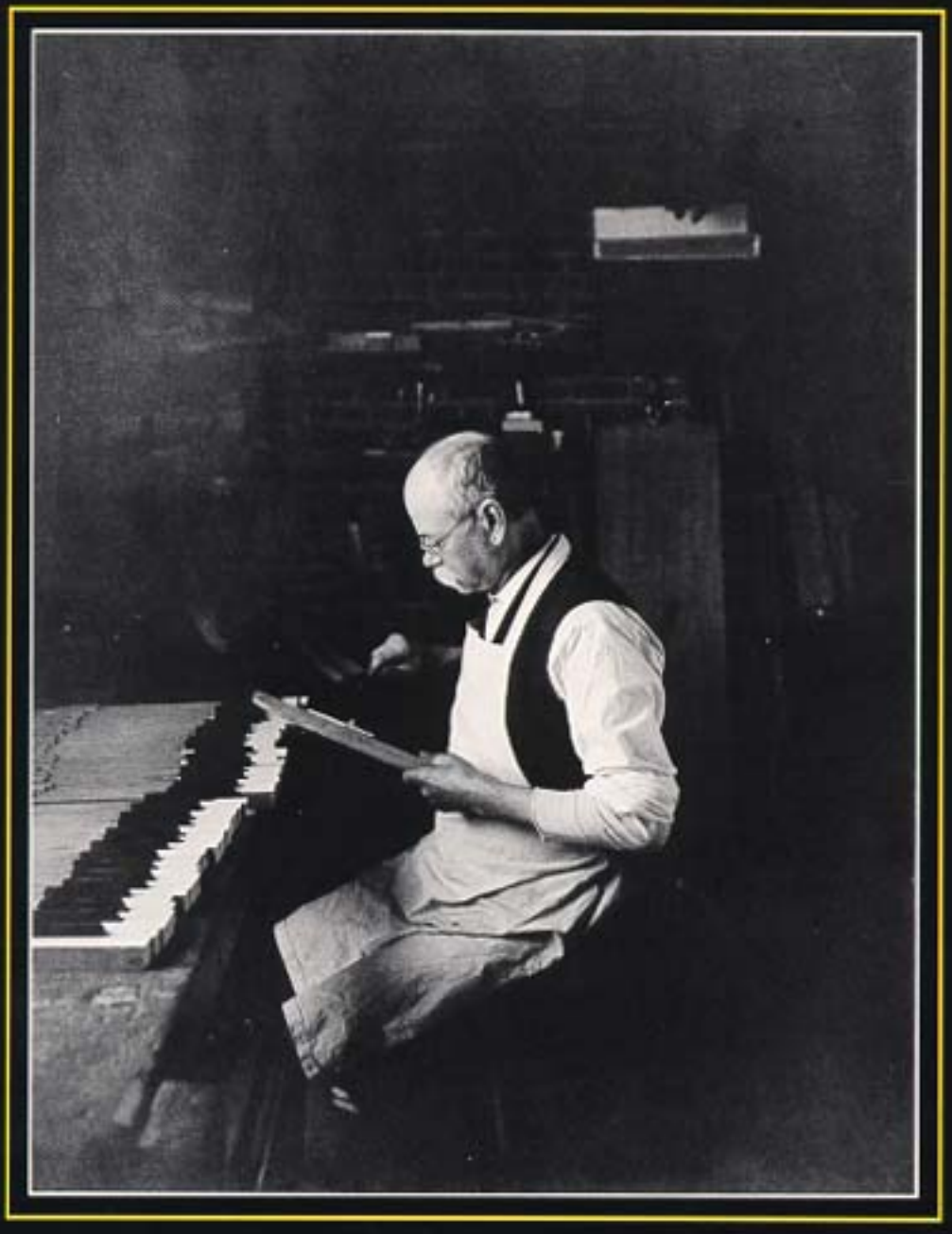
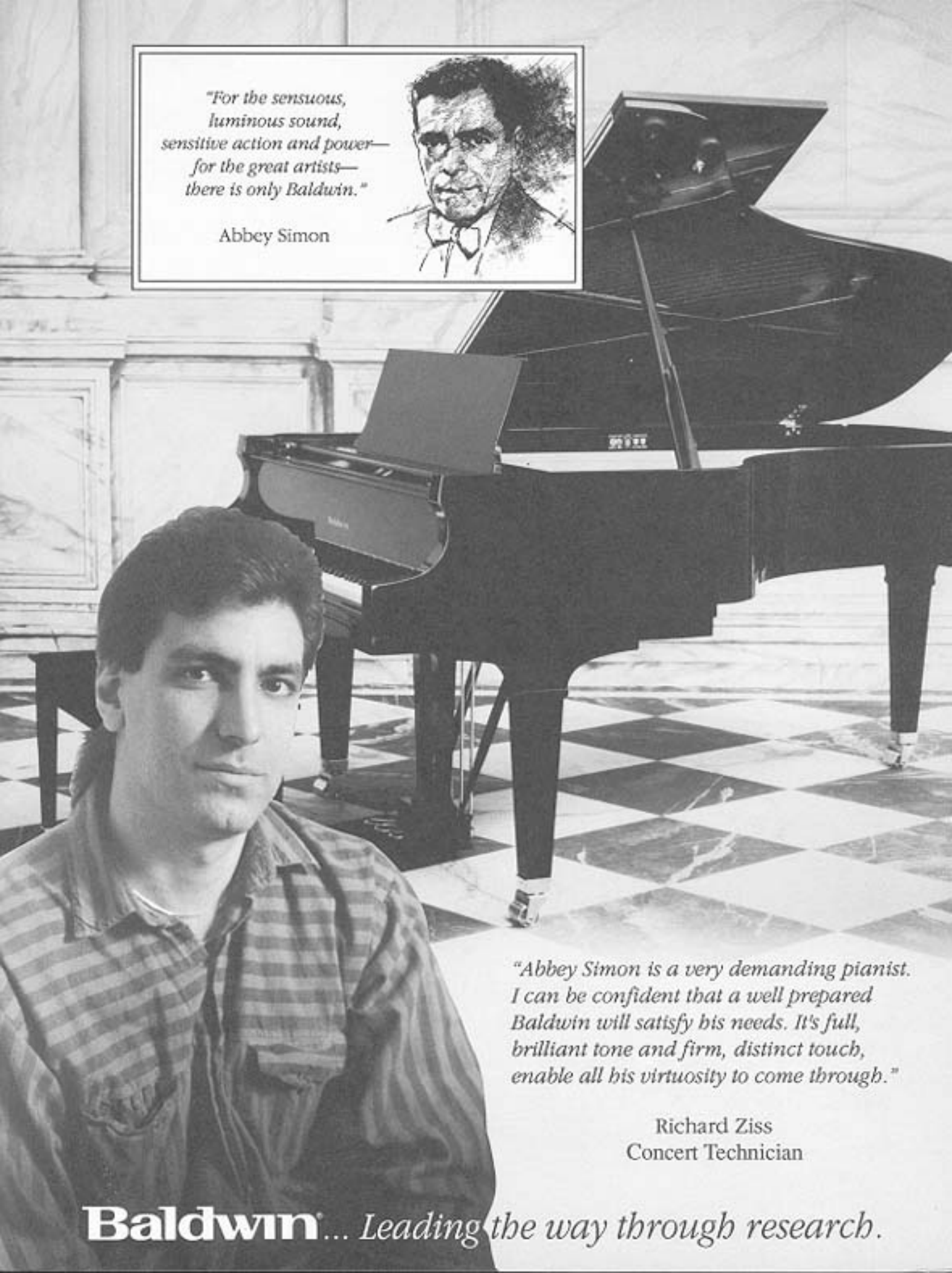
PIANO TECHNICIANS Journal

October 1991

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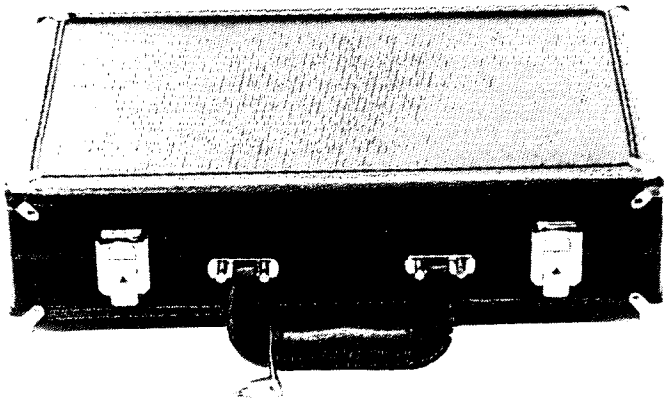

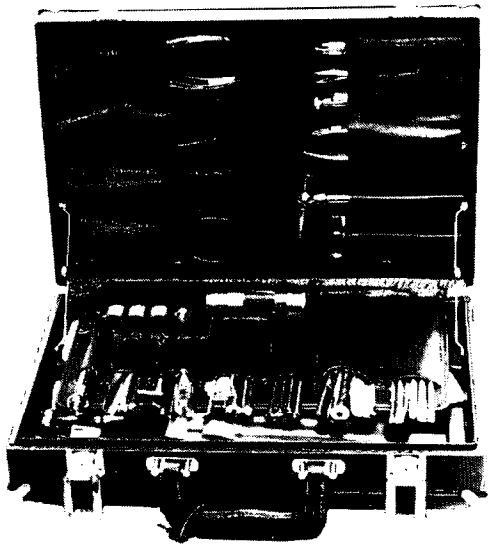

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PIANO TECHNICIANS
Journal

OCTOBER 1991 — VOLUME 34, NUMBER 10 OFFICIAL PUBLICATION OF THE PIANO TECHNICIANS GUILD, INC.

ABOUT THE COVER:
Earl Orcutt, RTT, of Forty Fort, PA, contributes this photo of a piano craftsman from an earlier time. Earl found the print among materials from a photographic studio operated by his family.

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Randy Potter School Purchases Aubrey Willis

As you may be aware, the Aubrey Willis School of Piano Tuning and Repairing ceased to exist September 21, 1990, when Career One, of Phoenix, Arizona, a licensee, went out of business.

Owners of the course Dave and Rose (Willis) Pennington asked us to consider taking over the license, to offer to "teach out" to stranded Aubrey Willis students, and to allow former Aubrey Willis students to transfer into our school as Continuing Education students. Many already have.

David Pennington, RTT, former President and Director of Instruction at Aubrey Willis, said "It was the best course in its day, but it has needed rewriting and updating for many years. When the Randy Potter course was published (in 1987) it was more complete and up-to-date than anything even my father-in-law had conceived of. They have become the industry leader in teaching piano technology. I have been recommending Randy's course for some time." Pennington, was trained by Aubrey Willis and is married to his daughter, Rose.

For more information, see the related News Release in the July 1991 Industry News section of the *Piano Technicians Journal.*

See us at the Arizona State Seminar, Tuscon, January 3-4, 1992; the California State Convention in Ontario, CA, February 21-23, 1992; and the Pacific Northwest Regional in Banff, AB, Canada, April 2-4, 1992.

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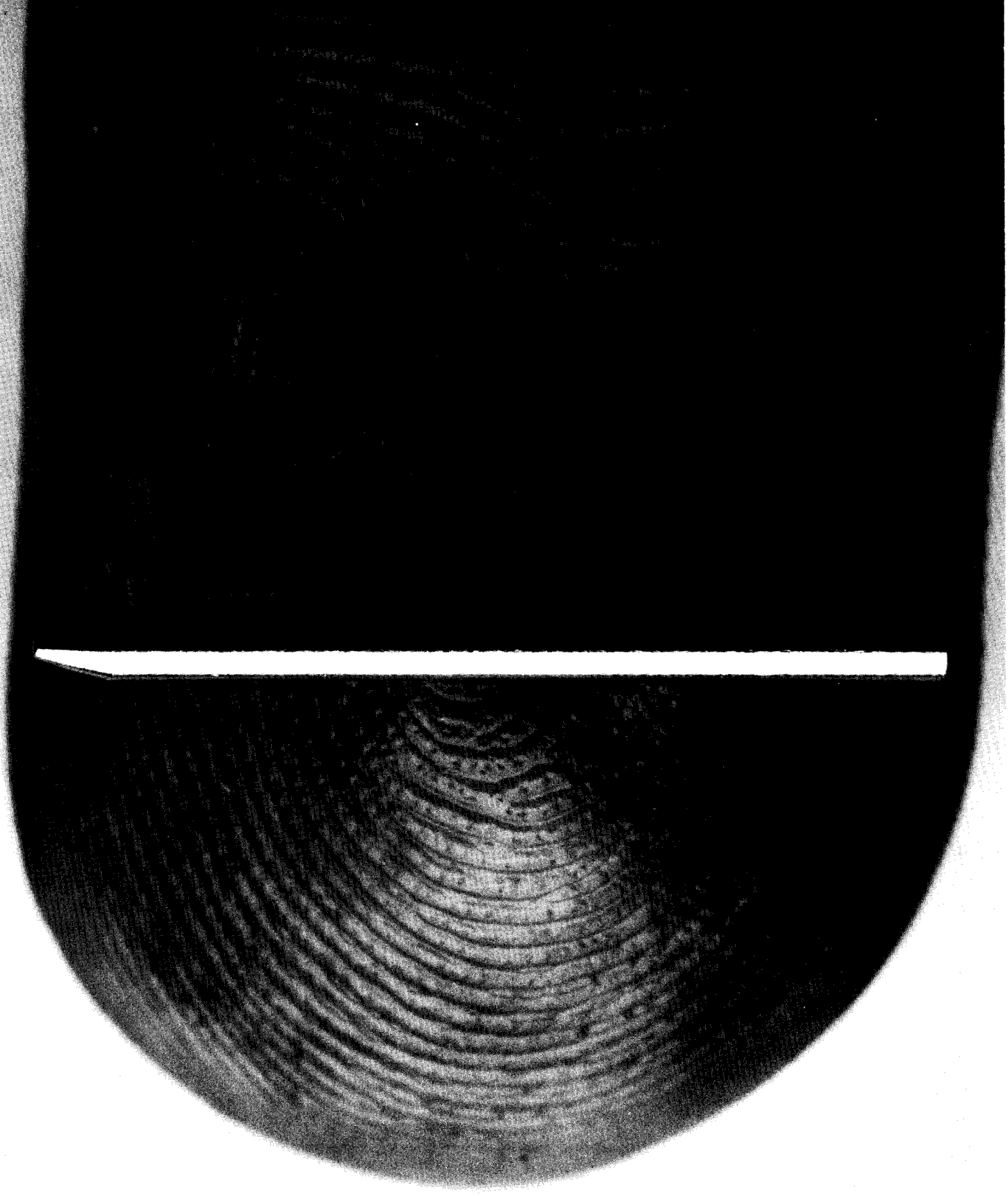

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President's Message

Continuing Our Success

Nolan P. Zeringue, RTT
President

There are those of us who are interested in the political affairs of PTG and in the administration of the daily operations of the organization. I know, also, that there are many who are interested only in the educational aspect of the organization and have no interest whatsoever in the running of PTG. We have many great classes in piano technology at the annual convention and at the many regional and chapter seminars, but that is not the whole of PTG.

Without the interest in the operations of PTG, the administration of the PTG budget, the chartering of chapters, the constant updating of the PTG Bylaws, and the many committee functions, I am sure that you would not have the availability of the classes which are so necessary in upgrading our profession and so beneficial to the expansion of your knowledge in your daily work. Before PTG and the other organizations before it, there were no classes for anyone to attend. One had to do the best one could on his or her own.

These are some of the reasons why I think that chapter business meetings (even if they are short), regional meetings at seminars, and the regional meetings at the annual convention are very important to the entire membership. Just because I am elected President and the other members of the PTG Board are elected to run the affairs of PTG does not mean it is our organization to run.

PTG belongs to all of the 3700+ members and it is their right to be in and a part of the running of the organization. It is necessary to meet with the chapter presidents and with the the regional vice presidents to listen to what is taking place, what is in the future, and what is being placed on the back burner.

What you have to say is most important to the Board, and I feel it is most important that we meet even if it has to be in a class period at the convention to plan, praise, and maybe to pout. When we as the PTG Board fail to keep the membership informed and involved in the operations of PTG is the day we begin our demise.

Industry News

Dampp-Chaser Hosts Third Annual Field Expert Recognition Breakfast

A number of piano technicians and a piano dealer were recognized for outstanding performance at the Third Annual Field Expert Recognition Breakfast hosted by Dampp-Chaser Electronics Corporation of Hendersonville, NC, at the recent Piano Technicians Guild Convention held at the Adam's Mark Hotel in Philadelphia in July 1991, reports Dampp-Chaser's President Stephen R. Smith.

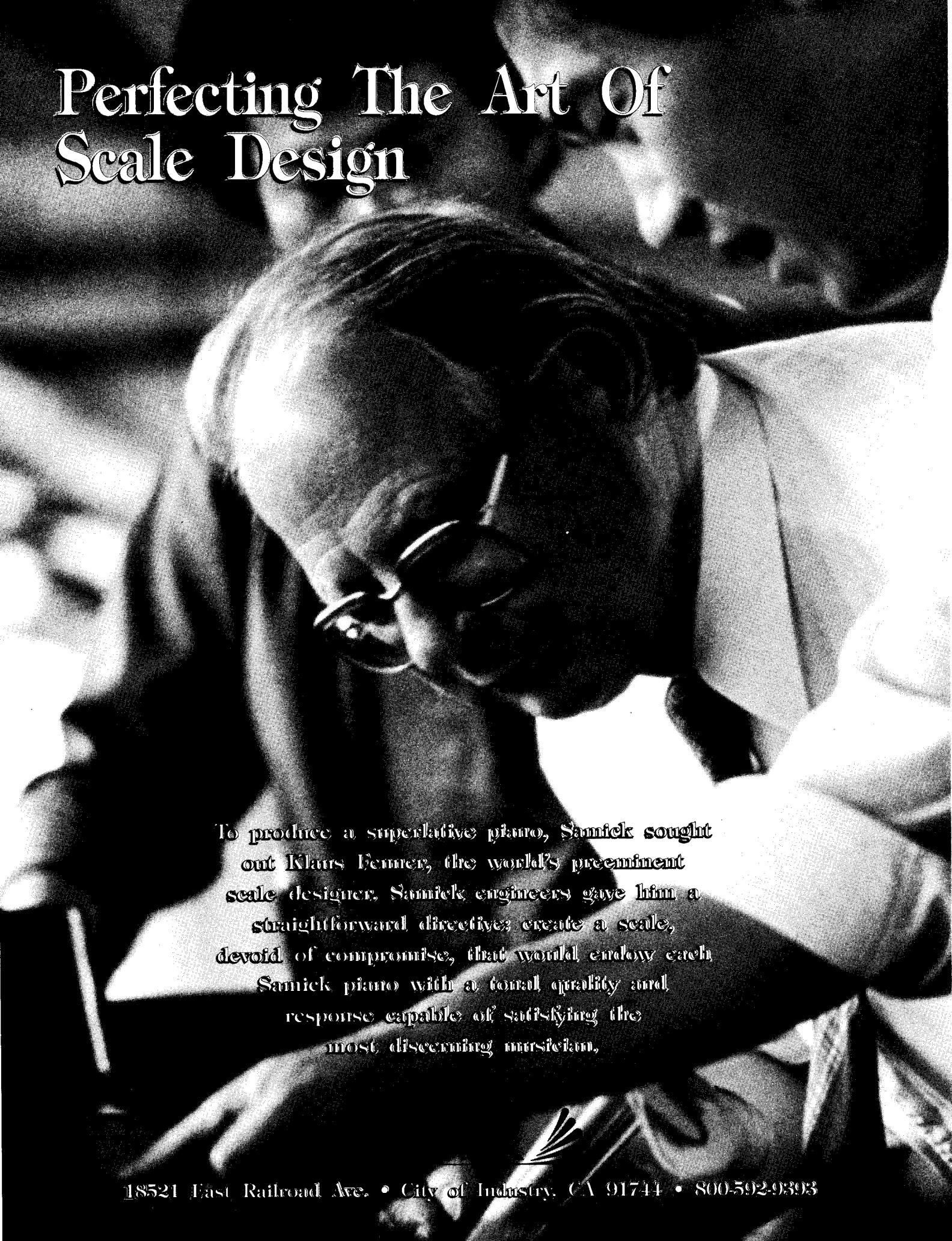
The breakfast was attended by more than 110 piano technicians and their spouses, Smith said. All of the technicians were field experts in humidity control in pianos, having installed at least 25 Dampp-Chaser Piano Life Saver Systems, which consist of a dehumidifier, a humidifier and a control called a Humidistat.

The Robert M. Sides Piano Company, 201 Mulberry, Williamsport, PA 17701, was recognized for selling and installing over 2,000 Dampp-Chaser Systems, believed by Dampp-Chaser to be the most sold and installed by any piano dealer in the world.

David Patterson, RTT, 3864 Chesswood Drive, Downsview, Ontario M3J 2W6, and Howard F. Jackson, RTT, 2017 Frances Place, Monroe, Louisiana 71201, were recognized for product improvement suggestions.

Vincent Maccaro, Jr., RTT, 81 2nd Avenue, Westwood, NJ 07675, was recognized for submitting to Dampp-Chaser, drawings which Dampp-Chaser will distribute to all field experts (over 500) as an aid to installing humidity control equipment in different piano models. Smith said, in the last year Mr. Maccaro has submitted more drawings than any other field expert.

Smith reported that field experts at the breakfast were enthusiastic about a new video training tape which Dampp-Chaser makes available free to all piano dealers, tuners and technicians, and a two- by three-foot color poster which is available free to all piano dealers for their showrooms.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From The Home Office

Piano Destruction — Threat or Menace?

Larry Goldsmith
Executive Director

For years, our sources have whispered tales of ritualistic piano destruction, of cults of piano technicians who have crossed over the line in exploring the dark side of piano technology. In dingy late-night bars and anonymous telephone conversations, the story is quietly told — pianos tortured and demolished by unspeakable means, their broken and splintered bodies buried in unmarked graves or burned by bloodthirsty, marshmallow-toting mobs.

These stories cannot be confirmed, of course. Not since a hot July night in 1904, when piano dealers burned eight square grands on a beach near Atlantic City, NJ, have such activities been exposed. Nobody has ever been willing to testify to having attended one of these incidents, much less participated. One unidentified source told me of laughing gleefully as two old uprights slammed together, pirouetted like clumsy square-dancers and then fell apart like something from a Roadrunner cartoon. "We all wore sheets and masks," he said. "Nobody will ever find the evidence."

Secret photos show a piano's destruction, above, and fiery funeral.

But never mind the truth. Can't you see the vision in your mind's eye? Sparks flying upwards in the night sky, the sounds of a once-mediocre musical instrument in its death throes, overlaid with the chanting of the barbaric hordes. Perhaps they're singing "Kumbaya." Chilling.

Some defenders of their outlandish practices call it euthanasia — putting hapless junkers out of their misery so that they can never again be visited upon some defenseless nursing home, church, shirttail relative or beginning piano student. Others, taking a leaf from Dr. Frankenstein, put it down to science. We'll be better, they say, for knowing exactly what stresses a piano can endure. But the means by which this is done! In some cases, I'm told, these dark rituals even involve the use of construction equipment.

But now piano destruction has gone public, and in a big way. If they read the *Wall Street Journal*, these individuals have to be feeling...well, challenged right now. In a recent issue appeared the story of one Hew Kennedy, a resident of Shropshire, England, who has constructed a copy of a 14th-century machine of war called a "Trebuchet." It's basically a catapult on steroids — four stories tall and weighing 30 tons. He uses it to launch grand pianos, dead horses and small automobiles for amazing distances. Why? "It's bloody good fun," he says. Good fun, indeed! Mercifully, he's not a piano technician. His interest in pianos seems to be solely as ammunition. He buys them by the truckload from a junk dealer, the article says.

The story explains that in the old days, decaying horse carcasses were launched into a beseiged city to introduce plague among the defenders.

It doesn't say why anyone would want to launch grand pianos — or even the casual spinet — into a beseiged city. Maybe they were accompanied by decadent sheet music. Perhaps a bit of light opera, or maybe some heavy metal, to introduce moral decay among the inhabitants. Or maybe, instead of fighting, the defenders would spend their time wondering why a free piano that had flown 151 yards — that's Hew Kennedy's record — and landed on cobblestones wouldn't stay in tune.

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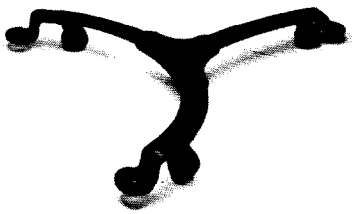

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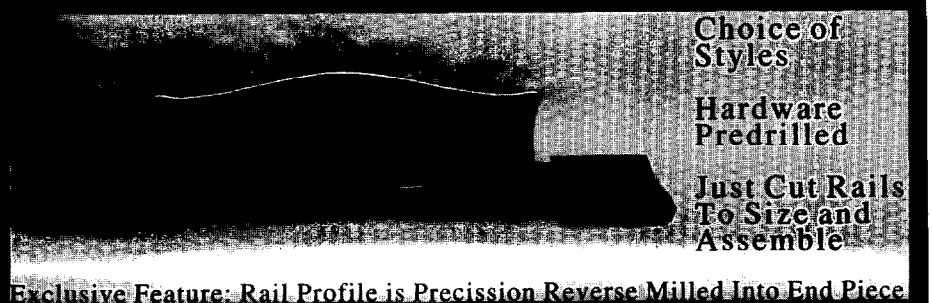

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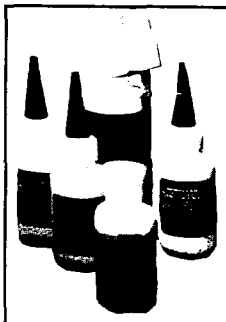

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Economic Affairs

Our Economic Future

Jack Wyatt, RTT
Economic Affairs Committee Chair

As the incoming chair of the Economic Affairs Committee, I would like to express my thanks to Carl Root, for the fine job he and his committee did over the past years. I found the surveys he conducted enlightening and think they will be useful for many years to come. I want to personally thank him for taking time out at our recent convention to offer me advice and suggestions as he was already busy as a member of the newly-formed Marketing Committee.

As to our future: I am very optimistic. The trend that started several years ago of restoration of grand pianos is now in full swing. Many technicians now specialize in restoration, mostly grands at this time. Of the dozens and dozens of brands of high-quality grand pianos built from the 1880s through the 1940s, almost none have been discarded. As a matter of fact, not many of the so-called low-priced grands built during this time frame have been thrown away. As a result, there is an enormous supply of pianos in need of our services. Some of these instruments have been restored, many have been repaired, and many have been "fixed" while some have been "fixed" at. However, all of them need or will need our services. Many of the grands that have been sold in the recent years already need repair such as hammers, knuckles, dampers, etc. These pianos will need continuing service that only piano technicians provide. We have not even mentioned the thousands and thousands of durable little spinets that were built in the '50s, '60s and '70s. Not many of these have been disposed of either. There are many specialists appearing in our profession. Some rebuilders specialize in pinblock, soundboard, action, and key replacements as well as key rebushing, case parts, keytops, bridge replacement and bridge capping. While rebuilders may not do all the things mentioned above, the majority do most.

Thanks to the PTG, these skills are being taught to those who wish to learn. Today the methods and techniques of our rebuilders are freely exchanged. In the past, rebuilders would rarely pass on their knowledge and methods to other technicians. I attribute this change in attitude to the influence the PTG is having on our profession.

When a young technician enters the piano service business today, he or she can choose what field they want to pursue. While conducting a class of college students recently, the question came up as what was the best field to choose. I informed them that there were many variables involved in choosing a field, such as location, needs of that area, and where their personal interests and skills lie. Many people are not prepared to serve a long apprenticeship with a rebuilder. Some simply cannot afford to do so because of their financial situation. However, for those who can, I strongly recommend this specialized field, as it appears this will be the most profitable in the piano service business.

Some students just want to tune. When starting a new business it would be very difficult to find a sufficient number of pianos to tune. I suggest that they become affiliated with a piano retail store. This is an excellent way to acquire much needed experience in servicing pianos and to improve their tuning skills.

Due to the decline in sales of new pianos, it has been said the end of the piano may be near, that electric keyboards will replace the piano. To this notion I say "bunk and baloney." This was also predicted in regard to the radio, the record player, the electric guitar the the electronic organ. In fact, the piano exists today in greater numbers than ever. None of the instruments mentioned above equal the pride of ownership as does the piano. The appreciation of fine pianos sold in the past is well known. The fact is that fine grand pianos 80, 90, and 100 years old in "as is" condition are worth many times more than what they sold for new. This is but one reason why so many pianos are being restored today. Even though quality work by a skilled technician is very expensive, the increased value of these fine grand pianos in restored condition far exceeds the cost of the restoration. Many grand pianos of medium quality are also worthy of restoration. Various reasons for this include performance, durability and lower cost. The appreciation of quality workmanship by the public is increasing and they are willing to pay a fair price for it. The members of the PTG must be ready to provide high-quality service in all areas of repair and restoration. When one considers all this, it is very hard not to be optimistic about the future of the PTG and our profession in particular.

TECHNICAL FORUM

Pinblock Installation, Part III

Susan Graham, RTT, Technical Editor
Walter Brooks, Jr., RTT, Connecticut Chapter

Before proceeding with final installation, let's review the pinblock installation thus far. The new block has been rough-cut and fit to the flange with woodworking and then a thin epoxy coating. Screw holes have been drilled, and, with several screws installed, tuning pin locations have been marked. The location registry holes have been drilled in the new block and used to mark cutting lines, and the new block has been cut to final dimension. The surfaces which will not be glued have been given a coat of clear finish to retard excessive moisture content changes. The block is ready to be drilled and installed.

Tuning pin holes must be accurately drilled. Location is important and feed rate and rotation speed must be controlled for successful and uniform pin tightness. A drill press is required.

Most drill presses have fairly small tables. For stability, a larger platform is made which can be screwed firmly to the press table. This is a simple but substantial piece of wood: Brooks uses a platform 5' x 8 1/4" x 1 1/2". Bolts are installed in it which protrude from underneath and through the openings in the press table itself, held by wing nuts. A thin strip or lip runs between the table and the platform to tilt the platform to the desirable angle (figure 1). Use a protractor and a scale to figure the required thickness and location for this strip. For the 8 1/4" width, a strip 3/4" thick produces a five-degree angle.

A five-degree angle works best for Steinway and Mason & Hamlin blocks. Other brands may require a different setting, and some may even vary from treble to bass.

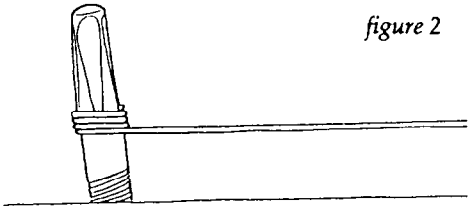


figure 2

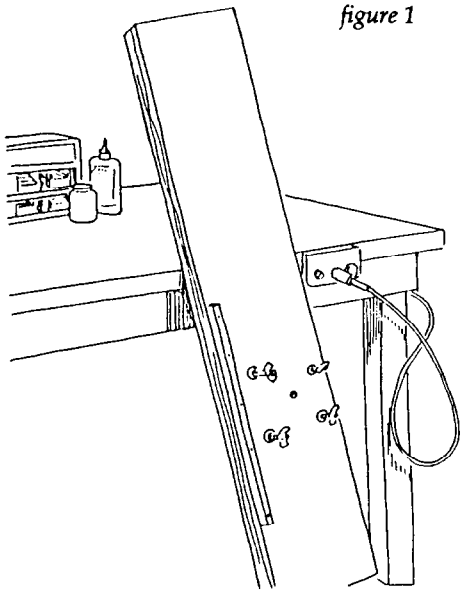


figure 1

illustrations by Valerie Winemiller

Drilling with the block at an angle tilts the pin back so the coil will be at 90 degrees to the string as it leaves the pin. This way, the string comes straight off the bottom of the coil and the coil doesn't walk up or down the pin (figure 2).

The block needs to be stabilized on the platform so it doesn't move or lift up on the drill bit. Hold-downs, which fasten to the shaft of the drill press and clamp down on the work, are commercially available (figure 3). To avoid scratching the block surface, line the foot of the hold-down with a piece of leather. Adjust it so the block can slide but not lift more than 1/32" off the table. As you drill, apply extra pressure by hand just as the bit breaks through the bottom of the block: this will help prevent splintering and lifting.

The drill bit must be a good-quality, high-spiral bit. Dimension is determined by the material used: the supplier for the pinblock blank can also supply or advise on the correct bit. This is no place to be cheap!

The bit must be kept cool during drilling. Brooks attaches the hose from the shop vac to the drill press (it is running on suction, and the end of the hose is practically touching the surface of the block — figure 3). A compressor hose can be arranged so it blows air directly on the bit, and sophisticated devices which actually chill air as it comes through the nozzle are available from Webb Phillips. Cooling the bit helps maintain uniformity of hole tightness and extends the life of the bit.

Drilling slowly also prevents burning of drill bits. Feed rate and spindle speed are both important. In general, the faster the feed and speed, the larger the hole will result (the drill bit heats up, expands and burns). A too-slow speed may not permit the bit to cut easily, however. You want to find the spindle speed which allows the bit to cut easily, and maintain a feed rate that lets the bit just guide itself down into the block. Test in a waste piece of the material you have used: drill several holes at various

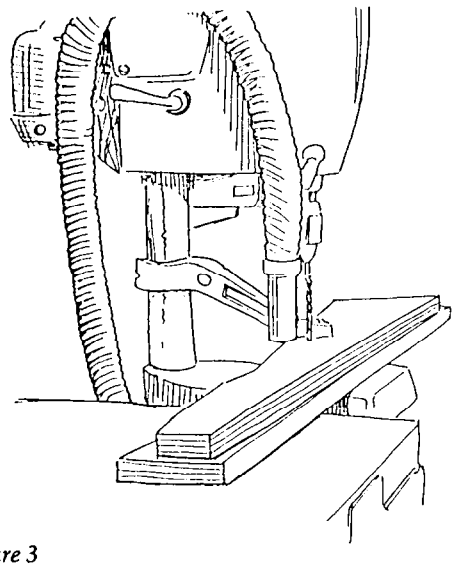


figure 3

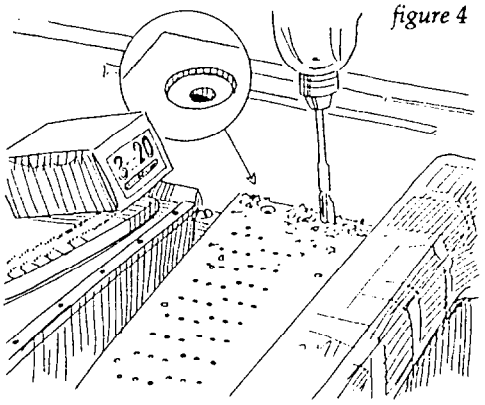


figure 4

feed and speed rates, labeling each, and then drive pins in to feel or measure torque. If varying the speed still doesn't produce the desired result, you may need to switch bits.

The correct torque will vary according to the material being used and, to some degree, your location and even stringing procedure. Rather than get into figures here, it is suggested that you again deal with the supplier of your pinblock material, and/or an experienced technician in your location for advice. It is worth mentioning, however, that there are both lower and upper limits to what is acceptable: excessively tight pins can create problems, as well as those which are too loose.

Due to the thickness of the wire (and coil), less pin will be in the block in the bass; slow the feed rate slightly as you drill for bass pins so the fit will be tighter. If you want to turn the block slightly so the angle of the pins in overstrung sections lines up with the actual direction the string takes as it leaves the pin, this can be done, although Wally hasn't found it necessary.

After drilling, lightly countersink the bottom and top of the holes (about 1/16"-1/8" deep). On the bottom surface, exposed above the keybed, this improves appearance and prevents splinters. Countersinking the top surface is important, as it prevents it from splitting as the pin is driven in.

If you are set up and prefer to drill the tuning pin holes after the block has been installed in the piano (which requires a special stand and platform for the drill press), you will obviously skip the previous operation and can go ahead with fitting the block into the case. After the block is drilled, however, it is still a good idea to pull the plate and countersink at least the top edge of the holes (the underside is a little tricky since the block is installed but it can be done with a flexible shaft tool).

The block is now ready for final installation into the case. Put it in place and measure down from the top of the case, checking the reference measurements made from the old block. As stated, the new block can be no thicker than the old one (the blank should have been thickness-planed or routed, if necessary, before fitting). If it is too thin (and it should be no more than 1/8" thinner than the old), a hardwood shim should be placed at the support shelves to raise the block to the correct height.

When the block is the correct height from the top of the case at the side and the stretcher, put the plate back in. Check location by using the registry holes: drop the nails through the holes in the plate webbing and be sure they line up with the holes in the block. You can usually move the plate around slightly with a few good yanks or by clamping it to the case.

Now check to see that the plate will go back in its original position when it is fastened to the new block. Put in and tighten five or more webbing screws. Check the side-to-side and front-to-back location, using the punch marks you made in the plate struts to record the original location. If these don't check out, remove the plate and grind the interfering edge of the pinblock where it is contacting the case and forcing the plate/block assembly into the wrong position.

Reinstall the plate, install the five webbing screws, and check the registry holes and punch mark measurements. When these check out, make a final check by clamping the plate into the case — this not only insures location, but gets the clamps set up for epoxying the block to the case.

Clamp the plate down at the ends first (the block is already screwed to the plate with five webbing screws) — this will require clamps at least 24". Then pull it to the stretcher with clamps running from the flange through the keybed (under the block).

At this point, all the measurements should be correct; make a quick check to be sure the rim bolt holes line up as well. Then unclamp, unscrew and remove the plate.

Now the block is epoxied to the stretcher and end supports. Although epoxy usually is not considered the most appropriate wood-to-wood glue, in this instance it works well. The joint will not be subject to enough stress to pull it apart, and the body of epoxy enables it to fill in any small gaps (which may occur at the stretcher cut or where veneer was pulled away during removal of the old block). The purpose of fastening the block to the stretcher is to unify the block and case, recreating the rigid and stable structure of the original design.

Mix a good-quality paste epoxy (see September issue) and apply a heavy coat to the long or stretcher edge of the block. Also apply a light coat to the inner rim shelves and put a few dots on the case where the ends of the block will contact.

Drop the bass end of the block in first and then lower the treble end carefully — this is the end which was cut at a three-degree angle so it could be put in place without jamming or causing case damage.

Put the plate back in immediately. Insert the reference nails. Put in some webbing screws to pull the block tightly to the plate so it mates to any curve in the webbing. Even though the wood was worked to fit to the plate, it may change slightly when the screws pull it up tight. This contact must be solidified before the remaining edges are clamped.

Recheck the measurements from the punch marks in the plate struts. No matter how carefully you fit and install the block and plate, it's almost always possible for it to drift a millimeter or so. Once again, move it back in place with a few good yanks (or by using a clamp against the case if needed).

When everything lines up and matches the measurements, clamp the ends down. Then put five or six clamps from the plate flange to the stretcher (pass them underneath the block through the action cavity) and pull the block and stretcher together. As with clamping the block when the flange face was epoxied, check back and forth among these pressure points to be sure clamping pressure is equally distributed. Since you screwed the block tightly to the plate first, epoxying it solidly to the ends and then to the stretcher unifies the block, plate and case into a rigid and stable structure. Following this clamping sequence in-

sures that the epoxy bond at the stretcher stabilizes the block in its exact and final configuration.

Now install and tighten down two or three rim bolts. Clean up any squeeze-out at the bottom of the block using a chisel to remove it from the wood and then wiping it off the blade with a rag and lacquer thinner (don't try to use the wet rag directly on the case — it just smears and works the material into the pores of the wood and can damage the finish).

After the epoxy has set thoroughly, pull the plate back out. Clean up any squeeze-out on the top of the block with a heavy chisel. Wear safety glasses — the material is very hard and forms sharp chips.

It isn't usually necessary to dowel the block back to the stretcher but it can be done by toenailing — inserting the dowels at an angle so they run through the block into the stretcher (just be careful not to run through the finished veneer). If the piano is likely to be moved a lot, these dowels are an added safety factor.

Screws (3" x #20) are put in the ends of the block, running down into the shelf (which is actually part of the inner rim). This helps solidify, and prevents shearing, particularly if the instrument should be dropped.

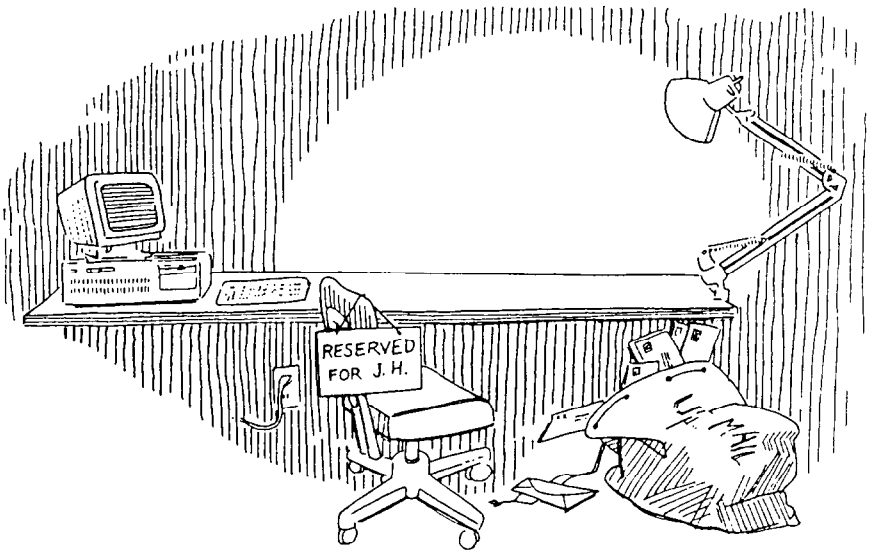
You can usually get three screws in the treble and two in the bass. To be sure that the screw heads are below the level of the block top, use a speedbore bit slightly larger than the diameter of the head and make a flat recess about 1/8" deep (figure 4). (This will also insure that you leave enough clearance from the side of the case for the heads — and to give you room to work with the drill.)

Drill for the screws as for the webbing screws: clearance for the shoulder first. This hole should run all the way through the block, to be sure that the screw doesn't hang up in the block, but is threaded tightly into the shelf. Then drill for the median diameter (down into the shelf), and then countersink at the top. The top of the screw must not protrude above the level of the block.

Vacuum out any chips and install the screws. As an added cosmetic touch, apply black paint to the flange edge and top of the block for about one inch at the ends, where the wood may be visible after the plate is installed.

If you've worked with a little patience and some common sense, you should now have a pinblock installed back to its original tolerances. You should feel confident that this is a stable, high-quality job. Wally points out that, after you've done it a few times, pinblock installation by this method can be done in less than eight hours of work time. This article has been intended to present you with a way that you can do this important job in as efficient and worry-free manner as possible.

I'd like to thank Wally for taking the time to do this little project — it has been a pleasant and educational experience for me and, I hope, for the readers of the *Journal* as well.



Dear Susan,

While browsing through a hundred-year-old copy of *The Music Trades* magazine (Volume 2, Number 3, April 18, 1891), I found the following article. The author chose to remain anonymous, but identified himself as "An Artist."

Etiquette Of Piano Tuning

Always wear a silk hat if that article fits you, says an English contemporary; it looks well. When you enter a house place your card on the oxidized sauce dish the servant presents to you; it should be small and plain, and engraved, and if you are working for a music firm their name should appear in the lower left-hand corner, very small. Always wear spotless linen; it is expensive, but it counts. Upon entering the parlor, place your hat upon the finest reception chair, and contrive to drape your handsome overcoat upon some expensive chair or lounge.

Open the piano with great ostentation, and try to find a mouse nest in it. If this is impossible then as the next best thing, try to discover moths; the older and richer the family the more likely they will abound... In tuning the piano be sure to set a faultlessly equal temperament, and call attention to the fact and explain it. It will help to mystify the people.

Should you be so unfortunate as to break a string, examine the broken ends with your pocket microscope before the wondering people, and inform them that the per centum of carbon in the steel wire was insufficient, that it became crystalline and broke because it was not strong enough to hold.

Do not spit on the wall or floor behind the piano or in the ornamental fire-place; use the cuspidor; it is more stylish.

Endeavor to study the culture of your patrons and when done tuning, execute a few motifs of symphonies, the *Rhapsodie Hongroise*, No. 2 or a fantasie on *Annie Rooney* or *Johnny Get Your Gun*, as may be acceptable to their tastes.

In receiving payment for your work, dexterously display your purse, bound in silver and lined with gold. In leaving the house carry your satchel of implements gracefully and *en régle*, and leave the servant to close the door after you.

Edward Swenson

As many of you know, I have re-

signed as Technical Editor and Jim Harvey will be taking on the job. Jim's wit and his wide experience as a piano technician are well-known to us through his work as a teacher at Guild functions and as a technical representative for Kawai. He is ready to begin this new challenge, so, this is my last issue as editor.

It would be appropriate to say something witty or at least profound, but at this point what I really feel is gratitude — gratitude for the support and encouragement which has come from so many of you. If I start thanking individuals I'm bound to leave out some of the most important. However, I'm sure you'll join me in an enourmous thanks to my artist, Valerie Winemiller. Not only has she done outstanding work for the *Journal*, but she has been an unfailing and exceedingly accommodating ally. I doubt if the *Journal* readers realize how many times I've gone to her needing several slides amalgamated into one drawing, the lines straightened, the background clutter eliminated, and the perspective fixed just a little — and done soon so I can meet the deadline! She has come through every time. It has been a pleasure for me, and I hope, for you, to have her work in the magazine. If you'd care to drop her a note, the address is 121 Monte Vista, Oakland, 94611.

Speaking of accommodating allies, I can't forget the Home Office crew, particularly Lisa Gray and Larry Goldsmith. Here again I've had nothing but encouragement, tolerance and patience, not to mention just plain professional support. I've also enjoyed and appreciated the same support from the various Executive Boards which served during the past four years.

And there are the writers whose columns have been making the *Journal* — and me — look good all this time. Bill, Fern, Nick, Jack, Rick — it wouldn't have been the same without you.

Now, how to thank the rest? The ones who sent articles, tips, questions or gave freely of advice; the ones who "volunteered" to do a convention class report; the ones who pointed out some of the directions the *Journal* still needed to go; the ones who came up to me with a handshake and a thank you — all of this meant a tremendous amount to me. Editing and writing is a funny thing: material is prepared and published, but the notion that someone actually is reading can be a little remote. The thanks (and criticism) served to keep it real — and to keep me in touch.

In closing, I can sincerely say that this has been a great experience — yes, time consuming, aggravating, demanding and all the rest — but fulfilling, especially for the contact it has given me with my fellow technicians. Do the same for Jim. The *Journal* will be changing — I'll let him tell you about that — but don't foget that it is *your Journal* and that you have much to say about what it will be. Many thanks.

Susan Graham

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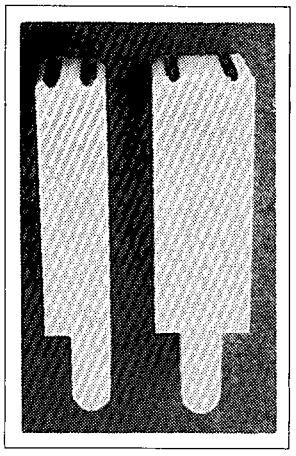

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PRACTICALLY SPEAKING

Using The Table-Mounted Router, Part I

Bill Spurlock, RTT
Sacramento Valley Chapter

The router is a unique and versatile shop power tool, capable of cutting and shaping wood in a wide variety of ways. With the appropriate bits and fixtures, a router can cut grooves, rabbets, and mortises, cut decorative profiles into the edges of boards, form precision wood joints, and even cut holes and circles. Mounting the router in a table greatly expands its usefulness while at the same time improving accuracy and safety. In this article I will present some suggestions for choosing a router and/or router table for those considering adding this tool to their shop, and also explain basic router table operations.

To review some of the possible table-mounted routers in our trade, I refer the reader back to these previous issues of Practically Speaking: February 1990: routing a recess for key bushing cloth across mortises; May 1990: key balance hole repair; November 1990: thinning grand table shanks; March 1991: key end trimmer for removing old key fronts; May 1991: trimming keytop sides; June 1991: trimming keytop notches.

Choosing A Router

Routers come in a variety of sizes and types. In general there are two main categories: plunge routers and conventional fixed-base routers. With a fixed-base router the depth adjustment can be changed only with the router turned off, by loosening a clamping mechanism and raising or lowering the motor in the base. In other words, the bit extension must be set before the cut is started. This means that when using the router freehand to make a mortise cut, the edge of the base must be set down on the board and the spinning bit tipped down into the wood to get started. This is very dangerous for both your project and your body. In contrast plunge routers have a motor that rides on two vertical steel tubes projecting from the base, allowing you to set the base squarely on the work, then "plunge" the bit safely straight down into the wood to a pre-set depth. At the end of the cut a locking lever can be released, allowing the bit to spring back up above the base; this also makes its safe to set the router down on a table before the motor coasts to a stop. This ability to safely start and end cuts in the middle of a board makes the plunge router more versatile than a fixed-base design for freehand work.

Although any router can be mounted on a table, some styles are more suited to this purpose than others. Of primary concern with a table-mounted router is ease of depth adjustment. When the router is mounted upside-down under a table, a complicated depth setting mechanism can be difficult to see, let alone adjust. Plunge routers usually have a simple-to-operate locking lever; however the plunge mechanism is spring loaded, so in order to quickly raise the bit above the table you must both push upward forcefully on the motor, then hold it in place until you tighten the locking lever. This will not work on a lightweight bench top router table since you would lift the entire table up in the air while trying to just raise the bit. To overcome this difficulty most plunge routers are equipped with a fine adjustment knob that essentially jacks the motor up to the correct setting. This provides a very convenient means of making fine adjustments, although it is a little slow if you have to move the bit a long distance.

Most fixed-base routers will work well in tables, as long as the motor is somehow engaged to the base so it will not simply drop out the bottom when the locking lever is released. Some designs use a rack and pinion gear and adjustment knob to crank the motor in or out of the base with ease and control. Others have nubs on the motor body engaging a spiral "thread" in the base, so that the motor is simply rotated to extend or retract the bit. At least one manufacturer, Porter-Cable, makes a router motor that easily interchanges between a conventional fixed base and a plunge base. This provides the best of both worlds - the fixed base is simple to mount and use under a table, and the motor can be removed and clamped into the plunge base in seconds for freehand work. (The Porter-Cable plunge base also fits most other brands of routers having 3 1/2" diameter motors; if you have such, you can convert it into a plunge router by simply obtaining this base.)

Another major consideration when shopping for a router is whether to buy a less expensive and less powerful 1/4" model or step up to a 1/2" type. This decision will depend upon what you intend to use the router for, and what type of work you think you might be doing in the future. The 1/2" routers and 1/2" shank bits are both more expensive, but offer clear advantages in quality cutting, safety, and capability. Obviously, the 1/2" routers have more powerful motors, and thus can take heavier cuts with larger bits. The 1/2" bit shanks are much more rigid than the 1/4" size, so the bits vibrate less and hence cut more smoothly. In fact, there are some large diameter bits with 1/4" shanks that are downright scary to use, especially in a router with much chuck runout. The greater surface area of the 1/2" shanks also makes them much less likely to slip in the router chuck, galling the shank or migrating outward. Since 1/2" routers are the standard for industrial use, there is a much greater selection of bit types in the 1/2" size. All in all, if you can afford it I would highly rec-

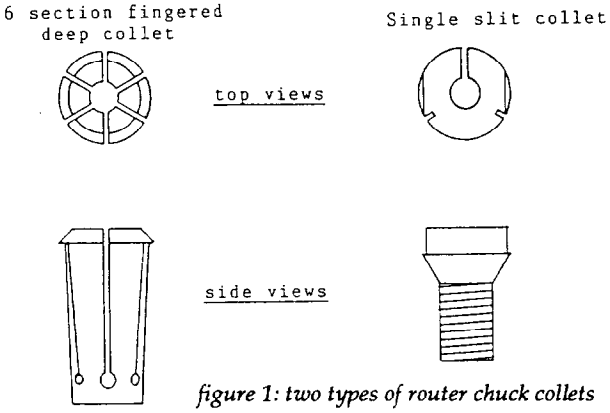


figure 1: two types of router chuck collets

ommend a 1/2" router.

Another feature worth looking at is chuck design. See figure 1. The better routers have a collet (the central part of the chuck that grips the bit) split into multiple (ideally six) sections. This design conforms well to the bit and tends to center the bit accurately. Less desirable is the collet that is a solid sleeve with a single slit down the side. This design is more rigid and so does not conform to the bit as well, increasing the likelihood of slippage and runout. Chuck depth also varies. Many industrial type router bits have very long shanks and require a deeper chuck than your average hardware store router for most secure mounting. Four routers that have deep, precision collets are the Black & Decker Elu (a Swiss import), Freud, Bosch, and the Porter-Cable.

Router Tables

Routers can be mounted in a variety of tables ranging from small portable bench-top models to larger free-standing floor types, and can even be added onto existing shop table surfaces. Consider what table size you would like, your shop space requirements, and if you want to build it yourself from a kit or plans, or buy a ready-made table.

The simplest and least expensive alternative is one of the small portable router tables sold by Sears, hardware stores, or one of the speciality woodworking suppliers listed at the end of this article. Widely available for around $30.00, these typically have a steel or plastic table measuring approximately 12" X 18", with steel legs. Just about any router can be attached to these by screwing or clamping the router base to the underside of the table. This type of table is perfectly adequate for key recovering and much other light work and has the advantage of the low cost and portability. However, its table is too small to handle large boards and its lightweight requires it be clamped to the bench for some jobs.

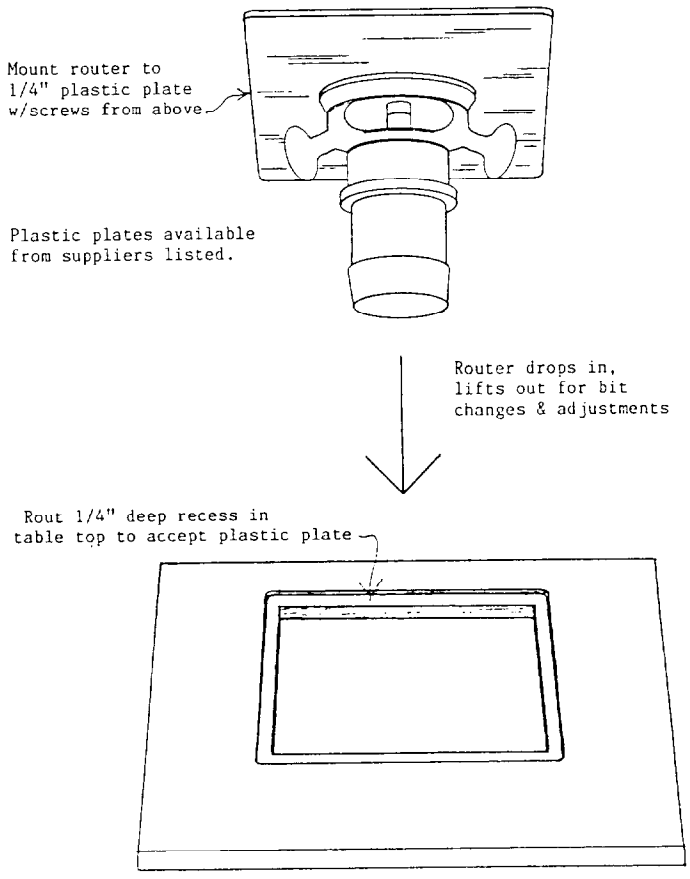
If you would like a heavier-duty table that can handle larger stock you might consider purchasing one of the larger free standing router tables. One such is the Freud, which has a 30" X 21" plastic laminate table on a heavy maple base. It comes with a fence and has a miter slot to accept a standard miter gauge. This table uses the "drop in" router mounting system, where the router is mounted to a 1/4" thick plastic or phenolic resin board and simply rests in a recess in the table top, as shown in figure 2. The advantage of this mounting system is that the router can be just lifted out for the changing bits, and can be used for many freehand routing jobs outside the table with the mounting plate still attached. Check various suppliers for price; the best I have seen is $150.00 from Highland Hardware. This looks like an excellent table, and is still light weight enough to be portable.

Building your own router table might give you the best set-up to meet your particular shop needs. It is not difficult, and can be a constant source of satisfaction as you find more and more uses for this shop work horse. The drop-in mounting system shown in figure 2 makes it simple to make your own table top from any good-quality hardwood plywood or plastic laminate material. I have made two tables using sink cut-outs (the waste pieces from a countertop shop after they cut the openings for sinks) laminated to 1/2" plywood for stability. The slick Formica makes an ideal friction free surface that resists scratching. Look in your Yellow Pages under "kitchens" for countertop manufacturers/installers.

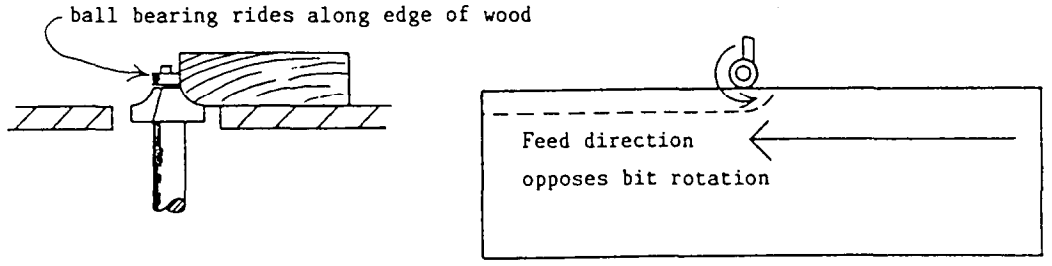
To make your table top, first obtain a phenolic or Lexan mounting plate from one of the suppliers listed. Determine what size opening you will need in the table top in order to allow the router with handles to be lifted easily out the top. Cut the mounting plate about 1/2" larger all around. This usually results in a rectangular mounting plate about 6" X 10". Drill and countersink holes from the top of the plate to accommodate mounting screws to line up with the existing threaded holes in your router base. With the router screwed to the plate and a small straight bit in the router, make a center mark for the bit opening, then cut a hole that will clear your largest bit.

Position the mounting plate as desired on your table top, and draw a pencil line around it. It is usually desirable to have the opening offset closer to one end of the long edges to allow a greater fence-to-bit distance on one side of the table. Clamp straight pieces of

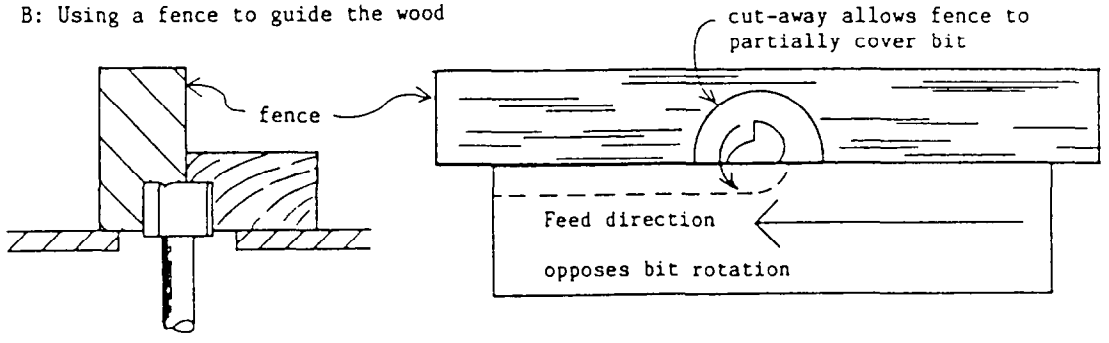
figure 2: drop-in router mounting system



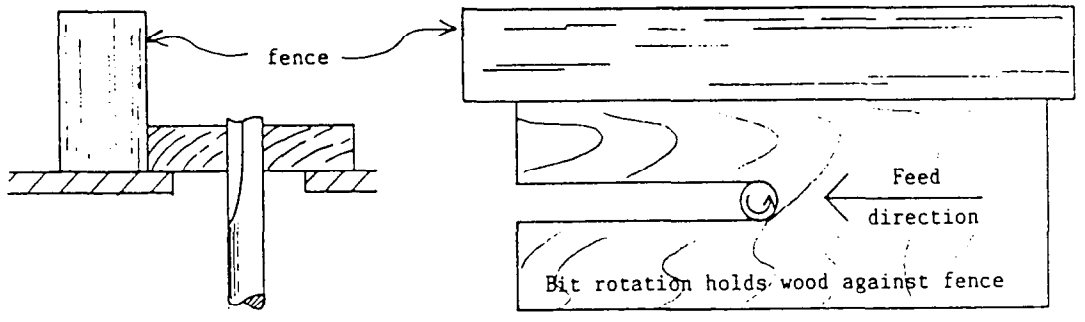
A: Ball bearing guide bit for edge shaping



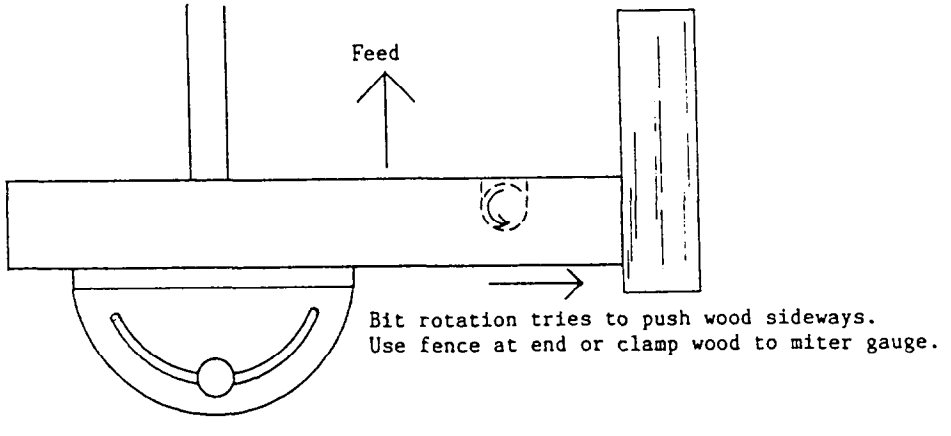
B: Using a fence to guide the wood



C: Using a fence to cut a straight groove



D: Using a miter gauge to rout across a board



wood to the table top in a large rectangle around the desired opening to act as fences for routing the recess for the plate. Using a 1/2" or larger straight bit set to 1/4" depth (to match the plate thickness), route a perimeter recess for the plate. You can then cut out the (smaller) center opening in a similar manner using a 1/4" straight bit and cutting in stages of increasing depth. This leaves a 1/4" deep shelf around the perimeter of the opening to support the mounting plate flush with the table top. The recessed area in the table will have rounded corners; radius the corners of your mounting plate to match. Route a 3/4" miter slot across the table top, located so that your miter gauge will slide past a router bit with adequate clearance.

Your table top can be mounted on a three-sided plywood base to make a bench top unit, or on a taller stand for a floor model. The best way to mount a router is to incorporate it into an existing tool table or bench top. If you have a table saw with extension tubes (for the fence), you can make the router table top described above and mount it between the tubes to serve as a combination router table and saw table extension. With the router bit lowered beneath the table surface it will not interfere with sawing operations, and the saw provides a solid mounting platform for your router without taking up additional shop space. Best of all, your table saw fence can be used for routing operations as well.

Router Bits

The popularity of the router as a small shop tool has mushroomed in the last decade. In fact, serious shop nuts like myself usually end up with several routers! Parallel to this router boom has come an increasing variety of high-quality bits for the professional woodworking trade that are far superior to the basic hardware store variety. These quality bits cut better, stay sharp longer, and are available in an ever-increasing variety of shapes and sizes. If you have had poor results with router work, try switching to a professional quality bit and you will likely see a dramatic improvement.

Some of the better known brands of quality router bits are Amana, Freud, and Bosch. Generally the bits offered by the suppliers listed at the end of this article are of top quality, with the exception of certain Asian imports. Although generally well made, I have found a few of the less expensive import bits to be non-symmetrical and poorly sharpened, and to have sloppy brazing of the carbide tips. For almost all work, especially for routing hardwoods, carbide bits give the best results and last the longest.

Basic Router Table Use

For all router table uses the workpiece must be guided in some way, depending upon the type of bit and cut. Realize that a rotating bit will push the workpiece in the direction of its rotation, and unless restrained by a guide or fence you will have no control over the path of the cut. Several examples are shown in figure 3. An important safety practice with all power tools is to never try to cut very short pieces of wood. Short pieces place your fingers very close to the blades, and at the same time are likely to be grabbed and thrown back at you or cause an unpleasant encounter between your fingers and the bit. To make a small item, start with a longer piece of wood, do the necessary routing operations, and then cut it to length as the last step. Alternatively, devise a fixture to hold small pieces securely as they are run across the router bit.

Bits intended for shaping the edges of wood usually have a ball bearing which rides against the workpiece, providing a guide and limiting the depth of cut. See figure 3A. The workpiece can be a straight board, a circle, or any other shape; as long as it is held in contact with the bearing the edge profile will be consistent. Ordinarily the workpiece should be fed in a direction opposing the direction of rotation of the bit, as shown. This way, the bit pulls itself tightly against the wood and cuts a path for itself as it goes. Where splitting occurs, the initial cut can be made in the same direction as bit rotation to remove the bulk of the material, followed by a clean up cut the other way. You must keep a tight grip on the workpiece when feeding with the bit rotation, since the bit will try to push the workpiece faster than you want to feed.

For many operations the workpiece is guided along a fence. To cut along the edge of a board, the fence must have an opening so it can partially cover the bit, as shown in 3B. If you are using your metal table saw fence, attach an add-on wooden fence for this purpose. As with the ball bearing guide bits, the feed direction should be opposite the direction of bit rotation.

To rout a groove lengthwise within a board, you must consider which way the bit rotation will try to push the board. In the example shown in figure 3C, the leading edge of the bit forces the board against the fence, ensuring a straight cut. If the board were fed in the opposite direction the board could be pulled away from the fence, causing a crooked cut. When cutting a deep slot in hard wood, it is best to make the cut in two or more stages of increasing depth to reduce stress on the bit and guide system.

Figure 3D shows routing across a board using a miter gauge. Here the bit will force the workpiece to the right. If fed from the other direction the force would be to the left. If the bit is too small and the cut shallow, the workpiece can probably be held to the miter gauge adequately by hand. However, for heavier cuts, the board will have to be clamped to the miter gauge or a fence positioned for one end of the board to ride against. A sandpaper covered facing board attached to the miter gauge will help to grip the work.

Always stop and "dry run" a cut in your mind before turning on the router. Look to see which way the bit will rotate and what forces that will place on the workpiece.

Conclusion

Much more information on router equipment and techniques can be found in the catalogs available from the suppliers listed below. In particular I would recommend the book "Router Jigs and Techniques," by Patrick Spielman, available from most of those same sources.

Next month I'll present plans and instructions for some specific router projects useful to our trade. Among them will be: a jig for shortening and bevelling the tails of molded keytops, a jig for filing perfect square joints on replacement ivories, and a technique for repairing split spinet music shelves.

Suppliers of Router Equipment

Highland Hardware: 1-800-241-6748, Woodworker's Supply: 1-800-645-9292, Trendlines: 1-800-767-9999, MLCS Ltd.: 1-800-533-9298, Grizzly Imports, Inc.: 1-800-541-5537 (West) 1-800-523-4777 (East), Cascade Tools, Inc.: 1-800-235-0272.

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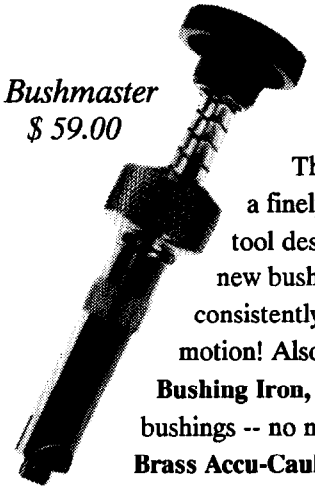

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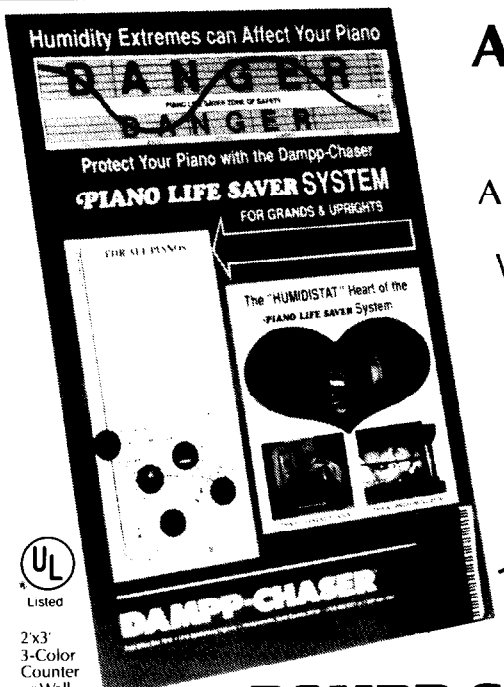

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TUNING UP

More On Octave Tuning

Rick Baldassin, RTT
Tuning Editor

After my class at the recent convention in Philadelphia, I was talking with Bill Clayton, RTT, from Charlotte, North Carolina, about the subject of octave tuning. During the course of the conversation, he gave me the following letter on octave tuning:

Tuning The Octave

One day I was watching a respected colleague trying to tune an A3-A4 octave on a Baldwin 243 piano using his Accu-Tuner. No matter what he did, he didn't like the result. I asked to give it a try aurally. Using his Accu-Tuner he measured the result as being wide of a 2:1 octave but narrow of a 4:2 octave. "That can't be," he said, and continued his search.

Since then I have expanded my search on the octave to explain the above result as well as to try to redefine what we, as tuners, really hear when we properly tune octaves.

When we tune an octave I have often wondered just what we should try to hear. Reading articles in the *Journal* would lead one to believe that from C3 to C5 we should be trying to compare either the fourth and second partials, the sixth and third partials, or some compromise between the two. Various tests are then given to help determine where the octave lies in relation to the partials.

We are led to conclude that the width of an octave is related to the partials in the manner of a 2:1 octave being the most narrow, then 4:2, and 6:3 the widest.

I suppose if one tunes only concert quality instruments the above descriptions would hold true. But, I, and most of you, have to live in the real world and tune pianos of various makes and quality of scaling. This reality then makes the above information nice to know, but not very practical when working on the not-so-perfect real pianos which make up the bulk of our business.

Using an Accu-Tuner I have done some very simple research into octaves and partials which has led to the following conclusion: From C3 to C5 we tune 2:1 octaves *all the time*. I am sure there are those who will disagree with this conclusion and will present some good arguments against it. I must admit I am just beginning to learn what makes a tuning good.

When we tune 2:1 octaves we make them a little wide, perhaps one-half beat per second (BPS) wide on average, varying from a perfect 2:1 to as wide as three-quarters of a beat.

A convenient interval to use to test this theory is the A3-A4 octave. Tune A4 to A4 at 0.0 cents, then tune A3 to A4 at -4.0 cents. This will produce a strong 2:1 beat of one BPS which will be much more prominent than any beats which may be present in the 4:2 or 6:3 partials. Then reduce the 2:1 octave deviation to -3.0,-2.0, and -1.0 cents and notice what happens. The octave will improve. How-

Figure A

YAMAHA CF 9'

first note partials:		2nd	4th	6th
first note and cents deviation:	A3	0.0	2.6	9.1
second note and cents deviation:	A4	0.0	1.9	7.2
second note partials:		1st	2nd	3rd

What I did in each example was to tune each octave to a perfect 2:1 relationship as indicated by the 0.0 in the first column, and then measure the indicated partials. In order for stretching of the 2:1 octave to occur, according to conventional wisdom, the fourth and sixth partials of the lower note, A3 in the above example, must be larger than the second and third partials of the upper note, A4. The difference at the 4:2 level is only 0.7 cents, and at the 6:3 level 1.9 cents. Therefore a match anywhere from the 4:2 to the 6:3 level would be tolerable. Therefore conventional wisdom applies.

YAMAHA G1

first note partials:		2nd	4th	6th
first note and cents deviation:	A3	0.0	2.8	9.1
second note and cents deviation:	A4	0.0	3.1	8.1
second note partials:		1st	2nd	4th

first note partials:		2nd	4th	6th
first note and cents deviation:	C3	0.0	-1.2	4.1
second note and cents deviation:	C4	0.0	0.3	3.5
second note partials:		1st	2nd	3rd

At A3-A4 the octave is 0.3 cents narrow of the 4:2 while the 6:3 is one cent wide. But at C3-C4 the 4:2 is 1.5 cents narrow and the 6:3 only 0.6 cents wide. Both octaves could be tuned a cent or so wide of the 6:3 level and sound good.

Figure B

LESTER 38

"

first note partials:		2nd	4th	6th
first note and cents deviation:	E3	0.0	0.2	4.0
second note and cents deviation:	E4	0.0	2.3	5.1
second note partials:		1st	2nd	3rd

This example shows that both the 4:2 and 6:3 levels are more narrow than the 2:1.

The final example is the Baldwin 243, 45" studio, with which we are all familiar.

BALDWIN 243

first note partials:		2nd	4th	6th
first note and cents deviation:	C3	0.0	0.7	7.9
second note and cents deviation:	C4	0.0	4.3	7.9
second note partials:		1st	2nd	3rd
first note partials:		2nd	4th	6th
first note and cents deviation:	D3	0.0	2.2	8.7
second note and cents deviation:	D4	0.0	2.5	6.8
second note partials:		1st	2nd	3rd
first note partials:		2nd	4th	6th
first note and cents deviation:	A3	0.0	6.1	15.6
second note and cents deviation:	A4	0.0	1.0	5.3
second note partials:		1st	2nd	3rd

Looking at the A3-A4 octave we can see a 5.1 cents difference at the 4:2 level which would, if matched, produce 1.25 BPS at the 2:1 level, and a 10.3 cents difference at the 6:3 level which would produce 2.5 BPS at the 2:1 level. Both are unacceptable.

Since we tune to A-440, the A3-A4 octave is our starting point and the tune of this octave sets the overall sound quality of the finished tuning. The 243 must be tuned narrow of the 4:2 partials in order to produce good results. Again, the 2:1 octave from one cent to three cents wide works best.

The D3-D4 octave tunes close to the 6:3 partials while the C3-C4 octave needs to be a little wide of 6:3.

This all goes to demonstrate that within our normal temperament range the rules of conventional wisdom apply for some intervals, and can vary on the narrow or wide sides for other intervals. And the variations, from wide through normal to narrow, can all occur within the temperament range of the same piano. No wonder tuning can be so complex.

The only interval that remains constant in octave tuning is the 2:1. It is always tuned somewhere from pure to a little wide of pure, to suit your individual taste. The same cannot be said of the other intervals we use as references. Therefore we tune only 2:1 octaves.

The best way to tune an octave is to take it wide of pure and then bring it back toward pure so that it sounds good. If the 4:2 or 6:3 partials happen to coincide, that is OK, but if they don't, that is OK too. The last thing we should do is think that an octave should conform to some preconceived mold of matched partials and then force the octave into that mold using various tests or visual aids.

For good octaves use your ears and common sense. Do not use any tests or visual aids. Just listen.

ever as you approach a perfect 2:1 octave the 4:2 and 6:3 partials could become bothersome. Generally, but not always, the best sounding octave will be a 2:1 octave with about one-half beat of stretch.

Consider the examples in *Figure A* and *Figure B* taken from real pianos.

*****

Our thanks to Bill for his letter. Upon reviewing this material, two thoughts come to mind. First, as with most things, rules are established. These rules are generally fairly simple and straight-forward. Then follow several pages of exceptions to the rules which must be learned. "I before E, except after C...." We don't throw out the rule just because the opposite is true after C, or in the word "neighbor." The rule works most of the time, so we keep it. Second, reducing our concept of octaves simply to what is happening at the 2:1 level is overly simplistic. It is like saying anything you would like to purchase costs a penny or more.

The problem child which Bill refers to does present some interesting problems, and I am sure there are many other examples which present this type of problem. In my class on bass octave tuning, it was demonstrated that in cases where the piano was well-scaled, the placement of the lower note of the octave was easily found, and that the placement of the note followed what Bill called "conventional wisdom."

Usually, the term "conventional wisdom" applies to thinking that is without merit or out-dated, which use is continued out of habit, or because the user doesn't know any better. I don't think that this is the case here. I think Bill has come upon one of the legitimate exceptions to this wisdom. So you remember all that stuff I have been writing about for the past five years? Well, it works all the time, except for a few notes on the Baldwin 243, and any other place it doesn't.

Seriously, there are good reasons to pay attention to the relationship of the higher partial levels. For example, if we keep the fourth partials in line with each other (in a nice smooth curve), this will allow a good progression of intervals which involve a fourth partial. In the temperament region, these would include the Major thirds and fourths. Gen-

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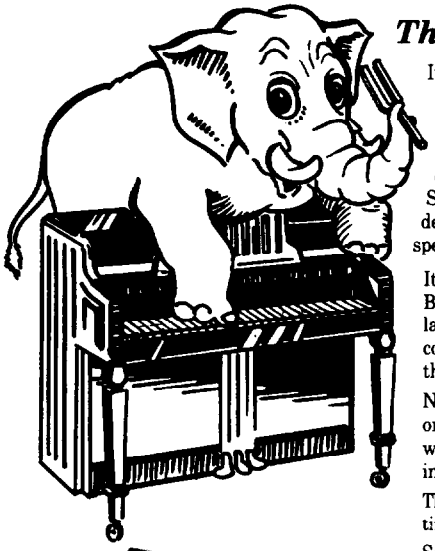

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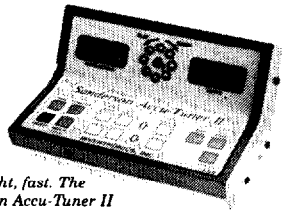

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erally speaking, as well, it is more accurate to tune listening to a higher partial level, which gives the lower partial levels by division, rather than tune on the lower partial level and obtaining the higher levels by multiplication. For example. if we assume we can tune to within 0.1 cents, if our error is 0.1 cents at the fourth partial, then the error at the first partial would be 0.1 cents divided by four, or 0.025 cents. That same 0.1 cent error at the fundamental would be multiplied by four, or 0.4 cents at the fourth partial.

I know this is hard to imagine, but it could be possible that the best possible tuning of the impossible octave on Bill's piano, considering the entire piano and not just the one octave in isolation, is not where the octave sounds the best, and that correcting the problem with this one octave could create a myriad of other problems which might have to be dealt with throughout the entire tuning. It is a depressing thought.

What Bill says about the 2:1 octave is true, and so it is not harmful to think this way, but it does, as Bill mentioned, preclude the use of the many octave tests which can help to keep us consistent, and not wandering all over the place.

Remember that conventional wisdom says to be leery of wound string on the tenor bridge, when the tenor bridge has plain strings and takes a dog leg at the end, going across breaks, and on any piano from which there is less than 36" for your tuner to hit the floor.

Until next time, tune between 4:2 and 6:3 except on Baldwin 243, or when it sounds like "h e _ _" (pronounced "hey") as in.... Well, I think its time to go now. Sorry, no more time for question or comments. Complimentary letters are still accepted.

Rick Baldassin
Tuning Editor
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GOOD VIBRATIONS

The Business Of Piano Rebuilding: A First Look

Nick Gravagne, RTT
New Mexico Chapter

Last month's article dealing with the American dual-economic system painted no rosy picture for the small businessman. That the entrepreneur has a harder row to hoe than the blanketed and powdered salaried professional is not news to the small business community. Like the American Revolutionary militia, non-uniformed (at first) and essentially fighting a guerrilla war, the small-time business operator can only survive in an economy which is really not set up for him by being exceptionally resourceful, dedicated and motivated. It is hoped that this series on economics for the piano rebuilder/technician will remind us that rebuilding pianos can and should be a legitimate business enterprise. Success lies not only in facing the hard realities of our economic system, but in overcoming a multitude of technical shortcomings, and in finding the right professional attitude and niche. We need to talk and write about such matters periodically.

Incomes Compared

Many piano technicians, particularly those with college degrees, wonder if they could make either a better living, a more secure one, or prestigious one if they worked in another field. Due to the esoteric and even hidden nature of the piano tuner's world we can eliminate the prestige factor from our economic considerations. Although the piano technician's clients and customers, especially those owning expensive grand pianos, may hold in the highest regard "his" or "her" piano tuner, the rest (and largest) segment of society hasn't a clue as to how the music world at large works, let alone how piano technicians fit into it. Pesky doubts remain for some technicians. Could a better and more secure living be made working in another professional field? Clearly, not all piano technicians have the option of hanging up their tuning hammers and starting a new career. Still, many do. More to the point, however, the piano technician needs to have some sense of what other professionals or trades-people are earning in his geographic area, and then compare *in a relative way* his income with theirs. In any case, the piano technician must know for himself what income is necessary in order to purchase a decent quality of life.

Why? Simply because there might be no other way to set not only pricing policies, but educational and professional goals as well. There can be no better reason for attending PTG seminars and conventions, for example, than to learn of the technical, business, and professional attitudes evidenced by the many instructors and attendees. Not to involve oneself in such pursuit is to create a career vacuum and a reclusive personality. It is easy to lose touch not only with piano-economics, but with the rest of the economic world and one's own potential and possibilities. Changes occur daily within the industry which affect career advancement and regression (similar to the vicissitudes of the stock market). The economic engine is dynamic, and as such does not tolerate static individuals or businesses. Hence, for the piano technician, setting pricing policies and professional goals cannot be separated from continuing education.

Since there exists in the ranks of piano technology an extremely varied cross section of personalities, age, family size, educational and financial background, raw talent (oftentimes untapped), and the like, it would be impossible to compare in a general way other career choices and incomes available to the piano technician. But I can at least assess my own circumstances. To be sure, the following comparison and analysis is arbitrary, but it does serve to make a point.

Without tabulating the pros and cons of my personal traits, situation, and educational background, suffice it to say that for me those areas of practical interest and natural ability as far as careers go lie either in engineering or in education. Let's take engineering. Had I gone into the field at the time I entered piano technology, I could easily be earning (here in New Mexico) a minimum of $45,000 per year plus benefits — pension, health and other insurance policies, vacation pay and other perks — which would effectively boost my salary to $52,000. Considering no other income or expense, Federal taxes based on my family of six would roughly work out thus:

taxable wages	$45,000
(less IRA contributions)	(2,500)
adjusted gross income	$42,500
(less standard tax deduction)	(5,450)
(less six exemptions dollar deduction)	(12,300)
taxable income	$24,750
taxes paid from IRS tables (1990)	(3,709)
social security taxes withheld (7.65%)	(3,443)

Now, take-home pay works out thus:

wages	$45,000
(less social security taxes)	(3,443)
(less federal income taxes)	(3,709)
(less IRA contributions)	(2,500)
after-taxes/contributions take-home	$35,348

This final amount, which breaks down to an income of $2,946 per month, represents available cash to pay the usual bills for mortgage or rent, food, clothing, etc. When the company-paid benefits are added in, the *effective* available cash-per-month adds up to $3,529.

Analyzing this simple arithmetic it becomes obvious that in order for me to do as well as a piano technician I need to earn an annual after-tax *net* income of $42,348 (12 times 3,529). From this after-tax income every sort of personal need — not business need — must be purchased — all insurances, shelter, food, commodities, vacations, transportation, private music and art lessons, etc.

Expenses — They Purchase Income

But being self-employed means that income can only be generated at cost. Said another way, all dollar expenditures are like investments — they must earn their way by "purchasing" more dollars. Any expenditure that can't carry its own weight must be dropped. Usually, the piano rebuilder's expenses are considerably higher than that of the field technician in that he or she must purchase rebuilding materials such as pinblocks, action parts and so forth. True, the customer pays for these, but as far as a seasoned cost accountant or the IRS is concerned, financial records reflect only two accounting categories: debits and credits, otherwise known as expenses and revenue.

Now no two technicians have exactly the same conditions generating those expenses which purchase income. Still, a general rule for small-shop rebuilders is that roughly one-half of total income is lost to expenses. There are wide variations here, so for the sake of brevity a breakdown of usual and possible expenditures will not be tabulated. But it can be easily imagined that, in addition to the usual expenses such as telephone and transportation, a significant outgo can be realized to such non-tax accounts as parts and materials, casual and part-time or full-time help, outside services such as refinishing or other sub-contracting, specialty tools, equipment, and shop space.

If, for the sake of this article, the one-half rule is accepted (and over the years it more or less bears out), then in order for me to net an after-tax $42,348 per year, I have to gross at least $84,696. But wait! The self-employed have to pay the full social security punishment on net income at a whopping rate of 15.3%. In addition, unlike the company worker, he is awarded no hidden, non-taxable benefits. So without going into the additions and subtractions, my gross income as a rebuilder needs to reach $95,000 in order for me to effectively have the same taxable income as a salaried engineer, or to be able to purchase the same quality of life. This large yearly gross will be modified downward as this series continues, and other accounting and business practices are factored in. For the moment, however, let's accept it as a point of departure. (Note: For field technicians or other rebuilders with different income-to-expense ratios the reasoning still holds in principle.)

A Preliminary Look At Setting A Price

Now what do I have to do to gross $95,000 per year? As a monthly figure this reduces to $7,916, and as a weekly figure (divided by 4.33) it further reduces to $1,828. If we allow for a 40-hour work week, then an "hourly shop fee" for parts and materials as charged to the customer (remember, we are working with gross) works out to be $45.70. To a piano rebuilder who more or less accomplishes the same work on all pianos that come into the shop — refinishing, new soundboard, bridge caps, block, action — a single number such as the hourly shop fee is all that is necessary to quote bids for such work. Of course, the experienced rebuilder should also be a good scribe, or have hired one, since reasonable records must be kept documenting the number of hours and dollars costs sunk into the typical rebuilding project, or partial project. Since people work at different levels of speed and motivation, it is useless to state that an all-out rebuilding project should take X number of hours. But let's say that 300 hours is necessary for the rebuilder working alone to actually to all the work, including making the soundboard and refinishing the case. The hourly shop fee times 300 hours equals $14,250 — not out of line for, say, a Steinway A or O in some locales. Doubtless there are rebuilders around the country who will say the number is too high or low; such assessments are not the point of this article.

It should be remembered here that this method of backing into a price structure for a total or partial rebuild has been arbitrarily based on the income of a professional working in the engineering field. The number of possible erroneous conclusions which can be drawn by bringing in all sorts of other professional incomes is enormous. It is expected that the reader will exercise reasonableness. In any case, the piano technician can set a net income goal and then estimate the gross income required to meet that goal by following or modifying the reasoning as found in this article. In industry, particularly the medium to small business, the sales price is set by beginning with a figure that a certain item is likely to sell for, and then analyzing all production costs required to make the item. If, after adding on a margin of profit, the item appears possible to produce, a decision is made to go ahead. Piano rebuilders and technicians can also use this method of price setting. Still, the biggest single cost item for the rebuilder is number of hours on the job.

Now, taking a breather, what have we ascertained at this point? Simply, that if I want to effectively earn what I could have as a salaried engineer I need to charge a grossed hourly shop fee of $47.50, which includes time and materials, for an all-out rebuild. For the moment we are avoiding complicating factors such as sub-contracting costs (sometimes incurred either by choice or necessity) to have various facets of the job done "out of house." Also, we are ignoring the accounting practice of delineating between labor and materials as separate cost items. Thus, at this point in the discussion we have determined that if a rebuilder working alone takes 300 hours to complete the project, the customer's fee will have to be $14,250. But what if there aren't enough well-heeled or sophisticated people in New Mexico who can afford this. Then several choices present themselves: 1. do the quality job anyway and accept a lower standard of living; 2. change careers, if possible; 3. cut corners, do a lesser job and charge less; 4. finish the job in fewer hours and without compromising quality; 5. hire a shop crew than can account for a significant portion of that total 300 hours, thereby lessening the amount of time I must spend on the job. If I want to stay in piano rebuilding then choices four and five are what I must concentrate on.

The Essence Of Cost Accounting

In industry, management relentlessly focuses attention on costs—hence the evolution and high priority role of the cost accountant. Were the company to realize a $100 increase in costs along with a $100 increase in revenue, the cost increase would be considered the more significant of the two since it directly affects, dollar for dollar, *net* profit. Conversely, a $100 reduction in costs indicates a like $100 increase to net profit without ever having made a sale. It is oftentimes easier for the firm to control costs, hence increase profits, than it is to generate the relative sales necessary to increase net profit by the same amount that a cost-cutting measure would. As mentioned, the piano rebuilder's largest single cost item is time spent on the job. If, however, the piano rebuilder were to imagine himself not as the business owner, but rather as an outside consultant who charges the business a fee for rendering specialized service, his costs and business sense would attain a certain perspective. We will return to this presently (and in a future article), but first a more easily grasped problem needs to be solved — that of applying fast but accurate shop skills. These should be considered a given, or developed into such in a reasonably short time.

Speed is of the essence. If everything else remains the same, the faster one completes the job the more money one makes, or has the potential to make. As piano tuners we all know this. But speed is the enemy of quality. Nonetheless, there is a point where, for the individual craftsman, optimum speed and quality meet. This point won't be the same for everyone, but everyone must find it, and then become comfortable with it. The shop and work areas must be neat, organized, with all tools and materials quickly available. Such shop conditions, beyond being efficient and cost effective, are a pleasure to work in, and induce safe work habits. The work in progress should flow logically and without hitch; the the technician should have mapped out, if only in the mind, the necessary tools, supplies, work areas, and general flow of the work. All of this, and more, are the signs of professionalism — and cost-cutting.

With reasonable speed and shop efficiency in place, personnel is the next critical cost-accounting consideration. To a point of diminishing returns, the amount of money to be made is inversely proportional to the owner's number of hours spent on a given project. Said another way, the fewer hours he or she works on the job, i.e., others are completing it, the more money he or she makes. This is so *if* the total price is not reduced in order to meet or beat competition. Industry demands a human, robotic, and mechanized work force for the same reasons—to make more money for the owners and/or to meet or beat competitive prices. It was mentioned earlier that piano shop owners might better consider themselves as consultant-specialists hired by their own firm to accomplish the most highly-skilled tasks. Simpler jobs can be delegated to semi-skilled or apprentice workers at a lower rate of pay. We will pick up here next time in order to have a closer look at these last statements.

Keeping It Simple

The intention of this article is to provoke thought, to set the stage for what is to follow. The small businessman can only do so much, know so much about a hundred different aspects of being in business, or spend any significant time in records keeping. I reject any thinking promulgated by some specialists and consultants that the small operator, beyond his or her area of expertise, must become expert in the myriad aspects of running a business. Hence, one must now be a computer and communications wizard, become as shrewd as Rockefeller, as slick as a Madison Avenue advertiser, become an accounting, tax, and business manager of impeccable insights and habits, a Dale Carnegie disciple, a holistic evangelist of mind and body, and much more. Certainly, some knowledge and instinct are important here, but there is only so much time in the day, and the business operator's normal tasks of plying a trade are sufficient enough to fill it.

So I make this promise: Following articles, although stressing the need for records keeping, will not be a dry and useless study in cost accounting or a diluted version of the *Wall Street Journal.*

The businessman, like the working engineer who has at his fingertips science boiled down to a handbook, must also have access to not only specific shop techniques, but the simplest yet effective records and business keeping methods.

SOUND BACKGROUND

The Career Of Hermann Von Helmholtz And His Devices For Acoustical Studies

Jack Greenfield, RTT
Chicago Chapter

Hermann von Helmholtz (1821-1894) was a versatile German scientist responsible for major advances in musical and physiological acoustics as well as in other branches of physics and physiology. The theories he developed and scientific information he obtained by his experiments are remarkable, considering the crude test devices he had to use. Included among his important studies are: analysis of musical tones by resonance, combination tones, physics of harmony, physics of tone quality, acoustics of vocal sound, and the physiology of tone perception. He also wrote on some phases of music theory including the development of musical scales, tonality, modes, harmonic structure and style. An expert pianist, he investigated the influence of hammer design and interaction with vibrating strings on piano tone. He also provided advice on the application of some of his principles to piano design in correspondence with Theodore Steinway in New York.

Helmholtz's Education

Helmholtz was born in Potsdam, the oldest of five children. His father, a former army officer, taught philosophy and literature at a secondary school which Helmholtz attended. His father also taught him Greek, Latin, Hebrew, Arabic, French and Italian at home. Helmholtz also had a deep interest in music, art and other cultural activities.

During his early studies, Helmholtz displayed great aptitude for physics but since his parents could not afford to finance his university education completely, he applied for a scholarship in medicine and was accepted by the Friedrich Wilhelm Institute in Berlin. Acceptance required his commitment to serve as an army doctor for eight years after his received M.D.

During four years (1838-1842) as a medical student, Helmholtz took courses in physics, chemistry and higher mathematics in addition to the regular medical classes. For recreation he played the piano. He became an accomplished pianist. After Helmholtz graduated from medical school and passed the state medical examination, he was assigned to the army regiment in Potsdam to serve as a surgeon.

Helmholtz's Early Research

While carrying out his military duties, Helmholtz had time also for research in a small laboratory he set up in his barracks. He did his initial work in physiological chemistry. At that time, physiologists had limited understanding of the process of physiological actions. Helmholtz considered inadequate the vague explanations he was taught. He contended that physiological processes were subject to the same effects of chemical reactions and physical forces as non-living systems. He and some former classmates were among the first scientists who initiated studies of physiology from the standpoint of physics and chemistry.

His first project was a investigation of the chemical changes in the muscles during the production of energy for muscle action. In 1847, he presented a paper on this work to a meeting of the Physical Society of Berlin. Besides describing his experiments, he provided a discussion on general physical principles of the conservation of energy, a subject then widely debated by physicists. The paper attracted considerable interest and won him great respect. In recognition of his scientific ability, in 1848 he was released from military duty for an appointment as associate professor of physiology at Konigsberg University. He now began research study on the speed of nerve impulses. This led him to work on the physiology of vision and hearing.

Helmholtz Becomes Interested In Acoustics

Helmholtz's interest was drawn to acoustics during the early 1850s. He began to concentrate his attention on acoustics in 1854, continuing intensive studies until 1862, although he had moved in 1855 to a position as full professor of physiology in Bonn, and then in 1858 to a major position as professor of physiology at Heidelberg. He published his first paper on a subject in acoustics in 1856 while at Bonn, "On Combination Tones," or the "Tartini Tones." Two years later he presented "The Physical Causes Of Harmony And Disharmony" and "On Air Vibrations In Pipes With Open Ends." Later papers he prepared after coming to Heidelberg include "On The Quality Of Vowels" (1859), "On The Motion Of The Strings Of A Violin" (1860), "On Musical Temperament" (1860), and "On The Arabic-Persian Scale" (1862).

His most important publication on acoustics by far, was his book "On The Sensations Of Tone," first published in 1863. Primarily a textbook containing historical as well as scientific information, the book includes material from his previous papers and from studies of other scientists, earlier and contemporary. Part I is concerned largely with the physics of musical tones and the physiology of their perception. Part II covers combination tones, beating, consonance and dissonance. Part III discusses musical scales, tonality and harmony. The

appendices contain more technical mathematical theory and details on Helmholtz's experiments.

Helmholtz's Later Work

Helmholtz also carried on studies in physiological optics and general physics at the same time as his work in acoustics. After publication of "Sensations...," and the paper "Telephone And The Quality Of Sound" (1877). He accepted his final position, Director of the Physico-Technical Institute of Berlin, in 1887, where he spent the last seven years before his death in 1894.

Helmholtz's Double Polyphonic Siren

An important factor contributing to Helmholtz's achievements was his ability to conduct meaningful experimental studies in spite of the limitations of the devices then available for laboratory research. At mid-19th century, the best that could be done to measure frequency of musical tones was matching the pitch of tones from a calibrated siren emitting puffs of air at a determined frequency. Helmholtz first used a type of siren which H.D. Dove had introduced in 1851. The rotating disc of the Dove siren contained a series of four air jets directed toward four concentric rings of holes. The air jets could be opened or closed individually or in any combination to give single notes, intervals or chords. Helmholtz later developed a more elaborate modification of the Dove siren. It consisted of an assembly which held two Dove sirens in a single frame, one above the other and driven by the same shaft. The perforations of the discs were spaced to produce all eight tones of the just diatonic scale. Besides pitch measurements, Helmholtz used his double siren to produce intervals for the study of combination tones, consonance, beats and other phenomena.

The Helmholtz Cavity Resonators

Helmholtz developed an ingenious technique based on his theory of resonance for analysis of complex tones. It involved identifications of partials by the resonant response of the cavity resonators he designed. These consisted of hollow spheres with an opening on one side through which sound entered and an aperture shaped to fit the ear of a hearer on the other side. The production of tones with a distinct pitch by the oscillations of air in such vessels with large interior space but with a small mouth, can be demonstrated by blowing across the opening of a jug or a beverage bottle. Due to the "springiness" of the enclosed air, the pressure within the vessel fluctuates rapidly from slightly above to slightly below the outside air pressure. This forces air to pulsate rapidly in-and-out of the opening, thereby producing the sound waves that reach the ear. The "natural" frequency of the vibrations of tones produced in this way depends upon the size and shape of the vessel. The larger the volume or the length of the opening, the lower the frequency — but the larger the cross-sectional area of the opening, the higher the frequency. When a cavity resonator is placed where it can receive external sounds containing a component that matches its natural frequency, the resonator will respond with a tone that has a definite pitch of that frequency. Sound waves from the eternal source provide the energy to drive the resonant oscillations of the air within the cavity resonator.

When Helmholtz began his resonator experiments, he used spherical glass vessels prepared by modification of chemical laboratory glassware such as retorts. As his work progressed, he developed a formula for determining the volume and opening area for producing a specific pitch. He then had a set of special glass spheres made up to his specifications. These ranged from 1 1/2 to six inches in diameter. The final form of resonators he adopted, consisted of thin sheet metal spheres with openings on opposite sides for receiving external sound waves and for listening to the resonant responses.

Helmholtz Resonance In String Instruments

While analysis of complex tones with Helmholtz cavity resonators is an obsolete method now, the phenomena of cavity resonance is an essential element in the production of musical sounds in some instruments in which a large volume of air is coupled to the air outside through a small opening. In string instruments such as members of the violin family, the resonance characteristics of the air enclosed, as well as those of the wood body, influence quality of tone. The design of these instruments is such that they function as Helmhotz resonators. The natural frequency of oscillation giving maximum resonant response is called the *main* air resonance as well as Helmholtz resonance. This frequency depends on the relationship between the size of the sound hole openings, the thickness of the plate at the openings and the volume enclosed.

For instruments of the violin family, the sound-hole openings are in the shape of an "f." A tone at the pitch of the main air resonance can be produced by blowing across the "f" opening in the same way as blowing across the top of a beverage bottle. In scientific studies, resonant response characteristics are usually determined by plotting resonance curves or loudness curves based on data obtained with suitable laboratory equipment (October 1990 *Journal*, page 36).

In bowed string instruments of good quality the resonances are fairly wide and of such strength and distribution that they would minimize the differences of response across the range of notes. In studies of some fine violins, the main air resonance was detected at the approximate pitch of the open D string and the main wood resonance a fifth higher at the approximate pitch of the open A string. Because of the complexity of form and variety of woods used, the body vibrates in a complex pattern of modes, producing a series of additional wood resonances at the pitch of higher notes. The resonances reinforce not only notes with neighboring fundamentals but also lower tones with nearby partials.

Among other types of string instruments, the Helmholtz resonance effect on tone in guitars is similar to that in violins. The cases of harpsichords and clavichords are closed on the bottom to form sound-boxes but the oscillations of the enclosed air do not contribute directly to the quality of tone. They do, however, influence the motion of the soundboard. The traditional sound-holes, sometimes decorated with rosettes of cast metal or parchment and veneer were placed there primarily for ornament.

Helmholtz's Just Harmonium

The development of the "free-reed" organs during the first half of the

18th century, as a substitute for pipe organs in small churches and homes provided Helmholtz a convenient means for producing musical tones for his acoustics research. After the earlier appearance of several less satisfactory instruments, a French instrument maker, Alexander-Francois Debain patented an improved model he named the "Harmonium." In this instrument, the reeds are mounted directly on top of the wind chest. Air pressure is provided by a pedal-operated bellows. Each key of the keyboard controls a valve that opens and shuts the air supply to the corresponding reed. Most other European instrument makers later also adopted the harmonium principle of pressure bellows operation. In the United States however, instrument builders generally designed reed organs to operate with suction bellows.

Helmholtz wrote that he selected the harmonium for his experiments because of its uniformly-sustained sound, piercing tone quality, sensitivity to deviation in intonation and distinct production of combination tones. In contrast with the more closely spaced partials of piano tones, free reed partials are much further apart — theoretically the next two partials above the fundamental (f) occur at approximately 6f and 17.5f.

Helmholtz acquired a large harmonium built by J. and P. Schiedmeyer of Stuttgart. The instrument had two keyboards with two registers of reeds for each keyboard. It was tuned by the manufacturer according to Helmholtz's directions. One register of reeds for each keyboard was tuned in equal temperament. The other two registers of reeds were each tuned in Pythagorean intonation with just fifths, but differed in pitch by a syntonic comma (the difference between a just and a Pythagorean major third, approximately 22 cents). This was an arrangement first suggested by Euler in 1732. The tuning procedure was quite complicated with steps requiring that some notes of one keyboard be tuned to notes of the other keyboard. The intervals for the tuning process were just major thirds and fifths. Tuning accuracy was checked by listening for beatless triads. (Reeds are tuned by scraping the surface of the reed at the tip to raise pitch or at the base to lower pitch.)

The unusual tuning of the harmonium made available a much larger range of just tonal and harmonic resources than the limited possibilities of a single 12-note octave in just tuning. By selecting the proper note from each keyboard and considering some as enharmonic equivalents, it was possible to play all major scales in the cycle from C-flat to B and eight minor scales in just intonation. The instrument provided 15 each major and minor chords (including enharmonic duplications) in just intonation. In addition, the registers in Pythagorean tuning and equal temperament made it possible for Helmholtz to compare characteristics of intervals and chords in three different intonations. ≣

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Correction Note

The following line was omitted after the last line on page 23 of the August 1991 article: "...an expandable bellows operated by the player's arm. The name *Akkordian* was first used in Vienna in 1829 for an..."

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October 11-13, 1991	**Texas State Association 1991 Seminar** The Crest Hotel, Austin, TX Contact: Mary Smith; 2002 Oxford Avenue; Austin, TX 78704 (512) 462-0212
October 17-20, 1991	**1991 New York State Conference** Sheraton Inn, Buffalo Airport Contact: Robert Tarbell; 358 Bedford Avenue; Buffalo, NY 14216 (716) 873-5465
November 8-10, 1991	**North Carolina PTG Conference** Adams Mark Hotel, Charlotte, NC Contact: Eugenia Carter; 4317 Commonwealth Avenue; Charlotte, NC 28205 (704) 568-1231
January 3-4, 1992	**Arizona State Seminar** Aztec Inn, Tucson, AZ Contact: Bob Anderson; 5027 E. Timrod Street; Tucson, AZ 84711 (602) 326-4048
February 21-23, 1992	**California State Convention** Red Lion Hotel, Ontario, CA Contact: John Voss; 2616 Mill Creek Road; Mentone, CA 92359 (714) 794-1559
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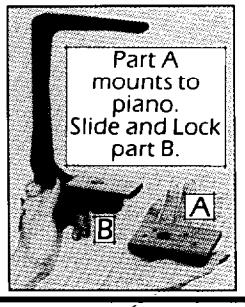

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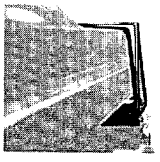
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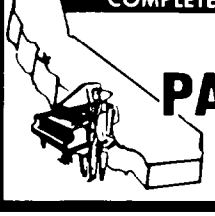
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AUXILIARY EXCHANGE

President's Message

The Northeast is still in the grip of a terrible drought. We have been carrying water for our vegetable garden sine we returned from Philadelphia and have had only one significant rainfall during the entire month. Our shallow well has gone dry and we have now run a hose from our house's deep-well supply of water to down near the garden, where we fill pails to keep the tomatoes, lettuce, beets, and broccoli coming. This, of course, takes place before or after heading out to do the tunings.

Imagine my surprise to receive a letter from the home office early in August setting the dates for the planning committee meeting to be held the end of September at the Hyatt Regency Sacramento. This will be for the 35th Annual PTG Convention and Institute and, as many of you realize, we just catch our breath from one convention and then plunge into the work of the next. Tomatoes notwithstanding, the work of the Guild Auxiliary goes on!

My airline reservations were made yesterday morning and I'm going over some of the comments from the questionnaires collected at this year's convention, which many of you were interested enough to fill out. You can be sure these will be given serious attention at the planning meeting in September.

There were two statements, most shocking to me, that accused the Auxiliary members of being unfriendly. "My wife was very disappointed by the lack of friendliness of Auxiliary members at this convention," complained one husband. "If the Auxiliary wants to grow, people should be friendlier!" advised another respondent.

I have always found Auxiliary members to be the friendliest people to meet and to be with among all my friends and acquaintances. They seemed even friendlier than others among my former college chums or my local friends. The locals probably know me, and my various foibles, better and therefore keep a safer distance!

I began to wonder if I were guilty of being unfriendly. I know my office as President involves a good deal of running around and last-minute problem-solving at conventions. Sometimes my attention span may be less than perfect while I'm trying to remember everything I have to cover at meetings, additions that must be made to programs, introductions, etc. Are too many of us too busy to be friendly? I certainly hope not.

If we, the Auxiliary members, are giving the impression of being less than friendly we'll have to review our attitudes and try to be more "sunshiny." I wish I knew the situations which prompted the two complaints. I wonder if there were others who felt this way, and I hope we can put forward the friendly faces and warmth that we have always been known for in the past.

Arlene M. Paetow

From Your Editor

This is my second attempt at putting together the copy for the Auxiliary Exchange. I can't stress enough that this is *your* magazine. If you have comments, suggestions or contributions please don't hesitate to contact me. We have an international distribution, and I'm certain that readers would like to hear from all corners.

In the next few months I would like to highlight the area around Sacramento to whet appetites for the upcoming convention and institute. I would also like to share regional highlights and activities and need "field reporters." Please don't feel uncomfortable about submitting any articles or information no matter how short or long.

I plan on sticking in the occasional "blurb" about things related to the season as well as information gleaned about business practices and other "helpful hints."

As the saying goes "Keep those cards and letters coming in!"

Greetings From Pakistan

(Editor's Note: The following descriptions of life in Pakistan were sent to Beva Jean Wisenbaker by LaVeta McGary who has been a member in the Houston area. Beva Jean was kind enough to forward the letter to me for inclusion in the Auxiliary Exchange. LaVeta is teaching nursing in a Seventh Day Adventist hospital in Karachi and is apparently also doing missionary work with her husband Bill. These are excerpts taken from LaVeta's letter sent to a number of people and I have pulled out the tidbits which best give a taste of life in Pakistan.)

Dear Friends,

I want to get this letter written to let you know that we're alive, and at the moment, well. We are living about a mile (kilometer) from the hospital while they remodel our apartment. They are painting and putting in a tub. Our apartment has one door, with 14-foot ceilings and is made of concrete. It is at the intersection of Jinnah Blvd. and Depot Lines and the *noise* from the traffic is awesome.

Karachi is a city of 14,000,000 (million) people. Traffic is hair-raising. Here's a brief description of some of the vehicles: A huge 1950s bus with people packed all over, in and on it, with the women in a caged area in front; small cars in all conditions, mostly dented; water and sewer trucks gaily painted; golf carts decorated and used as cabs; a motorcycle with a

family of five on it — baby in father's lap sound asleep; camel carts hauling a load of lumber; a mule cart hauling rebar for a building with at least 50 pieces dragging out the back. The aroma is awful — much like a compost heap.

As Principal of the nursing school my duties are staggering. Nursing Education here is for girls ages 15-30 who are single or widowed. They must score at least a C on their 10th grade exam and pass an entrance exam. The first three years is basic nursing and the fourth is midwifery. When they finish they must stay and work at the hospital one year for each year of their schooling. They are not allowed to marry but may have sanctioned boyfriends. I have 96 girls in the school, and fortunately only 26 have sanctioned boyfriends. This part of my life is a real soap opera!

We would love letters, cards, home videos, etc., but most of all your prayers. LaVeta and Bill McGary; Karachi Adventist Hospital; P.O. Box 7289; Karachi 3 Pakistan

A Longing For The Country

When Julie Berry introduced me as the new Auxiliary Editor a couple of months ago she stated that my husband Mike and I "raise alfalfa hay" among our activities. She was only partially correct. We do have horses, which we board out, and we have been "brokering" a little alfalfa locally. However, we don't have acreage for the little "gentleman's farm" yet. So, in the meantime we're working toward getting moved out to a small parcel. We're not talking cash crops or large numbers of livestock, but to us it'll be "the farm."

All of this interest leads to an Andy Rooney-ish question "Did you every wonder... Why so many barns are painted red? Architecturally, barns change from region to region, but wherever you go, a traditional barn is usually painted red. Even new barns which want to look traditional will get covered with a shade of red anywhere from scarlet to a deep brick red.

In the late 1700s farmers began to realize that some sort of wood preservative was needed for the outbuildings. (Prior to that time it had been considered garish to paint the barn.)

Lampblack was used which, when applied, turned the wood grey. Northern farmers came up with a combination of iron oxide, lime and milk which was a strong red color. Eventually red and barn were synonymous.

Anyway, file this little tidbit of trivia away. You never know when you might be able to dig it out and use it at one of the upcoming holiday gatherings!

A Spooky Idea

An easy way to make ghost decorations for the Halloween season involves Elmer's glue and a piece of cheesecloth or very lightweight cotton batiste or gauze fabric. You will also need an inflated balloon or other rounded surface for drying your ghost.

Simply cut the fabric into the desired size (an 18" to 24" square makes a centerpiece-sized ghost.) Pour the glue into a shallow dish and add water to thin the glue. A 50/50 mix of glue and water seems to work well.

Dip the fabric in the glue mixture to thoroughly wet it. Squeeze the excess out with your fingers and open the fabric out flat. Lay over the balloon or whatever you are using for a mold.

Let the fabric drape over your mold and the ends lay down onto the table surface. An inch or so of fabric laying around the base of the ghost's body will dry and enable the ghost to stand up on it's own.

Once the ghost is completely dry you can draw eyes on it or leave it plain. A "gaggle" of these of all sizes on a tabletop or hanging in a doorway would be a cute and easy seasonal decoration.

Notice

The new Bylaws as ratified in July will be included in the November Newsletter.

To comply with the Bylaws, anyone desirous of submitting changes, please have them to the Bylaws Committee Chair by November 1, 1991.

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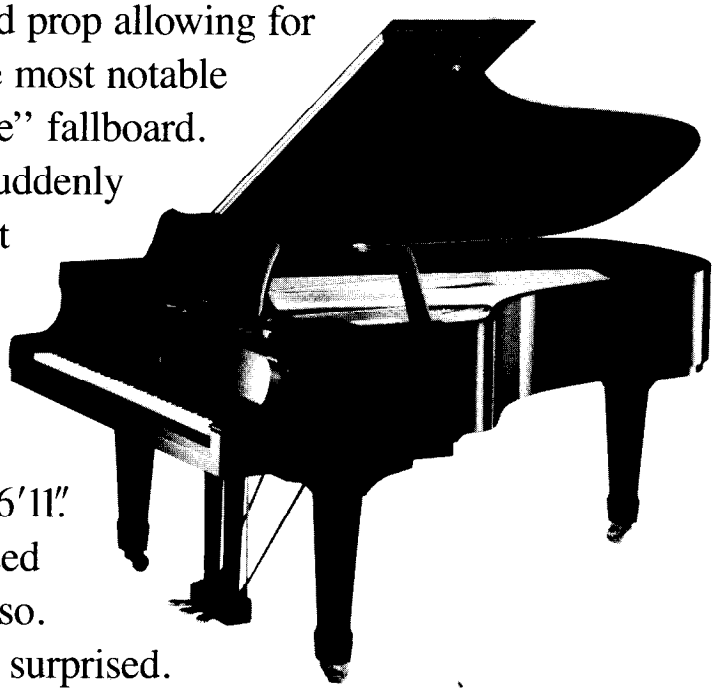

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Tech Gazette

Yamaha Piano Service October, 1991

From the Engineers

In last month's issue of Tech Gazette, we talked about a couple of new features that have been integrated into our new line of grand pianos. Some of these changes are aimed toward better "user options" for the musician, such as the 3-position lid prop, the 5-position music rack, and the soft-close fallboard.

Other changes we've talked about are purely technical in nature. These include the new plate mounting system and the mortised pinblock. This month, we would like to continue with two more improved technical features.

The first is the boxwood cap that will be found on the top section of the treble bridge on all of the Conservatory grands. Boxwood, by its nature, is an extremely dense, fine-grained wood. Our engineers have determined that because of its close-grained hardness, it serves the purpose of a bridge cap better than any other material. The bridge cap must be very hard for two specific reasons:

1. To sustain the sidebearing pressure of the strings against the bridge pins throughout the life of the piano.
2. In combination with the rest of the bridge, to act as the transfer point between the string vibration and the soundboard.

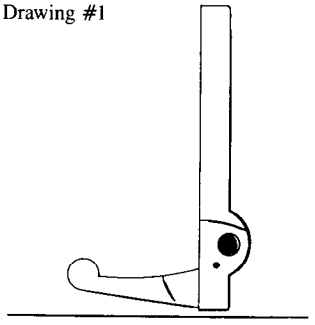
Of course, we don't want the bridge to absorb any string vibrations, but rather to transmit them to the soundboard, where they are actually amplified. The density found in boxwood allows this to happen. An added benefit of boxwood is that its make-up is naturally resistant to cracking or splitting, and will help maintain the solidity of the bridge better than any other material. This combined benefit will enhance both the performance capabilities and the technical integrity of this exciting new line of Conservatory grand pianos.

Over the years, as you're no doubt aware, refinements have been ongoing in all Yamaha pianos. As a technician in the field, you may not be familiar with all of these improvements. But one that has just been incorporated in both the new G and Conservatory grands is worth mentioning.

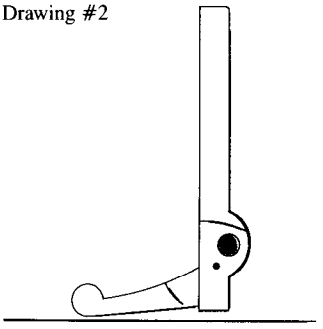
Prior to 1980, the jack was characterized by a 90 degree angle at the jack stem or tail (see drawing #1). This was used in all of the grand pianos. Since 1980, the angle of the jack stem or tail was increased (see drawing #2). This resulted in an improvement in touch and repetition. Now, an additional refinement has been developed and implemented. The top of the jack now has a slight angle that results in faster, smoother repetition (see drawing #3).

Although this may look like a small refinement on the surface, the resulting improvement in repetition is quite significant. What it does is give the pianists that "little bit more" that they are always looking for. It's the little *edge* that Yamaha is always striving to deliver. This new version of the jack is incorporated into all the new G and Conservatory series grand pianos.

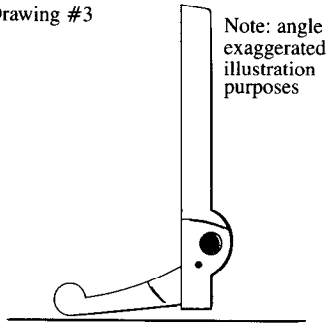
Drawing #1



Drawing #2



Drawing #3



Note: angle exaggerated for illustration purposes

Yamaha will Participate in

DISKLAVIER™ SERVICE SEMINARS:
October 28 - November 1
November 18 - 22
PTG CONVENTIONS:
October 3 - 6, Ohio State
October 11 - 13, Texas State
October 17 - 20, New York State
November 8 - 10, North Carolina State
LITTLE RED SCHOOLHOUSE 1992:
January 6 - 10
February 3 - 7

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OCTOBER **UPDATE** 1991

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

Marketing: Committee Sets Priorities

Keith Bowman
Marketing Committee Chair

This is the first in a series of articles about marketing as it relates to the Piano Technicians Guild. It will also provide an opportunity for the reader to keep informed about the activities and progress of this committee. This article will address the structure of the Marketing Committee, review our charges, and define the projects that we currently are working on.

But first, let's review the term, *marketing*. What is it, exactly? My dictionary defines a market as an opportunity for selling, to market as to expose for sale, and marketing as the process of selling.

The most important point that can be made is that marketing is a *process*. It is a way of structuring our minds and our businesses to satisfy the needs of our clients. In our profession, marketing may involve research to identify or quantify the target group, or clientele, and define their needs. And then, a way to communicate the value of our services to individuals in that group through such means as advertising and community relations, for example. It also means doing any number of things to *keep* that client base.

To do these things effectively means developing a marketing plan or strategy, and then deciding on tactics to execute such a plan. This is just as important for a sole proprietor as it is for a large corporation. You likely are already using many marketing techniques in your own business. While such components can be short-term in nature, the marketing plan itself is a long-term investment.

So how does all this fit into the PTG? The first observation I made, after Council voted unanimously to create this committee, is that we as an organization are ready to commit to long-term planning. What do we hope to achieve with this direction? A stronger position in the music industry, a higher recognition factor with the piano-owning public, more appeal for non-members, and most important for us all as individuals, better membership benefits.

At this point, I would like to address what this committee intends to achieve, in terms of the charges mandated to us:

•Implement the overhaul of PTG brochures. We have prioritized some initial brochure projects, which are work-in-progress, and I will go into detail later in the article. Brochures, technical bulletins, and other business aids are the main focus point this fiscal year, considering the committee budget and the fact that this overhaul is long overdue.

•Work with a marketing firm to develop an organizational logo. One of the first pieces of advice heard from all marketing firms contacted was to get a logo, or graphic representation. Ideas on possible logo designs can be developed and brought to Council in the form of a presentation. Council delegates in turn can take these ideas back to their chapters for consideration. Due to our legislative structure, we are probably looking at 1993 Council to actually approve any new logo design.

•Coordinate and implement a marketing and public relations program for PTG with a marketing firm. We have just begun our relationship with the Phelps Group. This group has an excellent track record in media relations and all other components of a marketing campaign, and they are fully equipped to help us launch a program that is right for us. Before we can embark on any program, however, we must give ourselves time to learn how to work with them, and to provide them with a solid organizational identity. I will have more to say on this in future articles.

•Committee charges also specify keeping the PTG Board and Executive Director regularly updated on progress of the marketing and public relations programs. This ties in with the structure of the Marketing Committee.

The committee is composed of myself and six other members: Janet Leary, David Patterson, Carl Root, David Rostkoski, Steve Schell and Gracie Wagoner. In addition, due to many other members interested in helping, a network of 33 individuals was formed. Their names appear at the end of the article. This network will help the core committee with resources,

continued on next page

Marketing...

planning, and help stimulate and process input from the membership. Board members receive network mailings, and Regional Vice Presidents in particular will benefit for having current information for their newsletters.

Finally, I would like to talk about the six current business aid projects that we are working on. The first is a membership solicitation brochure. This was started first because the Phelps Group already had most of the material needed, and being non-technical in nature, it was easier for them to prepare. The hardest part was deciding on the type of cover design, as this will be the common graphic element for all such brochures, or, collaterals.

Manufacturers' quotes, or, "How Often Should My Piano Be Tuned?" is another that needs updating, and we are communicating with manufacturers to develop the content for this brochure.

As to the other four projects, we plan to have the content material developed close to the distribution date of this *Journal* edition. There are two more brochures: general piano maintenance and information, and one targeted to music educators and performing artists. And the first two of a new technical bulletin series, one explaining pitch-raising, and the other regulation.

We are working with the Marketing Committee Network to decide where next to turn our attention. Other possibilities include additions to the technical bulletin and brochure series, a newsletter for clients, a service record book, recital programs, and other such business aids.

This is where you come in. What products could help you in your business? I invite you to contact a committee or network member and give us your ideas. I plan another article for the December issue and expect to have further progress to report on all aspects of Marketing Committee activity. Until then, please discuss any and all issues contained herein with your chapter, and let us hear from you!

Marketing Committee Network:
David Abdalian
Robert Anderson
Ron Berry
Dick Bittinger
Larry Caldwell
Gina Carter
Mike Carraher
Walter Connell
Bruce Dornfeld
Jim Ellis
Fred Fornwalt
Ward Guthrie
Phil Gurlick
Clayton Harmon
Marshall Hawkins
Norman Heischober
Preston Hutt
Mitch Keil
John Lillico
Jessica Masse
Don McKechnie
Tom McNeil
Lorelle Nelson
Webb Phillips
Randy Potter
Steve Smith
Christopher Solliday
Robert Stephanson
Kent Swafford
Lou Tasciotti
Mike Travis
Matthew Wrensch
Jack Wyatt

Supplement Delayed

A supplement originally scheduled to accompany the October issue of the *Journal* has been delayed until the November issue. The supplement will include minutes of the 1991 Council meeting, 1991-1992 committee assignments and charges, and revised Bylaws, Regulations and Codes.

The Soundboard

To The Soundboard:

The Southeastern Pennsylvania Chapter says thank you to all of you for your participation in the first-ever tool and parts auction held at an international convention. This was the first time something like this was ever tried at the convention. Several of us had experience with auctions, and it's always something people enjoy, both buyers and sellers. So, we decided to have one at a national convention so you could enjoy it too. From the looks of the faces on the video, it appears that you did.

With the huge crowd, table upon table of sale items, several auctioneers and a new process to contend with, careful planning really paid off in a smooth event. We have all been gratified at the way the auction ran. Speaking of running, we did a lot of it, but it was a lot of fun.

We owe a special thank-you to Young Chang America for their sponsorship, in the form of sumptuous buffet tables.

There was talk of repeating this type of event at future conventions. If any of you would be interested in undertaking such a project, we would be happy to share our experiences with you.

Ruth Brown

Action Models Available

Three-note action models for use in administering the Guild Technical Examination are again available from the Home Office. The action models, made by Kimball Piano Division, are $150, plus shipping.

Continuing Education Program Begins Operation

After several years of study, a program of continuing education opportunities was approved by the 1991 Council in Philadelphia. As reported by Continuing Education Committee Chairman Phil Gurlick in last month's *Journal Update*, the program begins operation this month.

The program features a handbook titled "Passport to Excellence" which contains the regulations and a copy of the application forms for recording credit hours accumulated. The Handbook was developed by the committee, which also includes Ellen Sewell and Greg Shaffer. Handbooks and forms may be requested from the Home Office. Seminar directors and chapter program chairs are asked to request copies to have on hand.

Here are the continuing education regulations as published in the program handbook.

Purpose - There are new developments being made constantly in the field of piano technology. The Piano Technicians Guild feels that it is very important for the technicians to keep abreast of new developments, and to continue to increase their knowledge of the field in general. Therefore, to encourage and reward active participation in educational opportunities available to technicians, the Continuing Education Committee has instituted this program to promote ongoing education in the field of piano technology. The Program should increase member participation in Guild sponsored and other functions which will benefit all members.

Eligibility - The Continuing Education program is open to any RTT member of the Piano Technicians Guild in good standing.

Enrollment - To enroll in the CE program, the RTT need only begin keeping track of eligible activities on a CE form, and gathering the required authorized signatures for each class or program. No prior registration is immediately necessary, as the participant will send the records to the Home Office for validation by the CE Committee upon completion of the CE requirements.

Credit Hours - The numerical unit for record keeping is designated as a credit *hour*. All Guild-sponsored educational functions will automatically be eligible for credit hours. Each credit hour corresponds to one hour of class time or other educational function. For example, a 1.5-hour class at a Guild Institute would be valued at 1.5 credit hours. Hours are valued in a like manner for all Guild-sponsored educational programs, whether they are chapter-, regional-, or Institute-sponsored. To be Guild-sponsored, a program must be presented under the auspices of a chapter, regional seminar/state group, or the Guild Institute. Programs falling outside these guidelines would be recorded under the Independent Study category. Chapter meeting technical sessions should normally be assigned a value of 1.5 hours, for uniform record keeping.

Only chapter meetings having a technical/educational session will be eligible for credit. A social meeting does not qualify. Chapters which have fewer meetings per year but longer technical sessions may assign an hours valuation to the session which corresponds to the length of the actual technical session. Meetings of members outside of regular chapter meetings, such as work on chapter rebuilding projects, etc., should be listed under the Independent Study category.

An eligible function such as a one-day seminar should generally not be valued at greater than six hours, the amount usually available at a full day of Institute classes.

Validations - The participant should have his or her attendance at a sponsored function validated by the instructor's signature on the appropriate line of the CE form. The instructor may empower a member present at the class to assist in the validations. One instructor or designate may validate the period for a mini-technical or other multiple-instructor-style program. Officers of host chapters may designate members to validate attendance at special partial- or full-day seminars, so as not to burden instructors. Recognizing that instructors also obtain an educational benefit from giving and preparing for classes and technical sessions, they may receive the same CE credit as an attendee of their class. This would not prevent an instructor from also taking independent study credit for the time spent in class preparation, especially if it involved special research.

Chapters should designate a member or members to validate chapter meeting attendance - usually the Secretary. A member or officer of the chapter may be empowered to keep an attendance log and validate chapter attendance on a yearly basis.

Independent Study - Twenty percent of the hours necessary for completion of the CE requirements may be fulfilled through independent study. This study can take the form of manufacturer seminars, trips to piano factories, or other private study. Each hour of independent study will correspond to one credit hour. No more than six hours

continued on next page

Education...

can be accumulated in one day of independent study.

Independent study requires no pre-approval, though the independent work must be directly related to piano technology. Indirect subjects such as tax planning or record keeping are not eligible.

A complete description of the independent study work should be submitted with the CE forms upon completion of the CE requirements. Routine piano service work or activities such as simply reading the *Piano Technicians Journal* should not be considered independent study. Activities such as study of piano service books or literature, or experiments with different service methods and applications are acceptable.

Independent Study is not required as a portion of the CE credit. It should be considered an option.

CE Requirements - To complete the requirements of the CE program the applicant must accumulate a total of 120 credit hours, 24 of which may be independent study. Upon completion of these requirements, the applicant will send copies of the validated CE forms to the Home Office along with descriptions of independent study work, if any. These records will be forwarded to the CE committee for evaluation and approval.

Upon confirmation that the applicant has fulfilled the requirements of the CE program, the applicant will receive a handsome certificate, suitable for framing, signed by the President of the Piano Technicians Guild and the Chairman of the Continuing Education Committee. Each RTT who completes the CE program will also be mentioned in the *Piano Technicians Journal.*

While working on the requirements for the CE program, it is strongly suggested that the participant keep copies of all validated forms in separate locations for safekeeping. The participant may use as many separate forms as is necessary or convenient, as long as one form contains the totaled amounts of hours when submitted. Copies of all validated forms must still be submitted with the form containing the total.

Sponsoring groups at all seminars are encouraged to have CE handbooks and CE forms on hand at all functions for those who may not have them. CE forms may be photocopied.

The CE certificate is renewable. Upon being awarded a CE certificate, the participant may begin accumulating credit hours for another. Since the certificates are dated, there will be an incentive to maintain a current award.

New Written Exams Ready For Use

Corrected versions of the new Guild Written Examination approved by the 1991 Council have been distributed to all chapters. The exam was produced in two versions, one printed on green paper, the other on yellow. Each version includes a set of test questions and an answer template for use in grading. A three-part answer sheet can be used with either exam.

Dates & Deadlines

October 11-13, 1991
RTT Tuning and Technical Exams. Texas State Seminar. Austin, TX, Chapter Test Center. Application deadline: September 11, 1991. Contact: Bill Cory, 711 Landon Lane, Austin, TX 78705 (512) 472-9358

RTT Tuning and Technical Exams. Dallas Chapter Test Center. Contact: Walter Connell (214) 942-2827; for technical, Will Nieberding (214) 247-4084

November 1, 1991
1992 dues invoices to mail

November 7, 1991
RTT Tuning and Technical Exams. North Carolina Conference Test Center. Application Deadline: October 15, 1991. Contact: Bill Clayton (704) 392-7836 for tuning exam; or Bill Alexander (704) 455-2998 for technical exam.

November 28-29, 1991
Thanksgiving — Home Office closed

December 24-25, 1991
Christmas — Home Office closed

December 31, 1992
New Year's Eve — Home Office closed

January 1, 1992
1992 Annual dues officially due

New Year's Day — Home Office closed

January 31, 1992
Unpaid membership dues delinquent

February 3, 1992
1992-93 officer nominations to Nominating Committee Chair

Amendments proposed for 1992 Council due to Bylaws Committee Chair