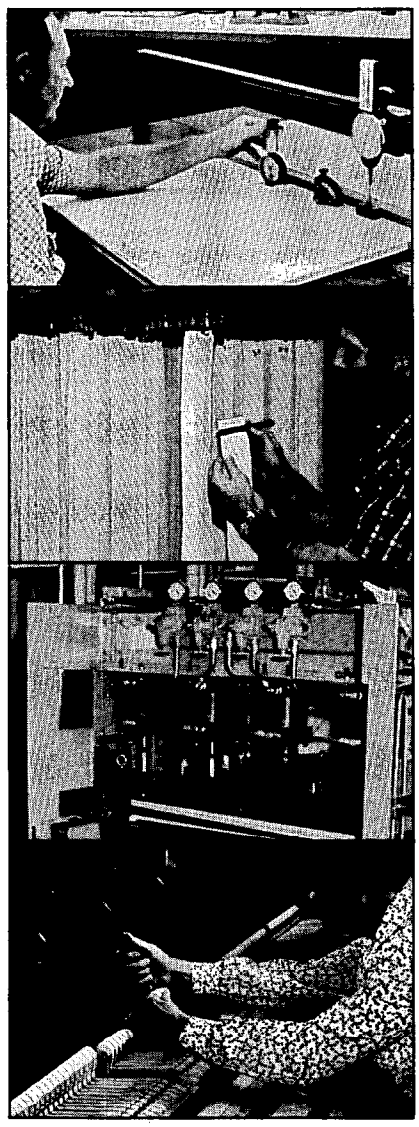
Piano Technicians
# Journal
July 1988

# The Baldwin Piano...

## *You can see why it sounds better*

We firmly believe that hammer making is one of the most critical of all piano building processes. That's why we spend significant extra dollars in materials and time in the manufacture of all of our own hammers for both vertical and grand pianos.

Our special concern starts with materials. We pay a premium price for 100% virgin wool felt made to our standards for weight, thickness, taper, size and hardness. To guarantee that all hammer felt meets our standards, we subject every sheet we receive to stringent testing before accepting it for production.



The same extra concern continues in our exclusive construction procedures. First felt is treated in our moisture-conditioning chamber until it reaches a prescribed moisture content. Then the felt is placed in a special hammer press, designed and built by our engineers. This press has preset closing pressure and automatic cycling for consistency. We use a special thermosetting glue to secure the felt to the moldings. And we check throughout the process to insure that the proper felt hardness is retained.

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# The Piano Technicians Journal

**July 1988**

*Official Publication Of The Piano Technicians Guild, Inc.*

*Volume 31*
*Number 7*


## IN THIS ISSUE...



**THE COVER**

*A photographic study by L. Paul Cook, taken during the 1986 Guild European factory tour.*




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# President's Message

**M. B. Hawkins, RTT**
**President**

## *'...The Highest Possible Service Standards...'*

As we conclude the 31st year as an organization, it seems appropriate to review the preamble to our Bylaws:

*Recognizing the need for a united piano technicians organization to achieve the highest possible service standards and to effectively promote and improve the piano tuning and servicing industry generally, the American Society of Piano Technicians and the National Association of Piano Tuners merged to form a single professional organization to be known as the Piano Technicians Guild, Inc., under articles of incorporation in the State of Illinois, August 21, 1958.*

As simple as this preamble is, it takes the voluntary efforts of many, many people to keep our organization going. For some, it is easy because their natural inclination is to help others. For others it takes persuasion to first become involved and then to continue. Most, after they have started to be a part of what makes things happen, are very glad they decided to get involved.

As we look back over the years there have been some years with great membership growth and some with not many new members at all. One thing must be remembered. Often many people see piano service as something enticing. They become involved and learn quickly in the beginning, then reach a plateau and level off. Just about the time they should be really beginning to develop professionally, they fall away. The general public may not be too demanding, so a work force of low to moderately skilled people may be allowed to exist in this field. It has been the thrust of the Piano Technicians Guild to improve the skills of the professional in accordance with our preamble.

Continuing to improve and providing more benefits and know-how demand many hours of voluntary service. Allow me to take this opportunity to invite those who have not chosen to be an active driving force in the organization to try it. You will, more than likely, find it more gratifying than you ever imagined. You will also become aware that giving is much more satisfying in the long run than just continuing to receive without giving anything back to the profession which provides a means of employment and continual professional development.

Have a nice summer! ■

# The Langer 80 B.P. System by Kimball

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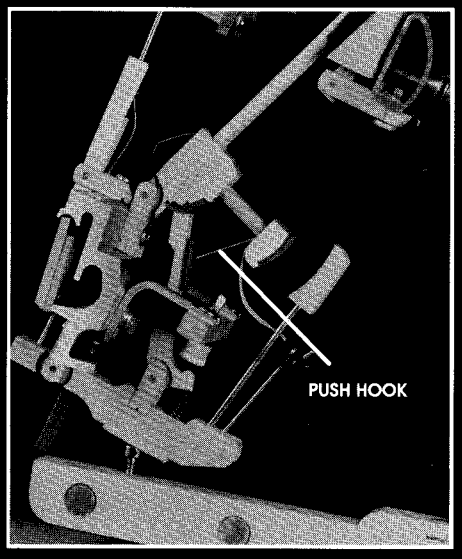
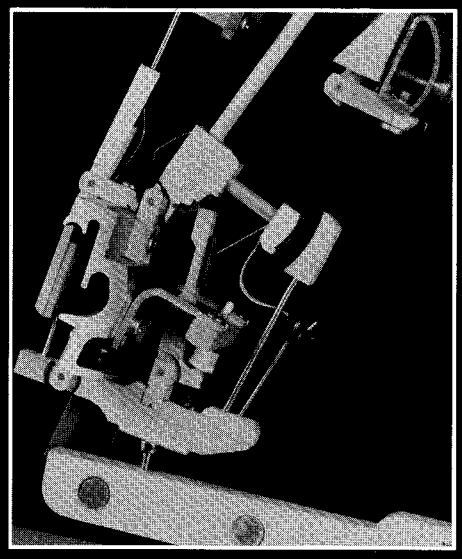
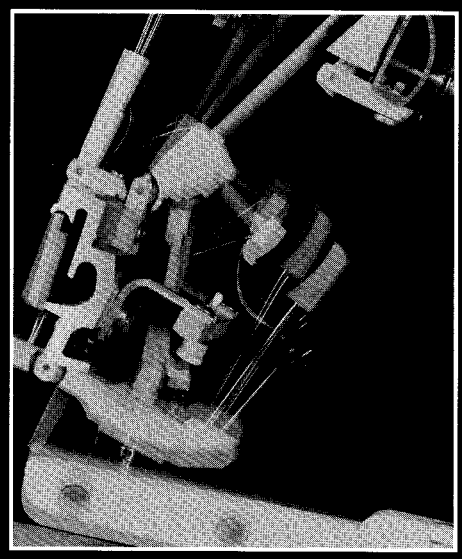



The unique "push-hook" attached to the catcher, replaces the jack-stop rail.



As the key is depressed and the hammer approaches the strings, let-off is about to take place. The "push-hook" will limit the jack travel.



The jack returns more quickly than on a standard action. Repetition is 2 times per second faster than other actions and the ability to trill inside the keystroke is dramatically improved.

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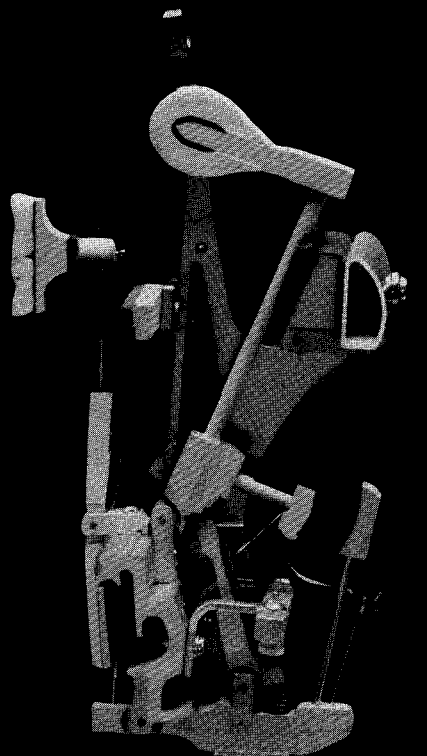
The Langer 80 B.P. System is found only in the new Classic Studios by Kimball.



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## From The Home Office

**Larry Goldsmith**
**Executive Director**

# *Joining Hands To Do The Things You Can't Do Alone*

From friend Clayton Harmon in Asheville, NC, comes a newspaper clipping headlined "Piano Strikes Up Lifesaving Tune In Lenoir Blaze."

"The pop of a burning piano's strings was sweet music to its owner, who credits the noise with awakening him in time to escape a fire that destroyed his home.

"I was awakened by a ping, ping, ping," said Bennie Conner, 41. "It sounded like someone playing it, but with a high shrill sound."

Conner was able to make his way out of the house, which was destroyed in a blaze caused by a faulty electric heater.

What with the efforts the piano industry (including the Guild) is making to promote the piano, maybe we've found a new selling point — sort of a musical fire alarm.

Perhaps you're unaware of how the Guild has reached out to other segments of the piano industry in recent years. During his presidency, Marshall Hawkins has made opening lines of communication a high priority. These efforts have included discussions with manufacturers, both individually and through the Piano Manufacturers' Association International (PMAI), as well as other industry groups. Through efforts of Paul Monroe's Industrial Relations Committee, we are visible at conventions of the National Association of Music Merchants. Our Teacher Relations Committee, chaired by Fern Henry, has staffed a booth and presented a class at the Music Teachers National Association Convention. By presenting an annual scholarship at this event, the Piano Technicians Guild Foundation also has given the professional piano technician a great deal of visibility.

These efforts have been carried out at the chapter and state level as well. A number of chapters and state organizations work closely with teacher groups in their areas. Some keep mailing lists of teachers and include them in mailings of chapter newsletters. Others operate a booth at state teacher conventions.

As you know, the piano industry has changed a great deal in recent years. Through it all, the Guild has remained strong and our visibility has increased. We have reached out to other industry groups to cooperate in promoting the instrument we all love so much. These gestures have been welcomed, and the Guild has been treated with increasing respect.

In St. Louis, we will bring together representatives of these groups for what might be termed a "piano summit," — public and private discussions aimed at finding new and better ways of promoting the piano. Because the Guild convention is the only industry event dedicated solely to the piano, this seemed a natural thing to do.

Among those who will take part are Karl Bruhn, senior vice president of Yamaha Music Corp., immediate past president of PMAI and newly elected president of the American Music Conference (AMC); William McCormick, president of Jordan-Kitt Music and immediate past president of AMC; Dolores Zupan, president of MTNA; and, of course, President Hawkins. The panel discussion, set for 3 p.m. Wendesday, July 20, will be moderated by Dr. Frank Wilson, a neurologist and author of the book "Tone Deaf and All Thumbs? An Invitation to Music-Making For Late Bloomers and Other Non-Prodigies." You may remember Dr. Wilson's keynote address from our 1986 convention in Las Vegas.

It will be an exciting program. I hope to see you there.■

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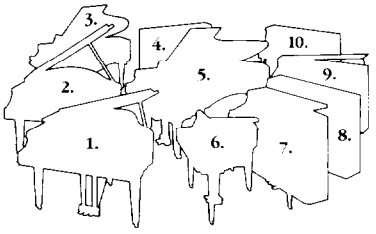


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THE
# TECHNICAL
FORUM

# *Heavy Parts; Tech Ed Advocates Vise; Cleaning And Lubricants, Part II*

**Susan Graham**
**Technical Editor**

This month's Forum is a collection of odds and ends. Pertaining to weight control in a grand action, there are a few more procedures to consider before drilling holes and inserting leads into keys. I've received comments, additional suggestions and requests for clarification pertinent to our discussion, and those are included. Next month I will be attending the NAMM expo in Atlanta and the Technical Forum will feature a long-awaited article on key bushing by Fern Henry and Bill Spurlock. In the following month (if all goes according to plan) we will actually get around to putting some leads in keys.

The beginning of this series touched on the possibility of the actual weight of parts affecting touchweight in an action. Action rebuilders have been familiar with the problem for years. Dense, modern hammers with a greater molding weight, and heavier, non-reduced shanks add to touchweight and affect voicing, particularly in the treble.

We can once again obtain reduced treble shanks and some hammer makers have lighter mahogany moldings available, but there is still the problem of pianos with excessively heavy parts already installed.

These are not just rebuilds — for years many manufacturers produced pianos with very clunky action parts. There has been a return to better quality, but the "heavyweights" are still out there. They are frequently not very old or heavily used — notorious problem pianos, purchased at considerable expense with disappointing results.

Making them enjoyable instruments can earn you a great deal of gratitude and the status of genius in your local musical community. The steps previously detailed in this series may help remedy the unsatisfactory performance of these actions, but they may ultimately need keyleading as well. If actual weight of parts is a problem, however, solving that (and not just the symptoms it creates) makes good technical sense and will produce a better job.

Removing weight from assembled and installed parts requires more patience than shaping new parts prior to installation. Because any of us may encounter this problem, I will approach solving it from a field-service technician's point of view instead of the heavy-duty rebuilder's. This means offering rather low-tech, low-budget tools and techniques. It is not meant to encourage what Mark Anderson calls the "stone knives, bone chisels" mentality which plagues many piano technicians, i.e., the fond hope of conducting a business equipped with a Swiss army knife and a pair of vice-grips.

Many of us, because our business does not *require* use of large power machinery, scrimp on investing in such tools. We improvise (and suffer) our way through jobs which could be easily and better done if we were properly equipped.

It is true, however, that many of us are limited in capital and workspace. Therefore, I'll try to offer solutions in which ingenuity and foresight can enable a technician to cover the basics while still building a "library" of tools.

Power sanding capability is basic, but the requirements for such a tool are not always simple. For some jobs a stationary belt is best; for others, a disc; and for still others, a drum sander may prove handiest. There is the matter of size, often characterized as "industrial" versus "hobby." We are all committed to purchasing top quality tools, but often the six-inch belt which is the most effective for big work is too wide to permit maneuvering small parts safely and with enough control. Space limitations make combination tools attractive, but these often compromise on power.

I find that stores and mailorder suppliers which cater to wood carvers and seekers of high-quality hand tools are as likely to carry equipment suitable to the average piano technician as the heavy-duty industrial suppliers, and are frequently more helpful and creative in offering solutions. It helps to knows what you intend to do with a tool — occasional light woodworking, or frequent and heavy making of missing case parts, etc.? How many sets of hammers do you shape per week? per day? per hour?

Pay attention to the accessories available for equipment you already own. Examples are the tools shown in use in this article. A sanding disc can be fitted to a table

*Continued on page 10*

*While attending the*
*National P.T.G. Convention*
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*Continued from page 8*
saw or even an electric drill in a holder.

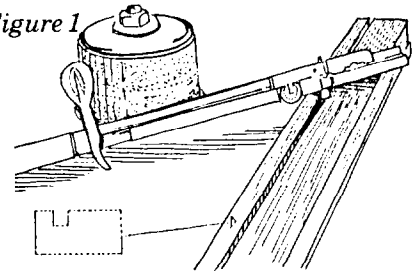
A drum sander can be used in a drill press (although it is not considered good practice to exert heavy or frequent sideways pressure on a drill press spindle since that is not the stress they are designed to withstand).

In my shop I happen to have a separate drum sander, with a low-rpm motor, mounted in a large stationary table. This is the tool I use to shape shanks. The drum is particularly handy when the hammers are already installed, because the curved working surface allows selective contact of a fairly small area. There are more sophisticated systems to reduce shanks utilizing a router table (in the future we will get into these) but anyone who has a drill press, quite possibly the most indispensable piece of machinery one can own, can set it up with a drum sander and utilize the method described.

To tell the truth, I usually do this job freehand, but for those who desire absolute uniformity or are nervous about the klutz factor, a simple shank holder can be devised from two pieces of hardwood scrap. Make friends with a cabinet shop owner or get access to a lumberyard's sawtable scrap box. One piece has a shank-deep rabbet cut along one side, with cut-outs for the knuckle, drop screw and hammer. (*Figure 1.*)

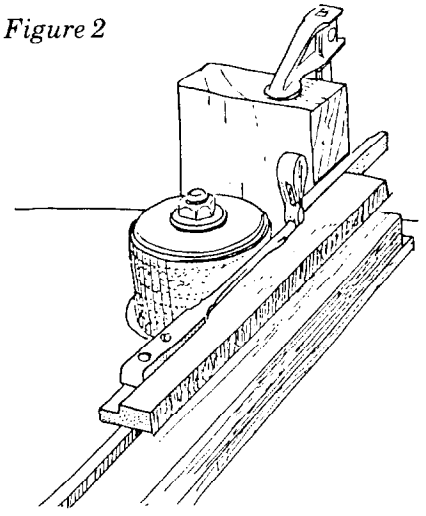
It is necessary to deepen the rabbet slightly where it will accommodate the flange, so the

*Figure 1*



entire assembly rests securely in the groove. The width of the rabbet is such that the side of the shank extends beyond the edge of the holder, exposing it to be reduced. The underside of this piece has a dowel extending from it. This fits into a groove, cut with a table saw into another piece of scrap, creating a track for the holding piece. An extension on the holder contacts a stop block clamped to the sanding table. With a little experimentation, the whole thing is aligned to the drum and clamped to the table so a hammer assembly can be placed into the holder, swung against the drum, and moved along the track to reduce the side of the shank. (*Figure 2.*) If the track piece is about two inches thick (or is shimmed up), the shank can be turned over and the other side sanded with the hammer hanging downward.

*Figure 2*



Reduction is only done in the top sections (I reduce shanks down to the #50 hammer) so very large and/or angled hammers are not a consideration.

Wood is removed only from the sides of the shanks. Because the grain of a shank is quartersawn, in a plane with the vertical line formed by the hammer, the loss of strength is minimal. This would not be true if the shank were reduced bottom and top, or completely around — the strength of the shank with the grain is approximately four times greater than across it.

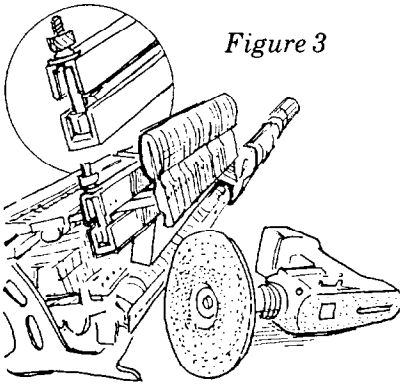
Reducing shanks not only reduces weight, but can improve the voicing in the treble by eliminating some of the mass which produces a woody "thump" on impact.

The same benefits can be gained by reducing hammer weight, where there is often even more surplus which can be spared. Many hammer tails are rather massive. Although there is a curve where the tail will contact the backcheck, the end is still clublike. There also may be a sharp corner, which wears out backcheck leather at an alarming rate. Such tails can be reshaped with a sanding disc in an electric drill. I use the rubber disc commonly available at hardware stores, although some technicians prefer to make a rigid disc from a piece of masonite, using the mandrel which comes with the rubber disc.

If a good solid clamp is used to hold the shanks, shaping can be done without removing the hammers from the rail. The clamp shown (*Figure 3*) is the Jaras clamp, purchased from Schaff, but a similar device can be made from channel steel or aluminum and nuts and bolts.

An important feature is the rubber lining, which is a piece of tubing forced into the channel. The tubing gives a better "grip" than would felt. There is a shim

*Figure 3*



under the middle eight inches of the tubing, bowing it slightly to compensate for the greater clamping pressure at the ends where the bolts are. Clamping the shanks is important to prevent damaging the centers, and is particularly important for teflon-bushed shanks since teflon is less forgiving of stress (it cracks).

Tail shaping is an operation I do freehand — I raise the clamp up on a two by four so I can easily see the curve of the tails, and use the disc to shape them. The design of the hammer and the bevel of the backcheck give clues to the desirable shape. Some tails are fairly straight and curve just at the end, as on many European hammers. Others have a more gradual curved or rounded appearance, as on most American-made hammers.

Another factor is backcheck alignment to angled hammers. Some actions have backchecks turned to match the angle of the hammer. These hammertails cannot be gang-shaped unless the backcheck is readjusted, which

may or may not be possible depending on whether the wire and head are press-fit or threaded.

Since it is also not in keeping with the original look of the piano, I prefer not to do it. I remove those hammers and shape the tails individually on a stationary disc. If, as on most American pianos, the line of backchecks remains parallel to the rails, then the tails of angled hammers are squared off correspondingly (making them somewhat triangular in cross section) and can be gang-shaped.

Keep in mind, however, that one side is thinner than the other. Watch the reduction rate of the *narrow* side or you may be in for a nasty shock. Don't get any tails too narrow and pointed or they may be weak. After the disc has done the heavy work, I clean up any unevenness by hand with a sanding block and knock off the lower edge to be sure that no corner remains to chew the backcheck. I roughen the tails slightly with a checkering file and the job is done.

While we're back at this side of the action, I might mention a problem which I'm running across lately — tenor hammers so big through the lower shoulder that setting a correct blow distance causes them to rest on the tops of the backchecks. This can create a false reading of hammer line and jack position, and allows the staples to dig grooves in the backcheck leather. This condition can also be a result of replacement backchecks installed too high. The result is the same as produced by incorrect beveling of a backcheck — a strange sort of sluggishness, bad repetition on very heavy blows, or even locking up as the backcheck catches the protruding "staple" (it's usually a twisted wire). It may be necessary to raise the hammer line slightly, squeeze the wire deeper into the felt with pliers, or lower the height of the backcheck head (or all three). Just a little incidental information...

Back to hammer weight. Many modern hammers have a minimal taper. The sides of the tail are nearly parallel all the way to the bottom of the molding. Redoing this taper can also remove weight. Care must be used if the hammer is installed on a shank, particularly angled hammers where the shank extends beyond the plane of the side of the hammer.

Either a belt or a rigid disc sander, equipped with a supporting platform and a simple guide, can be used.

For a moderately priced tool which performs a multitude of functions I'd be hard pressed to beat the Zyliss vise, fondly regarded as the poor man's shopsmith. This Swiss-made aluminum clamping system includes a basic vise which clamps to a bench top, and a number of attachments which permit extending the clamping range the length of the bench, fixtures for clamping dowels, "soft jaws" for light work, a turntable attachment, and a drill holding fixture. I have even used it as a giant C-clamp in clamping pinblocks to plate flanges when drilling for plate screws. I purchased it at a woodcarvers' show. The vise is distributed by Clark National Products, with offices at 984 Amelia Avenue, San Dimas, CA 91773 and 975 Chattahoochee Avenue NW, Atlanta, GA 30318. There may be other sources as well.

*Figure 4*

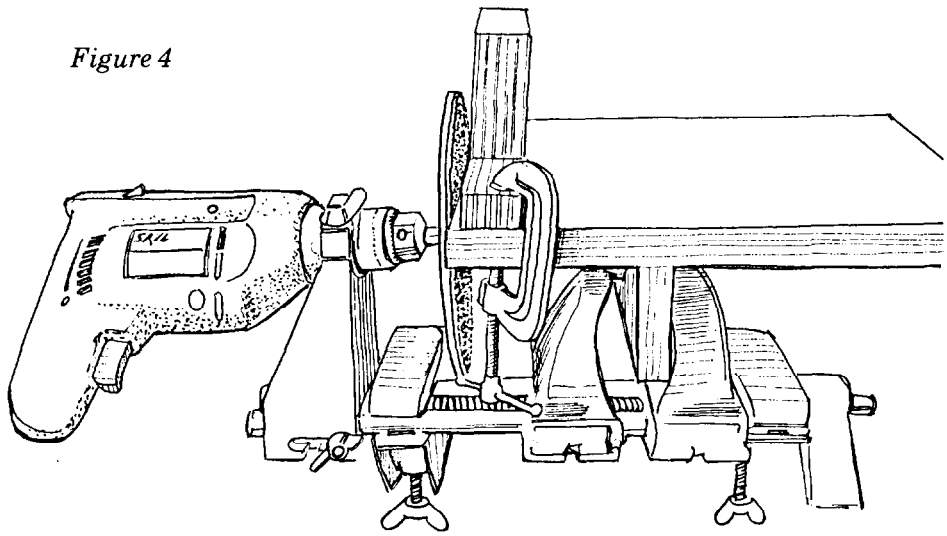
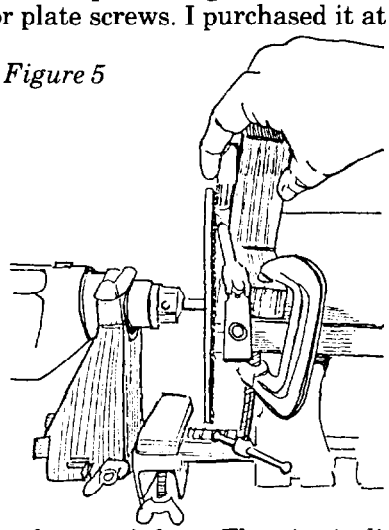


*Figure 5*



In this case (*Figure 4*,) I am using an electric drill and a rigid sanding disc, the drill holder, and a T-shaped platform held in the jaws of the vise to support the guide. (Unfortunately, the only drill I've found in current production which fits in this holder is the cheap Skil shown — a disposable tool if ever there was one). The guide is a block of wood with the lower edge cut to a four-degree angle, also a modified T shape to provide legs which can be clamped to the platform. The body of the T, the part the hammer contacts, is slightly narrower than the sanding disc, allowing the shanks of angled hammers to swing away from the disc, preventing damage. The hammer is held tightly against the guide and pressed down to contact the sanding disc and taper the tail (*Figure 5*.) Taper tails just up to the felt — do not remove molding out from under felt, which needs the support to produce tone when striking the string.

I also have sanded the entire sides of hammers before installation by holding them flat against the disc, but this too is difficult with the shank in the way in angled sections. It easily can be done in the treble, however. The sides must be kept parallel (above the taper of the tail). If you cannot do this freehand, create some sort of a guide.

Both these operations involve working with the hands close to a sanding disc, which is a little hazardous. The support platform should be as close as possible to the disc, the sandpaper or cutting disc should be new and sharp, and you should be feeling pretty sharp yourself. I use an item trade-named a Whizz-disc rather than sandpaper. It is a flat

disc made of some sort of abrasive fiber and resembles a surform blade. I mount it on a masonite backing. It is made by Arco Products in Englewood, NJ, and distributed through Ace Hardware stores. It cuts very quickly and cleanly, and stays sharp through many uses.

This guide system for tapering tails will work on a vertical belt sander, which is probably a little safer since the belt pulls the hammer straight down and doesn't tend to kick it out by the force of rotation present in a disc.

It is also possible to remove some hammer weight by removing some of the molding just under the shank — enlarging the radius of the shaping at the front of the tail. This is done with a small drum-shaped bit, either a sanding drum (such as the ones we are not using in a moto-tool to shape hammers) or a kutzall bit, chucked in a drill press. The kutzall bits are spiny wonders for removing wood, available in all sorts of shapes and sizes, in steel and a finer "gold" grade. Again, these are available in larger hardware stores and can also be ordered through specialty woodworking suppliers (many of which are listed in *Fine Woodworking Magazine*). Like most serious cutting tools, they must be used carefully but will do a fast job of removing wood. The cut they leave is a little coarse and may need to be finished with a sanding drum.

I have been told that there was a time when an expert voicer might remove wood from hammer moldings with a sharp penknife. In the field, faced with a few treble hammers with a noticeable "whack" of impact, this might be worth a try.

As regards the weight question, you may be asking yourself how much good all this sanding, shaping, building of jigs, etc., really does? Well, by pestering my local pharmacist to allow me to use his gram scale, I found that I can remove over a half-ounce of weight from a hammer through shaping. When you consider that this will translate to three grams of weight loss at the keyfront, and add the benefit of reducing treble shanks, it is a significant help in fighting a touchweight problem. Moreover, it does have voicing benefits, and it is attacking the real source of the problem. It may still be necessary to relead keys, but it reduces the amount of lead needed, leaving more of the key intact and, not incidentally, an action which is overall lighter and easier to shift in the piano (and carry outside it).

**Cleaning:** Every time I mention Renews-it, I get phone calls telling me it doesn't exist, or asking where to find it. Please observe the spelling: the product *Renuzit* is no longer on the market. Renews-it, however, is manufactured by the Lundmark Wax Company in Chicago. I spoke with a very helpful Mr. Burke, who assured me that they are still making this product and intend to keep doing so. It is available nationwide through Ace Hardware (if it is not on the shelves, any store can order it through the wholesaler).

He was unwilling to reveal the contents, except to assure me that it does not contain wax. As I've said before, I suspect that any product meant for home drycleaning would probably work — this happens to be the one I prefer.

**Verdigris, Again:** Every time I mention verdigris, I get letters telling me that it can be burned out. I refuse to have anything to do with the suggestion that this can be done safely with the shank still pinned onto the flange, since I am convinced it damages the hole in the flange.

However, a colleague has sent a thorough and logical presentation of a method he uses with good success. I still maintain that the cloth is already damaged and will eventually need to be replaced, but his point that something needs to be done in the interim is well taken. He suggests modifying a soldering tip. I might add that a tip can also be made from a 3/16-inch threaded brass rod, which will screw into the Weller soldering iron described. Either the purchased tip or the brass rod can be reduced to the desired diameter by chucking it in a drill press and working against it with a file.

Randy Woltz writes: "Get a Weller pencil-type soldering iron, 25 watt, which takes thread-in tips, from any good electronic supply or hardware store. I also recommend getting the stand to hold it. With the soldering iron, get tip #ST-8. File or grind the tip so that it is straight (not tapered) and about the diameter of a #20 center pin (.020 inch). Punch out the old center pin. With the soldering iron hot, put the tip into the bushing no longer than one second. You should see an immediate puff of white smoke. Do this on both sides of the flange and touch the tip to both sides (exterior) of the birdseye to burn off any remaining verdigris. Now ream and repin normally. The intense heat of the soldering iron causes the waxy verdigris to become a liquid and then a gas.

That is the white smoke you see. The 25-watt iron is just hot enough to do the job, but of course, if you leave the iron tip in the bushing more than a second it will scorch the cloth.

When you have done this, there is no trace of the verdigris left. The entire time it takes to do this on each flange (remove the pin, burn off verdigris, ream, fit new pin and cut off) is about one minute. Try it yourself. It works!"

*Randy Woltz*
*Tustin, California*

**On To Lubricants:** Ray Chandler, service manager for Kawai, tells me that coarser grades of talc are actually abrasive, so it is worth the money to buy a more refined grade from your local chemical lab supply. He likes Dry-lube (more about this in a minute) and also mentions in his class molybdenum disulfide, hereafter known as MoS2. This is a graphite substitute. It is packaged as McLube 108 by the McGee Corporation in Aston, PA, and is a spray product which dries to a grey film.

Raye McCall carries it as McLube 1798, and also supplies McLube 1725, which is a lighter-duty, teflon-like spray coating which dries to a colorless film. McGee also packages McLube 1708, which is a combination of the two. MoS2 can be sprayed on repetition levers and jack tops (masking off surrounding areas) and also has pedal-and-trapwork applications.

Chandler also reports success in using a single drop to lubricate squeaking keybushings. Since these bushings squeak because glue has wicked through the cloth and is contacting the pin, this is probably a temporary fix. The real solution is to rebush the keys — but once again, something must be done in the interim and MoS2 will do the trick. I like this idea better than using silicone oil, since silicone has demonstrated so many nasty tricks like creeping, interfering with future glue joints, etc.

*Continued on page 14*

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Exhibit Hall . . . . . 2:00PM–6:00PM

**Tuesday, July 19**

Exhibit Hall . . . . . 9:15AM–1:30PM 2:45PM–6:15PM

Professional Service—The Next Step . . . . . Class Periods 3 & 4—Classroom G

**Wednesday, July 20**

Exhibit Hall . . . . . 9:15AM–1:30PM 2:45PM–6:15PM

Professional Service—The Next Step . . . . . Class Periods 1 & 2—Classroom G

The Disklavier™ and Midi Grand—
an Overview . . . . . Class Period 3—Classroom G

Piano Summit—Panel Discussion
"The Future of The Piano" . . . . . 3:00PM—Promenade A & B

Convention Awards Banquet . . . . . 7:30PM—Promenade C & D

**Thursday, July 21**

Exhibit Hall . . . . . 9:15AM–1:30PM 2:45PM–6:15PM

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Professional Service—The Next Step . . . . . Class Periods 3 & 4—Classroom G

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**Tech Gazette** will resume in August

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*Continued from page 12*

And as for Dry-Lube ("one puff's enough"), the question came up at the recent Pacific Northwest Conference: what is it? Some say mica, which is predominantly aluminum silicate.

Doug Wood from Seattle has the advantage of a father who is a spectroscopist for AT&T Bell Labs, who reports it is *not* MoS2, not teflon, not nylon, but a talc-like substance "whose lubricating abilities depend on a plate-like structure with plate-like morphology (which) is how graphite and MoS2 work also." In other words, Dry-lube is talc (which is magnesium sulfite) or possibly mica, or a combination of the two along with other silicates.

The exact contents of a particular bottle probably depend on which end of the mine it was dug from, but they are all organic compounds and work in the same fashion. A similar lubricant, soapstone, is steatite — another form of talc. Which one you use comes down to preference.

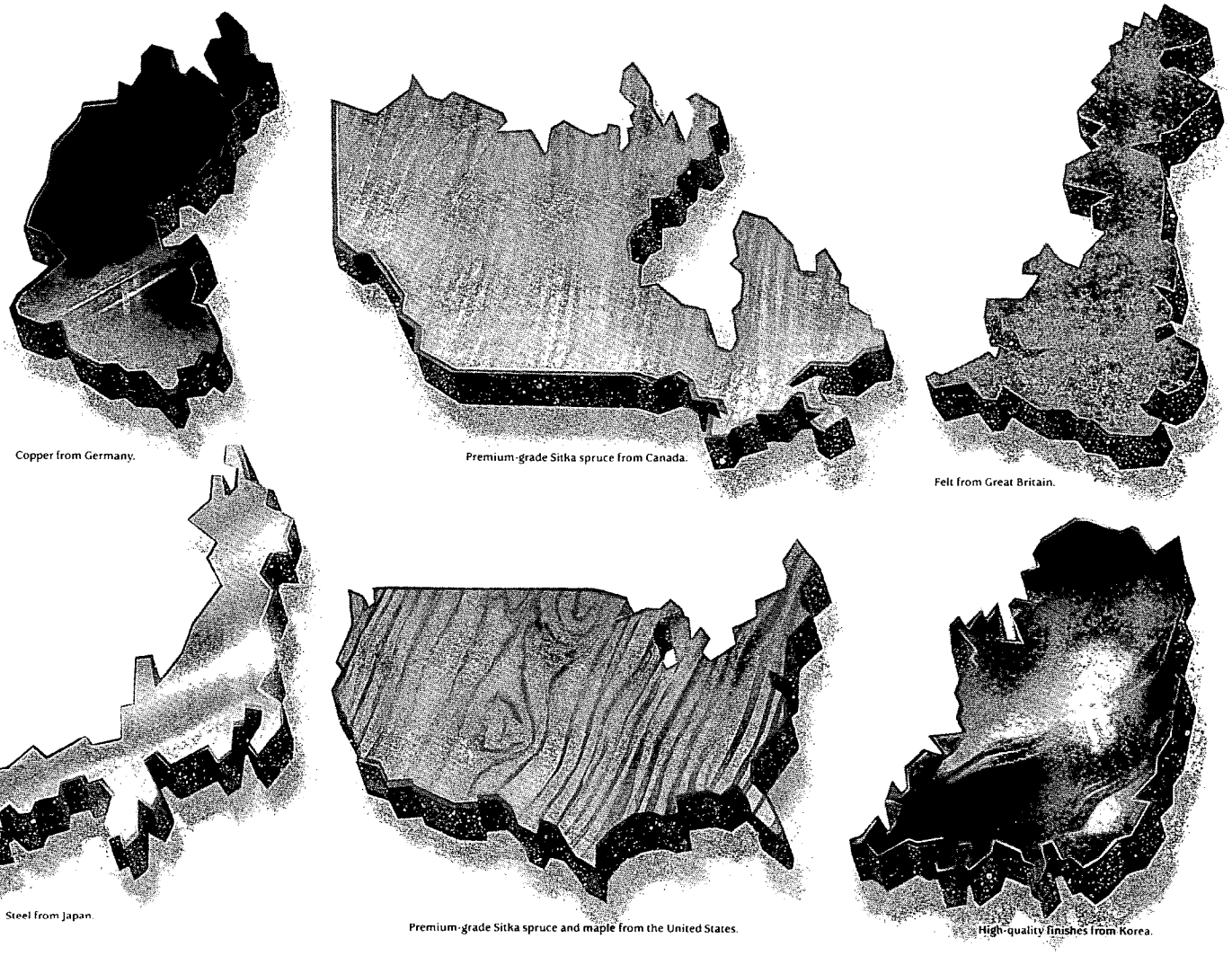
Would you rather carry a stick which breaks into little pieces and gets lost or a bottle which loses its cap and exudes its contents all over your toolcase? They are all excellent for knuckles and keybeds.

I reported several months ago that the original Dupont teflon spray tradenamed Slipspray is now manufactured as TFL 50 (dry). Having tried it for several months, I can report that it does seem superior to the locally packaged "mold release" sprays. The TFL 50 forms a coating more quickly, with less of the spray vehicle saturating the parts. It therefore does not seem to harden knuckles. Although it is quite expensive, the teflon is less inclined to precipitate and settle in the bottom of the can (the locally packaged products all require agitator balls such as in paint cans to break up the teflon because it frequently solidifies at the bottom of the can and less and less will be contained in the spray).

It is currently available through Ford Piano Supply in New York. The manufacturer, Remgrit, will accept orders of a case or more, addressed to Mr. Jordan Jacks, Remgrit Corporation, RemChem Division, 242 N. James Street, Room 106, Wilmington, DE 19804: (302) 995-7538. They also are interested in hearing from other distributors. Cost is approximately $40 for a dozen five-ounce cans. They also manufacture a "wet" teflon spray in a non-evaporating base which works well for metal-to-metal contacts and is finding favor among horn players as a slide, spring and even leather lube.

Speaking (further) about lubricants: having been advocating careful cleaning of repetition springs, scraping of grooves and applications of dry graphite only (via a pencil lead), I now learn from the Snyders that this sometimes allows the spring to click. I'm now puting a *very tiny* amount of VJ lube on the cleaned spring and still graphiting the groove as before. Sure enough, it cures some of those mystery clicks.

I appreciate all the mail, and try to use and/or answer as much as possible. It helps if material is typed, double-spaced. The most usable photographs are black-and-white prints (color slides for cover art). Hope you're having a good summer — see you in St. Louis.■

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# *Formulas For Inharmonicity*

**Rick Baldassin**
**Tuning Editor**

As you may have gathered by now, the content of this monthly column is largely governed by the mail I receive each month. This month, I received a letter with a very interesting question. I also had noticed the phenomena the reader mentioned, so I was interested in the answer myself. It has caused me to do the far greatest amount of research yet. After all the work, I am not sure the answer will fill all that much space, but the whole process was interesting

The letter came from Dennis Gorgas, Edmonds, WA.

Dennis wrote:

*Dear Rick,*

*Help! In 1980, Dave Roberts wrote a series entitled "The Calculating Technician" which was a wonderful series. Subsequently, I took all of his formulas and programmed them into an inexpensive hand-held computer. Dr. Sanderson also developed a series of formulas covering the same material as Roberts.*

*I did some sample calculations to compare both sets of equations. All of the results were comparable, except for values of inharmonicity in the mid to low bass region. For example, calculating the value for I(4) (Inharmonicity at the 4th partial) for a single wound bass string (Note #1 on a Steinway B) using Dr. Sanderson's formula gives a value of 3.6 cents. Using Roberts' formula with the same string parameters gives a value of 7.6 cents for I(4).*

*As I calculate I(4) values for each note going from note #1 to note #20 (the highest bass note on a Steinway B) the values draw closer and closer to each other until finally, at note #20 they are equal. The results of the plain wire formulas of Sanderson and Roberts compare exactly. Any ideas as to the discrepancy in the I(4) values in the bass section?*

Sincerely,
Dennis Gorgas

When "The Calculating Technician" series was printed, I was a big fan. I followed the series very closely, and programmed the formulas into the TI-59 programmable calculator. Some time later, Dr. Sanderson sent me a sheet with his formulas, and I programmed them into the TI-59. I noticed at that time that there was a discrepancy between the two.

I knew I had the Roberts formulas programmed properly, because I was able to enter variables which Roberts had published and obtain the same published answers. I assumed that the discrepancy was due to a programming error with the Sanderson formulas. This idea was supported by the fact that Dr. Sanderson's formulas accounted for the additional inharmonicity contributed by the "step" in the double wound strings, and therefore the Sanderson formulas were expected to give higher values than the Roberts formulas, not vice versa.

In talking with Dr. Sanderson, I became aware that in order to execute the sine functions in his formulas, the calculator had to be switched from the "degree" mode to the "radian" mode. Having worked this problem out, I began using the Sanderson formulas. I continued wondering whether my program was correct, but the values I calculated were within the parameters set forth in Dr. Sanderson's "Piano Technology Topic #5 - Piano Scaling Formulas."

At this point, I basically shelved my programs for the Roberts formulas. That is, until I received this letter.

My first action was to confirm the prior discrepancy. The TI-59 programs confirmed this. I then programmed both formulas into a computer spreadsheet, which reconfirmed the discrepancy. Finally, I worked through each formula by hand, one step at a time.

Obtaining the same results from three different methods, I concluded that I could end the misery, and accept that there was, through no fault of my own, a discrepancy between the two formulas.

This is how my adventure began. I dug out all 20 issues of the *Journal* containing "The Calculating Technician," and read them again. I examined my files, and pulled out any papers dealing with inharmonicity, including copies of articles from the *Journal of the Acoustical Society of America,* various class handouts on the subject, and a copy of Dr. Sanderson's handwritten formulas. With several formulas in hand, I set out to obtain some piano data.

Because Dennis mentioned a Steinway B, and because I care for and have ready access to a Steinway B, it was my choice of piano. I carefully measured the core diame-

ter (d), the overall diameter (D), the string length (Ls), the lengths of the unwrapped ends (L1a and L1b), and the cent readings for the 4th and 8th partials of each note. Data obtained from Steinway B, #CB364 is listed in *Figure 1.*

With this data, I could then calculate the tension and inharmonicity from both formulas. From the readings for the 4th and 8th partials, I could calculate the inharmonicity constant, and hence the inharmonicity at any given partial. To calculate the inharmonicity constant from two different partials of the same note, first take the difference of the two numbers.

For note A0 we would subtract -34.7 from -22.6. The result is 12.1. We would next divide 12.1 by the difference of the squares of the partials we used. Since we used the 8th and 4th partials, we would take (8x8)-(4x4) = 48. To finish the calculation for the inharmonicity constant of note A0, we would divide 12.1 by 48, 12.1 divided by 48 = 0.252, so our constant for note A0 is 0.252.

If we want to know the inharmonicity at the 4th partial, we multiply the constant by 4 squared, or 16. (0.252 x 16 = 4.0). Therefore, I(4) for note A0 = 4.0 cents. *Figure 2* gives the inharmonicity constant (B), inharmonicity at the 4th partial I(4), and Tension (T) as calculated from the Sanderson and Roberts formulas and compares it to the measured (and calculated) values for B and I(4).

Note that the tensions are the same for both the Sanderson and Roberts formulas. Note also that the B and I(4) values from the Sanderson formula most closely match the measured data. While the Roberts formula comes close in the upper notes, there is a significant departure in the lower notes. There are two notes with error of 0.5 cents at I(4) with the Sanderson data. I attribute this to unevenness in the overall wrap diameter, or possibly resonances in the soundboard and case which cause the inharmonicity to be higher than calculated.

Having established that my data corresponds with Dennis' data, and that the Sanderson formulas are by far more accurate in calculating the inharmonicity, we need to explore why the Roberts formula gave innacurate results. Before we can explore this, we need to look carefully at each of the formulas:

**Figure 2**

| | SANDERSON | | | ROBERTS | | | MEASURED | |
|---|---|---|---|---|---|---|---|---|
| Note | T | B | I(4) | T | B | I(4) | B | I(4) |
| A 0 | 278 | .216 | 3.5 | 278 | .453 | 6.8 | .252 | 4.0 |
| A♯0 | 281 | .160 | 2.6 | 281 | .347 | 5.2 | .163 | 2.6 |
| B 0 | 281 | .155 | 2.5 | 281 | .333 | 5.0 | .154 | 2.5 |
| C 1 | 296 | .152 | 2.4 | 296 | .320 | 4.8 | .152 | 2.4 |
| C♯1 | 298 | .128 | 2.0 | 298 | .267 | 4.0 | .125 | 2.0 |
| D 1 | 275 | .106 | 1.7 | 275 | .220 | 3.3 | .117 | 1.9 |
| D♯1 | 269 | .093 | 1.5 | 269 | .187 | 2.8 | .096 | 1.5 |
| E 1 | 253 | .105 | 1.7 | 253 | .187 | 2.8 | .110 | 1.7 |
| F 1 | 229 | .075 | 1.2 | 229 | .133 | 2.0 | .075 | 1.2 |
| F♯1 | 215 | .083 | 1.3 | 215 | .133 | 2.0 | .115 | 1.8 |
| G 1 | 195 | .085 | 1.4 | 195 | .127 | 1.9 | .085 | 1.4 |
| G♯1 | 196 | .088 | 1.4 | 196 | .127 | 1.9 | .090 | 1.4 |
| A 1 | 200 | .088 | 1.4 | 200 | .127 | 1.9 | .092 | 1.5 |
| A♯1 | 197 | .093 | 1.5 | 197 | .127 | 1.9 | .098 | 1.6 |
| B 1 | 192 | .095 | 1.5 | 192 | .133 | 2.0 | .094 | 1.5 |
| C 2 | 205 | .097 | 1.6 | 205 | .127 | 1.9 | .098 | 1.6 |
| C♯2 | 202 | .086 | 1.4 | 202 | .113 | 1.7 | .085 | 1.4 |
| D 2 | 199 | .094 | 1.5 | 199 | .113 | 1.7 | .094 | 1.5 |
| D♯2 | 195 | .088 | 1.4 | 195 | .113 | 1.7 | .090 | 1.4 |
| E 2 | 189 | .097 | 1.6 | 189 | .120 | 1.8 | .096 | 1.5 |

*Fig. 2 shows the Tension (T), Inharmonicity constant (B), and Inharmonicity at the 4th partial I(4) for both the Sanderson and Roberts formulas, as well as the measured/calculated values for B and I(4), based on the Steinway data listed in Fig. 1.*

**Figure 1**

| NOTE | d | D | Ls | L1a | L1b | 4th Par | 8th Par |
|---|---|---|---|---|---|---|---|
| A 0 | .063 | .224 | 59.5 | 1.0 | 0.5 | -34.7 | -22.6 |
| A♯0 | .058 | .215 | 58.875 | 0.938 | 0.438 | -27.4 | -19.6 |
| B 0 | .058 | .205 | 58.25 | 0.781 | 0.438 | -24.6 | -17.2 |
| C 1 | .058 | .201 | 57.5 | 0.75 | 0.5 | -21.8 | -14.5 |
| C♯1 | .055 | .193 | 56.063 | 0.75 | 0.438 | -17.3 | -11.3 |
| D 1 | .051 | .178 | 55.75 | 0.688 | 0.438 | -18.2 | -12.6 |
| D♯1 | .048 | .169 | 54.875 | 0.625 | 0.625 | -18.4 | -13.8 |
| E 1 | .048 | .157 | 53.938 | 0.75 | 0.563 | -16.9 | -11.6 |
| F 1 | .042 | .144 | 52.938 | 0.688 | 0.563 | -12.6 | -9.0 |
| F♯1 | .042 | .134 | 51.875 | 0.75 | 0.5 | -17.5 | -12.0 |
| G 1 | .040 | .123 | 50.813 | 0.688 | 0.688 | -10.6 | -6.5 |
| G♯1 | .040 | .119 | 49.75 | 0.688 | 0.688 | -10.1 | -5.8 |
| A 1 | .040 | .116 | 48.625 | 0.625 | 0.688 | -13.3 | -8.9 |
| A♯1 | .040 | .111 | 47.563 | 0.688 | 0.625 | -9.2 | -4.5 |
| B 1 | .040 | .106 | 46.375 | 0.688 | 0.5 | -9.5 | -5.0 |
| C 2 | .040 | .106 | 45.25 | 0.625 | 0.625 | -7.6 | -2.9 |
| C♯2 | .038 | .102 | 44.063 | 0.563 | 0.625 | -6.8 | -2.7 |
| D 2 | .038 | .098 | 42.875 | 0.688 | 0.5 | -9.9 | -5.4 |
| D♯2 | .037 | .094 | 41.75 | 0.563 | 0.563 | -7.6 | -3.3 |
| E 2 | .037 | .090 | 40.5 | 0.5 | 0.625 | -7.4 | -2.8 |

*Fig. 1 shows data from Steinway B: d = core diameter in inches, D = overall diameter in inches, Ls = speaking length in inches, L1a = unwrapped length at agraffe end in inches, L1b = unwrapped length at bridge end in inches, 4th Par = cent reading of 4th partial in cents, and 8th Par = cent reading of 8th partial in cents. For notes F2 through E2, the left string of the bichord was measured.*

Sanderson Formula for Inharmonicity Constant B Single wrapped string

$B = B\,core + B\,end\,a + B\,end\,b$

$B\,core = (330d)^4/TLs^2$

$B\,end = .287\,(D^2 - d^2/D^2 + .12d^2)$

$[4 \sin(4\pi L1/Ls) - \sin(16\pi L1/Ls)]$

$In = Bn^2$

$T = f^2Ls^2(.89D^2 + .11d^2)/434$

T = tension, lbs; f = freq, Hz; Ls = Speaking Length, in.; d = core dia, in.; D = overall dia, in.; n = partial number.

Roberts Formula for Inharmonicity

$In = 1731(n^2-1)(S(1+B/8)+(3B/1+B)[|(a/L)-\sqrt{S}|^3 + |(b/L) - \sqrt{S}|^3])$

$B = .89[(D^2/d^2)-1]$

$S = d^4/139430L^2T$

$T = 2(\frac{m}{6})(Ld/802.6)^2(1+B)$

T = tension, lbs; L = speaking length, in.; d = core dia., mils; D = overall dia., mils; B = wrap weighting factor; S = Steel wire stiffness factor; n = partial number; m = note number; a = unwound end at agraffe, in.; b = unwound end at bridge, in.

Note that the Sanderson formula designates "B" as the inharmonicity constant, where Roberts designates "B" as the wrap weighting factor. Also, "d" and "D" are in inches for Sanderson, and mils (inches/1000) for Roberts (i.e. .038 for Sanderson = 38 for Roberts). Sanderson's formula gives $In = Bn^2$, where Roberts' does not directly give the inharmonicity constant, but figures In directly, and uses the multiplier $(n^2-1)$ rather than $n^2$.

I tried to investigate the source or roots of these various formulas. In a conversation with Dr. Sanderson, he indicated that his formulas were based on a formula by Franklin Miller, presented in the *Journal of the Acoustical Society of America,* Vol. 21, No. 4, July 1949. The paper was entitled "A Proposed Loading of Piano Strings for Improved Tone." His idea was to add gold plating to the ends of the string which would cancel the inharmonicity.

That idea never flew, but his formula, which predicted the behavior of a stepped string was able to be adapted to predict the behavior of wound strings in the piano. Dr. Sanderson said he was amazed that the formula, which was designed to take into account the loading effect of small amounts of gold, was able to be adapted to take into account large amounts of copper loading.

The origin of the Roberts formula is somewhat less clear. Roberts states in his text, "This formula was based originally on the theoretical works of both Miller and (Harvey) Fletcher, but I have since modified the formula to agree more closely with a number of wound string experimental data..." (*Journal*, June 1980, p. 22).

Dr. Sanderson told me that before Roberts published his series, Roberts told him that Arthur Benade (who Roberts cites frequently in his series) had developed the formula for him. In looking back through my notes and class handouts, I found a list of formulas which Roberts published in July 1978. In this handout, the formulas for stiffness (S), and Inharmonicity (I) for wrapped strings were different. Below are the formulas listed in the July 1978 Roberts handout:

Original Roberts Formulas for Inharmonicity of Wound Strings

$$In = 1731(n^2-1)\left\{S + \left(\frac{\pi^2}{3}\right)\frac{2A[(D/d)^2-1]}{1+A[(D/d)^2-1]}\left(\frac{a+b}{L} - \sqrt{\frac{S}{2}}\right)^3\right\}$$

$$S = \frac{4.62(d^2/L^4)}{2^{(\frac{m}{6})}\{1+(A/1.07)[(D^2/d^2)-1]\}}$$

A = .89 for copper; a = unwrapped end at agraffe, b = unwrapped end at bridge; S = Steel Stiffness factor; n = partial.

Using this formula, and entering the data for note C1 gives I(4) = 2.6 cents. This is much closer to the measured value (2.4 cents). From this, I can only assume that in his attempt to customize the formula, Roberts took a wrong turn along the way.

For those of you who wish to continue using the Roberts formulas, I would suggest you use the formula given in this article, as it gives more accurate results than the formula printed in "The Calculating Technician" series.

While searching through my files, I also found another formula for inharmonicity in wound strings. This formula appears to be taken from the *Journal of the Acoustical Society of America*.Though it does not take into account the inharmonicity added by the unwrapped ends of the string, the result it gave for I(4) of note C1 from the above Steinway data was surprising. The formula is as follows:

$B = 6.17 \times 10^{12}\ d^4/D^2F^2L^4$

$In = Bn^2$

B = inharmonicity constant, cents; d = core diameter, inches; D = overall diameter, inches; F = frequency, Hz; L = Speaking length, inches; n = partial.

From the example for note C1 above, where d = 0.058, D = 0.201, F = 32.703, L = 57.5, and n = 4, the result is I(4) = 2.4. This compares exactly with the measured calculation and with the Sanderson formula. When using the same formula for note E2 above, where d = 0.037, D = 0.090, F = 82.407, L = 40.5, and n = 4, the result is I(4) = 1.3.

This compares to our measured value of 1.5, and the Sanderson value of 1.6. From this we see that while this formula will get us close, it is not entirely accurate because it does not account for the additional inharmonicity added by the unwrapped ends or step in double wound strings. This formula would probably serve to get you close, as long as the unwrapped ends were 0.5 to 0.75 inches in length. For that matter, if you take the "B core" of Sanderson's formula alone, it will get you very close, as it accounts for the bulk of inharmonicity, providing the unwrapped ends are 0.5 to 0.75 in length. If these lengths are longer than this, their contribution is significant to the total value for "B."

Dr. Sanderson said that it was Jim Hayes of the Western Massachusetts Chapter who brought to light the concept that the copper wrap did not serve to add inharmonicity to the bass string, only to lower the frequency. If we were to remove all of the copper wrap from note C1, the inharmonicity for that string would remain the same as it was when it was the core wire with the copper wrap in place, as long as the tension remained the same.

The difference would be that the string would sound at a much higher pitch. Note C1 had d = .058, L = 57.5, and T = 296. With the copper wrap, its frequency was 32.703, but without the wrap, its frequency would become 107.472. In both cases, B (or B core for the string with wrap) is 0.137.

I have mentioned in this article that Dr, Sanderson has a formula for inharmonicty of double wrapped bass strings. Actually, the formula is the same as above for B core, B end a, and B end b, but add an additional equation to calculate the inharmonicity contributed by the "step" where the outer wrap ceases to be wound over the inner wrap and is wound on the core wire for a short distance. The formula is as follows:

Sanderson Formula for "B step" in double wound bass strings

B = B core + B end a + B end b + B step a + B step b

B core = same as above

B end = same as above

$$\text{B step} = .287\left(\frac{D_2^2-D_1^2}{D_2^2+.12d^2}\right)\left(4\sin\frac{4\pi(L1+L2)}{Ls} - \sin\frac{16\pi(L1+L2)}{Ls} - 4\sin\frac{4\pi L1}{Ls} + \sin\frac{16\pi L1}{Ls}\right)$$

d = core dia, in,; D = overall dia, in.; D = step dia, in.; L1a = unwrapped end at agraffe, in.; L1b = unwrapped end at bridge, in.; L2a = length of step at agraffe, in.; L2b = length of step at bridge, in.; Ls = speaking length, in.

This formula must be worked through twice, so that the effects of the steps at each end are accounted for. Remember to work through the equation for B core above, and through the B end equation twice to account for the unwrapped length at each end. These formulas are highly accurate and will work regardless of whether the unwrapped ends are .5 inches long, or 12 inches long. If you are calculating for unwrapped ends or steps longer than about 1.0 to 1.25 inches, then the above formula should be used.

If you are working with unwrapped ends and steps which are about .5 to 1.0 inches long, Dr. Sanderson has simpler formulas to calculate B end and B step. They are as follows:

Measured data showed that the Sanderson formulas were highly accurate in predicting inharmonicity in wound strings, while the values from the Roberts formulas grew farther from the measured values the more heavily the string was wrapped. In "The Calculating Technician" series, Roberts stated that he had modified his formula to more closely match measured data.

Examination of my files produced a Roberts handout dated July 1978 (two years prior to "The Calculating Technician" series) which contained different formulas for the Steel stiffness factor (S), and Inharmonicity (I). Calculations with the original Roberts formulas produced results much closer to the measured data.

Sanderson Simplified Formula for B end

$$\text{B end} = 5695(D_2^2-d^2/D_2^2+.12d^2)(L1/Ls)^3$$

d = core diameter, in.; $D_2$ = overall diameter, in.; L1a = length of unwrapped end at agraffe, in.; L1b = length of unwrapped end at bridge, in.; Ls = speaking length.

Sanderson Simplified Formula for B step

$$\text{B step} = 5695(D_2^2-D_1^2/D_2^2+.12d^2)([(L1+L2)^3-L1^3]/Ls^3)$$

d, D , L1a, L1b, and Ls are as above, and D = diameter of step, in.; L2a = length of step at agraffe, in.; L2b = length of step at bridge, in.

The above formulas can be substituted for the more complicated formulas when the unwrapped ends and steps are about one inch or less. When the lengths are longer than one inch, the more complicated versions should be used if the highest accuracy is desired. Just for fun, I entered the data for note C1 using the simplified B end formula and the results were identical to those of the more complicated formula.

Since the Steinway B has no double-wrapped bass strings, no data was available to compare the Sanderson and Roberts formulas.

In conclusion, there is a discrepancy between the Sanderson and Roberts formulas for inharmonicity in the wound strings.

For this reason, those wishing to continue using the Roberts formulas were advised to use the original Roberts formula. Another formula was presented which took no account of the unwrapped ends, yet gave fairly accurate results, because the unwrapped ends were .5 to .75 of an inch long. It was stated that the Sanderson formula would give accurate results no matter how long the unwrapped ends were. The additional formula for calculating double-wrapped strings was presented, along with simplified versions which are very accurate with reasonably short lengths for the unwrapped ends and steps of double-wrapped strings.

Finding the answer to Dennis' question took a lot of time and research. There were some side benefits, however. While I was looking through back issues of the *Journal* and through my files, I found three additional items of interest. The first was an article by Ron Berry entitled "Beats: What they are and where they come from." (March 1980). It is as relevant today as it was eight years ago, so it will be featured in an upcoming issue for the benefit of our newer members.

The second was a class handout presented at the 1987 California State Convention by Jim Coleman entitled "Passing the Tuning Test." That information also might be useful to our Associate Members preparing to take the Tuning Test and also will be featured later in the *Journal*.

Finally, I came accross a quote by Jack Caskey, quoted in a handout by Bob Burton and Sheldon Smith (I believe from the 1981 San Francisco Convention). I will share it in closing:

"Only experience can determine for you the time and cost required to accomplish the basic job or any combination of replacements along with it. Part of one's education is getting his feet wet, and even though a technician feels he may have lost money on certain jobs, he should still complete the job, even though it is necessary to take a loss. Charge the loss to education; mark, learn, and remember so that when the next similar job comes along, you can apply your new professional information and benefit from the past experience. But don't short change the customer. This is short-sighted and it will usually backfire in one form or another.

"There is no such thing as 'free education.' There is cheap education, but of course it is worthless. Anyone who sours on the pangs of certain bitter educational experiences is usually an unhappy person. He has not yet learned that education stops only when the old man dies."

This is most certainly sound advice. I hope that many of you will take advantage of the rich educational experience available in St. Louis. Hope to see you there. If you have a question or comment, please send it to:

**Rick Baldassin**
**2684 W. 220 North**
**Provo, UT 84601**

# *Early Production of Upright Pianos in England*

**Jack Greenfield**
**Chicago Chapter**

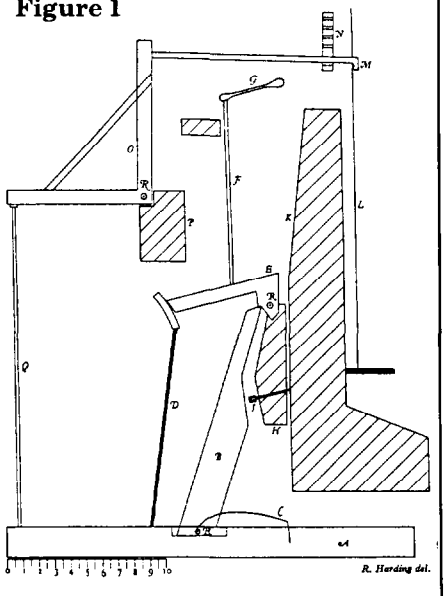
Except for a few experimental instruments built since their first introduction in Italy and Germany about fifty or sixty years earlier, the manufacture of upright pianos did not begin until the final years of the Eighteenth Century. In Austria and Germany, the Giraffenflugel, or giraffe piano, was in use while in Great Britain, the "upright grand" became popular. These pianos were primarily vertically placed grand pianos with actions altered to strike the vertical strings. The modified Viennese actions in giraffe pianos were rearranged into a preferable "downstriking" design with the hammers directed toward the soundboard.

However, it was not practical to change the direction of the hammers of the English grand action for English vertical pianos. The first English upright pianos were true "vertical grands" containing upstriking actions with hammers facing forward to strike the strings from the rear through the gap between the pinblock and the rail supporting the bottom edge of the soundboard. The pinblock and tuning pins were just above the keyboard.

The earliest record of work in England on an upright piano design is a 1787 patent assigned to John Landreth for an upright piano action. Except for the changes mentioned, Landreth's action closely resembles the Backers/Stodart action patented in 1777.

In Landreth's action, the hammer shank is mounted vertically on an intermediate lever known as the hammer tail. The intermediate lever serves as a wippen. A triangular butt projecting below the front end is hinged to the hammer rail. The back end rests on a back check block or pad mounted on a stiff wire set in the key lever behind the jack. The spring-loaded jack pinned in a slot in the key lever presses up against the hammer tail butt when the key is depressed. The jack escapes when it is pushed back in moving against an adjustable regulating button mounted in the hammer rail just above mid-height of the jack. A long slender vertical damper rod resting on the back end of the key lever transmits motion through a cumbersome series of levers to raise the damper pads.

**Figure 1**



*Landreth's upright action, 1787.*

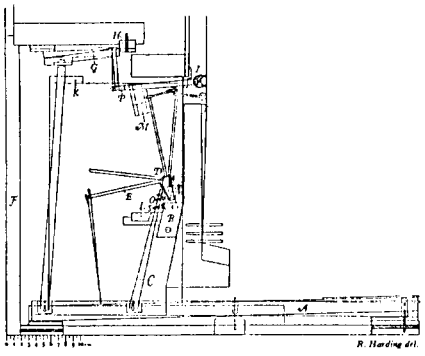
Landreth built an action model but appears to have completed few, if any, actual instruments. While his action design was not accepted, Landreth is given credit for introducing the use of felt bushings in action centers. His patent specifies "woolly substance manufactured after the manner of a hat" to be inserted into the jack, hammer and damper system action centers to prevent the parts from rattling.

**Acceptable Upright Grand Introduced:**

The next upright grand design that appeared was more successful. In 1795, 17 years after Robert Stodart's patent which showed the English grand action, his son William received a patent for "an upright piano in the form of a bookcase." This was a vertical grand piano in a tall rectangular case with doors, on four legs and with shelves on the right in the space between the bent side of the piano and the right case wall.

William Southwell's action was a more efficient modification of the English grand action than Landreth's action. By 1795, the English grand action had been refined and was more compact with fewer bulky parts. The use of pinned action centers was more

**Figure 2**



*Stodart's upright action, 1795.*

common, although leather-hinged hammer butts were still widely used.

Southwell's action employed the same principles of escapement, using a long thin jack pinned in a slot toward the rear of the key lever. Let-off was regulated by the position of a wood button on the head of a screw set in the hammer rail. When the key was depressed, the top of the jack pressed up against one of the lower sides of the triangular-shaped bottom of the hammer butt until forced away by the regulating button.

Southwell's action contained the same type of hammer butt as the grand action but had the hammers mounted slightly inclined from vertical and resting on a hammer rail as in modern uprights. In addition, long back check levers were added, extending from the rear of the hammer butts to the wire-mounted back check blocks behind the jacks. The back check levers were weighted to assist in return of the hammers after the blow; hammer springs were not used. The hammer pads pressing the strings above the hammers could be lifted and dropped by a system of levers starting from a long vertical damper rod attached by pinning at the rear end of the key lever. The instrument had two pedals—sustaining and *una corda*.

Stodart's upright grand was copied by other manufacturers soon after introduction. Broadwood did not begin to build such instruments until five or six years later when he began to make them to order. Broadwood Company records (Wainright's *Broadwood By Appointment*) show that not all of them were made in the Broadwood factory. In 1805 Broadwood contracted to have such instruments, with the Broadwood label, built in the factory of James Black, a former employee.

Although sold at prices about 15 percent higher, upright grands were inferior to horizontal grands as musical instruments. Haydn was probably being courteous in his favorable comments for the upright grand he saw on a visit to Stodart's shop in London in 1795. It is evident that the long levers and weighted principle for hammer return made the action slow in response. The physical construction of the piano made it necessary to remove the action from the back for inspection and repair.

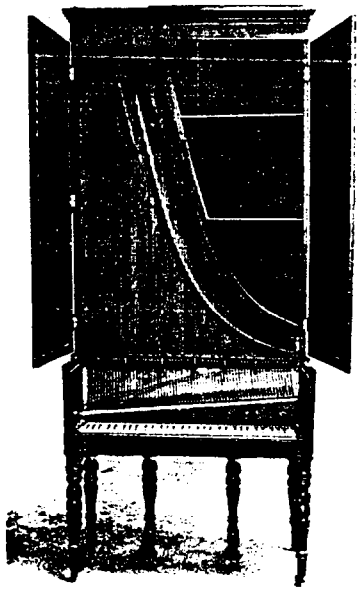
The height of eight feet or more and top-heavy construction were other serious objections. After introduction of improved upright

pianos that were lower in height early in the Nineteenth Century, production of the upright grands began to diminish, ending after 1830.

**The "Upright Square":**

The upright square piano was a transitional form that appeared in the development steps moving toward better upright piano designs. The inventor of this piano was William Southwell, an instrument maker from Dublin who settled in London in 1794. In 1798 Southwell received a patent for "certain new improvements in the action and construction of pianofortes." His patent drawing shows two identical instruments except the front panel is removed from one.

**Figure 3**



*Stodart's "Upright Grand".*

They were constructed by placing square pianos upright with the keyboard side on the bottom on four legs. The pianos have the original square piano scaling with strings running from tuning pins on the right across the front, inclined slightly upward to hitch pins just below the top extending from the left two-thirds across the piano. This requires the hammer line to be inclined downward to the left in order for the hammers to strike the strings. The hammers strike near the top string terminations when lifted by long thin connecting rods or stickers which rest on capstans on the back part of the key levers.

Harding shows some details of a Southwell "sticker" action she observed in a Paris museum in a piano built by Southwell or copied by another builder. No details of the let-off arrangement are shown.

Even though Southwell's 1798 piano design was a failure, his ideas for the use of stickers to transmit motion and for down-striking action were more successful in the more satisfactory upright designs which he and others built later.

**The Invention of the Modern Upright Piano:**

The next step in the history of the upright piano was the invention of a radically different instrument patented in 1800 both in the United States and in England. The inventor, John Isaac Hawkins, was a young English engineer with a variety of other interests as well as keyboard instruments. His father, Isaac Hawkins, was an instrument maker who worked in London. John Isaac arrived in the United States a few years before 1800. Harding shows that beginning in 1800 he lived in Philadelphia and then in nearby Bordentown, NJ, where he sold pianos.

In 1803 he returned to London where he remained until 1827. He then moved again, possibly to the United States, and finally, in 1845, went to London to his last known address. He had acquired several piano design patents while in Philadelphia but none later. His primary interests later were in engineering fields in which he received a variety of non-musical patents.

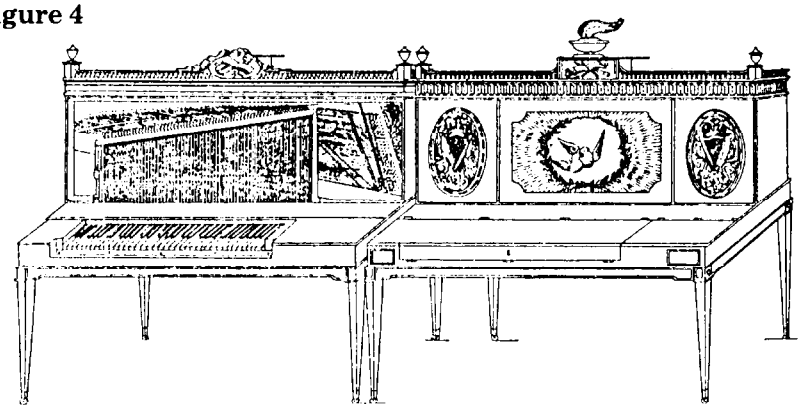
There are two Hawkins upright pianos still in existence—one at the Smithsonian Institution in Washington, D.C., and another in the instrument collection of the Broadwood Company in London. The original patent issued in the United States has been lost, but the English patent which was issued to John Isaac's father begins:

"Now know ye that the said Isaac Hawkins do hereby declare that the said invention of improvements was communicated to me in confidence by my son, John Isaac Hawkins residing in Philadelphia, North America and is described as follows."

Following this opening statement the patent gives details of the design. It is possible that a piano built in the United States was sent back to England for patent purposes. Hawkins probably had a local instrument maker's assistance for piano construction.

While Stodart's 1795 upright piano can be considered a true "upright grand," Hawkins' instrument was a prototype of the modern upright in many details. Hawkins and a Viennese builder, Mathias Muller, working independently, share credit for invention of upright pianos with tuning pins near the top and with the bottom extending below the keyboard to the ground. Muller originated the principle of the tape check action in his modification of the now obsolete Viennese action. Hawkins' compact design was more in line with the modern upright action in other details.

**Figure 4**



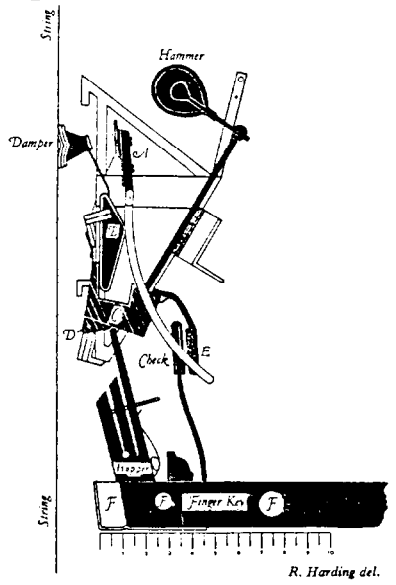
*Southwell's "Upright Square," 1798.*

**Details of the Hawkins Piano:**

Action. A down striking conversion of the English grand action in which the jacks, placed in slots

in the back ends of the keys, press up against the hammer butt lower surfaces which are shaped to allow escape just before the hammers hit the strings. As in modern

**Figure 5**




*Hawkins upright section, 1800.*

pianos, the hammers rest on hammer rails and pivot on pinned action centers.

The hammer heads are composed of several layers of leather and cloth. The damper pads, blocks and compact mounting below the hammer heads resemble modern damper and lever assemblies except for the pinned damper levers. They are weighted instead of spring-loaded for return after lifting by projections on the front of the butts. Butt check pads held on curved wires from the back of the butts make contact with back check pads on wires set directly on the key levers in front of the jacks.

Stringing. Strings spanning a range of five octaves, F1-F6, are aligned vertically with a slight incline to the top left. The upper bridge and pinblock are metal with the threaded tuning pins in threaded sockets. The lower bridge is wooden in a typical curve, but the lower hitch strings are in a straight line along the bottom, making all strings equal in overall length.

Case. The structure is reinforced by an iron frame and bracing that holds the soundboard. Called a "Portable Grand Piano," the instrument, with a height of 54 inches, has carrying handles on the sides and a keyboard that folds up. The case of the Smithsonian piano is unornamented and the lower front below the keyboard is covered with long narrow pedal-operated "Venetian Swell" panels opened and closed like a venetian blind.

The instrument case in the Broadwood collection is different. It is ornamented with fine wood carvings. The lower front is closed off with a pair of doors on side hinges. A pedal-operated damper rail lifts the dampers for sustaining. In addition to the preceding operated by the right pedals for "forte," the left pedals in each lower a rail that interposes a strip of leather or felt between the hammers and strings to muffle the sound for "piano" as in many modern uprights.

**Influence of Hawkins' Upright Piano:**

The pianos Hawkins made were not good as musical instruments. The most famous among the few buyers in the United States, Thomas Jefferson, returned his piano at Monticello because it would not stay in tune. It is doubtful if any of the other piano builders, then scarce in the United States, had any interest in uprights. Hawkins' ideas had much greater influence in England where most of the progress on vertical piano design during the early decades of the Ninteenth Century took place.

Hawkins' basic plan of placing the tuning pins on top and dropping the bottom of the piano to the ground was followed by other English upright builders soon after Hawkins' patent appeared. While there were no direct copies of Hawkins' action, the trend in actions moved toward more compact designs to reduce height and bulk of the instrument.

Hawkins helped overcome the piano makers' aversion to inclusion of metal parts and in 1808 Broadwood began to experiment with metal bars for structural reinforcement. Hipkins gives Hawkins the distinction of being the inventor of the modern upright piano. Hipkins stated that in Hawkins' piano "So many new ideas were surely never grouped before in one musical instrument."■

# COMPUTERS

## AND PIANOS

# *Word Processor*

**Ron Berry**
**Vice President**
**Indianapolis Chapter**

Last month we talked about hardware. Now we will begin a series of articles about software. A commonly used type of software is the word processor.

Everyone has typed a letter. Word processors help accomplish typing letters but go way beyond just using a computer as a typewriter. The first big difference between a typewriter and a word processor is that as you type, letters appear on a screen making it possible to go back and correct or edit before you print. Those who have ever typed a mimeo stencil know how hard it is to correct one—this ease of correcting alone makes the computer worthwhile.

Also, as you type you don't worry about carriage returns because the computer automatically goes to the next line when it reaches the edge of the screen.

Want to change margins? Just say so and the word processor instantly readjusts the text. You could readjust a letter you wrote to a narrow column format and run it in your chapter's newsletter. Your newsletter editor would love that! If you want the right-hand margin justified just say so and the program will add spaces to the line to evenly align the lines of type. Some programs will vary the size of the space between words to justify lines of type. You can even have the computer stop and ask you how to hyphenate words to avoid putting too many extra spaces in a line.

Do you get tired of typing out often-used phrases time after time? You can create a "macro" which allows you to redefine any one key to type out the entire phrase at the touch of a single key. You could even redefine the whole keyboard for the new Dvorak key arrangement if you wanted. The Dvorak keyboard is interesting. The common arrangement of keys (called the Qwerty keyboard because the first row of letters is QWERTY) was designed to slow down fast tpyists so they wouldn't jam the mechanical levers on typewriters. The Dvorak keyboard has put the vowels, which are used in every word, under the stronger fingers rather than the weak ones. People who have learned this setup report a 20 to 30 percent increase in typing speed.

Do you have certain paragraphs that you find yourself using over and over in your writing? These can be typed in once, saved and then merged into other documents as needed. Do you have a standard rebuilding contract? You can save it and then just fill in the details for a particular job instead of retyping the whole thing every time. You can have a standard estimate form and then just fill in the details. We are often asked for appraisal letters for insurance purposes. Save your letter and you

need only change the details the next time you write one. Reminders for overdue accounts can be saved and you only need to put in the name to send them.

Another handy capability is a mail merge. You merge a form letter with an address file to produce a number of individually typed letters with personal information in each. Many word processors allow you to check certain data and print messages accordingly. For example, you could have an address file include the last time the piano was tuned and use that information to print a different line for those who had their piano tuned six months ago than the line used for those who had it tuned a year ago.

People who do a lot of writing can mark words in their text as they write so the computer program will remember those key words and later alphabetize them for an index with page numbers. Even if a page is later added in the middle of the text, it will still keep the index straight. By the way, inserting or rearranging text is another easy task with a word processor but very difficult to do with a typewriter. Footnotes also are easily handled simply by telling the word processor that you want one; it then saves space at the bottom of the page automatically.

Spell checkers are available as separate programs or sometimes as part of the word processor program. These programs go through a document and mark any words which are not in the program's dictionary. You then go through the document and the program shows you the word in question and several lines around it for context. You have the option of leaving the word as it is, replacing it with one of the words the program thinks you might have meant, replacing it with a word you type in, or leaving it alone but adding it to the dictionary so it won't ask you about it the next time. (Most spell checkers don't know the word "wippen.")

Some spell checkers are extremely sophisticated in their selection of words and have phonics rules built in. For example, if you type "zilofone," the program will suggest "xylophone," even though this spelling is far different from what was typed. Grammar checkers and thesauruses are now available to check word usage. If you have used the same word 42 times in a two-page document the thesaurus will suggest other words of similar meaning that could be considered.

Word processors are very useful programs. Whether you do a lot or a little typing you will find them great time savers. If all you ever type is one envelope at a time, you will find the word processor takes longer to set up than to simply type the envelope. But, if you send letters to the same people over and over you can type the addresses once and run out envelopes or labels whenever needed after that.

If you have a data base for your customer records which is compatible with the word processor you can use the data base to generate the list of addresses for the word processor to use.

Some of the newer electronic typewriters have some of the features described here but they are limited to word processing only. If you have a computer system you can word process and do the other things I will describe in the following articles. ■

# *Front and Rear Bearings*

**Nick Gravagne**
**New Mexico Chapter**

As a prelude to this month's discussion on component bearings we must first answer a couple of typical questions. The first: How can there be only one angle of deflection when, under the proper conditions, there obviously exists a front string angle and a rear string angle at the bridge? This question assumes that the existence of front bearing and rear bearing would indicate *two* string angles at the bridge—not one angle of deflection as has been shown in this series.

Actually, there is no contradiction. The single angle of deflection, or downbearing, is really the sum of the front and rear angles. These concepts are just two sides of the same coin. It all depends on your point of view; your plane of reference. If one angle of downbearing is being considered, the necessary reference plane is the *string* itself—the front or rear segment, it makes no difference. But when the component bearings are being checked, the *bridge top* is the correct (or at least most convenient) reference plane.

In Figure 1 a cross section of a bridge is shown, the top of which lies in a horizontal plane represented by the extended line. There is a front string segment and a rear string segment both of which approach the bridge at radical 45 degree angles making the following point clear. Look at the front string and rear string angles of deflection independently of each other by using the horizontal bridge top plane as a reference plane.

First, notice the front string segment. It approaches the bridge and then deflects downward to the level of the bridge top. Angle F, which exists between the dashed line and the horizontal bridge line, is obviously 45 degrees.

Next, follow the rear string segment as it approaches the bridge and also deflects downward to the level bridge top making a 45 degree angle of deflection. So, taken independently, and with the bridge top as a reference plane, the front segment and rear segment have 45 degree angles of deflection.

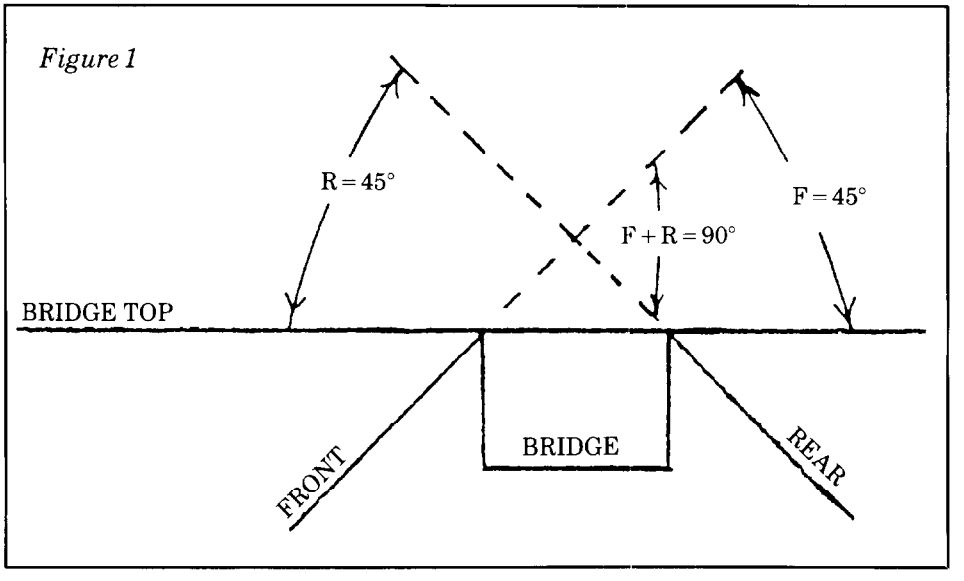
On the other hand, if the front (or rear) string is the reference plane, (ignoring altogether the level bridge top plane) it is clear that the rear string deflects down and away from the front string at 90 degrees, which is the sum of the independent front and rear deflections. The 90 degree angle is shown in the drawing as F and R.

Obviously, then, any talk of a front and rear angle, or front and rear bearings, assumes the bridge top itself as the reference plane—an acceptable assumption depending on what we're looking for, and in light of other modifying factors such as the cant or planed slope of the bridge, should one or both exist.

The bridge top, however, is not an absolute or primary reference plane. By definition, a reference plane is a starting place, a datum; something or somewhere to refer to when building anything—be it argument or piano. The bridge top cannot be such a place since its very position as to its height, both front and rear of the bridge, must be dictated by the string—our primary reference plane for downbearing.

Still, the bridge top is a very use-

*Figure 1*



ful secondary reference when it comes to investigating the component bearings. (More on this momentarily.)

Let me respond to another typical question: What is the correct front angle (angle F in the exaggerated drawing Figure 1) for any given downbearing angle, say 1.5 degrees? In other words, if the bridge top is the reference plane, the front string should be running downhill toward the agraffe. But how steeply? Can it be measured in thousandths of an inch with either feeler gauges and a rocker gauge or a machinist's dial gauge? What are the correct numbers? The answer to all these questions is that there is no correct answer.

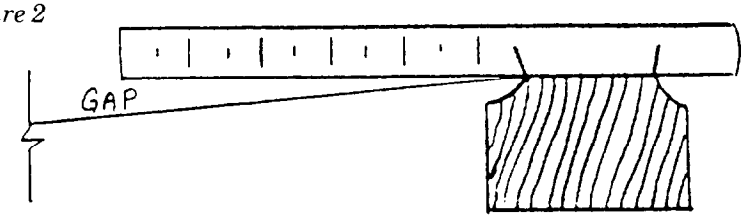
Oh yes, a nice neat drawing of strings and bridge can be made. The whole of it would incorporate a 1.5 degree downbearing angle in the unstrung piano, a shallow triangle made up of agraffe to bridge to aliquot and back to agraffe—all the necessary trigonometry; and in a matter of minutes the front angle can be computed to the nearest second.

But the answer would be arbitrary, theoretical and essentially useless since, as has been pointed out repeatedly in these articles, the computed angle would diminish as the soundboard compressed under the downbearing pressure. And even if we took the angle of downbearing as measured in the strung piano (for example it might read 0.75 degrees), working out the theoretical front angle would still be academic and very much subject to whether the bridge top was planed slanting toward the rear.

There are many more encumbrances here, so let's stop and talk about the single thing that matters most about component bearings: is the front string bearing down, pushing on the bridge at the front notch? It cannot be if there is negative downbearing (see last month's *Journal* article). Negative downbearing means the string is pulling the bridge up instead of pushing it down. If the bridge pins were removed, the string would be completely free of the bridge, or nearly so. True, sometimes there *appears* to be positive front bearing when in fact there is actually negative downbearing.

Confusing? It certainly can be, which is why I believe that downbearing, distinct from component bearings, should be checked first. After the existence, or absence, of downbearing has been ascertained, check the *nature* of downbearing as it is applied to the front and rear of the bridge. Remember, downbearing exists if the bridge, or any part of it, blocks a straight path

*Figure 2*



from agraffe hole to the top of the rear string rest. A couple of ideas were presented last month on checking for downbearing. But however you determine this condition, take care not to confuse it with component bearing readings.

When cornered on the subject, most tuners will say that a clean unison is the most important "interval" in piano tuning. In light of this very pragmatic thinking (which speaks volumes), the same could be said about positive bearing at the front of the bridge. Other conditions may not be quite right, or ideal, but positive front bearing, like solid unisons, can cover a multitude of sins (venial sins, anyway).

*Figure 3*

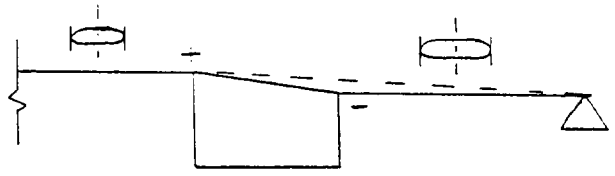
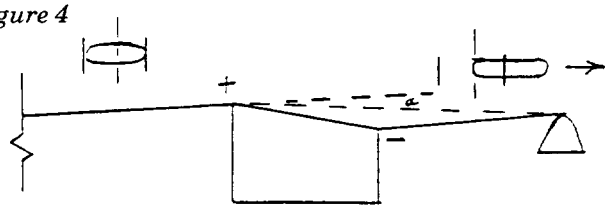


*Figure 4*



Bubble moves away from bridge but positive downbearing exists.

In contrast, the absence of front bearing can be the root of all sorts of evils: false beats, the tuner's nemesis; sizzling and jingling noises; a thin, inarticulate tone; unstable tunings, to name a few. These problems are primarily due to the strings riding up on the bridge pins instead of staying solidly anchored at the point where bridge pin and hard wood come together. Tapping the strings down to the bridge with a wooden or brass rod is the usual temporary, if incomplete, solution.

As long as we're on the subject of string angles, it seems logical to touch upon the practice of checking these angles in the strung piano. Checking front bearing is simple. Since it is a component bearing, the bridge top itself should be the reference plane. We are looking for a front string segment running downhill from the bridge top plateau.

If you have one of those thin steel, flexible six-inch pocket rules, you have a very handy and convenient tool for this purpose. This rule can be placed edgewise on the bridge and flexed a bit to clear strings and bridge pin obstructions (see Figure 2). The bottom of the ruler edge represents the extended plane of the bridge top. If there is positive front bearing, a gap can be found between the underside of the rule and the string indicating that the bridge top and string do not lie in a common plane. No gap indicates zero (but not negative) front bearing as the bridge top and string are then coplaner. Negative front bearing exists when the rule dips below the string plane. Obviously, the same technique applies to checking rear bearing. In fact, the little rule is long enough to reach beyond the rear string rest in much of the upper scale.

One of my favorite tools for measuring both downbearing and component bearings is the bubble gauge. I have two—a homemade version and a commercially available Lowell type. These are very sensitive, easy to use, and easy to demonstrate to a piano owner if necessary. (Bubble gauges have been featured in past *Journal* articles, so I won't belabor the point. You may wish to refer to September 1983, Chris Robinson; and January 1986, Tom Lowell).

The complete downbearing condition includes checking for the existence of downbearing, as pressure, along with the distribution of that pressure at the front and rear notch. Using a bubble gauge the procedure is:

1) Check downbearing. Place the feet (or foot) of the gauge on the front speaking string and adjust the bubble vial so that the bubble is centered, level. Now move the gauge to the rear string segment without changing the front-to-back gauge orientation and note how the bubble moves. If toward the bridge, even a small amount, there is downbearing. If the bubble moves away from the bridge, there is negative bearing caused by the bridge being *below* the plane which exists between agraffe and rear string rest. As will be seen shortly, this is not foolproof.

2) Check for front and rear bearing. Level the gauge on the short piece of string which crosses the bridge between pins. Positive or negative component bearings can be found by moving the gauge to the appropriate string segment and watching the bubble. If it moves toward the bridge there is positive bearing; away from the bridge means negative bearing.

Without going into great detail, the existence of negative to zero downbearing, or negative to zero front bearing, usually means a partially sunken, completely collapsed, or distorted soundboard. I find this condition to be common in old pianos.

A moment's reflection on the downbearing and component bearing diagnostic procedures mentioned earlier makes it clear that the combinations of the whole downbearing puzzle are infinite. There is no realistic way to cover them all.

Still, there are a couple of common combinations which beg closer examination.

1) Downbearing is zero but positive front bearing exists. For example, if checked with a bubble gauge, the bubble is level on both front *and* rear strings, but front bearing reads positive and rear bearing reads negative or flat. This condition is most common in old pianos and rare in new.

How can this be? Figure 3 shows how. The rear bridge pins are holding the rear string to the bridge. Were they not doing so, a slight presence of downbearing

would be detected by the bubble gauge. The dashed line between front bridge to rear rest deflects downward from the front string. Such conditions point out why I never use one gauge or a single approach. Also, this combination of bearings, if found in a piano which shows signs of some existing crown in the soundboard (found from underneath in the strung piano or from the top after teardown), is probably indicative of a partially sunken soundboard, but not collapsed or distorted. Furthermore, the bridge is not rolled forward. Such a piano may be a good candidate for judicious plate lowering or bridge building if the crown is not too flat.

2) The bubble gauge seems to indicate negative or flat downbearing when actually positive downbearing is present.

This is sometimes found in the best new or rebuilt pianos. (See Figure 4). Again, there is positive front bearing and negative rear bearing caused by the gripping bridge pins. This condition appears most often when the soundboard has sunk more than anticipated after stringing *and* the bridge top has been planed to an appreciable rearward slope. The original angle of downbearing, as chosen, was perhaps a bit shallow or, if not, the bridge top may have been planed too much at the rear.

The condition is not serious. Notice that downbearing as pressure exists (the angle between the dashed lines) and that there is positive front bearing. The bubble representations show, however, a negative downbearing. Improper diagnosis of this condition is the most common error I have seen. Also, please note that the arrangement is not conducive to causing the bridge to roll forward since the axis of rotation is at the bridge top and not below it.

I have heard that some pianos are designed with this downbearing condition in mind, or a variation of it where there is effectively no pressure on the soundboard but plenty of front bearing. Unfortunately, I haven't heard anything specific, e.g., what manufacturer and exactly what the mechanics are.

One final comment on Figures 3 and 4. Notice that the bridge top is drawn as sloping to the rear. This is purposely done since many pianos, old and new, call for such a spec. Anyone who has had to take careful measurements for serious bridge reconstruction has encountered this slope firsthand and duplicated it. This existence of rearward slant is another variable factor in downbearing analysis which can cause confusion. It is also why the beginning of this article stated that the bridge top is not the primary reference plane—the string is. Any mental picture of a level or horizontal bridge top (in fact, level with respect to what?) might better be erased because it tends to focus downbearing at the bridge top in a neat, pat way which doesn't always exist, because of design, shifting conditions of age or uncontrollable forces. Incidentally, slanted bridges are usually planed 1/32-inch lower at the rear.

When stated as an angle it works out to about 1.5 degrees. Interesting.

When calculating the pressure on the soundboard in the strung piano, excercise common sense. If ten people are standing on a solid, level platform and another ten people of identical weight are standing on an adjacent large, flexible trampoline, are the trampoline people heavier because they have sunk below the level of the platform people? No—but they may be smiling more.

How much should the bubble move in checking downbearing? *Any* movement is significant, but somewhere between 0.25 degrees and 1 degree seems common. In lieu of a bubble gauge, the height of the front string plane over the rear string rest is about half of what it was in the unstrung piano. These are generalities, not to be seized upon with religious zeal.

In summary, downbearing exists when the plane of the front string, if extended beyond the bridge as a straight line, will pass over and clear the rear string rest. Checking for bearing at the front or rear notch is then necessary to determine how the string is pushing on the bridge. Slightly negative or flat front bearing, if accompanied by positive downbearing, may not be serious if the condition is found where the relative humidity is, say, 35 percent. If found in a wet season, however, the condition will worsen when the environment dries out. Negative front bearing found where downbearing is also negative almost surely indicates a rolled bridge with a distorted or collapsed soundboard. ■

# *Piano Technicians Guild Merchandise*

## *Business Aids*

| | Quantity | Total |
|---|---|---|
| Billing Pads* — 2-part with logo, 50 per pad: 1/$4.00, 3/$10.00 | _____ | $_____ |
| Piano Service Appointment forms* — green, 6 part: 100/$22.50 | _____ | _____ |
| Service Stickers* — red and blue with logo: 100/$6.00, 200/$9.00, 500/$20.00 | _____ | _____ |
| Personalized Service stickers* — with your name & address: 500/$50.00, 1,000/$90.00 | _____ | _____ |
| Pamphlets* — 100/$12.50, 500/$55.00 (must be ordered in lots of 100) | | |
| A-440 and Your Piano | _____ | _____ |
| Care of Your Piano | _____ | _____ |
| Piano Pointers | _____ | _____ |
| How Often Should My Piano Be Tuned? | _____ | _____ |
| The Tuner To Turn To | _____ | _____ |
| The Unseen Artist | _____ | _____ |
| Should I Have My Piano Tuned In Summer? | _____ | _____ |
| Reminder Cards | _____ | _____ |

## *Free Items*

| (Indicate quantity needed by each item) | Quantity |
|---|---|
| Lending Library List | _____ |
| List of Manufacturers and Suppliers | _____ |
| List of Piano Technology Schools | _____ |
| Magic Kingdom Club Application | _____ |
| Member Benefit List | _____ |
| Reader's Digest Reprint — "The Other Masters of the Keyboard" | _____ |
| "The Piano Tuner-Technician" brochure | _____ |
| "What Is The Piano Technicians Guild?" brochure | _____ |
| "The Registered Tuner Technician — Skill, Integrity, Service" brochure | _____ |

## *Publications*

| | | |
|---|---|---|
| "Piano Parts And Their Functions," by Merle Mason (revised edition) | | |
| Member price: $10.50 for hardcover, $8.00 for softcover | _____ | _____ |
| Non-member price: $15.50 for hardcover, $13.00 for softcover | _____ | _____ |
| "5-Year Supplement To Classified Index" compiled by Merle Mason (covers 1979-1983) | | |
| Member price: $12.50, Non-member price: $15.00 | _____ | _____ |
| Journal Binders — Brown, fits 9" x 12" 1/$6.50, 2/$12 | _____ | _____ |

## *Jewelry*

| | | |
|---|---|---|
| Membership Pins* — lapel-type, gold with blue and white RTT logo: 1/$5.00 | _____ | _____ |
| Tie Bar* — RTT logo, as above, with gold clip: 1/$5.50 | _____ | _____ |

## *Miscellaneous*

| | | |
|---|---|---|
| "Skill, Integrity, Service" Poster — 16" x 20" color: 1/$9.95 | _____ | _____ |
| Coffee mug — Blue on white ceramic 1/$4.00, 4/$12.00, 6/$16.50 | _____ | _____ |

| | | |
|---|---|---|
| **Subtotal** | _____ | _____ |
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| **Missouri residents only add 6.125% state sales tax** | _____ | _____ |
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Phone: _____ Member Number: _____

**Piano Technicians Guild**
**9140 Ward Parkway**
**Kansas City, MO 64114**

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# *Encouraging Associate Members to Upgrade*

**Ron Berry**
**Vice President**

A lot of discussion has taken place concerning Associate members taking tests to upgrade. There seems to be a hesitancy on the part of some Associate members who feel they already have most membership benefits without bothering with the tests.

I have addressed this issue in the *Journal* and believe the main difference between Associate and Registered Tuner-Technician memberships is in the members' heads. Associate members may feel that they have all the benefits of membership, but they know that they have not put their skills to the test. It is up to the chapter to give them a gentle nudge towards taking the tests.

This has been the responsibility of the chapter since long before the recent membership classification changes.

In fact, there used to be a requirement that an Apprentice member take the tests every six months, although this requirement was largely ignored. With the expense of the new tests, this requirement was omitted.

Many Associate members are just waiting to be encouraged to take tests. They assume someone will tell them when they seem ready to pass the tests. Chapter members are in the best position to help an Associate member assess readiness for the test. Don't just leave these people hanging; let them know they are expected to upgrade. Please help them know what they need to work on in order to pass the tests.

There has been a recurring request for printed material informing Associate members what to expect from the tests and what kinds of thing to study. This request is currently being addressed and material should be available in the future. Most of us had someone who encouraged us and pushed us on. Now it is our turn.

**Seminar Attendance**

At a recent seminar I had the opportunity to talk with several nonmembers who were attending. Their attitudes reminded me of my early days in the piano business. Until you have been part of the Guild for a while and have begun to see its real value, it is hard to understand the reasons to spend money on dues and attending seminars.

Often this attitude comes from an underestimation of piano technology in general. Once you have taken a correspondence course or have read a book you feel like you really know something. Probably the greatest benefit of attending your first seminar is getting "blown away" by all the information presented. People find how much there is to learn in this business and they find that the standards they were applying to themselves are not nearly stringent enough. It can be quite depressing to arrive at a seminar thinking you know something, and leave realizing how little you really do know. Some will get discouraged at that point and go away forever.

I was once talking to a nonmember who lived just a few blocks from a convention site. I was encouraging him to attend the convention. When I mentioned that there would be people who do rebuilding at a level far above what most even consider doing, his comment was, "I try to stay away from people like that." This comment told me much about his personality, his goals and his work.

On the other hand, there are those who, after being shot down, will pick themselves up and take advantage of the openness and willingness to share information that is so prevalent in PTG. These people will succeed. They will learn the craft, pass the knowledge on to others and continue the tradition that has guided the Guild over the last 30 years.■

# *New Members During May 1988*

**REGION 1**

*BOSTON, MA — 021*

William B. Boulton
21 Sanderson Road
Waltham, MA 02154

Thomas F. Byrne
6 Pearl Street
Stoneham, MA 02180

Jeffrey Stuart Gibson
47 Trevore Street
Squantum, MA 02171

K. Allen Larrabee
43 Lowell Street
Somerville, MA 02143

Paul M. Rattigan
151 Circuit Street
Norwell, MA 02061

*RHODE ISLAND, RI — 029*

Albert R. Aunchman
15 Orly Drive
Warwick, RI 02889

Arthur Tortolano
243 CrescenT View Ave.,
#D218
East Providence, RI 02915
401-433-5390

*MONTREAL, QC — 060*

4 Roger Lepage
891 Belmont
McMasterville, QC J3G 5M6
Canada

Istvan Nagy
110 Summerhill
Pointe-Claire, QC H9R 2L5
Canada

*TORONTO, ON — 062*

David R. Anderson
16 Page Street
Toronto, ON M6G lJ2
Canada

*NEW YORK CITY, NY — 101*

John A. Hartman
2 Railroad Avenue
Cold Spring, NY 10516

*LONG ISLAND-NASSAU, NY — 111*

Morty Dinerstein
29-09 137th Street, #3-L
Flushing, NY 11354

Allan N. Schumacker
40 Maple Avenue
Westbury, NY 11590

*PHILADELPHIA, PA — 191*

Carol O'Toole
908 Woodland Drive
Southampton, PA 18966-4

**REGION 2**

*BALTIMORE, MD — 212*

Pam C. Lance
800 Chesapeake Ave., #1B
Annapolis, MD 21403

*RESEARCH TRIANGLE, NC — 275*

Zachary C. Drill
2840 N. Roxboro Road
Durham, NC 27704

*PAMLICO, NC — 278*

Lewis Spivey
720 Dana Lane
Rocky Mount, NC 27803

*CHARLOTTE, NC — 282*

Roger D. Manus
7316 Twillingate Drive
Charlotte, NC 28215

*ATLANTA, GA — 301*

Bradley P. Phillips
3357 Montheath Pass
Duluth, GA 30136

**REGION 3**

*NEW ORLEANS, LA — 701*

John H. Guthans
P. 0. Box 248
Lacombe, LA 70445

*OKLAHOMA, OK — 731*

Nathan L. Sobel
1514 Morland Avenue
Norman, OK 73071

*DALLAS, TX — 752*

Kenneth L. Ridout
521 Bardfield
Garland, TX 75041

John E. Woods
114 Royal Lane
Waxahachie, TX 75165

*NORTHWEST TEXAS, TX — 791*

Roy E. Howard
5705 16TH Street
Lubbock, TX 79416

*EL PASO, TX*

John B. Promen
10116 Luella
El Paso, TX 79925

**REGION 4**

*LOUISVILLE, KY — 401*

Ronald E. Lawson
7906 Woodfern Way
Louisville, KY 40291

*CLEVELAND, OH — 441*

Shue Ho
340 Miller Avenue
Kent, OH 44240

*INDIANA, IN — 467*

Donald N. Sprague
307 N. Washington Street
Lafayette, OH 45854

*SPRINGS VALLEY, IN*

Jon W. Light
Rt. 2, Box 748
Huntingburg, IN 47542

**REGION 5**

*HUTCHINSON, KS — 675*

Susan D. Zwickle
Box 126
Grainfield, KS 67737

**REGION 6**

*VANCOUVER, BC — 011*

Peter C. Goertzen
3654 Hurst Crescent
Abbotsford, BC V2S 6G7
Canada

Trevor T. Nelson
19749 Connecting Road
Pitt Meadows, BC V3Y 1Z1
Canada

*LAS VEGAS, NV*

Thomas A. Cavanaugh
3600 Swenson, #313
Las Vegas, NV 89109

*LOS ANGELES, CA — 901*

Lisa Roselinsky
218 Loma Avenue, #5
Long Beach, CA 90803
Santa Barbara, CA — 931

C. John Overboe
83 South Palm Street
Ventura, CA 93001

*SAN FRANCISCO, CA — 941*

Ira J. De Long
P.O. Box 585
Pacifica, CA 94044

**AFFILIATES**

Vendel E. Cox
P. 0. Box GT2422
Nassau, Bahamas

Edward A. Cox
P. 0. Box N8969
Nassau, Bahamas

## *Membership Summary*

| | |
|---|---|
| Northeast Region | 808 |
| Southeast Region | 567 |
| South Central Region | 310 |
| Central East Region | 606 |
| Central West Region | 401 |
| Western Region | 849 |
| Not in Regions | 48 |
| Total RTT Members (1988) | 2,473 |
| Total RTT Members (1987) | 2,542 |
| Total Members (1988) | 3,589 |
| Total Members (1987) | 3,482 |

## *Reclassifications*

**REGION 2**

*ROANOKE, VA — 240*

Larry W. Baliles
Rt 2 Box 220
Stuart, VA 24171

*PAMLICO, NC — 278*

Lewis Spivey
720 Dana Lane
Rocky Mount, NC 27803

**REGION 4**

*CLEVELAND, OH — 441*

Alan J. Nemeth
1290 Hird Avenue
Lakewood, OH 44107

Kenneth C. Slater
2795 Coleridge
Cleveland, OH 44118

## *Reinstatements*

**REGION 1**

*PHILADELPHIA, PA — 191*

Curt Lockman
652 Ridge Rd.
Telford, PA 18969

**REGION 2**

*ATLANTA, GA — 301*

Larry R. Miller
395 Sunset Drive
Norcross, GA 30071

**REGION 3**

*BATON ROUGE — 708*

George Jackson
Route 1, Box 261G
Zachary, LA 70791

Ricky Jackson
Route 1, Box 261G
Zachary, LA 70791

*NORTH CENTRAL LOUISIANA — 713*

Robert Smith
303 Hermitage Road
Pineville, LA 71360

**REGION 6**

*TUCSON, AZ — 857*

Arnold Evans
3750 W. Goret Road
Tucson, AZ 85745

*LAS VEGAS, NV — 891*

Gerald Orrico
2929 Mojave Road
Las Vegas, NV 89121

**AFFILIATES**

Chang Ming Hui
Sichuan Conservatory
Chengdu, Sichuan
China

# Calendar Of Coming Events

| Date | Event |
|---|---|
| July 18-22, 1988 | **31st Annual Piano Technician Guild Convention & Institute**<br>Adams Mark Hotel, St. Louis, MO<br>Home Office: 9140 Ward Parkway, Kansas City, MO 64114, (316) 444-3500. |
| September 10, 1988 | **2nd Annual Maine Chapter Lobster Bake**<br>Pernaquid Point Lighthouse<br>Paul Rice; H.C. 31, Box 84; Bath, ME 04530; (207) 443-3372 |
| Sept. 30-Oct. 2, 1988 | **Florida State Seminar**<br>The Jacksonville Hotel, Jacksonville, FL<br>John Pelick Jr.; 1567 Townsend Blvd; Jacksonville, FL 32211-4944; (904) 724-4795 |
| October 7-9, 1988 | **Ohio State Conference**<br>Rodeway Inn, Columbus<br>Kim Fippin; 37 University St.; Westerville, OH 43081; (614) 890-2197 |
| October 14-16, 1988 | **Texas State Seminar**<br>Tropicana, San Antonio<br>Leonard Childs; 7867 Lark Ridge; San Antonio, TX 78250; (512) 647-3648 |
| October 20-23, 1988 | **New York State Seminar**<br>Quality Inn North, Syracuse<br>Arthur Nick Smith; 730 Park Avenue; Syracuse, NY 13204; (315) 478-1669 |
| October 28-30, 1988 | **Central East Regional Conference**<br>Sheraton Inn, Normal, IL<br>Robert Morris; 1729 D Valley Road; Champaign, IL 61820; (217) 356-9781 |
| November 4-6, 1988 | **North Carolina State Seminar**<br>Comfort Inn<br>Sam Corbett; Rt. 3, Box 115; Grifton, NC 28530; (919) 254-5016 |

# The Piano Technicians Guild Foundation

***Your profession needs your help...***
Give something back to those who made a difference in your career — a teacher, friend or mentor. Your contribution to the Piano Technicians Guild Foundation ensures that their work will continue.

***What does the Foundation do?***
The Piano Technicians Guild Foundation is a separate, non-profit entity with its own board of directors. Contributions to the Foundation's Steve Jellen Memorial Fund for Research and Education are used to promote the piano and the professional technician.

*To contribute, complete this form and mail to:*

***Piano Technicians Guild, Inc.***
***9140 Ward Parkway,***
***Kansas City, MO 64114.***

## *Congratulations to Mary Alice Spencer, Brookings, SD*

***Winner of a $500 PTG Foundation Continuing Education Scholarship***

*Ms. Spencer, assistant professor of music at South Dakota State University and a Music Teachers National Association nationally certified teacher of piano since 1971, was awarded the continuing education grant during the Music Teachers National Association Annual Convention in Salt Lake City, UT, March 23, 1988.*

## *Thanks To These Recent Contributors**

*W. Dean Howell*
Wendell Eaton
Ernie Preuitt
Mr. & Mrs. Albert von den Driesch
Mr. & Mrs. Jeffrey Blonar

*Marge Evans*
Ernie Preuitt

*Robert J. Russell Sr.*
Ernie Preuitt
Jack Greenfield
Wendell Eaton

*Andrew DeLong*
Lehigh Valley, PA, Chapter

*Robert A. Burton*
Santa Clara Valley, CA, Chapter

**Note: Honorees' names are listed in italics*

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# The Auxiliary Exchange

## Presidents Message

Every person who accepts the office of President of an organization has goals and aspirations they hope to achieve during their tenure. These often cannot be accomplished.

You reach for the moon and, if you are lucky, catch a star for your effort!

My highest priority was to fulfill the "Purpose" outlined in our ByLaws. I believe the Scholarship Fund does this to perfection. This was not accomplished alone, but with the full cooperation of the Executive Board, the most generous contributions from our members, and full support of all. The guidance, expertise and cooperation of the Piano Technicians Guild Foundation was of great assistance and I shall be forever in their debt.

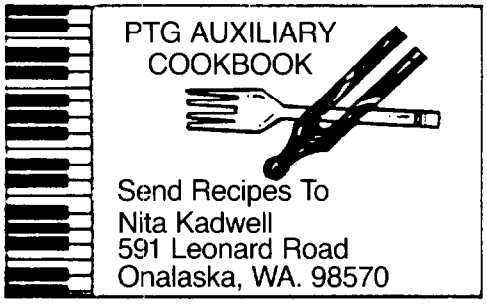
Another goal of high priority was to increase membership. While the development and circulation of the Auxiliary Brochure was a step in that direction and did result in slightly increased membership and seems to be pointing us in the right direction, we still have a long, long way to go!

Some may recall that I promised reduced emphasis on the "tea and cookies" type of activity by expanding convention programs to a wider range of interest. Those who attend this year's convention in St. Louis will find more classes available for anyone who desires to have more knowledge of their spouses' business. This would not have been possible without the cooperation of the Institute Directors, The PTG Executive Board and the unselfish contribution of instructors time—both PTG and PTGA members.

All of my goals were not attained but, then, I could fill the remainder of these pages with "wish I coulda's."

Now I have the honor of joining the elite group of Past Presidents. I have enjoyed serving as your President and I thank you for allowing me to do so.

**Ginger Bryant**




## *1988 Auxiliary Schedule — July 18-22 — Rose Garden Room*

**Sunday, July 17**

Auxiliary Room open.

**Monday, July 18**

9:00 a.m. Board Meeting

9:00 a.m. Walking Tour conducted by St. Louis Auxiliary of four-block radius of hotel. Meet in Auxiliary Room.

3:00 p.m. Class — Gary Green, Sohmer Piano Co. — "All You Should And Would Ever Want To Know About Ivories."

**Tuesday, July 19th**

8:30 a.m. Auxiliary Opening Assembly
Welcome to St. Louis
Memorial: Pauline Miller, Los Angeles, CA.

9:00 a.m. "History of St. Louis" — presentation by Dr. Raymond Breun of the Jefferson National Historical Association.

10:00 a.m. Get-acquainted coffee.

10:45 a.m. Council Meeting.
Member-At-Large Meeting

3:00 p.m. Tea — Program: Auxiliary Scholarship Recipients.

***Please see Auxiliary Membership Booth for child-care information***

**Wednesday, July 20**

9:00 a.m. Optional tour, including Lafayette Square, Missouri Botanical Gardens, Jefferson Memorial Museum, lunch on the Robert E. Lee Riverboat, and drive through Forest Park. There is a separate fee for this tour.

3:00 p.m. Return to hotel.
Auxiliary Suite open all day for those not going on tour ("Auxiliary Room In Use" sign posted outside indicating suite number).

**Thursday, July 21**

8:30 a.m. Master Graphoanalyst, Sue Mathias.

10:00 a.m. Class — Sharla Kistler, RTT, Lehigh Valley, PA, Chapter — "What It Is, Where It Goes, And How Not To Do It."

12:30 p.m. Installation Luncheon — Program: graduate student, the St. Louis Conservatory and Schools of the Arts. Installing officer: Christine Monroe, California, At-Large.

4:00 p.m. Post Board Meeting

**Friday, July 22**

8:30 a.m. Organizational Forum — Moderator: Julie Berry.

10:00 a.m. Business Class — Chris Monroe, Paul Monroe, RTT — "How To Build, Increase And Maintain Your Business."

## Grant Farm

The Grant Farm, outside St. Louis may be the only farm in the United States where you can milk a buffalo! The home of Augustus A. Busch, Jr., it got its name from the fact that on it stands the log cabin in which Ulysses S. Grant lived for a few years just prior to the outbreak of the Civil War. Grant Farm has on its 280 acres every animal indigenous to North America and a few from other parts of the world as well. Riding around on the little tram they have for tourists is like getting personally acquainted with a lot of beasts you've always wanted to know. It's a great get-together of people and animals complete with beer and pretzels for the adults, with pop and cookies for the kids.

**A. Huether**

## From Our Mail Bag....

With the arrival of July we start the second half of our year. I have received letters over the past six months which reveal a genuine interest, concern and appreciation of our Auxiliary. And in the doldrums of summer it seems to be a good time to share them with you.

**Margaret Moonan** of Rome, NY, wrote to convey her anticipation of a "get-together" with Auxiliary members at a luncheon in Altoona, Pennsylvania's Calvin House. This was part of the spouse program of the Pennsylvania State Conference. Marge has her youngest at home with her and Bill since the rest of the clan are married or employed out of state. The Moonans had a pleasant trip to Florida and visited with Marge's mother for a week.

In early January. **Doro Odenheimer** warmed us with an account of their Yuletide party. There were 28 members gathered in an intimate room at the Taix Restaurant where they enjoyed dinner, their own (brought-from-home) cookies and cake following by a talk by Harry Berg, Readings by **Sarah Lampiasi** and **Pauline Miller** and a barber-shop quartet to round out the festivities. Festive decor, napkins and a Santa for each was prepared by **Fern Morton.** They did not have to be concerned with shovels, sand, snow tires and ice-choppers.

It was in late January that **Lilla Shattuck** phoned to ask about the health of **Ginny Russell's** husband Bob. We provided her with information as best we knew, then added that prayers and get-well letters were the best we might give him. She was told the Huethers have sent him cartoons cut from local newspapers. Then, three weeks after Bob Russell's death, Lilla sent a page of humorous statements excerpted from accident insurance forms and asked that we look them over and decide for her if Bob would enjoy reading them. They are being kept in safe keeping for Ginny.

Barbara Menz-Smith of Scituate, ME, wrote on April 20 to express her thanks for the memorial tribute she read in the *Journal* for her aunt, our Honorary Life Member, **Bertha Schwendeman**.

We thank all who sent birthday cards, Valentine and Easter greetings.

**Exchange Editor:**
Agnes Huether
34 Jacklin Court
Clifton, NJ 07012

## Nominating Committee Report

The P.T.G.A. Nominating Committee has submitted the names of the following individuals as nominees for offices on the Board for the term 1988-89:

President — Agnes Huether

Vice President — Arlene Paetow

Recording Secretary — Bert Sierota

Corresponding Secretary — Judy White

Treasurer — Barbara Fandrich

The two secretaries are currently incumbents and are eligible to continue service on the Board. Nominations from the floor will be entertained if anyone is interested in running for a particular office.

**Cele Bittinger, Chairperson**
**Deanna Zeringue**
**Beva Jean Wisenbaker**

## New Members

Cordelia Grijalua (Gus)
14548 Dalman Street
Whittier, CA 90603

Helen Wheeler (Arend)
4130 Mountain View Lane
Vacaville, CA 95688

Wendy Cate (Allan)
5307 Cortolane Drive
La Crescenta, CA 91214

Paul Cook (Claudia Ellison)
3137 Voltaire Drive
Topanga, CA 90290

Barbara Fleming (Thomas)
15567 E. Brown Place
Aurora, CO 80013

Edna Accardi (Bernard)
3330 Taylor Avenue
Bridgeton, MO 63044

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**MAPLE KEY BUSHING CAULS** for two-caul method (bushing one side of mortise at a time) as taught by Spurlock/Henry. Available for key pin sizes .087", .125", .131", .133", .137", .146", & .163". **Bill Spurlock, 3574 Cantelow Rd., Vacaville, CA 95688, (707) 448-4792.**

**WOULD LIKE TO TRADE** new studio pianos for older grands needing restorations such as Steinways, Baldwins or Mason & Hamlins. **Call Jim Brady collect @ (317)259-4307 daytime or (317)849-1469 evenings or write 5259 N. Tacoma, Suite 14, Indpls., IN 46220.**

**KORG AT 12 AUTOCHROMATIC TUNER.** Shows note, octave, pitch: seven octaves (some pianos, 5 octaves). Generates four octaves. Calibrate A = 430-450 Hz. Batteries, adaptor, earphone, case, warranty, one lb. $145 postpaid ($220 list). **Song of the Sea, 47 West Street, Bar Harbor, Maine 04609. (207) 288-5653.**

**WENOL** — W. German metal polish contains jewler's rouge, no ammonia, cleans, polishes, protects. Mentioned at PTG convention. Great for capstans, balance rail pins, bottom of studs. Price break in case lots. Case equals twenty 3.9 oz. tubes. Also in 39.0 oz. cans. Write for prices and order from **VANCE PIANO SERVICE, 1881 W. Marion Ave., Punta Gorda, FL 33950.**

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**88 PIANO KEYS REBUSHED** fronts and centers with extra quality felt. Return freight paid with prepaid orders. **Tommy L. Wilson, 1418 Ewell Avenue, Dyersburg, TN 38024. (901)285-4064.**

**RESCALING SERVICE;** Customized tunings for Sanderson Accu-Tuner; custom rebuilding and remanufacturing. Soundboards, pinblocks, etc. **Ed Buck, 171 Lincoln Street, Lowell, MASS 01852 (617) 458-8688.**

**"LET'S TUNE UP"** $20.00 per copy. Last few hardbacks will soon be gone. No immediate plans for another printing. Paperbacks still available at $17.50. Make checks payable to **John W. Travis, 8012 Carroll Avenue, Takoma, MD 20912**

**HAIR RAISING POWER,** fiery brilliance, and velvety warmth. The new Isaac "Solo" hammers. Premium hammers for premium pianos. Exclusively from: **Steve Pearson Piano Service, 831 Bennett Ave., Long Beach, CA 90804. (213)433-7873.**

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**CUSTOM PIANO COVERS** made to your specifications, Perfect for any storage or moving situation. Also available many gift items — shop and kitchen aprons, windsocks, potholders — send for new brochure and samples. **JM FABRICations, 902 185th St. Ct. East, Spanaway, WA 98387, (206)847-6009.**

**52 PIANO KEYS RECOVERED** - .50-$50.00; .060-$60.00; .075 with fronts-$75.00. New sharps-$32.00; sharps refinished-$17.50. Keys rebushed, felt-$60.00, leather-$95.00. New fonts-$25.00. Return freight paid with prepaid order. **Charles Wilson, 1841 Kit Carson, Dyersburg, Tenn 38024, (901) 285-2516.**

**LEARN PIANO TUNING** – Small classes: Personal attention: Calif. State approved: Veterans approved: Not a mail order course. Call for free brochure. **S.F. School of Piano Tuning. 967 Airport Blvd., South San Francisco, CA 94080, Tel. (415) 871-4482.** "Our 8th Year".

**HARPSICHORD AND FORTE-PIANO PARTS** and kits, original factory materials from the finest early keyboard suppliers in the world. Also Troubleshooting and assistance to fellow RTT's on harpsichord problems. Authorized Zuckermann Agent. Lowest Factory Direct Prices - buy from the source. Catalogs, price lists free. **Yves A. Feder RTT, Harpsichord Workshops, 2 North Chestnut Hill, Killingworth, CT 06417 (203) 663-1811.**

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**CASES FOR ACCU-TUNER AND TOOLS** starting as low as $80.00. Will accommodate Sight-O-Tuner. AUTHORIZED DISTRIBUTOR FOR SANDERSON ACCU-TUNER. **Bob Conrad 816-444-4344, 6405 Wyandotte, KCMO 64113.**

**SANDERSON ACCU-TUNERS from Authorized Distributor.** The most accurate and advanced tuning aid available. Tuning lever note switch for Accu-Tuner $25. Consignment sale of used Accu-Tuners and Sight-O-Tuners for new Accu-Tuner customers. Call for details. **Rick Baldassin, 2684 W. 220 North, Provo, UT 84601, (801) 374-2887.**

**NEW SOUNDBOARDS MADE FOR YOU.** Ship old board. New board comes to you ready for installation. Send for instruction on: **Victor Video Tape, $94.75. Victor A. Benvenuto, 6825 Germantown Avenue, Philadelphia, PA 19119. (215) 438-7038.**

**THE GUIDE $10.** The Piano Technicians Guide. A job time study and work guide. Revised and printed to fit a pocket. **Newton J. Hunt, Dept. of Music Douglas-MASA, Old Music Bldg. New Brunswick, NJ 08903**

**THE RANDY POTTER SCHOOL OF PIANO TECHNOLOGY** — a complete home study course for beginning and intermediate students, in piano tuning, repairing, regulating, voicing and business practices. Top instructors and materials. Call or write for information: **RANDY POTTER, RTT; 61592 ORION DRIVE; BEND, OR 97702; (503) 382-5411.** See our ad on page 3.

**VICTOR A. BENVENUTO VIDEOTAPES.** PIANO TUNING AURAL/ELECTRONIC...$175. The most accurate approach in fine tuning. KEY MAKING...$124.75. GRAND REBUILDING (2 tapes)...$225.75. Preparation, pinblock replacement, damper installation, restringing. GRAND REGULATING...$175.75. SOUNDBOARD REPLACEMENT...$94.75. Ship old board - new board comes to you ready for installation. Please specify VHS or Beta. All prices include shipping. **THE PIANO SHOPPE, INC. 6825 GERMANTOWN AVE., PHILADELPHIA, PA 19119. (215) 438-7038.**

**GRAHAM ANDERSON,** Piano Rebuilding and Repair, **3632 Fernway Drive, Montgomery, AL 36111.** 20 years' experience with Steinway - London. Specializing in replacement of action rails. Also available GENUINE IVORY KEY TOPS replaced. Call or write for free estimates. **(205) 284-0197.**

**JOHN TRAVIS PUBLICATIONS** going out of business. *"A Guide To Restringing"* for sale by the book or by the dozen. Paperbacks each $16.50 postpaid, hardbacks each $21.50 postpaid. Order now. No COD. Make check or money order payable to: **JOHN W. TRAVIS, 8012 Carroll Ave., Takoma Park, MD 20912.**

**AUBREY WILLIS SCHOOL** Our home study course in Piano, tuning, repair and regulating has been used by hundreds to learn the basics. Accredited member National Home Study Council. No cost information. **Aubrey Willis School, 301 W. Indian School Road, Suite B-111, Phoenix, AZ 85013. (602) 266-1640.**

**NILES BRYANT OFFERS TWO HOME STUDY COURSES:** Electronic Organ Servicing: Newly revised. Covers all makes and models - digital, analogue, LCI's, synthesizers, etc. Piano Technology: Tuning, regulating, repairing. Our 87th year! Free booklet: Write or call **NILES BRYANT SCHOOL, Dept. G, Box 20153, Sacramento, CA 95820 - (916) 454-4748 (24 hrs.)**

**COMPONENT DOWNBEARING GAUGE OWNERS** - convert your style 1 gauge to a style 2 gauge with this easy to install kit. Style 2 gauges have an added interchangeable magnetic base. Sent $9.00 to **Tom Lowell, 2360 Galls Cr. Rd., Gold Hill, OR 97525.** Style 2 gauges can be ordered on account from the following: ASPCO, Ford, Itoshin, Pacific, Pianophile, Randy Potter School of Piano Tech., Renner Schaff, Tuners, and Pianotek, Ltd.

**KORG AT-12 AUTOCHROMATIC TUNER,** Play instrument; tuner shows note, octave, cents sharp or flat for seven octaves: C = 32.70 Hz to B = 951.07 Hz.(On some pianos, listens best to middle five octaves). Plays four octaves: C = 65.41 Hz to B = 987.77 Hz. Calibrate A = 430-450 Hz. Batteries, AC adaptor, earphone, case, year warranty, 1lb. Introductory offer: $135 postpaid ($190 list).**Song of the Sea, 47 West Street, Bar Harbor, Maine 04609, (207) 288-5653.**

## Wanted

**WANTED: STEINWAY GRAND PIANO** any size or condition. Call: **Doug or Tim at (804)358-1929.**

**WANTED!! DEAD OR ALIVE** "Steinway Uprights" Call collect, **Ben Knauer (818)343-7744.**

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**Up To $1000.00 Finder's Fee** will be paid for successful purchase of a Mason and Hamlin Ex-Player. I have mechanism to install. Pls call collect (317) **259-4307 or evenings (317) 849-1469. Jim Brady 4609 Cranbrook Dr., Indpls., IN 46250.**

**PIANO TECH WANTED:** Leading Steinway, Yamaha and Samick dealer located in Midwest is in need of an experienced Tech for concerts, in-house and field. Benefits, salary, commensurate with experience. Submit resume with salary requirements to: **Hammell Music, 1530 Middlebelt, Livionia, MI 48154.**

**PIANO TECHNICIAN WANTED:** RTT preferred, minimum 2-5 years experience in tuning, repair and rebuilding. Full-time permanent position with good salary and benefits. Call: **Evan Tublitz — Syracuse Artist Pianos, Ltd. (315)446-5660.**

**PIANO TECHNICIAN/REFINISHER** looking for tuner technician and/or person experienced in refinish and touch-up. Tired of driving around town in the snow, relocate in sunny S. Florida, company benefits, paid vacation and holidays. **BOBB'S PIANOS & ORGANS, Inc., 2512 S. 30th Avenue, Hallandale, FL 33009. (305)456-7800, 1-800-531-9927 in Fla. Watts.**

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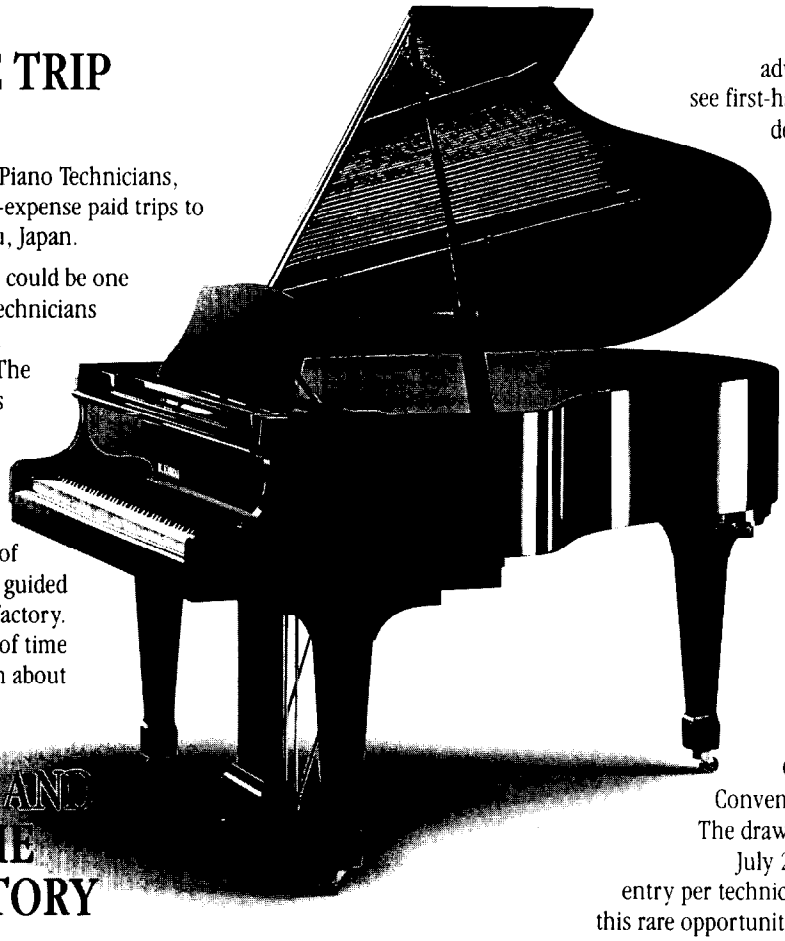

## WIN A FREE TRIP TO JAPAN

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In the Spring of 1989, you could be one of the three lucky piano technicians who will embark upon an unforgettable journey to The Land of the Rising Sun. As Kawai's special guest, you'll enjoy FREE roundtrip airfare, hotel accommodations and meals. The highlight of the trip will be a personal guided Grand Tour of the Kawai factory. You will also have plenty of time to shop, explore and learn about Japan and its culture.

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In order to qualify you must be a current member of the Piano Technicians Guild. You can register for the drawing at an authorized Kawai dealer. All entries must be received no later than July 15, 1988. You can also register at the Kawai Exhibit Booth at the Piano Technicians Guild 31st Annual International Convention in St. Louis on July 18-20. The drawing will be held on Wednesday, July 20 at the Convention. Only one entry per technician will be allowed. Don't miss this rare opportunity to win a trip to Japan and the Kawai Grand Tour of the most technologically-advanced piano factory in the world.

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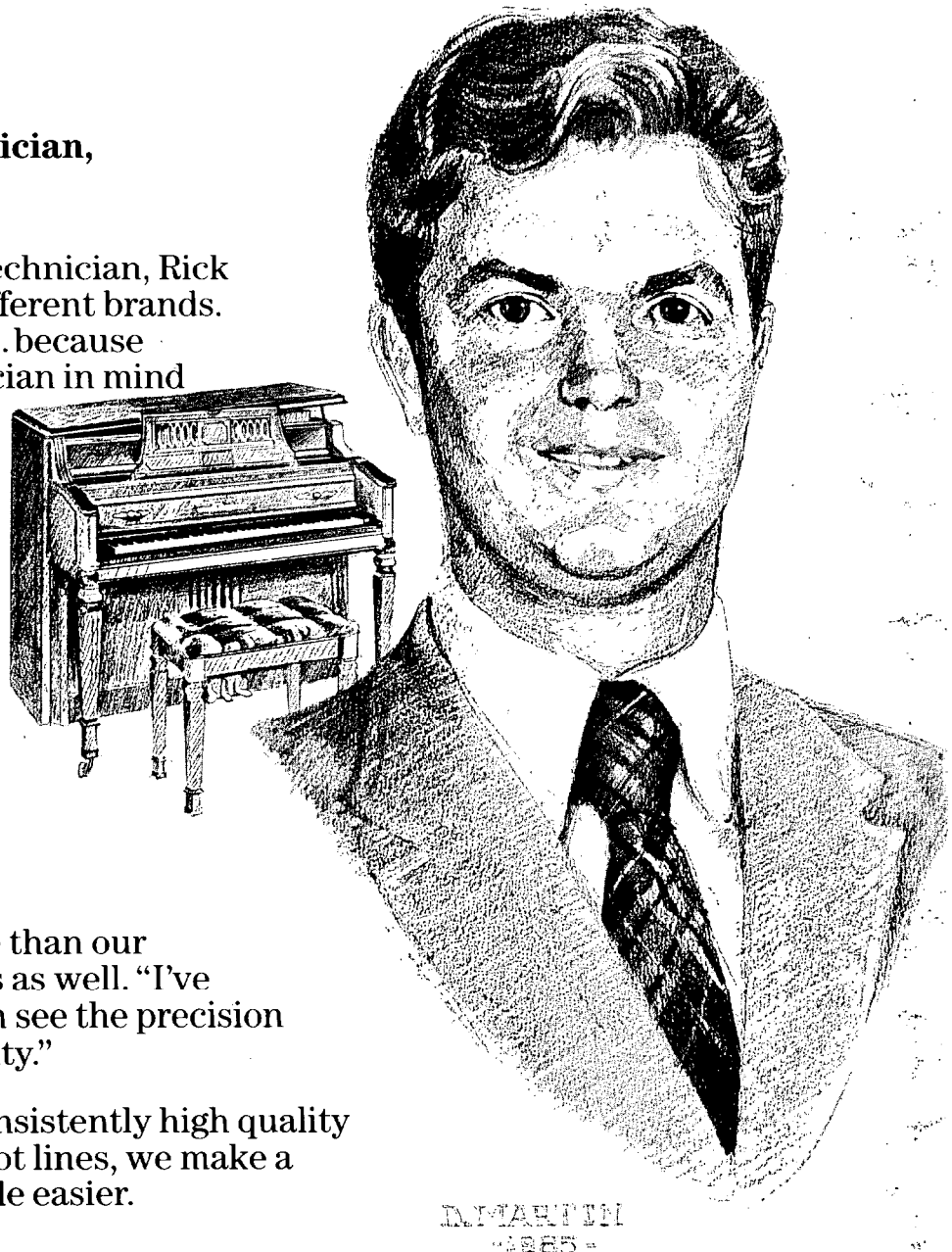


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July **UPDATE** 1988

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

## *Convention Highlights*

**Council** — The 1988 Council of Chapter Delegates will be Sunday, July 17, and Monday, July 18, in St. Louis Ballroom A, B, and C. Delegates may present their credentials and pick up voting materials at the convention registration desk between 2 and 6 p.m. Saturday, July 16, and during a special pre-Council briefing session in the St. Louis Ballroom at 6:30 p.m. Saturday evening. Delegates may also check in at 8 a.m. Sunday.

**Regional Meetings** — Regional Vice Presidents will meet with their members at 4 p.m. Wednesday, July 20, to honor outstanding chapters and members, and to discuss matters of concern to members of the region. Regional meetings will be in these rooms: Northeast — St. Louis A; Southeast — St. Louis B; South Central — St. Louis C; Central East —St. Louis F; Central West —St. Louis G; Western —St. Louis H.

**Committee Meetings** — A number of Guild committees will meet during the convention. Committee meetings are scheduled for 4:45 p.m. Wednesday, July 20. Room and committee assignments will be posted on a bulletin board in the registration area.

**Newsletter Editors Workshop** — A workshop for editors of chapter newsletters is scheduled for 4:45 p.m. Wednesday in Directors' Room 41. Workshop discussion will center on solving problems of producing a quality newsletter on a small budget.

## *New Technical Exam To Be Introduced*

**Bill Spurlock**
**Chairman, Examination Review Subcommittee**

The Exam Review Subcommittee has just completed work on a new technical exam which we feel is the most straightforward and easily administered exam to date. This new exam, which replaces the Chicago version, is the product of comparing the Chicago and revised LA exams to see what content might be missing or redundant, and what exam procedures were troublesome and which worked well. As many of you know, this committee revised the LA exam last year and this year undertook the revision of the Chicago version. It was not our committee charge to combine the two. However, the lessons learned in the LA revision were inevitably applied to this year's work on the Chicago test. The result is a hybrid which combines the strong points of both.

The format of the exam text is largely borrowed from the LA revision, i.e. three ring binder form, organization of text in easy-to-find sections covering instructions, forms, and the grand, vertical, and repair sections. Thorough instructions on setting up the props and running the test have been included to make testing less intimidating to chapters and to improve consistency and fairness.

Also borrowed from the LA version is the concept of examiner-determined specifications for hammer blow and key dip for use in scoring action model regulation, to ensure that the scoring specs. actually fit the action model used.

In the LA exam, examiner instructions are scripted and given verbally only, whereas the original Chicago exam provided no examinee instructions at all. In this new exam all instructions to the examinee are given in written form and left at the work station so the examinee can refer back to them as necessary. This ensures that all examinees get complete information with the least possibility of misunderstanding. Timers are also left with the examinees so they can budget their time to best advantage.

In order to increase the success rate in technical exams we have included a set of oral prescreening questions in the exam book. Given over the phone or in person, these are intended to be a tool for examiners to use in advising an applicant as to his readiness to challenge the exam. Though this prescreening procedure is strictly voluntary, it is felt that most examinees will welcome the chance to find out if they are really prepared, and in what areas they might need extra work. (An upcoming series of articles in the *Journal* on how to prepare for the technical exam, will also address this need for information.)

Two classes will be offered in St. Louis to introduce this new test to examiners and to discuss technical testing in general. Another class, titled "How to Pass the Technical Test" will be offered to those preparing to take the exam.

# Dates & Deadlines

**July 17-18, 1988**
*Council Meeting;* Adam's Mark Hotel, St. Louis, MO

**July 18-22, 1988**
*31st International Convention & Technical Institute,* Adam's Mark Hotel, St. Louis, MO

**August 6-7, 1988**
*RTT Tuning & Technical Examinations* (Southern California Area Exam. Board), California State University — Long Beach; Call Carl Lieberman (213) 392-2771

**September 16-17, 1988**
*RTT Tuning & Technical Examinations* (Cincinnati Test Center) The College-Conservatory of Music, University of Cincinnati. Call Michael Wathen (513) 475-5194

**October 1, 1988**
*RTT Tuning & Technical Examinations* (Portland Test Center) Portland, OR; Call Joseph Garrett (503) 357-4713

**October 15-16, 1988**
*RTT Tuning and Technical Examinations* (Northeast Region) Glasboro State College, Glasboro, NJ; Call Hilbert Felton (215) 482-2000

**October 21-23**
*CTE Recertification*
New York State Conference, Syracuse, NY; Call Chuck Erbsmehl (716) 759-6126

**March 24-25, 1989**
*RTT Tuning & Technical Examinations* (Cincinnati Test Center) The College-Conservatory of Music, University of Cincinnati. Call Michael Wathen (513) 475-5194

# University Technicians Active

**Tom McNeil**
**Chairman, College And University Technicians Committee**

The College and University Technicians' Committee has been busy for the past year with several projects. The committee has been identifying piano technicians serving at colleges, universities, and conservatories. We presently know of about 300 such technicians, about one-third of whom are non-PTG members.

Those 300 technicians are now receiving the *College and University Technicians' Newsletter*, Issue Number 4 of which is presently going to press. If you are a piano technician working full- or part-time for a college, university or conservatory, and you are not receiving the newsletter, please let us know. Send your name, institution, and address to: Tom McNeil, State University of New York, College at Fredonia, School of Music, Fredonia, NY 14063. Also, if you know of someone, especially if he or she is not a PTG member, who is serving one of these institutions, please give us the person's name and institution.

The Committee has also been actively working to organize technical classes and seminars of special interest to college techs wherever PTG conferences are held. Another Committee project is the development of guidelines for maintenance and replacement of institutional pianos.

If you are interested in these areas, and problems associated with working in the university environment, please plan to attend the College and University Technicians' Forum at the St. Louis Convention. This important meeting will be held on Wednesday, July 20, 1:30 to 3:00 p.m.

The Committee is seeking a few energetic new members. If you would like to serve on the College and University Technicians' Committee for '88 - '89, please contact Tom McNeil, committee chairman, prior to or during the Convention. See you in St. Louis!

*For information contact: Tom McNeil SUNY College at Fredonia School of Music Fredonia, NY 14063 — (716) 673-3247 (office) (716) 672-7757 (evenings, until 10 p.m.)*

# In Respectful Memory...

**Miles E. Farster**

Miles E. Farster, chapter sustaining member of the Hampton Roads Chapter, died May 27, 1988, at 87 years of age. Miles was a founding member of the then Hampton Chapter and served as Secretary -Treasurer for many years until a stroke curtailed his activities and forced him to retire. Miles personified the ideal PTG member — he came to every meeting, took part in whatever was being done, cheerfully took the roll, the minutes, and our dues money, actively promoted the Guild and made all who came feel noteworthy and welcome. With loving care and patience Miles turned a multitude of pianos into musical instruments, and inspired his fellow technicians to go and do likewise.

*Garland 0. Goodwin*

# *Michigan State Seminar — New Horizons*

**Stanley Oliver**
**Detroit-Windsor Chapter**

The very successful three-day gathering drew well over 200 technicians and piano teachers in Livonia. It was hosted by the Detroit-Windsor PTG chapter. A determined effort was made to attract piano teachers and almost half of those in attendance came from this group to hear Franz Mohr, Steinway's premier concert tuner speak on " What to do or not to do for the care of your piano."

Franz, as well as President Marshall Hawkins, noted the advisability of securing the professional services of PTG craftsmen. The Michigan Music Teachers Association publicized the seminar to its 850 members and from dealer sources another 1200 teachers were mailed special flyers as invitations. Music departments of numerous local colleges were also sent separate announcements. Albert Fillmore, widely recognized as a teacher and now composer, addressed a large luncheon gathering.

Two dealers, Hamil Music and The Piano and Organ Exchange, furnished "Happy Hours" lending greatly to the general jollity. There were several exhibitors as well as tutoring and testing segments. A unique banquet feature was "Music Photo Painting," staged by Jim Vernick, a fascinating mix of spectacular photography blended to carefully chosen music. Mr. Vernick has shown his artistic program around the United States and touches new depths with a subtle combination of sight and sound.

A great mix of national and local instructors evoked hearty commendations. Each class was introduced by a monitor. A large seminar committee met monthly leading up to the actual three days of the complex gathering under the guidance of genius Hugh Gulledge. Hugh's meticulous care of detail produced a smoothly run gathering and we can be sure with enhanced teacher-tuner relations.

## *Presentations Planned For Teachers, Dealers*

**Bridging The Piano Gap** — Teachers in Missouri and Illinois have been invited to participate in a seminar focusing on communication among teachers, technicians, dealers and manufacturers. The seminar, sponsored by the Guild's Teacher Relations Committee and its St. Louis Chapter, will begin at 8:45 a.m. Wednesday. The session will be moderated by Teacher Relations Committee Chairman Fern Henry and will feature as panelists Dean Shank, RTT, of Rice University; Kristin L. Peterson, manager of customer services for Steinway & Sons; and Owen Jorgenson, RTT; of Michigan State University.

**Dealer Seminar** — Piano retailers in the St. Louis area will participate in a seminar at 4 p.m. Wednesday in Directors' Room 44. Technical representatives of piano manufacturers also have been invited to attend this session, which will focus communication and cooperation to solve mutual problems.

*Steinway & Sons concert technician Franz Mohr addresses an audience of technicians and teachers at the Michigan State Seminar. At right, President Hawkins and Stanley Oliver.*

# Chapter Notes

*Reading-Lancester*

In May the Reading-Lancaster Chapter took a trip to New York City and were given a tour of the Yamaha Research and Development Center, which was interesting. After lunch we went to A and C Piano Rebuilders and were given a tour of their facilities. We stopped on the way home for a fine meal to round out the day.

Our regular May business meeting was held at the Brunswick Hotel in Lancaster, PA, which will be the site of the 1989 Pennsylvania State Conference, hosted by the Reading-Lancaster Chapter.

After the business meeting, which included election of officers, we were given a tour of the hotel meeting rooms and its fine conference center facilities.

*James Bittinger*

*Los Angeles*

Alan Slater opened our meeting with the treasurer giving her report. It was a good year for our chapter — no red figures. Help is available for those who ask for it in preparation for the Craftsman examination. This will be the last part of June.

Our main speaker for the evening was Mark Stainthorp of the Ambassador College. His topic was on refinishing. He has to have pianos ready for about 150 programs per year. With so much moving of pianos, the cases get scratched and he must keep them in good-looking condition. Concerning refinishing, he spoke about stripping materials. "Clean Strip" was one he liked. Any residue must also be removed. He brushes on fillers first with the grain, then crosswise, then with the grain again.. He recommends six coats of lacquer and waiting two weeks before rubbing. On the soundboard, just one coat of lacquer (never dip a piano part in stripper fluid). After the lacquer is hard, then use 400 sanding paper with water and dish detergent. Polish with two different grits of polishing compound.

When using gold leaf, brush on the adhesive exactly where you want the gold leaf to stick. There is no need for a clear finish over it unless it is submect to much wear or if it is used outdoors. We were surprised to hear how thin this gold leaf is. It is one-3.5 millionth of an inch thick.

After 17 years of reporting the LA Chapter news to the *Journal*, this reporter is resigning from this position. It has been a pleasure to do this, but after heart surgery and retirement from major piano repairs, it is time for a younger person to take over. I extend my personal "thank you" to the *Journal* staff and to our chapter for having given me this long opportunity.

*Harry Berg*

# All-Star Panel To Discuss Future Of Piano

What is the current status of the piano in American life? What impact have new electronic keyboard instruments had on piano sales and on Americans' playing habits? What does the future hold?

These are some of the topics to be considered by a blue-ribbon panel during a discussion at 3 p.m.July 20 during the St. Louis Convention. The discussion is open to the public.

**Panelists:**

*Dr. Frank Wilson, M.D., Moderator*

Dr. Wilson is Assistant Clinical Professor of Neurology at San Francisco's University of California Medical Center and a frequent lecturer on the neurological aspects of music-making. He is author of the book "Tone Deaf And All Thumbs: An Invitation To Music-Making For Late Bloomers And Non-Prodigies."

*Karl Bruhn*

Senior Vice President of Yamaha Music Corp., Bruhn is president of the American Music Conference, past president of the Piano Manufacturers Association International, and a manufacturer's representative for the National Association of Music Merchants.

*Marshall B. Hawkins, RTT*

Hawkins is 1987-88 president of the Piano Technicians Guild, Inc. A member of the Guild for 18 years, Hawkins formerly was a music educator, directing the U.S. Navy bands and ensembles and heading its band director school.

*William McCormick*

McCormick is president of Jordan-Kitt Music, one of the nation's largest music retailers, and is past president of the American Music Conference.

*Robert Silverman*

Silverman is editor and publisher of Piano Quarterly, a magazine for lovers of pianos and piano music. It is published in Wilmington, VT.

*Dolores Zupan*

A St. Louis area music teacher, Zupan currently serves as president of the Music Teachers National Association, an organization of more than 22,000 professional music teachers.