Piano Technicians Journal

April 1983


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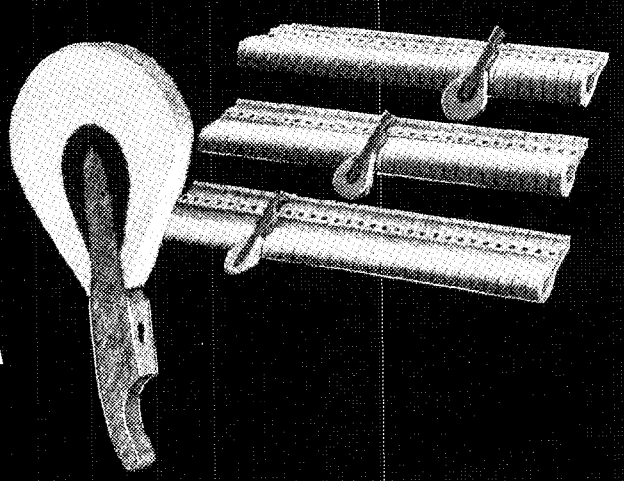

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Piano Technicians Journal
Official Publication of the Piano Technicians Guild

April 1983
Volume 26, Number 4

CONTENTS

Cover: The stringing process of the Kimball Viennese Edition Professional Grand Piano is shown on the cover. The initial tension is applied to the plate and inner rim assembly. Bass stringer Jeff Kendall demonstrates how the strings are added in sequence using half-gauge wires. This process is followed by the first stage of tuning, known as chip tuning.

Photo by John Carnes.

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The February issue of the Journal contained an ad submitted by the San Francisco School of Piano Technology, indicating that one could "learn piano tuning in 3½ weeks."

Many members expressed their indignation and wished to express their opinions regarding this ad. A technician spends years and years in learning his trade, and it is obvious that the highly skilled profession cannot be learned in the time indicated.

The San Francisco school has agreed that they will no longer insert this claim in their ads. This statement represents the school and the school alone, and the validity of the statement is hereby officially rejected by the membership and officers of the Guild.

Editorial

It seems to me that this is a good time to talk about money. There is a notable lack of it and it seems to get into an awful lot of conversations. I am hearing reports from across the country that things are kind of slow for piano people but they seem to be gradually picking up. When the financial squeeze is on it is perfectly natural to look at money in a different light. People have only three choices when faced with a money problem. They can increase their income. They can decrease their expense. They can also do a little bit of both. In any event, it is an uncomfortable feeling and their attitudes are bound to change towards those with whom they do business.

I came across an article written by Charlie Huether back in July of 1974. The title was "Dedicated to Piano." It had to do with people's attitudes toward the technician when times were slow. I quote a paragraph or two to illustrate what I'm getting at. "The anxieties over a slowing of income can only make one tense and worrisome, and these attitudes sometimes carry over into our business relations with customers."

"In addition, it always seems that when times are slow and we grow anxious, the customer seems to be more unreasonable, more irritating and more difficult to deal with and to satisfy. These are the times when we run into most of our trouble with our customers."

I'm sure this observation holds true for not only Piano Technicians but for most business people — particularly those in the "service" field. This is a time that requires patience and reasonable discussion. While the service may be exactly the same as before, performed in the same manner with the same degree of skill and dedication, it suddenly is questioned and becomes suspect. More often than not, it's simply an "anxious state of mind" and a more than average concern for "getting the most for their money." This is a time when the Technician must take the time and trouble to point out the various facets of his technology, why he is doing the things he is, the necessity of it and the degree of skill and understanding it takes to get it done properly.

Most people have no idea what a piano technician is up to when he tunes their piano. They see a little bag of tools, they hear the sounds, they know he spends the time, they see him making adjustments and repairs and it looks perfectly simple to them. Something one might pick up out of a book or learn as a hobby. They have no concept of the time, patience, education/learning, years of practice and skill it takes to become a fully qualified, certified and properly trained technician. On the surface, it looks like so much "tightening of wires" and listening to sounds. This is what we call "bits and pieces" information in our field, Association Management. It occurs when a person judges an entire profession based on what he or she sees on the surface. They have no training or background in the field, have no idea what lies beneath the surface in terms of education, training and experience, know little of the detail involved but still tend to draw quick, simplistic and often incorrect conclusions.

I might use as an example the last time I had my piano tuned. The young man was a fully qualified technician, pleasant and skilled in both his demeanor and his performance. He, of course, was a member of the Guild. After looking over the instrument he announced that it would need a "double tuning." It had been long overdue and I (of all people) had not gotten around to having it taken care of. My first reaction was, do I really need it or is he taking advantage of me? Times were good, I was not worried or concerned about money, so I simply said, "sure, go ahead and do whatever is necessary to make it right." I was perfectly satisfied that he was doing what had to be done.

If money were in short supply, I might not have had my piano tuned at all unless I needed it for a specific reason and/or we made use of it regularly. One has a tendency to move toward the vital necessities of life when it comes to shortages of cash. If I *did* have to have it tuned I would think twice before I agreed to a double tuning because of the additional cost. I might need that extra money for food on the table or a mortgage payment.

We have the same problem in our business when it comes to providing services to our client organizations. They want to skip the frills and get only those things done that are vital to the organization's continued existence. When their income from their respective businesses comes up short they take longer to pay and take a harder look at their dues payments (as well as their other spending). This is not the time to raise budgets, increase dues, spend money on non-necessities or luxuries. This is the time to negotiate for services, cut out the fat, and reduce the work load. This is why we are not increasing the budget next year, not increasing the dues next year, holding the costs to absolute minimum, and will still do our best to satisfy the membership and maintain the work flow.

From the technician's point of view, he/she must take special care to explain

what he/she is doing and why he/she is doing it. Convince the client — even with their limited knowledge of the subject — that it is imperative that the work be done for the proper performance of that piano. Convince them that you are just as concerned with the cost since you too must watch your spending in these difficult times.

To quote Charlie further, "To get back to the slow seasons, don't let the crotchety customers and the dilapidated pianos get you down. Keep that smile on your face and extend the same friendly hand in greeting each customer. Embrace each of those awful instruments as if they stood on the concert stage and accept their challenge."

Everybody faces the same problems in business in bad times. Difficult customers, suspicious attitudes, unreasonable demands for more services for less money, questioning on competitive prices, etc. An old saying is, "There is hardly a product or a service that somebody somewhere cannot provide cheaper by cheapening it." This holds true for the Piano Technician and the artist, for the lawyer and the doctor, for the Piano manufacturer and the rebuilder. In his last paragraph Charlie states that "aggravation is more debilitating than physical labor. Keep it to a minimum and sit down to a good supper, refreshed."

The International Scene

Fred Odenheimer, Chairman
International Relations Committee

An interesting study would be to compile figures of piano production throughout the world. Is it growing, decreasing or just remaining stationary? It also naturally depends on the number of years we consider in such a survey. Looking back to the years after World War II, it seems that American production of pianos has held fairly steady in the ± 200,000 column until 1981. 1982 certainly was a difficult year for the industry. In Western Europe (Austria, Finland, France, Great Britain, Holland, Italy, Sweden, Switzerland and West Germany), it seems production fluctuated quite a bit.

While there was piano production in Japan since the turn of the century, manufacture really only took off after WWII when the piano became a generally accepted and desirable instrument in the Japanese home. Production peaked in 1980 at 392,545 units (source: Das Musikinstrument) but has fallen back since then to perhaps the 350,000 level.

Production of pianos in Korea is very likely still on the rise. Other countries to consider would be Canada, Mexico and Brazil, with considerable capacity in the Far East, Taiwan and China, and in Eastern Europe, Russia, Czechoslovakia and East Germany. There should be other countries not mentioned but production probably is insignificant. So what would total world production be, 700,000 or 800,000 units a year? Perhaps some of the readers have an answer.

Our best wishes go to Louis Renner, Stuttgart, Germany, on the 100th birthday of their founding. From small beginnings, Renner actions and parts today certainly have a world-wide reputation for fine quality. I must mention the fact that their main factory today is in Odenheim, a small town near Heidelberg. This fact caused me to stay overnight there some years back in a little guest room above the factory.

Our best wishes also go to "Das Musikinstrument" on their 30th anniversary.

If you still feel you want to attend the IAPBT convention in Japan, April 10, 1983 is the absolute deadline for registration. Your registration fee of $350.00 has to be in Japan by April 15. Latecomers immediately contact Fred Odenheimer, 15358 Wyandotte St., Van Nuys, Ca 91406 or phone (213) 785-8402. If you cannot go then become a member of "Friends of IAPBT." Yearly dues are $15.00.

President's Message

Ernie Preuitt
President

Change

Some years ago when I moved from the country to the big city, I found myself having to make many adjustments. Not having inside plumbing out in the country, I found myself referring to the "privy" on many occasions. I also caught myself going to the "cellar" instead of the basement. My stove is in the cellar (basement), it is very expensive to operate, but at least I need not carry out the ashes. Down home I walked just about every place I went and knew where I was going, while here in the big town I was forced to use public transportation and expose my ignorance by asking the conductor where I was to get off.

Until recently I thought I had seen changes never dreamed of, but each year now brings us unbelievable changes. It used to be all time pieces had a round face with two hands. Now, sometimes we must look a second time to tell the time, due to the many faces and numbers on the tiniest of clocks. Wife can now cook a complete meal in the microwave during a TV commercial. Typewriters are no longer typewriters, but word processors. Even the adding machine that Santa brought us a few years ago is obsolete, due to the several hand held calculators cluttering up the top of my desk.

It has, not suddenly but slowly, dawned on me that if one does not at least try to accept these changes, one will soon find that he is quite alone in this busy and interesting time of life.

I have recently been reading a book published in 1907, written by J. Creel Fischer, in which he states the best way to tune a piano is by setting a two octave temperament by the use of octaves and fifths. If he were living, I wonder what Mr. Fischer would think now if he were to hear many of the tuning instructors explain how much simpler it is to hear fast beating intervals than the slow ones. I, too, learned to tune by fourths and fifths only, but my first encounter with a Piano Technicians Guild seminar was to find out how much better my work would be if I accepted some change.

A few weeks ago I was discussing with Ben McKlveen the classes for the upcoming institute at the convention in New Orleans. I suggested that we stick to basics and leave the glamorous stuff out. I had in mind particularly the computer, but for all the mistakes laid at its door and all the jokes made about it, its expense, upkeep, and the special training it takes to program and operate it, we had better face the fact that the computer is here to stay. All it really does is store information, which we can do by the use of our card index system, or depend on our mental recall, but just think of the time saved by the simple touch of a button. I really don't think a *computer* ever made a mistake. Haven't heard a new computer joke for quite some time. They are becoming less expensive and a person with average intelligence can learn to set one up and operate it in a surprisingly short time. So don't be surprised if you see a computer class at the next convention in spite of my conversation with Ben.

Change has always been a part of modern life, and new ideas are not new, but they do come faster and faster. Let's not be too quick to discard something new, give it a chance, try it yourself, then if it doesn't work for you continue as usual, but keep an open mind and eye for something new. Maybe we'll never reach perfection, but what's wrong with striving for it?

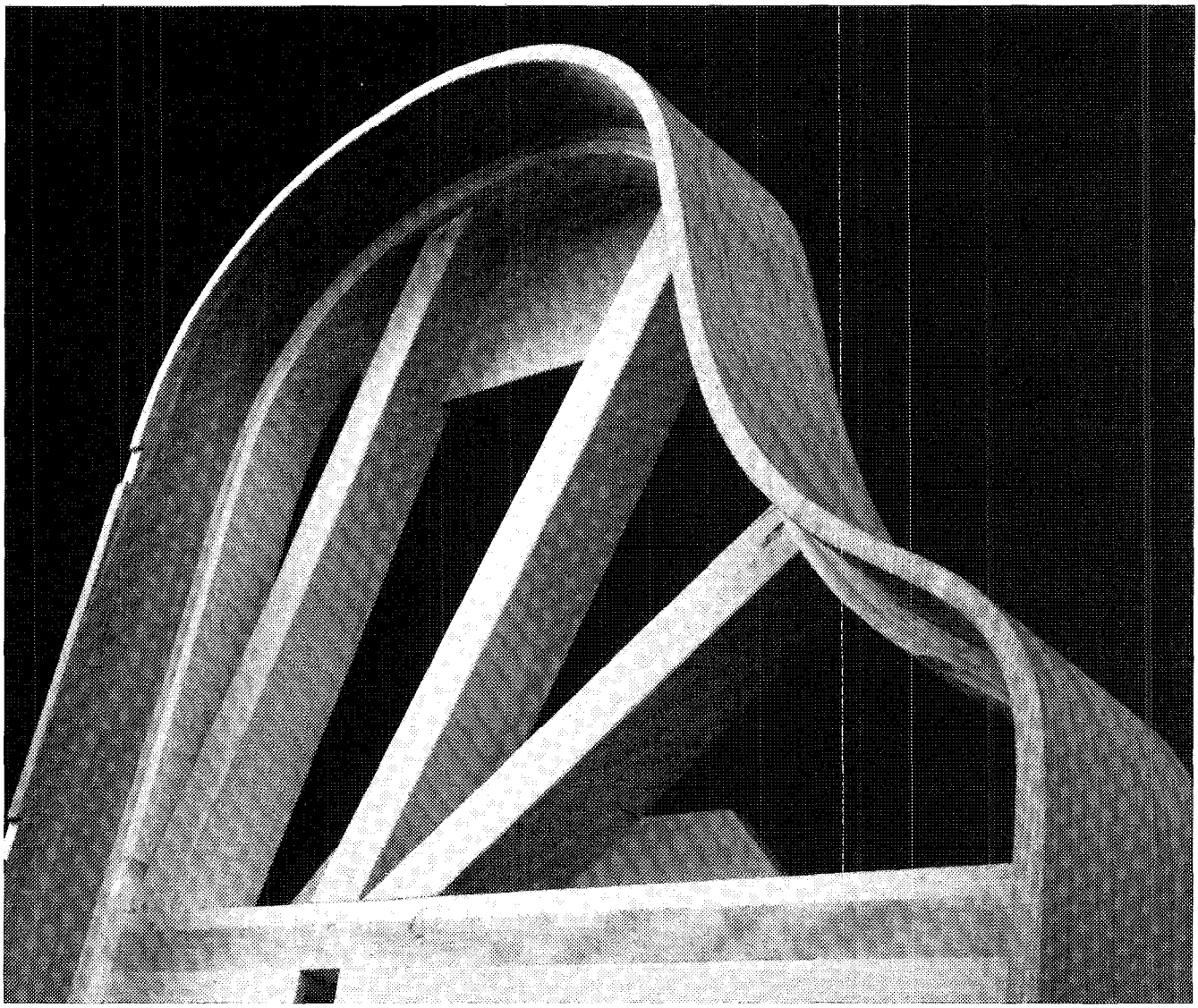
Old ways of doing certain things are OK — so are old words and phrases, but they certainly date a person. I much prefer the new and modern ways. This has been a rather cold and exhausting day. Think I'll go eat supper, sit by the phonograph and work a jigsaw puzzle, and hit the feather bed early!

ALL DAY TUNING SEMINAR

Eight (8) Hours with Jim Coleman

All you've ever wanted to know about tuning but were afraid to ask: Listening to partials, Understanding inharmonicity, Setting the temperament, Tuning the low bass, Comparing aural and electronic tuning, Preparing for the new Piano Technicians Guild tuning exam.

Sponsor: San Francisco East Bay Chapter, Piano Technicians Guild.
Date: Saturday, May 7, 9:00 A.M. to 6:00 P.M.
Place: 16875 E. 14th St., San Leandro, California.
Cost: for Piano Technicians Guild members, $45 (the price of only one tuning); for non-Piano Technicians Guild members, $75 (the price of only two tunings).
Limit: Space available for 50 registrants, so get your registration early.
Registrar: Mail check to Don Bourdon, 102 Belvedere St., Napa, CA, 94558. Make check payable to "San Francisco East Bay Chapter, Piano Technicians Guild"



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For literature about the Steinway, write to John H. Steinway, 109 West 57th Street, New York, N.Y. 10019.

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THE TECHNICAL FORUM

Jack Krefting,
Technical Editor

As we proceed with the discussion of vertical piano rebuilding, it occurs to me that I'm doing most of the talking, which is fine for formal events such as lectures, sermons or pronouncements, but not so good in a series which purports to represent the state of the art. If it is to be such, then more of you upright rebuilders should be taking part by writing me with your ideas and methods. As of this issue, we are discussing bridges, as we will next month also; but by the time you read this, we will be planning the issues which deal with stringing, chipping, keyboards and action work, an area where almost everyone is an expert. Please let me hear from you so that I may include your ideas when we reach that point in the discussion.

Vertical Rebuilding

Many old uprights have bass bridge problems, and since the bass bridge is relatively easy to repair or replace, most of the pianos are worth the effort. Treble bridges, though, are another story. Replacement is most often out of the question because of the difficulty of the task; but just so we can say we did, let's discuss that before getting to the more useful topic of recapping.

Let's assume that the plate is out and the keybed has been removed, but the case sides are in place, since that is the most common situation. Before removing the old bridge, it is imperative that an accurate means of relocating it be found. One such means was discussed in our December 1982 issue on pages 8 and 9, a system that uses the plate as a reference point for the bridge. This is fine so long as the plate is accurately located, and as a matter of interest it would be better to locate the bridge to the plate than to the back, but remember that when one reference is dependent on the accuracy of another, which in turn refers to a third, a stack-up of tolerances could occur. It's a little like making

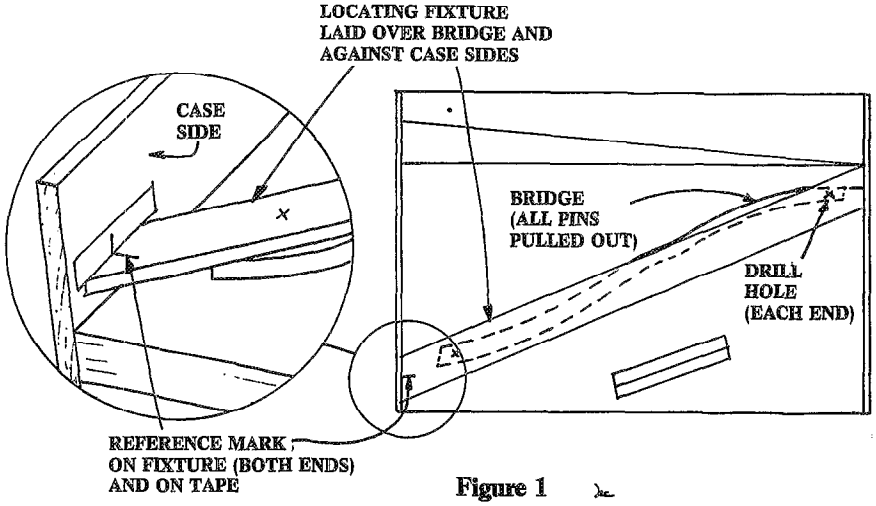


Figure 1

duplicate photographs by taking a picture of a picture, and then a picture of that picture, and so on. By the fifth or sixth generation the results are beginning to lack precision and clarity.

Figure 1 illustrates another method which uses the case sides as a point of reference, since in this case the technician has chosen not to remove them. A stick of clear wood, about 3/8" thick by two inches wide by five feet long, is cut to fit over the treble bridge at each end, and to butt against the sides of the case. All the bridge pins are pulled out — this will have to be done anyway to make the pin pattern, and it helps now too — and a piece of masking tape is stuck to the inner face of both case sides. Using a sharp pencil, mark a point of reference on the end of the stick and on the tape. Then drill a small hole through the stick, bridge, and soundboard so that a small tooling pin (balance rail pin or similar) may be used for relocating the new bridge. One hole in each end will do the job, although another in the middle isn't a bad idea for a treble bridge; more importantly, be sure these tooling holes cannot intersect bridge pin holes because the eventual result would likely be a false beating string. Why? Because if the pin is not seated firmly in the bottom of its hole it will vibrate, and the integrity of the termination is lost.

Make a pattern of the bridge pin holes now, before removing the bridge from the board, so that if it should warp or twist later you will still have the scaling. Fasten a piece of Mylar or paper to the bridge and rub it with the side of a pencil point (if paper) or make little holes in it with an awl (if Mylar) to indicate the location of each hole. Be sure to include the tooling holes, otherwise an accurate reproduction cannot be made. Next, remove the bridge.

It should come off easily once the screws have been removed and moist heat applied, but if it doesn't you may have to use a 25% solution of acetic acid. The stuff leaves annoying, sinus-clearing fumes not dissimilar to those of ammonia, so it is better not to use it unless conventional methods fail. Try to get the bridge off in one piece, because we will use it as a pattern for its replacement.

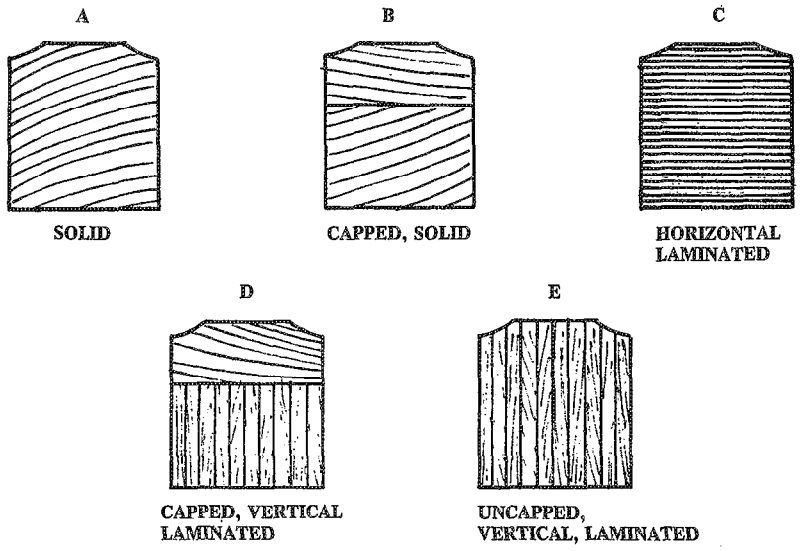


Figure 2 Bridge Cross Sections

In **Figure 2** we see some of the bridge construction methods commonly seen in pianos today. The solid bridge is easy to make, but has serious drawbacks as well. For one thing, it will be impossible to find a piece of suitable maple that is curved in the shape of a treble bridge, so when the bridge is cut from a straight-grained plank there will be places where the end grain runs out the side of the bridge. Ideally, as we discussed last month, the grain should be continuous from end to end for rapid and efficient radiation of vibration. Another drawback of the solid bridge is that it is more prone to splitting than other types, particularly if there is a pronounced curve at one end which orients the grain across the bridge rather than along it. Then, too, most solid bridges are flatsawn for economy, a feature which makes splitting even more likely because wood tends to split radially and that is the way the pins are driven.

One alternative would be the capped bridge shown in B of the same drawing. This is better, because the grain of the capping can be made at a 25° or 30° angle to that of the body, thereby making the bridge stronger, easier to notch, less likely to split, and the angle of the grain makes the bridge warp into a natural crown, saving a lot of planing later. Of course, there is now another glue joint and we are presumably still dealing with flatsawn wood; but all in all B should be considered superior to A. C is an easy bridge to make, because it is simply cut from pinblock stock. Its many horizontal laminae make it probably the strongest, and certainly the most resistant to splitting, of all bridge types. However, the corresponding penalty is

that the number of horizontal glue joints make this bridge the least desirable from a tonal standpoint. There is no direct continuity of grain, either from end to end or from string to soundboard.

E is the best from the standpoint of grain continuity, both end to end and string to soundboard, and it is second only to C in resistance to splitting. Its principal disadvantage is that it is harder to notch, particularly in the high treble where the notches run across the grain. It also has quite a few glue joints, and a special fixture must be made to shape the bridge, much in the same manner as laying up a continuous bent rim for a grand piano. From the standpoint of economy, there is far less wasted material in E than any of the others.

D is a compromise of sorts between B and E, in the sense that it takes some of the advantages of each, although it was in use long before E was even considered practical. Both D and E are relatively expensive to make on a production basis, and so have been reserved for fine grands; but in a custom rebuilding shop, such a bridge could be made for a vertical also.

Assuming the technician has selected A, B or C, the old bridge should be laid on the new bridge material as soon as possible after removing it from the soundboard — before it can warp or twist — and its outline traced on the new material with a sharp pencil or a scribe. The bridge is then cut out on a bandsaw or with a saber saw and planed and sanded to the shape of the original. The bottom surface must be identical to that of the old bridge if the original scaling is to be reproduced. This is especially important to emphasize in the case of vertical rebuilding, because while a lot of not-so-good grands are routinely rebuilt, only the very best uprights are worthy of such effort; such instruments generally were well-designed and should be rebuilt the same way, not capriciously redesigned.

If D or E has more appeal, the rebuilder will need to make a special caul as shown in **Figure 3.** It is not necessary to use expensive pinblock stock for the caul. Ordinary plywood is fine — in fact, if one half of the caul is a little bit flexible it will mate better to the other half, and that prevents voids in the glue lines. Just be sure that the caul is at least as thick as the bridge is high, and make the new bridge taller so it can be planed to the optimum height. Since this has a direct effect on downbearing, be sure there is enough material.

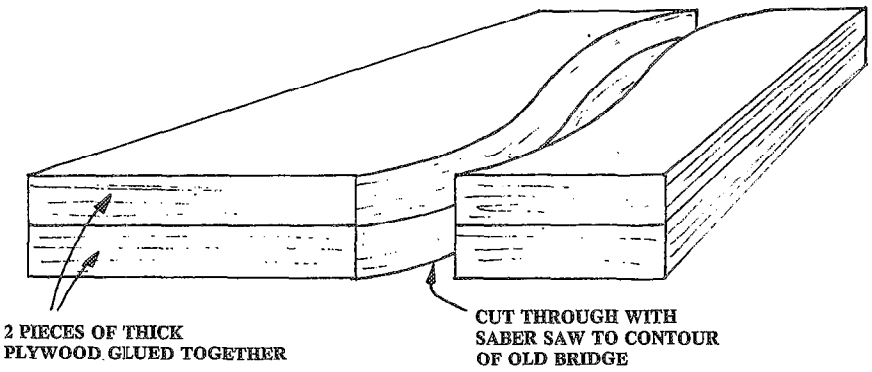


Figure 3

Flatsawn maple is probably best for this, because when turned on edge it becomes quartersawn, which is ideal both for tone and split resistance. The material should be about 1/8" thick, or possibly up to 3/16" — rimstock is fine — thick enough to provide tangential grain continuity from top to bottom (string to soundboard), yet thin enough to bend in the caul. Select eight to twelve such pieces, depending on the thickness of the material and the width of the old bridge. All pieces must be full length, as butt joints within the bridge would be undesirable both tonally and structurally.

Cover the portion of the workbench that will receive the bridge with waxed paper (see **Fig. 4**) to prevent gluing the bridge to the table, and make a dry run to be sure you have enough clamps to bend all laminae into position without voids. The smaller the radius of the curve, the more clamping power is needed. When satisfied that the caul will do the job, release everything and

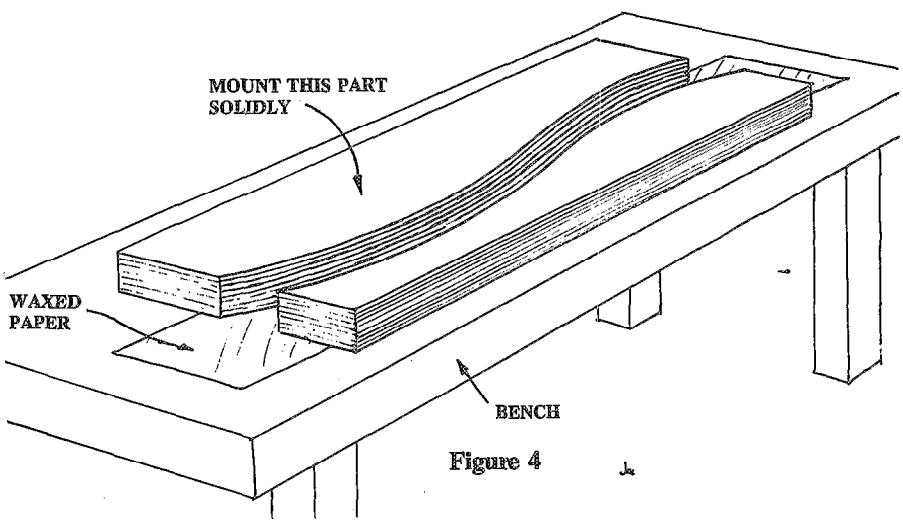


Figure 4

do it again with glue (Fig. 5). Willis Snyder recommends resorcinol glue, a very strong, water-resistant glue that provides plenty of working time. The only disadvantage to resorcinol, so far as I know, is that it is the color of dried blood and the glue lines look thicker than they are. If the rebuilder has another glue with similar properties that dries to a light color, that would be better from a cosmetic standpoint. Don't use white or yellow glues for this, though, because they have a tendency to creep in this application. Epoxy should not be used, either, because it forms a film between laminae instead of a direct bond. If we were repairing a cracked bridge and needed gap-filling ability, on the other hand, epoxy would be the best thing to use. We will be discussing bridge repairs in upcoming issues, so I will not dwell on that here.

Tighten the clamps in the middle first, or if there is a dogleg at the middle/treble break start there, and work outward toward the ends. This forces the squeeze-out ahead of the clamp pressure, avoiding glue pockets in the middle. When the glue has cured, remove the bridge from the caul and plane off excess material, top and bottom, taking no more material than necessary for a clean surface. Use a long jointing plane or a power jointer/planer. It's a good idea to place the bridge into a cooker or dry storage area to get rid of the excess moisture before proceeding further. Then, if configuration D was selected, add the capping material. This will also be covered in more detail later.

Finally, whether D or E has been selected, plane a concave configuration into the underside of the bridge to match the crown on the soundboard. By far the best tool for this is a compass plane, which has a flexible sole that may be adjusted to plane curved surfaces. Compass planes are available from specialty woodworking tool retailers.

Next month in this space we will discuss installation, drilling, pinning and notching.

Soundboard Crown

The following letter from A. David Stewart describes his method of measuring crown, and raises some interesting questions as well:

I would like to share with you a technique I use to obtain a clear picture and a rough measurement of the soundboard crown on grand pianos.

The following items are needed.

1. *a blanket (optional)*
2. *thin white kitchen string*
3. *masking or scotch tape*
4. *a flashlight*
5. *a wooden ruler (grade school type)*

I then follow this procedure.

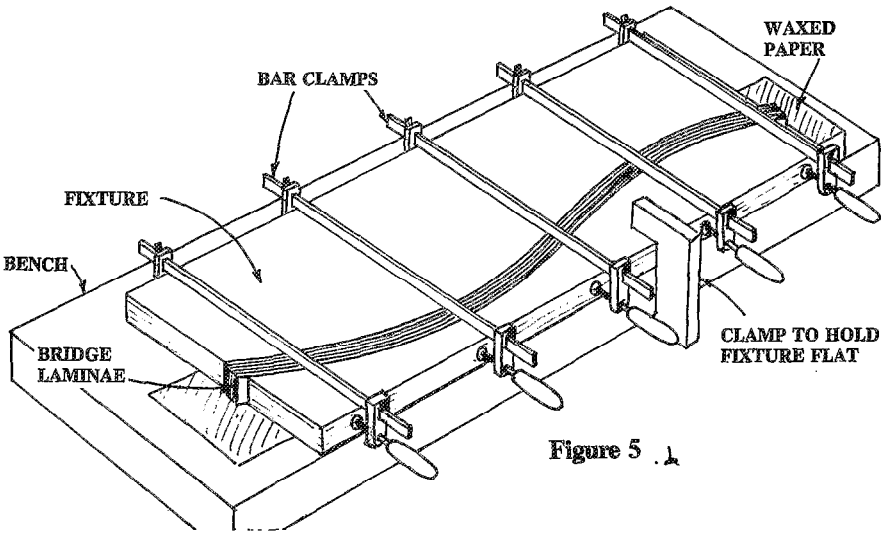


Figure 5

1. *Spread out the blanket, under the piano, unless there is a nice rug on the floor.*
2. *Crawl under the piano, dragging with you the string, tape, flashlight and ruler. Now, lie comfortably down on your back, with your head resting directly below the centre of the soundboard.*
3. *Using a piece of tape, fasten one end of the string to the soundboard, as close as possible to the case rim, between the two longest ribs. Now guide the string along the board between those two ribs. Stretch it slightly, then fasten it down with tape to the soundboard, near the rim, at the opposite side of the piano.*
4. *Take the flashlight in your right hand and turn it on. Hold it at approximately a 45 degree angle to the string. You will know when you are at 45 degrees when the shadow cast by one of the two ribs on the soundboard equals the thickness (top to bottom) of the rib. That right arm holding the flashlight is now probably fully extended, with the knuckles comfortably touching the floor. By moving your wrist, play the flashlight along the string. VOILA — you see a complete picture of the crown. The shadow of the string on the soundboard looks exactly like an archer's black bow.*
5. *To* **measure** *the crown, simply hold the ruler up to the string with your left hand and measure the distance between the string and its shadow. You may easily do this at any point along the string that you wish. I usually take my reading at the centre of the board, where the crown is the highest.*

I believe (please correct me if I am wrong) that crown is necessary to stiffen the soundboard so that it will withstand the 2,000 pounds or so of downbearing pressure produced by the strings (much like a domed roof easily supports a heavy snow load). I also believe that, like a radio speaker, with its dome-shaped cardboard speaker cone, the added stiffness prevents flutter and rattle on low frequency notes.

Being a novice, the importance of the measured amount of crown is not clear to me. For example; on a 5 foot 3 inch Knabe baby grand (S/N 107579, 1929) I measured a crown of 3/16 of an inch at the centre of the soundboard. My kitchen string was 3½ feet long. I wonder if someone could advise me as to whether this amount of crown is reasonable.

In addition, answers to the folowing 2 questions would sincerely be appreciated.

1. *How does the tone of the piano change with various amounts of crown?*
2. *How much crown should I expect to measure? . . .*

A.D. Stewart
Willowdale, Ontario, Canada

As our correspondent has noted, crown is necessary to withstand the force of downbearing, which probably ranges from 200 to 2000 pounds. All else being equal, the higher the crown, the greater the resistance because a curved surface is stiffer than a flat one. The most notable example of this principle is the egg, whose shell would not be strong enough if it were square, to say nothing of the problems that would create for the hen. The next most notable example would probably be the Jaguar XK-E, which was designed on this "monocoque" principle for stiffness and light weight.

A piano with a lot of crown has a built-in safety factor for plenty of downbearing, but because of its stiffness will be less responsive than a flatter board. On the other hand, a board that is insufficiently dried before bellying will be too flat. Such a board will crack in a dry environment, and possibly even develop a negative crown if the bearing is heavy enough.

Having established, I hope, that too much crown is as bad as too little, I will say that the amount of crown one should expect to measure will vary from virtually none to a quarter inch or more, depending on the age of the board, how it was made, the amount of compression it has absorbed, and the relative humidity at the time of the measurement. Some makers use a flat press with flat ribs, relying wholly on atmospheric moisture for crown, while others shape their ribs; also, some are trying for more crown than others because there is considerable disagreement as to the ideal amount. In any event, though, I am surprised to hear of 3/16" in a 54-year-old piano, especially if that represents its average crown. Half that amount would be more like what I would expect to find. I have rebuilt many pianos that had even less crown and, without replacing the board, have had excellent tone and long sustain times. Some of the old, flat boards will sing better than new ones provided the technician is careful not to add too much downbearing.

Because the maker knows that he must make the piano so it will be playable all year, not just when the crown happens to be just right for the best tone, the amount of crown designed into the board represents the middle of the range which would be tolerable, considering the possibility that the instrument might be moved from Las Vegas to Miami or vice versa, and must be playable both places. The tone has a tendency to brighten in dry weather, but that could be as much from the change in the hammerfelt as from the change in the crown.

New Block, Old Look

One of our Affiliates has contributed the following example of Old World craftsmanship:

Dear Jack,

...On some old instruments with open blocks it is of interest to keep the "old look" when replacing the pinblock. Top veneer up to 10 mm. can be removed and put on again. Just soak it with alcohol and use an iron to heat it up, both to destroy the old glue. It may take from one to ten hours. Then put the veneer in alcohol again for some hours, and put it in press (like press flowers) for several weeks on a warm dry place. Then it's only to glue it on again.

Picture 1 - 4 is taken from repair of a Pleyel piano no. 50236 (ca. 1870?). Someone had changed tuning pins some years ago, but the piano was impossible to tune in the left part. The main reason was a visible crack in the pinblock following the upper row of the

tuning pins from left to the middle. Someone had also put veneer, copper, and ivory into the tuning pin holes to make friction. But the result was that the top of the piano was raised instead with 1.5 cm. (half an inch) still visible in picture 1, closest to the camera.

This piano has been in the owner's family since it was new, and I was asked to make it good again. On some Pleyel pianos I have seen the pinblock drawn down because of too little support, and on this one it was obviously too little support upwards too. So I decided to strengthen the instrument with an extra iron plate.

Picture 1 shows my acryl pattern and the top layer removed.

Picture 2: New pinblock, and space made for 4 mm. ironplate.

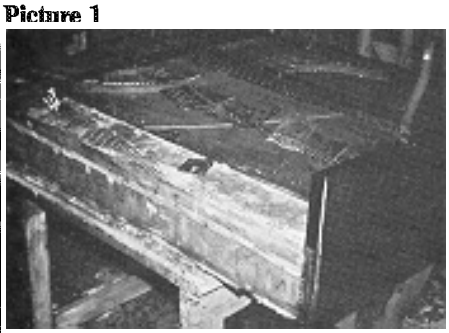
Picture 3: The pattern used for drilling holes in the ironplate and this placed on the piano.

Picture 4: The old wood glued on again.

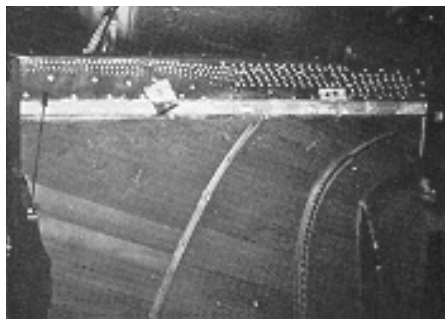
Picture 5 is taken from restoring of a Square-Piano about year 1810. I had to put new wood into the pinblock, and the old veneer on top again. The "loop pinblock" (front left in picture) was too much damaged, and I had to make a new top also after making a pattern and correcting some of the holes . . .

Odd Aanstad
Larvik, Norway

Picture 1



Picture 2



Picture 3

Picture 4

Picture 5

Stringing Felt Color

Here's an interesting letter on a topic that hasn't come up for a long time:

. . . For the last several years I've been dissatisfied with the various colors of string felt, cloth, hitchpin punchings and stringing braid. It seems that the understring felt is bright red while the cloth used in the tenor is usually a pink color. The string braid is also uneven and sometimes too light. I have solved this by dyeing all of the red felt/cloth for a stringing job the same shade of red. **Rit** *makes several shades of red that are nice, but their* **Scarlet** *is the easiest to blend with our reds. I just hate to see a nice stringing job leave the shop with ugly cheap-looking cloth on my nice, clean, freshly refinished plate.*

Simply follow the directions on the bottle of dye and throw it all into the dryer when through, or if not in a hurry you can air dry it on a table. The understring felt gets a little fuzzy in the process but it can be ironed with a steam iron to smooth it again. To make sure it's all the same color dye it all at once. Standard instruments get a medium dark red and antique pianos get a darker maroon — this darkening occurs if the stuff is left in for longer periods. Rinse well with hot, then cold, water and then dry.

Small items such as hitchpin punchings can be put into a nylon stocking to keep them together . . .

Sally Jameson, RTT
Spencer, North Carolina

Gadget of the Month

Russell Gordon came up with a great idea for modifying a drill guide for drilling bridge pins, as illustrated in **Figure 6.** Here's his description:

. . . I replaced the guide bars from a Portalign drill stand with ½" steel rod from the hardware store. These rods were first bent to the proper angle for bridge pins. Sets can be made at different angles, and by a slight rotation of the whole tool the small inward angle can be drilled when desired. This tool should enable the beginning bridge repairer to have uniform, craftsmanlike results.

Russell H. Gordon
Goldens Bridge, New York

Here's another gadget from Roy Haines, whose coil-winding jig was featured several months ago. This time Roy is making brass tools for seating

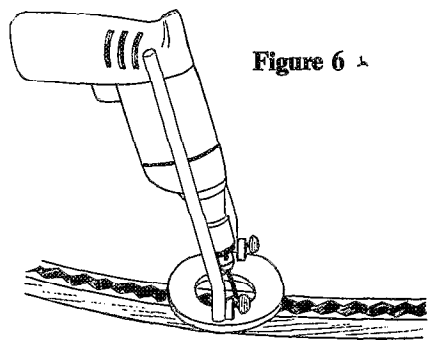


Figure 6

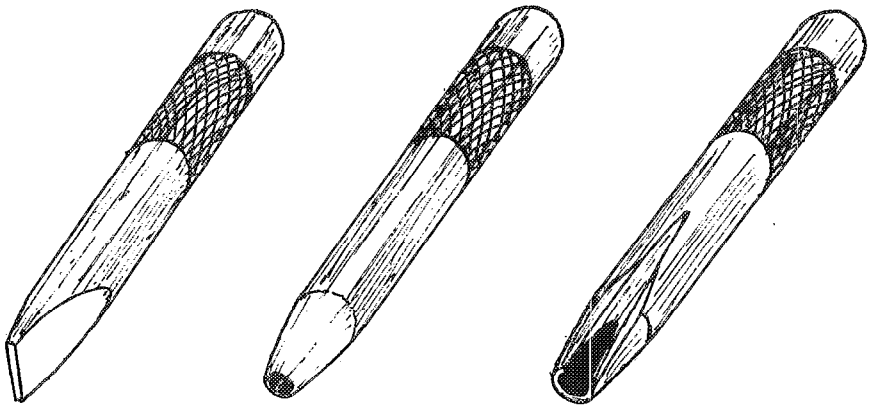


Figure 7

strings on bridges and around hitchpins. The tool on the left in **Figure 7** is for seating strings on the bridge, and the one on the right is for tapping the string down against the plate around the hitchpin. The one in the center was designed to increase downbearing on Baldwin grands.

Roy is making these available to Piano Technicians Guild technicians in limited numbers for $4.50 each or two for $8. These punches are machined from solid brass and are quite heavy, but aside from that they make a useful addition to the toolcase. For further information please contact Roy at 7726 Jamieson Avenue, Reseda, California 01335.

Newsletter Tech Reprint

Considering the expertise in the membership of the Indianapolis Chapter, it is not surprising that we often find good technical articles and tips in their newsletter. The December 1982 issue of the Indy 440, edited by Fred Rice, contained the following tip by Guy McKay:

Removing the Acrosonic Action

As we service the Baldwin Acrosonic we are sometimes required to remove the action. On the older models we find that the abstracts (or pick up fingers) pass through a wood rail over the capstans. This rail has holes which have been bushed to position the upper end of the abstracts.

As we remove the action this rail must stay in position with the abstracts still protruding through it. To achieve this we usually secure two abstracts in the all-the-way-up position next to the rail.

One method often used is to slip a damper block over the top of the abstract pin and tighten the set screw with it in the up position.

Another method, which I prefer, involves using two heavy rubber bands. Since the rubber bands are already in my case to secure the temperament strips and glue bottle, it means no extra tools in the small case I carry.

As the drawing shows (*see* **Fig. 8** . . . *ed.*), the rubber band is hooked over the top of the abstract pin. Then it is passed down and around the portion of the abstract that contacts the capstan. Then it passes back up over the rail and is hooked on the top of the abstract pin again. This process is repeated with an abstract on the other end of the action.

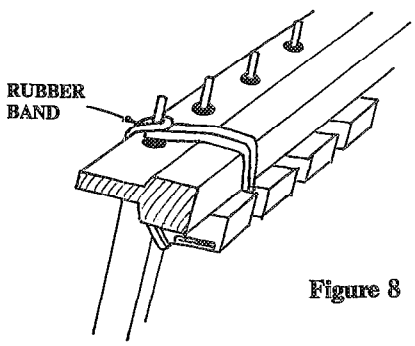


Figure 8

This will permit quick and easy removal and replacement of this popular little action.

Dear Jack,

An update on the cracked plate repair of a Bauer Grand is in order. The repair was made in December 1980 and reported in the April 1981 issue of PTJ.

Tunings in March, May and December 1981 and in April 1982 indicated that the repair was stable. **However,** *in November 1982 the plate broke in another area, namely — at the upper end of the pressure bar. (*See **photos 6 & 7** . . . ed.*) The piano of course is now useless and ready for a decent burial.*

Photo 6

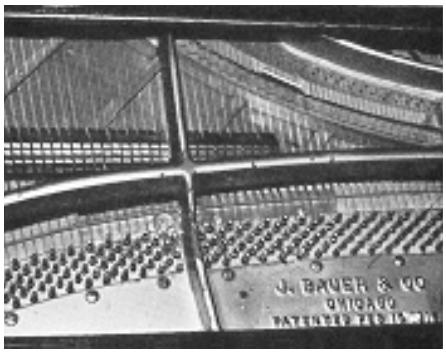
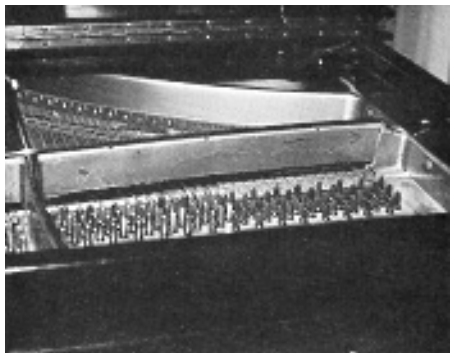


Photo 7



— Ed Reineck

Thanks, Ed. The interesting thing to me is that, although the plate unfortunately did break again, it didn't break where it had been previously repaired. Possibly there was crystallization in the iron, because normally cast iron strengthens with age.

In Conclusion

We are pleased to announce the addition of four new regular contributors.

Joseph Anthony Meehan of the Maine Chapter, who has made something of a specialty of appraising pianos, has a lot of valuable advice to offer on this subject. This very interesting series begins next month.

Also beginning next month will be a column entitled "One Man's Newspaper" by Christopher Robinson of the Connecticut Chapter. Chris happens to be extremely talented, both as a technician and as a writer, so this series promises to be one of the best yet.

This month marks the beginning of a series called "The Full-Time Technician" by Clair Davies of the Bluegrass Chapter. This series will deal with some of the not-so-technical aspects of our work, including business aids and advice. Clair's straight-from-the-shoulder style will, I'm sure, be widely appreciated.

Gerald Foye of the San Diego Chapter, who has written for us on an occasional basis in the past, joined us last month as a regular columnist with his "It's The Little Things That Count." Gerald brings his wit and his shop experience to bear on typical piano-related problems in this series of short, useful tips on a variety of technical subjects.

Please send all technical material for publication to me at this address:

Jack Krefting
3802 Narrows Road
Erlanger, KY 41018

It's The Little Things That Count!

Gerald F. Foye, RTT
San Diego Chapter

Regarding your business card; the object is for the customer to be able to locate it again for future use. Nailing it to the side of the piano case is good since your customer will definitely remember you for a long time. Having business cards made in larger sizes, like 4 foot by 5 foot, makes them difficult to misplace.

However, a nifty solution is to stick a paper tack to the back of the business card. An Avery self-adhesive paper tack is a specially made sticker with double-back glue just for this purpose. Place one on the back of each of a stack of business cards. Then all the customer has to do is remove the protective covering and stick it inside the piano bench or any other favorite location. Be sure to put the date on your business card before handing it to the customer so they will know when the piano was tuned last. This product should be available in office supply outlets.

Sound Background

Jack Greenfield, RTT
Chicago Chapter

Social Changes Influence

By the end of the sixteenth century the character of musical style had begun to change. In contrast to the restraint of the Renaissance era, music became bolder and more expressive by greater use of modulation, dissonance, dynamic contrast and other characteristics. The term *Baroque,* originally a French word for "bizarre," is applied to the dominant musical style of the period 1600-1750.

Some of the social changes then underway had a direct effect on musical activities. While the Catholic church continued to support and influence religious music, the new Protestant churches began to develop their own musical styles. Secular music advanced in importance under the patronage of royal courts and rulers of smaller states. In addition, "academies" were organized by private persons to promote many musical activities.

New Musical Forms

Composers, now less restrained by traditional principles, sought to expand the range and intensity of expression by new ideas in harmony, tone color, and musical form. The seventeenth century saw the establishment of opera, oratorio, cantata, symphony, overture, concerto, sonata, toccata, prelude and fugue. The Baroque desire for expression and contrast also had a strong influence on the development of musical instruments and orchestral music. Range was widened by expansion of keyboards of harpsichords and organs and the introduction of larger, lower pitched wind instruments. The clarinet, oboe, and French horn replaced their less flexible predecessors and bowed string instruments took the place of inexpressive plucked string instruments. The Baroque violin with its qualities of strength, range, and articulation rose to a level of primary importance. The orchestra as it exists today, based to a large extent on violin and other bowed string tone in combination with woodwind, brass, and percussion, emerged during this era.

Harmony, Modulation and Key Change More Important

The Baroque style originated in Italy. In spite of the divisions and local conflicts between areas under the control of Spain, Austria, the Papal states and independent rule, Italian musical ideas were a dominant influence on the music of other European countries from the mid-sixteenth to the mid-eighteenth centuries. One of the major developments was started shortly before 1600 by a group of musical intellectuals including Vincenzo Galilei. This association, known as the *Camerata,* introduced a "speech-song" musical style based on their conception of Ancient Greek drama. Such performances led toward the development of opera. The new music dramas were composed with a different type of musical structure in which a single solo melody was sung or played against a background of a solid harmonic block of sound. In polyphonic music, a number of different melodies of equal importance move together. As the new style progressed, harmonic structure and chordal progressions become more prominent. Most of the ecclesiastical modes disappeared, leaving only the forms which became the major and minor modes; composers more frequently used modulations and key changes to provide variations in tonality.

No Standard Intonation in 1600

Because of the necessity of having suitable fixed scales for keyboard instruments, tuning became a major subject of debate. In the year 1600, there were at least a half dozen tuning and temperament systems considered important in theory and in practical music. Many theorists believed only that some type of just intonation was correct from the standpoint of ideal principles, but they disagreed among themselves on the merits of pure Pythagorean, just variations, and ancient Greek tunings. Moreover, it was widely recognized that just intonation sounded harsh and unpleasant in the compositions with shifting tonality played on keyboard instruments. These were generally tuned in a regular meantone or irregular temperament. There also may have been some keyboard tuning in equal temperament, which was widely used for lutes at that time.

Early Baroque Performance Pitch

Although intonation was hotly debated, Renaissance and Baroque theorists and musicians appeared to be less concerned over performing pitch levels. Aron's 1523 tuning instructions for the harpsichord specified that the initial C could "be placed at any pitch one might wish."

The first theorist who made a thorough study of pitch was Michael Praetorius (or Schulz before Latinization). Praetorius' three volume *Syntagma Musicum* or "Musical Treatise" published between 1613-1619 is one of our main sources of historical technical information on pitch, musical instruments and style of his period. Praetorious was active in a wide range of musical activities. In addition to studies on theory, history and orchestration, he wrote many ecclesiastical and other compositions and conducted vocal and instrumental groups in religious and secular performances after his 1604 appointment as *Kapellmeister* for the Duke of Brunswick. He also had the responsibility for compiling the first codes standardizing Lutheran church music practice. Being aware of the tuning problems in combining a variety of musical instruments, and the added complication of regional differences in performing pitch, he wrote about pitch in great detail.

There are several earlier references. In 1511, Schlick had written about the pitch of church organs. Shlick gave dimensions for a standard organ pipe to be used either as F2 for a low pitch instrument or as C3 for a higher range. Calculations based on Schlick's data give A4=380 Hz or 510 Hz depending on whether the standard pipe is F2 or C3. Schlick began the custom of naming octaves and sets of organ pipes with the open pipe length of the bottom C. The length of an open organ pipe giving the C2 pitch is about 8 feet; the C2-C3 octave is the eight foot octave. The set of pipes ranging upward from this pitch is the 8 foot set or stop. Notes played on the 8 foot stop pipes sound in the same octave as on the piano.

Schlick's pitch levels were used to some extent elsewhere, but levels somewhere in between his high and low were more customary. Many seventeenth century woodwinds now in collections are pitched around A4=470 Hz, sometimes referred to as "Renaissance pitch."

Praetorius did report that the 1361 Halberstadt church organ (the oldest in existence) was tuned at approximately the same level as Schlick's high organ pitch; but most other pitch levels he gave were considerably lower.

Beginning with the work of Ellis in 1880, a number of different modern scholars have estimated frequency figures based on their interpretation of Praetorius' writings. Ellis' data are fairly well accepted. Although a more recent study by Mendel presents a substantially different interpretation, placing Praetorius' pitches about 400¢ higher than Ellis' corresponding determinations, figures given by Thomas and Rhodes in the 1980 Grove Dictionary of Music are fairly close to those of Ellis.

Praetorius' books contain diagrams with dimensions for a complete octave of wooden pipes and a corresponding octave of metal pipes. Also included are woodcut illustrations of typical musical instruments accurately drawn to scale. From these drawings and other information, Thomas and Rhodes believe the pipes were probably tuned in ¼ comma meantone temperament; they estimate that Praetorius' ideal pitch was about A4-425 Hz, approximately 60¢ below modern standard pitch. Ellis' figure was 424.2¢.

Praetorius indicated this was the pitch used in his musical circles, referred to as either "choir pitch" or "chamber pitch," but in some other regions the pitch levels for church and secular music were not the same. he listed only a few church organs, including the one in the Halberstadt cathedral, with higher pitch, but reported lower pitch levels to be more common. He approved of lowering pitch to make vocal music easier for church choirs. His examples included Prague — a whole tone lower; and Italy, the Netherlands, and England — three semitones lower. The Prague church pitch of A4=380 Hz was the same as Schlick's lower church pitch. Later scholars reported most Baroque organs in France and Rome were tuned to this pitch. In other Italian cities either higher or lower pitch was more common. In England after church organs had been removed by the Puritans during rule by the Commonwealth government from 1649 to 1660, many of the new replacements after 1660 were built at a higher pitch (around A4=480 Hz), about a whole tone higher than Praetorius' ideal pitch.

Praetorius believed his pitch was most desirable for secular chamber or orchestral music. Higher pitch would cause broken E strings, lower pitch would sound dull. However there is evidence of use of a chamber pitch about 62¢ lower (approximately A=410 Hz) elsewhere — particularly in France. This is the pitch determined for many of the French Baroque woodwinds in instrument collections. There are also reports of harpsichords tuned at this pitch. Christian Huygens, the great Dutch physicist and mathematician of the second half of the seventeenth century, who also played several musical instruments, made frequency determinations placing his harpsichord tuned in ¼ comma meantone temperament at a pitch of about A=409 Hz. Soon afterward the scientist Joseph Saveur, noted for his work in the physics of sound, reported Parisian harpsichords were generally tuned at a pitch corresponding to about A4=408 Hz. In present day performance of compositions of the early Baroque era, if pitch is lowered for authenticity, A4=415 Hz, a semitone below standard pitch is a convenient compromise between the chamber pitch of Praetorius and the lower chamber pitch of France and elsewhere.

THE FULL TIME TECHNICIAN

by Clair Davies, RTT
Bluegrass Chapter

Training First

Anybody can pick up a few tunings these days. Anybody can set up shop and act like a piano tuner; hundreds of nervy novices do it every year. But not many survive to become responsible full-time technicians.

To have a future in this business, you must get training. Without it, you will spend a lifetime repeating your mistakes, and you won't be successful; you will become a liar just to get by. If you are just starting out, I urge you: don't become a liar — become someone real. Stop and get training now.

And don't fool around; get *real* training, on-the-job training — learn by doing. Realize that in the classroom, and from courses and books, you don't learn piano work, you learn *words* about piano work. Words are fine, but words in lieu of experience will hold you back, particularly in the beginning. You won't learn the job until you *do* the job and are shown your mistakes and how to correct them — over and over and over.

How do you get this kind of training? Who on earth would give you that kind of attention?

Go to the best piano technician you can find and try to attach yourself in any way you can. Often a truly outstanding technician has an unfilled need for the keen appreciation that can be given him by an eager student, because the fine detail of his own work is not perceived by the people around him. Don't be deterred if he seems unwilling to teach: many fools and dreamers knock at his door for quick lessons in making quick money. You have to prove yourself constant and reliable, hence worthy of his interest, so be persistent. Despite all blows to your pride and dignity, keep trying. If he accepts you, he will show you everything he knows gladly, and it will change your life.

I won't tell you precisely where to look for such a person, but be assured he is there — seek him out. To do my seeking, I left a small town in Illinois and went to New York. Let me tell you one way of finding a teacher.

I hadn't done much with myself that year, at age twenty-three, except play the guitar and do odd jobs. Although I had military service and two years of college behind me, I had yet to be a winner. I had no trade, no profession, and saw none in that little town that I cared to take up. My dream was to live alone somewhere with my guitar, practicing fourteen hours a day. That wasn't done in Vandalia.

To Dad, the notion of my leaving had less the look of necessity than of irresponsible flight. He wanted me to stay and help run the hatchery. But in 1960, small hatcheries were on the way out, because small farmers had stopped raising chickens. I had no heart for the work anyway — grading eggs, shipping chicks, selling feed — besides, Dad and I fought, as strong-minded fathers and sons will do.

Mom thought I could stay in Vandalia if I did piano tuning. She knew it was more in my line — working alone, working with my hands. She ordered books on tuning from the State Library in Springfield, then sent me to Orville Force.

Orville sold Acrosonics two blocks down the street in an old frame house, whose asphalt siding told buyers how small his mark-up was. (He sold *a lot* of Acrosonics.) He said *sure* I could work on his pianos — as long as I didn't want any money — and sold me a six-dollar hammer. My first piano took seven hours, and Orville said it sounded just fine. A dealer sure is easy to please when the price is right.

While tuning my first few pianos, I got a letter that changed everything. In the Coast Guard I'd had a shipmate who abetted me in profitless pursuits like the guitar. He wrote me about small towns, "It's not so much that they're against you, but that they're never really with you." It wasn't true, of course, but it's what I wanted to hear. His enlistment was ending, so he said, "Let's meet in New York — like Mec-

ca."

That was it. I packed the guitar and the cheap hammer (to my father's disgust and my mother's dismay) and caught the next bus going east.

Today I'd be afraid to jump in like that, but youth doesn't fear living on salami sandwiches and tramping all around town in the cold. The city was covered with snow and I had a hundred and fifty dollars — or about two weeks — to track down a job somewhere. The guitar was a loss, naturally enough, so I looked for piano work. I was following my natural bent, though I didn't see it at the time. But my natural bent, after just five tunings or so, wasn't seen by anyone else either; at the first factory I went to, the provincial urbanite behind the desk only scoffed, "Our tuners do thirty a day! You wouldn't be able to eat!" I begged for a chance, but he just laughed. Piece work. He was right. At *two* pianos a day, it wouldn't even be salami sandwiches.

Even so, his disdain made me angry, and determination set in. Keep in mind I had no history of fixing my eye on distant stars, but now I began feeling a stability that surprised me, a sureness that set my lips firmly together. I *knew* I could do the work in that factory, or some other factory or store, with just a little bit of help.

The first answer you get is always no, but I didn't catch on for a while; I accepted that answer as final, like a good boy, in the next dozen interviews all up and down Manhattan.

There were a couple of smaller factories that "weren't hiring." The buildings had a gloomy, decadent look, and from what I could see of the hunched and slow-moving workmen, in the dust and the dim light, the last hiring must hve been at least forty years past. I was received only briefly by sullen old men in such places.

Neither were the fancy piano stores hospitable to a confessed novice. The people I encountered were primarily salespeople, condescending, haughty — typically without sympathy for technical people whether skilled or unskilled. But I found one exception.

It was the day I had tackled every store on Fifty-seventh Street and wound up standing at dusk in front of Steinway Hall. I could see the lights of the chandelier through the many-paned front window: refinement fairly radiated from within. It was very intimidating to a good boy from Vandalia, and I hesitated a long moment, thinking, "It's a waste of time, they'll squash me like a bug." But I went in anyway.

What I met there was revelation; for while I was not by any means received with open arms, I was treated for the first time with *respect.* That impressed me profoundly and accounted largely for all that came afterward. And the place itself glowed with gentility, tradition shone forth from every surface; and to see those pianos — so rich and fine and perfect, room after elegant room full of them — I fell precipitously in love.

Of course, the answer was no. But the refusal was perhaps too kindly, because I read in the tone of it an invitation, rightly or wrongly, and I went back again the next day, then again the next, still being politely turned away. You see, at that point in my career I had absolutely nothing to lose, nothing to defend, especially not pride.

Six times I went back until, at last, with a twinkle in his eye and an indulgent smile on his lips, the manager agreed to have me tested.

For three hours, I meticulously applied myself to a fresh-smelling Everett console, with my fresh-smelling copy of William Braid White lying open beside me on the bench. Then a snowy-haired gentleman, middle-aged, but with a soft, youthful face, came and quickly played over my work. I felt I had done a pretty slick job.

"Well," he said, brusquely, looking past me as if talking to someone else, "it's a rough tuning at best." My stomach sank.

I suppose I must have hoped he would break into a grin, shake his head in admiration, and ask deferentially whether I would consider joining the concert staff. Instead, he stood quietly, listening for what I had to say. He seemed unfriendly but he wasn't; he just couldn't see me.

"I've only tuned about five pianos," I said. "Yes?" he said. It was an oddly laconic, though very direct, exchange. "Who showed you how?" "Nobody," I said.

He played some octaves again — then in the middle, some fifths and thirds. "You need to be shown what to do," he said.

As strange as it may seem, up to that very moment I had only been looking for a job; I hadn't been looking for a teacher. I'm sure I didn't think I needed a teacher. Suddenly, the meaning of my impulsive journey across the country and my travels all around that irritating city became clear. I saw a dim vision of myself in this man, so unlike me in appearance; but I also saw in him something I didn't have — ability, competence, real worth — and I wanted it. Impetuously, I grasped for it.

"Teach me," I said, "Show me the right way to do it. Get them to hire me. I'll do anything you say."

I think he heard himself in my voice and remembered how hard it had been for him to get a break starting out. I could see he was on my side. Yet, he was not entirely a pushover; I had to court him, I had to persist, I had to come back yet another time. And I admit buttering him a bit about the honor

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Shoptalk

Susan Graham, RTT
San Francisco Chapter

The Soundboard

Working on soundboards requires skill as a woodworker and as an artist because there are two types of problems we encounter in boards. There are structural problems which affect the function; delamination from the ribs and loss of crown are the most common. There are also cosmetic problems such as dirt and deterioration of the finish which affect the market value of the instrument. Cracks may be classed in either category. By themselves, they are a cosmetic problem but need attention: usually, customers know only that there is *something* large in a piano which shouldn't be cracked. Therefore, they become slightly hysterical over soundboard cracks, will not purchase a piano which has them, and generally need re-education that it is not the kiss of death. At times, cracks can be beneficial: in the case of loss of crown, they provide a means of at least partially correcting the problem. Cracks can also indicate rib delamination or structural weakness, which are more serious problems. In evaluating a board for repair, then, we first determine just what it is that needs to be solved, as well as whether the board is still sound enough to warrant any work.

The first indicator is the voice of the piano; the hammers may be in bad shape and the tone poor, but a certain amount of volume and sustain suggests that there is life in the board. There are five physical indicators of board condition: bearing, crown, ribs, edges, and overall wood quality. Bearing can be checked quickly with a rocker gauge. In this preliminary stage, this is to be sure there is some bearing everywhere, meaning that the bridge is displacing the strings from a straight line between termination points. If not, more careful readings are taken to determine how extensively there is zero or negative bearing. After the bearing, look at the crown of the board. "Crown" refers to a different factor than bearing: while bearing denotes the relationship of the bridge to the string, crown refers to the actual arched shape of the board itself. The board is so constructed in order to improve its resonating ability and to withstand the down-pressure of the strings. Of course, since the bridge sits on the board, changes in one affect the other, but it is necesary to evaluate them separately. A piano could have negative bearing but adequate soundboard crown (if, for instance, a replacement pinblock is too high) or have bearing but no crown (if the board has flattened but the plate has been lowered so the strings still contact the bridge). To check crown, stretch a string beside the longest rib, with the ends contacting the board where the rib joins the case (use thumbtacks to hold it in place). If there is a gap between the string and the board at the middle of the rib, then the board has crown (the board curves above the line described by the straight string). If there is little or no gap, then the board has flattened. It may or may not be salvable, depending on the degree of loss, the overall condition of the board and, to some extent, under what conditions the piano will be used. If the board has "oil-canned" it will displace the string and is a hopeless case and must be replaced (there are pianos around with deliberate negative crown: these will have adequate bearing and very tall bridges). Although some crown can be restored by careful drying and shimming of the board, be cautious about undertaking extreme cases, considering that a new board or total replacement of the piano might serve the customer better.

Check the ribs for delamination by visual inspection, using a thin blade to probe along the glue line where there are cracks or buzzes. Feel across the top of the cracks for unevenness in the soundboard where it has pulled away from the rib. Then check around the rim to be sure the board is still glued tightly to the rast.

Finally, attempt to determine the healthiness of the wood. Spruce which is gray (not just from surface dirt but in

the cells of the wood) or crumbly has aged to near collapse and should be replaced or left alone to die gracefully. "Repairing" such a board and lowering the plate to get bearing only increases the stress and hastens the demise of the instrument.

Another possible problem related to the board and bearing is bridge roll. This is a condition in which the bridge has tilted forward so the string is contacting the back of the bridge rather than the front. This can be due to poor construction of the bridge, or to the soundboard collapsing in front of the bridge, or to the bridge delaminating. In any of these situations tone is weak since the speaking length is not positively terminated. It may be possible to see that the strings are creeping up the front bridge pins. There will usually be pronounced false beats. If the condition is slight it can be difficult to detect while the piano is still strung; it is possible to read back bearing as front bearing and assume that all is correct. The easiest way I know to check for this is with a piece of fishing line used as a string, stretched under the capo and lowered slowly so it just contacts the bridge. You can see if the string contacts the front of the bridge first. If not, you have another problem to correct but it is a bridge problem and this is a soundboard article so for purposes of brevity we shall assume that the bridge is in good condition. It *is* a soundboard problem if the board has collapsed, causing the bridge to roll. A slight amount of waver is common in older pianos and is not cause for concern as long as the front bearing remains greater than the back, but if the board has weakened it needs to be replaced.

When the work is undertaken, make a sketch of the piano and record measurements before disassembly. Measure the bearing on both sides of all breaks and in the middle of the long bridge: at least every ten unisons and more frequently if there are problems to correct. I measure bearing with a rocker gauge and a set of feeler blades which run from .0015 to .015 in thickness; there are also dial gauges which are easy to read accurately. Don't settle for "about a nickel, about a dime" thickness readings unless you are sure the plate will go back in exactly the same place and no adjustment of bearing is necessary. After destringing the piano, check the bearing again, using fishing line as a string. This supplies information about how the board behaves under stress. Since any plate adjustment must be made while the piano is unstrung, failure to take both sets of measurements may lead to either an unpleasant surprise or unnecessary worry over readjusting bearing and/or crown. Adjusting bearing based only on measurements taken on the unstrung piano is inaccurate, as the load of strings at pitch will cause the board to change and bearing may actually improve in some areas. Too much bearing is undesirable, since it restricts the motion of the board and acelerates its flattening. Therefore, do not lower the plate for more bearing unless it is necessary according to strung-piano measurements. Similarly, if crown is to be improved, you should check with the string along the rib and measure the gap before and after destringing.

Use hardwood wedges to register the plate position; two at each front corner and several at the back of the plate. Align the wedges with screw holes or other reference points to be sure of putting them in the same place when the plate is reinstalled; draw a line on each wedge as close to the plate as possible. Number the wedges and mark their location on the chart. (Take wedge readings with the plate screws in.) If you are replacing the block, make whatever additional references you want to be sure of a record of the original plate position. Then remove the plate to expose the board for work. Even if there is no board work I usually remove the plate before restringing — it is the only reasonable opportunity to inspect the pinblock and other hidden areas.

I also remove the nose bolts before I do the board — fewer obstacles to scrape my knuckles or dull tools. Mark them or measure their height above the board so they can be quickly reinstalled nearly correct (final adjustment is made when the plate is in). They should be numbered by scoring them with a file and noting their sequence on the chart. Tape off the bolt holes and the plate screw holes. Although it will be scraped later, the board should be clean before work is begun. It is easier to detect cracks on a clean board and the work is more pleasant. Dirt left standing on the board works into the wood, making for a less than satisfactory final result. I wash the board with soap (Murphy's Oil Soap) and warm water, exercising a little finesse to keep water off the keybed and out of the screw holes. Then the board is rinsed and dried with rags.

If there are no cracks, the board could be scraped and refinished immediately, but I dry it for at least a few days to be sure nothing is going to open up or delaminate. If there are cracks, and particularly if crown is to be improved, the board and the shims must be very dry before repair. It must be brought to a lower moisture content than it might ever achieve naturally, or the cracks may open up again. My shop is dehumidified; when drying a board I turn up the heat (which enables the dehumidifier to pull more moisture out of the air) and hang Dampp-chasers (3) under the soundboard. I've used a space heater under the board but the fire hazard worried me. Heat lamps can be used so long as the heat is not too concentrated and is not scorching beams or ribs. Drape the piano with wool or cotton blankets so the heat is retained under the board. Don't use plastic or synthetic drop-cloths — they will hold moisture on the surface of the wood.

How long to cook a board? This depends on how damp the wood is to begin with, as well as how great a humidity variation the piano must withstand later. You should know the range of humidity in your area and consider that, but keep in mind that the customer may take it into his head to move to the desert. Try to repair the piano so it will stay repaired even under extreme conditions. There is a device with prongs which can be plunged into wood to read moisture content but it is an expensive gadget, and mainly used when replacing boards. As a rule of thumb, dry the board until the width of any cracks has doubled, or you hear ribs popping loose, or until a week has gone by and nothing has happened. Begin work but leave the Dampp-chasers running until shimming is completed.

If there is rib delamination or the board has separated from the inner rim, it should be repaired before other work is done. The potential difficulty in making these repairs is finding a clamping method to pull the board together with the ribs or rast. There are many methods and devices to clamp ribs: there was an excellent discussion, with illustrations of the various techniques, in the Technical Forum of the November 1980 *Journal.* Sheet metal screws can be used around the rim but bar clamps will usually work for this repair and are definitely a worthwhile investment for a rebuilder.

I get best results with a shimming tool with a very narrow triangular blade, since I can cut the groove deeply enough with relative ease and then widen it if necessary. It's been suggested that in enlarging a crack for shimming we should compress rather than remove wood. I do not agree with this. First of all, compressed wood, if it expands later, may separate where the cells have been crushed. *Voila!* a new crack. Secondly, compressing wood requires so much strength that the accuracy of the cut suffers. Therefore, shimming tools are kept sharp enough to remove wood. Many technicians equip shimming tools with a guide to limit the depth of the cut; for some reason I've never done this but it seems an excellent idea.

Evaluate the cracks before charging in with the knife. If a crack "jumps" a grain line you must decide whether to run the shim across the grain or to end that shim and begin another. If there is more than 1/16" of grain to cross, it may be better to repair the cracks separately. It is difficult to cut across the grain where there are these parallel cracks without freeing large splinters of wood. Splinters in turn leave gaps, making a uniformly tight-fitting shim impossible unless a great deal more wood is removed. Even then the groove may be s-shaped and the shim will not fit well. On the other hand, placing two or more shims very close together is difficult because there is very little wall of original sruce left to hold the shims. in these instances it may be better to shim one crack and let that dry before cutting for nearby shims, or to shim the worst cracks with wood and fill the others with epoxy, or to carefully rout or saw out the whole area and place in a new piece of spruce. To do this one must avoid damaging the ribs by placing a depth guide on the saw; the cut must be very straight so a guide is clamped to the board. The piece is chalk-fit (as a block to a flange but using white chalk) and glued in place with go-bars or a t-nut beam for clamping pressure. This is a rather difficult repair and perhaps should not be undertaken without further assistance than just this article.

At the mention of epoxy in soundboards there will be grumbling among the traditionalists. I should know — I grumbled against it myself for years. However, bear in mind what has been determined about soundboard cracks — they don't seem to affect the sound but are principally a cosmetic problem. It may be the best solution to use epoxy to fill the lesser cracks in a multiple-crack situation than to put in a lot of sloppy shims (pulverizing the board in the process) or a poorly fit large piece, or to leave the whole thing alone and try to disguise it with the new finish. I also find epoxy useful for the fine lines of dirt or old glue or whatever it is that looks like a crack but doesn't run through the board and doesn't open up, but doesn't look good and can't be snaded out. These can be carefully cleaned out on the surface and a bead of tinted epoxy put in which will make them practically invisible.

Wedge between the soundboard and the beams before shimming. This forces slightly more crown into the board (as well as supporting and keeping it quiet while work is done). If the shims are well-fit and the drying properly done, the board will tend to retain this additional crown when the wedges are removed. Push these wedges in between the ribs and beams but don't hammer them home too tightly or something

may break.

Of all the passes made with a shimming knife, the first is the most important. Do this with the sharp point, using very light pressure and going very slowly so you can watch the grain of the board. Once the path is set the knife will tend to follow it, so get it accurately placed. As the cut deepens, more and more pressure can be applied. The tool should be kept perpendicular to the crack; leaning it to the side will produce a waver in the groove and the shim will fit poorly. The depth of the shim should match the depth of the crack. If the crack goes all the way thrugh, so should the shim.

Avoid piling up sawdust and slivers at the ends of the cracks — pull loose material out of the crack entirely. I shape the ends to a gradual curve (like the prow of a boat) and shape the shims to match. This makes a smoother transition than a squared-off end. Work from crack to crack, progressively deepening each, or take breaks, or do whatever you have to do to maintain control and patience. Spruce is so soft it will not tolerate any errors. Often places develop where the wood begins to tear or splinter or the grain pinches the knife. Smooth these as soon as they appear; usually changing the direction in which you pull the knife and exerting less pressure until the tight spot is worked out helps. Unless the board is very old or thin or you are very large, it is helpful to climb onto the board or sit on the rim for better control and supervision.

Purchase shims by the bundle and pick out those which match your knife, or else cut your own on a table saw. They should dry on the board as it is drying. As you look at a shim from the side, check that the narrow edge (the bottom) is reasonably straight and has a continuous grain line. Discard any with gaps, large splinters, or an uneven thickness. Look at the ends, checking for a straight vertical grain, which indicates desirable quarter-sawn wood. Sand the shim lightly and mark arrows on the top to indicate planing direction. Once the shims are in the board there will be obstacles such as bridges to work around, so orient the shim for easiest possible planing. Find the planing direction by shaving a sliver off the top — if it shaves off smoothly, that's the right direction. If it gouges or splinters, that's wrong.

As the grooves get deeper, fit each with an individual shim and finish the cutting to match that particular shim. A shim, when pushed down with the fingers, should fit snugly and not rock from side to side. There shouldn't be gaps along the edges or at the ends. Push the shim down along its entire length, feeling for spongy places where it isn't solid to the board. Mark these areas on the board with a pencil so the groove can be enlarged where needed. When it is properly fit, the shim should be snug enough so it can be pushed down and will stay and can just be eased up out of the crack without losing splinters. This is a stop-just-before-it-breaks situation: experience will yield judgement.

I used Titebond to glue shims for years but since I took the plunge to fix some cracks with epoxy I now use it to bond in the wood shims as well. Even the most carefully fit shim is bound not to contact the board at absolutely every point. Since epoxy bonds in a different manner than glue, it fills these gaps with more integrity than does glue. The argument against epoxy is that it may not move with the board as the wood changes, allowing the crack to open up. However, the technique has been in use for some time now and it seems safe to trust it. Since sound travels principally with the grain rather than across, I don't worry that the epoxy is interfering with vibrations. Of course it is true that a material which behaves for 20 years may not last for 60 so I may be redoing some of these boards in my old age; it's also true that we are great traditionalists in this profession and resist change; on that score you must decide for yourself.

I use a liquid epoxy and tint it with powders. When shims are being glued the board still has its original finish. This makes clean-up easier, as the old finish helps repel the glue where it isn't wanted. It does make it helpful to scrape a sample section so the epoxy can be tinted to match the color of the refinished board; if you use a finish which imparts color you may wish to apply that to the sample. Tint to the lighter grain of the board, using quite a lot of powder so the epoxy becomes opaque. Untinted epoxy dries to a dark but translucent line and is obvious as "not wood." Mask off the cracks underneath, then use the epoxy as a glue to put in the shims. The shims should be pushed down firmly without sideways pressure or they may snap off. They usually will stay in place if well-fit but if they ride up out of the board you should use go-bars, a t-nut beam, or weight to apply clamping pressure.

To fill those dark lines, carefully clean out any dirt or darkened wood with the knife point. Apply the epoxy. I use a heat gun to warm the material slightly so it becomes even more liquid. Then I poke it with a thin wire to release any air bubbles which will leave tiny pits in the surface. Once the material is on the board it is difficult to see just where the level of the spruce lies, so slightly overfill an scrape to level later.

Garret Wade (the woodworkers' supply company) has come out with a gap-filling glue which may the answer to the no-epoxy-in-wood problem while still offering complete filling of the crack. I haven't tried it yet but can report its existence. Other technicians are having success with it so far.

When the glue is dry, the shims are levelled to the board. Small planes are good for this, and a chisel and/or small drawshave will be needed for tight spots. Peel rather than hack, being careful of planing direction. The shims chip or break off below the board surface quite easily, especially if wood is removed too vigorously.

When the shims are flush, or nearly so, the board is ready for scraping and preparation for refinishing, but I'm out of space and time so we'll get to that later.

IN THE FIELD

Continuing Education

Ben McKlveen, RTT
Cincinnati Chapter

A curious new phrase has crept into our vocabulary in recent years. It is "continuing education." What does it mean? Where did it come from? What is its significance?

Forty years ago, when the country was coming out of the depression, there were some rather rigid notions about education. It was thought that most people could get along in life with a high school diploma. College was for a specific career such as medicine, law, engineering, or business. Of course, a few hardy souls ventured into liberal arts, but it was thought that they would "specialize" in something later.

At this time there was a sort of informal continuing education. It took place on the job while you worked. It lasted just long enough to give you the essentials of what you needed to do your job. This might be as little as five or ten minutes to explain a procedure, or as long as a few weeks, if some special skills were to be learned.

With the close of World War II, there began an explosion of knowledge that is still going on. Research, information, skills, and techniques spawned by the war effort proliferated and created new industries and new products, and changed old industries. This, in turn, brought forth even more change. Some way had to be found to keep up with this information glut. More people began to go to college. Soon a college diploma was not enough; advanced degrees became necessary. Still, changes and new data raced ahead of our ability to keep up. An incident from my own family serves as a practical example.

In the early 1950's, my sister, who was a nurse, left her profession. She married and exchanged her nurse's cap for a mother's apron. When her youngest child entered school, she returned to her profession. It had been several years since she last worked. In that time, there had been so many advances in the field of nursing, so many new drugs and procedures had been developed, that she was obliged to go back to school for a number of weeks to get caught up. This was called a "refresher course." Actually, it was "continuing education."

Each new drug, new machine, or new technique in the medical profession sends thousands of people scurrying into classes, seminars, or formal schooling just to learn how to use these innovations. Where once there were doctors and nurses, there are now, in addition, an army of specialized technicians to absorb and utilize all that is new in the medical field. Continuing education has become formalized.

Besides medicine, the sciences have utilized the classroom, the seminar, and the trade journal to spread the word about new developments. In those fields that require licenses (medicine, law, education, etc.) continuing education is a requirement for license renewal or for advancement in the field.

Non-regulated industries and businesses have seen the advantages of continuing education. Sales forces for all manner of companies, as well as engineers and production staffs for various manufacturers, meet with increasing frequency to help each other solve problems.

The piano business is no exception. Basic training in the service of pianos is really only a beginning. If you are lucky, you learn the fundamentals. But fundamentals don't make a skilled and polished technician. Experience helps. Supervised experience is even more valuable. Not all of us have been well grounded in fundamentals or privileged to have had good supervision. The early tuners' organizations tried to help by sponsoring seminars and conventions that stressed the basic skills. The efforts by technicians of twenty-five or thirty years ago gradually yielded to better trained teacher-technicians and a corresponding sophistication of material. Organization and discipline of classes improved. The Guild fostered better relations betwen the manufacturers and the technicians, which led to some of the best "continuing education" we have seen, such as the Yamaha "Little Red Schoolhouse," the Baldwin Service School and, recently, a service school by Kimball.

To be sure, these schools are not open to everyone. However, the Piano Technicians Guild Institutes are open to all. Granted, it takes time and money to attend these events, but the costs are very reasonable when compared to the costs for similar training in other occupations.

The benefits vastly outweigh the costs. To be able to learn new techniques, to see new products, to keep abreast of change is to stay alive in your business, to make it more profitable and enjoyable — in short, to be successful! We work in a non-regulated profession. No one forces us to "take classes" for "credit." No "mickey-mouse" garbage courses bedevil us. May it ever be so! Call it whatever you will, good continuing education adds to our skill, enjoyment, independence and profit. It is available to us. As I said, it does take time and money, but the results are worth it and we are fortunate to have continuing education as a choice.

During the coming months, there will be state and local seminars within easy reach of almost everyone who reads these pages. In July, "the big one," the national convention with its four and one-half day institute takes place. The best minds in the piano business from field and factory will be there to instruct you. Why don't you plan to put some "zing" back into your career? Attend one of these events. Make some new friends, meet some experts, learn some new skills and garner some inspiration. You will return to your work richer for having done so. As Justin Wilson, the Louisiana Cajun humorist, says, "Try it; yo' like it, I ga-ron-tee!"

Soundboard Cracks, Compression Ridges and Natural Laws of Physics

Samuel Nock, RTT
Phoenix Chapter

Tech. Ed. note: The notion that a board with open joints is necessarily more stable and/or less likely to develop cracks or ridges is one that is open to question; this article is presented anyway, subject to that proviso, because of its interest. — J.K.)

It has been said on reliable authority that one would be hard pressed to find conventional soundboards in pianos which are not cracked to some degree. To this fact we must add that crushed wood fibers in soundboards also exist to the same, or perhaps even greater, extent. This is true because the same laws of physics, disregarded in soundboard design, account for both types of damage.

In recent years the *Piano Technicians Journal* has carried numerous reports dealing with the repair of soundboards. These articles have made it unmistakably clear that crushed fibers are far more damaging to the soundboard than are normal cracks. Many piano technicians and piano owners express dismay at the sight of soundboard cracks, but seldom notice the signs of the much more detrimental crushed fibers. This attitude is an unfortunate display of innocence. Owners are to be excused on this point, but with all that has been said about crushed fibers it is difficult to find an excuse for technicians. Lying beneath all compression ridges are crushed fibers. Compression ridges, for the most part, are easier seen than the cracks.

At the present state of the art we are faced with the existence of cracks. As for me, I find no fault with soundboard cracks provided they are clean, have no buzzing fibers and the sounboard is solidly glued to ribs, bridges and rim.

Later in this paper, I will discuss the laws of physics which have been neglected in soundboard design, and which are the direct causes of the problems we are discussing. Also I will propose what to do to correct these problems.

This paper deals only with conventional soundboards as we know them. I make no comment about, nor reference to, the development of laminated soundboard design. My interest in the study of cracks in soundboards started several years ago when I lived in southern Connecticut and was involved in especially demanding piano service. During the year the humidity would vary up to the 80-95 percent range. In the winter, with temperatures mostly below freezing, the water vapor would freeze out of the atmosphere leaving the air dry. This dryness combined with indoor heating resulted in low relative humidity.

Eight of my customers belonged to a skilled duo-piano group. Each had a pair of excellent quality grand pianos in his home and it was my privilege to match-tune these pianos frequently. When the atmosphere was humid I would find these pianos four, five or six beats per second sharp. In the dry atmosphere I would find these same pianos four, five or six beats per second flat. These pianos had fairly tight soundboards with only a limited number of small cracks. I reasoned that when moist air called for the expansion of the wood, the only direction in which the soundboard could move was up, and so the bridge was lifted causing the pitch to rise. Conversely, when the board dried out in a lower level of humidity, the board contracted causing the pitch to fall.

Meanwhile, I was comparing the physical status and performance of my grand piano with that of my customers, which is of similar quality. It is 6' 1½" in length and has seven cracks, varying from 16" to 58". While my customers' pianos with their tight soundboards were going sharp or flat, my piano remained at A-440, month after month, moving occasionally only a beat or two one way or the other. Under the same atmospheric conditions as those of my customers, cracks in my piano's board were wide enough to take up the expansion. With each crack to crack segment moving within its own area, there was no contact with adjacent board segments, hence there was no buildup of dimension; the soundboard remained level and the pitch of the piano remained stable.

A crucial test came when I moved from wet Connecticut to dry Arizona. Sun City, Arizona, in the Valley of the Sun, has about the driest atmosphere in the nation; average yearly rainfall is 7.05 inches, relative humidity is often below 5 percent, and seldom does the relative humidity go higher than 30 percent.

When my piano was loaded aboard the truck for moving, the humidity in Connecticut was in the 90 percent bracket. After ten days and 2,800 miles of travel, the piano was put into my Sun City home where the humidity that day was 9 per cent. My piano checked out at one beat per second flat.

In Sun City I have kept close watch on six customer pianos, including my own. All are good name grands, all have well cracked soundboards and range in age from 57 to 90 years. The performance of these instruments is amazing. They hold their pitch with not

more than one or two beats per second variation from year to year. In one of these pianos the middle string of A-440 has held without adjustment for two years. In another it has held without adjustment for four years. In tuning these pianos from time to time there are many pins throughout the scale that do not need to be adjusted at all.

Over the long life of these instruments this pitch stability has resulted in less turning of tuning pins. They all have original size number 2 pins, and all have excellent holding power.

Now let me endeavor to explain the laws of natural physics which act on piano soundboards. Imagine, if you will, a volume of air, a bucket full, or a room full, or a cubic mile full. For sake of discussion, let us say a cubic foot of air at 50 percent relative humidity and 72 degrees Fahrenheit temperature. Let us also assume that our volume of air contains a piece of soundboard wood.

When we heat this unit volume of air it expands to a larger volume. (This is the law of expanding gases.) However, the vapor which moves with the expanding air does not expand at the same rate as the air, and so the percentage of vapor to the larger volume of air is less, creating a lower relative humidity. That part of the vapor which moved from our original volume to the larger volume also moved out of our piece of wood, creating a partial vacuum. Now the next natural law comes into play: nature abhors a vacuum, so our piece of wood contracts to fill the space vacated by the moving vapor. Our piece of wood has become smaller. This is the process of shrinkage, the condition which we describe improperly as drying out.

Next let us look at the opposite end of this vapor condition. Starting again with our first unit of air at 50 percent relative humidity and 72 degrees Fahrenheit, let us cool the air to a lower temperature. This time the air becomes compressed to a smaller volume but the vapor content is about the same. Hence, our unit has a higher relative humidity and the vapor moves into our piece of wood. Now we have the law of physics that only one object can occupy the same space at the same time, so the wood fibers expand to receive the vapor. This is the expansion about which we talk.

In the foregoing I have tried to demonstrate that we are dealing with the forces of nature which are irresistible; we must live with them and everything we do must adjust to them. For example: To allow for expansion and contraction of steel due to temperature change, the mid-span of the deck of the George Washington Bridge which spans the Hudson River between New York and New Jersey moves up and down through seven and one half feet during each twenty-four hour cycle of temperature extremes.

Examine a small steel bridge and you will find one end is anchored to its pier. The other end is resting on a roller to allow the structure to move back and forth, adjusting to temperature.

Another illustration to show the forces of nature: if a wood floor is laid, such as in a gymnasium, expansion joints are constructed approximately every twelve inches across the grain of the wood. This permits each twelve-inch section of floor to expand and contract with changes of humidity, without touching the neighboring section. The floor moves back and forth in the same plane. Therefore there are no compression ridges, no crushed fibers and no buildup of dimension which could cause the floor to self-destruct.

Even our human bodies are created to adjust to outside pressure changes. Consider the fact that shoes feel tighter on the feet as you ascend in an airplane. The explanation is inside pressure of the body adjusting to lighter air pressure. You also feel this pressure at your eardrums. And these changes are felt in reverse as a plane descends.

This brings me to the main point of this discussion: namely, that we should design the proper means for controlling the expansion and contraction of piano soundboards.

All people in the piano industry, from manufacturers to the purchasing public, and all those in between, will need to be educated to this change of attitude and to accept rather than be dismayed at the necessity of seeing lines of daylight through piano soundboards. When nature provides this daylight, we call it

a crack. Man should create these "lines of daylight" which we may call "Expansion Control Joints."

Up to now nature has been providing those cracks as if trying to correct man's mistakes and the industry has been fighting nature by designing all sorts of ways to fill those cracks. We fill the crack and it breaks open again, either in the same place or another place adjacent to it. The process is never-ending — useless.

By the same process it is useless to replace soundboards to overcome compression ridges and crushed fibers. A new soundboard as we build them now will break out again at the first exposure to humidity changes.

Some years ago the Steinway & Sons Piano Company printed and circulated a very useful article which was written by Dr. William Braid White, Principal of the School of Pianoforte Technology, Chicago, Illinois, titled, "The Soundboard of the Piano." The article was reprinted by Steinway with permission from the Piano Trade Magazine of Chicago, Illinois. I include that article with this paper.

The Soundboard of the Piano

From an article by Dr. William Braid White, Principal of the School of Pianoforte Technology, Chicago, Ill., reprinted with permission from the Piano Trade Magazine, Chicago, Ill.

"In the piano the function of the soundboard is to take up and repeat the vibratory motions of the strings, and thus to set up in the air sound waves of vastly greater size and power than could be generated by the strings alone. The more faithfully the soundboard performs this function, the better soundboard it is.

"The layman will better understand this amplifying function of the soundboard if he will think of the relatively enormous area of the board when compared with the very small area of all the strings taken together. Hence, when the piano is played, the soundboard, repeating the vibratory motions of the strings, sets in vibration vastly more air than could the strings themselves.

The more than two hundred strings that constitute the tone-generating element of the piano are stretched, at high tensions, over wooden bridges, or supports, which are rigidly fastened to the surface of the soundboard. Thus, within a small fraction of a second any motions of the strings are transmitted through the bridges to the soundboard, which as it were, accepts them, and faithfully reproduces them over its entire surface. These tiny but intensely complex motions, originating at the strings, are transmitted to the large body of air surrounding the front and back surfaces of the soundboard, thereby setting up powerful sound waves which immediately register on the ear-drums of all within hearing.

"So faithfully does the soundboard perform this difficult function, that no matter how many strings may be sounding at one time, their almost incredibly complex motions will always and unfailingly be taken up and reproduced. Thus, the soundboard of the piano acts just as does the parchment head of a drum or the thin steel diaphragm of the receiver element in a telephone. It should be remembered, however, that it is the strings, and not the soundboard, that originate, by their vibratory motions after they have been struck, the sound which the soundboard amplifies.

Construction of the Soundboard

"In order to obtain these very remarkable effects of amplification, the soundboard of the piano must be constructed with exquisite skill. Its length and breadth depend of course, upon the size of the instrument, while its thickness, with some variations between one end and the other, averages one-quarter inch. The pieces of sprucewood from which it is made are matched in such a way that the grain runs roughly parallel to the line of the great bridges upon which the strings rest.

Facts Little Understood

"It is strange but true that these simple facts about the effect of the strings upon the soundboard's responses to the strings, are still very little understood. Thus there persists a common notion that a crack in the wood must in some way cause a deterioration of the tonal output. Actually, no such effect is to be expected.

"The erroneous idea that a crack in a soundboard reduces the tonal output is undoubtedly due to the equally erroneous theory that sound "vibrations" in some way travel transversely across the soundboard. But, as has been shown here, the movement of the board is that of the movement of the strings, up and down in the case of a grand, backward and forward in the case of a piano of vertical construction. The glued-up strips of thin spruce, reinforced by bridges and ribs, which constitute the soundboard, become in fact a single unit, so that the whole board vibrates with the playing of even one single note anywhere in the scale.

Effect of Cracks and Checks

"For this very reason a crack or check in a soundboard reduces the soundboard's ability to amplify the vibrations of the strings only to the extent to which the crack reduces the vibrating area of the board.

"Soundboard areas vary with the size of various pianos, but consider for example a board with an area of 4,000 square inches, counting both surfaces. Now assume that there is a crack in this board 35 inches long and one-eighth inch wide, which would be an enormous crack. That crack would have an area (counting both surfaces) of 8¾ inches, and so would reduce the air disturbing area of the board by less than ¼ of one per cent, an amount utterly negligible.

"Here we have considered the effect of an enormously big crack. A dozen ordinary cracks, even if they extended from end to end of the soundboard, might have about as much effect, certainly no more. So long, in fact, as the structure of the soundboard remains solid, with ribs and bridges adhering correctly to the surface of the soundboard, and with the entire periphery rigidly fastened into the frame of the piano, the question of cracks is utterly unimportant.

Effect of Atmospheric Changes Greater

"As a matter of fact, the tonal output of any piano, with no cracks in the soundboard at all, is subject to vastly

greater change with every change in temperature and humidity. The alternate absorption and evaporation of moisture affects the soundboard, and therefore the tone of the piano, to a far greater degree than any crack or accumulation of cracks, yet few persons complain of this or even appear to notice it.

"I have gone into this matter at some length because the public, and some piano men, are misinformed on the subject. To correct the difficulties that arise out of public misunderstanding of this matter has been the object of this article."

Jack Krefting, in his "Tuner Technician Forum" of July 1979, quotes some views from Walt Thatcher which are quoted here in part. All of the Thatcher views, plus Jack's observations on our subject, are worth reading again. Thatcher says:

"Taking another splinter from the board is the abysmal ignorance of so many people in our profession concerning cracks. Have you counted the number of customers who told you that a previous tuner stated that the soundboard was cracked and therefore ruined? Naturally you (all of you) learned people examined the board, and in nine out of ten cases replied, 'Tut, tut, the board is fine.' I recollect 143 instances. Multiply that by 10,000 and Braid White must be plum tuckered out turning over in his grave."

Jack Krefting in his "Forum" has given us a great wealth of opinion and direction and I quote from that column in the *Journal* of March, 1979, page #9.

"Cracks in a soundboard are the most visible candidates for repair work, but in importance they rank a distant fifth — well behind loose ribs, bridges, edges and compression ridges."

In this discussion, I have tried to establish and explain several points. They are:

1. Space for expansion and contraction is demanded by nature.

2. Nature will create that space via uncontrolled cracks and crushed wood fiber unless man provides a control mechanism.

3. The faithful amplification of sound by the soundboard is not noticeably impaired by the existence of a relatively small open space in the soundboard.

It is my sincere belief that it would be advantageous if our entire industry could unify its thinking to realistically accept the existence of expansion control joints, and that expansion control joints be designed and built into all pianos. Actually we are not facing wide open unsightly lines of daylight through the soundboards.

This paper makes no attempt to designate the design control joints by means of a general statement. Each piano should be specifically designed. It is, however, fair to say as a starter that with a soundboard width across the grain, at right angle of approximately four feet, we face a total accumulated opening width of approximately 3/16ths of an inch at 5 percent relative humidity. One half this amount at 50 percent relative humidity and near zero at 95 percent relative humidity. This would be with soundboard fabricated with eight boards about six inches in width.

Here are some of the plus factors: 1) Greater stability of pitch. Less maneuvering of tuning pins, thus greater retention of holding power. 2) Less stress at glue joints between soundboard ribs and between soundboard and the rim, thus insuring longer life with less needed repair work. 3) No soundboard cracks to fill and no soundboard buzzing to correct. 4) With absence of crushed wood fibers the board remains stronger, more resonant and more likely to retain its share of support to the soundboard crown.

In architectural and industrial design there is a prime rule that *FORM FOLLOWS FUNCTION.* The function of a soundboard is to amplify sound and it should maintain its stability under normal atmospheric conditions, including places of human habitation and transportaiton. It should do this for many years without failure of its parts and without excessive maintenance costs. Expansion joints will achieve this.

As for form, we will need to become accustomed to seeing the neat rows of well organized open spaces. I would suggest that these joint lines be ornamented by fine lines of color stain to match the case. This among other things will tell the observer that the open joints are there by design and intent.

I urge all who are associated with the piano industry to realize the need for change in soundboard design, and to consider design as demanded by the physical laws of nature.

After Touch

David Pitsch, RTT
Utah Valley Chapter

50 Point Guide To Grand Regulation, Part XXX

Step #46 Check string level/damper seating

Most technicians know that piano wire, even after being strung and pulled up to tension, still retains a natural curve as a result of being reeled upon a spool during manufacturing. Because of this natural curve, the three strings (or two) which make a unison may or may not be perfectly level at the point where the hammers strike and where the dampers seat. Irregularities in string level may also be caused by the holes in the agraffes not being perfect. Whatever the cause, they must be corrected. If one string in a unison is higher or lower than the others, problems in voicing and damper seating are sure to result.

Since the string level affects both voicing and correct dampening, I find it easiest to match the string level to the dampers, then alter the tops of the hammers to finish matching the hammers to the strings. Theoretically, all strings should be perfectly level, with all of the tops of the hammers also perfectly level, and correct dampening on every note. However, being one who is more practical than theoretical, I have a tendency to leave the dampers alone if they are working fine! Play each note staccato, listening for the familiar "after ring" which tells that the dampers are not seating correctly. Don't forget also to try the dampers using a lighter, legato touch, as well as using the sustain pedal. If any dampers are heard to "ring through," feel the string directly in front of the damper head and check for a problem in the level of the strings.

Not all problems with dampening are caused by string level. Sometimes the damper head is bent side to side or front to rear. Maybe the damper-to-string alignment is off. On trichords, if the middle string is dampened but one of the outer strings is not, try cutting the middle of the trichord a little deeper. There are numerous other reasons for incorrect dampening besides these. But if the strings are felt and one of the unisons seems to be too low or too high, try leveling the strings. When one string is low and the others are high, the obvious solution is to raise the low one. However, some technicians would rather not raise two low ones to match one high string when one is high. It is possible to lower one string. Whatever your preference, the end result should be to get all three unisons level.

To raise a low string, take a string hook, as used in restringing, and place it under the offending string between the agraffe and the damper. Slide it back and forth with a slight upwards motion a couple of times. This process is much like voicing in that you can always do a little more if needed, but it becomes a problem when you've gone too far. Don't run the string hook too close to the agraffe as you want to put a slight *bend* in the wire rather than a crink. It is possible to break a weak agraffe, so put only a slight upwards pressure on the string. Retune the string and check for correct dampening.

As mentioned above, if one unison is high to the other two, you have a choice. The high string can be lowered, or the two lower ones can be raised with the method just shown. If you prefer to lower a high string, take something softer than the wire, a piece of brass or hard wood (not a screwdriver) and gently run it up and down the string using a slight downwards motion. This is a little trickier, and perhaps not as permanent as raising low wires.

Step #47 Check sostenuto tabs for evenness, adjust knife angle

The evenness of the sostenuto tabs should already have been checked while performing steps #43 & 44, the damper lift form the key and lifter rail. If these previous steps were done correctly, all tabs will be in a straight line. If they are not, go back to step #43 and redo, as any change in the height of the damper lever to get good tab alignment will cause problems with the damper lift from the key and lifter rail.

Adjusting the sostenuto knife angle is rather simple. Adjustment is made by varying the length of the sostenuto pedal rod. Looking from the treble side of the piano at the rod, it should be at 5 o'clock in its rest position, 3 o'clock in the raised position.

Step #48 Adjust sostenuto knife in/out and up/down

Now that the tabs are perfectly even and the knife angle is adjusted, all that is left is the in/out and up/down adjustment of the sostenuto rod itself. Taken in this order, working on sostenuto systems becomes considerably less painful. If you can't remember anything else about the sostenuto rod, remember the distance 1/8". The rod cannot interfere with the normal playing of the piano. All tabs must clear the rod when not using the sostenuto pedal. On the other hand, when the pedal is played, it must catch and hold firmly any tabs in the raised position. Adjust the rod in/out to give 1/8" clearance between the rod itself (not the knife part of the rod) and the ends of the tabs.

With the sostenuto pedal in the down position, we want to raise any tabs corresponding to the keys being depressed, but we want them raised higher than the distance the key will raise them. The damper levers when raised by the sostenuto rod should be pushed well into the felt of the damper stop rail. This

will eliminate any unwanted noise from other tabs coming up and hitting the knife from underneath while the sostenuto pedal is in use. This adjustment is far more critical on pianos where the tabs are not hinged with a return spring. These stationary tabs will really cause a noise if the rod is not so adjusted. Make this adjustment by leaving 1/8" between the tops of the tabs in the down position and the bottom of the sostenuto rod. This adjusts the rod up/down position.

Virtually all grands are made with the sostenuto rod connected to the belly of the piano. By removing the action, access can be gained to work freely on all the parts. The exception is the American made Steinway. The sostenuto rod is connected to the action frame. On these pianos, any adjustments on the placement of the keyframe on the keybed will change how the sostenuto works. To regulate the in/out and up/down on these pianos, place the action in the piano and secure its position with the cheekblocks. By playing notes and catching them with the knife, I can see with the aid of a light how the rod is working. Remove the action, adjust, reinstall and check for correct positioning.

Step #49 Adjust shift pedal rod length and stop screw

Depress the shift pedal slightly and place a piece of paper in between the left side of the action and the keyframe stop block. Release the shift pedal and pull on the paper. The paper should be held firmly in place. If it comes out, the shift pedal rod length is too long and is holding the action out of place. Adjust the rod length until there is no lost motion but make sure that the action is secure against the stop block.

Now depress the shift pedal fully. Look at the string grooves in the hammers on the three string unisons. The shift pedal stop screw on the treble side of the piano should stop the action such that the string groove for the left unison is now directly under the center unison. Some technicians prefer to adjust this screw out a bit further so that the groove for the left unison is not quite under the center string. Whatever you prefer is fine. Just make sure that the action shifts at least half a string groove but not more than one groove. Actions which shift too far run the risk of having the hammer hit the left string on the upper note, causing a bit of discord! Check to make sure the action returns freely and no noises are heard while shifting.

Step #50 Adjust strike point, tune, voice

The final regulatory step on the 50 point checklist is to adjust the strike point. This is done by playing note 88 and listening to the quality of sound. The action is freed at the treble by removing the keyblock. Pulling the action out or pushing it in while playing the last note will tell just where the ideal strike point is. Assuming that the strike point was correctly adjusted in the past and has now changed because the hammer has worn, the action needs to be a little further in. By sight, the hammer should just clear the capo d'astro bar. By sound, it is correctly positioned where the tone is the clearest and loudest.

If the action will not go back as far as you want it to, take a screwdriver and lift up the front of the keyframe using the guide pin as leverage. This will show if the action should be further in. After the correct position for the keyframe has been found, loosen the screws holding the guide on the keyblock and reposition the guide to match the new keyframe position. Some pianos have an adjusting screw at the back of the keybed, so look to make sure this is not forgotten. The normal amount that a technician should be repositioning the action is around 1/32". If you find that it needs a great deal more, either the action was wrong before you got to it, or someone did a lousy job of hammer replacement!

This ends the 50 point checklist as far as grand regulation goes. Following will be two "appendages," one dealing with tuning, the other with voicing. I apologize for stepping on anyone's feet, or for not having covered some aspects of this checklist in as much detail as others. To elaborate on the former apology: everyone has a favorite way of doing something. If anyone disagrees with what I have written, please write in and share your opinion with the readership. In that way, we will all benefit. As to the latter apology, I tried not to repeat what had recently been published in the *Journal* by other technicians. Unfortunately, this meant skimming over some important subjects. In closing, I sincerely hope that no technician has had an action in his shop, performing each step as he read about it in the After Touch series. Surely, there would be one very unhappy customer!

A TWO-OCTAVE TEMPERAMENT

A.E. Sanderson, RTT
Boston Chapter

This temperament works from the outside in. That is, it first establishes the widest intervals by tuning two single octaves and a double octave. This span is subdivided into six parts by tuning six contiguous major thirds. Then finally, the three untuned notes within each major third are filled in by tuning fourths and rising thirds. Working this way from the outside in guarantees the compatibility of all intervals, and gives the tuner direct control over the width of his octaves and double octaves right at the beginning. Scale problems with the piano will show up at this stage when they are easy to correct by making minor compromises. Also, the skeleton framework of six thirds can *always* be tuned to rise smoothly all the way. This virtually guarantees rising thirds in the completed temperament unless there are very serious scale problems with the piano.

1. Tune A4 to 440.

2. Tune A3 from A4, 4-2 octave ½ beat wide. (Tenth ½ beat faster than third.)

3. Tune A2 from A3, 6-3 octave ½ beat wide. (Minor third ½ beat slower than sixth.)

4. Check A2-A4 double octave, no more than 1 beat in 4-1 partials. (Seventeenth no more than one beat faster or slower than third.) If out, change A2 to make double octave tolerable. (Note: the above octave choices are optional — you may tune any type of octave you prefer. The important thing is to set these three notes to your satisfaction before proceeding.)

5. Tune a set of six contiguous rising major thirds from A2 to A4. This can always be done on any piano, but the beat rates will depend on the inharmonicity of the piano. It is helpful to know that the beat rate of a major third is supposed to be just midway between the beat rates of its two contiguous neighbors on either side. Also, the beat rates of two contiguous major thirds are in the ratio of four to five with each other. It should never be necessary to move any of the As to get these rising thirds.

6. Tune an ideal temperament from F3 through $C^{\#}4$ using only thirds and fourths. Again this can be done on any piano no matter how poorly scaled. You are entitled to five perfectly rising major thirds, and four exactly equally tempered fourths over this mini-temperament of nine notes, so keep at it until you get it. Remember not to touch the previously tuned F3, A3, and $C^{\#}4$. One logical way to do it is as follows:

   a. Tune $A^{\#}3$ up a fourth from F3. Tune $F^{\#}3$ down a third from $A^{\#}3$, rising with respect to F3-A3. Tune B3 up a fourth from $F^{\#}3$ to match previously tuned fourth.

   b. Tune $G^{\#}3$ down a fourth from $C^{\#}4$. Tune C4 up a third from $G^{\#}3$, falling with respect to A3-$C^{\#}4$. Tune G3 down a fourth from C4 to match other fourths.

   c. Test: G3-B3 third should be halfway in beat speed between its two adjacent neighbors, $F^{\#}3$-$A^{\#}3$ and $G^{\#}3$-C4. If it's not, your fourths are wrong. Proceed as follows.

   d. Expand (or contract) both the $F^{\#}3$-B3 and G3-C4 fourths keeping them matched to each other until the G3-B3 third is correct, retuning only G3 and B3.

   e. Retune $F^{\#}3$ and $A^{\#}3$ in such a way as to match the two affected fourths, and to place the $F^{\#}3$-$A^{\#}3$ third halfway in beat speed between its two adjacent neighbors.

   f. Retune $G^{\#}3$ and C4 so as to match the two affected fourths, and place the $G^{\#}3$-C4 third halfway between its two adjacent neighbors.

   g. Test: Five perfectly rising thirds and four virtually identical fourths.

7. Tune in both directions away from the mini-temperament, checking both thirds and fourths. The beat rate of each new third can be obtained directly from that of its previously tuned contiguous third, above or below. Remember the four to five ratio of beats. Fit each note in using both intervals (and others as they become available) until the entire two octave span has been tuned.

8. Final test: Rising thirds all the way, all fourths acceptable, fifths nearly pure.

More Than The Old-Timers Ever Taught Us About Tuning Stability Part I

George Krippenstapel, RTT
Connecticut Chapter

(Tech. Ed. Note: Mr. Krippenstapel wishes to acknowledge the invaluable assistance of William Trousdale in the preparation of this article. Dr. Trousdale is a member of the Physics Department faculty at Wesleyan University, Middletown, Connecticut. — J.K.)

Some years ago when I was first apprenticing as a piano tuner, I frequently had the experience of tuning a piano, as I believed, more or less correctly. Returning to it minutes, hours, or days later I would find it badly out of tune from where I had left it. No doubt, other tuners have had similar experiences. The man that I was apprenticing with, a man of some forty years' experience who was respected among his clientele, told me that I needed to learn to "set the pins," then the strings would not slip. He explined that I had to move the pin in little jerks, bring the string slightly sharp and ease the string into the correct pitch from sharp. I diligently did this, and the results were worse than ever. I became doubly puzzled when I noticed that he himself rarely followed his own advice. He tuned both well and rapidly, and complaints about tunings slipping, even in critical concert or television situations, were not a problem. I concluded that he had intuitively developed and used procedures which gave good results, but that he did not understand from an analytic point of view what he was doing, neither did he analytically understand what was happening with the piano.

I thought about the problem rather considerably over the years. I abandoned strictly following his literal advice and experimented with different ways of tuning. During the time when I was gaining more experience and my tunings were improving, I reasoned that there was more to the matter than could be reduced to any one single set of rules. Sometimes I moved the pin smoothly, other times in a series of small impacting jerks. Sometimes I brought the string in tune from the sharp side, other times from the flat side. Sometimes I pounded the key very forcefully many times; but at other times, in spite of all my efforts, the string would blithely creep out of tune, to my great puzzlement and dismay.

After many thousands of hours of tuning and criticism and self-criticism and correction and guesswork, I eventually got to the point where the stability of my tunings was, in practice, a small if not completely negligible problem. However, I still did not completely understand what I was doing and could never be absolutely sure that my tunings would not waver.

The three problems that the tuner must solve as he is developing his skill are: speed, accuracy, and stability. They are the ways of looking at a task and, like the legs of a three-legged stool, absolutely depend on each other. The problem of accuracy is yielding rapidly thanks to the use of convenient and accurate electronic pitch analyzers, and due to a better theoretic understanding of the nature of inharmonicity. As questions of accuracy are resolved the results contribute to speed. It is now time to begin to focus on the third leg of the problem. This task, as we shall see, may prove to be knottier than the other two, for a good reason. It is impossible, given the current state of the art, to directly measure the factors involved, when we are actually tuning a piano in practice. The most we can do is to estimate them and develop a feel for the proportions.

I believe that it is possible to state with confidence that, if a piano is correctly tuned, and if all the forces are correctly balanced, and if the piano does not undergo any changes in temperature and humidity, then it can be used for a virtually indefinite amount of normal playing however forceful without varying in its tuning. This is an ideal of tuning stability which I am convinced by my own personal experience can be approached very closely in practice. A description of how to approach this ideal will be given in four steps. First, we will describe a tuning pin and string and how it reacts to indiscriminate movement. Then we will need to take a digression to discuss some terminology and to introduce some concepts of general physics that we will need for our analysis. Then we will apply these concepts to our ideal string and tuning pin to see how they interact. Fourthly and finally, we will consider the combinations of conditions that might be found in actual pianos.

We will consider the case of a single string in an imaginary grand piano which is below pitch and stabilized. We will describe pulling the string up to pitch, doing everything possible wrong and one by one consider how to correct or minimize the incorrect techniques.

In visualizing the following discussion it will prove helpful to distinguish four physically separate and different sections of the string-tuning pin system that we are working with. First, there is the tuning pin itself. Next, the string, which can be thought of as consisting of three segments. First, the segment which starts the hitch pin and goes over the bridge, which we will call the *hitch pin segment.* Then we have the *speaking length.* Finally, we have the segment that starts at the capo d'astro bar, or agraffe or pin, passes over the belly felt and coils around the tuning pin, which we will call the *tuning pin segment.*

1. We turn the tuning pin to the right. At the same time we bend the top of the tuning pin away from the string. This induces molecular stresses into the steel tuning pin (which is somewhat springy).

2. The tension in the portion of the string between the tuning pin and the agraffe increases. At the point where the tension of this segment equals that tension of the speaking length *plus* the friction of the felt and agraffe, the tension of the speaking length rises to that which will give the desired pitch.

3. The increase in tension of the speaking length is not, however, enough to overcome the friction of the bridge and duplex plate. It remains at a lower tension, and the bridge is thus under pressure to roll toward the speaking length of the string. This roll of the bridge causes several problems if not compensated for. First, the free vibration of the soundboard is impeded. In extreme cases the string rides up on the bridge pin, and a buzz originates. If the whole piano is repeatedly maintained in this condition, the soundboard may develop premature splits and loose unglued ribs near and parallel to the bridge. Immediately upon reaching correct pitch, we remove the tuning hammer. We have the following situation: (1) The tuning pin has stresses in it causing it to turn to the left and also back down; (2) The tuning pin segment of the string is at a tension higher than the speaking length; (3) The hitch pin segment is at a lower tension.

The string and tuning pin system are in an unstable condition at this point.

We have three points of instability: (1) The tuning pin, which, in settling, will tend to lower the pitch; (2) The difference in tension between the *speaking length* of the string and the *tuning pin segment*, which will tend, in settling, to raise the pitch; (3) The difference in tension between the *speaking length* and the *hitch pin segment* which will tend to lower the pitch.

(For purposes of this discussion we are disregarding the effects of pitch raising. We are concerned only with the stability of the individual note as the piano is used normally.)

Therefore, we have two factors which are tending to lower the pitch, and one factor which is tending to cause the pitch to go sharp. The ultimate settled pitch of the string will depend on the relative magnitude of the factors.

Friction and Elasticity

In order to understand what happens when we move a tuning pin, we will now discuss some notions which will prove useful. Since the string and the tuning pin are in contact with other materials, our attempts to manipulate them during tuning are affected by friction. There are several different kinds of friction.

When two surfaces are rubbed together under pressure, the resistance to their motion is called "friction." For most materials the resistance, or friction, increases with the increase of applied force until some critical value is reached (called the braking friction or "static friction"); the resistance drops, the object slides on the surface and, while sliding, the frictional force, "the sliding friction" or "dynamic friction," is constant and lower than the static friction. The difference between braking and sliding friction varies with the nature of the materials in question.

With some materials the difference is close or negligible. With others the difference is great. In practice the measurement of the difference is complicated by "creep." If the applied force is near the limit for braking friction, it is sometimes possible to observe slow movement which is different from the sliding effect of exceeding the braking friction limit. This is due to micromolecular differences in the pressure being applied to keep the surfaces together, something like very tiny vibrations.

In addition to braking and sliding friction, there is also a third type called slipping or *hydrostatic* friction. This is the friction which occurs between two surfaces lubricated by oil. When this situation is present, there is no minimum force which locks the two surfaces, and any distorting force will eventually cause movement, even if over a very long period of time. Under normal circumstances this type of friction does not play a part in our discussion. It does, however, explain why oil or grease is so disastrous to a tuning pin or to the pin blocks. A pin can never be made tight enough to overcome the inevitable slippage. Even a little oil will cause a long-term creep which never locks.

Metal has a particular type of elastic property; under moderate tension it will stretch and then return to its original length. As tension increases a point is reached called the "elastic limit" at which further increases in tension do not cause the material to stretch further. More important, as this point is neared or passed, changes take place in the metal itself. It loses its ability to return to its original length and becomes stiffer. If steel wire is brought too near its elastic limit and quickly released, the composition is changed less than if it is held at tension for years, as for example in a piano string.

The gradual loss of elasticity is important in any consideration of tuning techniques in relation to older pianos.

We will now turn to a point-by-point analysis first of the tuning pin and then the string to see how the various types of elasticity and friction influence our efforts to achieve a stable tuning.

The Tuning Hammer

There are basically two different ways of moving the tuning pin. One is impact motion, the other is smooth or dragging motion. Impact motion imparts a great deal of rotational force to the tuning pin in a short space of time. In effect, a shock wave is sent through the steel, and this shock wave utilizes the inertia of the steel to cause the pin to move more nearly as a unit, with reduced twisting. By selecting a suitable combination of speed and force, there is in theory no limit to the smallness of increment of movement possible. In practice, however, there is a lower limit which depends on the skill of the tuner and the kinds of tools he uses. There are several impact tuning hammers available which exploit this principle. There is another type of tuning hammer exemplified by the one sold by Hale, developed by Steve Fairchild, which has an extra mass at the end of the shaft. This can be used as a sort of impact hammer when used in conjunction with a loose-fitting tip. Both of these require some experience to use properly. By selecting the amount and speed of the applied force, the tuner can move the pin in one motion directly to the desired point without stopping at intermediate points. This technique of pin movement is fast because it eliminates consideration of intermediate points. It also enhances stability, since it does not induce unnecessary torsion into tight pins. However, it is desirable to employ impact motion only under certain conditions and not under others. The times when it is to be preferred are as follows.

If there is a large amount of turning to be done, for example in pitch raising, impact motion can be fast and accurate as well as an enhancement to stability, depending on the skill of the tuner. When the pins are tight and the strings are fresh and move over the friciton points relatively freely, impact motion can be very useful because it enhances both speed and stability. It gives better results faster. And impact motion seems to be about equally effective regardless of the placement of the hammer relative to the string; 12:00 o'clock tuning or 3:00 o'clock tuning give results which do not seem to be significantly different.

However, in dealing with pianos which have normal or loose pins, impact motion gives negligible advantages. In fact, if the strings are subject to any significant degree of binding friction, especially in the tuning-pin segment, impact motion may be misleading as a means of keeping track of that friction.

Alternatively, when dealing with pins which are extremely tight, especially if they are "draggy" tight, the smallest practical amount that the pin can be moved by impacting may not be small enough to achieve a fine tuning. In this event, the tuner must use a smooth, steady motion. We will now discuss observations which will make effective use of smooth motion easier and surer.

Tuning pins vary in sizes from 1/0 to 7/0. The degree of taper and the swaged head are not standardized. For solidity and speed, as well as comfort and convenience, the tuner should carry a variety of tip sizes. Ideally, the tip should fit far down onto the pin, going as near to the coil as possible; however, if the tip fits so loosely that it actually touches the coil, it may be awkward for fine control in smooth motion. The tip should contact the tuning pin at the point nearest the coil. The top of the tip will then rock, but the bottom will remain in contact with the pin. If the tip touches at the top of the tuning pin, the taper of the tip is too steep for the pin. Such a situation is not impossible to work with, but is not preferred.

The tip should allow as little play as possible in rotation; a tip which allows rotational play is either too large or very worn. It is impossible to eliminate all play from the contact between the tip and the pin. For this reason, it is unwise and uncomfortable to use an extension-type tuning hammer with the extension any longer than necessary to obtain convenient leverage. (Wasted motion is the enemy of speed and accuracy.) It is best to eliminate play at the tip, and also at the end of the handle.

When you have selected a well-fitting tip, observe the amount of *rock* that it has, i.e., up-and-down motion on grands or in-and-out motion on verticals. Hook your thumb under the tuning hammer handle, and select one of the extreme positions. When turning the tuning pins, keep the handle in that plane; control the motion up and down as well as rotationally. This gives the maximum area of contact between the tip and the pin without bending the pin. Simply pushing or pulling the hammer allows the tip to "ride up" on the pin, causing wasted motion and possibly contributing to bending pins.

It is impossible to eliminate a certain bending component of the force applied to the pin. Usually that force can be made so small that it can be ignored for practical purposes, especially if the pins are not tight.

However, even if we discount deliberate bending, the shape of the hammer itself always causes a bending exactly tangent to the hammer, exactly in the direction that it is pulled or pushed. If the hammer is parallel to the string, either directly over the string or away from it, the bending of the pin that takes place goes from side to side relative to the string. This bending component of the pin affects the tension of the tuning pin segment end the least, when the hammer is in such a position. Thus, one might think that 12:00 o'clock or 6:00 o'clock would be the preferred positions, and they are, for the most part; however, in certain instances it is better to use the 3:00 o'clock position. For smooth motion, the tuning hammer tip must fit the tuning pin as snugly as possible. The force applied must be strictly rotational. Any bending force or force at right angles to the length of the pin ("normal" force) will result in an induced stress, causing a deformation (bending) of the pin which will eventually relax, if it is not removed, causing change of tension on the string.

To be continued.

The Full Time Technician
(continued from page 19)

it would be for me — working for Steinway — something to live up to. He liked hearing that. In the end he spoke for me and I was hired.

Though I would have felt better calling him Mr. Riou, he insisted I call him Marcy, as everyone else did. For six months, at seventy dollars a week, I was his apprentice.

During that time, I tuned about 400 pianos, every one of which Marcy checked from top to bottom. He was severe, never hesitating to make me do it over, but always making sure I knew how. We sat together on the bench taking turns, he with his expensive hammer and I with my cheap one.

Marcy would never discuss theory — no coincident partials, no beat rates, no numbers. I wanted to talk about White's book, but he would say, "Forget all that! Do it this way!" Then he would show me and I would try to imitate what he had done. The most instruction he ever gave was to say, "Make this one a bit slower," or "This is too rough, smooth it out." If you have learned primarily from a book or in classes, you may have difficulty accepting or even understanding this. Marcy taught me by rote, purely by ear. We didn't think, we didn't talk — we tuned.

I know a lot of theory now, and it pleases me a great deal to comprehend some of the mysteries of inharmonicity, yet I've never done cleaner, smoother tuning than I did in relative ignorance that first year with Marcy Riou.

Learning, as I did, to do the job quickly and well, under the strict guidance of a genuine professional, assured my success. I've had no trouble at all staying busy ever since.

Coming Events

UPCOMING CONVENTION
THE PIANO TECHNICIANS GUILD

1983 July 4-8
New Orleans
New Orleans Hilton & Tower

LOCAL CONVENTIONS AND SEMINARS

April 7,8,9, 1983
PACIFIC NORTHWEST CONFERENCE
Vance Tyee Motor Inn
Olympia, WA
Contact: Michael D. Reiter
902 - 185th Court East
Spanaway, WA 98387
(206) 847-6009

April 9, 1983
STEINWAY ONE DAY MINI SEMINAR
Steinway Hall
New York City
Contact: Nancy Hazzard
6 Joan Place
Staten Island, NY 10314

April 10, 1983
ALL-DAY SEMINAR
Hilton Inn South
Denver, CO
Contact: John Bloch
1584 S. Broadway
Denver, CO 80210
(313) 722-4221
757-0004

April 22-23, 1983
MIDWEST CONFERENCE
Marriott Inn
Ann Arbor, MI
Contact: Mike McGuire
4151 McAlpine
Milford, MI 48042
(313) 363-8488

April 29-30, 1983
NEW ENGLAND REGIONAL SEMINAR
Ramada Inn
Mystic, CT
Contact: Scott Welton
P.O. Box 404
Bethel, CT 06801
(203) 743-7342

May 12-14, 1983
PIANO TUNERS ASSOCIATION CONVENTION
Claredon Hotel
Leamington Spa, England
Contact: Ralph Long
8 Baldock Street
Ware, Hertfordshire
ENGLAND, SG12 9DZ

September 16-18, 1983
ANNUAL WISCONSIN DAYS
University of Wisconsin at Madison
Contact: Bob Hopf
431 N. Main St.
Lodi, WI 53555
(608) 592-3731

October 2-4, 1983
FLORIDA STATE CONVENTION
Sheraton, Jacksonville Beach Resort Inn
Jacksonville Beach, FL
Contact: Barney J. Johns
3546 Oleander St.
Jacksonville, FL 32205
(904) 786-0868

October 14-16, 1983
OHIO STATE
Columbus, Ohio
Contact: Nancy Burkhalter
1053 West Broad St.
Columbus, Ohio 43222
(614) 268-9770

October 20-23, 1983
NEW YORK STATE CONFERENCE
Executive Hotel
Buffalo, New York
Contact: Charles Erbsmehl
4165 Ransom Road
Clarence, NY 14031
(716) 759-6126

INDUSTRY NEWS

Changes at Boston School

With the commencement of the new term in September, the School of Stringed Keyboard Instrument Technology at North Bennet Street School will have a new director. Bill Garlick, who has directed this well known school since 1968, is pleased to announce that he is succeeded by David C. Betts, who assumes the directorship in September. David has played a valuable role in the development of this program over the past several years, and became co-director of the school in September 1981. Bill Garlick will continue working at the school in an advisory capacity until June 1983.

At the beginning of 1982 Christine Lovgren joined the staff teaching part time for the remainder of the semester. We are very pleased to announce that Christine will assume a full time teaching position this September. Both David and Christine are graduates of the school.

What happens to Bill Garlick after June 1983 is a question no doubt many would like to ask. The answer to that is in preparation, but for the moment he says "wait and see." An announcement will be circulated in due time.

William E. Garlick

Steinway & Sons Appoints New Director of Technical and Customer Services

New York — Steinway & Sons has appointed O. Vincent Orlando to the new position of Director of Technical and Customer Services. In his new post, Mr. Orlando will head up a newly formed service department of the piano manufacturing Company.

In making the announcement, Lloyd W. Meyer, president of Steinway & Sons, said that by centralizing administration of all service activities in a single department, "We will be able to respond even more quickly and comprehensively to customers' needs, as well as develop meaningful, new piano service programs."

This new department will have supervision over all customer and technical services, including the repair and parts department, the warranty program and processing of customer-owned Steinway pianos. Mr. Orlando will also supervise the training of dealer and Steinway technicians as well as liaison with all independent piano technicians.

An industrial engineer, Mr. Orlando has held various supervisory positions in manufacturing since joining Steinway in 1955. Most recently he was manager of manufacturing, planning and administration.

Mr. Orlando attended the Newark College of Engineering and received a bachelor's degree in industrial relations from the New York University School of Accounts and Finance, where he also did graduate studies in business administration. Born in New York City, he resides in West Hempstead, L.I., with his wife, Marianne. They have four children: a daughter, Kate, and three sons, Stephen, William and Donald.

SCHIMMEL Model 205 Plexiglas Grands for French TV

This past November SCHIMMEL shipped two 2.05-metre grands in a plexiglas version to a French radio/TV network, part of a large order. In view of the special use to which they were to be put, but also on the basis of the experience gathered in manufacturing the first plexiglas grand ever to be put on the market over thirty years ago, SCHIMMEL created a completely new cabinet design.

The heavy, bronze-tinted plexiglas gives the instrument a very special look. The legs, pedal-lyre, fall and other cabinetry elements were designed especially for this material. With an air of elegance the 20-cm-thick plexiglas outer rim encircles the heavy sound-producing portion of the instrument. The inner rim and key-bottom, visible through the plexiglas, are veneered in jacaranda, in a colour which nicely complements that of the plexiglas. The practically invisible seams in the rim and the other parts display the mastery of the plexiglas craftsman with which SCHIMMEL worked in close cooperation. Also striking in appearance and lending a charm all their own to the instrument are the metal parts, all gold plated.

SCHIMMEL has produced a few additional plexiglas grands in excess of the order, which will be made available for special displays, SCHIMMEL Days and other marketing measures, both in Germany and abroad.

CHAPTER CONTEST — BE A WINNER!!

Promote Attendance at the 1983 Convention New Orleans, LA July 4 — 8, 1983

You will want to enter this contest not only to create interest, excitement and ATTENDANCE at your 1983 convention but to win one of the exciting prizes named below.

RULES

FIRST PRIZE — FILM "Music of Sound"

Awarded to the Chapter with the largest percentage of PAID member registrations to the convention.

SECOND PRIZE — SET OF TECHNICAL INSTITUTE TAPES

Awarded to the Chapter with the second largest percentage of PAID member registrations to the convention.

THIRD PRIZE — FOUR COPIES OF THE CLASSIFIED INDEX

Awarded to the Chapter with the third largest percentage of PAID member registrations to the convention.

The winning chapters will have special recognition at the convention.

GET ON YOUR MARK
GET SET
GO!!!!!!

WIN

1983 Institute

Ben McKlveen
Institute Director

How do you put an institute together? What are you trying to achieve? What are your goals? These are questions I have been asked from time to time. There is no simple formula but there are common ingredients that are shared by all institutes.

In building a program we try to bring together the best people to be the faculty. It will include factory personnel as well as field technicians. They will teach classes that relate to every aspect of our work. The Guild is fortunate to have so many excellent teachers. We can vary the programs from year to year. Learning opportunities are expanded by this variety. Some topics are repeated every year — tuning, for example. We have aural tuning, electronic tuning and various combinations of aural and electronic techniques. There are new people coming to conventions each year, so there is always a need for a variety of tuning instruction.

This year we have managed to lure **Bill Stegeman** out of retirement to do his celebrated class on aural tuning. This is one of the most comprehensive classes on the "why" as well as the "how" of tuning. If you have never attended, you owe yourself the experience. If you have seen this class, go again. It is always worthwhile.

Al Sanderson, the inventor of the "Sight-O-Tuner," will be teaching tuning skills with an electronic emphasis. If you use a little of both aural and electronic techniques to tune, the very talented team of **Jim Coleman** and **George Defebaugh** will combine to teach a class comparing aural and electronic skills. **Larry Bowen,** from the Washington, D.C. area, will repeat his fine class to help you refine and upgrade your tuning techniques with aural and visual electronic tuning aids.

Classes in piano regulation need to be repeated every year. This year, the **Wurlitzer team** tackles vertical regulation and the **Kimball team** will take you through the intricacies of grand regulation — hands on — with model actions. If you don't do much regulation, or you are new to the field of piano technology, these classes will give you a good basic understanding of the process.

If you think you know something about grand regulation, I suggest that you look in on the advanced grand regulation class taught by **Chris Robinson** from Connecticut. This talented man and gifted, dynamic teacher will give you much to think about. Chris takes grand regulating to new levels of understanding by asking you to think beyond textbook specifications and routine screw tuning.

The father-son team of **Willis and Dave Snyder** will teach two classes. Shop and Business Operation will deal with a discussion on different kinds of shops, basic equipment and the operation of a shop as a business. Inventory, time studies and cost accounting will be covered also. An imaginative class involving grand hammer installation also will be taught by this talented duo.

Bill Brandon is back to teach about the installation of upright hammers, shanks and butts. Bill was a field technician who now works for Everett. His class is designed to show how to utilize factory techniques to get quality results in action rebuilding.

The superb class on Grand Dampers by **La Roy Edwards** and the Yamaha team will be repeated this year. It covers complete damper regulation, troubleshooting, damper installation, and includes the theory of damper engineering.

Jim Harvey, Kawai National Technical Services Director, will teach a class about tools. The material is directed at the beginner, who wonders what to buy, and to the experienced technician who wants to rethink about what he is carrying on every job.

The voicing class will be taught by a new team featuring **Newton Hunt** and **Sally Jameson.** These talented technicians will deal with piano tone regulation in three parts: the pragmatic approach to daily voicing problems, the aesthetics of piano tone, and the historical perspective of piano tone since the 18th century.

Special features include a number of new and very different classes. **Wally Brooks** and **Frank Stopa** have agreed to teach keyboard building. Most technicians are helpless in the face of a disaster involving heavy keyboard damage or loss. This class will help you learn to survive such catastrophes.

We have been exceedingly fortunate to obtain the nationally acclaimed audiologist, **Dr. Charles Berlin,** who will teach two classes on how and what we hear, hearing disorders, and hearing as it relates to musicians and tuners. Dr.

1983 Institute Classes

REPEAT	INSTRUCTOR
Auro-Electronic Tuning Techniques	*Bowen*
Shop Business and Operation	*D. Snyder, W. Snyder*
Installation of Upright Hammers, Shanks, and Butts	*Brandom (Everett)*
Grand Dampers	*Edwards, Caskey*
	Dennis, Utsonomija, Nishio (Yamaha)
Steinway Servicing	*Heuther*
Historical Survey of American Piano Industry	*Johnson, Reuter, Weisensteiner (Kimball)*
Grand Regulation	*Juhn*
Vertical Piano Trouble-Shooting	*Neblett*
From the Bottom Up	*Robinson*
Progressive Grand Regulation	W. Snyder, D. Snyder
Grand Hammer Installation	*Heischober*
Advanced Player Repairs	*Heischober*
Advanced Player Forum	*Selected Technicians*
Private Tuning Tutoring	

NEW CLASSES	INSTRUCTOR
Basic Tuning Class	*Stegeman*
Electronic Tuning	*Sanderson*
Basic Vertical Regulation	*Wurlitzer Team*
Hammer Construction and Voicing	*Krefting*
Vertical Dampers	*Krefting - Sims (Baldwin)*
Voicing	*Hunt - Jameson*
Wood Joints	*Geers*
Home Computers in Your Business	*S. Nicholson*
Pinblocks	*R. Kingsbury - S. Kingsbury*
Woven Felt Manufacturing Use and Problems	*P. VanStratum*
Keyboard Building	*W. Brooks*
Comparison of Aural and Electronic Tuning	*J. Coleman - G. Defebaugh*
Rescaling Problems	*S. Fairchild*
Pinblock Plugging	*B. Russell*
Audiologists and How we Hear	Dr. C. Berlin
Business Class	
Tools	*J. Harvey (Kawai)*

Berlin is a professor at the Louisiana State University Medical Center. He also plays jazz piano with his own group at the Marriott in New Orleans. You can't afford to miss him!

Computers are here! To teach you about the utilization of home computers to help you run your business we have **Steve Nicholson** from the Minneapolis area. Steve is a technician and rebuilder who has opened his own computer service. He will be in New Orleans to teach you the basics, advise you, and show you the advantages of the computer world.

In this article I have outlined for you barely half of the features of the 1983 Technical Institute. Next month in this space, I will continue with a listing of other classes, specials, and surprises that we are preparing for you. It is time for you to do your part. Begin making your plans to be there. The facilities and staff that will be in New Orleans are the best that can be obtained. Your presence is needed to make it all work.

More next month.

Tuning Exams Offered At New Orleans Convention

Tuning exams will be offered at the New Orleans Convention. Due to the necessarily limited number of times available for testing, scheduling will be done in advance on a first come/first served basis.

Applicants for membership or reclassification must be cleared by their local chapter first. They must have passed the written and bench exams before taking the tuning test. All chapters have copies of the "Application for tuning test." This must be filled out in order to set a time for the test.

Send this Application along with $40 examination fee (checks payable to the Piano Technicians Guild) and the coupon below to Christopher S. Robinson, 190 Long Hill Road, S. Windsor, CT 06074 for scheduling. You will be sent a time for your tuning exam. Those craftsman members desiring to take the exam as the first step towards Examiner certification may sign up also. There is no fee and no chapter approval in this case. However, all RTT's applying for Examiner status are required to sign the consent-to-serve form *before* they are given the test.

Those who have passed the exam with 90s and wish to learn how to give exams as the second step toward certification should contact Chris Robinson at the above address so you can be assigned to work with an experienced Certified Tuning Examiner.

The $40 exam fee holds your scheduled time. It can be refunded only if notification of cancellation is given to Chris Robinson at least 48 hours ahead of the scheduled time. If demand exceeds the time available, names will be kept on a waiting list in the order received. Those on the waiting list who do not receive an examination time will have their exam fee refunded.

Requests for tuning exams must be sent before June 15, 1983 for scheduling at the New Orleans Convention.

Name _____

Address _____

Phone _____

PRESENT CLASSIFICATION

Nonmember _____ Student _____

Apprentice _____ RTT _____

Other _____

TAKING EXAM TO BECOME

Apprentice _____ Craftsman _____

Examiner _____

Applicants for membership or reclassification send $40 exam fee (checks payable to Piano Technicians Guild) and "Application for Tuning Exam" along with this coupon to:

Christopher S. Robinson
190 Long Hill Road
South Windsor, CT 06074

AUXILIARY HIGHLIGHTS

The Piano Technicians Guild Auxiliary invites wives, husbands and friends of technicians to sign up for our convention program.

The registration fee for Auxiliary activities admits one to the following:

* An Entertaining Reception on Tuesday
* A Scrumptious Luncheon on Thursday

plus

* An Introduction To New Orleans so you'll know what to see and how to get there
* Lots of musical entertainment
* The Auxiliary Council
* A meeting with the Piano Technicians' Sketch Artist
* Admission to one institute class
* Auxiliary classes on Piano related topics
* Auxiliary classes on general interest topics

AND MORE

ALSO . . . you can buy a ticket for a SUPER 2 PLANTATION and LUNCH TOUR which departs from the hotel Wednesday morning. The bus will take you to Nottoway and Houmas House Plantations with lunch at Jean Lafitte's Restaurant and bring us back to the hotel for just $30.00 apiece. The tour is open to anyone at the convention.

PIANO TECHNICIANS GUILD CONVENTION AND TECHNICAL INSTITUTE
JULY 4-8, 1983
THE NEW ORLEANS HILTON HOTEL

Registration Form

Name _____

Home Address _____

City _____ State/Province _____ Zip _____

CHAPTER NAME _____ Nickname for Badge _____
(If not the same as above)

☐ Member ☐ Non-Member
☐ Visually Handicapped ☐ Will be Staying at the Guild Headquarters Hotel

Spouse's Name _____ Nickname for Badge _____
(If Attending) *(If not the same as above)*

REGISTRATION CUTOFF DATES
(Cutoff Dates are Firm and Absolute)
Check Boxes and Total

		Staying at the Headquarters Hotel
GUILD MEMBERS		
Postmarked by May 2	☐ $ 90.00	☐ $ 85.00
Postmarked after May 2	☐ $110.00	☐ $105.00
NON-GUILD MEMBERS		
Postmarked by May 2	☐ $175.00	☐ $170.00
Postmarked after May 2	☐ $195.00	☐ $190.00
SPOUSES		
Auxiliary Member	☐ $ 35.00	☐ $ 30.00
Non-Auxiliary Member	☐ $ 45.00	☐ $ 40.00
SPECIAL CLASS		
PRIVATE TUNING Tutoring	☐ $ 35.00	☐ $ 35.00
Banquet (optional)	☐ $ 30.00	☐ $ 30.00
Closing Luncheon (optional)	☐ $ 15.00	☐ $ 15.00
TOURS		
MISSISSIPPI RIVER STEAMBOAT CRUISE Tuesday Evening, July 5 *(Includes Dinner and Entertainment)*	☐ $ 25.00	☐ $ 25.00
SUPER 2 PLANTATION AND LUNCH TOUR Wednesday, July 6 (Sponsored by Auxiliary)	☐ $ 30.00	☐ $ 30.00
TOTAL ENCLOSED	$_____	$_____

OPTIONAL TOUR HIGHLIGHTS

When you register for the 1983 Convention **don't miss the boat or bus** by not signing up for the two optional tours offered.

LOCAL HOST CHAPTER SPONSORED

MISSISSIPPI RIVER STEAMER CRUISE - Enjoy dinner, New Orleans jazz and a cruise down the Mississippi River. The cruise will be offered Tuesday evening, July 5, and is being planned by the Local Host Chapter. The paddlewheels will start churning and members will be loaded aboard right next door to the hotel. Step aboard and relax to the sights and sounds of New Orleans. Only $25.00 per person.

AUXILIARY SPONSORED

SUPER 2 PLANTATION AND LUNCH which departs from the hotel Wednesday morning. The bus will take you to Nottoway and Houmas House Plantations with lunch at Jean Lafitte's Restaurant and bring you back to the hotel for just $30.00 per person. The tour is open to anyone at the convention.

Tickets for optional functions must be bought no later than 48 hours before the event.
NOTE: Spouses of Guild members and/or children age 16 or over may register for Institute Classes at Piano Technicians Guild member rate. Guides for visually handicapped technicians may attend classes at no charge.

DO NOT WRITE HERE

Date Rec. _____ Priority Number _____
Amt. Pd. _____

Cash _____ Check _____ Money Order _____
Chapter No. _____ Member No. _____
Classification _____

1982-1983 MEMBERSHIP/BOOSTER CLUB

Booster Club	Pts.	Mbrs.
ALLEN, Jon	1	1
ANDERSON, Vernon A.	5	1
ATHERTON, Olan M.	2	2
BAIRD, John H.	1	1
BALIGIAN, Agnooni C.	1	1
BANTA, Norman	5	1
BEATON, Richard	4	1
BECK, Jacqueline	3	3
BERRONG, Jack	2	2
BITTINGER, Richard	6	2
BLANTON, Tom R.	1	1
BLOCH, John	4	1
BOURDON, Donald W.	1	1
BOYNTON, Richard B.	1	1
BRADY, Stephen H.	1	1
BRIDGES, Nate	1	1
BRILEY, James E.	3	1
BROOKS, Walter	6	2
BROWN, Glenn	1	1
BRYANT, Ken	1	1
BUYCE, Harold R.	2	2
CALLAHAN, James	4	1
CASWELL, Alan R.	5	1
COATES, Timothy C.	5	1
CONNER, J. Stuart	1	1
CRABB, Larry	15	5
DAVIES, Clair	4	1
DEROCHER, James E.	4	1
DETAR, Brian S.	1	1
DELLINGER, Ray	8	4
DENNIS, Robert R.	4	1
EATON, Wendell E.	4	2
ERLANDSON, Robert	1	1
EVANS, Daniel A.	4	1
FLEGLE, Richard A., Sr.	3	3
FLOYD, R. Errol	2	2
FREIDIN, Irving	5	1
GARRETT, Joseph A.	1	1
GEIGER, James B.	1	1
GRIFFIN, Rudolph	5	1
GRIFFITH, M. Laverne	1	1
GROSSMAN, Matthew	1	1
GUERRA, Edward F.	5	1
GUSTAFSON, David	1	1
HAINES, F.L.	1	1
HAINES, Roy	3	1
HALE, David	1	1
HALE, Robert	10	2
HARMON, Clayton	1	1
HAWKINS, Marshall B.	5	1
HESS, James N.	4	1
HESS, Marty A.	1	1
HITT, Henry L.	1	1
HOSTETLER, Robert	1	1
HOUSTON, James	4	1
HOWENSTINE, Richard	1	1
HUFFORD, Robin	3	1
JORDAN, Wayne	6	3
KEAST, Lawrence J.	1	1
KEYES, Otto R.	4	1
KINSER, Bill	4	1
KLINE, Albert	5	1
LAGOY, Martha M.	4	1
LANDIS, Glenn A.	3	1
LARAVELA, Larry	4	1
LEARY, Janet	1	1
LITTLE, Mary Davis	1	1
LOEFFLER, W.J.	4	1
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MACKINNON, R. Taylor	1	1
MARTIN, Edward E.	1	1
MASTAGNI, Angelo	3	1
MAYR, Vitus J.	9	2
MEISSNER, Walter	1	1
MILLS, Fred	1	1
MIZELL, Wade	1	1
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MONROE, Paul	1	1
MOORE, Robert	1	1
MOTSKO, William R.	1	1
MURRAY, Samuel	1	1
NICHOLSON, Dennis	1	1
NICHOLSON, Steve	1	1
ORR, Ronald	2	2
PENNINGTON, David L.	1	1
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PERRY, Mark J.	1	1
PHILLIPS, Webb	9	2
PREUITT, Ernest	4	1
ROSENFELD, Jim	1	1
QUINT, Richard B.	1	1
SANDERS, Charles	1	1
SANKEY, Lee M.	5	1
SCIORTINO, Joseph	8	2
SILVA, E. Michael	4	1
SMITH, Sheldon P.	3	1
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SPURLOCK, Bill	4	1
STALCUP, Rocky	4	1
STONE, Sidney O.	7	3
THOMAS, Dean	2	2
THOMAS, H. Vince	4	2
THOMPSON, Treacey	1	1
TRUAX, Richard	4	1
TUBLITZ, Evan	1	1
UPHAM, Russell	1	1
VERHNJAK, Karl	6	2
WALKER, Elizabeth K.	1	1
WALSHE, Robert C.	5	1
WELTON, T. Scott	4	1
WEST, Ivan	4	1
WHALEY, Denzil	1	1
WIGHT, Blais	1	1
WILEY, John	5	5
WOLF, Bob	8	2
WONDRA, Lola	4	1
WOOD, Edwin	2	2

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Membership Is Everybody's Business

Charles Huether
Vice President

When we started this year's membership columns with the theme "Membership Is Everybody's Business," an attempt was made to involve everyone in encouraging people they knew who might be qualified to join the Piano Technicians Guild. How successful these efforts have been in encouraging people in the profession to consider joining, we cannot tell. We do know how many have been processed, and it would seem that it is about average for the organization given existing circumstances.

However, the numbers being processed is one thing, but the numbers applying and not being processed is another. We have no way of knowing how many prospective members are waiting overly long for their applications to be processed at the chapter level. This month's brief article is addressed to chapters and their examining processes. If you think your chapter can benefit from this article, please make sure that the chapter officers see and read it.

We have had some bottlenecks and problems in the recent past because of the introduction of the new standard tuning test. Requirements for the type of piano, qualifications of testors and length of time to take and administer

Continued on page 47

Auxiliary Exchange

President's Message

Dear Friends and Members of the Auxiliary,

As I sit down to type my message to you each month, I usually debate whether to talk about the forthcoming convention or not. I don't want you to think my middle name is convention. On the other hand, I think the convention is definitely the highlight of the Auxiliary's membership year. Technicians can be fully functioning members of the Guild whether they attend any conventions or not. They have local meetings (some of our Auxiliary chapters do, too), and they have the *Journal* to keep them in communication about technical developments, so they can still thrive even without the convention. I am convinced the Auxiliary is different.

The conventions and seminars are important to us because the basic give-and-take of communication is at the very heart of our organization. We have a lot of common experiences to share with each other. We need the chance to be together in the same room, to give each other the support and feedback which helps us realize there are other piano tuners' families across the country whose lives parallel ours. These people can understand things about pianos and piano tuners that don't make sense to the neighbors on our street.

Naturally, you are still a valued and valuable member of the organization even if you don't or can't attend the conventions. I would never mean to imply otherwise. However, in looking through our membership roster I see that most of our members do regularly attend national and/or regional conventions. Many of our new members join at conventions where they can see first-hand the value of affiliating with these people who are becoming their friends. The personal news we publish in our newsletters only has appeal because we recognize the names and know the people behind the names. Our organization actually depends on the friendship and fellowship which develop when people are together.

Therefore, I don't feel bad at all talking about conventions and seminars so much, for they are such a significant part of our Auxiliary. They are where I have met you and gotten to know you. They provide the backdrop for my recent visits to Washington, San Francisco, Philadelphia, Minneapolis, and other cities. They remind me of my friends and close associates in the piano service industry. Anything I can do to urge you to expand your horizons by participating in an auxiliary program at the convention or to commend you for already having done so seems justified in light of the benefit we reap from your presence.

I will close by saying I am very excited about the July convention. New Orleans is a terrific city. We have lots of interesting experiences planned for you. And we hope to see you there.

Tune in to New Orleans tout de suite!
Julie Berry

FOURTEEN YEARS AGO

Hello to all —

Little did I know in the year 1969, as I traveled to the quaint city of New Orleans, that I would be returning in 1983 as the Immediate Past President of the Auxiliary. That was my first Piano Technicians Guild convention, and I felt quite bewildered. You see, Jack had never told me about the Auxiliary. When we entered the hotel there were several people in the lobby, all who knew Jack, calling out to him or stopping us to talk. To me it seemed as if the whole world knew Jack. We finally got to the registration desk and settled in. This camaraderie, of course, continued throughout the convention and still is continuing.

Jack was involved with the guild's classes that year, and as I was returning to our room the next morning from taking him to his class, I met this large group of women in the hallway. Not knowing who they were, I was trying to work my way through when someone recognizing me called out, "There's Jewell, Jack Sprinkle's wife. How about joining the Auxiliary?" "The what?"

Then several women started telling me (all at the same time) about the Auxiliary. It sounded so inviting and better than sitting in my room that I said "Sure!" From that day I have made so many acquaintances and friends that now whenever I walk into a convention or seminar site I, too, can enjoy stopping people in the lobby and chatting with them. I have since learned that Jack did know members from all over the world.

The tea was my first Auxiliary function, and I thoroughly enjoyed my table companions. We had the Installation luncheon at The Court of the Two Sisters, a beautiful garden setting. The Auxiliary honored me as the "Bride of the Convention," presenting me with a lovely gift. It was all such fun, especially meeting all the other wives!

Each evening Jack, being a jazz enthusiast, and I (sometimes with some friends) would go down to Preservation Hall to listen to the jazz musicians. I never really cared much for jazz music, but watching and listening to those great artists, I found it very interesting and learned much from them about

their music. Of course, just strolling through the "Ole French Quarter" is an experience one can never forget.

One of my many remembrances of New Orleans was our last night there. Jack and I had closed up Preservation Hall and were making our way back to the hotel along the very busy and noisy Bourbon Street. The last block was very quiet and dark where an old hotel had been vacated and stood empty, making the block very deserted. Here we heard one lonely cricket lustily chirping his song to the big, big world, filling the whole block.

Yes, I'm looking forward to returning to New Orleans, again visiting with my many friends. There are some who have made their transition from this earth who will be fondly missed, but I know I will meet many new acquaintances to expand into the future.

If this is your first convention and you feel somewhat bewildered, just step right up and ask about the Auxiliary. I hope it will be me who you will ask. You will be most welcomed to our family. Our President, Julie Berry, and the New Orleans Chapter have planned a very exciting program for us this year. So come and join us —

Jewell Sprinkle
Immediate Past President

A TAX TIME REMINDER

If you find yourselves in the unfortunate position of not being able to pay income taxes that are due April 15th, please be sure you mail the return anyway and include payment for as much of what you owe as you can scrape together. There is always a lot of guesswork involved in trying to estimate what taxes a small business will owe. This year it may be especially difficult if your income has been down because of the recession. You might be tempted to wait until you have the money before you mail your return, but that is not good thinking. Failure to file a tax return is a crime. Filing the return even if you don't have all the money to send will avoid any criminal implications. You will be charged interest from the time the money was due until the time it is paid. You might also be assessed a penalty for underpayment of estimated taxes. But you won't be facing any criminal charges for failure to file an income tax return. If you call the IRS and explain your situation they may be able to work out a payment schedule with you. If you send partial payment with your return you will be billed for the remainder, never fear.

There is a form called "Form 4868, Application for Automatic Extension of Time to File U.S. Individual Income Tax Return." Filing this form will give you an automatic 4-month extension for getting your paperwork together. However, it does not give you an extension of time for paying what you owe. You are supposed to send a check representing what you think you will owe with the Form 4868. You will be billed for late payment of tax and late filing unless you show reasonable cause for not paying or filing on time.

To leave you with a brighter note, I want to be sure you are taking advantage of the new deduction for two-earner married couples. On your 1982 tax return you may deduct 5% of the lower net earnings up to $30,000. If you and your spouse both earned income during 1982 and you file a joint return, you are entitled to a deduction which wasn't available in prior tax years.

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THE SUNCATCHERS ARE COMING!

THE SUNCATCHERS ARE COMING!
****

Membership
Continued from page 45

the test have all been factors slowing down processing. Now is a good time to review chapter policy and procedure regarding not only the tuning test, but the other tests as well.

Most important of all, care should be taken to see to it that the burden on testing does not rest on the shoulders of only a few chapter members. A Certified Tuning Examiner is necessary to give the standard tuning test. However, the assistants and those giving the other tests can be the same people who have been giving them in the past. Make sure that as many members as possible are encouraged and in fact do participate in giving examinations. It spreads the responsibility, is educational for the exam giver, and does not overburden a few chapter members. The more people giving the tests, the shorter the waiting period for the applicant and the less likelihood of his or her being discouraged from joining.

Most chapters have a trial period for potential members. They are asked to attend a few meetings to find out if they like it, if they feel they may be qualified. This also gives membership a better chance to know the new person. Then the applicant is ready to file the application. Be ready to start the testing. As soon as the application is accepted by the chapter and it can be processed, give the written test before or during the next meeting. No problem for an applicant to sit in the rear and do the quiz. He or she is already one leg up in the process and should feel elated because he/she got such a good mark, or forewarned of what may follow if he/she did not do too well. It gives them a chance to reconsider.

Next meeting be ready with a bench test. This too can be done during, or before the regular meeting if facilities can be arranged in the meeting place. This is easier than first glance if you are really trying to facilitate matters. Doing these tests at meeting dates has a double advantage. It provides a variety of examiners, people who might be reluctant to come at a special time like a weekend or weekday evening just to test. It also quickens the pace of processing. Meanwhile, plans are in the works to have a tuning test time and place. This might only happen a couple of times per year. Not unusual, not necessarily a burden. The prospective applicant can be tested directly on a piano and if qualified by aural judgement as passing, he/she can be immediately processed as Apprentice. This too might be arranged for an evening during the meeting. The applicant misses part of the technical, but he/she is progressing towards a more fulfilling kind of participation, that is, as a member.

If there are problems in facilitating the membership testing process so that it will leave a member hanging with an application filed but no testing for several months, suggest that he/she subscribe to the *Journal* in the meantime. The unused portion of the subscription when membership is achieved will be prorated against dues. Meanwhile they get the magazine. And becaue they have invested some funds in their membership process, they might be anxious to make sure the chapter doesn't drag its feet.

I am sure there are other systems of being prompt in processing. These are some suggestions. Above all, don't let prospective members die on the vine while the chapter postpones testing because the few people who have been doing all the work are getting tired and no one else wants to help. Membership application and processing should be a top priority in each chapter. This is the first impression each new member gets of the membership. How professional we are is reflected in how we handle prospective members.

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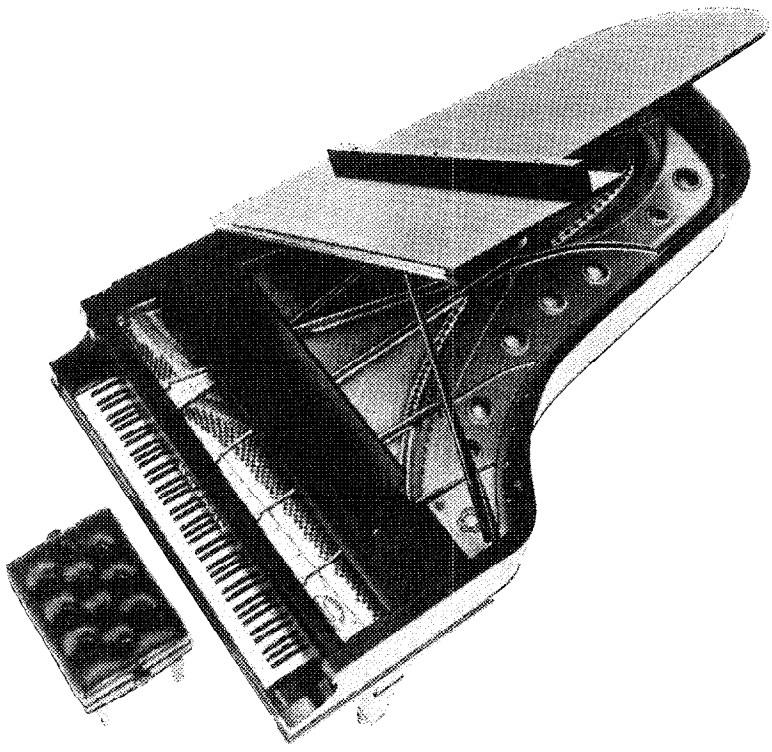

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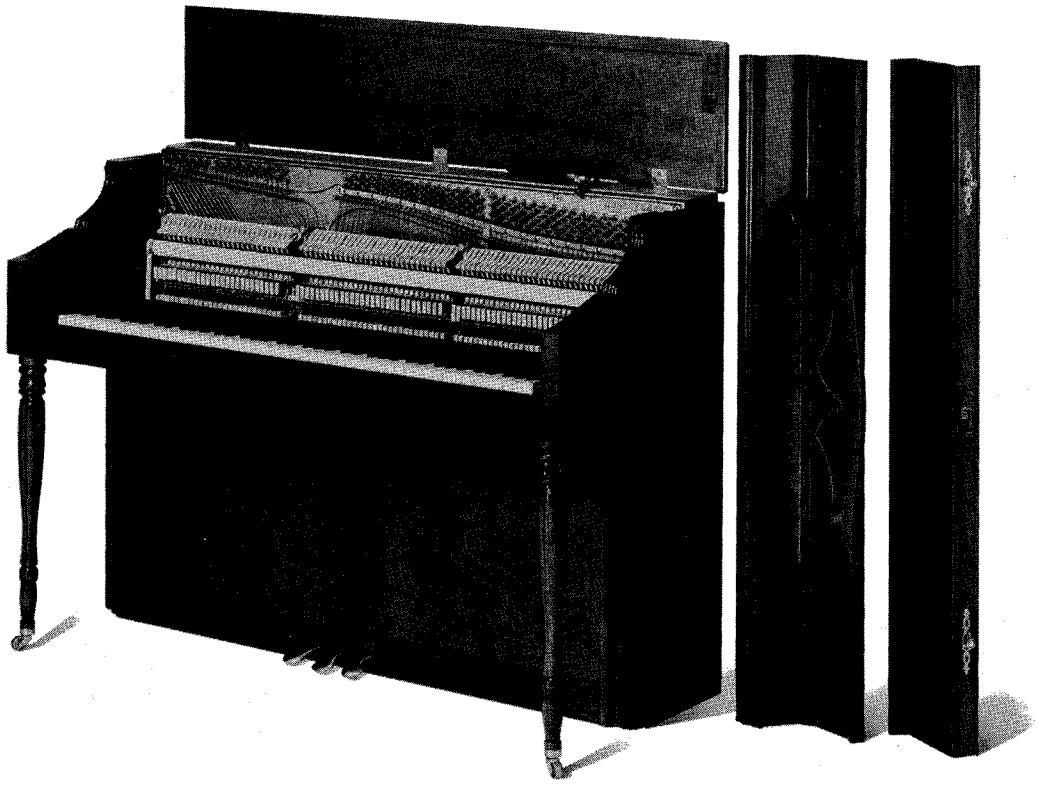

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UPDATE

April 1983

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Delinquent — Unpaid dues are now delinquent as of March 31, 1983. Second billings for those who have not paid their 1983 dues have been sent. If you have not received any billings, please notify the Home Office.

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If you have any questions regarding Insurance, please call Eloise Ross, Sunset Insurance Co. (206) 932-0203 rather than the Home Office. It will save you a long distance call if you dial directly to Sunset Insurance.

Especially for Visually Handicapped Members

Your committee is eager to discover how we can be of help to the visually handicapped members in the Guild. We need your ideas and suggestions so that these can be considered and as many as possible put into action.

The elevators at the Hilton Hotel in New Orleans definitely will have the Braille labels and we have requested a special class on Steinway for you, to be given by Fred Drasche, as well as a tools and aids display designed for you and presented by Ed Schadler.

Please, call or write any member of the Visually Handicapped Committee with your suggestions just as soon as you can. Your input on any facet of Guild procedures and business will be most helpful. The committee is:

Kenneth Williams, Chairman, *149 Anderson Avenue, Syracuse, NY 13205 (315) 492-1696*
Lawrence Goetsch, *P.O. Box 1453, Sherman, TX 75090*
Kenneth Carter, *550 South Lyon, Marshall, MO 65340 (816) 886-3034*
Harry Berg, *2612 Gill Avenue, Bakersfield, CA 93306 (805) 871-4600*

PTG CALENDAR

April 15 **DELEGATES**	Chapters elect delegates and alternates to the 1983 Council session, New Orleans, LA this July. Send completed credentials form to the Home Office by April 15.
April 15 **REPORTS FOR AGENDA BOOKS**	Closing date for receipt at Home Office of Guild officers' and Guild Committees' reports to be included in the Council Agenda Books.
April 15 **SUSTAINING MEMBERSHIP**	Closing date for receipt of applications.
April — June **CHAPTER ELECTIONS**	Bylaws require the elections completed by the end of June. Send information to the Home Office.
April 29 **AGENDA BOOKS**	Will be mailed to chapter presidents for review by all chapter members.
April **CONVENTION**	Send in your registration for the 1983 Convention. Great technical institutes, tours, exhibits, jazz and sights to see.
June 15 **PRESIDENT'S CLUB**	Closing date for points towards President's Club pin for bringing in new members. (See Membership page for rules)
July 1-2 **BOARD MEETING**	Pre-Council meeting of the Board of Directors
July 3-4 **COUNCIL**	Council session. All members welcome.
July 4-8 **CONVENTION OPENING**	Grand opening session on Monday evening. Parade to the exhibits. Institutes start Tuesday. See full schedule in your convention brochure.

Proposed Changes to Piano Technicians Guild Bylaws for 1983 Council Session

Note: italic type shows existing laws and regulations.

1. Checking References for Business Ethics

Bylaws Article IV Section 1 c)

c) All applications for membership must be checked for accuracy and references.

Delete and replace with the following: "All applications for membership must have references checked regarding compliance with the business practices as outlined in the Piano Technicians Guild Bylaws."

Comment: Capitol Area, NY submits this as a way to keep some checking of an applicant's business ethics while staying within FTC regulations.

2. Ethics Concerning Fees for Recommending Dealers

Code of Ethics 2)

2) If I accept or solicit a fee from a piano dealer or seller for recommending the purchase of a particular piano, I do so in the knowledge that I may be dividing my loyalty beyond the point of my own best interest (employed members excepted).

Delete after comma and replace with the following: "I do so only with the full knowledge of the buyer."

Comment: This is presented by the Lexington, KY chapter. The Bylaws committee recommends deleting this entire code as situations concerning recommending pianos are too varied to be covered by a code such as this.

3. Ethics for Visual Tuners

Regulations Article II C 2)

2) Any member who shall advertise or otherwise imply, or claim to the public that "visual" tuning is inherently superior to aural tuning shall be deemed guilty of violating professional ethics. However, this section shall not be construed to include the making and argumentation of such claims in technical meetings and forums of piano service men, in order that the development of improvements and refinements of the art shall not be discouraged or suffer from improper discrimination or bias.

Delete entire section and replace with the following: "Members who use 'visual' tuning techniques may not publicly advertise, imply or otherwise convey that such tunings are superior in any way to aural tunings."

Comment: This article was pointed out by Piano Technicians Guild attorney as being potentially discriminatory. The above wording from the St. Louis chapter is suggested as something more legal.

4. Code of Ethics

Code of Ethics 8)

8) No member shall be permitted to use our organization's name to promote a piano tuning school or the like, without the proper endorsement of our Guild Board.

Delete after comma "without proper endorsement of our Guild Board."
Change comma to period.

Comment: Since the Piano Technicians Guild no longer endorses tuning schools, it is a housekeeping matter to remove reference to it here.

5. Eliminate Business Promotion Committee In List of Standing Committees

Bylaws Article XIII Section 1

Public Relations and Business Promotion

Delete Business Promotion from Public Relations Committee Article I Section B 20)

20) Public Relations and Business Promotion — There shall be a committee on public relations and business promotion, to consider and/or develop advertising and promotion programs, business promotion pamphlets, radio and television material sponsored by the Guild, etc.

Delete "Business Promotion" from title and before first comma.

Comment: Board feels that Business Promotion is currently and more appropriately handled by home office and board. Business promotion pamphlets etc. need to be made up on a national basis.

6. Eliminate Recognition Committee

Bylaws Article XIII Section 1

Delete Recognition Committee from list of committees

Regulations Article I B 21

21) Recognition — There shall be a recognition committee, whose duties shall be to express, to members and others, appropriate commendation, appreciation, sympathy, etc., from the Guild.

Delete entire section.

Comment: Board feels this committee has outlived its usefulness.

7. Hall of Fame Committee

Bylaws Article 1 B 12)

A) The Hall of Fame Committee shall be composed of no less than six Piano Technicians Guild members, one from each region and one Piano Technicians Guild member from the piano industry appointed by the President.

Delete A and replace with the following: "The Hall of Fame Committee shall be composed of five (5) RTT members of Piano Technicians Guild, one of whom may be from the piano industry. Each member shall be from a different region."

D) After committee chooses no more than two recipients, the chairman may request more information for the Hall of Fame Record Book (if needed, from other sources throughout the country other than the recipients chapter, or other nominating chapters).

In section D) delete "no more than two recipients" and substitute "one recipient."

Comment: Hall of Fame committee feels that since only RTT members are franchised, then only RTT members should be on committees. They feel that there are too many awards given each year and feel that fewer recipients would make the awards more meaningful.

Bylaws committee agrees with only one recipient, but feels that there are valued Allied Tradesman who could make just as good a judgment on who should receive an award as any RTT, and therefore recommend not adopting part A.

8A. Awards Committee

Regulations Article III Section A 2 a) and 2 b)

2) Piano Technicians Guild shall make the following annual awards:

a) A Piano Technicians Guild Member of Note Award, to not more than four (4) members each year, for recent outstanding service and dedication to the Piano Technicians Guild.

Delete "four (4)" and replace with "two (2)."

Comment: Bylaws committee has mixed feelings on changing to 2 awards yearly; some agree with the idea and others feel that since these awards are for recent contribution to the Guild that 2 might be too limiting.

8B. *2 b)Member of Note and Golden Hammer award winners shall be chosen in March by a committee of five appointed by the president from the list of previous award winners. No one shall serve more than two consecutive terms on this committee. The president shall designate one member of the group to act as chairman.*

Delete paragraph in section b) beginning: "Member of Note . . . "

Comment: The awards committee felt that fewer awards should be given to make them more meaningful. The deletion of the paragraph discussing membership requirements and rules for the committee is suggested as these matters will be covered under Hall of Fame committee rules if the two are merged in the next item.

9A. Merge Hall of Fame and Awards Committee

Regulations Article III Section A - Awards

1) The Guild may make an annual award, with the approval of Council, to the person, organization, or business deemed by the Executive Board to have done the most to promote public interest in the piano industry.

2) The Piano Technicians Guild shall make the following annual awards:

a) A Piano Technicians Guild Member of Note Award to not more than four (4) members each year, for recent outstanding service and dedication to the Piano Technicians Guild.

b) A Piano Technicians Guild Golden Hammer Award to one (1) member each year, for outstanding service and dedication to the Piano Technicians Guild over a period of years.

Member of Note and Golden Hammer award winners shall be chosen in March by a committee of five appointed by the president from the list of previous award winners. No one shall serve more than two consecutive terms on this committee. The president shall designate one member of the group to act as chairman.

3) Chapter achievement awards shall be given each year by the Chapter Management and Achievement Committee, the awards to be developed by chapter size and to be graded for effort, success and merit of yearly activities.

Move entire article to Reg. Article I Section B - Standing Committees 1)

9B. Regulations Article I section B 12

12) Hall of Fame — There shall be a Hall of Fame to honor those who have shared their talents, time and loyalty to our profession so that we may have what is ours today. Therefore, the Piano Technicians Guild has instituted this Hall of Fame record wherein names, with profiles and tributes to honored ones, may be preserved and remembered.

A) The Hall of Fame Committee shall be composed of no less than six Piano Technicians Guild members, one from each region and one Piano Technicians Guild member from the piano industry appointed by the President.

B) If a chapter nominates a committee member to the Hall of Fame, the committee member must either resign from the committee or withdraw his nomination.

C) Only chapters may nominate candidates for the Hall of Fame, and a resume of the candidate must accompany the chapter's choice of nomination.

D) After committee chooses no more than two recipients, the chairman may request more information for the Hall of Fame Record Book (if needed, from other sources throughout the country other than the recipient's chapter, or other nominating chapters).

E) The Hall of Fame Committee shall complete its work by March 31st of each year. The person(s) so honored will be recognized at the following Annual Convention during the opening session.

F) They shall be presented with a certificate suitable for framing and a lapel pin, if living and present. If the honoree(s) are not present, the award(s) shall be forwarded to the local chapter president who will bestow the honors in an appropriate manner.

G) If the honoree is deceased, the award shall be made to a member of the family. (In this case, the certificate only would be adequate.) If the award to the deceased cannot be made at the convention, then the certificate shall be forwarded to the local chapter president nearest the recipient who will present the award in an appropriate manner.

H) All persons elected to the Hall of Fame shall be additionally honored by having a picture, if available, and a short history outlining their contribution to the piano industry included in an honor roll to be displayed in a prominent position at each convention. After the convention the book will then be returned to the national office for safekeeping.

I) Eligibility qualifications for a person to be considered for nomination to the Hall of Fame should include the following:

1. *Long-term dedication to the causes, ideals, and purposes of the Piano Technicians Guild.*
2. *Outstanding personal and professional integrity to the point of being an inspiration to others.*
3. *Outstanding contributor and implementor of ideas, programs, etc., resulting in a definite improvement and upgrading of the piano industry as a whole.*

J) Suggestions for nominations shall be solicited through a form in the monthly chapter mailings, with the chapter form completed and a resume of the nominee to be sent to the committee chairman, no later than December 31st.

K) After convention send back resumes of unselected nominees shall be sent back to the chapter for them to update the resume and again submit the following year, if so desired.

Move Regulations Article I Section B 12)-Hall of Fame to item 4) in Awards Committee Article.

Comment: Both Committees agree that there is too much overlapping of work and information for efficiency in both committees. Member of Note, Golden Hammer and Hall of Fame should all be handled by one committee. Bylaws committee agrees.

9C. Bylaws Article XIII Section 1

Delete "Hall of Fame" in list of standing committees.

Awards (Member of Note and Golden Hammer)

Insert "Hall of Fame" in parentheses after "Golden Hammer."

10. Guidelines for International Relations Committee

Regulations Article I Section B 15)

15) International Relations — There shall be a committee on international relations.

Add "This committee shall be responsible for fostering relations with organizations and individuals in foreign countries who are in the piano industry, especially piano technicians. The committee will be responsible for Piano Technicians Guild tours to foreign countries. It shall review and approve or reject applicants for affiliate membership.

Comments: This is presented by San Francisco East Bay chapter as a definition of this committee's function. Bylaws committee recommends adoption.

11. Add Chapter Program Development Committee as a Standing Committee

Bylaws Article XIII Section 1-Standing Committees

Add "Chapter Program Development"

Regulations: Article I B

Add "Chapter Program Development — There shall be a committee for the development of new chapter program materials, such as tapes, slide programs, films, and written material."

12. Eliminate Home Office Collection of Chapter Dues

Regulations Article II Section B 2)

2) Chapter Dues Collection — Chapters may elect to have chapter dues billed and collected by the home office. Chapter dues will be included in their entirety as part of the first payment. Such dues will be reported and sent to participating chapters in April.

Eliminate entire item.

Comment: The Piano Technicians Guild Accountant and a recent examination by the IRS recommends we discontinue Home Office collection of chapter dues because of tax consequences. IRS seems to be inclined to consider money collected on behalf of chapters as income which is taxable even though it is returned to the chapters. Separation of finances between chapters and the home office is important to maintain our tax position and comply with current IRS regulations.

13. Senior Members at Large Transfers.

Bylaws Article VIII Section 4 b)

b) Each member, except Members-at-Large, Honorary, and Affiliate members, shall be a member of a chapter, or one of the chapters, which has jurisdiction over the area where the member lives and/or works. Upon moving into the jurisdictional area of a chapter or chapters, the member shall join the chapter, or one of the chapters, within ninety (90) days.

Add to last sentence: "except that Senior members as defined in Article VI Section 1 h) who have been members-at-large may remain members-at-large.

Comment: Board feels that this sort of "grandfather clause" could help keep retired members who might resign if required to join a new chapter.

14. Senior Member Dues

Bylaws Article VI Section 1 h)

h) A member may continue membership and pay no annual Guild dues provided that the member:

1. *Has a minimum of ten years continuous membership in the Guild and has reached the age of sixty-five.*
2. *Is no longer significantly engaged in any form of piano work.*
3. *Agrees to pay the cost of the Guild death benefit insurance or consents to drop from the insurance program.*
4. *Agrees to pay a cost established by the board of directors for receiving the Piano Technicians Journal or consents to drop from the Journal mailing to members.*
5. *Has approval of the chapter. Members-at-Large must have approval of the Regional Vice President.*

Delete 3. and 4. and replace with new 3.: "Agrees to pay the cost of *Journal* and Insurance program or agrees to drop from *Journal* and Insurance program.

Comment: Board feels that too many options exist presently concerning taking *Journal* and insurance which make bookkeeping cumbersome. Board feels *Journal* and insurance should come as one package.

15. New Chapters Within Jurisdiction of Present Chapters

Bylaws Article VIII Section 4 Add d)

When a new chapter is proposed within the jurisdiction of an existing chapter, the board(s) of the existing chapter(s) must be notified in writing at least two months before the new chapter is chartered. The new chapter must be approved by the Regional Vice President and by a simple majority of the existing chapter(s). The National Board shall have the power to overrule if requested. No portion of an existing chapter's name may be used without its consent. New chapters must either send a representative or a letter through the Regional Vice President to the Council Meeting at which the charter is approved.

Comments: This proposal is sent by San Francisco chapter in reaction to difficulties encountered at the Washington Council Meeting. The Bylaws committee feels the idea of proper communication is important but feels that the idea of the present chapter being able to prevent the formation of a new chapter by a vote is not a good idea. Historically, these cases involve hard feelings between chapters but in the end both chapters are better off for the division.

16. Reinstatement of Former Members

Bylaws Article VI Section 7

a) A member who has resigned in good standing may be reinstated with continuing membership by paying any back dues and with approval of the chapter.

b) A member who has resigned in good standing may apply as a new member and will take an examination if requested to do so by the chapter and will, if accepted by the chapter, receive a new entry number. This will not constitute a continuing membership.

c) A member who has been dropped for non-payment of dues may be reinstated with approval of the chapter and upon request of all back dues and a reinstatement fee of $30.00. This will constitute continuing membership.

d) A member who has been dropped for non-payment of dues more than twelve months earlier may apply as a new member, receive a new entry number and shall take an examination if required to do so by the chapter. This will not constitute continuing membership.

Delete all four paragraphs (a,b,c,d) and substitute: "Any former member wanting reinstatement must make application as a new member. The application fee will be assessed but back dues will not. Former Student, Apprentice, Associate, Allied Tradesman, and Affiliate members may be readmitted to their former classifications without examination. Former Registered Tuner-Technician members must take examinations and pay the required examination fees, unless their original examinations had the same form as those in use at the time of reinstatement.

Comment: This is submitted by Lexington, KY Chapter. At present some chapters require reexamination and some do not; this proposal makes the same standard for all.

17. Elimination of Rebates for Applications Made at Seminars and Conventions

Bylaws Article IV Section 1 e)

e) All applications for membership at any convention shall be referred to the respective chapter for processing in the required manner.

Add: "Conventions and Seminars shall not give rebates for applications taken at such seminars.

Comment: Washington DC chapter states: "There have been several problems in our area with these certificates. First, we have found it very difficult to get to know an applicant and complete the examination process before the six month expiration dates. . . . That problem is compounded by the fact that many applicants are given the impression that their applications will be processed ahead of others in line. . . . Along with the administrative problems, and much more important, is that the people in the membership booth just don't often know who they are dealing with. It has happened that new members have been courted who have been notorious in the area for their poor ethics and technical quality of work.

Bylaws committee sees both the advantages and the problems of the use of these certificates and has no recommendation.

18. Time Limit To Pass All Parts of Exam

Bylaws Article IV Section 2 c)

c) To achieve a Registered Technician rating, an applicant must make a grade of at least 80% on each of the three parts of the examination. Grade averaging shall not be permitted.

Add: "Failure to make 80% on one or two parts of the exam will not require retaking the parts passed at 80% as long as all three parts are passed no more than two years prior to the reclassification date."

Comments: With the implementation of the Standardized tuning test, there have been applications turned in stating that the tuning exam was passed in 1979 by the old system. Bylaws committee feels this is necessary and that 2 years is sufficient time to pass all parts of the exam even in a busy or inefficient chapter.

19. Student Membership

Bylaws Article IV Section 3 a)

a) The application fee shall be thirty dollars ($30.00). If the applicant becomes a member, fifty percent (50%) of the fee shall be retained by the chapter which the applicant is joining, the remainder forwarded to the home office. If, after examination, the applicant does not become a member, the chapter shall retain fifty percent (50%) of the fee and refund the remainder. In the event that no examination occurs, the entire application fee shall be returned to the applicant.

b) Upon receipt of the chapter-approved application and fee, the home office shall process the membership application, and billing for fees shall be sent payable from the beginning of the month following acceptance into membership.

Change 2nd sentence to read: "If the applicant becomes a Registered Tuner-Technician or Apprentice member . . . etc."

Change 3rd sentence to read: "If the applicant does not become a Registered Tuner-Technician or Apprentice member, he/she becomes a student member. He/she may then join the chapter as a student member by paying an additional $30.

Comment: Board and bylaws committee feel that this is misuse of the Student category. This option is available at present if the applicant is indeed studying piano technology. To make them students automatically if they can't pass the examinations for Apprentice would work against the student classification.

20. Recertification of Certified Tuning Examiners

Regulations Article IV g 5)

5) Certified Tuning Examiners shall be recertified at regular intervals, every five years.

Add words: "Recertification shall require passing the tuning exam at 90% again and being reapproved by the Executive Board."

Comment: Recertification is required but never defined specifically.

21. Reclassification Fee

Bylaws Article VI Section 5

A reclassification fee of ten ($10.00) dollars shall be sent by the applicant to the home office with the reclassification request. (See Article IV Section 4e).

Add words: "except for Apprentice members reclassifying to Registered Tuner-Technician where the reclassification fee is included in the Registered Tuner-Technician Tuning Exam Fee.

Comment: This is present board policy.

22. RVP Assistants

Bylaws Article XI Section 9 d) Duties of Officers

d) Regional Vice President — The regional vice president shall exercise a general supervision over the chapters and the membership within the region, promote the welfare and harmony of the Piano Technicians Guild, act as the president's deputy in any matter on authorization of the president, be membership chairman for the region, be the advertising representative in the region for the Piano Technicians Guild Journal, attend major meetings held by chapters in the region whenever feasible, assist in forming new chapters, and act as delegate to Council to represent all franchised Members-at-Large in the region.

Add: "Regional Vice Presidents may appoint assistants (such as state chairmen) to help with duties within the region. Expenses incurred by such assistants will be covered by the Regional Vice President allowance subject to prior approval.

23A. Advertising for Associates and Allied Tradesman

Bylaws Article III Section 2 b Associates

Associates shall be nontechnical members who, because of their position and interest in the piano industry, wish to support overall Piano Technicians Guild activities. As Associate members they may not advertise or promote personal performances of piano service, but may advertise or promote piano service in general or by qualified Registered Technician members.

Change second sentence to read: "As Associate members, they may promote and advertise membership in the Guild, using the logo and all its privileges, provided the member *clearly* states that he is an Associate member in all advertising, promotions, and correspondence. Membership must be approved annually by the majority of members of the chapter. Member-at-large Associate membership is not allowed.

23B. Bylaws Article III Section 2 b Allied Tradesmen

Allied Tradesmen shall be members who regularly follow some branch of piano work as their livelihood, but are not qualified tuners. As members of the Piano Technicians Guild they may not publicly advertise being qualified to service pianos beyond the extent of their personal qualifications. They must be members of a chapter.

Change Allied Tradesman to read the same as for Associates.

Comment: St. Louis chapter submits this amendment. In light of the reversal of this last year, and the potential for abuse, the bylaws committee recommends not to adopt.

24. Prior Notice for Bylaws Amendments

Bylaws Article XVIII Section 1 c)

c) Proposed amendments must be submitted in writing, with supporting arguments, to the chairman of the bylaws and regulations committee no later than one hundred and thirty-five (135) days prior to the opening meeting of the Council session.

Delete: "no later than one hundred thirty-five . . ." to end of sentence. Substitute: "by the mid-term Board meeting."

Comments: San Francisco East Bay chapter states the following reasons:

1. This is easier to remember and calculate than a specified number of days.
2. It may be important to the mid-term board meeting to review proposed changes.

Bylaws committee feels that since the Board has a chance to review and make recommendations on bylaw amendments at the pre-council board session that the present date which is mid to late February is early enough.

We would like to thank those members from throughout the country who have expressed their pleasure at the new four-color covers on the *Journal.* It may interest you to know that we were able to bring this about for very little cost due to having them printed two months at a time in advance. In addition, several advertisers have expressed an interest in four-color ads on the back cover since it is now possible to do so. This could increase our income and put us in a more competitive position with other fine *Journals* in the industry who have far greater circulation numbers than we do.

In addition, some manufacturers have expressed an interest in supplying us with four-color separations for future covers.

— **Don L. Santy**
Executive Director

January 11, 1983

Home Office Collection of Chapter Dues

This Piano Technicians Guild accountant's recommendation is taken up under Proposed Bylaws Amendment #12

Dear Mr. Santy,

I want to advise you and the officers of Piano Technicians Guild of an item that came up in the recent audit of the Guild.

The Guild has routinely collected dues for the various chapters and then remitted those dues to the chapters for their use. The IRS advised us that the chapters are not covered under the non-profit status of the Guild. They are therefore construed to be separate small corporations which are taxable at corporate rates. The respective chapters could, of course, file to be non-profit also.

I would suggest that the Guild stop collecting these dues since future audits will probably address this if it is apparent from the financial statements that dues are collected from the chapters.

Please let me know if you have any questions regarding this.

Jack N. Seidel
Piano Technicians Guild Accountant
Jack Seidel & Company
Certified Public Accountants

Tips on New Member Applications

The application forms are coming in in very good shape and we are pleased that very few applications have to be returned to the Chapters for completion.

If the grey section of the application is not completed and signed, showing acceptance by the Chapter and classification of the applicant, the home office must return the form to the chapter.

The entry fee for Registered Technician, Apprentice, and Allied Tradesman is $30.00. $15.00 of the $30.00 is sent to the Home Office, and the balance of $15.00 is retained by the Chapter. If $30.00 entry fee is received by the Home Office, the Home Office will not refund the $15.00 to the Chapter but credit the prospective member $15.00 towards his/her Guild dues. The red tape of refunding $15.00 to Chapters sending $30.00 is unnecessary bookkeeping.