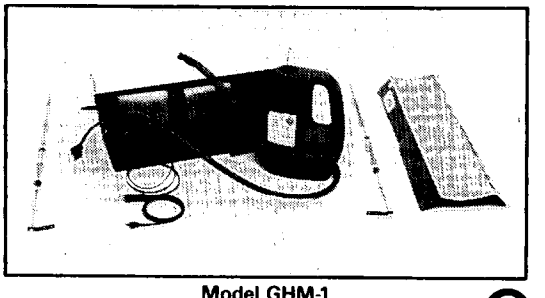

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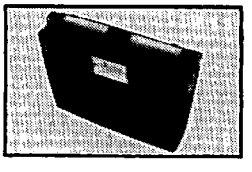

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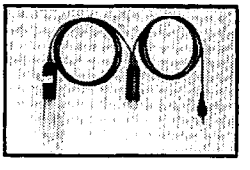

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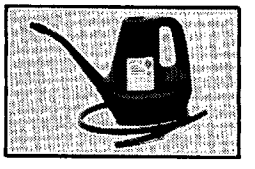

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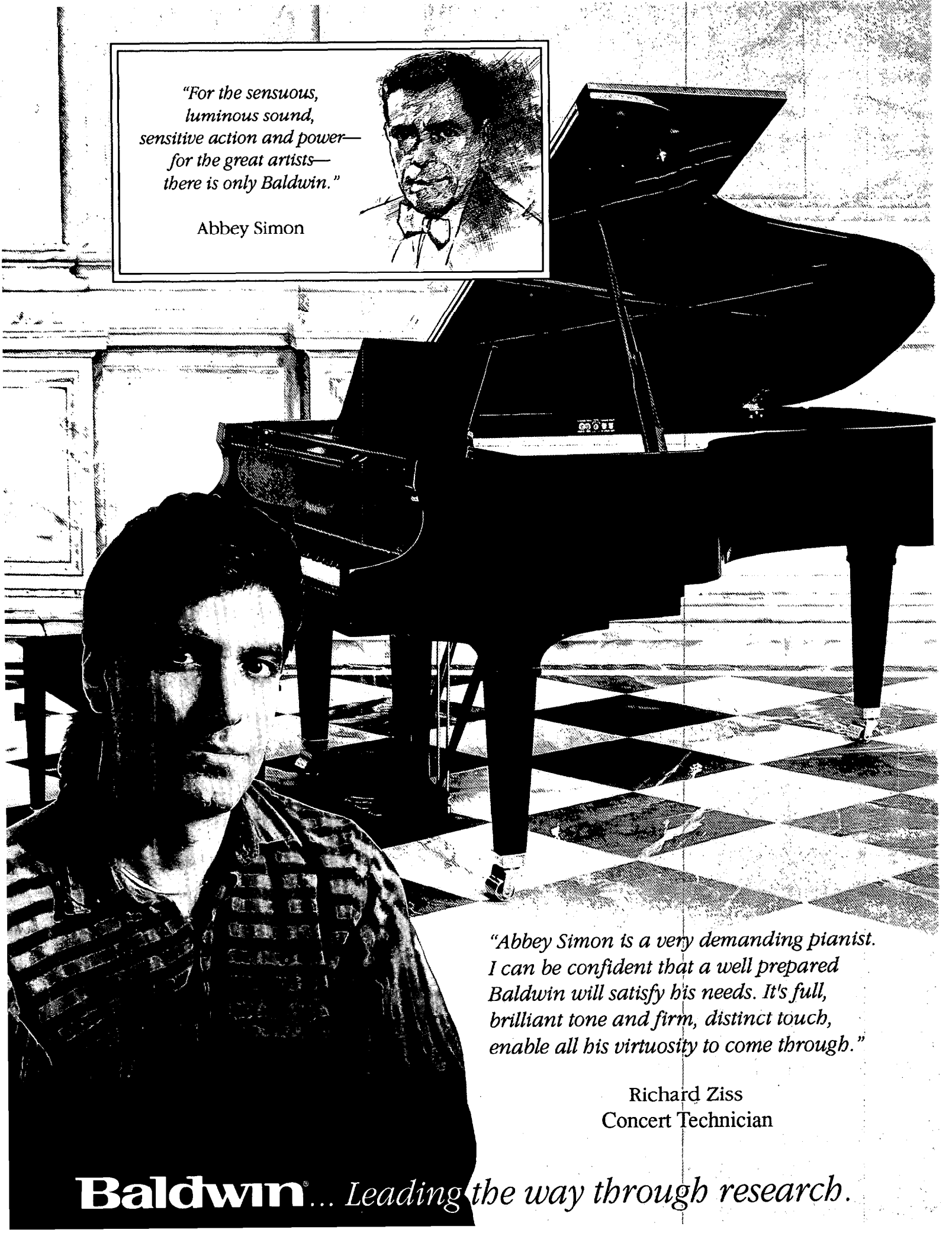
ON THE COVER

Extracting a broken vertical hammer shank as described in this month's PACE Lesson Plan.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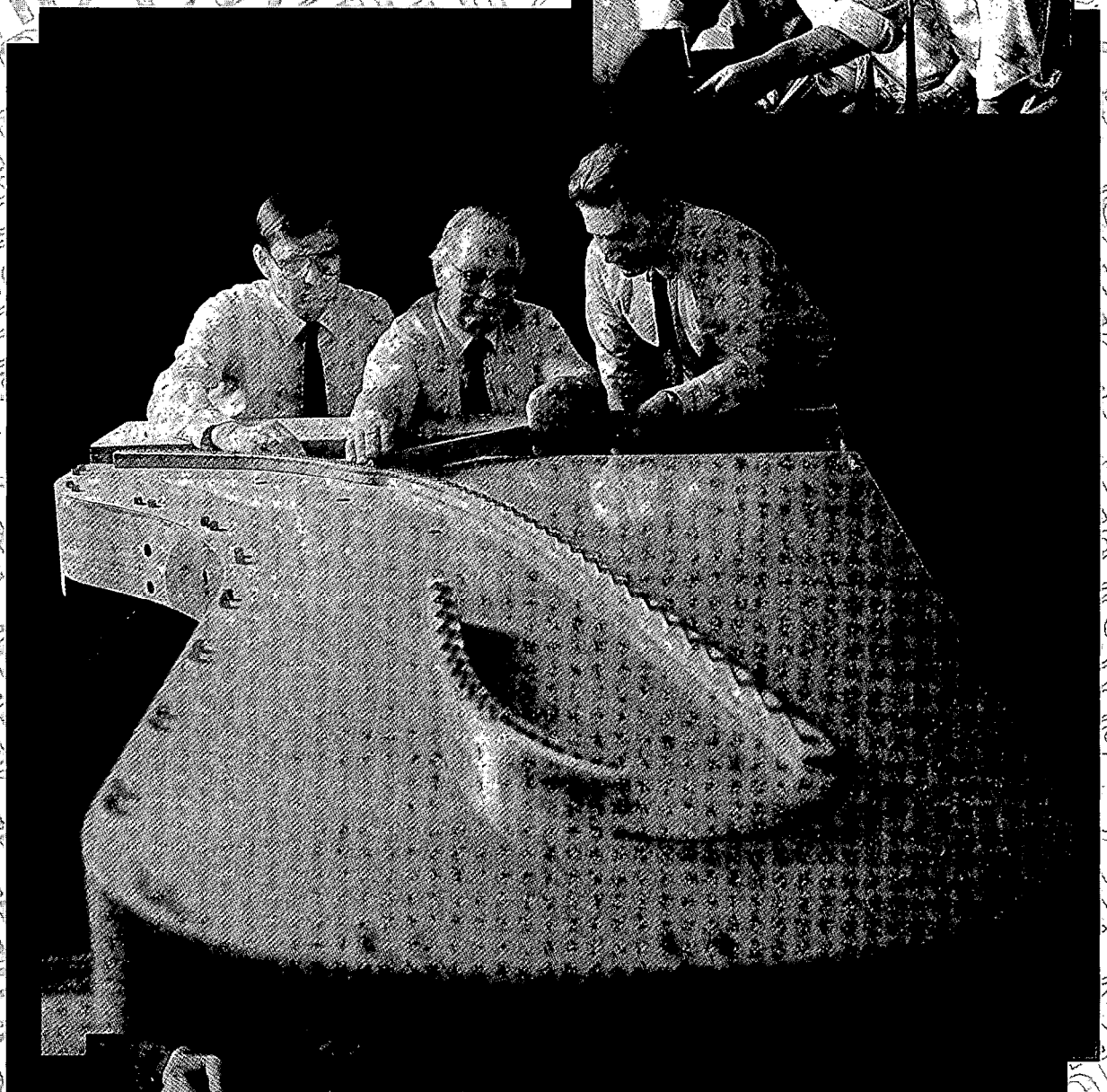

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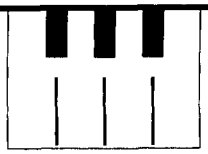

President's Message

PUTTING *Education First*

Why did you join PTG? Most members seem to answer simply. . . to learn. Each of us can cite a particular class or *Journal* series or mentor who has made a difference in our knowledge and skill. To keep the priorities of the organization in line with the members' desires, then, Board and Council must attend carefully to our educational programs, planning both short and long-term strategies to keep our offerings relevant and effective.

In the last two months we have launched the PACE program, initially designed as a planned curriculum for Associate members who are preparing for the RPT exam. Through monthly Lesson Plans published in the *Journal* and through the PACE checklist (sent to all Associates and chapter officers in September), PTG has provided tools for chapters and individual members to customize into viable local educational efforts. Two strategies are recommended: active use of hands-on learning situations and increased emphasis on mentoring. To support chapters and individuals in each PTG region, the RVP, the regional ETS Committee members, and the regional Chapter Services Representative will be working as a team to assist and strengthen chapters with all available resources.

PACE (Professionals Advance through Continuing Education) was developed in direct response to member requests for positive actions that chapters can take to help increase the number of RPTs. It is important to note that the PACE program requires no budget subsidy at all; the RVPs and the ETS and Chapter Services committees may use part of their allotted funds to support the program in the chapters, but no additional PTG funds are needed.

The PACE Lesson Plans will first cover the skills tested in the exams, but will then expand to feature a broad range of competencies necessary to the working piano technician. Ivory key repairs, tilting a vertical to replace casters, rebushing a damper guide rail. . . the possibilities are endless. The Lesson Plans are formatted so that they can easily be combined into book form to be a lasting resource and contribution to piano technology.

Since we in PTG support continuing education for all members, the 1993 Council took a step toward planning for the future by endorsing a special Educational Panel. Chaired by Michael Drost, our Central West RVP, this panel is specifically charged with studying the educational programs in PTG, suggesting appropriate goals for the organization, and proposing strategies that could improve our educational offerings for members at all skill levels. The first report from this panel is due at the Board meeting in January and the '94 Council can look forward to hearing and acting on the panel's report. Council designated $25,000 in the 1994 budget (half of the $12 dues assessment from each member) to be used for educational programs, exact allocations to be based upon the panel's report and the Board recommendations.

We are fortunate to have a wealth of talent, wisdom, and educational experience on this important team. Michael Drost taught a piano technology curriculum at the University of Wisconsin for eighteen years. As CTE, chapter officer, and RVP (for now the fifth year) he has thought deeply about the central importance to the success of the individual technician as well as to PTG. Also serving on the panel is LaRoy Edwards, founder of Yamaha's Little Red Schoolhouse and a charter member of PTG; LaRoy is one of the most respected teachers and gentlemen in our profession. His experience and insights continue to provide positive direction. Doug Neal, instructor at Western Iowa Tech, brings an astute understanding of current theories of adult education and a decade of experience training technicians; his practical and professional approach to educational planning can be of great service to PTG. And Dr. Al Sanderson adds his perspective (and wit) to the

discussion, drawing on his teaching experiences at Harvard as well as his considerable knowledge of the exam process in PTG. Each of these men has been a thoughtful participant in PTG for many years. I and several other Board members have been privileged to audit their first two meetings, which have been lively study sessions! This panel is essentially laying the groundwork for a long-range vision for education in PTG. For the first time ever, Board and Council will benefit from a comprehensive study of that activity we devote so much energy to: education.

Ask yourself: what more could we be doing to improve education in PTG? Is electronic access to information the key; should we have on-line informational services for members? Can we improve our exam process? How could our Annual Institute, our *Journal* and other publications be used even more effectively? Does effective continuing education for RPTs mean a more planned curriculum, perhaps in cooperation with schools and manufacturers? Is the PACE program well focused? How can PACE be best utilized? The panel is asking all these questions and more. Your input is invited. Please direct your letters to the Chair, Michael Drost; the panel is interested in exploring all available ideas. I feel great confidence in their ability to integrate the data and help us, the membership, to articulate our educational goals and find the best path to reach our potential.

One thing we should remember: any goals we define will serve as signposts along the path—not fixed destinations. We are committed to learning, a process that never ends. We have come far in PTG. We can go even farther.

Technical Forum

Certain time-sensitive material must be published at fixed times during the year. The NAMM show and the national convention coverage come to mind. As strange as it seems to read about last summer's convention in October's issue, that's the way it must be. However, to try to get back in sync, I must print some of the correspondence that's starting to collect algae. In truth, many of these letters are recent, but the writers waited a while before finding (or taking) the time to write. By the time you receive this issue, many of you will have weather conducive to sitting in front of a toasty fire and turning the pages with your popcorn-slicked fingers. It's just as well since this is going to be a rather wordy issue.

I usually like to add a little spice (pepper?) to convention reports, by drawing on my abilities as a cynic. Due to emergency surgery and a related stint in the hospital with a collapsed lung, there wasn't the luxury of time in the last issue to do much of this. It *was* interesting to hear that my ailment was typically that of *young* males. Maybe I'm finally growing up?

Before we dig into the mail bag, I'd like everyone to know that I appreciate what appears to be a renewed interest in the magazine, and particularly the Forum. I want this to be your area, and if some act of commission (or omission) on my part has incited your involvement, I'm glad. Even letters with negative implications provide a platform on which to grow and improve our publication. Thanks, too, for the positive letters, most of which do not get published... but do not go unnoticed.

The first letter is fresh out of the mailbox, and is positioned here because the member needs assistance in a hurry.
Help!

Dear Jim, I have been a member in the PTG for the past 35 years and urgently need your help. I volunteer at my wife's Geriatric Center and they are eager to amplify the sound in vertical pianos. The piano supply houses inform me that the "Goddard" piano microphone is no longer available.

Your expert help in this matter will be greatly appreciated. Best regards,
John A. Demsey

Readers Write Back
a.k.a.
THE GOOD THE BAD & THE UGH!

Jim Harvey, RPT
Editor

John, I'm pleased that after thirty-five years, you've found something you need help with. However, whatever "expert" help I might have offered in this area is now outdated information. I'm placing this near the top of the column in case someone else can assist in this situation. Perhaps another member has a used pickup lying around and would be willing to part with it. If what you were told is accurate, I suspect that MIDI, synthesizers, and general economic situations caused the Goddard system to no longer be manufactured.

I think if I were to be presented with the same situation today, on an *experimental* level I would try one of those "area" or "zone" PZM microphones. From my library of resource materials, the Radio Shack catalog says "*...uniquely designed to respond to sound pressure so that it cuts echo effects while increasing clarity and range. Excellent for stage performances, pulpits, executive board rooms and conferences.*" The frequency response is 20-18,000 Hz. That should be more than adequate for the purpose described here.

Another idea is that of using *two* magnetic pickups (accessory to the Accu-Tuner). Those who have used these pickups are aware that there is usually a "sweet spot" on the plate for bass and treble, respectively. That's the rationale for two of them — find the sweet spots, then run the two outputs through a mixer, then into an amplifier.

I must caution that both these suggestions are mind games on my part — I've not tried either of them! UPDATE: Scratch the magnetic pickup idea. I called "Doc" Sanderson, and he threw a monkey wrench into my theory. I *had* figured that there may be a low-frequency response problem, but had *not* counted on the hum factor. The magnetic pickups do not have any "hum-bucking" characteristics built into them. When used properly (with the Accu-Tuner), this is not a problem, since the AT's filtering matrix compensates for the hum.

When used as I suggested, however, the hum factor would likely make this application impractical. The reason I updated my response instead of erasing it was in case someone else, like myself, wakes up in the middle of the night with a radical idea. By leaving this "out-take" idea here, you can go back to sleep!

On a more realistic level, why not just suspend a microphone behind, or down inside the piano? I realize you want to do the best possible job under the circumstances. But, being quite candid, this is not a recording session or a major concert event we're discussing here. Just be

sure to use lots of "gaffer's" (duct) tape to secure any cables, so the folks don't trip over them. Buy the cloth-based tape. The adhesive seems better than that of the plastic tapes, although both look about the same battleship gray in color. Later, should you decide to remove the microphones, any residual tape "grahdoo" (not sure of spelling — so substitute "residual") can be removed with mineral spirits.

Lights, camera...draw?

Dear Jim, I'm pleased with the huge improvements in the Piano Technicians Journal *over the past few years. One thing I would like to see improved more is the quality of photographs that accompany technical articles. Some of them are fairly dismal. I can appreciate the fact that drawings work much better in some cases than photos to illustrate technical things, and the quality of the drawings has usually been very good. I hope some better standards can be applied to the photographs that get printed in the* Journal. *If a picture is worth a thousand words, a grainy, overexposed or poorly lit photo is worth a thousand badly-written words full of typos. Yours for elucidation,*

Jonah Blaustein

Elucidating mode on. I agree with you, Jonah, and will speak to Nick Gravagne about this! Seriously, we became spoiled (and deservedly so) with Bill Spurlock's excellent graphics. (Many folks think Bill has drafting skills, and don't know that all those drawings are done with a dull pencil on a Big Chief writing tablet.) Then there were Valerie's drawings during Susan Graham's tenure. Those were (usually) generated from a photograph, instead of in real time. Many of our writers, however (myself included), are not "natural" artists, and tons of exotic equipment is not going to change this. Nor do we have artist friends living a block away. This forces us to use photographs in *most* cases.

Now is a good opportunity to mention this. If at all possible, any submitted photographs destined for *inside* the magazine should be taken in black and white. The resolution is simply superior to that of converting color prints (or transparencies) to black and white. Unfortunately, here in the sticks, both Tater and his brother Tater at the camera store think black and white film is a new invention. Even when I can find it (or special order it), there's the problem of getting the film processed. It seems all the labs are geared for color. Again, not an insurmountable problem, but rather touchy when a deadline is approaching, and one's pictures are "in the mail". I'm a licensed (black and white film) darkroom navigator, but no longer have my equipment. Even this would only help the Forum, not photographs from other sources.

When the excuses above have been factored in, now we're left with the skills and equipment available to

the person taking the photograph. And we're professional piano technicians, not professional photographers. But we'll keep working at it.

Lubricants revisited

The following are responses from the February '93 discussion of center pin lubes. Actually, the first was a note wrapped around a product sample. As best I can figure, I may have had it *while* doing the article. I had put it in the shop, intended to try it (as requested) and then forgot. Here are the contents of the note:

Hello JH, Sorry about small btl Zip-Slip. Will shortly be available — in 4 oz. glass bottles. Perhaps plastic — fancy silk screening — containers are 'modern' — but they also spill easier! I like the sturdy feel/look & solidness of glass! Please try the product. It cleans, lubricates, and actually restores the bushing. Zip applied, the part swings more than the oft-said 7, but it's not loose! But try it — it's quite a product. Lovingly,

John

I used to speak Ford, so will attempt a translation:

- if possible, he wants the solution packaged in a glass container (it did turn out that way);
- the stuff works;
- it's okay if the newly lubricated shank and flange swings more than seven times;
- he likes me.

I, too, like the idea of a glass container, in spite of the extra precautions required for travel. I've always had a problem with petroleum-based products not being there when I needed them when packaged in plastic containers. It seems the carrier dissipates through the pores of the plastic. On a positive note, the bottle says "Guaranteed or purchase price refunded. When have you heard that recently? On the negative side, the label also reads, "DO NOT INGEST." So much for a multi-purpose elixir.

More on lubrication...

Dear Jim; The new issue of the Piano Technicians Journal *arrived a few minutes ago, and I read with interest your article about center pin lubes, and especially a question about Protek. You mentioned several other center pin lubes, but failed to mention the McLube 1725, which I carry. It is an excellent center pin lube which has been used by numerous technicians for several years, and also was tested by one of the manufacturers several years ago, and they determined that it was as good or better than anything that they had tried.*

I would appreciate it if you could see your way clear to make mention of this at some time in the future. Also, why not try it for yourself so that you can determine its adaptability to the situation?

Ruth McCall

For a long time after they introduced these products in Southern California, I thought that Ray and Ruth McCall had a "stencil" on the McLube products. You know, like if you order enough pianos from a manufacturer, you can have your own name put on the fallboard. My stupidity was just as prevalent then as now. I did not mean to *leave* out any vendors, no more than I meant to *point* out all the vendors (or other lubricant manufacturers — of which I'm also guilty). RemGrit (Schaff?), SuperLube (Webb Phillips, I think), Hoppes (dunno — gun shop?). Even now I can't name them all. The question was about Protek, and my error was likely that of also pointing out that Ford had a recent offering in this market. Aside to Ruth: as one of the charter users of the product (I think), I do have, use, *and* recommend McLube 1725. I've just never tried it on center pins.

Whazzit?

Dear Jim, Could I be alone? I read something like: "I have encountered breakage where the upper part of the pivot bracket is welded to the tubular arm" — and I really haven't a clue as to what you're talking about! I also think that people who do *know what you're talking about don't need the information contained in your column as much as those of us who don't. My concrete suggestions are as follows:*

1) Help those of us who have trouble visualizing something we have either never seen *or never "observed", and use a labeled photo or diagram to illustrate — I bet the manufacturers would help.*
2) A lot of technicians are women these days, and maybe went through school before girls took shop classes. Some of us get to piano technology by way of interest in music, but not necessarily interest in or knowledge of mechanics, tools, woodworking, etc., and are forever trying to fill in the gaps. By realizing the gap exists, perhaps the Journal *editors could do more to help.*

A thousand thank-you's to you and your distinguished predecessor for everything I have *learned from the Technical Forum articles. I would never have been able to change careers and become an RPT without all the wonderful people in the PTG.*

Linda Scott
[at a long address in Mexico]

You're not necessarily alone, Linda, providing you speak Spanish. I'll concede this one (June '93 Forum, page 28). However, there were several other areas in that one article that could also have used some "help". It boils down to where to draw the line between clarity and overkill. For those times, perhaps a trick I sometimes use will help localize the part under discussion. The trick is to read backwards. In this case, start with "trap lever". This usually takes us below the belt line, whether on a vertical or grand. From that point, any part

names are fair game, since, unlike the nomenclature used in actions, the names of trapwork parts varies widely among manufacturers. In this instance, we add "tubular", then "metal" — still reading backwards. This differentiates this type of lever from "stick", the wooden variety we usually see on older uprights that connects the pedal to the (1) pedal rod dowel; (2) pedal reach dowel; (3) any number of other names for the same part; (4) another stick. Having the PTG house organ "Piano Parts and Their Functions" also helps. The bracket and plate mentioned would *involve* the "pedal lever bracket" (#26), and "pedal lever swivel flange", (#23), both on page 18 of PP&TF.

Comments on Chris' comments

Hello Jim, I was in agreement with just about all I read of Chris Day's comments in the August '93 Journal. *I have often thought that a lot of what is written in the* Journal *is theoretical; or unrealistic; or the ideal and not reflecting my experience. At the same time, I realize the* Journal *should reflect the highest standards and procedures. Also, we all work in different economic situations, and we all have different economic goals and requirements. While this can be a dilemma when putting together a fine source like the* Journal, *it is not insurmountable. I think Chris Day's idea of an entertaining discussion of daily compromises made by technicians a good one. What a conscientious technician feels should be done and what a customer will allow are often two different things. That these situations even exist may be denied by many. We seem to have some technicians with big egos and thin skins out there. Maybe we could talk about it and get some of us to lighten up a bit. Thanks.*

Kent Gallaway

Thank *you*, Kent. Did you send your entire letter? I looked for a second page, thinking you may have included one or more daily compromises — just to get this off the ground. Incidentally, a lot of what's written *is* theoretical and unrealistic. There are at *least* two examples in this article alone. My "theory" of the magnetic pickups blew up in my face. And, I neither use nor endorse the practice of consuming center pin lubricant between calls.

More thoughts on the Thomas piano (Part 1)

Note: The next letter was sent to the original author, and copied to me. However, the information provided needed to be known by more than three people, so is reprinted here.

Ted, In your column in the recent PTG Journal *which mentions the Thomas piano, you ask if anyone could tell you why they designed a soundboard with a reverse crown. This may be of interest to you.*

A company that I worked for around the year 1962 sold the Thomas piano, and I had the opportunity to meet the designer at a trade show in Chicago of that year. When asked about the reverse crown, he said that his thinking on this was a result of discussions with people in the construction industry. I have no idea if this is true, but he said that when a building is constructed, the beams or horizontal supports are not straight across, they are curved downward in anticipation of eventually going in that direction anyway. Since a crown in a soundboard does tend to flatten or in some cases does reverse, he evidently thought it was a good idea to reverse it originally and then be done with it. A very strange approach, to say the least.

The designer of the Thomas piano was either Mr. Rippen himself or someone who was associated with the Rippen Piano Co., a piano that was made in Holland. The Thomas piano was made in Ireland and then shipped to the USA. It also came out under the name "Lindner".

Dennis Kurk

Dennis, sometimes it's the noise; sometimes it's just a hard day following a rough night before. Either way, we must take some of the information from a trade show with a grain of salt. I think manufacturers of Quonset huts, geodesic domes, igloos, and flat-bed trailers might have a problem with this fellow's rationale. But then, maybe I'm the one who's having a problem "seeing" this.

Thomas piano (Part 2) and other comments

Dear Mr. Harvey, I just read your comments on the Thomas piano and it sounds remarkably like the Irish-made Rippon piano. (I'm not sure of the spelling of that name, but then I have to look up even common words like Steinweigh!) I had a friend/customer several years ago who had one of these pianos — although he usually referred to it as the Ripoff piano. At the time I saw it there were many broken parts. This friend had a business trip to England and Ireland, and while there he tried to find parts for it to no avail. I wonder if Thomas made the piano you referenced themselves, or if they imported some from Rippon. Life has been good to me and I have never run into another like it.

Thanks also for your comments last month about "vintage" pianos and their care (attempted resurrections?) Although it is difficult to tell a customer that their beloved piano — bequeathed to them by their favorite aunt — has now died, I feel we do them a disservice by trying to "recondition," "rebuild," or "restore" these dead instruments. Good on you for your honest statements about these things. A 1904 Bush & Gertz might have sentimental attachments, but it has neither great musical potential nor monetary value as an antique.

Thanks for your good work on the Journal. *It is a valuable asset to every subscriber, and a publication of which the Guild can be justly proud. Sincerely,*

David M. Porritt

Open season on Dan Bowman

Jim, The article entitled "Tuning With Hearing Aids? Certainly!" in the November issue was excellent and prompted me to share some thoughts on hearing problems — something we all think about, albeit privately, I'm sure. I was originally urged to write when I read a piece in a recent Journal *where a technician was extolling the benefits of*

hammer movement over pounding the keys when setting the strings. I'm sorry, but I can't remember the technician or the issue, but he was concerned about hearing damage.

In the late 40s and early 60s, I assisted my uncle in the servicing of pipe organs, he being a factory representative of Casavant Fr. in Canada. Organ chambers can be extremely loud, and over time, he, like most organ men of that era, started to lose the upper end of his hearing range. He taught me to tune in order to take care of the high notes. I wasn't in the business long enough to suffer noticeable hearing loss, fortunately, and this background was one reason for my interest in piano servicing many years later.

After servicing pianos for approximately eight years, I was hired as the piano technician for San Diego City Schools with the responsibility for 920-plus instruments. In fact, my remarks may be of more use to institutional technicians than to the more common household technicians, but each can decide its applicability. All of these instruments must be serviced at least once each year while music programs and secondary schools get more frequent attention. That means that during summers and at other times when classes are out, it's not unusual to service 8 to 10 or more pianos a day. Yes, it is physically and mentally demanding, but it can be done. If the instruments are well maintained it's not like a full-blown service session every time, but that's another subject.

After some particularly long stretches, I noticed a peculiar phenomenon. My ears, especially my right one (since I tune right-handed), started to feel like what I would describe as fatigued.

There is surely a correct physiological term for this, but fatigued is what I would call it. It should be pointed out that approximately 90% of these instruments are 45" studios, so the sound is projected right into my face. I naturally became concerned and decided to try some type of hearing protector. The most logical was the flesh colored foam type that expands in the ear canal, but they proved unsuitable because they attenuate a full 35dB. Solid rubber ones are even worse — I simply couldn't hear the notes properly. I then purchased a Radio Shack sound level

routine. The tests are not scientific in the formal sense of the word, but I tried to be consistent. I took readings from a cross-section of instruments, positioning the meter at approximately the distance my ears would be. I selected a non-damped function, using the full frequency range of the meter. I was surprised at the results, a number of which I will list. These are random notes on the pianos with the loudest notes coming from the tenor and the softer ones coming from the treble. The following is a simplified list of my findings:

1980s Steinway S
92-104dB
1950s Gulbransen studio
98-106dB
1980s Yamaha studio
96-106dB
1960s Baldwin L
94-100dB
1950s Everett studio
102-106dB
1960s Wurlitzer studio
98-110dB
1980s Kawai KG2
94-104dB
1980s Kawai GS40
98-102dB
1940s Hamilton studio
98-116dB
1960s Hamilton studio
96-106dB
1970s Hamilton studio
102-110dB

I should point out that one string can produce this level of sound and that three strings in unison do not produce three times the volume of one string. The brochure with the meter gives the time exposure limits recommended by the government as being the maximum time before hearing damage is possible. I have taken the liberty to reproduce it here since it is stated as being from the Department of Labor and is therefore readily obtainable information.

Duration (Hrs)	Sound Level (dB)
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4	115

Since dBs are measured logarithmically instead of linearly, I determined that I might indeed have a problem. For instance, 60dB is not 10 more than 50dB, it's 10 times more, if I remember my physics. A simplified list of various sound levels we can relate to follows, using 0 dB as the hearing threshold:

Quiet whisper	20dB
Background music	60dB
Loud orchestra	80dB
Start of unsafe levels	90dB
Rock music	110dB
Pain threshold	130dB

Rather than drag this on and on, I'll get to my solution. I discovered that using small wads of cotton reduced the loudness enough to make the day easily tolerable with no more fatigue. I don't stuff it in deeply, just push it into the ear canals loosely, but enough to fill the ear canal. One of the more interesting benefits that I hadn't counted on is the noticeable and dramatic reduction of unwanted harmonics. Since many people shop for price, it's not unusual to come across some pianos with less than desirable tone quality, especially in the treble.

I fully agree with Herr Fenner that we can't blame the manufacturer for all our problems, but some of the verticals built in the 60s and 70s stretch the term "musical instrument." I was amazed at how much trash the cotton filters out. It even helps with the strange phenomenon in which humans hear a high frequency lower than it really is.

This solution is not a miracle cure-all, but the two main benefits are noticeable and substantial. I hope this can be of help to other technicians, if for no other reason than to stimulate thought and conversation toward even better methods. Yours,

Jon Joyce

Thanks for this excellent report, Jon. I agree on the cotton, having tried a number of other, far more expensive devices for hearing protection before "discovering" this easy-to-find, superior material. By the way, although you mentioned the one versus three string phenomenon, I'd be interested in your findings in terms of stridency between those instruments as a result of differing hammer wear (string cuts). I doubt that you shaped or replaced the hammers on those instruments just to get your readings. I further realize this is an

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unreasonable request, since it would be difficult to establish a "controlled" experiment with that many different sizes and brand names. But since you're the one with the new toy, perhaps you could give us your findings on one or two pianos, measured from the same distance, both before and after hammer shaping and voicing.

Open season on Bill Ballard (Part 1)

Dear Jim, Regarding Bill Ballard's article "Tuning on a Leash," I also have been known to "float" the pitch standard, but I have a different way of framing the issue. Our ultimate purpose in this work, and therefore the ultimate standard by which it must be judged, is an esthetic, qualitative consideration; what is most musical? I am all in favor of measuring and quantifying as long as we keep in mind that in our field, the quantitative is always an approximation of the qualitative. An idealized tuning that looks beautiful on graph paper may yield some important and interesting insights, but it may or may not have anything to do with what actually sounds most musical.
To apply this to the pitch standard issue, let's start with a point on which I think we would all agree. If I am tuning for a same-day ensemble performance; the season, weather, or starting pitch of the piano are practically irrelevant because the pitch must be at A-440 when I am finished. Musicality does require a pitch standard. On the other hand, when doing a home tuning during seasonal extremes; I may feel that my dedication to a pitch standard (and therefore to what is most musical) is served by tuning the piano such that the average pitch until the next tuning will be A-440. This is a simplification for the sake of brevity, but I'm sure you get the gist of it. There are many musicians among PTG members who know that while "most musical" cannot be quantified or easily defined, and even changes over time, it is a far cry from "anything goes." It is in fact a very demanding standard and makes our work much more interesting. Sincerely,

Chris Trivelas

More Ballard bashing (Part 2)

Dear Jim; Bravo! for Bill Ballard's article, Tuning On a Leash, (Journal *August 1993).*

I couldn't help laughing out loud at his opening paragraph, "Picture this: it's late August and you're doing back-to-school tunings in the local high school..." It is August and my wife, Bonnie, and I are just starting on the eighth year contract renewal we have in the Granite School District here in Salt Lake.

The contract is for tuning approximately 700 pianos spread out among 91 schools; high schools, junior highs, elementary, and specialty schools for the handicapped. With our other residential and institutional business, including three other small school districts in two other states, it takes us about nine months to accomplish the Granite contract.

The contract pay per piano is just a little more than half of what we charge for a resident, and only ten percent of the total contract is for "minor" repairs. It would be great if we could tune just in the fall and spring at times when the humidity conditions bring the pianos back to where they were the year before. It would be great if we could tune the same pianos at the same time each year. But, to hope for ideal conditions like that is futile. Even if that were the case, one year may be wet and the next one dry.

We have found over the years that in order to be able to make this type of work profitable we must make some compromises. For instance, none of the district pianos is given a "concert" tuning unless we are specifically asked to tune a specific piano for a specific concert. Also, for the sake of time as much as anything else, we let our "A" float. From a practical standpoint we have to. We each tune from six to eight pianos per day (plus making minor repairs) when we are working in the district. Three or four residential pianos per day would make us the same money but would cost us more in time and travel.

We have tracked one set of five pianos in a high school with a particularly bad humidity problem over a three-year period. Because of this problem, two of these pianos get tuned three or four times each year, rather than the usual once. We noticed that from the dry time to the wet time, they all changed in total as much as fifty cents. The band teacher wanted his kept as close to A-440 as possible, but the choral teacher was willing to let his and the practice room pianos float.

For the three practice pianos tuned only once, at the point in the year where the humidity put them back at the "stable" tuning point, each piano needed only a slight touch-up. But, in between these times it was very obvious that the

crown was increasing as the humidity increased. The center of the pianos from the bass break to the treble beak was considerably more sharp than on the ends. for the other two, an Everett console and a Kawai KG2C grand, it didn't make much difference whether they floated or not. About the same kind of changes were needed for each, except the console in the band room needed to be brought up (mostly in the middle) during the dry time, and the grand merely needed to be leveled out; middle up and ends down. Less overall work was needed in leveling than in attempting to stay at A-440 and both teachers were satisfied.

It has been my experience over many years that the majority of players, professional or non, really don't care and are not able to discern what the standard (A-440) is. Even the most discerning musician ear is interested mostly in the relative interval relationships rather than whether the piano is really on A-440, A-438, or A-444. As a matter of fact, I know few highly trained musicians who can't even tell me the basics of what a beginning tuner should know about interval relationships. Extremely few are analytical enough to say more than, "It sounds swell," or "That unison sounds a bit off." The question needs to be asked, then. Why do we tuners — who do know what a good tuning is — try so hard to be so perfect when even the best performer, not to mention the audience, can't even begin to tell the difference between our own very best and our own barely acceptable? I think there must be several answers; maybe as many as there are good tuners: (1) The challenge to keep from being bored. (2) Fear; even if they don't know, we do, and maybe, just maybe, someone else might know; someone we don't suspect. (3) Pride. We can and always should attempt to do the best we know. There must be many others.

As a CTE I have tested tuners that have tuned in excess of ten years who still cannot set a temperament accurately enough to pass the RPT test. Yet, they have a satisfied clientele and are full time tuners. Perhaps the majority of non-Guild tuners are in that category and are competing for the same business that we are. The reason that I have to bid so low for school contracts is because of some of these. Those who do the buying are looking for two things: low price and dependability without complaints. They can't tell the difference and moreover — don't care. In business one must compromise in order to make a living. Sometimes the most VALUABLE job is not the most perfect according to an absolute standard, but a job that gets done adequately within the budget limitations of the customer. Few people drive Rolls-Royces or feel the need to, but many drive Asian imports they can afford. There may be a few who want, for their own reasons, to have their pianos tuned right on A-440 or whatever. Those we must be able to serve as well as those who can't tell if we let their "A" float. Most of the time for most of my customers, I let the "A" float.

James E. Hill

Ballard and I tossed his idea for that article around for quite a while. The concern was whether it was in keeping with professionalism — especially in the pages of the *Journal*; and to a lesser degree, how much heat it would generate from those who failed to understand the intent of the article. It was decided that since we both endorse this practice, as circumstance dictates, there must be others who also subscribe to the practice — even if that practice is not discussed publicly. Considering these two responses, as well as the others concerning real-world versus the theoretical (Kent Galloway's letter, for example), it appears the decision to publish was sound.

Postscripts

Whew! If you made it this far, thanks for hanging in there. Members often tell me (in person) something to the effect of: "Jim, I really meant to write and tell you ... [whatever]." While I appreciate having this type of input, there's nothing like having a card or letter to share with the membership. It just legitimizes (don't look that up) the entire process. So, please keep the correspondence coming, whether good, bad, or ugh!

Join me in thanking Bill Ballard for his tour as contributing tuning editor. As evidenced above, his articles have given us food for thought, and not always in predictable ways.

Also, let's welcome two new additions to the *Journal* team beginning this month: Michael Kimbell is assuming the post of contributing tuning editor. Without even bothering to say "howdy," he jumps right into tuning from the standpoint of music *theory*. There are a number of musicians in our organization, but for those

who are not, Michael's first article will provide valuable insight into how music terminology applies to us. I hope you enjoy it as much as I did. In a different vein, Ron Nossaman has been recruited as a feature writer. Ron is the editor of "The Voicing Tool" (Wichita Chapter). From what I can determine, his unique (there must be a stronger word) writing has been part of the "underground" for quite a while. I hope you'll agree, after experiencing his style of writing and wit, that it's time his material is brought to the surface!

That's a wrap for now. My eyes are tired from looking at "Winders" for days. And since patience is not one of my strong points, there are other parts that are also sore from waiting. Let me put it another way: ever wonder why Winders' icon is an hourglass? I'm going out (and stand up) to tune a pianer while you continue reading this month's issue. J

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LESSON PLAN

Technical Lesson #3

Vertical Shank Replacement

By Bill Spurlock, RPT

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

This lesson will present methods for doing a professional job of broken shank replacement. Participants will learn disassembly of glue joints, proper dry-fit of new parts, and proper alignment and gluing.

Getting started

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

Hands-on session set up

This job is easily taught to a group in a hands-on format. Obtain the following parts and materials:

- Old upright hammer & butt assemblies, preferably on an old action
- Extra #6 x 1 1/2" dry wall screws with sharp points ground off
- Extra Hypo Oiler-type bottles containing water/ wallpaper remover solution
- Extra disposable lighters or heat guns
- New shanks
- One set of all tools shown in photo 1, for meeting leader

Estimated lesson time

45 minutes

Tools and materials participants must bring

Participants must obtain and bring all those items shown in Photo 1. The plier-type hammershank extractor is shown; however the less expensive screw-type works fine also. Prepare the drywall screw by grinding the sharp point to a blunt end.

Assigned prior reading for participants

From PTG Technical Exam Source Book (PTG Home Office, 816-753-7747):

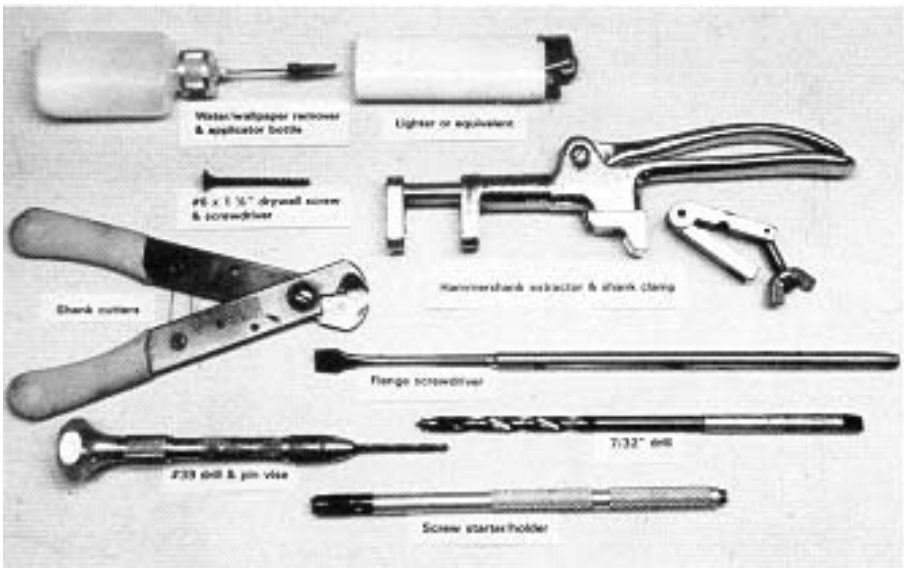
- Article, "Vertical Shank Replacement," pg. X.1
- Figure 1: "Traveling Hammers," page III.1
- Figure 2: "Action Screw Holder," page X.17

General Instructions

This is a common repair but one that is often poorly done. Common problems are: damage to the old hammer or butt during removal of the shank, improper gluing technique resulting in sloppy or weak joints, and poor alignment of hammer and butt with neighbors. Most problems are avoided by extracting the broken shank rather than drilling it out, because this preserves the original bore hole and thus the original parts alignment.

Often the shank can simply be pulled out using the shank extractor and shank clamp, after first heating the hammer butt (or hammer) to soften the glue. In general, however, I find the method outlined below[1] less likely to result in scorching the hammer butt or head, since the heat is applied to the puller screw rather than to the parts themselves. For the purposes of this lesson, I suggest the following procedure:

Technical Lesson #3 begins on the next page



For this lesson:

The meeting leader as well as the participants should have or obtain one set of all the tools shown here.

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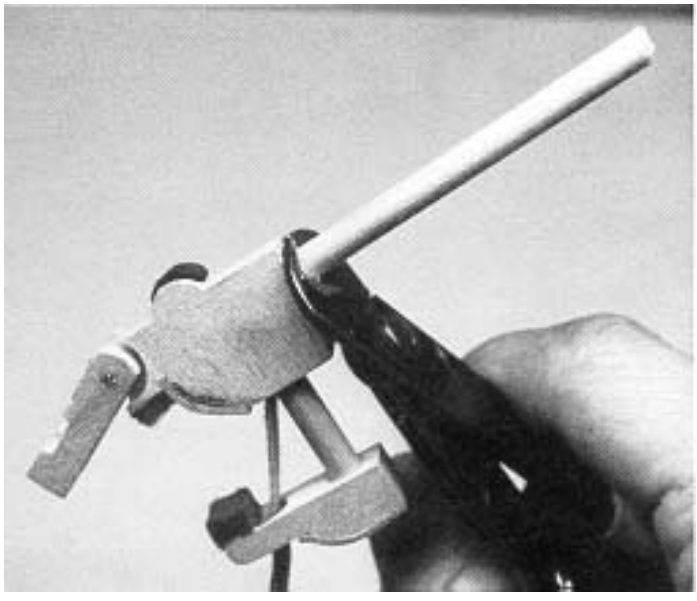

Photo 2: To extract, first chip off the old glue collars, then apply a drop of wallpaper remover/water solution (in a small tipped squeeze bottle) to the joints, being careful not to wet the butt leather or flange bushings. With very old parts, you can often pull the old shank pieces out of the butt and hammer using the plier or screw-type extractors and shank clamp, without heat. If that fails or if there is not enough old shank to grab, cut the shank off flush with the butt or hammer as shown.

Photo 3: Drill a hole in the shank with the #39 drill. Try to keep it reasonably well centered (it need not be exact), and drill to the bottom of the shank (approximately 5/8"). You should be able to feel when the drill hits the small glue space at the bottom of the shank.

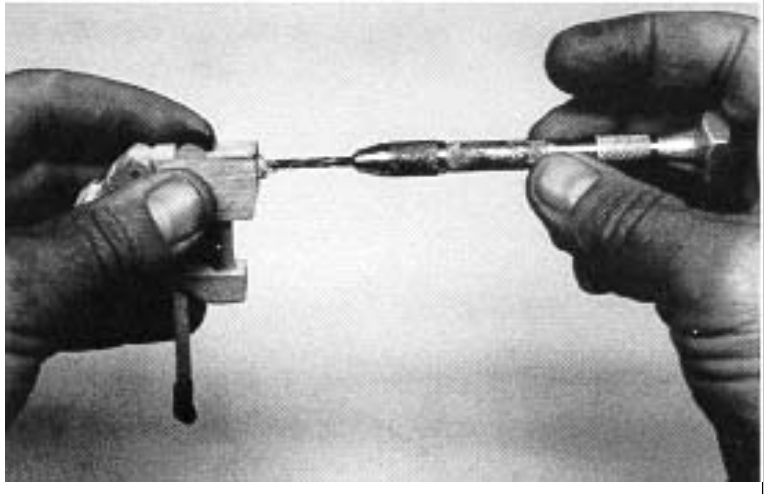

Photo 4: Using a small-tipped applicator bottle, fill the hole with the water/wallpaper remover solution. Refill a second time. *Important: avoid wetting the hammer butt leather or flange bushings.*

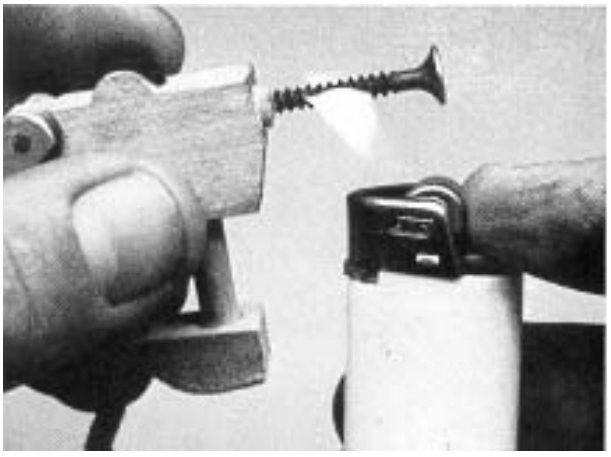

Photo 5: Insert a 1 1/2" x #6 drywall screw into the hole until it bottoms. Heat the exposed part of the screw with a lighter flame or heat gun just until the sides of the hammer butt feel warm and moisture sizzles around the base of the screw.

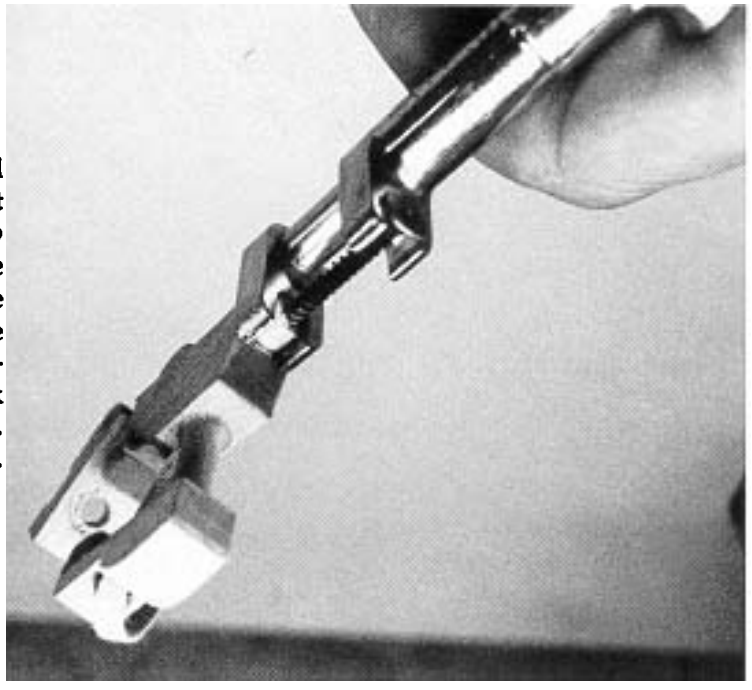

Photo 6: Use the shank extractor tool between the screw head and the butt (or hammer) as shown. The shank stub should pull out easily. However, if the screw strips out, the shank will still be easily removable because the glue joint has been soaked; just use tweezers or an awl point to break the shank into splinters and pull the pieces out. Clean the hole using the 7/32" drill.

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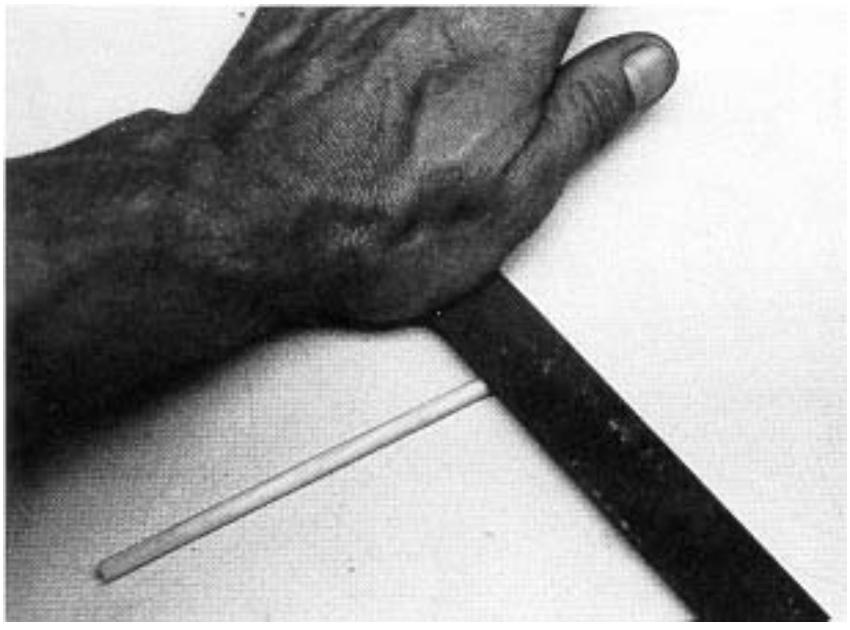

Photo 7: Knurl the ends of the new shank by rolling under a file on a flat surface. Use enough pressure to compress the shank so that it will slip *freely* into the hammer and butt.

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LESSON PLAN

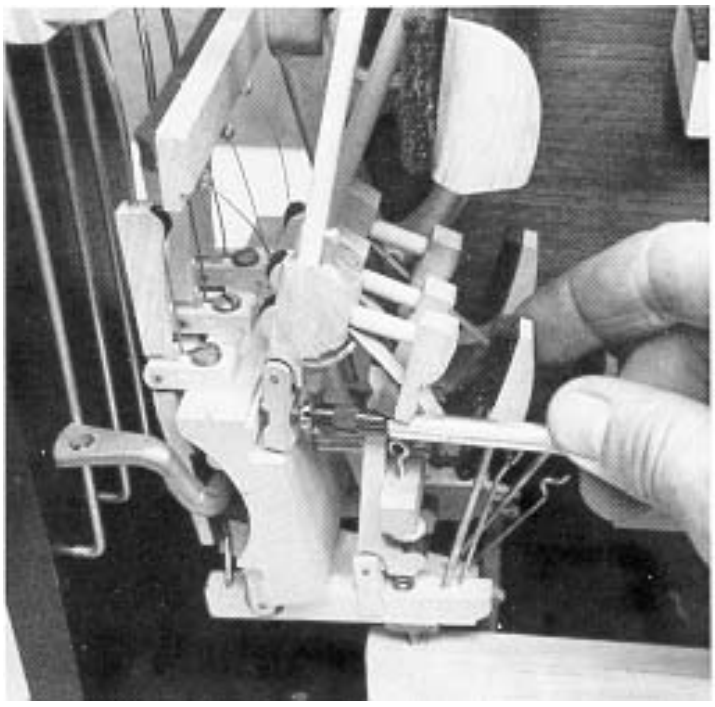
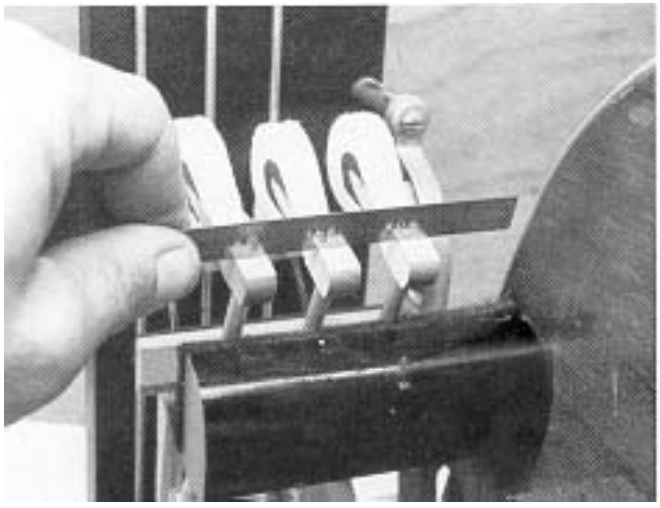
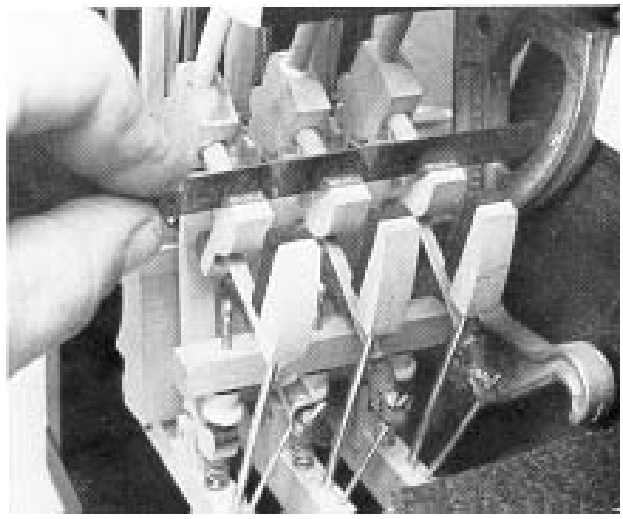
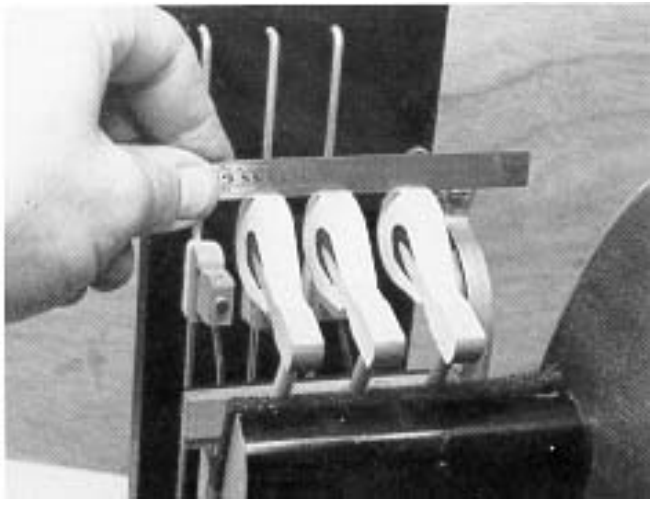


Photo 8: With the shank dry-fitted to the butt (no glue yet), re-mount the butt to the rail. Use the screw starter to hold the screw until it engages the action rail, then use a regular flange screwdriver to tighten. *Important: before tightening a wood screw, always turn it backwards first, until you feel it "drop" into the threads in the wood, then turn it clockwise to tighten.* This prevents accidental cross-threading and damage to the screw hole, and is especially important with critical parts like action rails and frequently removed parts like key slips, grand action stack-to-keyframe screws, etc. Check shank travel and paper the butt flange if necessary.



Photos 9, 10, & 11: Dry fit all parts and cut the shank to the correct height. Make sure the shank is a free fit in the hammer and butt, and that it can be aligned parallel to its neighbors. Re-knurl the shank or ream the holes again as necessary until all parts will align easily. *Important: Be careful to avoid stressing the action center.*





PACE
Professionals Advance through Continuing Education
LESSON PLAN

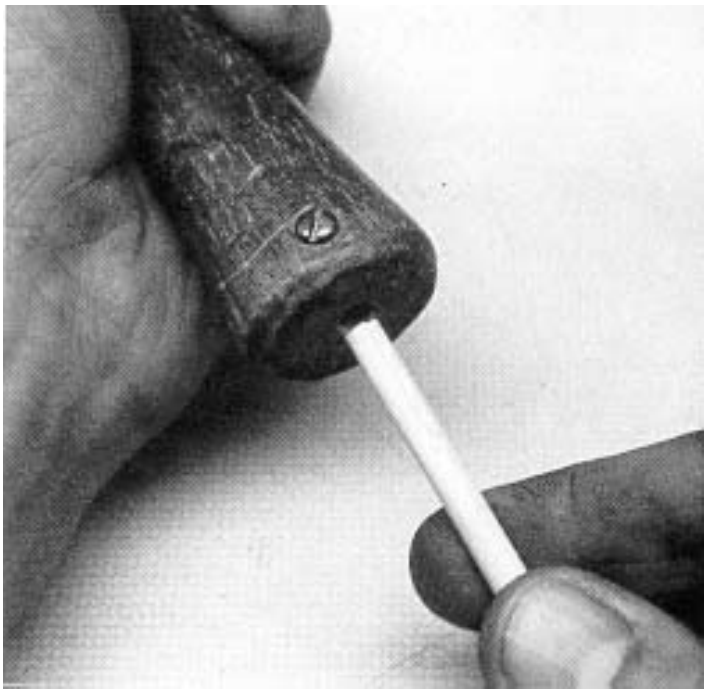


Photo 12: Put a glue-escape slot in both ends of the shank so that glue will not prevent the shank from seating to full depth. A tool for scoring a glue-escape slot is easily built into the handle of another tool, such as the hammer handle shown here. (Drill a 15/64" hole, 1" deep into a hammer handle or any piece of wood. Then drill a 3/32" hole 3/8" from the end of the handle, intersecting the larger hole. Install a # 6 pan-head sheet metal screw in the small hole, deep enough so that its point protrudes into the large hole. Adjust as necessary so that the screw tip scores a shank inserted into the tool.)

Final steps:

• Apply glue to **both** shank and butt, and insert the shank. Align the shank parallel to its neighbors, and the catcher even in height to its neighbors.

• Double check the dry fit and alignment of the hammer, apply glue to **both** hammer and shank, and install, aligning the hammer molding and strike point with its neighbors, and the hammer head parallel to neighbors.

• Clean up any excess glue squeeze-out, being especially careful of glue that may have dripped down the side of the butt onto the jack, or from the top of the shank onto the hammer rest rail.

If the action is in a piano, continue with the following steps:

• Space the hammer to the unison strings. This can be done by loosening the flange screw and shifting or tilting the flange (wood flange types), or by heating the shank and holding it gently to one side as it cools to warp it.

• Re-adjust let-off, capstan, and checking for the repaired note.

Follow-up

As with any new information, participants should practice this procedure on their own until they can perform it easily with consistent results. Practice, along with obtaining the necessary tools, will reward the technician with the *skill*—as well as the knowledge to do the job. Participants should also broaden their skills by practicing parts spacing and traveling on other action parts and various types of actions.

[1] Thanks to Mark Anderson, RPT, San Francisco chapter for teaching me this method several years ago. This job has gone smoothly for me ever since!

PACE

Professionals Advance through Continuing Education

LESSON PLAN

Tuning Lesson #3

String Settling

By Michael Travis, RPT

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

This lesson consists of the demonstration of string settling technique, and practice of hammer and string settling technique for stable tuning. Following the instructor's demonstration, each participant will practice by first unison-tuning one string to a pitch source, then tuning the other two strings to the first, and finally tuning an octave down along with its unison strings. The group, with the instructor's guidance, will evaluate the two unisons for stability and clarity, and briefly discuss the techniques used. After completing this lesson, participants will have a concept of how to achieve stability in tuning, an introduction to aural pitch setting and octave tuning, and a review of unison tuning and hammer technique.

Chapter meeting set up

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

Tools & materials participants must bring

Tuning hammer, mutes, pitch source.

NOTE: the "Coleman Beat Locater" (available from Superior Instruction Tapes) will be needed in upcoming units on interval tuning. Group orders are suggested.

Home study assignment for participants

From *The PTG Tuning Examination: A Source Book*, read: "Passing the Tuning Test" by Jim Coleman, Sr., p.71, (*PTJ* 8/88); "Learning to Pass the PTG Tuning Examination," part 9, "Stability" by Michael Travis, p.53 (*PTJ* 8/90); "Some Thoughts on Unstable Tuning" by Dan Bowman, p.127 (*PTJ* 2/89), and "Letters" by Rick Baldassin, p.129 (*PTJ* 4/89). See also "Tighten Up Jack!" by Bill Ballard, *PTJ* 3/93. Practice setting pitch aurally (tuning one string as a unison to an aural pitch source such as a tuning fork), and tuning the other two unison strings to the first, settling all strings by firmly playing the keys as described below. When satisfied that the unison is stable and matched to the fork, tune a string one octave down to it, and its two unison strings, using a similar settling technique.

General instructions

Two of the most difficult skills for beginning tuners to master are first, making tiny incremental movements of the tuning pin in the pinblock, and second, making sure the string will be stable at the desired pitch, even under the stress of heavy playing. These skills are generally said to be accomplished through a combination of good hammer and string settling technique. Those who learn to practice these skills early on have a solid foundation for tuning success. A previous lesson demonstrated how to practice hammer technique. This lesson includes a demonstration of string settling technique, a brief explanation of what it is and why it's important, and practice in applying hammer and string settling technique together in tuning a few unisons. The unisons selected, A(49) and A(37), will serve to introduce setting pitch and octave tuning. However, do not lose focus on hammer and string settling technique by discussing beat rate checks for pitch or octave tuning; these will be presented in future lessons.

A primary source for this lesson is Rick Baldassin's treatment of this subject in the "Letters" article mentioned above. Instructors and participants alike should read at least this ahead of time. A quote from Norman Neblett's letter provides the central concepts for this lesson: "The tuning pin acts as a medium to get the string close enough to be driven into place. When close, pressure is applied up-pitch or down-pitch on the tuning pin, and the string is then literally shocked into position with heavy blows to the key. It is then tested the same way without any pressure on the tuning hammer. If the pitch stays, great! If not, you are forced to start over again. ... The more you move the tuning pin, the more unstable the tuning."

The instructor should briefly explain this concept verbally (or by a combined demonstration/explanation) and then run through what each participant will be doing. First, detune the outside strings of A(49) by one or two bps, mute them off, and then detune the center string. Repeat for A(37). Without using test notes, aurally

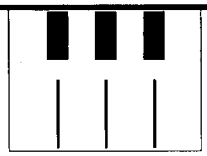
tune A(49), center string to A-440, settling the string with firm blows and as few hammer movements as possible as described above, explaining what you're doing as you go. Repeat while tuning side strings to the center. Repeat while tuning A(37), center string to the tuned A(49) unison, and the A(37) side strings. Demonstrate stability with test blows, asking participants to note any change in the unison sound. See if anyone has questions on what is to be done, and then proceed.

Before each participant's trial run, the instructor should prepare the A(49) and A(37) unisons by detuning and muting as before. The participant will then tune A(49) to an A-440 fork or other aural pitch source, and then the side strings. The instructor should observe whether the participant's technique shows an understanding of the lesson. When this much is done as best the participant can do it, the instructor should ask the participant to play the note softly at first for all to hear, then apply a few more test blows, and then play it softly again. If the participant is being too gentle, the instructor should apply the test blows. Get the group's comments on the quality of the unison sound, both before and after the test blows. Appropriate suggestions may be offered to the participant at this time for possible improvements in technique, and the instructor may demonstrate by clarifying the A(49) unison. The participant should now proceed to tune the A(37) center string to A(49), and then the A(37) side strings, testing for stability and getting the group's reactions as before.

Each participant should have a tuning time of about ten minutes. When all have had an opportunity to perform, the instructor can reiterate the main points of the lesson and urge all participants to continue practicing. It is important to be as encouraging as possible. Each piano presents a more or less unique set of problems, and so hammer and string settling techniques are usually difficult (but not impossible!) to learn.

Time permitting, the instructor may wish to point out and/or demonstrate other aides to tuning stability, such as string seating on the bridges, plate tightening, temperature and humidity control, etc. A neat demonstration of one effect of temperature change on tuning (thanks to Dan Bowman) is to touch a finger to one string of a tuned unison for about thirty to sixty seconds, noting the sound before and after.

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



Good Vibrations

Last month we stated that most of the time our customers are complaining about a tone that has become "harder and harsher" than it used to be. Some techniques of needling and softening (with fabric softener) were discussed. These procedures, along with hammer filing techniques, are best understood when experienced in a real-life situation. Short of that, an article packed full of photos can be very helpful. We are still working out the photo stuff, and will include selected pictures to support past and upcoming articles.

SOFT TONE SOFT HAMMERS

By Nick Gravagne, RPT
Contributing Editor
New Mexico Chapter

Suppose your customer is complaining about a tone that is too mellow (soft), either all through the scale, or in a certain section (usually the first capo section and higher). First, do you agree that the tone is dull? Some customers will ask for the impossible: they want ear-crushing volume *and* sweetness. I explain to such customers that I will try to brighten the tone; but at the point of diminishing returns, i.e., when the tone sounds harsh or "pingy," I will stop. Assuming the hammers are too soft, what can we do? Well, filing or hardening or both come to mind.

It is wise to consider any liquid solution applied to hammer felts as a last resort. In the case of soft hammers, a layer of felt should be removed. Use either a sharp 100 grit paddle file, or else 3/8" wide strips backed by reinforcing tape (such as duct tape). Note that a "layer of felt" does not have a precise meaning, except that the felt can be seen "rolling" off the hammer surface in one continuous "peel." If using a file, start on the low shoulder of the hammer to get the peel going, continue *over* the crown, and finish on the opposite shoulder. Take off as thin a peel as possible. Repeat as necessary. It is important to watch the peel advance up and over the hammer. This is your only gauge as to how the process is going. Remember that you are wasting your time in brightening the tone until felt is removed at the crown of the hammer. It doesn't have to be much but some felt must be removed at the top of the hammer. If the hammers are grooved, as they would be in all-out hammer shaping, the peel will typically roll up to the top and then disappear. So, continue the process until a thin, continuous peel can be rolled from one shoulder to the other.

Should the hammers have a definite nap, i.e., they peel and roll nicely on one shoulder but tear and pull on the other, then you

must remove layers up to the crown from both shoulders and finish the crown by stropping with sandpaper strips.

Some technicians prefer to work solely with strips. They have developed workable techniques for all hammer shaping and tone work. Generally, when brightening hammers using strip techniques, pull the strip up both shoulders to the crown, then strip sand the crown.

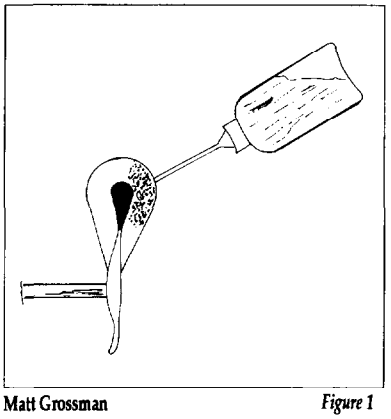
Whatever method is used, the idea is to remove a thin layer or two in order to expose a firmer hammer surface. A brighter tone should be the result. If not, stop filing — you're wasting time. These hammers need hardening by lacquer.

Practices vary, and so do opinions. The extreme positions are: 1) hardening solutions should never be necessary, nor used; 2) such hardeners are fine — " I use them all the time!" Those against "lacquering hammers" insist that a properly made hammer requires no help from wood finishing products or from melted plastic, for heaven's sake. The other camp takes an almost cavalier attitude and hardens hammers at the first sign of dullness. Most of us draw a line somewhere in the middle.

Bringing up a piano in the customer's home qualifies in my mind as a repair/reconditioning job. If I think a hardening solution will improve the tone in some section of the scale, then I have no qualms in using one.

In Matt Grossman's fine article "Voicing Concepts" (July '91 *Journal*), a good argument is made for firming up hammers with multiple applications of thin lacquer solution. A case is further made for considering the concept of hammer hardening as "coating" the fibers. Matt says, "...the lacquer need not be applied so thick that it interferes with the resiliency of the hammer. It can be mixed in very thin proportions so that it merely puts a coating on the felt fibers...." The recommended ratio is 15 parts acetone (or lacquer thinner) to 1 part clear lacquer. This is for starters. The mix can be strengthened; but the idea is to use the lightest proportion you can get away with. Sometimes multiple applications are necessary. Hammers treated thus can still be voiced down with ordinary needling techniques. Hammers soaked in heavy solutions, however, will not properly or fully separate when needled.

Figure 1 shows a hammer being soaked with a hardening solution. The bottle is a hypo-oiler plastic squeeze type, available from Pianotek and other supply houses. Begin juicing the hammer at the position shown in ***Figure 1***. The solution will "wick up" to the crown, and also run down the tail. Stop there and let dry. Acetone dries more quickly than lacquer thinner; and the acetone/plastic pellets* solution dries more quickly than lacquer thinner/lacquer. Any drying can be accelerated with heat from a hair dryer, but absolute final drying will take hours, or even overnight.



Matt Grossman *Figure 1*

The process is repeated until the hammer sounds brighter. If too bright or "pingy," it can be needled and sugar coated down with shallow needles right at the crown.

Sometimes a hammer may produce a tone that isn't necessarily too dull, but it lacks command — the attack is weak and the tone seems "light" compared to its neighbors. Such a tone may be the result of over-eager needling in the high shoulders. Remember, firm (yet springy) shoulders are critical for producing a strong attack and solid tone. So, if the tone seems "sort of bright" but weak in overall effect, suspect weak shoulders. Try lacquering the shoulders only with a 10:1 solution or stronger. Again, remember that you can voice through light-bodied hardening solutions; needling and sugar-coating will bring it down again — but go easy with the needles and keep in mind that many "bright tone problems" exist at the crown of the hammer. (See last month's article "Hard tone — Hard Hammers.")

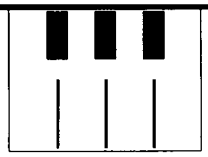
What is the piano telling you?

It is sometimes said that piano tone, like language, continues to evolve as demands are made upon it to satisfy ever-changing tastes. The day a harsh and pingy piano tone becomes the accepted norm is the day I will probably get out of this business. Until then, rather than forcing a particular tone from the instrument, I think we would do well in letting the piano tell us what tone will work best. This is very true of other instruments such as violins and even percussion. Why fight it? Generally, performance pianos (9', 7', etc.) residing in recital halls should be bright, loud and strong in tone. Complaints of dullness or deadness in such instruments should be handled carefully. Assuming the pluck tests indicate good sustain and reasonable volume, these hammers need a layer or two removed first. If not enough, then hardening is next. But be alert to the point of diminishing returns: as the hammer is made harder the tone may become louder, but after some point, also thinner. When the tone is as loud and full as possible, without being harsh, thin, and pingy, the instrument is giving all it has to give! At least with that set of hammers.

The same is true for the home piano. Some pianos sound great when mellow, but awful when brighter. We all need to develop our instincts in this matter and learn more to hear what the piano is telling us. How far will it let us push it?

* *Pianotek sells "Hammer Hardener Pellets" which dissolve in acetone. Directions read, "Allow to dissolve for several hours. Apply directly to hammer strike point or shoulders. Because it dries quickly, you will be able to hear results within 30 minutes.*

"You may needle any hammers that are too bright...." J



Tech Talk

Don Mannino, RPT
National Service Manager
Young Chang Pianos

Alignment & Traveling

Sixth in a Series of Articles on

Grand Action Regulation

In the last few months we set the foundation in our action regulation job by assuring that the keyframe is located and bedded well, and the key level has been established and regulated. The next step in this job is to insure that the upper action parts are all aligned and traveled properly. It is appropriate to review the purpose of our regulation work once again to underscore the reason for taking all these intermediate steps in the regulation process.

As was stated in my previous articles, the job of the piano action is to accept the pianist's input and transfer the motion as efficiently and with as much control as possible. Simply put, if the action parts are not in good alignment to the strings, energy will be lost through added friction and misdirected motion. Even slight misalignment will cause some losses, and the inconsistencies from note to note that we try to eliminate in our action service will be increased. Imagine that a point of light is on the center of the top of a capstan, and the room is dark other than this point of light. If you move the key up and down rapidly and look at the key from the side, you will see a slight arc of light. If you look straight down on the capstan from above, the arc will become a very slim line, with no sideways motion in the arc provided the key bushing mortises are properly aligned.

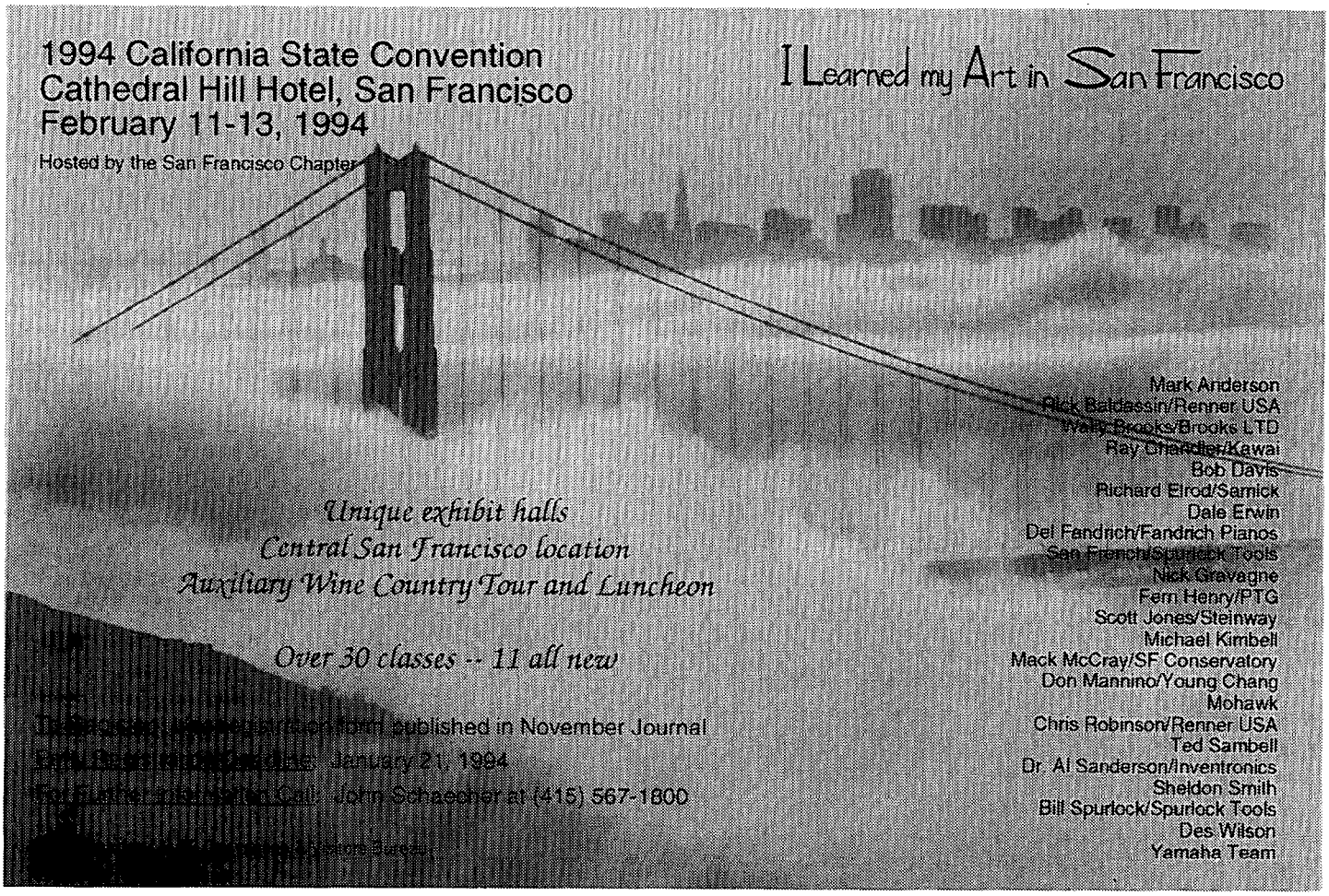
This arc of the capstan motion we are imagining lies within a plane, and that plane should be perpendicular to the plane of the strings. It makes sense that any motion that is not directed *at* the strings cannot transfer power *to* the strings. Although the energy lost through misdirection is relatively small (it ends up as heat from friction within the action parts and centers caused by flexing and wobbling), it will contribute to unevenness in the action, as a poorly traveled and aligned action will have a different misalignment on each note. Now imagine that there are small light sources at the center of each part of the action: one on the capstan, one on top of the repetition lever, and one at the center of the knuckle (for this to work I guess we have to stretch our imaginations a little, as all of the action parts would have to be transparent). Now make the imaginary room you are in dark, and move the key fast enough to create a blur of motion with the lights. If you look at the parts from the side, you would see each light move in a slight arc again, and if you change your perspective and look exactly straight down at them again, the lights should all converge into a single line. This would indicate that the parts are all moving in precisely the same plane, and are therefore traveled and spaced perfectly. Although absolute perfection such as this may never be attained in real pianos, it is still the ultimate goal of good action traveling and spacing. The regulation procedures below are assuming (as in most of this series) that the parts are in reasonably good condition and properly assembled. It doesn't make much sense to spend your time spacing and traveling if the hammers are not glued on straight! On to the regulation procedures:

Step 5: Space and Travel the Upper Action Parts. This consists of four separate steps:

a. Travel hammer shanks
b. Space hammers to strings
c. Space wippens to hammer shanks
d. Travel wippens

There are a number of popular shimming materials for traveling hammer shanks. They fall into two classes: sticky and non-sticky. The advantage of sticky paper is that it sticks to the flanges, of course. This helps when the parts have to be removed from the rail for some other repair — the traveling paper stays stuck to the part, so the part shouldn't have to be re-traveled.

Pre-gummed traveling paper is available from some supply houses already cut in nice little pieces just the right size to stick on the flange. This will work well, but I find that these slow me down, as they require that the flange be taken completely off the rail to stick them on in the right place. Another sticky variety is brown pre-gummed package tape, the type you wet and stick. I have used this by cutting long, narrow strips about 2mm wide by 20 cm. This works well, but it is pretty thin, so it makes only very



small changes in the traveling, sometimes requiring many applications before you have enough. You don't really have to wet this, by the way. Just put it in dry, and time, along with some humid weather, will make the paper stick to the wood enough to do the job. Some technicians cut regular masking tape into small strips to stick under the flange, but masking tape seems to deteriorate too much over time.

Of the non-sticky type, some people use small strips of sandpaper ("A" weight 220 garnet paper works). This has the problem of being pretty thick, so I found that I ended up fudging around with the position of the paper under the flange too much. I have seen new pianos where the factory workers kept placing more and more paper under the flange on *both* sides of the screw — the first piece over-traveled, so another piece went in the other side, which over travelled it again, etc. (one tends to become a little cynical about piano manufacturers when you find seven strips of traveling paper under a flange; three strips on one side, and four on the other!).

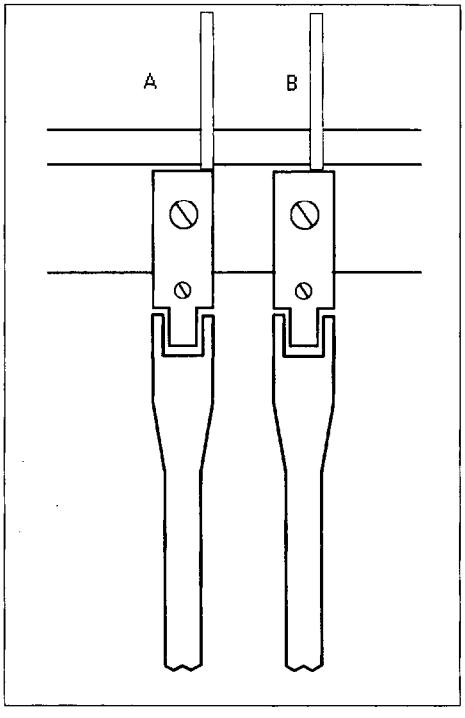


Figure 1—Location of Traveling paper

My favorite material is just plain paper, cut in strips. I prefer good quality stationary bond for its longevity and stability, but it probably isn't all that important. The drawback of any non-gummed traveling paper is, of course, that it will fall out when the part is removed. Cut long strips of business stationary paper (about 2mm wide, and don't use the part with the thick, raised lettering). This type of paper is heavy enough that it has sufficient body to allow you to loosen the flange screw and slip the paper underneath. I suppose that the lack of fuss in using ungummed paper has overridden this shortcoming in my work, but feel free to use what works best for you.

The first step in traveling shanks is to set some sample shanks at the ends of each section for true vertical motion. This will keep you from setting all the hammer shanks traveling off in one direction in unison. I like to travel the hammer shanks looking straight down at the

hammers from above. Take the action stack off the keyframe and place it on your flat workbench, turned around so that the hammers are towards you. Place a T-square on the bench so that the broad base is flat on the bench, and the thin, ruled length sticks up in the air. Raise the first hammer up off the rest cushion a little, then slide the T-square over to the hammer shank from the side so that the ruled part just barely touches the side of the hammer *shank*. You have to play around with the T-square a little to find a position where it will lightly touch the side of the shank while still sitting flat on the bench and not getting in the way of the hammer, especially in the bass and low tenor where the hammers are large and mounted at an angle. The T-square rule usually has to touch the hammer rest rail or the back of the wippen to get it far enough away from the hammer.

Now that the T-square is in position, lightly and carefully raise and lower the hammer shank. Watch *very closely* where the shank touches the T-square for any change in the contact. If the shank is traveling vertically as it should, the shank should stay in light contact with the T-square as the shank is moved up and down. Place traveling paper under the flange to correct for any "drift" of the shank, then move on to the next sample shank at the end of a section. When traveling the hammer shanks, place the paper under the side of the flange towards which the shank travels. If the shank moves towards the right as it is lifted, place the traveling paper under the right side of the flange. You can fine-tune the amount of traveling done by moving the paper closer or farther from the screw. Placing the paper close to the screw (**Figure 1, example B**) makes a slightly larger correction than placing the paper at the edge of the flange (**Figure 1, example A**). You can also reduce the amount of travel by placing the paper a little less deeply under the flange.

With the long paper strip underneath the flange, tighten the screw and test the part with the paper still sticking out from the rail. This method speeds up the process, because the paper can be easily adjusted if it isn't quite right on the first try. This is the main reason I like the non-gummed, slightly stiff paper. If the shank needs less traveling, loosen the screw and either move the paper away from the screw towards the edge of the flange, or pull it out from under the flange a very small amount, then retighten the screw and test it again. If it needs to have thicker paper, loosen the screw, pull the strip out, fold it over to double thickness at the end, put it back under, tighten the screw and retest it. Once the shank is traveled well, carefully tear off the paper flush with the flange and move on to the next part. If you can't get it torn neatly you can clean up the paper stubs with a razor blade later on.

Once the end shanks in each section are traveled well, place a thin straight stick of wood (or whatever works: I use the thin strips of birch that are used as spacers in boxes of Renner hammer shanks). Move through the action from one end to the other fairly quickly in one pass, occasionally using the T-square to recheck a shank here and there at the center of the sections. After the full set is done, turn the action around the other way, and re-check your work looking from the other direction. It seems like no matter which way I turn the action for the first pass, I always see a few shanks that need correction when I turn it around to recheck it.

One reason for regulating grand actions with the piano nearby is that good wippen traveling requires that the hammers are spaced to the strings before the wippen work is done. A bench regulation will get everything close, especially with very well-made parts, but the finest results will come if the wippens are spaced and traveled *after* the hammers are carefully spaced to the strings.

After the shank traveling is done, recheck the screw tightness of

all the flanges, remount the action stack to the keyframe and put the action in the piano. Recheck your earlier action positioning now, and put the cheekblocks in to make sure everything is where it will be when the piano is fully assembled. Now space the hammers to the strings.

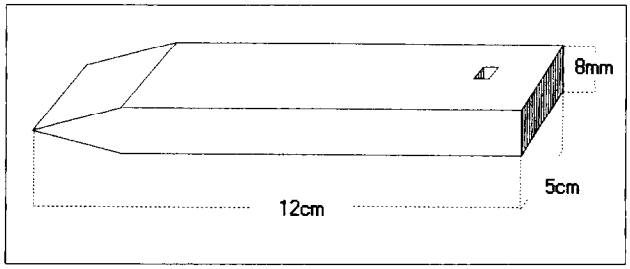
The best technique for this depends on the action type. The easiest hammer shanks to space are those that have a tapered flange, with space to allow a screwdriver to be inserted between the flanges to space the hammers. There are also tools made to fit certain action types (such as Renner, Baldwin, and some Yamaha actions) to speed up the process, but careful use of a broad-tipped blade screwdriver can work well. Space the shanks by bending over the piano, lifting up on the jacks to bring the hammers up to the strings, and inserting the tool between the flanges to work them into position.

A small pillow placed on the stretcher bar can help tremendously, by the way — leaning on something greatly reduces the stress on your back.

Spacing close flanges is a little more difficult and requires that you pull the action in and out many times as you work. To decrease the number of moves in and out you can use chalk to mark the key upstop rail for each key according to the direction the hammer needs to move. After you have marked all the keys that need adjustment, pull the action out, adjust the hammers, replace the action, wipe off your marks, and repeat the process until all are correct. I have seen factory workers use this technique and be surprisingly fast and accurate.

I have two techniques for adjusting closely spaced flanges when the action is slid out onto your lap. You can loosen each screw slightly, twist the flange by hand and hold it there, then tighten the flange screw; or you can use a large, wide and thin blade tool (like a blade screwdriver, only shaped more like a fan at the tip) inserted in the cracks between the flanges to twist the flanges into position. These are available from supply houses, but they usually need to be sharpened a little to be sure they go down between the flanges deeply enough to keep from damaging the wood.

In Steinway actions the flange wraps over the front edge of the rail, so a different technique can be used to space these. I made a tool patterned after one I saw at their factory, made from steel stock about 8mm thick by 5cm wide. Cut it to a length of about 12cm, then grind a chisel point on the end. To use it in spacing, place the chisel point between the flanges with one hand, and tap on one side or the other with a small hammer to knock the flange into position. The square hole at the opposite end is used for turning the action glide screws. This flat tool is easier to work with than a tuning lever when bedding the keyframe.



Spacing Tool for Steinway Style Flange

These flanges that wrap over the rail sometimes don't want to stay put when you need to space them over a fair amount. If the hammer creeps back over after you have spaced it, apply a small piece of traveling paper (gummed is best here) under the *front edge* of the flange, on the same side that the flange needs to be moved towards. Since these rails are rounded, the flange naturally wants to be pushed straight (or crooked, depending on how accurate the machining is) when the screw is tightened. Shimming the front edge of the flange helps

to support the flange in a slightly angled position on those occasions when the flange needs to be moved a lot in order to get the hammers properly aligned.

Some manufacturers prefer to space the hammers slightly off-center, towards the right on three string unisons and towards the left on double- or single-string unisons. This allows the hammers to be made narrower in the bass and reduces the amount of travel in the unacorda pedal. In the process this helps to prevent problems of some hammers catching the first string of the neighboring notes when the unacorda pedal is used. This slight offset of the hammers does not affect the tone as long as all strings are being struck solidly.

Once the hammers are spaced to the strings, the action should be put back on your workbench again, and the upper action should be removed from the keyframe for easier access to the wippen flanges.

Now space the wippens to the hammer shanks. The easiest way to see this is to turn the action stack with the hammers towards you again, raise the hammers up, then drop each hammer down one by one and sight down on the parts to see how the knuckle meets the repetition lever. From an idealistic standpoint the correct way to do this job is to first travel the wippens by lifting groups of wippens with a small wooden block, correcting wandering wippens by *twisting the flanges* with the spacing tool. Then the wippens should be spaced to the knuckles with traveling paper. Please note this point: for action parts in which the flange is perpendicular to the moving part (as with wippens and damper underlevers), you travel the parts with a spacing tool, and you space the parts with traveling paper. If you want to be absolutely precise, this procedure of traveling first, then spacing with traveling paper is the correct one, and I especially recommend it for poorly made action parts with lots of alignment and traveling problems.

In practice I find that it is more efficient with well-made parts to space the wippens to the hammers by rotating the flanges around their flange screws with the blade type flange spacing tool, then checking the traveling and correcting any "wanderers." Raise and lower the wippens from underneath and watch for poor traveling, and you will find that those which move laterally as you raise them will usually have been spaced a great deal to mate with the knuckles. In the process of twisting the wippen flange around its screw, it has become angled too far over, so it is traveling to the side. Straighten the offending wippen for correct traveling, then check the spacing of the following:

1. Hammer Flange Spacing. The hammer flange may have been screwed down closer to one of its neighbors, causing the knuckle to be off to one side.
2. Wippen Flange Spacing — same type of problem.
3. Poorly glued or cut knuckle
4. Misaligned hammer head, which is causing the shank to be spaced to one side to get the hammer aligned with the strings.

Once you have eliminated the problem, re-space the parts. If the wippen still cannot be aligned with the knuckle without causing a traveling problem, then put traveling paper under the flange to pull the wippen over underneath the knuckle.

Normally I find that there are just a few problem wippens in the average action, so this sequence of traveling and spacing wippens is very efficient. If there are more than a few problem wippens in the action you should adjust your procedures accordingly, which means you should travel the wippens *then* space them to the knuckles, as outlined above.

As you work on the wippen spacing, keep an eye on the tops of the jacks and their spacing within the repetition lever window. If any are rubbing one side of the window, then the jack should be spaced over by putting a slight bend in the jack center pin. With a block of wood, support the *wippen fork* underneath on the side of the jack that has the larger gap, then carefully tap on the top of the jack with a plastic-tipped hammer. If you go too far, take out the wippen, replace the center pin, and redo the procedure while the wippen is out, as it's a little easier that way (the edge of the workbench is usually a good support for the wippen fork).

The Damper Action

Although I would not normally travel and space the damper underlevers at the same time as the upper action traveling and spacing, I will cover the procedures here in the interest of not having to repeat all of the basic procedures and concepts for traveling. For one thing, I don't do all the traveling and spacing on the same day because the dampers are usually already installed and working by the time I regulate the rest of the action. Also, I tend to get a headache from all the eyeballing of the parts when traveling and spacing, so I don't usually have the wherewithal to tackle the damper system on the same day as the rest of the action!

The overall alignment of the damper action was covered a few months ago, so what remains to be covered here is the fine alignment of the underlevers, and the traveling of the underlevers that are wandering to one side or the other. This is best accomplished with the damper action out on the work bench.

Set the action on the bench as it would be in the piano. Some damper actions (in which the underlever flange rail is screwed directly to the piano structure, and is separate from the damper tray) will sit with the tray on the bench and the flange rail hanging out behind. On these actions, simply rotate the flange rail by hand, and the poorly traveled underlevers will move side to side in a very obvious fashion on the damper tray. This is a very graphic illustration, by the way, of how important traveling the damper system is — the friction of the underlevers on the tray felt and the key end felt can be sub-

stantial! Travel the parts as with the wippens, i.e., rotate the flanges around their mounting screws with a flange spacing tool to eliminate wanderers.

Then space the parts visually, placing traveling paper behind the flanges to move offending underlevers into good, even spacing.

Other damper actions (which use mounting blocks at the ends) will not sit flat on the workbench well, so the work will go fastest if you take the mounting blocks out of the piano, put them on the pins, and clamp the blocks to your workbench to hold the entire damper action in a stable manner. Then use your wood stick to lift the underlevers in sections to see any traveling problems.

If the damper system is not going to be disassembled, then check the damper underlever traveling by lifting the levers with a straightedge. Don't use the pedal to check traveling! Since many actions have the flanges mounted on the damper tray, lifting the dampers with the pedal to check traveling will not show any errors, because the flanges and the underlevers are moving together. Visually check the spacing, aligning the problem levers by removing the individual underlever and applying gummed paper on the back of the flange. Correct for any traveling parts with the flange spacing tool, inserted between the underlevers.

Next month I will discuss how to diagnose problems with the action spread and other parts of the action that need to be corrected before we start turning regulating screws. *(See regulation checklist above right.)* J

Regulation Checklist:

Regulation Step	Related Items
1. Locate Action	Replace stop block cloth. Repair keyframe at unacorda lever contact. Repair/tighten keyframe joints. Clean & polish keyframe guide pins or springs. Locate damper action to keys.
2. Bed Keyframe	Replace keyframe felts. Replace key pins.
3. Square and Space Keys	Key tops Key buttons Cleaning of key wood Key bushings Key balance holes Backchecks
4. Level all keys	Check, reset case part alignment
5. Space and Travel Action a. Travel Hammers b. Space Hammers c. Space Wippens d. Travel Wippens e. Travel Underlevers f. Space Underlevers	Action centers Hammer head alignment on shanks Space jacks in repetition lever window Repetition lever & jack surface (Dag, Emralon, etc.)

Tuner's Corner

The Ins and Outs of Intervals

By Michael A. Kimbell, RPT
Contributing Editor
San Francisco Chapter

A single note, played in isolation on the piano or some other instrument, is just a noise. It may be a very pretty or pleasing noise, but like a blob of melted plastic it is shapeless and defines nothing in particular. Play two notes, however, either together or one after the other, and suddenly, like plastic that forms itself into a tiny brick, a shape, a musical interval emerges which expresses something and which can be combined with other intervallic shapes to create a musical idea. An interval is more than simply the distance between two notes: it has a sound and a life of its own. Intervals are the raw materials out of which the composer shapes musical sculptures, the raw elements from which the performer creates worlds of energy and beauty. Intervals are the essential building bricks of piano tuning; the pianist depends on us to provide him or her with well-formed intervals, and any out-of-tune intervals are like defective or misshapen bricks which mar the edifice that the performer is attempting to erect.

In this article I shall explain the rationale behind the names of both the notes and the intervals we tuners deal with on a daily basis, in such a way as to make at least some of the intervals on the keyboard a bit less elusive. In like manner I shall also explain the relative sizes of the intervals, and shall group them according to their musical personalities and usefulness in piano tuning. Although some of this information may be elementary, I hope that its presentation in a new form may shed some light on what we tuners try to accomplish, as well as lay a foundation for subsequent articles on overtones and temperament debugging.

Intervals; double flats; key signatures; higher mathematics... Ugh! At the mere mention of the words "music theory," many mortals instantly take on a glazed look and exhibit a strong desire to change the subject rapidly. No—what I hope to accomplish in this and future articles is to share with you an intuitive and more artistic sense of what intervals and temperaments are all about, omitting what is useless to the tuner and tying the rest together as clearly and neatly as I can. Both as a composer and as a tuner, I deal with intervals constantly. I enjoy working with them, playing with them, combining and weaving them into songs and sonatas, and polishing them to a shining precision as I tune.

Even after the reams of intervallic esoterica which beckon to the theoretician are set aside, there remains a reasonably tidy amount of practical information about intervals which is both fascinating and useful to a piano technician in the field. Although we now have excellent electronic devices which can crank out perfectly respectable intervals, it behooves us to have an intimate knowledge of just what the machine is producing so that we have confidence in our own aural quality control as well as the ability to carry on when the machine is unavailable. Even more important, we can have a greater appreciation and enjoyment of one of our own principal products!

Before we can examine intervals, we need to consider the system of notes from which the intervals are derived. In this regard it would seem that we moderns have it lucky. We enjoy a simplified tuning system of twelve notes spaced evenly across the octave so as to create twelve equal "half-steps." We have even gone so far as to subdivide each of these half-steps into 100 nearly microscopic sub-intervals called "cents," for a total of 1200 cents per octave. Seemingly scientific, this arbitrary system offers us an easy back door into an intuitive understanding of the true nature of tuning. Using cents to describe what we hear, we can limit ourselves to grade-school arithmetic with small whole numbers, leaving the minefields of monster ratios and logarithmic calculations to the dedicated mathematicians.

Neat as the twelve-note system may appear on paper, however, one glance at the piano keyboard shows us that we are faced with a bit of a problem. If twelve is such a handy number to work with, then why are the keys arranged so asymmetrically? Why aren't they in groups of 3 or 4 or 6? As if appearances weren't bad enough, why aren't the keys numbered 1 through 12, or named according to the first twelve letters of the alphabet? Why aren't the intervals named according to the number of half-steps they contain?

The answers lie in the fact that much of our music is based on a seven-note scale, not a twelve-note scale, and that the historical legacy of a basic seven-note system is reflected, not only in the layout of the keyboard, but also in the names of the notes themselves as well as in the names of intervals bounded by these notes. Looking solely at the white notes of the piano keyboard, named according to the first seven letters of the alphabet (recycling from A in every octave), one sees that the octave is divided into seven unequal parts, and that the "half-step" distance between E and F or between B and C is less than the "whole-step" distance between any other pair of white notes. In the past, the terms "whole" and "half" would have been understood as approxima-

tions; only in modern equal temperament are these terms strictly true, and even today performers of other instruments may regard the fixed notes of the piano as a point of departure, to be tempered or bent further, or even "un-tempered" as the musical situation warrants.

Historically, the black notes were initially regarded as larger-scale alterations or colorations of white notes. In early church music, for instance, B-flat exists as an alternative to B-natural and not as a central point of reference in its own right. **Example 1** further illustrates the principle of using sharps or flats to bend or color the white notes. Notice in the example that letters of the alphabet are neither skipped nor repeated; whereas either "Ab-Bb-Cb-Db-Eb" or "G#-A#-B-C#-D#" would be correct, "Ab-Bb-B-Db-D#" would be incorrect. Moreover, we need to be aware that the terms "sharp" and "flat" are not synonymous with black notes. "Sharp" means changing or tuning a note approximately a half-step higher, while "flat" means changing or tuning a note approximately a half-step lower. C-sharp, C-natural and C-flat are all different varieties of the note C, and it is only in the modern, simplified 12-note system that C-sharp is tuned so that it matches the tuning of D-flat, or that C-flat is tuned so that it matches the tuning of B-natural. Black notes are always "sharps" or "flats"; although white notes are not necessarily "naturals", it is possible (as we shall see) for tuners to avoid the "unnatural" ones!

In more recent music the "chromatic" or "colored" black notes have gained equality with white notes to the point where white notes could sometimes become musically subsidiary to black ones. The subsequent amalgamation of myriad seven-note scales into a single twelve-note system has led to a kind of double life on the part of every note on the keyboard, with F-sharp masquerading as G-flat and vice-versa, not to mention E-sharp versus F and so on. **Example 2** shows the simplified set of all twelve modern notes, omitting subtleties such as double sharps and alternate names for white notes. As a further simplification, we tuners often take the liberty of naming black notes as "sharps" exclusively. However, when it comes to understanding intervals, it might pay to think in terms of preserving the order of the alphabet, so I hope that those of you who tend to prefer the sharper image will bear with me in the discussions that follow. If nothing else, we should be aware that, for our musician clients, the F major scale goes "F-G-A-Bb-C" and *not* "F-G-A-A#-C"!

Example 1 — Sharps and flats as coloring agents:

C	D	E	F	G	A	B	C
C	D	E	F#	G#	A	B	C
C	Db	Eb	F	G	Ab	Bb	C

We are now ready to explain the names and relative sizes of intervals wider than a whole step, namely the various thirds, fourths, fifths and sixths — the bread and butter intervals of piano tuning. Our place of reference remains the basic seven-note scale, the white notes named after the first seven letters of the alphabet. Historically, the note C is the primary starting point, not only for general understanding but also for many musical structures and elements of composition, and C will serve best as our own home base. The names "second," "third," "fourth" and so on are best understood as describing the number of alphabet letters *including the first note*, as illustrated in **Example 3.** (page 36)

Example 2 — The standard set of twelve notes:

C	C# Db	D	D# Eb	E	F	F# Gb	G	G# Ab	A	A# Bb	B	C

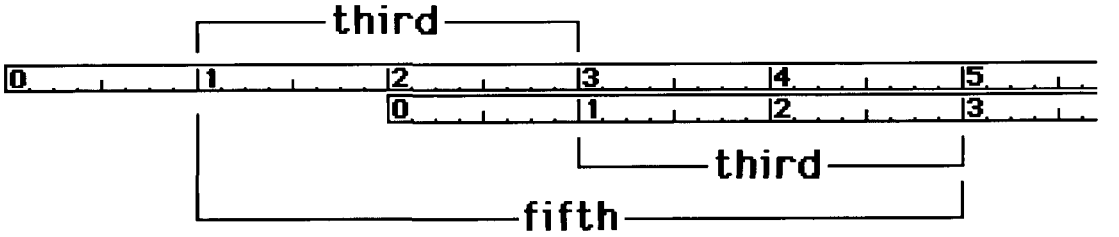
Because our counting includes the first note, some confusion seems to arise when we stack or "add" intervals. For instance, when we go up a third from C to E, and then up another third from E to G, we see that two thirds add up to a fifth, which seems to contradict our assumption that 3+3=6. Likewise, if

Example 3—Derivation of interval names from the musical alphabet

Unison	C	C	1	"one sound"
Second	C-D	C-D	1-2	2 sounds
Third	C-E	C-D-E	1-2-3	3 sounds
Fourth	C-F	C-D-E-F	1-2-3-4	4 sounds
Fifth	C-G	C-D-E-F-G	1-2-3-4-5	5 sounds

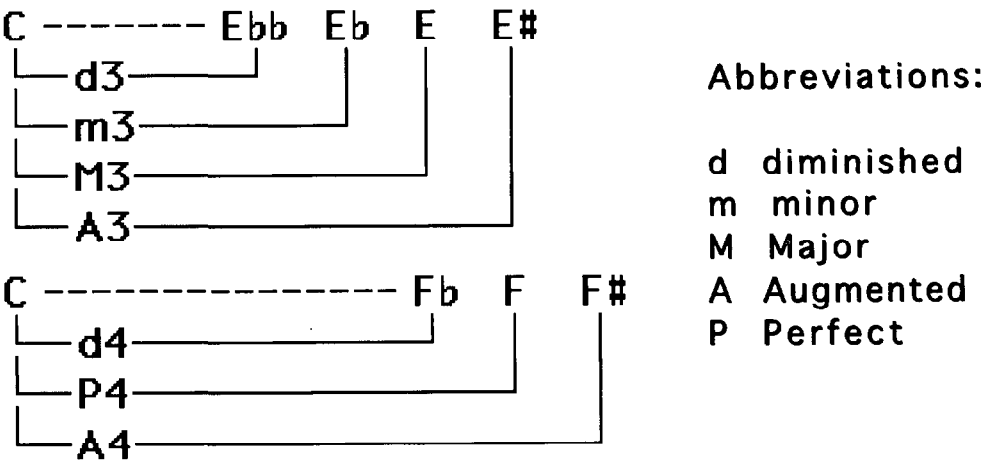
we make the mistake of regarding a third as two steps, then our assumption that 2+2=4 still seems to come up with the wrong answer. How then can we arrive at the correct number which is 5? To get the right answer we have to ask the right question in the first place. It is generally a mistake to count the number of steps or half-steps in an interval; instead, count the number of alphabet letters including both the first and the last note. If you should still insist on doing simple arithmetic with intervals, remember that it is like measuring with rulers starting on one instead of zero, as in **Example 4**, and always subtract one from the "addition" of two intervals: 3+3-1=5.

Example 4 — "Addition" of stacked intervals:



The real fun begins when we realize that there are at least two sizes of thirds: smaller or "minor" thirds (m3 for short), and larger or "major" thirds (M3). To really complicate matters, music theorists have invented super-small or "diminished" thirds (d3) as well as super-large or "augmented" thirds (A3), but fortunately we can ignore anything labeled "diminished" or "augmented" except perhaps for augmented fourths. Likewise there are several kinds of fourths: diminished fourths (d4), perfect fourths (P4), and augmented fourths (A4), as illustrated in **Example 5**. All of the other intervals operate in a similar manner. Faced with this potential confusion, we need to have several questions answered: What makes an interval "major" or "minor"? Which intervals come in "major" and "minor" varieties and which do not? Can we avoid applying the terms "sharp" and "flat" to white keys?

Example 5 — Various sizes of thirds and fourths:



For the moment let us consider just the thirds. Whether a third is major or minor depends first of all on its position in the scale of seven white notes, and then secondly on the "coloring agents" of sharps and flats. Of the thirds formed only from white notes, the major thirds (such as C-E) contain two whole steps (in this instance, C-D and D-E), while the minor thirds (such as D-F) contain a whole step (D-E) and a half step (E-F). The keyboard layout gives us another way of distinguishing white-note major thirds from white-note minor thirds: each of the major thirds (C-E, F-A and G-B) embraces two black notes, whereas each of the minor thirds embraces only one black note.

Now let's use the "coloring agents." Instead of playing C-D-E to arrive at the normally major third C-E, we can color the E to E-flat and play C-D-Eb to arrive at a smaller ("minor") third C-Eb. Similarly, instead of playing D-E-F to produce the normally minor third D-F, we can color the F by raising it to F#, producing a larger ("major") third D-F#. The bottom note of the interval can be colored just as easily: B-C-D produces the minor third B-D, while Bb-C-D

produces the major third Bb-D. Likewise, the major third C-E can be changed to the minor third C#-E, or to the diminished third C#-Eb if we color both the upper and lower notes of the third. C-something to E-something is always some kind of third, no matter how much we color either the C or the E. As long as we avoid mixing sharps and flats, we can avoid diminished and augmented intervals.

"Unnatural" white notes can be avoided by using the alternate names of both notes of the interval. Taking again the instance of the major third C-E, it should be apparent that Cb-Eb and C#-E# are also major thirds; by using the alternate, friendlier-looking spellings B-D# and Db-F we can avoid having to deal with C-flat or E-sharp.

At this point we can bring all of the intervals together into three groups, dividing those which can be "major" or "minor" from those which are only "perfect," and at the same time dividing those intervals that we want to make sure are in tune (especially in the temperament or midrange section of the piano) from those which can be ignored in the tuning process. The traditional musical names of the three groups are "perfect consonances," "imperfect consonances," and "dissonances." The "consonant" unisons, thirds, fourths, fifths, sixths and octaves are the building blocks of chords and harmony and must be tuned carefully, while the "dissonant" seconds and sevenths in traditional music either arise incidentally or are deliberately featured as spicy or more jarring elements, and can thus be left out-of-tune. The "perfect" and "imperfect" categories can also be related to piano tuning. On the one hand, the "perfect" unisons, fourths, fifths and octaves, which each come in one basic size ("perfect fourth," "perfect fifth" and so on), are tuned either as perfectly as possible or else with very slow beat rates. These intervals have a hollow or "perfect" sort of sound. On the other hand, the "imperfect" thirds and sixths, which each come in two basic sizes ("minor" and "major"), can be much more heavily tempered or mistuned with much faster beat rates; thirds and sixths therefore have a sweeter and livelier personality. The "dissonant" seconds and sevenths, with piquant or unruly personalities, also come in the two basic "minor" and "major" sizes. **Example 6** summarizes the three groups of intervals.

Putting it all together, we can now list all the intervals in order of increasing size: unison, m2, M2, m3, M3, P4, "tritone", P5, m6. M6, m7, M7, octave. **Example 8** illustrates these intervals, starting from C and working upward.

In tuning it is important that we think downward as easily as we think upward. **Example 9** illustrates the same gamut of intervals, but this time working *down*ward from C.

Example 6—The three groups of intervals

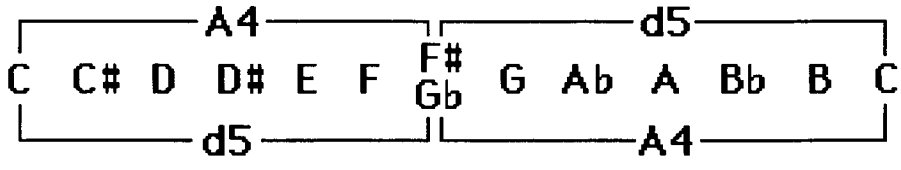
Perfect consonances	P4, P5, P8, unison	hollow, calm
Imperfect consonances	m3, M3, m6, M6	sweet, lively
Dissonances	m2, M2, m7, M7, A4	Spicy, unruly

If you look closely at Example 6, you will notice that I have included the augmented fourth among the dissonances. All of the other augmented and diminished intervals turn out to be puns on the normal intervals in the modern twelve-note system, but the augmented fourth (alias diminished fifth) is an anomaly and stands by itself. It is commonly known as the "tritone" because it is the product of three consecutive whole steps, as in C-D-E-F#. (See **Example 7**.) Tritones and minor sevenths are sometimes used to check the tuning in the low bass section of the piano.

Intervals wider than an octave, such as ninths, tenths, and so on, are known as *compound* intervals. Only a few of these, listed in **Example 10 (page 38)**, are used in piano tuning.

Since there are twelve different notes on the keyboard, it follows that there are twelve instances of each size of interval: twelve minor thirds, twelve perfect fifths, and so on. This is the point at which we might throw up our hands in despair and wonder if it

Example 7 — The tritone:



Example 8—Gamut of intervals upward from C

	m2	M2	m3	M3	P4	A4	P5	m6	M6	m7	M7
C to	Db	D	Eb	E	F	F#	G	Ab	A	Bb	B

Example 9—Gamut of intervals downward from C

M7	m7	M6	M6	P5	A4	P4	M3	m3	M2	m2	
Db	D	Eb	E	F	Gb	G	Ab	A	Bb	B	to C

is worth remembering (not to mention that horrible word *memorizing*) all of this information. The comforting answer is a three-fold *no*. First of all, things which are loved and used daily eventually memorize themselves. (If we hate the sound of intervals, we shouldn't be tuning!) Secondly, in a later article I intend to show how all of the consonant intervals relate very simply to the fourths-fifths tuning sequence or circle of fifths. Finally, in the meantime you can refer to the table of consonant (tuned) intervals shown in **Example 11**. After all, what else are computers and Journal writers there for?**J**

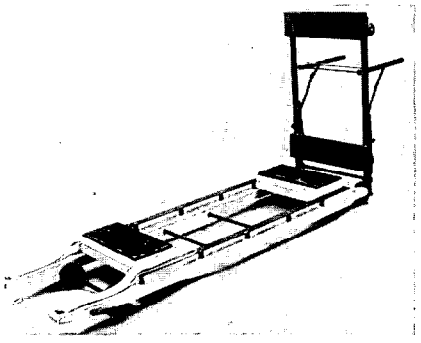
Example 10—Compound intervals used in piano tuning

Tenth	octave-third	P8 + M3
Twelfth	octave-fifth	P8 + P5
14th	octave-seventh	P8 + M7
17th	double octave-third	P8 + P8 + M3
19th	double octave-fifth	P8 + P8 + P5
21st	double octave-seventh	P8 + P8 + M7
24th	triple octave-third	P8 + P8 + P8 + M3

Example 11—Intervals used in the temperament

up from	m3	M3	P4	P5	M6
C	C-Eb	C-E	C-F	C-G	C-A
C#/Db	C#-E	Db-F	C#-F#	C#-G#	Db-Bb
D	D-F	D-F#	D-G	D-A	D-B
D#/Eb	D#-F#	Eb-G	Eb-Ab	Eb-Bb	Eb-C
E	E-G	E-G#	E-A	E-B	E-C#
F	F-Ab	F-A	F-Bb	F-C	F-D
F#Gb	F#-A	Gb-Bb	F#-B	F#-C#	Gb-Eb
G	G-Bb	G-B	G-C	G-D	G-E
G#/Ab	G#-B	Ab-C	G#-C#	Ab-Eb	Ab-F
A	A-C	A-C#	A-D	A-E	A-F#
A#/Bb	A#-C#	Bb-D	Bb-Eb	Bb-F	Bb-G
B	B-D	B-D#	B-E	B-F#	B-G#

Industry News



FINDLAY, OHIO—BICORP is introducing a self-lifting piano truck designed to move grand, baby grand and spinet pianos with just two persons.

BICORP recently purchased the Self-Lifting Piano Company which has manufactured piano trucks since 1901.

Joel Guth, director of marketing for the company said the new model SL 440 lifts up to 3,000 pounds on a frame of 67-inch hardwood sills which are bolted to 47-inch, 3/16 steel supports. A unique hand lever enables operators to easily lift the load. The stand-on-end feature and 2-inch casters allow the unit to be maneuvered around tight corners and stairways.

The platform is equipped with 8-inch raised felt, pad blocks to prevent any scratching or marring, while functional wood skids allow for easy sliding up or down stairs.

For complete product information call 419-422-3525.

Perspective

Regarding a Standard Pitch of A-440

Charles P. Huether, RPT
New Jersey Chapter

[Editor's note: According to his cover letter, Charlie discovered the following article (dated January 1967) among some old papers, filed under things he never did anything about. I think we all share in this practice, so we can especially appreciate the following humorous, although non-fictional story.]

Controversy over the acceptance of a pitch standard has been going on these many centuries with no signs of abating. In spite of the impassioned pleas for either a "brilliant" sound or for the need for an industry-wide standard, it all boils down to arbitrarily accepting my "440" or their "whatever". There has been, up to now, no scientific argument presented why one pitch is superior to another. There has been no scientific evidence produced showing the logical desirability of one norm over another. It is the hope of the author of this article to provide a scientific basis to end all the arguments.

In 1878, Sir Hiram Maxim, the versatile engineer and inventor, who included among his many inventions the machine gun, was installing electrical lighting apparatus on the grounds of the Grand Union Hotel at Saratoga Springs, New York.[1] One of the lamps developed a humming sound and he observed that the area of this apparatus was covered by swarms of insects. Upon further investigation, he discovered that the insects were all male mosquitos and that they were attracted by the sound.

Sir Hiram had difficulty getting anyone to become interested in his observations and because his own interest led him in another direction, he filed his notes away and forgot about them.

Today these early notes and observations have been revived and are being used as the basis for experiments in mosquito control. The results of these experiments have been published in the magazine *Natural History*, December 1966. This magazine is the journal of the American Museum of Natural History in New York City. In an article by Marc Roth, L.M. Roth and T.E. Eisner entitled "The Allure of the Female Mosquito," these results are discussed. Sir Hiram observed in 1878 that the male mosquito is attracted by sound. Further, that the primary purpose of the mechanism whereby the male mosquito is so attracted is for reproduction, and it is primarily the sound emitted by the female mosquito which interests the male.

Now here is the point. The female mosquito emits a sound in the 450 to 600 cycle range. This has been scientifically proven. So let Mr. Leonard Bernstein and the pitch raisers beware. Once they hit that 450 cps mark they will be targets for male mosquitos. Now we have something to go on. Since sounds in the neighborhood of 450 cps attract male mosquitos in droves, and since such large numbers of mosquitos an only be considered as undesirable at a concert or other musical presentation, let us keep the pitch at A-440!

1 The Grand Hotel at Saratoga Springs was also the place where potato chips were invented, which is why they were originally called "Saratoga Chips".

The Left Fork

The Pencil

Ron Nossaman, RPT
Wichita Chapter
Feature Writer

A woman recently contacted me to tune a grand that I had sold her about ten years ago and hadn't tuned in over five years. I really wasn't up to yet another round of customer reeducation on instrument maintenance, so I elected to let that one slide for now. She informed me that the piano had gone out of tune suddenly, just the other day, right after Oprah, and she had decided to throw a party. Now we're getting to the good stuff. I love how they throw tidbits like this out as if it explains everything. I admit I was mildly curious as to how this all tied in but, deciding the price of clarification was too high, I uncharacteristically kept my mouth shut and listened on. "Oh yes," she said, "there are some noises in the action you might look into, too." Noises eh? And what's an "intotoo?" Anyway, I figured this for a garden variety pencilectomy and tuning so I scheduled her in. This was an "unattended appointment." You know, that's where the door is left open and you let yourself in, locate the piano, and tune it all in a smooth, professional, uneventful manner. Isn't theory a wonderful thing?

Arriving at the appointment on time (Why does the timing always work out best when it matters least?) I lugged my tool case up onto the porch and, reverifying the address, tried the door. Imagine my surprise when it opened! I had the right address, and she had actually remembered that I was coming and left the door unlocked!

Having beaten unbelievable odds to get this far, I was in a mild euphoria of self congratulatory excess as I walked through the doorway into the presence of what must have been at least a three-acre sabre-toothed DOG (Trust me, this is a CAPITALIZED DOG). The DOG immediately got *very* loud and, I swear, even bigger, and was immediately between me and, I was sure, any hope of my chances of surviving the day. Talk about a mood backlash! I swear I smelled postman on HIS breath. I watched the tooth and gum show for a few minutes until my nervous system began to function again, and I verified that Moby Mutt had no real interest in eating me, but was merely meeting his contractual obligations as a combination watch moose and doorbell.

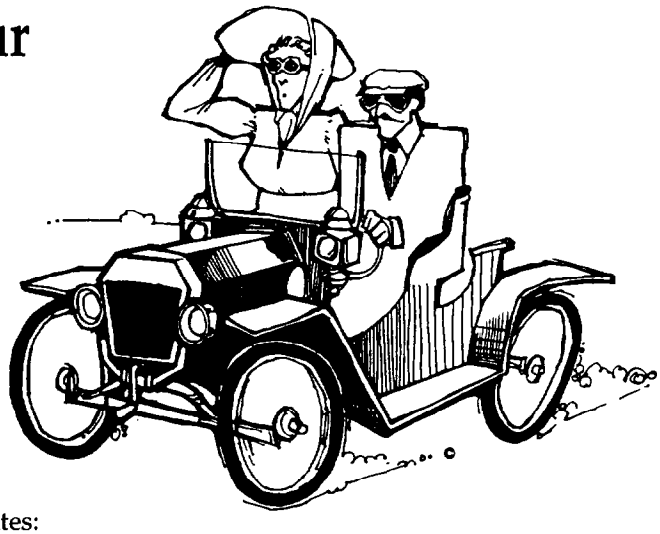
Eventually HE decided HE'd gotten all the entertainment HE was going to get out of me and wandered off looking for a spot to resume HIS nap. After a moment of weighing the relative wisdom of escaping while I could, or going farther into the house, I cautiously wandered into the living room to find the piano. It wasn't nearly as big as the DOG but at least it didn't attack me, so I took off my coat and got started. I figured I would putter about in the action and let the adrenaline shock wear off before I started tuning. Besides, the FLEA RANCH was already beginning to snore and I wanted HIM to get a little deeper into it before I started making noise.

Removing the required fifteen screws, I pulled the action to do the anticipated pencilectomy and found: 1 badly mangled damper, 2 broken hammer flanges, 15 pencils (some chewed), 4 ball point pens, 1 felt tipped calligraphic pen, 3 candy wrappers, 1 rubber band, 2 twist ties, 1 aluminum knob face with a threaded stud on the back, 1 Post-it note pad, 1 plastic drinking straw, 1 tooth pick with decorative plastic fletching (the cocktail sausage had been eaten already), 1 music wire coil from a past string repair, 1 small stick (possibly redbud, bark still on), 1 paper clip, 1 hair pin, 1 small plastic ball (1" dia. white, looked like a roll-on deodorant ball), 1 plastic flying disk (faux Frisbee), 1 thin dime (Roosevelt, I didn't get the date), 1 lapel pin (District NFSM 1988), scattered scraps of green plastic Easter grass, a very cheap A-440 tuning fork (!?), 2 green M&Ms, a couple of things too horrible to contemplate let alone identify, about half a Kilo of dustballs in a variety of shades of gray, and a partridge in a pear tree. All right, so I lied about the partridge, but the other stuff was there just like I said. Thinking I was beginning to see a correlation between the noises, Oprah, and parties after all, I piled all the stuff on her desk, made the repairs, tuned the piano, left a bill, and made it out the door without the DOG even waking up again.

International Relations

The 1993 PTG European Tour

By Yat-Lam Hong



The 1993 PTG European Tour took place between May 6 and 30. The 25-day trip started in London, and ended in Paris. Unlike previous PTG tours, this one was broken down into four separate segments: (1) tour of England, (2) Pianoforte Tuners' Association Convention in Colchester, England, (3) Europiano Congress in Skallerup Klit, Denmark, and (4) tour of Denmark, Germany, and France. Anyone interested in going could have signed up for all or any portion of the trip. The idea was to make the tour flexible enough to accommodate different interests, schedules, or budgets, so more people would go.

Our group this year was smaller than usual, and consisted of between 13 and 15 people for various portions of the tour. As some joined late or left early, it was not always the same 13 or 15. Eleven of us were PTG members, and the rest, spouses. Although the average age of the group was 61, this bunch of senior citizens was not the type who'd be happy to sit in the rocking chair on the front porch and watch the world go by.

This was a rather homogeneous group, as most of us already knew each other from previous PTG trips. Getting reacquainted and remembering names were no problems at all. I found it a bit distressing that so few new faces showed interest in these tours, considering the amount of work the International Relations Committee put in to make them possible. Maybe it was due to the last-minute itinerary changes, or the fact that this tour somehow was not as well publicized as it could be. Although I don't mind seeing old (no pun intended) friends over and over, these tours are beginning to take on the appearance of a private club. I hope the situation will change in the future. Anyway, here's the report of one traveller who signed up for the first three segments of this tour.

Our first day in London was spent on the obligatory visits to the many well-known sites: the historic streets, the financial district, Trafalgar Square, Big Ben, the Houses of Parliament, Whitehall, Hyde Park, Covent Garden, St. Paul's Cathedral, the Tower of London, Westminster Abbey, etc.—all "must see" items for first-time visitors. They still looked the same from the way I remembered them during my 1984 visit, except that different parts of these landmarks are now under repair. Many of these historical buildings are several hundred years old, and require constant maintenance just to keep them standing. If they were in the United States, some of them probably would've long been torn down to make way for high-rises or shopping malls, as the old buildings, however historical, are simply not "cost-effective" to operate.

Our guide also took us to a choice spot for the best view to see the Changing of the Guards at Buckingham Palace, which takes place daily, except on rainy days. (Water would ruin their very expensive uniforms and the black bear-skin hats.) This is a show put on strictly for tourists, and it keeps them coming from all over the world. It seems everyone who was there had a camera and was busy clicking away. The amount of film used up at this spot alone ought to be enough to keep Kodak in business, I'd think.

The country seems quite weary of terrorists' attacks. In all indoor public places, there were signs warning people to be alert and aware of unattended packages (which could be bombs), and to report them to authorities immediately. Subway stations (known as the "underground"), for example, have no waste baskets, since they could be ideal places to hide such things. It took some getting used to to see well-dressed people throw waste paper, candy wrappers, etc., all over the floor for lack of containers. The idea is, of course, to be safe rather than sorry. The same cautiousness carries over to all the concert halls, too, where large bags are not allowed. They must be opened for inspection first, checked, and re-claimed after the concert. Such a practice is so commonplace now it's considered a necessary measure of protection for all, rather than an invasion of privacy.

We also spent a most enjoyable afternoon visiting the Musical Museum in Brentford, a city of 10,000 about eight miles west of London, which contains one of the world's largest collection of automatic musical instruments—everything from the tiny clockwork music box to the self-playing "Mighty Wurlitzer" organ. Founded by Frank W. Holland, this 30-year-old museum

occupies the former St. George's Church, and is totally operated by the 50 or so volunteers, who do everything from running the gift shop to restoring instruments. All income, mostly from admission fees and donations, is used to keep the museum going, and nobody gets paid for working there.

The museum's guiding principle is that musical instruments should be heard as well as seen. That means keeping the instruments in playing condition, which, considering their age, is an endless job. The volunteers, all devotees to the cause, realize that most of the instruments in the museum are long obsolete, and without constant restoration, they'd be gone forever. Some of the more complicated instruments require having their literally thousands of parts cleaned, lubricated, repaired, or replaced, and volunteers with more enthusiasm than experience have to be trained in such painstaking work, but the daunting task goes on regardless.

Although Owen Cooper, the museum's director, patiently described and played for us a good sampling of the music boxes, celestinas, organettes, barrel organ and pianos, orchestrions, violin players (machines, not people), orchestrelles, etc., housed there, we had the most fun listening to the player and reproducing pianos. We heard Rachmaninoff and Paderewski play their own works, and it sounded as though the masters themselves were still alive. There was even a roll of Fritz Kreisler playing an Érard Ampico reproducing grand, but he probably should have stuck to the violin.

With a brief stop at the old university town of Oxford, we moved on through the Cotswolds (rolling hills) to Stratford-upon-Avon, the birthplace of William Shakespeare, where we saw a memorable performance of *King Lear* at the 1,562-seat Royal Shakespeare Theatre. The story of the play is rather complicated, and the scene where the Duke of Gloucester had his eyes gouged out was so violent that I could hear the capacity audience gasp. It was like watching a seventeenth-century horror show unfold on stage: People were stabbed to death, had their throats slit—and blood was everywhere. I had to keep reminding myself: "It's only acting. It's only acting." But good acting looks real.

After an overnight stop at Stratford-upon-Avon, we visited Cambridge, the other old university town, and then to Colchester, about 60 miles northeast of London, where our first Convention was to take place. As we traveled through England, and then on to Denmark, where we met many German and Danish technicians, language problems became more and more obvious to me. First of all, British English is quite different from American English, and the first obstacle is to listen through the British accent to hear what's being said. Then the words don't always mean what we think they mean. For example, at one of the Pianoforte Tuners' Association (PTA) Convention classes, the instructor said: "To regulate the domes, first tap the chasings." To an American technician, such advice would be totally incomprehensible, unless he knew that *domes* is British English for glider bolts on the grand key frame, and *chasings* are key buttons.

At another class at the Europiano Congress, the instructor actually said: "Many years, I make voices." He couldn't possibly have meant what he said. Rather, this was an awkward word-for-word translation from his native German. I had to mentally re-translate his words into idiomatic English: "I've been doing voicing for many years."

Sometimes language problems became funny. One of our days in Denmark turned out to be a public holiday, and a Danish technician explained to me that this was the day to celebrate "Jesus flying up into the sky" (accompanied by the gesture of flapping arms). Of course, he meant Ascension Day (the 40th day after Easter), a religious holiday that most Americans don't observe. His explanation was perfectly understandable—a bit clumsy perhaps, but very colorful and charming. I appreciated that.

Another example that comes readily to mind is the bathroom sign in England that said, "Disabled Toilet." If a toilet is disabled, it's out of service, and therefore unusable. This would seem to be the logical meaning of the sign, but what's really meant is a toilet *for* the disabled. By the way, in England, the facilities are referred to as toilet, lavatory, w.c. (for "water closet"), etc., but not "bathroom," which is where people take baths. I learned that in a hurry—out of dire necessity.

Between coping with accents, new vocabulary, and bad English that required mental retranslation, sitting through four hour-and-half classes could make for a long day. Often by the end of the day, I was exhausted from such intense concentration. Fortunately, there were always interesting diversions in the evenings for our enjoyment.

Now, back to our PTA Convention in Colchester. The oldest English city in recorded history, Colchester has a population of 140,000. It even has a very nice zoo, which two of us managed to visit. The Convention was held at the 110-room Marks Tey Hotel, about seven miles outside the city limits. The Convention was about the size of a good PTG regional conference. In addition to the English technicians, the registration roster also included their counterparts from the United States, Canada, Norway, Germany, Japan, Lebanon, and even Oman. (The one from Oman, a small country east of Saudi Arabia, also happened to be the only piano technician in the entire country.) Although 190 people were registered for it, there were never that many there all at once. Otherwise, the crowd would simply have overwhelmed the hotel, restaurant, bar, and bathrooms, I mean, toilets. I'm not sure whether it's due to shortage of time or money, but several technicians I met flew in from Ireland (among other places) early in the morning, attended just the one or two classes they'd signed up for, and flew back home the same evening.

The Convention began with a tour of the Kemble Piano Co. in Milton Keynes, which is about 60 miles northwest of London. Kemble (not to be confused with Kimball, the American manufacturer) is the larger of the only two remaining piano manufacturers in England. It makes the Kemble, Chappell, and Yamaha pianos. The other manufacturer is Whelpdale, Maxwell, & Codd

(also known as "WMC Pianos"), which makes the Welmar, Marshall & Rose, and Eavestaff pianos and it's also the English distributor for Blüthner, C. Bechstein, Zimmerman, W. Hoffmann, Feurich, Rippen, and Alexander Herrmann pianos.

The decline of piano business is worldwide, and Great Britain has its share, too. It's sad to look back and see that reputable manufacturers, such as Danemann, Challen, Bentley, Knight, and many others are no more. In a few cases, the names are still around, but they're made by someone else now. The weaker companies had to sell out, merge, or simply close up and die. These are not attractive options, and only the fittest ones have managed (pardon the pun) to survive.

We spent that morning visiting the Woburn Abbey, one of the buildings in the Duke of Bedford's estate, where Kemble had set up an elegant display of its products, and we saw the factory in the afternoon. Kemble has been making pianos since 1911, and it's still run by the Kemble family. Since 1986, it has also been under license to make Yamaha pianos for the European market. The combination of traditional craftsmanship and modern technology improved the quality of its pianos so much that, in 1992, Kemble won the "Queen's Award for Export Achievement," a prestigious recognition from the government. Kemble is also the official piano at EuroDisney, the theme park in France.

Kemble employs about 100 people at the plant and 20 in sales and office work. The company makes only vertical pianos. It uses soundboards and Delignit pinblocks from Germany, and actions and keyboards from Japan for most of its pianos. I recognized some of the same computerized machines I saw at the Yamaha factory in Japan, and the practice of driving the tuning pins halfway into the pinblock before stringing also looked familiar. But unlike the hard-driven Japanese Yamaha factory where productivity and efficiency are pushed to the maximum, the atmosphere at Kemble is more relaxed and humane. Some workers actually *smiled*, which is a most unusual sight at piano factories.

But productivity and efficiency are important for sheer survival. Quality control at Kemble is done through a card system, called the "Piano Assembly Route Sheet." This card stays with each piano from the beginning to the end of its production, and each worker is required to check off the items he's done and sign them. Thus, each worker becomes the "inspector" for the jobs accomplished at the previous work station. If something is not right, he can go back and straighten it out with the last person, and get the problem corrected immediately, rather than letting the mistakes pass and compound further down the line.

Posted throughout the factory are signs that say: "Quality is the key to success." They're a constant reminder to the workers that quality, the first requirement for survival, is in their hands, and that the security of their jobs depends on it. I especially liked the upbeat atmosphere of the place, where the employees seem to take pride in their work. Of course, the infusion of capital and machinery from Yamaha has also helped enormously in maintaining quality, not to mention productivity. Bob Wilks, the plant supervisor, told me; "When I first started working for Kemble 39 years ago, we made one piano a day. Now we make twelve a day."

The PTA Convention was a well-organized event. The class schedule was publicized well in advance, and those who signed up for the Convention registered for the classes they wanted at the same time. This gave the planners the necessary information to assign rooms: big rooms for big classes, and so on. The planning was so careful that the first class I attended had 23 registrants, and the room had exactly 24 chairs, one of which was for the instructor. Thus, the empty chairs in the room would tell the instructor how many late-comers are still on their way, and he'd wait for them even past scheduled time before beginning class, so nobody would have to miss anything. It was a very thoughtful gesture, but I have the feeling this wouldn't work at PTG Conventions. Besides, Americans may find such control too restrictive. Maybe this was the kinder, gentler nature of English character showing through. This is, after all, a country where even policemen (known as "Bobbies") don't carry guns.

The PTA Convention offered an ambitious array of classes, which included Concert Preparation by Bösendorfer, Upright Regulation, Basic Action Repairs, Basic Grand Action Design and Regulation, Fandrich Piano Action Design, How to Use the Accu-Tuner, Basic Player Piano Maintenance, Harpsichord Maintenance, Scale Design, Early Blüthner Regulation, Key Repairs and Bushing, Early Bechstein Regulation, Fortepianos, Steinway Sostenuto Pedal Regulation, etc. Like PTG Conventions, there were more classes than anyone could take in the time available. It was an embarrassment of riches. At the beginning of each class, the instructor was introduced by a PTA member. This gave the participants some information about the instructor, his background, credentials, achievements, etc., which made the instructor more approachable and the subject matter less intimidating. It was a nice touch.

Of all the classes I attended, one entire day (four hour-and-half periods) was spent at the Steinway Grand Regulation class taught by Jeff Prett, who is the head concert technician for Steinway of London, where he has worked for 24 years. For me, this class alone made the trip to England worthwhile. Following the 50-step outline, the class progressed slowly, but methodically. Like the rest of the class, I learned much from Prett, a very patient gentleman and a source for a wealth of information. He also encouraged the blind technicians in the class to come forward and feel the various tools and parts being discussed. This was truly "hands-on" instruction.

But first, I had to learn a new set of vocabulary quickly. For example, I had to know that *standards* are action brackets, *black lead* is graphite, *fork* is repetition lever, *listing cloth* is stringing braid, *box cloth* is action cloth, *French chalk* is soapstone, *rocker* is lever (as in "trap lever"), *spanner* is wrench, *slap rail* is damper stop rail, *lip* is sostenuto rail blade, *damper lip* is sostenuto tab, *toning* is voicing, *chasings* are key buttons, *rollers* are knuckles, and so on.

Sometimes, Prett has a poetic way of explaining things. For example,

he said that, upon release of the key, the grand wippen spring should be strong enough to raise the hammer "like the sun rising in the morning." But he acknowledged that differences between a slow sunrise and a fast one are permissible as long as they fall within acceptable limits.

Among the many things Prett taught us was the proper technique for adjusting the Steinway wippen springs. He emphasized that this is done by opening or closing the coil, not by kinking the spring itself. Step by step, he showed us how to use the spring hook to slide the spring out of its groove on the underside of the repetition lever, how to pull the spring up to strengthen it, and so on. We also learned a most useful tip on how to replace the spring after adjustment, and to be sure that the spring is actually in the slot and not riding on the edge. He suggested that we let the spring ride on the edge *first*, and then, using the spring hook to slowly press it toward the groove, and listen for that reassuring click.

It was at this point that something amazing happened: most of the English technicians in the class wanted to see *up close* exactly how it was done, as it was a small operation and hard to see from any distance. So, Prett invited all of them to come to the front, and gave what amounted to "private lessons" on this entire sequence six or seven times, each time to a group of two or three people. These private demonstrations took up 33 minutes of class time, but Prett was patient and understanding. He said, "There's no hurry; we've got all day." He was right. This was an all day (six-hour) class.

I think what aroused such curiosity was the fact that most of these English technicians didn't know that wippen springs could be adjusted when there are no adjustment screws. And judging from the many questions they asked, I got the impression that they rarely come across grand pianos in their work, let alone Steinway grands. Well, the same can be said of many American technicians, too.

One of the favorite lubricants used by English technicians is the "black grease," which is a mixture of tallow, Vaseline, and graphite. Prett cautioned that, because it's black, it should be used only for these places: the action return spring, the spring slots under the repetition levers, the dowels in the keybed that balance rail studs (glider bolts or *domes*) rest on, and various connections in the trap work and lyre. This is similar in texture to American technicians' "V-J Lube," which uses talcum powder instead of graphite, and it works just as well.

We also learned from Prett that, starting with serial number 450,000, the sostenuto rails on Hamburg Steinway grands are mounted on the belly rails, and are now part of the damper system, rather than part of the action. This is because Hamburg Steinways are sold in the Asian market where some of the countries have tremendously high humidity. The belly rail being more substantive and stable than the key frame, sostenuto rails mounted there are less likely to cause problems.

It's impossible to write about everything, but, for me, this all-day class with Jeff Prett was the highlight of the Colchester Convention. It was a privilege to have met this outstanding technician. Prett also invited us to look him up at Steinway, which is near the world-famous Wigmore Hall, next time we're in London. I'm sure he'll have many visitors coming in the future.

To keep us entertained, various diversions were planned for the PTA Convention. We were treated to a performance of Morris Dance one evening at the outdoor tennis court. This is the traditional dance of English chimney sweeps, performed by a local folk dance group, complete with blackened faces, black costumes sewn with bells and rattles, and an accordion band. These were strenuous dances, calling for strong legs and wrists. As the dancers went through their intricate steps, they also provided their own percussion effect by hitting each other with the heavy sticks in a rhythmic pattern—stick on stick. They hit with such force that if one dancer missed with his stick, the other guy's troubles would be over. But we didn't need to worry about such mishaps, as this group was well-rehearsed (twice a week), and everyone knew exactly what everyone else was going to do at all times.

Another evening we attended a concert of classical music by the Lansdowne String Trio, with pianist Johnny Pearson at the magnificent Bösendorfer Imperial. Other events included an auction of tools, and a video showing of the 1992 PTG Convention in Sacramento and activities of the "Hang Loose" Chapter in Hawaii.

The original plans for this trip included the International Association of Piano Builders and Technicians (IAPBT) Convention, which had to be cancelled, due to logistical problems. However, the Japanese members of IAPBT happened to be on a whirlwind (three countries in 12 days) tour of France, England, and Germany at the same time, and all 37 of them came up to Colchester to join us for the banquet and an organizational meeting on the last day of the PTA Convention. We knew many of them from previous PTG trips to the Orient, and it was great seeing them again in England. The mayor of Colchester was there to welcome them, too. With the many rounds of greetings, speeches, and gift exchanges, the Convention ended in a most festive spirit. Every participant at the Convention received a special gift—a PTA A-440 tuning fork. We were delighted to discover that we were all on pitch.

The organizational structure of PTA (Pianoforte Tuners' Association) is similar to that of PTG in many ways, or rather, the way we used to be, but on a much smaller scale. Founded in 1913, PTA has a current membership of around 300, about five per cent of whom are women. Membership in the organization is by examination, except for the "Friends of the PTA" category, which is by invitation only. (This is a special group of people who have made significant contribution toward the field of piano service. There are only six members in this distinguished group.)

The PTA is made up of mostly regular members who are divided into two categories: *Tuners* and *Technicians*, depending on their respective specialties. *Tuners* earn their livelihood doing tuning and minor repairs, while *Technicians* do mostly extensive repairs, re-

storing historical instruments, etc. I think the *Technicians* would be called "rebuilders" in the United States. Although a *Tuner* can rebuild and a *Technician* can tune, the difference is in the proportion of emphasis. Put another way, a *Technician* does mostly shop work, and a *Tuner* does mostly field work. They hold equal status in the PTA.

The *Student* members can be anyone receiving training at a school or workshop that meets PTA standards. They can attend all PTA general meetings, but cannot vote. They do receive the PTA Yearbook (same as our membership directory) and the newsletters (equivalent to our *Piano Technicians Journal*). However they're not allowed to advertise their PTA registration, and cannot use the PTA name or emblem. Incidentally, the PTA emblem is a tuning fork with three parallel lines running diagonally through it, the three lines representing the three-string unison. The ideal of this well-designed emblem is to keep pianos on pitch and in tune.

Another category is the *Affiliate*, which is for piano tuners, technicians, or builders with at least three years' experience at a factory or workshop approved by the PTA, or for *Students* who have taken, but not passed, their membership examinations. This category is similar to PTG's *Apprentice*, which is, of course, no more.

The membership exams for either *Tuner* or *Technician* are a rigorous affair, and the candidate takes his exams in the presence of at least two PTA members. The exact procedure is confidential, but according to what I was told, these exams are so tough that the unprepared or the phony are exposed immediately. Computers are not used in the grading, and a portion of the evaluation process is done by "gut feeling." Doesn't it sound just like the way PTG used to be?

Because these exams are so tough, passing them to become a full-fledged member (either *Tuner* or *Technician*) is considered a high honor. As a PTA member told me, this is a professional organization; it's not for "cowboys," a derogatory English term for the incompetent. PTA also maintains a library, and members can check out books on piano technology by simply paying the postage for mailing. The annual membership fee is £37, about US$59.00.

Unlike PTG, PTA actually recommends what its members charge for their work. For the self-employed technician, the 1993 recommended repair rate is between $21.00 and $26.00 per hour. For tuning, it's between $37.00 and $61.00, depending on the cost of living in the tuner's work area. The high end ($61.00) is for areas with high cost of living, where travel restricts the tunings to four a day. These tuning fees are for pianos that are tuned at least twice a year and located within one mile of the tuner's base of operation (usually his home). The tuning fee does not include any mechanical work, which costs extra, or the Value Added Tax (VAT), which the tuner must collect for the government. These rates are worked out by PTA, based on the tuner working 231 days a year (out of which 34 days are spent on paper work), and doing five tunings each tuning day.

If a tuner charges the recommended rate and tunes 197 days a year at five tunings per day, his annual income would be between $36,445.00 and $60,085.00, based on the current exchange rate of $1.60 to £1. PTA considers this range the lowest amount an English tuner has to earn to run a successful business. On top of these figures, PTA recommends that the tuner add on the annual inflation rate, so he won't fall behind in the economic race. The fact remains that, if one can't survive financially, one can't survive. PTA is simply doing what it can to help its members. Compared to the United States, the cost of living in England is high, and my very unscientific survey found that one pound there has about the same purchasing power as one dollar here. So, in terms of purchasing power, this range is actually between $22,778.00 and $37,553.00. Believe me, our colleagues in England are not getting rich on their piano-service business.

These recommendations by the PTA may seem strange to technicians in the United States, where even a casual discussion about fees carries implications of "price-fixing," which is totally illegal. In reality, the PTA-recommended fees are just guidelines from which each tuner has to vary, depending on the economic situation of his area, and, more than anything else, what he thinks his work is worth. It's here that his background, training, experience, educational level, credentials, etc., make the biggest difference, and in this regard, the situation in the United States is the same. It's the principle of free economy at work.

The only paid employee of PTA is a part-time secretary, who takes the minutes at the general meetings, produces the annual *Yearbook* and bimonthly *Newsletter*, handles all the advertising, answers all PTA phone calls, takes care of all PTA correspondence, mails out all publications and announcements, organizes various PTA functions, etc. All this work is done in one room of her house set aside for the purpose. This gives the expression "home office" a new meaning. In fact, the official PTA address is her home address. With so much of PTA business under her control, this secretary is easily the most powerful person in the entire organization, but by shouldering these responsibilities, she frees up the members to do their work.

One aspect of travel that's of great interest to me is the food of each country I visit. How and what did we eat in England? The answer can be summed up in two words: well and much. Let's start with breakfast. The exact items varied from day to day, but typically, a *Continental* breakfast included four kinds of cold cereals (corn flakes, rolled oats, granola, shredded wheat, etc.), five kinds of fruit (prunes, apricots, pears, orange or grapefruit segments, apples, bananas, melons, etc.), four kinds of juice (orange, grapefruit, apple, apricot, etc.), freshly baked rolls and croissants with butter, margarine, and an assortment of fruit preserves, plain or fruit-flavored yogurt, cold sliced ham, three kinds of cheese, and the usual beverages, such as milk, coffee, iced and hot tea, iced and hot water, etc.

But an *English* breakfast included all of the above, plus pork sausages, pan-fried mushrooms, skinless

bacon (cooked English style, soggy and not crisp), scrambled, poached, and hard-boiled eggs, sautéed potatoes, toast, and of course, the ever-present broiled tomatoes, without which the English breakfast just wouldn't be the same.

On most days, we had English breakfasts, with unlimited quantity on any item. It was an enormous amount of food, even if we took a tiny sampling of each item. Realizing we had taken too much, which happened almost daily for some of us, we faced the decision whether to let the extra food go to waste—or waist. We had to tell ourselves (and each other) that we don't eat like this back home, and then, went ahead and indulged. The fact is, even native Englishmen don't eat like this back home either, except for very special occasions. When we were on the road, every meal was a "special occasion" and we didn't pick the menu either. In that atmosphere, eating was more than just replenishing nourishment for the body; it became a dangerous form of entertainment. Then we looked at the itinerary, and said, "Well, only ten more days to go now."

If you think our breakfasts were fancy, our dinners were even more so. On most days, we didn't just *eat*; we *dined*, and in style. English dinners are very eleborate rituals. Every evening in the dining room, we were greeted by the uniformed staff, one of whom would bring us our individual menus, with a choice of several entrées, which varied daily. Another waiter (or waitress) would later come to take our orders. While the food was in the works in the kitchen, waiter No. 3 would come around and ask what we'd just ordered, and bring each of us the appropriate silverware for our meal. (For example, someone having fish would have different silverware from someone having beef.) And each diner had the exact number of utensils needed for his meal—no more and no fewer, as unnecessary silverware served no purpose other than cluttering up the table, which, in such formal settings, would be a no-no. Waiter No. 4 would then come around to take our beverage orders. Among other things, he was a wine expert, and could recommend the appropriate one to go with any meal.

Our food didn't come on individual plates. Rather, we were each served an empty warm plate first, so the hot food would stay hot longer. The dinners were often served European style, where one waiter would bring a huge tray of, say, just meat, and make his rounds serving everyone who ordered that. Once he got going, a second waiter would bring a tray of just vegetables and make his rounds the same way, and the same with a third waiter who would serve us potatoes, etc. The plate and silverware for each course were removed before the next course was served. While all these people were going round and round about us, the beverage waiter was busy refilling our drinks as they got low. It was a very labor-intensive affair, and the dinner was as much a meal as a ceremony, with fixed procedures. Needless to say, the food was superb. In fact, I don't recall having any bad meal on the entire trip, although some meals were a lot fancier than others. We also had our share of Yorkshire pudding in England, which is neither a dessert, nor a pudding. Rather, it's a pastry shell baked in the drippings of roasting meat and eaten with the roast. This one item alone is enough to make a vegetarian gag, but you must remember: We don't eat like this back home.

On most evenings, the men wore jackets and ties for dinner. In these formal settings, one would feel out of place without the right attire. To the English, such formality must be the equivalent of elegance, style, and class. Just look at how the average Englishmen greet their Royalty, and you'll get an idea how important it is for them to preserve the country's history, tradition, ceremonies, rituals, pageants, etc. Maybe these elaborate dinners were a reflection of the same mentality.

From Colchester, we traveled by bus to the harbor of Harwich (pronounced "har-rich"), where we took an overnight Danish cruise to Esbjerg, Denmark. It was in the first-class restaurant on board that some of us had our first encounter with the famous *det store kolde bord* (literally "the cold table"), which is a buffet arrangement with a large variety of hot and cold fish and meat dishes, and smørrebrød, for which Denmark is well-known. Smørrebrød are open-faced sandwiches (with bread on the bottom side only, usually rye or French bread), and covered with meat (either roasted or smoked), fish (herring is a favorite), vegetables, and cheese—all piled on in a most colorful arrangement. These are really edible works of art, and they look almost too pretty to eat. Accompanying the "cold table" were other tables loaded with many varieties of everything: bread, crackers, cheese, fruit, desserts, etc.—again, all in unlimited quantities. As soon as any tray became half full, the waiter would take it to the kitchen, and bring back a full tray of the same thing. Instead of going round and round as in England, these waiters were busy going back and forth. Faced with such abundance, we ate ourselves silly, and it was delightful. We really don't eat like this back home. Honest.

The bus from Esbjerg took us to Skallerup Klit for the Europiano Congress. Skallerup Klit (meaning "holiday village") is at the extreme northwest corner of Denmark, right on the shores of the North Sea, directly facing Norway, which is too far away to be seen. The nearest city you'll find on the map is Hjørring. Skallerup Klit is a very isolated beach resort owned by a non-profit organization. It's made up of about 150 chalets. Most of them are small houses, and the rest, duplexes. Other than the restaurant, a small grocery store, and a sports center (with swimming pool, handball court, exercise room, etc.), the village has no commercial establishment at all. There are jogging trails among the sand dunes, and the beach, miles and miles of it, is within a two-minute walk from any of the chalets. The chalets all have a fully equipped kitchen, television, furniture, but no telephone. This is a perfect place to do nothing at all, engage in deep thinking, or get away from it (city life) all. There are no ringing doorbells or telephones, and no noise or pollution associated with modern civilization. Everything here was built with compatibility with Nature in mind. It's a very, very quiet place—so quiet you could hear the sand crunch under your feet as you walk along the beach. In this

environmentalists' paradise was held the 1993 Europiano Congress. Maybe it's a very appropriate choice of location for a piano technicians' get-together. After all, our job mostly consists of restoring harmony to a chaotic world, well, at least a very small part of it: the piano.

Attending this Convention were 90 people, 70 of whom are technicians, and the rest, spouses and children. Among the technicians, three were from England, three from Switzerland, seven from Germany, 11 from the United States, 20 from Denmark, 10 from Norway, 11 from Sweden, three from Finland, and two from France. It was a very international group, and many languages were spoken there. If you spoke either English or German, you could cope, since almost everyone there could speak one of these languages. To learn Danish in a hurry is absolutely hopeless. After a week there, the only Danish word I learned was "tak," which means "thank you."

This Europiano Congress was originally scheduled for Paris. Due to numerous communication problems, it was moved to Denmark at the last minute. We're most grateful to Odd Aanstad, the Norwegian technician, who put the Convention back on track single-handedly. (Please note that "Odd" is his first name, not an adjective.) Working from Norway by phone, he had everything under control within four days—from selecting the site, to negotiating a reasonable price with the resort, to picking the menus, to lining up the classes, instructors, and exhibitors, to arranging for equipment to be shipped in... and to sending out publicity materials. I can well imagine those four mad days he went through, but it's proof how much a determined person could accomplish even in such a short time. Odd deserves the public recognition for having saved the Congress.

This being a multi-lingual Convention, all participants could understand either English, German, or Danish. Therefore, most classes were offered in one language first, and then repeated two more times in the other two languages. Kevin Gouldmann's class on Piano Disc was an exception. (More about him later.) Being fluent in all three languages, he did it all in one class period by saying everything three times, each time in a different language. That must be a *tour de force* of sorts, trying to think, teach, and do simultaneous translation in three languages all at once. This is quite a contrast to the many Americans who don't even know English very well.

Like the participants' nationalities, the classes offered at this three-day Convention had diversity. They included such topics as: Grand Regulating, Accu-Tuner, Piano Disc, IPAS Action, Finish Repair, Refinishing, Voicing, and a few others that I couldn't even figure out, since the class schedule was all in Danish. The afternoon of the second day was reserved for sight-seeing. We visited a private art museum in the countryside, where the building, dating from the 1400s, was a lot older than the paintings and drawings it contains.

We also visited the Börglum Monastery in Vendsyssel, which is now privately owned by a farming family. This enormous monastery is used as a church during the summer to bring in some income. In the winter, it's not used at all, as the family can't afford to heat it. This building is a Danish historical landmark, so it can't be torn down. Although the Danish government contributes something toward the horrendous maintenance costs, the owner said it's nowhere near enough, and he can't afford to maintain it with his income from the farm either. At the time we visited the place, he said the immediate needs are for a new roof and some emergency repairs, without which the deterioration would quickly accelerate to the point where the building couldn't be saved any more. We were suddenly made aware that owning an historical building is not always fun and glamorous. It could be downright depressing and financially ruinous.

The first class I attended at the Europiano Congress was Grand Regulating taught by Ingo Steinbach, a German technician who had worked at the Hamburg Steinway factory for eleven years, and then came to Copenhagen to work for a dealer. Now, he has opened his own shop, does all the important concert work in Denmark, and is generally recognized as the finest technician in the whole country. As grand pianos are hard to come by in a place as isolated as Skallerup Klit, a 40-year-old Steinway grand was shipped in from Norway for this class, thanks again to Odd Aanstad. It was immediately apparent that we were in the presence of a master technician. Unfortunately, Steinbach's English was so poor that he was uncomfortable teaching in it. He's much more at home with German or Danish. Just then, Leo Duricic, the Europiano Congress president who now works for Bechstein in Berlin, happened to walk in, and he was put to work immediately. Steinbach would talk to Duricic in German, and Duricic would translate his remarks into perfect English for us. Most American technicians attending PTG Conventions in the U.S. probably have no idea how serious a communication problem language barriers can create.

With simultaneous English translation, everything took twice as long, and it was obvious that Steinbach couldn't cover the materials he had planned for this hour-and-half class. By the time the class was up, he had just barely gotten through the early stages of grand regulation. We were a bit let down by this, but we only had ourselves to blame: we didn't learn the language of the host country, and in Denmark, *we* were the foreigners. Still, we learned some valuable things from this master technician, such as a different and possibly more efficient way to set the glider bolts (*domes* to the English), that the most efficient angle for back-checks to work is 72 degrees and how to make a special tool just for that purpose, how to make and use a space-saving two-piece home-made key-levelling device, and so on. I hope I'll have the opportunity to hear him again another time. He simply had too much to offer.

The Finish Repair and Refinishing classes were taught by Erik Christensen and Fransk Polering. Again, these two Danes are master craftsmen of their trade. As there wouldn't be time to demonstrate their techniques on one sample from beginning to end (some procedures require several days of waiting time in between for chemicals to dry), they had many fallboards in vari-

ous stages of completion lined up, and just went quickly from one piece to another, explaining everything in Danish, which was translated into English for us by Kevin Gouldmann. They knew exactly what to do with every kind of finish repair, and also what could happen if the proper sequences were not followed. From the first fallboard that was full of nicks and dents to the last one, which could easily be mistaken for a fallboard from a brand-new piano that just left the factory, the transformation was incredible. It was like watching great chefs at work: a pinch of this, and handful of that, no measuring devices of any kind, and no need to refer to any cook books, because the recipes have long been memorized and become part of their working knowledge. Basically, what these two craftsmen put on for us was a magic show. If one hasn't put in the many years of practice to perfect the results, one wouldn't even understand the procedure. Watching alone won't do it.

One of the chemicals they used frequently is a solution called "Vaseline Oil," which is neither Vaseline, nor an oil, but it smelled like some kind of petroleum distillate. Nobody there could tell us what it was or its English (or American) name. It doesn't matter, since we couldn't do that kind of work anyway. We came away from that class with a renewed appreciation for a piano's finish.

The most controversial class at the Europiano Congress had to be the one on IPAS Action taught by its inventor, Ingvor Petersen. Petersen is a sixty-ish Danish engineer, who had spent three years developing this action. IPAS is the acronym for Integrated Piano Action System, which was "hot off the press." If you weren't there, you haven't seen it yet. The advantages of this action, according to Petersen, is better geometry, technical reliability, faster repetition, greater dynamics, ease of control, and reduced wear. The idea for the IPAS action came in the most unusual way: It all started because Petersen realized that he was a bad pianist and that he found the traditional piano action (both grand and vertical) hard to play. Instead of practicing more to overcome his technical shortcomings at the keyboard, he decided to design a better action for the piano that's easier to play and less troublesome to maintain.

The idea for the IPAS action is to integrate all the movements in the piano action, rather than treating the moving parts as separate entities, such as the key, hammer, jack, etc. Except for the damper, all the moving parts in IPAS are interconnected at all times, and this, Petersen said, would reduce the amount of wear in the action. He showed comparative charts to illustrate the hammer acceleration paths of both the traditional and the IPAS action, and they clearly showed that IPAS was superior. He said a pianist's sense to touch is so sensitive that he could feel the slightest movement in the hammer, such as the let-off, acceleration, etc., through the key—just like a blind person who could feel the objects on the floor through his cane. His tests showed that IPAS repeats better, and lets off with less resistance.

Petersen had both a grand and a vertical IPAS action model on display. From what I could tell, neither action had a wippen, jack, back-check, let-off button, capstan screw, etc., as we know them. They didn't even have center pins or felt bushings. Instead, both actions were made of a series of black plastic and aluminum levers. These levers were all interlocked through a ball-and-socket arrangement, which had an internal tongue-and-groove set-up. The ball-and-socket allows the moving parts to move freely while the tongue-and-groove system inside the ball-and-socket keeps them from coming apart. Since the parts are made of self-lubricating plastic, no lubrication will ever be necessary in the IPAS action. (Please forgive my clumsy description. Words simply fail me in explaining such a system. You really have to see it for yourself to understand how the IPAS works.)

The IPAS action, according to Peterson, is far superior to the traditional action, but it could also mean that pianists would need to learn a new technique to play pianos equipped with IPAS. (Right now, there are none.) In the IPAS, the hammer is in contact with the key (through the linkages) at all times. This would give the pianist more control than he has over the traditional action where the key, jack, and hammer all go their separate ways after a point. Petersen also acknowledged that, although simple in concept, the IPAS action is extremely expensive to build, because every part has to be precisely engineered, or the action wouldn't work. But that's a manufacturing, rather than a pianistic, problem.

Well, the fireworks started as soon as Petersen showed his first graph on hammer acceleration. A German scale designer in the class immediately pointed out that IPAS appeared superior only because the acceleration curve for the traditional action was drawn wrong, and that the IPAS would "never work." In case anyone sitting behind him didn't hear it, he turned around and repeated his remarks loudly, "The IPAS would never work. Never!" I didn't know who was right, since understanding such charts, graphs, and equations requires intelligence, but it looked like at least one of them was wrong on this point.

That was only the beginning. Then, more charts led to more arguments. And soon, the class degenerated into several private discussions, each with its own leader telling his group (those who happened to sit nearby) what he thought of the IPAS action. One person even quipped, "IPAS? Yes, I pass." At that point, there was so much noise in the room that almost nobody was paying attention to Petersen any more. It was an incredible display of bad manners. Being a soft-spoken gentleman, he couldn't shout over the talking noise to be heard. I'm not sure whether he even finished his presentation, but it was clear he had lost control of the class. There was nothing he could do, except to wait for the break, which was still ten minutes away. Those were probably the ten slowest minutes in his life.

To Be Continued.

The conclusion of this report, as well as a report on the last leg of the European trip will be featured in the next issue of the PT Journal.

1993 EVENTS CALENDAR

NOV 4-7

New York State Convention
Westchester Marriott
Contact: Michael Meade, 27 Perch Drive, Mahopac, NY 10541, 914-528-3365

NOV 6

Orange County Chapter Seminar
1st Presbyterian Church
Contact: Peg Browne, 11511 Wasco Road, Garden Grove, CA 92641, 714-530-4768

NOV 11-14

North Carolina State Conference
Omni Hotel—Richmond, VA
Contact: Lewis Spivey, 15 Rachel Drive, Nashville, NC 27856, 919-937-4777

JAN '94 7-8

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

FEB 11-13

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

AUXILIARY EXCHANGE

Dedicated To Piano Technicians Guild Auxiliary News and Interests

I just arrived home from the Convention Planning Meeting in Kansas City. Did we ever accomplish a lot of work in one day's meeting! Hang on to your Jessie James hats, members; you heard it from me for the first time. We are going to have some new innovative things happen in Kansas City. My husband was able to go with me, and did he ever come in handy. He and Paul and Sue Speir went out to look over KC while I was in the meeting. They came up with some great things for us to consider for the Auxiliary program. Yes, members, we are going to be able to attend PTG classes this next summer. They will be opening up classes for us on Sunday morning, and I will work with Steve Brady to make sure there are classes that non-tuner spouses would want to attend. Hang on to your Jessie James hats, we ain't done yet! I went into the Planning Meeting asking for four points of interest for the Auxiliary program and I believe I got all four. Classes for Auxiliary members, children admitted to exhibit hall, drawing for free auxiliary registration for 1995 convention, and all people registering for the convention Auxiliary program automatically becoming Auxiliary members for the year. Now that's not bad for one day's work.

It was a very cooperative group of people and we covered much territory and planning in the hours that we met. I do believe your tuner/spouse will be very pleased with his/her program too. There will be something for everyone in 1994. Now what we have to do is sell the program and what better way than our new theme. . . . Expanding Horizons, Cultivating Artisans. Remember, you heard it here first!!!!!!!!!!!!!!!

Yes, members, we have a swimming pool next summer. So start your diet now and look for that latest fashion suit because we are even going to have water classes with an instructor. Remember the black swim suit you helped me buy in Philadelphia? Well, I haven't had a chance to wear it much, so I have to keep on my diet. All of you who were with us in 1985 in Kansas City know what a wonderful hotel that Hyatt is there. They have even made things better—they have remodeled the atrium and several conference rooms. And the front desk receptionists were most courteous and helpful.

I will tell you more as the year goes on but I wanted to relay the excitement of the September weekend in KC. I hope all of that excitement lasts the whole year long so that all of you will want to be there and see our new headquarters and attend the GREATEST CONVENTION EVER. Come on Home!

Oh yes, one more word of warning. The good news is that we were able to hold most costs at the present level; however, remember to get your reservations in by the deadline because the after deadline fee has gone up considerably. It pays this next year to get your plans made early and to make your reservations to Kansas City by the deadline and spend that saved money on a good steak!

More next month. In the meantime, enjoy the Fall colors.

Phyllis Krahmer Tremper
President

Check Out Those New Officers

OUR NEW TREASURER:

Writing an article about myself is not something I especially enjoy doing, but I was asked to write a short article about me so everyone would know more about their PTGA Treasurer, so here goes!

I grew up on a farm in a very small town in central Oklahoma with my parents, two brothers and one sister. I must admit, although I have lived in Dallas for 30 years, country life is still what I dream of. Leon and I met in our sophomore year of high school and married in 1962. We have been married 31 years and have three children (Rheba 29, Darren 26, and Tiffeny 14), two grandsons (Stephen 8, and Blake 3) and are expecting another (Granddaughter?) in November.

Leon and I operate a tuning and rebuilding business in Dallas. My responsibility in the business is recovering piano keys for the trade. Working in our shop adjacent to our home has been very convenient because while the kids were growing up I was able to work and still be a full time Mom. I could set my work schedule and take time off for all the important events in my life—school activities, dance recitals, drill team, and driving the kids to the million places they had to be (Mom's taxi service.)

I have several hobbies which include sewing, decorating, cooking, reading and painting. However, with family, work, and our involvement in PTG and PTGA, I never spend as much time on these activities as I would like. Maybe someday I'll decide to quit work and just play!

I look forward to serving as your PTGA Treasurer in the coming year. To work with Phyllis, Paul, Pearl, Judy Rose and Arlene to set the course for PTGA is an exciting prospect. As we constantly explore new ways to provide an organization that will meet the needs of all our members, I would like to see everyone become more involved in Auxiliary activities. Let's all do our share to see PTGA grow and become a successful supportive arm of PTG.

Sue Speir
PTGA Treasurer

The Results Are In—From Auxiliary VP—Paul Cook

L. Paul Cook has finished compiling the results of the questionnaire and has come up with the following statistics:

In all, 36 questionnaires were returned, 92% of which came from females. 78% of the questionnaires were filled out by Auxiliary members. This meant that about 1/4 of them were completed by non-members.

The majority of us are in our forties, and rising into our fifties, although our overall age range is from the thirties through the seventies.

81% of us do not have children under 18 years of age at home, which is a very interesting phenomenon. It makes me wonder if those spouses who have children simply are not able, for various reasons, to participate in our functions.

64% of us do professional work other than piano business. However, approximately half of us are full time homemakers. Approximately 60% of us work in the piano-related field part time. Most of that work is in scheduling customers, billing and shop work. Only one respondent indicated that they did any tuning at all.

60% of us work with computers, and most of that work is in word processing.

40% of us teach music, and that is split between piano and voice. 2/3 of us said we do not teach music.

40% of us have access to a fax machine.

Those wishing to attend classes at the convention said they would like to attend 2 or 3 classes. 10% said they would not like to attend any classes and 2 people said they would like to attend 10 classes or more. The classes that were most frequently requested dealt with business and computers, this was in addition to 6 who wanted to attend piano-related classes. Next up was time management, cooking, crafts, business development and self improvement classes.

Our favorite hobbies seem to be reading and sewing with cooking, walking, musical listening, gardening, running, reading and writing poetry all coming in next.

As was mentioned above, 78% of the people responding to the questionnaire were members of the Auxiliary. Half of those belonged to local chapters. Most of those not belonging to a local chapter said they would be interested in seeing a local chapter formed. Whereas 30% of us felt the name "Auxiliary" should be changed, 67% thought that it should not be changed. Most of the people wanting the name "Auxiliary" to be changed liked the name "Associates" or "Association." Other good names suggested were "PTG Partners" and "Friends of PTG."

89% of us felt that offering child care service would not encourage them to attend conventions. However, this is probably due to the fact that 81% of us do not have children under the age of 18 at home anymore. We should investigate this issue further to determine whether children and related problems are keeping the masses from attending conventions. If so, what (if anything) can we do to help?

Lastly, we asked what were the most fun things people liked to do. The winners there were "being with friends," followed by "tours." We also like to discover what the convention city is about, in big and small ways. We like sight-seeing, shopping, playing with grandchildren, traveling, seeing museums, old mansions, churches and places.

So far, this is what we know!

L. Paul Cook
PTGA Vice President

September • September • September • September

NEW MEMBERS

REGION 1

122-CAPITOL AREA, NY
ERICH C. BORDEN
RD 1, BOX 156
SCHAGHTICOKE, NY 12154

MICHAEL R. CHAPMAN
45 ST. CROIX ROAD
EAGLE BRIDGE, NY 12057

REGION 2

201-WASHINGTON, DC
RICHARD E. KEATING
10013 KINROSS AVENUE
SILVER SPRING, MD
20901-2216

301-ATLANTA, GA
TOM R. PHILLIPS
13090 HOY TAYLOR DRIVE
NORCROSS, GA 30093

MARY L. WATTS
17 COL. ESTILL AVENUE
SAVANNAH, GA 31406

331-SOUTH FLORIDA
TIMOTHY G. WEGMAN
[illegible]AROLINE STREET
[illegible]Y WEST, FL 33040

381-MEMPHIS, TN
RANDAL L. CARR
5401 WALNUT ROAD
N. LITTLE ROCK, AR 72116

THOMAS E. MALONE
122 STONEWALL
MEMPHIS, TN 38104

REGION 3

752-DALLAS, TX
LEON D. ZILIGSON
6821 LEDYARD
DALLAS, TX 75248

771-HOUSTON, TX
PETER DUETZ
1400 SAM HOUSTON PKWY.,
#105
HOUSTON, TX 77043

REGION 4

401-LOUISVILLE, KY
ERIC A. BUSTER
P. O. BOX 4194
215 W. MAIN, #4
LEITCHFIELD, KY 42755-4194

REGION 5

511-SIOUXLAND, IA
DAVID Y. NAPIER
212 19TH STREET
SIOUX CITY, IA 51105

REGION 6

917-POMONA VALLEY, CA
JOHN J. CATERINO
1532 S. GARVEY AVENUE
W. COVINA, CA 91791

926-ORANGE COUNTY, CA
STEPHEN C. GROSE
7 DOHENY
LAGUNA NIGUEL, CA 92677

950-MONTEREY BAY, CA
ELIZA B. STRUTHERS
207 WASHBURN AVENUE
SANTA CRUZ, CA
95060 2935

REGION 7

594-MONTANA
ROBERT W. TELLER
P. O. BOX 977
TOWNSEND, MT 59644-0977

841-SALT LAKE CITY, UT
RUEL R. BROWN
419 WOOD STREET
MIDVALE, UT 84047

September • September • September

RECLASSIFICATIONS

REGION 1

122-CAPITOL AREA, NY
STEVEN E. GREENSTEIN
BOX 697, RR 2
KERHONKSON, NY 12446

139-SOUTHERN TIER, NY
ROBERT A. MURPHY 1604
EAST SHORE DRIVE
ITHACA, NY 14850

REGION 3

771-HOUSTON, TX
DARRELL WADE
P. O. BOX 844
MISSOURI CITY, TX 77489

REGION 5

815-COLORADO WEST
N. CHANNING BARTLETT
P. O. BOX 1161
GLENWOOD SPRINGS, CO
81602

REGION 6

905-SOUTH BAY, CA
DAVID G. ERIKSEN
BOX 3647
REDONDO BEACH, CA
90277-1647

936-FRESNO, CA
JACK C. CASHION
P. O. BOX 4699
FRESNO, CA 93744

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Piano Discussions™

November 1993

News From The World Of PianoDisc

Star service for celebrities

PianoDisc techs offer stellar service for the rich and famous

What do actor **Arnold Schwartzenegger**, pro tennis player **Ivan Lendl**, actress **Geena Davis** and 49er wide receiver **Jerry Rice** all have in common? Just ask the PianoDisc certified technicians that have worked on their pianos. That's right - all of the prominent people listed are happy owners of a PianoDisc system.

In fact, some celebrities are so happy with PianoDisc that they own more than one. Author and screenwriter Sidney Sheldon, for example, owns two systems - one fitted to a turn of the century Chappell grand, the other to a Steck.

Of course we at PianoDisc think that everyone who owns and enjoys a PianoDisc system is a star. But, if you do an installation for a prominent person and you'd like to brag a little, send us a note (with a photo, if you can manage it), and if we mention you, we'll send you some cool PianoDisc stuff!

Franco Skilan of **Precision Piano Services** in North Hollywood fitted this turn-of-the-century Chappel burlwood mahogany 5'9" grand with a PDS-32 system for **Sidney Sheldon**, the renowned author and screenwriter. The piano is one of two PianoDisc-fitted pianos in Mr. Sheldon's exclusive Hollywood residence.

PianoDisc welcomes Mr. Rogers to our neighborhood

We're sure that all of you PianoDisc technicians will be just as grateful as we are that **Tom Rogers** has joined our PianoDisc family. Tom is not the Mr. Rogers of PBS TV fame (although he's just as nice), but he's already a star around here!

Tom's background includes manufacturing experience as **Production Manager for Memorex** and quality assurance background gleaned from over ten years with the **Verbatim Corporation**. Here at PianoDisc, Tom has assumed the position of **Director of Quality Assurance**. This means, among other things, that he wants to hear from all of **you** about any QA issues you may have. Tom will also be developing improvements in our tech support system and fine tuning our manufacturing and shipping procedures (so that you don't get any "surprises" when you open our kits!)

We hope that you will enjoy working with Tom, and he's looking forward to hearing from all of you soon!

Tech Spotlight

During our September training session we hosted technicians from all over. But one technician stood out, not for what he has done, but for what he is about to do. **Steven Westfahl** of **Laramie, Wyoming**, PTG technician and owner of **Westfahl's Piano Co.** has become our first certified PianoDisc technician in the Cowboy State. With the addition of Steven to the PianoDisc family we are now represented by at least one factory authorized music dealer in every state of the Union, as well as in Canada and Mexico. Of course, in most states there are many more than one, but considering that more people live in Flushing, New York than in the entire state of Wyoming, one is a good start. So, good luck to you Steven!

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

Setting Up The Technical Exam In Your Chapter

Bill Spurlock, RPT

This article is intended to give an overview of the set-up and operation of the PTG Technical Exam, and hopefully will encourage those chapters not currently offering testing to consider doing so. Testing activity can benefit chapters by stimulating discussion of state-of-the-art tuning and technical procedures within the chapter, and by motivating Associate members to upgrade.

Areas with several small chapters might consider pooling resources to set up Area Exam Boards. These have worked very well in several locations and offer the following advantages:

AEBs avoid duplication of efforts by several chapters. Instead, one set of exam props and one test piano serve several chapters; volunteers from those chapters then join forces to administer the exams.

Smaller chapters can participate in testing even if they only have need for one or two exams per year.

Examinees may find the exam process more comfortable in the more anonymous setting of an AEB rather than within their own chapter.

Exam dates can motivate Associates to prepare. Running an AEB requires advance scheduling at regular intervals to keep all area chapters informed. Thus test dates become specific target goals that Associates can work towards.

To learn more about setting up an Area Exam Board, contact Carl Lieberman, Secretary/Treasurer of Southern California Area Exam Board, 121 Clubhouse, Venice, CA 90291; or Brian Mahaffy, Chairman, Twin Cities Exam Board, 2629 Fremont Ave., Minneapolis, MN 55408.

Help For Your Examinees

Perhaps the most important step a chapter can take in preparation for testing is to provide some basic training programs for their Associate members. Actually, this need not be specialized material of interest only to beginners; it has been my experience that chapter technicals featuring basic repair and regulation procedures appeal to a large percentage of the membership. Most of us derive the majority of our income from basic in-home tuning and repair. By sharing our favorite methods at the chapter level we all have a chance to improve our skills and efficiency. The PACE Lesson Plans offer ready-made programs covering essential skills that can be easily integrated into chapter meetings.

The next important service chapters can provide is monitoring and evaluation of Associate members progress. As examiners we want applicants to pass the test; however, frequently examiners have not gone to the trouble of

Continued next page

THE SOUND BOARD

I wish to express my appreciation and thanks to the Piano Technicians Guild for the honor of being inducted into the PTG Hall of Fame. For many years I watched expressions of surprise, joy and pride as each new selectee accepted their certificate. No observation of another's reaction can come close to the feelings I had when my name was called.

The time, labor and worry which serving the Piano Technicians Guild represents have been amply repaid through the years by the benefits of friendships, achievements (especially small ones) and the widening of my knowledge, not only of things piano and organizational, but of people, places and the joys of serving.

Seeing how the Piano Technicians Guild has grown and prospered in size and respect through the years is reward enough. To be recognized as having had at least a small part in that success is something which I will cherish for years to come.

With gratitude and thanks,
Charles P. Huether, RPT

evaluating the applicant s readiness. This has sometimes resulted in a high failure rate, discouraged examinees, and burned out examiners.

The PACE Checklist provides a simple way for both the Associate member and chapter advisors to keep track of study needs and progress. Once the Associate member feels ready for the technical exam, the prescreening quiz in the exam book can be given to the applicant (orally, by phone or in person) on a voluntary basis to give both examiner and applicant some idea of the chances of success. The results of this quiz do not provide a basis for refusing to test an applicant; the purpose here is to give some feedback to those applicants not under the tutelage of someone familiar with RPT level as defined by the current exams. This procedure, combined with study of the Technical Exam Source Book, goes a long way towards reducing fear of the exam.

Acquiring Exam Props

You will require two action models and a few easily made props to run the exam. The exam text lists the specific requirements and preparation steps for the action models. Any action model meeting these requirements may be used; however, an actual piano is not permitted since this would alter the degree of difficulty of the exam (time limits, etc. are based upon the greater visibility and tool access and easier handling of models as opposed to a full action in a piano). Yes, the models cost money; however, five exam fees will just about pay for a grand and a three-note vertical model, which then become permanent fixtures for use in future testing as well as teaching aids for chapter technicals.

The technical exam consists of Grand, Vertical, and Repair sections. Materials required for the Grand section are:

Single note action model with removable key frame (or modified to be removable, as outlined in the exam text).

- Spare action parts for above, for replacement as needed.
- Regulating hand tools for examiner use.
- Timer (inexpensive electronic count-down timer from Radio Shack suggested.)
- Gram resistance gauge (from supply house).
- Ruler and calipers.

Materials required for the Vertical section are:

Three-note vertical action model w/pedals, cheek blocks, key slip and fall strip. These are available from Home Office, having been generously provided by Kimball Piano at the Guild's request. Price: $150.00.

- Spare action parts for above.
- Regulating hand tools for examiner use.
- Ruler and calipers.

In Memory

Robert Edward Bailey
November 27, 1943
September 18, 1993

Robert Edward Bailey, editor of the "Vancouver Beat" newsletter, died tragically on September 18th, the victim of a head on crash. He was on his way home after doing what he liked most, hiking.

Bob was not only a very well respected piano technician, but also a fully qualified plumber as well.

He always attended the PNWC Conference. At the most recent one in Seaside Oregon, he was an instructor. Bob said that he couldn't afford to go to these conferences, but that from a learning stand point, he couldn't afford not to go.

He was a very devout Christian and was also the organist for the Christian Life Assembly in Langley.

Bob was always a dominant person in the Vancouver scene. He helped organize the 1984 PNWC held at Coquitlan, B.C. Our sincere condolences go to his wife Bonnie and their three daughters; Deborah, Donna, and Laura.

Keith Hardesty
January 20, 1914
June 24, 1993

Keith Hardesty was a pioneer in the field of piano technology, a master craftsman who never settled for good enough, a man whose genius and insatiable curiosity made his journey through life an extraordinary adventure. He was a student of his craft, and of the human drama, and a beloved teacher of both. He was a man with the great heart of a king whose presence on this earth did not go unnoticed, one of those exceedingly rare individuals who made a difference.

Among the kind notes I received upon my dad's passing was one from Henry Z. Steinway which said simply, "So sorry. A great loss to the piano world." And another from Roger Williams which said "What a great talent he was. I'll miss him!" Then there were the accounts from piano men like Jim Bryant, Jim Christopher and so many others, who told me how Keith Hardesty had saved their lives by showing them value, leading them through despair into hope, teaching each to love what would become his life's work. And

Continued Page U4

Materials required for the Repair section are:

Stringing jig consisting of a scrap of pinblock with tuning pins, agraffes, and a steel plate to anchor the hitch pins. C-clamps to fasten the stringing jig to a table. #13 piano wire. Band aids, eye protection. Grand shanks and flanges for rebushing and repinning. An old keyframe w/ keys or a mocked-up keyframe with appropriate felts, keypins and keys, for rebushing. An old vertical action in a cradle with fileable hammers or a jig with several hammers mounted, for hammer filing and shank replacement.

Timer Stringing and Measuring Tools For Examiners

Anyone in the chapter doing much rebuilding should have scraps of left-over pinblock available for the stringing jig; a welding shop can cut the small square of 1/4" steel plate and drill it for hitch pin and mounting bolt holes very inexpensively. The next time you condemn an old upright and the customer asks how they can get rid of it, offer to haul it away and you will have the keys, key frame and action needed for the repair section. If you do come up with a spare keyframe and keys, you might glue the key rails to a 1/4" plywood backing, saw up into one-octave lengths, and offer these extra test fixtures to other chapters through a notice in the *Journal* Update section.

To ensure fairness to examinees, it is important that all test models and props be reliable and well prepared. The exam sections all have time limits, and the examinee is frequently nervous; exam day is not the time to test one's ability to improvise. Examples of unsuitable test apparatus would be a vertical model that requires an extreme amount of lost motion for jack return, or a hammer filing set-up with hammers that are very difficult or impossible to file smoothly. In the first instance, the examiners should ease tight centers, change butt leather, or weight keys as needed so the action regulates normally. In the second case, the hammers should be changed since the examinee may not have time to experiment with different techniques or ironing to achieve a smooth surface.

Facilities and Personnel

Step-by-step instructions for setting up and running the exam are contained in the exam manual. When more than one applicant is to be tested, the exam props for each section should be set up in separate rooms (or in private areas of the same room). This way, three applicants can be working simultaneously. When their time is up, they leave the room as their work is scored and the props are prepared for the next applicant, then they rotate to the next available section. Two examiners can test three applicants in approximately four hours.

Exam Forms and Paperwork

Examiners need to have the following forms on hand:

- Reclassification forms - available from Home Office. This is a three-part form used to record exam results, dates, and examiner names, for the purpose of documenting an applicant's progress through the three exams. This form is first given to the examinee upon taking the written exam. It is the examinee's responsibility to bring it to all subsequent exams for the examiners to fill out.
- Instructions for Examinee - found in the exam manual, pg. 8 (photocopy as needed from this master.) Mailed to each examinee 2-3 weeks before the exam date, this form specifies the exam time, date, and location and briefly lists the jobs they must be prepared to do.
- Exam Scoreforms - a three-part carbonless form available from Home Office. The examinee's work is compared with the scoring criteria in the exam manual, then their scores are recorded on the scoreform. At the conclusion of the exam one copy is sent to Home Office, one is given to the examinee, and one is retained by the examiner-in-charge. Note: It is important that scoreforms from all exams passed as well as failed be sent to Home Office. This allows accurate record-keeping on the number of exams given around the country, pass/fail rates, particular problem areas in the exams, etc.

These records are also used to maintain a list of examiners for special mailings such as The Examiner Newsletter.U

MEMBERSHIP PTG STATUS

Northeast Region	848
Northeast RPTs	518
Southeast Region	624
Southeast RPTs	377
South Central Region	313
South Central RPTs	199
Central East Region	622
Central East RPTs	383
Central West Region	382
Central West RPTs	247
Western Region	630
Western RPTs	377
Pacific NW Region	395
Pacific NW RPTs	234
Total Membership	3,814
Total RPTs	2,335

the loving recollections and encouragement of friends like Alan Eder and Larry Broadmoore.

Dad's life began in Fort Dodge, Iowa. The youngest of five children, he grew up poor, but never hopeless. It was his mother's burning desire that her only son become a concert pianist and to that end young "Bud" Hardesty was absolutely dedicated. Until the Japanese attack on Pearl Harbor sounded the death knell to Dad's aspirations, he spent every waking moment, when he wasn't working, practicing at the keyboard of an old Knabe upright, rented for the staggering sum of $5 a month. His lessons at that time were paid for by his mother's excellent home cooking.

He spent four years as an officer in the European Theater of Operations in the Second World War. He was a brilliant, sensitive man whose mind and spirit were horribly assaulted by the atrocity of war; and though he told me wonderfully detailed stories about everything else in life, the only thing he had to say about that experience was: "There is nothing romantic or gallant about war, nothing you can learn from it save that it is wrong."

After the War, he disembarked from the troop ship, gathered up my mom and all their belongings and headed for California. Shortly thereafter, he was walking down a street in L.A. looking for work when he spotted a sign in the window of Berkel-Richardson Music Company that said "Piano Tuner Wanted." He walked in immediately and applied for the job.

"Can you tune?" he was asked.

"Of course," he said, though he'd never held a tuning hammer.

"Bring your tools and report to work at 9:00 a.m.," the man said. And so, naturally, that's what he did. He went out and bought himself the necessary tools, watched and listened a bit...then proceeded, over the years, to make history in what became his chosen field.

He died as he lived, with class and dignity. Over the last few years, he had almost completely curtailed outside tuning...but there were a very few old friends whose homes he would occasionally visit and to whose precious instruments he would attend. On June 23rd, he made such a visit to the home of his old friend, Don Cole, a pianist and cellist with the Los Angeles Philharmonic Orchestra.

Of all pianos, Dad's favorite was the Steinway B and it is fitting that it was such an instrument...one, in fact, that he had earlier rebuilt...to which he gave his final attentions. He didn't feel well that night, but just as anyone who knew him would have expected, he willed his great, exhausted heart to keep beating until he had finished his last task. He began work in the early evening, took a break for dinner with Don and his friends, then returned to the job at hand. A little over two hours later, he tuned the pianos final note...and then, he was gone.

My husband's wise and loving mother said to me, "God must have loved your Dad very much to take him that way." And my husband says that Dad was called home because God figured it was time He had His own Steinway rebuilt. My son, Rob, says he can just see Dad up there in his Army uniform riding across the clouds on a motorcycle with Mom in the side car, smiling from ear to ear. Myself, I see him leaning over a Steinway, his right hand on his tuning hammer, his left, toying with the notes of his tuning song...but try as I might, I just can't hear that song.

Written by Jo Hardesty-Lanter
Submitted by Alan Eder, RPT

IN BRIEF

PTG

THE BYLAWS PROCESS
Wade Johnson, RPT
Bylaws Committee Chair

The new December 31 cutoff date for submission of Guild bylaws proposals means that the board, in its January 13-15 midyear meeting, can be aware of whatever changes the chapters and committees are proposing for consideration at Council next July, and will have better opportunity to evaluate these and have informed, thoughtful positions on them.

We believe this change will make for a more constructive process—but it puts an onus on the chapters and Guild committees to be heard from early if they have a proposal. The new deadline, so close to the midyear Board date, is truly "unstretchable" and obligates us to refuse proposals that arrive after December 31.

If the Bylaws Committee can be of any assistance with proposal development or wording, please contact us as early as possible...By the time of the holidays, we can't be of much real help!

TESTS! TESTS! TESTS!

The tuning and technical tests will be offered on January 14, 1994 at Fredonia State University, New York. Contact Chuck Erbsmehl, 335 Chestnut, Fredonia, NY, 716-679-4530, for more information.

OFFICE HOLIDAY HOURS

The Home Office will be closed November 25 and 26, December 24, 27, 31 and January 3 for the holiday season.