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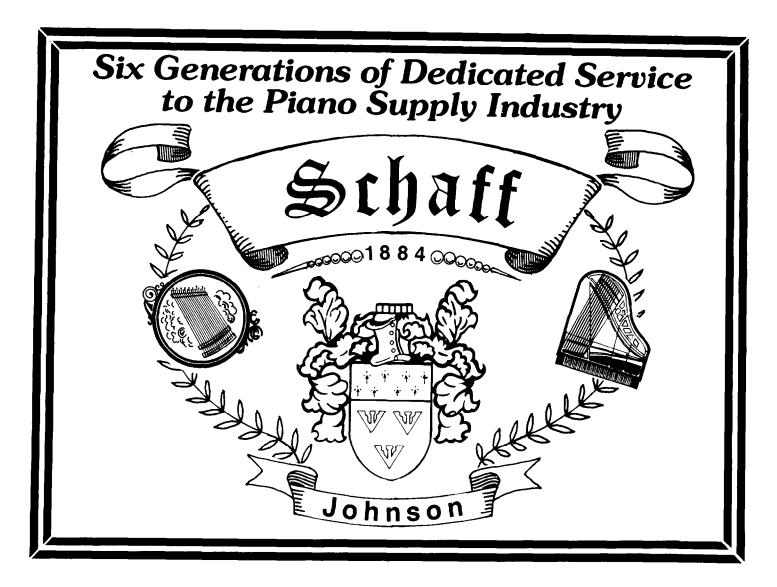
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Editorial Perspective

How to Buy a Piano

For those without the patience to read a book about pianos before embarking on the perilous journey of buying one, this tape may be just the thing. In just under a half-hour it hits the high points, educating the viewer on a host of



Steve Brady, RPT Journal Editor

topics, including: the various sizes and shapes of pianos, their prices and good and bad points, case construction and the action. The tape concludes with general information and advice on actually buying a piano, negotiating, warranties, piano teachers, and the importance of tuning and regulating the piano.

The tone of the program is upbeat throughout, with the actual presentation punctuated by musical interludes featuring Novak at the piano. To his credit, Novak states at the outset that "salespeople are very knowledgeable, but will say almost anything good about their pianos and bad about those of their competitors." He describes the frustration of

this dog-eat-dog mentality which causes some buyers simply to not buy a piano at all.

Novak also states correctly that "manufacturers produce only what the market demands," and that this response to market pressure affects both quality

ket demands," and that this response and price. He points out that while the basic technology of the piano has not changed much in the past 100 years, manufacturing techniques and materials have. He assures the viewer that the new plastics used by some manufacturers are far superior to those in use even 20 years ago, and that they are in

A review of Piano Buyer's Guide, a videotape by D.L. Novak. Seattle: Lou Visions, 1994. VHS, Color, 27 minutes, small booklet and buyer's checklist included. \$19.95 plus \$2.50 shipping & handling. Available from Brookside Press, 800-545-2022.

many cases superior to "other materials." Some manufacturers use the plastics, he says, to help make the piano more affordable.

As a sometime piano technician, Novak appears in a few segments doing technician-like things such as tuning, pulling the action out and regarding it seriously for a moment, then pushing it back in. He drags the keyboard out and shoves it back in without lifting slightly to avoid crushing the front edge of the keybed with the balance rail glides. Surely only a nit-picky technician (like myself) would be bothered by this subtle *faux pas*, but I couldn't help cringing.

When giving advice on finding a piano technician, Novak, a non-PTG member, eschews mention of the Guild, instead recommending that people question seriously the ability of anyone offering to tune a piano for \$20, stating confidently that "piano tuning costs anywhere from \$45 to \$75." Now, bearing in mind that prices may have changed somewhat since the video was made in 1994, Novak's figures might have been out-dated for the Seattle area even then. The bottom line: if you lend or recommend the video to a client, (depending on where you live) you might need to warn them that the prices may be out of date.

The video concludes with some excellent advice about keeping children and adults interested in playing, and keeping the piano available in the home even in those periods when nobody is playing. I found Novak's positive attitude

and well-reasoned advice in this section especially good. After all, it's by encouraging young players that we build tomorrow's market for the instrument we love.

Please submit tuning and technical articles, queries, tips, etc., to me:

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Journal Journal

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President's Message

Peace & Goodwill — Past & Present

Once again, too soon some of us think, we approach the end of another year. Where has the time gone? What have we done with the past 12 months that has caused us to be a better person? What actions have we individually taken to insure that the time invested in this year has been used wisely?

Ideally, we all strive to utilize our time well in per-



Marshall B. Hawkins, RPT PTG President

sonal interests and goals for the benefit of our families and others. We all, hopefully, work toward being positive and congenial. In today's world that is not always an easy task. It is not necessary to look very far to get a picture of ugliness of some sort. Look through the newspaper for a few minutes and there it is. Turn on the television and once again ugliness is before us in the latest news or expressed in the content of a program. Scan the offerings at your local movie theater and you will see some notso-pleasant themes. Turn on

the radio and listen to the lyrics to some of the music being played and you will find ugliness there as well. Ugliness shows itself in many ways. Sometimes it is simply inappropriate language which results in hurt feelings. At other times, disrespectful language can result in physical confrontations. They can be harmful to those directly involved a well as innocent people who just happen to be in the wrong place at the wrong time.

Although we may be confronted with negativity from time to time and will see ugliness displayed, it behooves us to direct our collective energies in the opposite direction. That brings me to the central point of this message.

Each of us should endeavor to place a positive focus on every day. Just for one day hold your temper and carefully monitor the words you speak. Just for a day look for the best in others and acknowledge each person you encounter with a smile. Just for a day really work at being kind, and thoughtful, and considerate. It can be directed toward family members, neighbors, clients, your business associates — master this spirit for one day and watch the results.

After all, this is traditionally the season that peace becomes the focus. Peace on earth and goodwill toward others. These words have such a heartfelt ring that I wonder why this thought is not transferred into action throughout the entire year?

So, what am I speaking of here? Nothing more than the universal message of peace and understanding. Do unto others as you would have them do unto you. This wisdom is as old as time and as true today as it ever was. There will always be some who will not agree wholeheartedly, but we should nevertheless proceed by choosing to view the brighter side. When we continue in this vein, we are making a suggestion. Whether we realize it or not, suggestions do have "hooks." You may not even be around when your suggestions take hold and come to fruition. That's okay. You stay on the upper edge by staying focused. Always strive to do the right thing, and the positive benefit will follow.

This time of the year is a perfect time to begin something new — if this is indeed new to you. Think about it. What a wonderful opportunity to really impact the future in a substantial way. All you have to do is be kind.

As we reflect on the months just past, let me speak to each of you reading this, and express my hope that you will not only remember the thoughts offered here, but embrace them throughout the year ahead. The words of Edwin Markham can give all of us personal guidance on how to approach the world around us. Peace and good will are all around us — we just have to look for it — and most importantly, share it!

The Right Kind of People

By Edwin Markham

Gone is the city, gone the day,

Yet still the story and the meaning stay:

Once where a prophet in the palm shade basked A traveler chanced at noon to rest his mules.

"What sort of people may they be," he asked,
"In this proud city on the plains o'erspread?"

"Well, friend, what sort of people whence you came?"

"What sort?" the packman scowled:

"Why, knaves and fools."

"You'll find the people here the same,"

The wise man said.

Another stranger in the dusk drew near,
And pausing, cried, "What sort o' people here
In your bright city where yon towers arise?"
"Well, friend, what sort of people whence you came?"
"What sort?" the pilgrim smiled,
"Good, true and wise."
"You'll find the people here the same,"
The wise man said.

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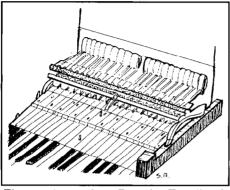


Figure 1 — Jon Page's Tautline™ Regulation Guide in use.

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The two uprights fasten to the action, and the adjustable, tightly stretched line serves as a string target. This tool is available from its inventor, Jon Page, RPT, for \$6 postpaid, or from Pianotech Piano Supply Co.

— Steve Brady, RPT Journal Editor



Piano Too Loud? Foam It!

When working with piano owners that need the volume of their pianos reduced, I always suggest the installation of acoustic foam. I sometimes include the application of alcohol and water on the hammers. Most houses are small, and there are lots of folks living in apartments, and the piano is virtually always against a wall. This makes for cramped quarters for some, and the need to play the piano shouldn't be restricted by its volume or its effect on the neighbors (although some people would do well not to play anything at all).

This foam is readily available at any foam supplier. These folks have foam of every kind for cushions, beds, camera bags, gun boxes, and so on. The stuff I like to use is medium dark gray, convoluted (yeah, I had to look it up) on one side and smooth on the other. It looks like an egg carton on one side. This is the side you put towards the sound-board. I make a template or pattern out of newspaper of every cavity on the back of the piano and then take those patterns to the foam guy. He's got an electric razor blade to cut the stuff cleanly and ever so slightly larger than the pattern. This allows for a pressure fit, no glue or two sided tape

needed. Very removable and very replaceable. There is a two-inch variety and a one-inch variety. I believe I've been using the one-inch stuff (one inch at the thinnest point). This stuff has absolutely no effect on voicing or tone created by the hammers hitting the strings, it just knocks down the overall volume. I was concerned about the effects of age on the foam. I've seen some foam turn hard, while other stuff turns to goo. He assured me the foam deteriorates because of a reaction to adhesives.

Once the foam is installed I usually voice the hammers down slightly, especially if they were bright to begin with. I make sure I've communicated this procedure in great detail with the customer first. They may not want the hammers messed with at all. The effect of the foam seems slight at first; however, I've never been asked to remove the stuff. In one case I lined the inside of the piano with foam as well to really absorb as much sound as I could with out ruining the appearance of the piano. I think if you were to leave the foam in the piano for a week or two and then remove it, the customer would notice the difference right away.

The alcohol treatment of the hammers is a mix of water and alcohol, the ratio of which I've not been real particular about. There needs to be enough alcohol in the water to allow penetration into the hammer felt. I use a hypo-bottle and run a thin bead right on the strike point, heavier in the bass and super thin and light in the top octave. Too much in the top octave and you lose tone, all that's left is the percussive knock of the hammer hitting the string, much like a hymnal hitting a small child's head — that thud part before the scream part. I sometimes don't put any on the top octave at all. It doesn't take long to dry, usually, in these parts anyway. In the Guineas it might take a week or two. But then what would you expect from a country that invented the Gamish Corn Hen (erroneously fowl humor, sorry).

Some people wonder how I can make a living at this.

— Larry Fisher, RPT Portland, OR Chapter



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Figure 2— Hammer flange screwdriver with notch filed in tip. places the hammer butt spring after the hammer assembly is back in the piano.

> — Isaac Sadigursky, RPT Los Angeles, CA Chapter

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Q & A/Editor's Roundtable



Buzzing Fallboard

I tuned a couple of days ago for a lady whose piano had a bad buzz/rattle. I typically tap around the piano looking for something loose. When I removed the fallboard and patted it I heard that sound of something loose. It was the metal bars screwed into the bottom of the fallboard. I tightened the screws, but the rattle was still there. I advised we remove it and see for sure that it was the problem. I soon found out it was made of lead and then I began to wonder what its purpose was? I thought it was steel plates to help prevent warping of the fallboard — wrong! Was the lead for counterbalance with the fallboard? To help keep it from falling on fingers? Well the rattle was gone and the fallboard worked fine and didn't seem to want to fall on the hands. Question — should I have pounded the lead to get rid of the rattle? Very soft and malleable!

— David Ilvedson, RPT Pacifica, CA

• Del Fandrich, RPT: Yes, the lead is for the purpose of counterbalancing the fallboard. The biggest problem occurs when the pianist reaches up to turn pages and their coat or shirt sleeve catches the top lip of the fallboard on its way back down. (There is a reason why this part is called the "fall" board.) You might want to be a little cautious in removing it permanently. I'm aware of at least one hand injury resulting from a fallboard falling on a pianist's hand.

There are at least two ways to permanently stop this thing from rattling. One is to put a layer of felt between it and the fallboard. Another is to glue the thing in place (along with the original screws) using PVC-E or melamine glue or even Elmer's® white glue. Of the two, I prefer the felt. It's easier to disassemble later, if for some reason it has to be taken apart. (Well, I don't know why either — maybe for finishing or something.)



Broken Plate

On the way to a concert an old six-foot Steinway grand had an accident. It broke loose from the strap which was holding it up against the wall inside a small moving van. It seems that it landed on its top, in the middle of the van floor, slightly protected by a few moving blankets.

There is a visible crack on the lid's treble side, the fallboard broke loose from the bass cheek-block hinge, cracking along its length (about a foot). Some other case damage and a little action damage inside may be related to the fall.

The plate and soundboard look okay. It is easy to see cracks in the soundboard, if present. There are no visible cracks in the plate. The owners are concerned about the plate having fine cracks that might not show up to the eye. It seems like a valid concern to me.

My question is: how would one go about making sure that there are no fine cracks? One could be on the underside and not cause problems until one late night when the wood is creaking or I am sitting there, lost in listening to those beautiful intervals and shimmering beats.

I actually cannot think of any way to be 100 percent sure, besides destringing and maybe taking it to the auto repair place for one of those "what daya call-its" where they test for cracks in engine blocks. There is insurance that would probably cover it, but is it really necessary?

I would appreciate hearing anyone else's experience with these kinds of situations.

— Ken Hale, RPT Sacramento Valley, CA Chapter

Danny Moore: I'll go ahead and admit in public that I dropped one on its head trying to unload it out of my truck by myself. Fortunately, it was a Howard junker that had been given to me, so no real loss. I disassembled it to inspect and was rather shocked at what I found. There was very little damage evident until I pulled the plate. The mass of the plate caused the plate to continue on its travel even after the case came to a rather sudden stop. All the plate bolts were pulled out about a quarter inch — nose bolts, everything. It was not noticeable with the plate strung and in the case. There was no evidence of any damage to the plate, however.

I would think that structural damage in the rim area and where the pinblock was doweled to the case would be a much greater likelihood than plate damage. After all, the plate was rather well-protected by the mass of wood it was bolted to.

It will be interesting to read other comments on this subject.

Del Fandrich, RPT: If memory serves, Howards were built with select poplar rim's — not exactly the most robust of woods. Did they not also use relatively small wood screws? Either way, if the piano had been afflicted with the plate-bolt-tightening regimen, they might not have been holding much before the great fall.

Most of the plates that have come through my shop actually damaged, i.e., cracked or broken, due to falls of this type have had the top two or three struts cracked just aft of the capo d'astro bar. This is already one of the weakest areas of the plate. There is already quite a lot of stress at the transition between the relatively thin strut and the relatively massive capo d'astro bar due to the uneven cooling rates between the two areas.

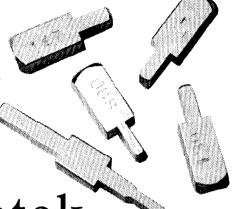
David Graham, RPT: In·light of an experience here last year with an Steinway & Sons D that was shoved off the stage and landed four feet below on its lid, I would not be too worried about one that just fell over. The D made it through the year last year, but the fact that it needed rebuilding before it went on its short flight didn't change after the trip. It is now at a rebuilding shop, where all is going well. The lid will even be salvageable, with a new lockbar being the only case part replaced.

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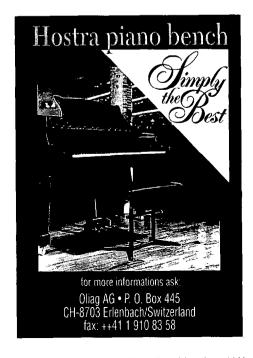


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Q & A/Editor's Roundtable

Continued from Page 12

Other than regluing a dag and tightening some screws, the piano needed nothing special. It sure was ugly-looking, though.

Wally Scherer: I don't know if any piano technicians have used this method, but when I worked at a shipyard back in the 70s, the shipfitters used a type of X-ray machine to examine weld joints in the steel plates to see if there were any invisible cracks. I think pipefitters do the same when installing pipelines for petroleum. I don't know how you would contact someone with such a machine, though.

Bill Maxim, RPT: In my first attempts at restringing grands I was very uneasy that all the plates rocked a bit and I seemed unable to get a perfect fit — I believe always with the tail high. Nothing has ever broken over the 20 years or so.

Then I bought an old Hamilton grand to fix up and resell. Then when I began to take it apart I discovered that half the plate bolts were missing!

Nothing had broken, and when I set the plate back in, it rested perfectly flat. Did the missing bolts help?

Fandrich: No. But having them missing probably didn't hurt all that much either. You just happened to find a relatively flat plate. (It does make one wonder, though. Why were they missing?)

Plates warp and twist quite a bit as they cool. There is often no way to use a plate unless it is flexed somewhat on installation. This is quite safe as long as areas of local stress are avoided — such as over-tightening a bolt with no support under it.

The only plate I've seen with a broken outer flange was one of these. The plate was mounted on tapered wooden wedges that were set — not glued—on the soundboard next to the plate bolts. Normally the pressure of the bolted plate flange held these blocks in place. At some time, however, one of them had loosened and fallen out. When the technician, acting on advice he had received in a PTG Convention class, tightened the plate bolts down, this one never "bottomed." Instead, the outer rim of the plate cracked across the bolt hole and into the plate panel about three or four inches.

Fortunately, this was an area of otherwise very low stress. The piano wasn't worth a whole lot and, with the owners knowledge and permission, nothing was done to repair the crack. I advised the technician involved to remove the bolt, measure the distance between the bottom of the plate and the soundboard, make a new block and fit it in place and reinstall the bolt. This was done and, the last I heard — it's been some years — the piano was still fine.

David Ilvedson, RPT: Many years ago I worked for a piano rental outfit; we rented Hamburg Steinways to artists who wanted a choice between the New York and the Hamburg. I was the technician who also helped move the pianos. One evening we dumped a Hamburg over squarely on its lid ... "Oh, oh." When we got it back to the shop the only problems were the dags which had broken loose on impact. It was still in (reasonable) tune. That piano ended up with Chick Corea. I think the plate will be okay if you dumped it on its lid.

Maxim: An engine rebuilding shop may be of help. I plan to have the engine of my service vehicle rebuilt, and the owner has described to me his test for cracks in the critical places.

Moore: I'll bash this one just a bit more. I think a metallurgist would guide you toward Magnaflux on this one. Radiography (x-ray) is a wonderful nondestructive test for welded metal because you can see any lamination, slag, impurities, pinholes, undercut or other gremlins that infect welded steel. Cast iron is full of impurities, air pockets and all the things that an inspector uses radiography to detect. (That's why it's iron instead of steel.) It would be very difficult to detect any minute cracks with all the other junk that would appear in the x-ray.

Industrial Magnaflux is specifically designed to detect cracks that are undetectable even by x-ray. It uses metallic particles suspended in a photosensitive liquid. When subjected to a strong magnetic field, the particles arrange themselves around the line of demarcation that interrupts the flow of electromagnetism. When examined under ultraviolet light, the imprint of the magnetic field is readily apparent and any cracks are obvious.

Problem: After you detect one or more minute cracks in the plate, how do you determine if the crack(s) were a result of the fall? As cast iron cures, it generally develops stress cracks around areas of dramatic changes in thickness — say where a strut meets the plate. This is a natural result of the molten iron cooling at different rates, thus the thick part contracts at a different rate than the thin part. So is it fall damage or have the cracks been there since it came out of the mold?

I have to go with David on this one. If all strings are still in tune and will hold, and you can't see any cracks, it's probably okay, and your inspection will be as accurate as any test you may perform.

Here's an old race-car tip for the real perfectionists: Cast iron may be stress-relieved by grinding (with a die grinder) any casting flashing, mold parting lines and/or other irregularities smooth and flush with the area around it. Also, radius grind the areas where struts blend to the plate, etc. I've done this on many race car engine blocks, but never on a piano plate. But then, I've never revved a piano over 6500 rpm.

Fandrich: As you suspect, there is no way to be 100 percent certain that there is no hidden or residual damage from a fall of this sort. However, you can be about 99.87 percent sure, which is probably good enough.

Of the several plates I've seen damaged in a drop, they have always broken on impact. Those, such as the Steinway, using hard maple rims and several nose bolts seem to survive with no apparent damage to the plate or rim structure at all. Those with poplar and/or "Select Hardwood" rims tend to have stripped out plate bolt/screws, etc. Of course, the plate bolts/screws could well have been stripped out before the piano was set up so the pianist could play it on his back. (We seem, somewhere, to have gotten the idea that plate screws/bolts need to be tightened to about 295 ft. lbs. of torque every time the piano is tuned. Okay for maple, not for Select Hardwood.)

I agree with Danny Moore. Magnaflux testing probably wouldn't tell you much. It might frighten you more than nec-

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Q & A/Editor's Roundtable

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essary, but the results would probably not be of much value. Plates do go through a lot of trauma as they cool. The iron shrinks as it cools. But it doesn't shrink uniformly. Large cross-sections cool at a different rate than do narrow cross-sections. The result is a cool plate that has all kinds of stresses in it. Some of these manifest themselves in twisted and warped sections — have you ever laid a straightedge along the bottom of a pinblock web, for example? You can bet that the pattern was flat. The web rarely, if ever, is.

So, tighten the bolts if you must. Check the nosebolt blocks — you know, the blocks bolted to the sides of the belly braces — to be sure they haven't shifted any. Fix the action. Fix the fallboard. Tune the piano. Enjoy.

Glen Deligdisch: I have been following this thread with some interest as some of the methods for checking this plate for cracks are ones that I use in the aviation industry.

I use 'Magnaflux to check aircraft parts (engine, transmission, landing gear, etc.) for defects. As I listened to the suggestion to Magnaflux a 6' grand plate I had to sit down and think, "with the equipment we have, how would I do that?" Let me comment on some of the problems and then make a few alternate suggestions.

The limitation is the size of the magnetizing coil (24 inches) or the distance between the pressure heads (42 inches) on our machine. We magnetize parts by two different methods and a plate of this size is too big. I'm sure there are Magnaflux machines that are bigger and could handle it. I'm sure you could arrange an appointment with one, but you might stagger at the cost.

There are two other problems with this method:

- We require all parts to be bare metal, the plate would have to be stripped. I suppose you could Magnaflux it with the paint on, but then I would not guarantee the results.
- 2. I don't know how I would demagnetize the plate. To demagnetize the plate properly it would have to fit through the coil. There are methods to do it after all, the US Navy demagnetizes a whole ship after construction before commissioning.

I don't think Magnaflux should be the first-line method for checking the plate. Let me suggest three other nondestructive crack detection methods that we also use in our shop:

1. Cheapest: Visual inspection with a 10X magnifying glass and bright light (such as a Maglite™ which can focus the light beam). This is always our first line of attack. Focus on obvious stress points, weak spots, where strength changes because the cast thickness changes or heads off in a new direction. God has made the human eye incredibly like our ears. We can detect a gap as small as one millionth of an inch if under the right conditions! A lot of cracks are not going to escape a good visual inspection.

Let me make an aside here. We place hard paints on aircraft parts for two reasons; for protection and to indicate cracks. Seldom do we find a crack in the metal part that did not first indicate its presence in the paint. From what I have been reading on the list about what we paint our plates with, a crack should be observable with the above method by looking for it in the paint.

- 2. Small expense: Dye Penetrant inspection. This method uses a dye that gets absorbed into the unseeable crack and then indicates when the developer is applied. The plate is cleaned thoroughly, the dye is applied, the dye is cleaned off again (but the dye in the crack remains) and then the plate is developed. The developer is a dry powdery substance that is sprayed on the plate and now sucks the bright red dye into one teaspoon white powder.
- 3. Kind of expensive: Zyglo Penetrant inspection. This method is a little bit more elaborate as it requires the penetrant and a black light (ultraviolet) for detection. It uses a fluorescent chemical instead of dye and is basically the same method as number two above.

We use these three methods to guarantee as being free of defects, airplane parts upon which people are placing their lives every day. I know they work.

A word of caution: If you ever find what you think is a crack with the above methods, don't stop there. Crack indications show up for a host of reasons but not all are cracks. If you find a crack, remove the plate paint by dissolving the paint. Don't sand it, because you can pack paint into a crack and cause it to stop indicating. Removing the paint with strippers, MEK (Methyl Ethyl Ketone) or other paint-dissolving product would be the way to go.

Sorry this is so long. I hope it is helpful to some.

Zen Reinhardt, **RPT**: First question — how is the tuning? Weird question, I know....

I remember reading in the *Journal* a few years back about a D that got hit from above by a collapsed roof and survived the blow in style — it lost a couple of unisons and sustained some cosmetic injuries, and that was about all.

Then a little more than a year ago I heard from a friend about another D that fell when the dolly under the skid broke. The only known cushioning it got besides the moving blankets it was wrapped in was the foot of one of the movers, who is still out on disability. Apparently, the overall tuning pitch dropped 30 cents on average, and there were massive cracks in the bellyrail. There was probably considerably more damage, the details of which I don't know, except that the plate seems to have survived it all. The remains of that piano got sent back to Steinway for rebuilding, and I have yet to hear how that one is coming along, or what other damages were uncovered by the people there.

I guess this still doesn't answer your question about how to check for hidden damage of the plate, but what I'm getting at is that there may be other structural damage. Good luck.

The Last Word

Ken Hale: There was nothing out of the ordinary for this piano, which I have serviced for years.

I took the weekend to digest all these replies, and talked to both parties today, the droppers and the owners. At the moment, I am going to buy a 10X magnifying glass and take my Maglite to the piano and go over the plate (paying close attention to the paint), check the screws and bolts and go from there. My understanding is that Magnaflux is not an option

Q & A/Editor's Roundtable

and that many plates have cracks from the factory.

There is some action work to be done. Nothing that I could prove or disprove happened in the fall, but stripped action bracket screws and a loose wooden part where the action bracket feet rest. It ain't over yet.

Thanks again, everyone!



Repair for Loose Jack Flange Joint

I haven't seen any discussion of one glue joint that has been a problem for me in old pianos: the joint between the upright jack flange and wippen. This joint is often broken in old pianos and nearly only in old pianos. The glue is invariably hide glue. If hide glue is as good as advertised, why is this joint such a problem. Am I the only one with the problem, or are there others out there?

— Bob Anderson Tucson, AZ

Newton Hunt, RPT: This joint, like many others, is a problem because of the different rates of expansion and shrinking of wood grains glued together at 90 degrees to each other.

The jack flange expands and contracts much more than the wippen rocker. Hide glue is a less than satisfactory glue because of its brittleness as it ages. Wurlitzer finally fixed this problem by putting the bushings in a jack and the bird's eye on the rocker as a hump left after the rocker was machined.

Only way to solve this problem is to reglue the joints with a more flexible glue or to allow CA glue to wick into the joint without taking it apart first.

One suggestion is to unhook the bridle straps, remove the wippen screws and let the wippens hang on stickers or remove them entirely and test each joint well, reglue those that come apart and replace the wippens. Doing it wholesale speeds the job.

Bill Schlipf: I've had this problem a lot as well. Now, anytime I work on an old upright action, the need is to straighten all jacks under the butt and apply a few drops of CA thin followed by CA medium to all those joints, loose or not. Then I leave the room for 1/2 hour if I can't do this outside! I don't use the activator here. This usually ensures that two or three won't cause a problem in the near future, and it doesn't take much time or glue. I have not had any callbacks yet on that.

Anderson: Ditto for me on the CA glue treatment for upright jacks. Why don't you use the accelerator? I've also started using the odorless CA. The stuff I've found at the Tucson Hobby Shop is the medium variety, but it is runny enough to flow into the joints okay.

Schlipf: Bob, through personal experimentation I have found that the glued joint is stronger if an activator is not used. There

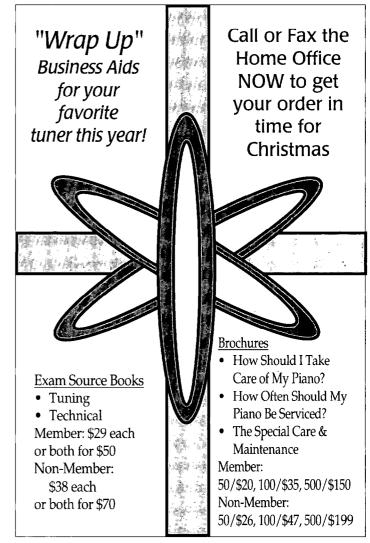
are usually several other things to do to the piano during the short wait. On odorless CAs, Dave Blanchard, RPT, in East Peoria, IL, a longtime friend who got me hooked on CA glue, informed me that his experiences with odorless had been quite a bit less than satisfactory. He went back to the odor. Maybe your drier climate has something to do with this. Personally, I haven't tried it because of his lack of recommendation.

Letters

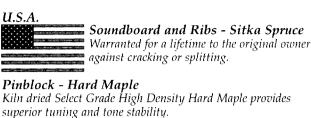
Didn't Think Plan Through

I was amazed that Elton John had to use an out-of-tune Yamaha grand at Diana's funeral. For such an event, one phone call would probably have gotten him a Steinway concert grand, tuned and prepared to perfection by one of the best technicians in England. Sometimes even those who plan such world profile events just don't *think*.

— Peter Krauss Oklahoma City



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Bridle Strap Function

By Jim Ellis, RPT Knoxville, TN Chapter

Abstract

any piano technicians now believe the primary function of bridle straps in vertical pianos is just to hold the wippens up to keep the jacks from jamming under the hammer butts when the action is out of the piano. By contrast, the historical record indicates that bridle straps were designed to facilitate repetition, and new timing measurements disclosed in this article confirm that this is what they do.

Introduction

A recent Journal article about bridle straps contained a statement with which I strongly disagree. My first reaction was to fax a rather hasty "Letter to the Editor" to Steve Brady expressing my own opinions. Four days later, however, I reconsidered and decided that printing that letter was not the thing to do. It would just create more arguments and resolve nothing. I faxed Steve again, asked him not to print that letter, and promised to send him an article of my own that would be printable, and one that I hoped would resolve the controversy. This is that article.

It is important that you not judge me critical of previous writers that I quote. That is not my intention. My intention is to show what has truly been believed, and therefore taught during the past two or three decades, and how it compares with the facts. After all, we tend to teach what we have been taught, unless it is proven to be wrong.

A popular belief now among many technicians is that the primary (if not the sole) function of bridle straps in vertical pianos is to hold the wippens up to prevent the jacks from getting caught under the hammer butts when the action is removed from the piano. The older texts on piano technology credit bridle straps with making repetition faster. However, the concept that bridle straps merely hold up the wippens to keep the jacks from jamming is now printed in modern texts and taught in PTG classes and at seminars.

Current Background

In his textbook on piano technology, Arthur A. Reblitz writes:

"The bridle straps keep the jacks from dropping and getting jammed under the bottom of the hammer butts when you remove the action from the piano."

In PACE Lesson #17, Bill Spurlock writes:

"The bridle wires and straps prevent the wippens from dropping too low and allowing the jacks to fall below the hammer butt felts when the hammer rail is pushed forward, the action is removed, or keys are removed."²

At a PTG convention a decade ago, a representative of a former well-known piano maker argued that bridle straps only serve to hold the wippens and jacks up when the action is removed. Holding the wippens up and keeping the jacks from getting hung is listed as the "correct" answer to a question about bridle straps in one of our PTG written exams. I have heard this same thing taught by instructors at PTG seminars and conferences.

A statement that clearly reflects the effect of the modern teaching regarding bridle straps is made by Edward McMorrow, when he writes:

"The bridle tape keeps the jack from dropping below the hammer butt when the action is removed from the piano. This makes it easier to reinstall the action. Some technicians say the bridle tape aids repetition, since it will help pull a hammer back to rest if the action center is sluggish."

In his recent article on bridle strap replacement, Rob Kiddell introduced the subject with the statement: "The primary function of the bridle straps is to keep the jacks from dropping below the hammer butt felt when the action is removed from the piano. That's it — simple."

Despite popular belief, that is not "it," and it is not quite that "simple" either. Bridle straps do indeed keep the wippens from dropping and the jacks from getting caught, but that is a secondary fringe benefit. It is not why they were put there in the first place.

Historical Background

In 1826, Robert Wornum of London patented an upright action with bridle straps. The drawing shows no return spring, so it appears that the only force that would have returned the hammer to the rest rail (other than gravity and a leather "hinge") would have been the pulling of the strap.⁵

"In London Robert Wornum's main contribution to the early upright piano was the development of an action derived from the English grand action and having a tape check — a device which ensures the rapid return of the hammer from the string after impact, without the use of a return spring."6

In his 1907 writing about bridle

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Bridle Strap Function

Continued from Previous Page

straps, J. Cree Fischer stated:

"Its purpose is to assist the hammer to return quickly by hanging to it with the weight of the wippen, extension, jack, etc., when the key is released. Thus the bridle becomes the main factor in the matter of quick repetition."⁷ Fischer also wrote:

"The purpose of the bridle is to jerk the hammer back quickly and the wire must be set, neither so far back as to check the stroke of the hammer, nor so far forward that the bridle is too slack to draw upon the hammer."

In describing the function of the bridle strap, William Braid White wrote:

"Its function is to assist the rebound pull on the Hammer-Butt when the descending Wippen, on the rebound of the Hammer, drops downward with the descending rear portion of the Key."

Deductive Logic

Deductive reasoning tells us that there should be an easier and better way to keep the wippens from falling down if that were the only function the bridle straps provided. Then why go to all that trouble to make, install, and regulate all 88 bridle straps? That does not make very good sense, does it? Have you ever played a vertical piano, noticed that something was just not quite right, and then discovered that some bridle straps were broken? Have you noticed that a vertical piano action would still repeat even though some of the hammer-return springs were either broken or out of their slots in the butts, provided, that is, that the bridle straps were intact? Have you also noticed that if both the bridle straps and the hammer-return springs were broken, the action would not repeat at all, and the hammers would just lean against the strings if they didn't happen to rebound on a staccato note?

These are clues that should be sending us strong messages about what the bridle straps really do. These questions now arise: Did the original designers not know what they were

doing? Did the writers of the earlier texts not know what they were writing about? Has the function of bridle straps changed over the years? Are bridle straps just a carry-over from the past whose time has come? Or is it possible that we have lost sight of the primary function of bridle straps because it is not obvious to us, while a secondary function is?

Modes of Repetition

Before answering the foregoing questions, we need to consider the three basic modes of repetition in vertical pianos. These are: 1) When the key is released slowly, the hammer returns more quickly than the wippen, and the shank must come to rest against the rail before the jack can return under the butt leather. 2) When the key is released quickly after the hammer has been held in check, the wippen returns more quickly than the hammer, and the jack returns under the butt leather before the hammer has come to rest against the rail. 3) During accented staccato notes, rebound off the strings drives the hammer backward with a force that is roughly proportional to the striking force, and the key, wippen, and jack must also rebound back into position, otherwise the repetition will fail.

In the first mode (slow key release), the bridle strap does not contribute anything to repetition unless the center is very sluggish or the hammer-return spring is disabled.

In the second mode (rapid key release after hammer in check), the return spring and the bridle strap share in getting the hammer back quickly. The beauty of the bridle strap in this mode is that it does not pull back on the hammer butt until *after* the jack has returned into position under the butt leather.

In the third repetition mode (accented staccato notes), the hammer never gets fully checked, and its rebound off the strings provides most of the return force. The contributions of the bridle and the spring to repetition in this mode are negligible. If the repetition should be tested in mode 3, it will lead to the erroneous conclusion that the bridle strap does not accelerate hammer return.

It has been pointed out that some vertical pianos have been built that did not have bridle straps. I recall that a top-of-the-line Conover upright built during the early part of the century had no bridle straps, but it did have little hooks on the backs of the jacks that worked in slots in the butts to help jerk the hammers back when the keys were released. These also held the wippens up when the action was removed from the piano.

In the second repetition mode (repeat after hammer in check), bridle straps, or their equivalents, do indeed augment the repetition. They make the system "redundant." Each part contributes to the total function to make it fuller and faster, and if one part fails, the other will take over "in an emergency."

Experimental Data

I used three vertical pianos that were typical of those that were built during this past century. These were: 1) A large upright built during the early part of the century, 2) a mid-century studio vertical, and 3) an almost new studio vertical that had been played very little. Middle C was the note used for each experiment on each piano. The hammer blow distance was 1-7/8 inch for the large upright, and 1-3/4 inch for both studio verticals. The hammer-return springs of the upright and the older studio vertical were the type that attached to a spring rail. Those of the newer studio vertical were attached to the hammer butts and hooked into cord loops attached to the flanges. The checking distance was regulated to 5/8 inch for each piano, and the bridle wires were set so that the straps had just enough slack to avoid lifting the wippens when the soft pedal was depressed. The action centers in the newer studio vertical were normal, i.e., neither loose nor sluggish. Those in the upright and the older studio vertical were very free, but not loose. There was no wobble or detectable side-play.

Perhaps the majority of notes played on pianos are those in which the jacks (in verticals) return under the butt leathers before the hammers fully come to rest against the rail (repetition mode 2). My experimental procedure was to measure the time required for the hammer to return from its checked position to the full-blow rest position following release of the key. To avoid the timing ambiguity that would have been caused by varying degrees of key release, the key was released suddenly.

To provide a timing mark at the very first upward motion of the key, I taped a small wooden tab to the front of the keytop so that it would extend out over the end by a little more than an inch. I mounted an electromagnetic sensor in front of the key, directly under the end of the tab. I had taped a small piece of 5-mil-thick Co-Netic¹⁰ to the bottom of the tab right at the end to provide something for the sensor to detect. The total weight of the tab and the Co-Netic was about 600 milligrams, which was negligible in as far as added weight to the key was concerned. To provide another timing mark when the hammer returned to the rest-rail position, I taped a similar piece of Co-Netic (weight 35 milligrams) to the butt of the hammer molding, and mounted another sensor directly behind it (in front of the rail).

The output of each sensor was connected to one of the inputs of a four-channel audio recorder used here as a transient data recorder. A third channel was used for voice memos. After I had completed all my experiments with the pianos, I connected the outputs of the recorder data channels to the vertical inputs of a dual-trace oscilloscope to make the photographs shown here. The scope trace was triggered by the beginning of the pulse that marked the very first upward motion of the front of the key following its release. The sensors I used respond to velocity in their immediate proximity (a few hundredths of an inch), but not to total motion. When

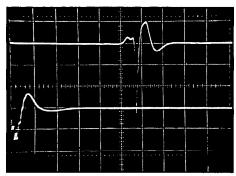


Figure 1 - 20 m sec/div.

coupled to the audio tape recorder that had a low-frequency response cutoff, the net result was to produce a differentiated pulse when the front of the key first began to rise, and another when the hammer shank hit the rest rail, but without touching the key or the hammer.

Figure 1 is a scope trace showing the return time for middle C of the nearly-new studio vertical. The bridle was attached. The sweep rate of the scope was 20 milliseconds per division. In the lower trace, the negative-going pulse near the left margin is the very first upward motion of the key. In the upper trace, the negative spike at about the 115-millisecond mark is the hammer shank hitting the rest rail. Figure 2 shows the hammer return time for the same note of the same piano with the bridle unhooked from the wire. Again, the sweep rate was 20 milliseconds per division. That time, the hammer returned to full blow position in 178 milliseconds, or more than 1.5 times as long as it took when the bridle was attached to the wire.

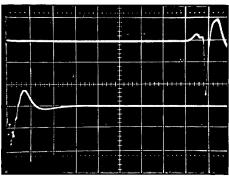


Figure 2 — 20 m sec/div.

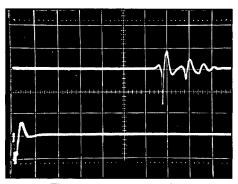


Figure 3 — 50 m sec/div.

Figure 3 shows the hammer return time for middle C of the older studio vertical when the bridle was unhooked from the wire and the return spring was out of its slot in the hammer butt. Notice the slower sweep rate in this

shot (50 milliseconds per division). The hammer return time was about 340 milliseconds. The wiggles in the upper trace following the negative pulse were caused by the hammer shank bouncing against the rest rail. When the hammer was moved closer to the strings than its checked position (with no spring and no bridle) it would not return at all. The same thing was true for the large upright. The hammer would just lean against the strings.

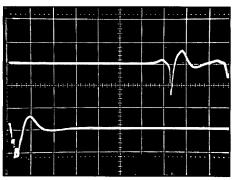


Figure 4 — 20 m sec/div.

Figure 4 shows the return time for the same hammer when the bridle was still unhooked, but the spring was back in its slot in the butt. The sweep rate was 20 milliseconds per division, and the return time was about 142 milliseconds (allowing for a slightly early scope trigger due to a noise pulse when the

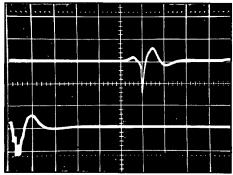


Figure 5 — 20 m sec/div.

key was released). The negative pulse at the 196-millisecond mark is the second bounce of the hammer shank off the rail. Figure 5 shows the return time for the same hammer, but with the spring out of its slot, and the bridle hooked back on the wire. The hammer return time was about 115 milliseconds (as opposed to 142 milliseconds), showing that the hammer returned more quickly with the bridle only than

Continued on Next Page

Bridle Strap Function

Continued from Previous Page

it did with the spring only. The hammer bounce off the rail did not occur as quickly this time, therefore it was inch position. With the bridle hooked to the wire, it required only 68 milliseconds — just half as long.

I want to stress this point: For the bridle strap to function as I believe it was originally intended, its wire must

HAMMER RETURN TIME IN MILLISECONDS			
Condition	O LD	OLD	New
	U PRIGHT	STUDIO	Studio
BRIDLE AND SPRING	110	87	115
Spring, No Bridle	145	142	178
BRIDLE, No SPRING	134	115	130
No Spring, No Bridle	300	340	No Return

after the trace had finished.

And finally, Figure 6 shows a return time of about 87 milliseconds when both the spring and the bridle were in place. Again, allowance is made for a slightly early scope trigger. Three bounces of the hammer shank against the rail are shown in this shot. For the older studio vertical with the return spring in place, it required 1.6 times as long for the hammer to return to full-blow position without the bridle as it did with the bridle. Many other test shots were recorded for all three pianos, but these that are shown are typical.

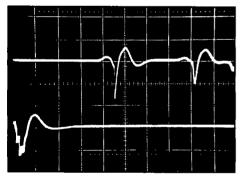


Figure 6 — 20 m sec/div.

For one of the experiments with the newer studio vertical, I blocked the hammer return at one inch from the strings, which was actually closer to the string than it would have been with the soft pedal engaged. The object in doing this was to see how quickly a repeat could occur before the hammer had come back to rest, but still far enough for the jack to get back under the butt leather if the key were released quickly. This test was done with the return spring in place. With the bridle unhooked, it required 136 milliseconds for the hammer to get back to the one-

be set so that the bridle has just enough slack to prevent it from lifting the wippens when the soft pedal is used and the rest rail is moved forward. If the slack is excessive, then it is true that the bridle will not do anything other than to hold the wippens up when the action is out of the piano. Its regulation is rather critical if it is going to be of any benefit to the repetition, and that is just what J. Cree Fischer wrote back in 1907.8

The table above shows the time (in milliseconds) for the hammer to return from the checked position to the full rest position. In each case, the hammer returned more quickly under the influence of the bridle alone than it did for the spring alone. The best results, naturally, were obtained when both the spring and the bridle were in place.

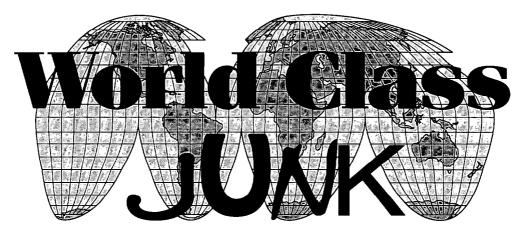
For accented staccato notes played on any of the three test pianos, the total time required for the hammer to leave the rest rail, strike the strings, and return to the rail again ranged from 30 to 60 milliseconds, depending upon the intensity of the blow to the key. Whether or not the bridle and the spring were in place made no measurable difference, except for the fact that with both the bridle and the spring out of the picture, the hammer would sometimes come to rest leaning against the strings after bouncing off the rest rail. What the bridle did do in this mode was to reduce the amount of hammer rebound off the rest rail. Perhaps this feature might account for the fact that, once upon a time, the bridle strap was referred to as the "bridle check." That is just speculation.

Conclusion

For bridle straps to function as intended, they must be regulated to have just enough slack to prevent them from lifting the wippens when the soft pedal is engaged. Excessive slack renders them useless as far as repetition is concerned. The popular belief that the primary function of bridle straps is just to hold the wippens up when the action is removed from the piano is wrong. Their primary function is to enhance repetition. To some degree, they also limit hammer rebound off the rest rail following accented staccato notes. Holding the wippens up when the action is out of the piano is just a fringe benefit of their presence. The current philosophy about the usefulness of bridle straps appears to focus upon the obvious and mundane, while disregarding the truly important function necessary for optimum performance, which is not quite so obvious at first glance.

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- 10. "Co-Netic" is a trademark of Perfection Mica Company. It is a very-high-permeability, low-hysteresis, low-saturation magnetic alloy.



By Susan Kline, RPT, Eugene, OR Chapter

Clean Keys & Other Attitude-Changers

hat makes a piano look like junk? Almost any piano? As you will gather from the title of this article, dirty keys are one of my pet peeves. I feel that part of my job as a tuner is attitude adjustment, when that seems to be called for. These people, my valued customers (all sorts and conditions of people, that's for sure), have hired me to enhance their enjoyment of their instrument. If a bit of cleaning, and advice on cleaning, can accomplish that, who am I to hold back?

Attitudes do not follow logical rules: they usually are instant, and subliminal, and are often visual in origin. The first glance at a piano keyboard, for instance, pro-

duces an indelible impression, complete with subconscious emotional reactions. Children in particular form strong and long-lasting impressions from what they see, and act on them later, sometimes for the rest of their lives.

What we need to fight, in my humble opinion, is the tendency of owners to look at a dirty, neglected piano and say, "Oh, that old thing ..." Sometimes "that old thing" has more real quality built into it than anything else in the house. Even when it is true (world-class) rubbish, they will get more good from it if they treat it with a little respect, however unearned.

I make no claims for infallibility in what follows.

These procedures are merely what I've gradually come to use and advise, and they seem to do more good than harm.

(There is one very exotic exception, dealt with later in the article.)

First Things First

Concentrate on what a player sees while seated at the piano. *Keys* make the strongest impression.

Wet a rag with plain water, wring it out well. Rub down the keys with it, not forgetting the black ones, or the *sides* of the black ones, where a kind of mud forms in drifts. (Best to do the naturals first, then the sharps.) If anything that refuses to come off, anything smeary or waxy, put a small dab of toothpaste (yes, gel works, too) on the rag and rub like mad. Then wipe clean with a fresh part of the rag. If there still seems to

be a waxy, dingy buildup, or the keys still get dirty quickly, you needed more tooth-

paste. If there is a gritty residue after the keys dry, you either used too much, or needed to wipe them clean a little more carefully. Once the keys have been cleaned this way, a plain damp rag is usually all that is required to keep them good. Keys of pianos in active use by sticky-fingered children should be wiped down every couple of weeks like this, partly for hygienic reasons (yes, in my opinion it *does* matter: I plan to write about it in another article.)

The advice above has served me fairly well. I often do "show and tell" for a few sample keys. (Kind of a dirty trick, like cleaning a prominent patch on a dirty wall!) If the owner seems incapacitated, out of his/her mind, busy, elderly (poor vision) or absent, I usually just tuck in and do the job myself. It only takes a few minutes. Schools and

minutes. Schools and churches often need this, Continued on Next Page



1. citrus solvent; 2. scratch remover — for light wood; 3. scratch remover — for dark wood; 4. furniture polish; 5. wash cloth or soft cotton rag; 6. tooth paste; 7. magic marker; 8. plain white candle; 9. steel wool.

Clean Keys & Other Attitude-Changers

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and it is also a sign that I have been there. No doubt, most of the time it is ignored by institutions, but (who knows?) someone may notice and get the idea that a clean keyboard is a good idea.

There is often another problem with keys: note names have been applied, either with stickers or marker. If it were an alcoholtype indelible marker, it would never come off. The stickers can usually be removed, using a single-edged razor blade in a holder if necessary, with care not to scratch the keytop. If the stickers have been on for many years, there may be a raised patch under them, where the key was protected from wear. For small amounts of ossified masking-tape type adhesive, the toothpaste and a lot of elbow grease will usually suffice. For worse problems, one can reach for the citrus solvent. There are many brands: one local one here in the Northwest is called "CitrasolvTM," and it can work magic with ever so many gummy, cruddy things. I find that ivory is not harmed by citrus solvent (which smells delightfully like orange peel), but a few kinds of plastic are. I have used it successfully on plastic keys, but a very gingerly attempt on an out of the way spot (such as the very end of a keytail in the extreme bass) may be called for. Certain plastics are dissolved by the stuff. Wipe off as much of it as possible after you are finished. A barely damp rag removes most of it fairly well.

Clean Keys ... The Exception

For a pianist in a concert setting, sweating under hot lights, lack of traction on frequently washed slick keys can be a misery. As Horace Greeley wrote to the "pianotech" e-mail list:

"Other than the normal complaints about tuning, voicing and regulation, too smooth a key surface is the single most common complaint I have heard from pianists in over 30 years of work. This list would include players all the way from older artists like Rubenstein (who used hair spray), Istomin (who still sands keys), and Rudolf Serkin (who mostly grumbled) through more contemporary artists like Hough (who constantly wipes the smallest bit of slick spot), to the ordinary bread-and-butter client."

Steve Brady explained to me that slick keys, both white and black, can be helped by writing on them with a plain white candle, and that artists love the result. He said, "Bella Davidovich always travels with a small candle or fragment of a candle in her purse — as Emanuel Ax told me, 'Never, ever clean the keys of a concert grand unless the pianist asks you to."

And Then the Rest of the Exterior

Many owners, when discussing the case of an old piano, start talking about refinishing it. Sometimes they already have refinished it, and are very proud of their efforts. I almost always dislike what they have done, but a tactful acknowledgment of the amount of work they have put in is certainly in order.

If the deed has not yet been done, I try to head them off at the pass. I explain that old pianos should *look* old. Antique dealers call this "patina," and value it. Pianos have earned the dings and dents and scratches, and the crazed varnish. If the varnish is stripped and replaced (or, often, stripped and *not* replaced) the result always shouts at me: "Look! I've been refinished!"

What one should demand of an old piano finish is simple: it should look clean and cared for. If possible, it should have color and feel fairly smooth to the touch. For finishes not too far gone, this can be accomplished by a simple polishing with any good furniture cream or wax. I tend to steer owners away from

paste wax (streaks), lemon oil (distillate is not good to breathe, it stays wet, when it finally dries it is cloudy) and anything containing silicone (sinks right through the finish, mottles the wood, cannot be removed). Old English® scratch remover is good, being sure not to use the dark variety on light finishes, and also being aware that it can stain the fronts of keys. I tell people how to remove the keyslip (or take it off myself) so they can clean it without damaging the keys. It goes without saying that one must be very careful not to drop scratch remover (or anything else wet) on the carpet, furniture, etc.

For finishes that are heavily crazed and deeply soiled (muddy buildup where hands have rested, general crud) I have a trick which works fairly well if approached cautiously. Take 0000 (extra fine) steel wool, wet it with the furniture polish, rub the polish on the finish, let it rest a few minutes, then very gently work on the worst of the mess, being aware that too much vigor will remove all the varnish. Then wipe clean with a rag. Any deep alligatoring (crazing, checking) will remain, but will be much smoother to the touch, and often some color will come back to the finish. A lot of grime will disappear, along with scratches. White rings from wet vases and glasses will disappear, though there may be no finish left where they were. Small paint flecks (most old uprights seem to have acquired light paint flecks at some time or other) will gradually come off. Fortunately, the paint is on top of (1) vanish, (2) wax (often many layers), and (3) dirt. Therefore it comes off first, usually leaving the varnish undamaged. White paint bruises acquired when pianos were banged into doorways and walls during moving will also usually disappear, though dents may remain.

Avoid steel wool if ...

There are three finishes for which steel wool is contraindicated: (1) Those which are still very shiny (it will dull them to a more matte finish). (2) those which are so cheap that the dirt has become incorporated into the body of the finish, turning to a kind of varnish-mud. These cheap finishes usually are on quite recent pianos. The old uprights usually had much better varnish, often French polish. The cheap-varnish-and-mud-type buildup, the kind you can peel off in strips with your fingernail, will dissolve very nicely with the steel wool wet with polish, but it will leave white wood behind. If the owner is aware of this, and not daunted by the prospect of staining and revarnishing the dirty areas, this is not so very bad an option. Otherwise, better to let sleeping crud lie. (3) I would also never use steel wool on black pianos, either ebonized (lacquer) or polyester. Both types have their own procedures and products, most of which I am not familiar with. On newer pianos, the manufacturer often will give instructions for care and maintenance. However, I have found that small nicks and scratches on black pianos can be made much less noticeable with a dab of black magic marker. Wipe the area with a rag afterwards, so no one will get their hands black from it.

Coda:

For those new to cyberspace who want to learn about the "pianotech" list (which can be an incredible resource), you can visit the following web site:

http://www.ptg.org/faq/lists.html

It contains subscription instructions and frequently asked questions about the four lists presently available. (pianotech — general technical information; caut — intended for university and institutional technicians; ptg-l, dealing with Piano Technicians Guild matters, for PTG members only; and a humor list, moderated by Warren Fisher.)

An Essay on the History of Tuning - Part VII

By Skip Becker, RPT Northeast Florida Chapter

Modern Times

In the last half of the 18th century, astronomers looked up at the sky through telescopes which were the technological marvels of the age. History tells us that they had removed the lenses tinted by faith, and gazed with all the cold hard logic that they could muster. They found no music, no harmonious creation, or evidence of the hand of God. But they did find Uranus, and Kepler's predictable order; and that the planets were indeed shackled to the Sun by Newton's gravity, compelled to their clockwork orbits in profound silence. The Age of Reason had begun.

Outside Paris, on Sept. 19, 1783, an astounded crowd looked up at the sky and saw a rooster, a duck, and a sheep sail by gracefully, in a gondola carried by a flying balloon. All returned safely to Earth, after a journey of more than a mile. Two brothers, Joseph and Sheehan Montgolfier (who made paper for a living), had been experimenting with hot-air balloons. On November 21, Doctor Benjamin Franklin (first U.S. Ambassador to France) was among the cheering crowd who watched the first manned balloon flight. Jean-Francois (the Pilatre de Rozier) and François Laurent (the Marquis d'Arlandes) kept their Montgolfier balloon aloft for 23 minutes by burning wool and straw, covering a distance of five and one-half miles across the French countryside. In December of that same year, physicist J.A.C. Charles, accompanied by Nicolas-Louis Robert, went aloft for two hours in a balloon filled with the invisible gas hydrogen! Who could doubt that modern times were at hand?

Natural philosophy, the science of the day, ushered in our modern world. There were the industrial, economic and political revolutions (regrettably beyond the scope of even this rambling essay); and there was that magnificent flowering of the arts. This is when they wrote the great classical music which is still the standard fare of every piano student, and every symphony orchestra, anywhere in the world. There was also a great flowering in the art of tuning. Tuning had long been recognized as a specialized art: musical science blended with experience and taste. "In essence, if not in every detail, all the varieties of temperament had been developed and described by the mid-to-late 17th century" (Paul Bailey, RPT). By the late 18th century, musicians were satisfied that they had found perfection. Well-Temperament was in nearly universal practice.³ The enduring expression found in classical music was based in the composers' consummate knowledge of the affects in temperament. Theorists who wrote about the philosophy of music, regardless of personal preference, clearly believed that this style of tuning would never die out.5 While it was often written that no two tuners tuned alike, they all conformed to the traditional style. The infinite varieties of individual temperaments were remarkably uniform in their development of key characteristics: musicians could determine a key signature by listening to the sizes of the intervals (Try that with ET!).

As a rule, musicians still tuned their own instruments (especially the ones who wrote that great music); but that rule was commonly broken. Tuning was still within the grasp of the dedicated amateur (who used popular instructions like Handel's), but most often the task fell to professionals. (Tun-

ers were selected for their good taste!) A major thrust of this essay has been to point out that when our music histories interpret the sophisticated tuning of these times as the "evolution towards Equal Temperament," they rob us of the very flower of our art.

The Established Temperament

Jean-Jacques Rousseau was a Swiss author, composer and musical theorist who lived most of his life in France. He published his important musical work, the *Dictionnaire de Music*, in 1768. William Waring translated it into English in 1771, followed by an improved edition in 1779. The *Dictionnaire* contained tuning instructions which were typical of the times. It was very influential (it is still being reprinted). Waring's translation of the instructions follows. The parenthetical notes have been added as guideposts:

First, we begin by ut (C) in the middle of the keys, and weaken the four first 5ths in ascending (G, D, A, E), until that the fourth mi (E) forms a major 3rd, absolutely just with the first sound ut (C-E), which we call the first proof.

Secondly, In continuing to tune by 5ths, as soon as we are arrived on the diesis (F#), we enforce the 5ths a little, though the 3rds may suffer, and when we arrive at the *sol* diesis (G#), we stop. This *sol* diesis ought to make, with the *mi*, a just major 3rd (G#-C), or at least tolerably so; so this is the second proof.

Thirdly, we take the ut again, and tune the 5ths in flat, viz. fa (F), si flat (Bb), and c. weak of consequence; then enforcing them by degrees, that is weakening the sounds till we come to the re B flat (Db), which, taken as the ut diesis (C#), ought to be found in concord, and form a 5th with the sol diesis (C#-G#), at which we had before stopped. This is the third proof. The last 5ths will be found rather strong.

These instructions were meant to accompany the Holder plan of 1694, transposed an octave higher, with B4 included. To be able to properly interpret these instructions today, we need to remember that ut, re, mi, etc., are the age-old names for the notes in the diatonic key of C. "Ut" is the French "do." We would also need to know that "weaken" meant to narrow an interval, and "enforcing" meant to widen it. Waring has inadvertently created some other problems for us with his translation (Owen Jorgensen wonders if Waring had any musical training at all). In France, "diesis" meant "sharp" (observe that Waring translated F# as F diesis). Rousseau explains that the St. Andrew's cross "X", was used in musical scores to indicate a simple diesis (that a note would be raised about one-half semitone), without changing the name of the note (C and CX were both called "C"). The double, or chromatic diesis, which indicated that a note was to be raised a full semitone, was symbolized by the familiar double cross "#" (which did change the name of the note). There was also a triple diesis symbol, "triple cross", which raised the note by 3/4 of a tone. Obviously, such exotic 1/4 tones are not available on the 12 fixed notes of a keyboard, but they were part of 18th-century musical science (and a measure, perhaps, of what we've lost). Also, in the charming French terminology, all the "flat" chromatic levers were named Bb! (See Jorgensen's *Tuning*: Chapter 39) This Continued on Next Page

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nomenclature goes back to the earliest history of the keyboard, when a chromatic short lever was first placed between A and B in order to play a true 5th below F. This first "flat" was designated as "soft B," or B flat. The name stuck. As the other short levers were installed, they were all called B flat (differentiated as Mi Bb, Sol Bb, etc.). As silly and confusing as this may seem to us, we can observe that our modern symbol for "flat" is b.

Waring also translated Rousseau's French term "fine 3rds" as "absolutely just." For the vast majority of tuners, "fine 3rds" weren't necessarily absolutely just. "Sweetness" is what the tuners were after. To be sure, pure 3rds are very sweet; but many tuners, certainly most professionals, included some beating. For 18th-century tastes, the requisite sweetness of the middle C:E 3rd disappeared beyond four bps (ET is 10 bps). Thomas Young, in 1799, quantified this limit as 1/4 syntonic comma (5.2 cents): "It appears to me, that every purpose may be answered, by making C:E too sharp by a quarter of a comma, which will not offend the nicest ear."6 Because of Waring's translation, it's quite possible that amateur tuning in England was much more "meantone-like" than that on the continent. Waring also had some interesting final remarks, which may have raised an eyebrow or two: "Lastly, the comma maximum, or comma of Pythagoras, in the reference of 524288 and 531441, is the difference which government causes to be null." Waring translated Rousseau's "temperament" as "government." It seems unlikely (to this writer) that even George III, great patron of the arts, could have banished the comma of Pythagoras by decree!

In any event, 18th-century musicians had no trouble understanding the instructions for this temperament (even the Warring translation). The three proofs would have only been the bare bones for professional tuning procedures. It is important to note that Rousseau was not the author. It was the established temperament (le temperament establi) as approved by musicians, organists and instrument-makers, according to custom.

Holder Bearing Plan Becomes Standard

The basic requirements for a good tuning in classical times were a tonality center based in the key of C, and the attendant affects of contrasting key colors. Contrast was a matter of taste, but the middle C-E major 3rd was the focal point for all tuners. The size of that 3rd determined the characteristics of the temperament. If it were set pure 5:4 (beatless), the temperament had great contrasts, typified by the Well Temperaments of Werckmeister. Professionals tended toward the upper limits

In any event, 18thcentury musicians had no trouble understanding the instructions for this temperament (even the Waring translation). The three proofs would have only been the bare bones for professional tuning procedures. of sweetness (4 bps), which enabled "smoother transitions."

While there were a multitude of individual tunings in practice, there was nearly a single bearing plan. The 24-note (C3-C5) bearing plan first published by William Holder in 1694 (see *Tuning*: Chapter 13) was standard for professionals. It was the type most often included with instructions for amateurs, usually found on the last page of

collections of sheet music. It was sometimes transposed up an octave, sometimes abbreviated by eliminating the highest notes. Holder was a mathematician and fellow in the Royal Society, and the first theorist to write that 5ths were contracted by "as much as" 1/4 comma, or as much as "the ear will bear." He was aware of the confusion caused by the poorly edited tuning instructions by Mersenne. He carefully proofread his manuscript and produced a much better set of instructions for Aron's 1/4-comma Meantone. This meantone bearing plan has proven itself to be efficient, flexible and enduring.

Individual interpretation of the bearing plan was, as always, based on taste and experience. Most tuners used the Holder bearing plan to implement the "new tuning," defined by "unrestrictive" circulating 5ths (which had surpassed strict meantone in common usage since the 1720s). Results typically ranged from a modified meantone (like the French "temperament ordinaire"), to the "scientific balance" between the intervals in sharp keys with flats, found in the temperament of Thomas Young (see *Tuning*: Chapter 69). Tuners generally allotted the available harmony to the "long keys" (popular term for white notes), and the inherent imperfections (diesis) were inflicted upon the "short keys." As demanded by tradition, the popular keys still received preference. "This practice cannot conveniently be laid aside" (Cavallo, 1788). The ratio of the major 3rd C-E was the most pure (5:4). This "native perfection" was usually extended to the related keys of F and G, and as much as possible, to the remaining long keys. The short notes were tempered sufficiently to allow for at least four of the five enharmonic pairs (i.e., C#:Db, etc.) The Valotti temperament is a refinement of this most common style, distributing harmony, or "sweetness," equally to the long keys, and dividing the diesis (in this case the Pythagorean comma) equally among the short ones.

All these tunings fell within the definition of the "established temperament." The technical term for it used by classical tuners was "good tuning" (and they were good tuners). Although meantone was modified to circulate, the more specific term "Well Temperament" (used nearly exclusively in Germany and Austria), was applicable if all the major 3rds fell within the Pythagorean limit. This eliminated diminished 4ths from the temperament, intervals (characteristic of meantone) considered "harsh" by late 18th-century tastes. It was the obligation of professionals to tune in this style. However, some musicians still used the Holder bearing plan as Holder intended: to produce meantone. It is important to note that we're not talking about musical "duffers" (tuners insufficiently equipped with musical science to be able to circle the 5ths). We're talking about great musicians and composers, who preferred the emotive sounds found in meantone, even if professional tuners cried "wolf." Meantone Temperaments are constructed of the "natural disposition" of notes in the scale. This, in turn, was the basis of the four major modes of feeling, or affections, found in traditional character of the keys. Theorists continued to advocate one or another version of meantone well into the 19th century, and it was still the most common style of tuning for organs. Regular or not, circulating or not, all tunings (both "old" and "new" styles) supported the character of the keys. This "doctrine of affections" was no mere peculiar requisite of keyboard tuning. It was the very heart of musical science.

A Word on Theorists

Scholars give us the impression that a great variety of temperaments existed in practice in the 18th century. They

have wrought confusion by inadequately distinguishing between temperaments which were in actual use, and those which were merely theoretical speculations. For example, earlier in the century, Neidhardt published over two dozen temperaments; but recommended only four as being of practical value. Whether any were of practical value was a matter of some debate. In 1736, the eminent theorist did manage to convince J.N. Bach, the organist at Jena, to try his special "church tuning" at the dedication of a new organ. Bach, the choir, and the congregation did not share Neidhardt's enthusiasm. Bach was implored to retune the instrument immediately, in his usual tuning, fondly recalled as "more singable."

Many late 18th-century theorists concerned themselves only with mathematically eloquent statements, so we still read about contracting 5ths by 1/4 comma and the virtues of Aron's meantone. In fact, several new versions of meantone were introduced, including the modified plan of Jean-Le Rond D'Alembert, the 1/7 comma of Romieu (not Rameau), and the 1/5 syntonic comma of William Hawkes. The writings of Robert Smith also continued to be very persuasive. Although he is best remembered for his work in optics, his instructions for organ tuning were by far the most practical of the century. His Harmonics, Or The Philosophy Of Musical Sounds, of 1749, was generally considered the most important contribution to musical science since the Galileis. He was a towering fellow of the Royal Society, and inspired the next generation of scientists in England (died in 1768). For harpsichord tuning, Smith advocated Huygen's meantone (based on 31 tones to the octave). Nor was he alone in the Huygens' revival. In 1786, Ephraim Chambers' Cyclopedia: or, an Universal Dictionary of Arts and Sciences, was republished, and included the remarkable statement: "This temperature of Mr. Huvgens deserves to be introduced into the practice of music." We must assume that this alternate spelling of "temperament" was less surprising in the 18th century than we find it. Due to lack of editing, the Cyclopedia was out of touch with mainstream tuning (symptomatic of many theorists), as it referred to Aron's 1/4-comma meantone as the "common tuning." When the Cyclopedia was reprinted in 1819, it contained this same reference, which was by then nearly a century out of date.

The logical concept of a scale composed of equal sized steps was, of course, ancient, and always popular — at least among theorists. A few even advocated such a system for keyboards, but as often called for 17, 31, or 51 divisions to the octave. Tuners who followed their instructions would have needed a very accurate monochord, and logarithmic charts to divide the octave into 17, 31 or 51 parts. Clearly, this was a foreign language to practical tuners. Furthermore, most theorists saw no problem in constructing a harpsichord with, say, 31 keys to the octave to accommodate them. For a 12-note system, theorists chose their favorite 12 tones (31 choices does offer excellent major 3rds), but the desired result was an "old-style" meantone tuning, similar to Huygens'. For most of the 18th century, "equal-sized semi-tones" implied meantone.

Collectively, theorists' attempts to revive the older tuning styles were a failure. Their work was simply out of fashion. Jorgensen suggests that they might have been more successful if they had included tuning instructions with beat speeds, instead of monochord distances. Professional tuners have always had an aversion to theorists, their monochords, and the oft-proved idiocy of experimental temperaments. Also, the best tuners were a century or so ahead of most theorists in terms of temperament mechanics.

Equal Temperament in Classical Times

Tuning a keyboard in the manner of lutes was an idea whose time had not come. It flew in the face of taste and tradition. Twelve-tone Equal Temperament lived only in the land of theorists; a mere handful recommended it for concert situations. No one considered it a proper tuning for a solo keyboard. Until D'Alembert's presentation of Rameau's theories appeared in various encyclopedias during the 1780s, it's doubtful that more than a double handful of musicians even knew about it. There was no demand for it, and, in general, tuners were against this sort of disestablishmentarianism.

By classical times, the pedigree of the ancient tuning of Aristoxenus included Monsieur Beau-grand, Zarlino, Galilei, Salinas, Couperin, Rameau, and D'Alembert. It might have remained in obscurity if the highly esteemed Rameau had not become enchanted with its mathematics. Rameau came to believe that notes should be tempered in increasing amounts as they descend the harmonic sequence: The octave (2:1) was inviolate; the 5th (3:2) could take a little tempering; the major 3rd (5:4) a little more; the minor 3rd (6:5) could take the most. This is, of course, the arrangement of notes in ET. Mathematics aside, it was not a popular idea. It ran contrary to the contemporary philosophy that 5ths could endure much more tempering than the 3rds. It also eliminated the affections, the very font of expression for the overwhelming majority of musicians. Rameau's response to this was that the "character of an air" comes ultimately from the genius of the composer, and was not dependent upon the "character of the keys," which only create distraction. After all, who had not been "moved" by the music of a lute — considered the most erotic of instruments?

In Paris, 1752, D'Alembert published his *Elemens de Music*. His personal preference for tuning was a modified meantone; his valuable tuning instructions were designed to eliminate the harmonic waste from oversized 5ths. In his section on temperaments, he included a treatment of the theories of Rameau, and contributed some elegant (and deservedly famous) mathematics of his own. Responding to the objections of ET from musicians, he admits: "It is true, that the 3rds will be a little harsh... It would be difficult in practice to tune... It is true, that this uniformity of modulation will to the greatest number of musicians appear a defect." He concludes: "All that remains is to acknowledge, with M. Rameau, that this temperament (ET) is far remote from that which is now in practice." In 1781, the Elemens de Music was included in its entirety, in the third edition of the Encyclopedia Britannica. Other encyclopedias commonly copied this music section word for word, which remained intact in the Britannica until the 1820s.

The Dread Marpurg

F.W. Marpurg (1718-1795) was largely responsible for the dissemination of Rameau's theories in Germany. For a time, Marpurg was a prolific writer, composer, critic, publisher and historian. He scratched out a living as the editor (and main contributor) of music periodicals, which dealt with musical topics of the day, and contained amusing anecdotes. They were

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directed to the popular German amateur music societies. His personal correspondence from these times reveals that he suffered from severe financial difficulties (times were tough in Germany). In 1757, he translated D'Alembert's Elemens. Fortunately for Marpurg, his understanding of the theories of Rameau was defective. He was lambasted by many of his educated readers. Far from chagrined, he discovered (to his delight) that controversy sells magazines! Marpurg extended the polemics into a lengthy series of articles in which he provided numerous arguments, in great detail, about the efficacy of Rameau's theories. His meretricious reasoning continued to draw fire, most notably from J.N. Forkel, G.A. Sorge, and his friend J.P. Kirnberger. In 1764 Kirnberger apparently decided that Marpurg had done enough, and used his influence to get him a position in the Prussian Lottery; a post Marpurg held until he died. After this, we hear little from Marpurg; but it would not be fair to suggest that he lost interest in music after he got a "real job."

In 1776, in a special publication devoted to tuning and temperament, he suggests that a composer might select a key for reasons "that have nothing to do with temperament ... the composer must obtain the character of his piece, the building up of an emotion, and the strength of expression, from sources quite other than the creative powers of the tuning hammer." His last periodical, in 1778, was a collection of letters addressed to various musicians, all supporting one or another of Marpurg's positions, and all apparently written, under pseudonyms, by himself. He holds great value for modern historians. From the perspective of the 20th century, his writings appear quite farsighted. His work contains many quotations from J.S. Bach, to whom Marpurg refers numerous times as the "supreme master of counterpoint and fugue.10" He was also the first to incorrectly conclude that Bach had tuned in ET. Such a conclusion was outrageous to a generation of musicians who knew better (most notably Kirnberger and Sorge). It could not be reprinted in his lifetime. But much of Marpurg's writing was translated and reprinted in the 1820s, during the Bach revival

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begun by Mendelssohn and his followers. With both Marpurg and his critics long dead, it drew no refutation.

And In England

Across the English Channel, in 1781, William Jones coined the technical term "Equal Temperament.¹¹" His Discourses on the Natural Philosophy of the Elements contained a chapter on "the Philosophy of Musical Sounds," where the short and descriptive term was used for the first time. By the end of the century, the new term was replacing "lute tuning" in common usage ("lute tuning" seemed inappropriate to describe a keyboard tuning).¹² Jones experimented with ET, which he referred to as "an" Equal Temperament (it would require more than another

century for it to evolve into "the" Equal Temperament), and recommended that musicians give it a try. He attributed it to Mersenne, and listed Couperin, Rameau and D'Alembert as pioneers. He recommended the system as the best keyboard tuning for a concert: "A musical reader may, however, be curious to try the effect of this equality, and compare it with the common methods. And for thorough-bass in a concert, a harpsichord might answer better when tuned by this rule than any other."

In order to accomplish this unusual tuning for classical times, Jones (as did most theorists who recommended ET) included a separate chapter entitled "Of the Monochord," where he provided the background, theory, and instructions on how to construct a monochord in ET. He described the experience: "When we tuned a harpsichord by this rule, we thought the notes were better than we had heard, and it was remarked that the chords were sensibly louder.... The 5ths in general are near perfection, even in the extreme keys."

Jones provides some left-handed proofs for the state of the art of late 18th-century tuning. He continues: "Yet, after all, a learned ear will want satisfaction in some places, and perhaps be obliged to retouch them a little nearer to the old proportions(!)... For my own part, I am rather persuaded that a variety of the tones and semi-tones is not only necessary to satisfy the proportions of the scale; but that even the extreme and less tunable keys have their beauties, and assist the effect of the more perfect ones."

He specifically complained about the "very sharp" major 3rds C-E and G-B, and suggested that they be reduced to ratios of 1000:796 and 6674:5310 respectively (more foreign language to practical tuners). In other words, Jones recommended tuning ET, but then well-tempering the notes until the result was palatable! We could not hope for a more clear example of late 18th-century tastes. Jones also mentions a Mr. Davis, who was "an ingenious gentleman, well skilled in the philosophy of music." Unaware of any previous authors on Equal Temperament, Mr. Davis "discovered" the ratios for ET, and thought he had invented it! "The fact that a knowledgeable person in the 1770s or early 1780s could have believed that he invented ET is evidence that ET was not practiced at all during those years (Jorgensen)."

Another classical pioneer of ET was Tiberius Cavallo. He was an Italian violinist, who settled in England in the early 1770s. He is best known for his treatise on electricity, and in 1779, he became a fellow in the Royal Society. In 1789, Cavallo presented a paper on temperament. He recommended ET, but did not use the new term. He referred to ET as "the temperament of equal harmony" — the term previously used by Zarlino and Robert Smith to describe a very different tuning. According to Jorgensen, "Cavallo's writing in 1788 gives one the impression that neither Cavallo nor anyone else of the times had ever heard of Equal Temperament. He wrote:

"In order to hear the effect of the above-mention equal harmony, I had a monochord made in a very accurate manner, and upon it I laid down the divisions for the 13 notes of an octave tempered in the manner explained above.

"After a great deal of trouble in adjusting the movable fret, correcting the divisions, & c., I at last succeeded so well as to render the divisions exact within at least the 300th part of an inch, and every part of the instrument was rendered sufficiently steady and unalterable.

"This being done, I had a large harpsichord, with a single unison (in order to judge the better of the effect), tuned

very accurately by the help of the monochord. With this instrument, in whatever key the performer played, the harmony was perfectly equal throughout, and the effect was the same as if one played in the key of E natural on a harpsichord tuned in the usual manner."

So Cavallo reaffirms that as late as the 1790s ET was not in common practice (or even part of common knowledge), and that the "usual manner" of tuning was remarkably consistent. Musicians could easily recognize the distinct texture of major 3rds widened around 14 cents.

John Robison

John Robison (1739-1805) was a professor of Natural Philosophy at the University of Edinburgh. After an early naval career, he became a prolific author of scientific works. In 1783 he was one of the founders of the Royal Society of Edinburgh, and served as the first secretary. He was the principal contributor of articles for the third edition of the *Encyclopedia Britannica*, which had included D'Alembert's treatise. Twenty years later, he seems to regret the inclusion. In 1801, he wrote an extensive article on "Temperament and the Scale of Music" where he points out the problems involved with tuning ET from D'Alembert's instructions. This article was included in the 1803 American Supplement to the *Britannica*:

"We shall only observe, that what is there delivered on temperament by M. d'Alembert, after Rameau, bears the evident mark of uncertainty or want of confidence in the principle adopted as the rule of temperament; and we have learned, since the printing of that article, that the instructions there delivered have not that perspicuity and precision that are necessary for enabling a person to execute the temperament recommended by Rameau; that is, to tune a keyed instrument with certainty, according to that system or construction of the scale. If such be the case, we are in some measure disappointed; because we selected that treatise of D'Alembert as the performance of a man of great eminence as a mathematician and philosopher, aiming at public instruction more than his own fame, by this elementary abstract of the great work of the most eminent musician in France (Rameau)."

Robison appears to be the first theorist to realize that keyboards could not be tuned with any accuracy without counting beats — something long known to professional tuners. He recommended applying Robert Smith's instructions for organ tuning to harpsichords. Smith made no provisions for ET. We take this as the final proof that the practice of ET in classical times was statistically nil. It simply couldn't be achieved without a monochord or a wizard's cap. We shall conclude this portion of our essay with Robison's impressions of the state of the art in 1801:

"To be able to tune a harpsichord with certainty and accuracy, seems an indispensable qualification of any person worthy of the name 'musician.' It would certainly be thought an unpardonable deficiency in a violin performer if he could not tune his own instrument; yet we are well informed, that many professional performers on the harpsichord cannot do it, or cannot do it any other way than by uncertain and painful trial, and, as it were, groping in the dark; and that the tuning of harpsichords and organs is committed entirely to tuners by profession. This is a great inconvenience to persons living in the country; and therefore take lessons from the professed harpsichord tuners, who also profess to teach this art. We have been present during some of these lessons; but it did not appear to us that

the instructions were such as could enable the scholar to tune an instrument when alone, unless the lessons had been so frequent as to form the ear to an instantaneous judgment of tune by the same habit that had instructed the teacher. There seemed to be little principle that could be treasured up and recollected when wanted."

At the turn of the 19th century, things were looking a little grim for musicians who wanted to tune their new pianos; but professional tuners could look up at the sky, and see the sun shining.

Notes

- I. From the London Notebooks of Franz Haydn: "On 15 June (1789) Iwent from Windsor to Slough to Dr. Herschel, where I saw the great telescope. It is forty feet long and five feet in diameter. The machinery is vast, but so ingenious that a single man can put it in motion."
- 2. Uranus was discovered in 1781 by the above-noted William Herschel, then music teacher, organist, composer, and amateur astronomer. A true product of modern times, Herschel's inspiration to study the heavens did not come from Pythagoras. He had studied music theory in Robert Smith's Harmonics, which led him to study Smith's Complete System of Optics.
- 3. Werckmeister's term "Well-Tempered" ("wohltemperierte") is the most appropriate to describe late 18th-century tuning. The term "Well Temperament" was not used in English-speaking countries until the mid-20th century. It had been known as "the new tuning," "good tunings," or the "ordinary" or "established temperament."
- 4. Vestigial affects can be found centuries later, even in a different tuning system. Those composers carved expression "into the bone" of their music.
- 5. See Jorgensen's *Tuning*: Chapter 72
- 6. Thomas Young's Outlines of Experiments and Inquiries Respecting Sound and Light contained a section titled "Of the Temperament of Musical Intervals."
- 7. Daniel Wolf, from the Tuning List: The tonal vocabulary for most works of Haydn or Mozart does not extend beyond the resources of Meantone, and limits "exotic" chords to the development sections. I could also state this fact in a different way: Haydn and Mozart avoided keys that would have been acceptable in a well-temperament. If we add the fact that certain instruments (organs, horns) were known to have been tuned or played in meantone, the case for the acceptance of meantone in the late 18th-century becomes even stronger.
- 8. Neidhardt recommended one each for the country, the city, the church, and the Court. The Court tuning was the 1/12 Pythagorean comma tuning of Aristoxenus (ET).
- 9. The editors added a footnote: "We do not pretend to give any decision for either the one or the other methods of temperament, each of which appears to us to have its particular advantages. We shall only remark, that the choice of the one or the other must be left absolutely to the taste and inclination of the reader; without, however admitting this choice to have any influence upon the principals of the system of music, which we have followed even to this period, and which must always subsist, whatever temperament we adopt."
- 10. At the request of the heirs of J.S. Bach, Marpurg rewrote the dedication for the third edition of his encyclopedic Abhadlung von der Fugue. At the time, the work was considered old fashioned.
- 11. Before then, in England, ET was usually referred to by a variant of working titles such as "the system of tuning 12 equal-sized semitones to the octave." On the Continent, it was most commonly known as "this tuning of M. Rameau."
- 12. Britannica, however, continued to use the term "lute-tuning."

The 2nd GPA Dublin International Piano Competition Dublin, Ireland All Six Prize Winners selected Kawai. The 42nd ARD International Music Competition Munich, Ĝermany First Prize Winner selected Kawai. The 45th Ferruccio Busoni International Piano Competition Bolzano, Italy First Prize Winner selected Kawai. The 11th Santander International Piano Competition Santander, Spain First Prize Winner selected Kawai. The 2nd Hamamatsu International Piano Competition Hamamatsu, Japan First Prize Winner selected Kawai. The 10th International Tchaikovsky Competition Moscow, Russia Top Two Prize Winners selected Kawai. The 9th Van Cliburn International Piano Competition Fort Worth, Texas, USA First Prize Winner selected Kawai.

L's becoming a familiar refrain.

Soundboard Damage

A Guide To Soundboard Cracks & Other Maladies — Part I

By Delwin D Fandrich, RPT Contributing Editor

Introduction

Much has been said and written about piano soundboards and their propensity to crack under certain conditions. This is far from being a new problem; it's one that has plagued piano builders, piano technicians and piano owners since the instrument was invented. In this article I'll try to explain why piano soundboards develop cracks and discuss what effect these cracks may have on the piano's performance.

Note: Some of the concepts and terms used in this article were introduced in my earlier articles on wood as an engineering material that were previously published in the Journal. Please refer to those articles for any additional background information you may need.

To understand the problems that develop in soundboards over the years, we first have to consider the material used to make them and how that material is treated during the fabrication of the soundboard. We'll have to understand how they are installed in pianos, how they work and what happens to them once they've become part of the complete piano and are left to survive in the often hostile environment of the real world. Most structural soundboard damage, including that dreaded crack, develop as a result of factors that are inherent in certain types of soundboard design. This structural soundboard dam-

age can be accelerated or postponed by the state of environment in which the piano resides. Short of maintaining the piano's environment at precisely 72 degrees F and 42 percent relative humidity in an environmental chamber there is not much that can be done to prevent the effects of atmospheric changes on the soundboard, but there are steps that can be taken to postpone them significantly. Unfortunately, even if all possible steps are taken to postpone or eliminate the environmentally induced breakdown of the piano soundboard, nothing will prolong indefinitely the ravages of time. That some soundboards have a greater propensity toward developing structural defects and their subsequent cracks than others, however, can usually be attributed to the processes used by the piano builder to achieve an efficiently operating soundboard system. That, and the vagaries of nature: two boards cut from the same tree can have quite different physical characteristics.

What is a Soundboard, Anyway?

Look at the inside of any piano. Underneath (or behind) the strings and

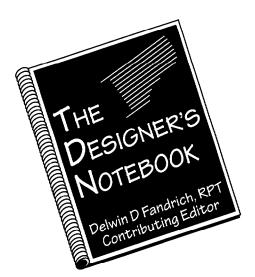


plate you will see a beautiful, nearly flat wood panel with lots of nice "varnish" on it and sometimes an elaborate decal extolling the virtues of the piano and listing all of the awards that the manufacture has won at various international exhibitions and county agricultural fairs. That wood panel is what most people call the soundboard. Usually, however, when technicians consider the soundboard, they are including both the soundboard panel and the system of stiffening ribs that are located on the "back" side of the actual soundboard panel. As well, since the bridges contribute to the soundboard's structure, they must be included in any discussion of how the soundboard works. To this, we must also include the stiffening and constraining effect of the grand piano's rim or the vertical piano's back assembly.

That describes the physical structure of the piano soundboard. In function, the piano soundboard is a *transducer*. A transducer is a device that transmits energy from one system to another, and/or converts input energy of one form into output energy of another. The piano soundboard system does both. It couples energy from the vibrating piano strings to the soundboard panel and then converts that energy into waves of compressed and refracted air that can be detected by our ears as sound.

Although the soundboard is threedimensional in nature, in function it can be considered to be a two-dimensional, wave-carrying medium designed to couple energy from a vibrating string plane and transform that energy into sound energy.

The strings used in the piano have very little surface area so they are not capable of displacing much air as they vibrate — the vibrating energy is there, but very little sound energy is created.

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Soundboard Damage A Guide To Soundboard Cracks & Other Maladies — Part I

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Without the soundboard, the piano would be barely audible. It takes the larger vibrating surface area of the soundboard to move enough air to make the piano audible. Since, by itself, the vibrating string produces little sound, and a much louder sound is heard when that energy is coupled to the soundboard, it is tempting to think of the piano soundboard as an amplifier. It is not.

In 1916, piano designer Samuel Wolfenden wrote "... and so, [the] strings of musical instruments, instead of being allowed to waste their force in the futile endeavour [sic] to produce audible sound waves unassisted, are induced to spend their energy in moving a sound-board, which in its turn moves large zones of air, with commensurate increase in the loudness of the sound. It must, however, be understood that there is no real increase of force; it is only more effectively used. In mechanics you never get anything for nothing, but are compelled to pay the full price for every advantage." This is certainly true with piano soundboard design and construction. Since the vibrating strings of the piano have very limited amounts of energy even after the hardest hammer blow, it's important that the soundboard use this energy to the best advantage.

So soundboards don't amplify the energy coming from the strings (even the best of them actually absorb and dissipate some energy in the form of heat as they work), they change it. And how much of the string's energy is converted into sound energy compared to how much is lost along the way is a matter of how efficient the soundboard is. Even though all piano soundboards look pretty much the same, some perform more efficiently than others. Pianos with more efficient soundboard systems will have the potential to both sound louder and to have longer sustain characteristics than those with less efficient soundboards. They will also have the potential to more closely track the broad harmonic spectrum of energy present in the vibrating piano string set.

Making the Soundboard.

The piano soundboard starts out in life as a group of individual "quartersawn," (or vertical-grain) softwood boards about 50 mm to 100 mm in width that are edge-glued together to form a single large flat panel. This panel is then planed or sanded to a thickness ranging from 8 mm to 11 mm and, depending on the builder's specifications, it may be further thinned along part, or all, of its perimeter. This panel will be quite flexible and fragile across the grain, so softwood stiffening ribs are glued across the back. There can be anywhere from seven or eight ribs in small, inexpensive pianos to upwards of 17 in large concert grands. Each rib is approximately 15 to 25 mm square or rectangular within these general dimensions. If the ribs are not actually square, then they are usually slightly taller than they are wide.

In modern pianos the grain angle of the soundboard is usually approximately parallel to the bridge line — approximately 45 degrees to the belly rail — and the ribs are usually glued roughly diagonally across the grain on the back side of the panel.² This assembly is then glued solidly to the piano's structural rim.

Most of the pianos built in the world today have soundboards that are made of spruce. In the United States this is either Sitka spruce or Eastern spruce with an occasional Engelmann spruce board thrown into the mix. This was not always the case. Both pine and cedar have been used. At one point, even cypress soundboards were tried.

There is so much misinformation about the selection and processing of the wood used in piano soundboards that it is difficult to tell fact from fiction. Many tales are told of the nearly magical



"tone" qualities of spruce. "Tone" wood is regarded as somehow different from ordinary wood. It has to be grown on the north (or south, or east, or west — take your pick) side of the mountain. It must be grown on the mountain because only wood from high elevations has the proper "resonance" for soundboards. But the "best" spruce trees are grown in the swampy regions close to the ocean. The climate must be cold to grow "good" spruce. But it is the mild climate of the temperate rain forest that creates the uniform straight-grain lumber needed for soundboards.

Similar tales surround the processing of soundboard wood. We're told that tone wood must be floated to the mill and kept submerged prior to processing. It must be air-dried for at least two years before it is milled. It has to be air-dried because kiln-drying destroys the wood's tone qualities. (Oddly, many of the same people making this claim also assert that the only proper way to belly a soundboard is to first dry it in a hot room until it has reached an equilibrium moisture content of 3.5 percent to 4.5 percent. Go figure....)

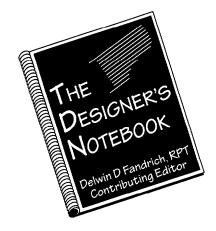
The best wood for soundboards should, supposedly, have an annular grain density of 18 to 20 grains per inch. Varnish (or was it shellac) enhances the properties of tone wood. Lacquer doesn't "sound" as good as varnish. The tone wood used to make the soundboard panel must be "resonant." Soundboards themselves should be "resonate." They should have "the power of resonance." The list goes on....

These tales, though they do make good sounding stories for poorly informed sales folk (and, alas, for some technicians as well), are based more on mysticism than on fact. The "scientific" basis for much of the current mystery surrounding the manufacture and function of the soundboard comes both from aural tradition and from an incomplete written history. Aural tradition can be a very strong influence in a small, tight society such as that surrounding the piano. Unfortunately, much of it is not very reliable. Much of the very sparse written history about early piano construction is also technically undependable. Many of today's misunderstandings about sound boards and sound board wood come from the book *Piano Tone* Building.³

In this book there is a fairly lengthy discussion of the various characteristics that make spruce such an ideal material for piano soundboards. Among other things there is a lengthy description of something called a "small membrane septum,4 like the vibrator on a phonograph reproducer with a somewhat thickened disc in its center ... it is this vibrating membrane that gives tonal value to the woods derived from the spruce, the pine and related species." An example of this membrane is then shown "being magnified 650,000 times." If the log is not handled properly after being felled "...these delicate membranes will be ruptured, thus giving rise to inharmonics or destroying tonal value. All the crowning or pressure put on a soundboard of this material will not improve the tonal effect." In the drawing the membrane is approximately 19 mm to 20 mm in diameter. This would make it 0.00003 mm in diameter in real life. The resonant frequency would be rather high, I should think....

As with most mythology, these ideas took root during a time when the actual function of the thing was poorly understood. Our understanding of the function of the soundboard is still somewhat incomplete, but some progress has been made. As our understanding grows, perhaps we can begin to treat the soundboard, and the material it's made of, in a somewhat more pragmatic light. There were, and are still, some perfectly wellfounded reasons for choosing spruce for our piano's soundboard. The most compelling of which is that it has the highest stiffness to weight ratio of any readily available wood, hard or soft. And within the spruce family, Sitka spruce ranks the highest.

I've recently come across two ideas that contradict much of the tradition surrounding the soundboard assembly. One of them has already passed the test of time and the other might. The first was a soundboard made of short spruce boards that were butt-jointed with a kind of half-lap lock joint to form the long boards that made up the soundboard panel. A forward-thinking and brave builder, that. This soundboard was in an upright piano built, probably, around



the turn of the century — no, I don't remember the name. The piano was being scrapped for other reasons, but I saved the soundboard. A great piece of work. It was fully intact, showing no signs of deterioration. To the best of my knowledge, it functioned as well as any soundboard of traditional construction right up to the end.

The other was found at the back of a new Kawai vertical soundboard. The ribs in this piano were made of short pieces of spruce finger-jointed together to form a continuous rib. While the rib scale itself left much to be desired, the ribs themselves were intriguing. I've already heard a lot of criticism of this construction, but I can think of no reason why these ribs should not work quite well. Time, of course, is always the great testing ground. But in the end I suspect the test of time will be a less formidable obstacle than will be the test of criticism coming from the technicians and the always-competitive salespeople.

Soundboards & Mechanical Impedance

So, what are the factors that determine whether a soundboard is a good soundboard or a poor soundboard? For many years piano builders have tried to define a soundboard function by how it looks. Potential soundboard wood was examined for certain cherished physical and aesthetic characteristics. It had to have uniform color. It had to have clear, tight grain — the annular ring count had to be at least 15 to 18 grains per inch. It could have no resin canals (pitch pockets). The grain had to be perfectly uniform — no bear-claws or wavy grain were acceptable. The belief was that since sound traveled along the grain, any abnormality of grain would "slow the speed

of sound" and somehow interfere with the sound produced by that board. Once I even heard a factory representative carry on about how the color of the soundboard affected the sound of the piano; wood with a light brown or a reddish brown color produced a "richer and warmer" tone while the yellow-white wood produced a "brighter, more harsh," tone. You can guess what the sound-boards in their pianos looked like. You can probably also guess what those of their competition looked like.

If, from the preceding, you get the impression that I'm no longer particularly in awe of these specifications, you're right. At least not as they affect the function of the soundboard.5 While uniform color and even, tight grain might be important aesthetically (it is certainly essential for that new four-color glossy brochure the company is preparing) they don't have all that much to do with how well a soundboard will function as a transducer or with how it will sound. (Actually, grain density does have an effect on tone. Wood with high grain density can be considerably heavier than wood with a so-called loose grain density. True, it is also stiffer, but stiffness can be achieved in other ways that don't add weight to the assembly.) The appearance of the wood is important in the modern piano, to be sure, but mostly only for its aesthetic value. If you'll allow me to ignore a few details that aren't really germane to the current discussion, the value of a soundboard can be better expressed in terms of how quickly and efficiently energy moves from the vibrating strings through the bridge, across the expanse of the soundboard and finally to the air in the form of sound energy. And this is best characterized by a property called the mechanical impedance of the soundboard assembly.

Mechanical impedance is simply a way of measuring and defining how a vibrating system responds to an applied force. The vibrating string applies a periodic mechanical force to the bridge. How the soundboard system responds to that force is a function of its mechanical impedance. A soundboard with high impedance will have more resistance to being set in motion by the energy within the vibrating string than will one with low impedance. All other parameters

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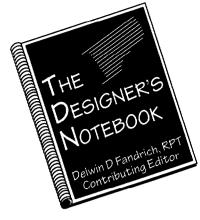
Soundboard Damage

A Guide To Soundboard Cracks & Other Maladies — Part I

Continued from Previous Page

being equal, a piano using a high impedance soundboard will produce a sound that sustains longer than one with low impedance. But a piano with a low impedance soundboard will probably sound louder.

The mechanical impedance of a vibrating soundboard system depends mostly on three things: how heavy it is, how stiff it is, and the inherent damping qualities of the wood being used. The basic (and highly simplified) relationship that quantifies the mechanical impedance (Z) of a piano soundboard system is: $\mathbf{Z} = \mathbf{t}^2 \times (\mathbf{Y}_{...} \times \mathbf{d}_{...})^{0.5} \times \mathbf{K}$, where \mathbf{t}^2 is the thickness of the panel, squared, Y is the modulus of elasticity - a measure of stiffness — for the wood, d is the density - a measure of weight - of the wood. K is a numerical constant and the exponent $^{0.5}$ means that the square root of the quantity $(Y_{\perp} \times d_{\perp})$ is taken. (Notice that the ribs are not accounted for separately in this relationship. Their effect on the assembly is averaged into t, Y and d.) For an unloaded soundboard, the parameters that determine impedance are fixed



by the mechanical characteristics of the soundboard assembly: the stiffness and the density of the wood used to make both the panel and the ribs, the thickness of the panel, the dimensions, shape and the quantity of the stiffening ribs, the dimensions and the locations of the bridges, etc. They are not easily altered once the piano is completed. Yet, as we'll see later, the mechanical impedance of the soundboard system does change over time.

Let's deal with the stiffness component of our equation first. A soundboard panel of practical dimensions will be fairly stiff longitudinally (with, or along, the grain), but quite flexible across the grain. Since we'd like the working sound-board to be more or less equally stiff in

all directions, stiffening ribs are added to the bottom side of the panel. These ribs — at least in traditional soundboard designs — are oriented approximately perpendicularly to the grain of the panel. In theory, we should be able to manipulate both stiffness and weight of the assembly by simply making the soundboard thicker (along the grain) and the ribs taller and wider (across the grain). There is, however, one major problem with this approach.

The total weight of the soundboard assembly is determined by the density of the wood used — i.e., its specific gravity — and by how much wood is used. If you want to be completely accurate, we would also have to include the weight of any screws used, the weight of the bridge and bridge pins and the weight of any finish materials used, but with the exception of the bridge, these are all fairly negligible. So, if we want the soundboard assembly to be heavier, we can make the panel thicker and the ribs bigger. If we want it to be lighter, we can make the panel thinner and the ribs smaller. In general, since we usually want the soundboard to be lighter, not heavier, there are practical limits on how dense the wood can be, on how thick the soundboard panel can be and on how tall and wide the ribs can

Soundboard Arch

he upward curve, or crown, in a sound board panel is often referred to as an "arch," I hesitate to use this word to describe soundboard crown be-

cause it implies a type of support for the crown that does not exist.

An arch is defined as "the spanning of an opening by means of separate units—usually bricks or blocks (both of which are very rigid materials) — assembled into an upward curve that maintains stability through the mutual pressure of a load and the separate pieces. The weight of the load is converted into downward pressures (thrusts) received by the piers (abutments) flanking the opening." For an arch to work, it must be made of materials rigid enough to transfer its load to its mounting points. The mounting points, themselves, must be rigid enough to withstand both the downward force and the spreading stress applied to them without any discernible movement. Neither of these requirements are met by the

10.00 mm Length of arc
= 1200.21 mm

Length of chord
= 1200.00 mm

3.82°
Center angle of arc

resilient wood used to make the soundboard panel or by the rim (or back assembly) of the plano.

The drawing at left illustrates the problem:

With a hypothetical crown of 18-meter radius, the difference between the length of arc—the length of a line following the inside surface of the soundboard—and the length of the chord is only slightly more than 0.2 mm. In other words, even if a soundboard assembly could be made of a completely non-compressible material, and if a load were then put on it in such a way as to completely flatten the curve, or crown, and if the ends were not constrained in any way, each end would only move outward by about 0.1 mm. And this with a fairly long rib. Even discounting the compressibility of the wood fiber in the panel and the ribs, there is no grand rim or vertical back assembly that has been built in the past, or that is being built today, that is rigid enough to support soundboard crown in the manner of a true arch.

be. It is this need to keep the assembly fairly light in weight that keeps us from simply using a 12 mm maple panel with 50 mm tall, 5 mm wide maple ribs.

Soundboard Crown

The stiffness part of the equation now gets a little tricky since, within limits, we must come up with a method to make the overall stiffness of the soundboard assembly somewhat independent of its weight. The most obvious method of making everything thicker and bigger has been ruled out because of the added weight. Most builders of high performance pianos make the soundboard panel fairly thin — 8 to 10 mm at the center, often tapering down to 5 to 6 mm or so around at least part of the panel's parameter. There are also physical limits placed on the ribs: too wide and they add too much weight to the assembly, too tall and there may be clearance problems with the belly bracing, too narrow and there may not be enough glue surface to insure a reliable bond to the soundboard panel.

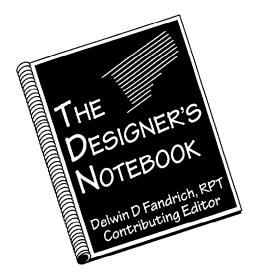
Fortunately, there is another way to get stiffness. We can make the soundboard assembly act as if it were a dishshaped "spring" by putting a slight upward curvature in it (see the accompanying sidebar) and then by compressing that spring. Even though the piano soundboard looks flat when viewed from the top, it is actually supposed to be slightly warped, or crowned toward the string plane. Putting this crown in the soundboard gives us the potential of being able to increase its stiffness without increasing its weight at all. Depending on the process used, the slight amount of crown put into the piano soundboard does not, in and of itself, increase the stiffness of the assembly very much. It is when the soundboard is "loaded" — i.e., when the "spring" is compressed — by the down-force of the strings bearing across the bridge that its stiffness is increased to the desired amount.6 The stiffness of the working soundboard now depends on all of the factors listed above plus the amount of crown initially built into the soundboard system and on how much the soundboard/spring is compressed by the downforce of the string load. Crown built into a soundboard assembly is a technique by

which the piano designer can manipulate the stiffness of the soundboard system independently of its weight. A soundboard assembly made to the same specifications but without crown will have approximately the same stiffness as its crowned counterpart until the latter is loaded.⁷

Traditionally, the amount of sound-board crown is very slight. As installed in the piano it amounts to a curve approximately equal to a 15- to 22-meter (roughly 50' to 72') radius. (See Footnote 2.) The amount of crown may be small, but its effect is mighty indeed. It is a tool that the piano designer can use to manipulate both mass and stiffness independently of each other and by so doing can tailor the soundboard design to produce a specific type of sound from a given stringing scale.

FOOTNOTES

- The Art of Pianoforte Construction by Samuel Wolfenden, 1916, Unwin Brother, Limited, Publishers., 1916. Mr. Wolfenden was the "Technical Expert" to the makers of the Weber Pianoforte.
- 2. While acknowledging that this arrangement is the most common, I am not at all endorsing this design as the best configuration for efficient soundboard performance. But this is not an article on soundboard design.
- 3. Piano Tone Building: Proceedings of the Piano Technicians' Conference, Chicago. 1916, 1917, 1918. Published by the Acoustic Department of the American Steel & Wire Company. These examples are found in a lecture on woods appropriate to piano building by Dr. E.W.D. Laufer, Horticulturist of the



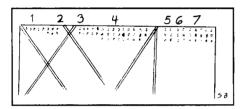
- American Steel & Wire Company.
- 4. A septum is "a thin partition or membrane that divides two cavities or soft masses of tissue in an organism."
- 5. All right, I have to confess. While I write this I'm being prodded by my conscience. Although I believe our industry makes far too much of a fuss over artificially glorified aesthetic specifications for soundboard wood, when we glue up soundboards we spend quite a lot of effort selecting our wood for both color and grain uniformity. We simply like the looks of the soundboards made this way. We do, after all, live in the middle of the temperate rain forest that is home to the mighty Sitka spruce. We carefully select for uniformity of grain (although we prefer a grain density of 9 to 12 grains per inch) and for grain orientation (plus/minus 20 degrees) and color and we do cut out resin canals when we find them. I admit it: we're suckers for a pretty board.
- 6. If you have a difficult time visualizing this, pick up a simple coil spring about two inches long from the hardware store and see how much force is required to compress it from say 2.0 inches to 1.9 inches and compare that to the force required to compress it from 1.0 inches to 0.9 inches.
- 7. Some pianos have been built with socalled "reverse crown." That is, the soundboards are ribbed and installed flat. They are deflected under string load just as the more conventional soundboards, but since they start out flat, they end up being curved away from the string plane. The argument is made that this is a more permanent method of "crowning" a soundboard. It is true that the curve will be more stable, but this places the wood fiber in tension and wood is particularly weak when placed in tension. The only reasonably successful application of this idea that I'm aware of used a laminated soundboard panel, so this was rather a moot point. Traditionally, soundboards built this way don't have quite the tone dynamics that those with a positive crown have. I don't really know if a reverse-crown soundboard can be engineered to sound the same as one with positive crown, but I doubt it. 12

An Aural Method for Half-Step Pitch Raises

By Ken Churchill, RPT Orange County, CA Chapter

Twice this week I've tuned spinets over a half-tone flat. One Whitney spinet required one hour and ten minutes the other, a Wurlitzer spinet, required one-and-a-half hours. The Wurlitzer took longer because of bent tuning pins. I forgot to take my special ground-down tip for those. In tuning bent pins, wedge the tuning hammer in there, tuning a little over pitch, then pound down until you think they're stable. You can always use an option to mute out some strings that are doubtful (which I did on this occasion).

This is the method I used on both pianos: (Illustrated for simplification)



- 1. Single bass strings 2. Doubles
- 5. Treble break
- 3. Double Tenor Strings 4. Triple Treble strings 6. End of treble dampers
- 7. High treble

Method: Raise pitch and tune A4,

A3, F3 and C3. C3 is the third note down in the bass section. This note will stay in tune until the pitch raise includes the bass section. It will make a good reference point to keep you up to pitch.

Raise pitch from C3 to A4 using normal temperament and checks primarily major thirds, fourths, and sixths, tune unisons as you go, or tune unisons later do not overshoot.

Tune A4 again noting how much drop, usually 1-1/2 to 2 beats per second. Raise pitch, from A4 to four notes past the treble break. Overshoot 4 bps at A#4 to 8 bps at point 5.

You may be one whole-tone flat at point 5 (four notes beyond treble break). Measure it. If, for example, G5 tuned equals A5 untuned, within a beat or two, continue to next step. If it isn't a whole tone, or is over a whole tone you can continue by adding or subtracting a few

From the fourth note beyond the treble break (point 5, I'll call it) jump up an octave and raise that note a whole tone, and the next tone below that. Descend the scale to point 5.

Method: using a single rubber mute, tune four strings up a whole tone each. Listen to only the string being tuned. Ignore the other open string. (Actually you may hear it drop a little as one string is tuned, apparently by the bridge pulling up flattening adjacent strings). You can do that, having already learned to ignore vacuum cleaners and crying children. Not only listen, but gauge the amount you turn the pin, which is very effective in raising pitch and getting close to hitting the goal. If you can't do it, practice. Pretend you are a ball player where you are made to practice with pin point accuracy. When you reach the treble damper section you may tune two strings instead of four at a time. Lean the mute the opposite way the hammer

When you reach point 5 you may find that note has lost the eight-beat overshoot and is right on pitch. It gives great comfort when it is; both aforementioned pianos were.

Raise pitch in bass section 1/2 tone using same method as above, no mutes. I find it easy with a little practice. With 30 years practice I can do that upside down, underwater - well maybe. You can cheat in the bass and only tune one or two single strings.

Fine tune C3 to point 5. Raise pitch from point 6 through point 7. Fine tune point 5 to point 7. Fine tune the bass. Try it, you'll like it! 🔂



Unfortunately, the Journal's long lead time precludes publishing reader mail at the same time as a puzzle's solution. However, interesting mail regarding puzzles will be printed when possible, even at the expense of the puzzle editor's dignity. Ideas and suggestions for future puzzles are always welcome, subject, of course, to whatever modification the whim of the editor may deem necessary. Puzzle mail (snail mail only) may be sent to Daniel Levitan, Puzzle Editor, 530 First Street #6, Brooklyn, NY 11215.

Puzzler #7 —

So Many Sequences, So Little Time

"Say there, Junior, what do you call that temperament sequence you're usin'?"

"No name. It's number 140."

"Number 140, eh? You know, now I come to think of it, you've been workin' here for nigh onto a month now

"Three weeks, two days and four hours, to be exact. I remember, because I was hired on my 20th birthday."

"Right. Anyhow, in all that time I can't recollect you ever using the same temperament sequence twice."

"That's right, old timer. I find it tiresome to use the same sequence more than once, so I use a different one each time I tune."

"No kidding. And you keep track of 'em."

"Yes. In fact, I plan over the course of time to try out every possible temperament sequence."

'And how long do you reckon that'll take?"

"Well, I really do enjoy working here at Farmer Brown's Piano Barn. I suppose I'll keep on tuning eight pianos a day, five days a week, with two weeks' vacation each year, until I retire at age 65. I haven't sat down yet and figured it out, but that should be more than enough time."

"I ain't so sure about that. 'Pears to me that, even if you stick to temperaments spanning an octave, and stick to the same octave, you've got 13 notes to tune. That would mean 13 factorial sequences, or ... lemme see ... 6,227,020,800. That's a powerful lot of pianos."

"In fact, I do stick to the same octave, F3-F4, but I always use the same starting note, A3. That would reduce the number to 12 factorial, wouldn't it? And don't forget that, although I can check any interval I want, the only intervals I actually tune in the temperament are major 3rds, perfect 4ths, perfect 5ths, major 6ths, and, at most, one octave. That cuts my options way

"I see. Well, good luck, young feller. I hope you know what you're doin'. Now, scoot on over so's I can get at my RCT."

Will he — or won't he — get through every possible temperament sequence?

See "Puzzler #7 Solution" on Next Page

How Long Does a Piano Last?

By Anita Sullivan, Eugene, OR Chapter

At the end of the summer people often do foolish things. Blame it on the lack of definition in the season. In late August or early September, when the birds are nearly silent, the hay is cut and baled, school hasn't quite become a reality yet, projects which might seem absolutely loony in January, or even April, assume the false glow of rationality. For example, you might find yourself taking six days off work and driving out to Montana to pick up the old upright piano which Grandmother — a fine musician in her day — bought used when she was just out of high school. You'll rent a trailer and haul it back home. All this on the word of Uncle Jake, who, speaking for the family as a whole, insists, "It's a good piano. Grandma didn't buy junk."

However, when days later, you set this piano up in your living room, you make a few discoveries. Five or six of the keys, including Middle C, don't make any sound at all. Your wife, who is a violinist, notices that the tuning is flat by a whole tone. The bass section buzzes. In fact, the piano—not to put too fine a point on it—sounds like hell. And, when you lift the top (something you didn't bother to do in Montana for some reason) and peer down into the subterranean innards of the instrument, you see cobwebs so thick you wonder if a saw rather than a broom might be needed to clean them out.

Well, no problem, call the local piano tuner out for a look. "I think it needs a tune-up" you tell her over the phone. The sticker inside the case, when you rub the dust off, claims the piano was tuned in 1915 and in 1917 as well. True, it did sit for 10, maybe 20 years in Grandmother's old farmhouse after she died, no heat through

all those Montana winters. But pianos are like violins, aren't they? They just improve with age.

So, the tuner comes, and after half-an-hour of peering and testing she shrugs and tells you your family heirloom is a basket case. Belly up, she tells you. End of the line. Unless you want to rally all the relatives around, pool your resources, and have it rebuilt for three or four thousand dollars. "Pianos don't last forever," she says gently, "any more than people do."

This brings up a great moral dilemma: what do you do with a piano when it reaches the end of its life? And how long does a piano last? In the early part of this century, piano manufacturers considered the lifespan of a piano to be 25 years at most. They compared pianos to cars — you traded them in every five years. It was unheard of to expect a piano to live to 100, even with the best of care. So, if the soundboard of your piano is full of cracks, the case needs repair and refinishing, the hammers are shot, mice have eaten most of the felts under the keys, and the ivories are coming off — well, do you invest thousands of dollars to raise a new piano up out of the ashes? And if not, what then?

You can't just take the ax to it. A piano is full of tension, about 18,000 pounds of tension, which needs to be released slowly and carefully before the instrument can safely be ranked as trash. Haul it to the dump? I don't know about *your* dump, but at my dump you drive your pickup truck right over to the rim of an enormous deep ditch and push all your garbage off into it, where it falls about 20 or 30 feet to squish and crash at the bottom. Can you imagine doing this to a piano? Sounds like heresy to me. Yet burial in the backvard is somewhat impractical.

My suggestion is this: find a good cabinet maker. There is fine wood in those old, pre-World War II pianos.

Walnut, mahogany, oak, rosewood. Double veneering over many of the parts. This is not just firewood, it is the stuff of which good tables, cabinets, and desks are made. Find someone who can take off the strings, unscrew the cast-iron plate for recycling. Think of your old piano as a natural resource, and give it new life. (Grandmother will never know!)

The Tuner's Life

Puzzler #7 Solution

No, he won't be able to tune every possible temperament sequence in the course of his career. Your Puzzler editor will leave to other, clearer heads the job of determining exactly how many possible temperament sequences there are; but here is a simple proof that this tuner, at least, won't get through them all.

First of all, how many pianos will he be able to tune over the course of his

career? Eight pianos a day, five days a week, makes 40 pianos a week; and, since he works 50 weeks a year, that's 2,000 pianos per year. He began at age 20 and plans to go to age 65, so he'll be tuning for 46 years, for a grand total of 92,000 pianos, and, therefore, sequences.

Now assume for a moment that he began his first sequence by tuning, in the following order, notes A3, F3, C#4, E4, and B3. At that point he can, using

only the "legal" intervals — major thirds, fourths, fifths, major sixths, and octaves — tune any of the 8 remaining notes in his temperament octave from the notes already set. In other words, at that point he has a choice of 8! (8 factorial) sequences; that is, 8 X 7 X 6 X 5 X 4 X 3 X 2 X 1, or 40,320.

After tuning all those sequences, if he now alters the sequence of his first five notes by tuning them (still using only those five legal intervals) in a

different order — say, A3, C#4, F3, E4, and B3 --- he can tune another 40,320 sequences. Yet a third legal order for the first five notes — for example, A3, E4, F3, C#4, and B3 will allow another 40,320 sequences. These three families of sequences together total 120,960 sequences, which is greater than the number of pianos — 92,000 — he plans to tune. Maybe he should just stick to the circle of fifths.

Grand Illusions ... The Page for Serious Cases



More Than Music Lives on in Pianos

ach, Beethoven, Brahms and yes, even Barry* all live in our pianos. The music of the masters as well as the mediocre inhabits our instruments — but little else should. By which I mean that pianos are all too often not just the abode of musical expression, but also the domicile of encroaching denizens. For purposes of organization, I have divided the various intruders into categories according to the number of legs they have.

The first category of invaders is defined as having six or more legs. Few things are more abhorrent to a piano technician than to open the top of a piano and therein observe the occurrence of a sudden scattering of exoskeletal creatures. Bugs. Insects. Moving insects. Both quick and dead, this embarrassment of roaches causes a general sensation that can best be described by the technical term "heebie-jeebies," which loosely translates along the lines of: "Now that they have departed the piano, are they crawling up my pants legs?" One of the unfortunate sequelae of these occurrences is the inevitable dropping of a valuable tool down into the bottom of the inhabited piano — the only way to retrieve the tool, of course, being to open the knee board and search around with one's hand deep into the dark recesses to find it. Do you think the author of this article recommends that? Do you think the author of this article would himself ever do that? I think not! That tool shall remain in the abyss for all time.

possible revision in job description might transmute this unpleasant experience into financial advantage merely by renaming ourselves Piano Technicians & Pest Terminators (PTPT, or in some circles, PT2). And there is, in addition, the comforting thought that the detritus

that moths leave behind in some pianos represents certain job security — for whatever they have digested from the instrument will surely eventually have to be replaced.

The next category of intruders encompasses those creatures with four legs, which save for the odd cat, is made up of mice. Although mice might not engender the extreme paranoia that their more numerous legged cousins do, they doo-doo more. What I am attempting to refer to as delicately as possible, are the excremental deposits left behind by furry little friends. One doesn't so much mind them using the rest of the world as a bathroom, but one would prefer the piano remain pristine, off-limits to the lavatory needs of said rodents. As a result of their latrinal habits, music played on such an instrument will at worst sound somewhat liturgical. Perhaps the best that might be said of these infested instruments is that they will always be rather "ratty" sounding.

eft for last is by far the most dangerous of the creature incursions — that is, the biped beast having two legs. Let me put forth the scenario for you: the wife presents to her husband the somewhat amorphous complaint that something is wrong

with the piano. "No problem, honey -I'll just go get my Craftsman® tool box and pull out a wrench, pliers, something or other, and I'll soon put that pianer to rights. Well, hey — maybe I can even use that new ball peen hammer I just got on sale!" This is a perfect example of the species referred to as UCPT (Unregistered Craftsman Piano Technician), variously known as SearsTM Best or Greene's Nightmare. At the first crack of the toolbox, the wife should immediately pull out her 9mm semi-automatic, point it directly at his socket set, and tell him to dial up an RPT (Real Piano Technician) or prepare to join the Bel Canto!

These creature incursions threaten the delicate balance that we, as professional piano technicians, must maintain. But really, although we might view any of these incursions with a certain disdain, we should always look on the bright side — recognizing that while these bugs, voles and vermin give us new and ongoing challenges to our noses, they create even greater challenges to piano *noises* — which they leave behind for us to cure!

— Terry L. Greene, RPT

* Manilow — A separate category

PIANOMAN Adventures by Alan Hallmark



Santa's Nightmare On Elm Street



PTGReview

PIANO TECHNICIANS GUILD

Dedicated To PTG News • Interests & Organizational Activities

Gallery of Rebuilders

Evelyn Smith, RPT Institute Director

Description: The Gallery of Rebuilders will be a display of rebuilt pianos at the Piano Technicians Guild Convention and Institute in July, 1998. The five-story glass walls of the Rhode Island Convention

Center (RICC) in Providence, RI will provide a dramatic backdrop for this display. Each piano may have a descriptive easel poster with information about the rebuilder and unique aspects of the piano or the re-

building process (parts, special features, history, etc.). During breaks at convention, a short recital will be given on each piano so attendees can hear as well as see the finished product.

Eligibility: Any rebuilder with a piano which meets PTG's definition of a rebuilt piano: "Rebuilding involves complete disassembly, inspection, and repairs necessary, including replacement of all worn, damaged, or deteriorated parts. The piano is then reassembled, tested, and adjusted to the same or similar tolerances as new — rebuilding restores the piano to original condition or better." The piano may be rebuilt by more than one person.

Dates: Pianos may be set up on Tuesday, July 7 or Wednesday, July 8; they should be ready for display on Wednesday at 2 p.m. when the adjacent exhibit hall opens. The Gallery will be opened with a ceremonial ribbon-cutting on Wednesday afternoon, to which the mayor and media will be invited.

Pianos will remain on display until the exhibit hall closes on Saturday, July 11. They must be removed from the RICC on Sunday, July 12.

Who may attend: All registered attendees of the convention and institute, and members of the public during limited hours.

Entry requirements

• *Display fee:* \$400/piano—\$200 to cover

PTG's costs + \$200 deposit to be refunded at the conclusion of the convention.

• **Deadline for entry:** There are very few spaces available, so it is important to reserve a space for a piano by submitting the application and paying the \$400 fee by February 10. Only one piano from each rebuilder will be accepted through February 10; if spaces are still available,

CONFIDENCE, R.I.

rebuilders may request a space for an additional piano by paying an additional \$400 display fee.

Rebuilder's Responsibilities

- 1) Transporting the piano to and from the display area, setting it up, and tuning it.
- 2) Insuring the piano.
- 3) Providing someone to play a 10-12 minute recital on the piano during one of the class breaks (PTG can help find a performer if the rebuilder requests it in advance).
- 4) Providing a poster-board display of materials to be placed on easel next to the piano.

PTG's Responsibilities

- 1) Providing security for the display.
- 2) Providing one tripod easel per piano to hold poster-board display of materials.
- 3) Coordinating the recital schedule.
- 4) Promoting the Gallery to possible convention attendees, the media and the public.

The Display: Each rebuilder may bring descriptive materials to be placed on a tripod easel next to the piano. (No additional tables may be set up). The information should feature any unique as-

pects of the piano or the rebuilding process —its history, unusual materials or features, etc.

Rebuilders are allowed to staff the display with one or two members of their staff during the convention. People staffing the display are not allowed to attend classes unless they have paid the convention registration fee.

Recitals: During some of the class breaks, short recitals (10-12 minutes) will be performed on the pianos. During a recital, all other pianos on display should not be played. Rebuilders may tune their piano in a temperament other than equal temperament if they choose. ∠

Attention Rebuilders

Wanted: rebuilt pianos for display at PTG's 1998 Convention & Technical Institute

Rhode Island Convention Center, Providence, RI July 8 - 12, 1998

Showcase your finest rebuilding work to technicians from all over the world

For applications, Contact Sandy Roady, at PTG's Home Office 816-753-7747, Fax 816-531-0070, or E-Mail ptg@ptg.org 3930 Washington, Kansas City, MO 64111-2963

APPLICATION DEADLINE: FEBRUARY 10, 1998

Why Providence is a Great Place For 1998

This is the second of our monthly articles, which will appear through June on this page, about some aspects of this subject. Future articles will discuss the many attractions right at your door (or within walking distance) when you get to Providence;

some history of the region, both nonmusical and musical; tips about what's worth a train ride to Boston; attractions in nearby Connecticut, etc.

This month, we seek to impress you with how very much the entire New England region has to offer, and with how relatively short the distances are from one attraction to the next ... people from other parts of the country who haven't visited our region tend to find it truly amazing.

Some of the finest attractions and points of interest are among the closest to Providence. Newport, with its famous and tourable mansions, its ocean drive, cliff walk, Tennis Hall of Fame, Brick Market Shops, beaches, regattas, and Music Festival, is just 39 miles away. Fall River's Battleship Cove, featuring the ship *Massachusetts*, two torpedo boats and other Navy vessels, is even closer — 19 miles. Mystic Seaport, CT, is just 50 miles — and on the way to or from there are excellent beaches such as Scarborough, and also the interesting fishing port of

Unified Exam Approved in Orlando

At the July 1997 PTG Council session in Orlando, the new unified exam was approved. This means the new unified exam is now equitable for both aural and electronic tuners. The new unified exam will alleviate concerns about perceived differences favoring one method of tuning or another. The difference between this new exam and the old one is procedure—the point tolerances are the same.

The new exam has been divided into two parts. The first part concerns Pitch, Temperament and Midrange. The second part has to do with Bass, Treble, High Treble, Stability and Unisons. In both parts of the exam the piano strings will be

Examinations & Test Standards Committee

muted so only the middle single strings will be tuned (the exception being the Unisons section). If any section of Part One is failed and all sections

of Part Two are passed, the examinee may retake part One alone for half the fee, within one-year of the exam. However, if any section of Part Two is failed, the entire exam will need to be repeated.

Part One begins with Pitch. The examinee is given up to 5 minutes to set A4 to his/her tuning fork. The exam clock will be stopped for scoring. If the A-440 is not within tolerance, the A will be detuned and a second attempt will be permitted. If the A-440 is within tolerance, Part One will continue with the Temperament and Midrange sections. The examinee will have 40 minutes to finish this part. The A will be re-scored as a part of the Midrange. After the scoring and aural verification, the Midrange is not detuned. If the examinee wishes, he/she may correct any errors while tuning Part Two. This will not change the scoring but may help when tuning the remainder of the piano.

Part Two: the examinee (whether tuning aurally or electronically) will have 60 minutes to complete Bass, Treble and High Treble. The examiners will score the Bass, Treble, and High Treble sections, then will score the Stability section with notes 28 through 51 (C3 - B4).

See "Unified Exam" on Next Page



Galilee, where they bring in the tuna. Looking east, Plimoth Plantation and Plymouth Rock, MA are 49 miles. Or looking due west, Tanglewood in Lenox, MA, summer home of

the Boston Symphony, is 144 miles — I've made the round trip in one day for an afternoon concert there.

Northern New England isn't that far away, either: Franconia Notch, NH, center of the area where you can view (or climb!) the famous White Mountain peaks, see the Flume and the Old Man of the Mountain, or ride the Canon Mountain Tramway, See "Why Providence" Continued on Next Page

Providence Highlights

By Evelyn Smith, RPT Institute Director

In the next six months, we'll have a series of *Journal* articles describing the lineup of special features and classes for the 1998 Providence Convention and Institute. To give you a taste of some of the exceptional offerings in store, this month we'll feature the Mason and Hamlin tour and the Gallery of Rebuilders. Watch this page and the web site (www.ptg.org/1998/cony) for more information.

Mason & Hamlin Factory Tour

The opportunity to see a piano's creation doesn't come often to technicians. It's fitting that in New England, the birthplace of piano making in this country, you'll be able to see firsthand how a manufacturer creates the instrument we love, from the selection of the finest woods to the final polishing of the cabinet.

The Mason and Hamlin factory in Haverill, MA is opening its doors to welcome technicians who'll be in the area to attend PTG's Annual Convention and Institute in Providence, RI.

On Wednesday, July 8, we'll take a chartered bus from Providence for the 1-3/4 hour ride to Haverill. The bus will leave the convention center at 10 a.m., arriving in time for a complimentary lunch at Mason and Hamlin. Small group

tours of the factory will begin after lunch, and the bus will return to Providence by late afternoon.

Gallery of Rebuilders

For the first time at a Piano Technicians Guild Convention and Institute, we will have a major display of rebuilt pianos called the "Gallery of Rebuilders."

The beautiful Rhode Island Convention Center, with its five-story glass walls, is an ideal location for the display. The Gallery is most likely a one-time event, made possible by the unique space at the convention center.

We'll kick-off the Gallery of Rebuilders with a ribboncutting on Wednesday afternoon, and the pianos will be on display throughout the convention. Accompanying each piano will be information highlighting unique features of the piano or the rebuilding process.

In the Gallery you can talk with rebuilders, play the pianos, and compare the craftsmanship of some of the finest rebuilders in the country. In addition, there will be short recitals given on the pianos during breaks between classes to give you a chance to both see and hear the finished products. The Gallery is not only a chance to increase your knowledge about the complex art of rebuilding — it's also a visual and aural delight.

In The Trenches

By Carl D. Root, RPT Member, Economic Affairs Committee

It was a long anticipated vacation. My wife and I had discussed the possibility of sightseeing along the northern Atlantic coast for many years, but were hesitant to make plans.

Economic News & Views Vacationing with young children had been difficult enough without adding the complications of uprooting ourselves every other night and moving on to a new base camp. But 15 and 11 seemed to be

old enough now, so we blocked out three weeks this past August and booked motels at the beginning and end of the trip, confident that we could find accommodations wherever newly-discovered attractions led us.

Midway through the trip, we decided to try a bed and breakfast. We chose one based on our guide book's description of an establishment which featured 'music room soirees.' I was prepared for some sort of songfest accompanied by an old upright, but when I located the large music room, I found an entire wall of classical records, tapes, and CDs partially obstructed by a Yamaha C5 (It turned out that a second piano, a Bösendorfer, had been sold recently to pay for a new addition and renovation to the old house.)

Could you have resisted the temptation? Surely they wouldn't mind if I noodled around in the piano for a few minutes. A chromatic scale immediately drew an audience, but the proprietor's reactions were not "Oh, do you play?" or "Will you entertain us tonight?," but "It's horribly out of tune. We've been meaning to get it done."

After revealing my true identity as a piano technician, I expected the subject to be dropped after a "my, what a coincidence." Instead, they produced a tuning hammer — a Hale professional adjustable model, no less, an A-440 fork, and a single mute.

"Would you consider tuning the piano in consideration of a couple nights' lodging?"

I suppose I could have declined with a polite: "I'm on vacation." The lack of a temperament strip was my first concern. I know a piano can be tuned without one, using a single mute because I had seen the late Jack Sprinkle do tuning concerts at Northern Virginia chapter meetings and was impressed with the results he achieved using this method.

I also determined that the long head and #2 tip, which wouldn't seat properly on the pins, would make pin setting a chore, but I tested a few pins and decided to accept the challenge. (Past PTG president, Ulys S. Rogers, once claimed to have tuned a piano with a socket wrench. I wonder if he had

Why Providence is a Great Place For 1998

Continued from Previous Page

is just 189 miles from Providence. Bar Harbor, ME, home of the spectacular Acadia National Park with its ocean drive and mountaintop views of the sea, is 333 miles. Burlington, VT on beautiful Lake Champlain is 291 miles from Providence — and Montreal is only another 83 miles from there!

Plan to come to New England next July ... we think you'll find both the Convention and the location rewarding!

—By Wade Johnson, RPT, Vice-President, RI Chapter & Host Chapter Committee€

been on vacation.) A doubled over red felt key cover made a fine temperament strip. An hour or so later, I announced that I had just completed a preliminary tuning and would go over it again tomorrow.

The principal pianist sat down and played ... beautifully! I realized that this moment was special because it was the first time either of my children had seen me tune a piano other than in our home. This performer's musical accomplishment followed by his repeated expressions of appreciation were not lost on them. Especially after I showed them two posters in another room, each featuring his likeness. One commemorating a performance at Carnegie Hall, the other, a recording session featuring Chopin etudes.

The follow-up tuning that I promised the next morning produced the expected improvements, so we decided to try some voicing. We dug up the necessary sewing needle and vice grips, picked a few offending notes, and left well enough alone.

It turned out that the piano had been tuned recently, but let's say it was not up to the standards to which he has grown accustomed. We like to be compared favorably to our peers as in, "This piano hasn't sounded so good since so-and-so tuned it back in nineteen whatever." While I was basking in the light of this favorable comparison, he was already thinking ahead and started to compose a list of pianos I could tune the next time I was in the area. Apparently, his prospects for another satisfactory tuning in the near future were rather grim. The nearest professional who could produce the desired results had told him, somewhat apologetically, that even for three hundred dollars, he could still not afford to make the long trip.

I was reminded of a time about 20 years ago, when I had been on a ski vacation in Jackson Hole, Wyoming. Sitting in a booth in a ski lodge after a day on the slopes I learned that my booth mates were all from the same family and enjoyed their piano at home as much as they enjoyed skiing. One problem, they lived in an area notorious for being one of the coldest spots in the continental US as well as being isolated. There was no tuner anywhere near them. They proposed a tuning/ski vacation in their neck of the woods. When I asked how many clients they could line up for this hypothetical visit, the response was: "Oh, about a hundred."

Being an itinerant tuner isn't such a farfetched idea. Bill Pealer, RPT, 40 years my senior, once described the travels of some of his older colleagues many decades ago when a tuning See "In The Trenches" Continued on Next Page

Unified Exam Approved in Orlando

Continued from Previous Page

After the Stability is scored, the examinee will have 30 minutes to complete the exam by tuning Unisons. Notes 28 through 51 (C3 - B4) will be used for this section.

In conclusion, the unified exam is not only equal for both the electronic tuner and the aural tuner, it is better—the examinee will know how they are doing at the end of each part. Before this latest change in exam procedure, the examinee knew if he/she were passing only at the end of the entire exam. Even if the examinee is not passing, it is recommended he/she complete the exam to get the full benefit of this experience.

— Richard Bittner, RPT ETS Committee Chairman⊄

Roanoke PTG Chapter

Promotes National Piano

Month on Radio

I have the privilege of serving as President of the Roanoke Chapter of the Piano Technicians Guild, Roanoke, Virginia. I am sure that many chapters did various things to celebrate September, "National Piano Month." Just a note to tell your readers what our chapter did. We decided that this would be a good time to make the public aware that there was such a thing as a professional organization of qualified piano tuners/ technicians. We co-sponsored a day of broadcasting on "WVTF" public radio station for Southwest and Central Virginia. Throughout the day, listeners were reminded about "National Piano Month" and that our chapter was cosponsoring for the day. No individual names — just our chapter name.

I think that there are times when we need to just put the name of our organization and what it stands for before the public. Remember, what helps PTG nationally, helps us all individually.

— Bob Hale, RPT President, Roanoke, VA Chapter 240

In The Trenches

Continued from Previous Page

was a couple of dollars and an extra charge for repairs was often replaced by a meal and perhaps a bed for the night.

I'm considering putting together a basic tuning kit to be permanently located under the front seat of my family car, but I'm not seriously considering going out on the road again. My longest regular commute was from Rockville, MD to Leesburg, VA years ago. This twice-a-year one-hour drive was pleasant enough for this suburban technician, but made for a very long day. A small surcharge paid by each of the five clients made the trip cost effective, but when a few of the piano players lost interest, the trips were discontinued. I know that there are many of you who consider a one hour drive to a service area to be an unavoidable part of your business overhead. It's the longer trips which include an overnight stay that interest me. Are there any of you out there who find this sort of business trip works for you? 🗷



Letter Generates News

(What follows) is a letter I drafted on behalf of the Portland Chapter. Every member received a copy and was encouraged to copy it and give it to clients, teachers and other pianominded people. I sent a copy to a local newspaper writer, teachers, etc. The newspaper writer responded with (the following) article ... to share with you. It's an incredible endorsement for the piano and an exciting return on the time spent working on the outreach letter. Promotion does help and is indeed vital to what we do.

— Julie Dunn Mackinnon, Portland Chapter

Piano Technicians Guild Portland Chapter Dear Friends in Music, Celebrate the Piano!!

September is the month nationally recognized and designed to honor and promote the extraordinary instrument that has been in service for nearly 300 years — the piano!

We can all thank Bartolomeo Cristofori (1655 - 1731), the inventor of the piano escapement mechanism. This mechanism allows for the rapid repetition of notes and control over playing volume thus truly making the piano a "piano-forte." This historic, inventive evolution continues even today and artistically allows us to share more fully the joy of music.

The Portland chapter of the Piano Technicians Guild encourages all teachers to take this opportunity to acknowledge the piano and its contribution to our world of music. We suggest showing a piano related video to your music students and/or contacting a local pianist to present a concert. We encourage you to contact your piano technician for information and assistance. Be as creative as possible in finding ways of honoring the piano and recognizing its place in our music history and daily lives.

September is the month to celebrated nearly 300 years of piano technology, artistry and heritage.

Celebrate the Piano!!! The Joys of Playing a Piano

Dorothy Jensen,

Special to the (Hillsboro) Argus

September has been nationally declared the month to celebrate pianos. How about that! Personally, I don't pay much attention to national this or that month. I have ghost-written a few proclamations myself and tend to take the news with a grain of salt.

But I'm tuned into pianos. We always had a piano when I was growing up. My big sister played and it was my life's ambition to play as well as she. My mother started me on lessons early, because she heard me (horror of horrors) picking out tunes by ear.

The wisdom she grew up with was that if you allowed a kid to play by ear, they would never really learn to read music. So much for the Suzuki method. Somehow, no matter what the family's financial state, we always got piano lessons, as long as we would practice.

Some of the teachers were good. Some of them were excellent. The last teacher I had was bored stiff and made it clear. I pounded my way through a lot of Beethoven sonatas before I pitched piano lessons.

Our piano was a beautiful old mahogany upright, with Doric columns for legs and a lot of carving around the music rack. It had a clear tone, not mushy like Sunday school uprights, and usually played all the black keys and most of the white.

With relentless tuning, it could nearly-almost-sort-of be brought up to pitch. We got a lot of good use out of it.

It was pretty clear, early on, that I would never become a public performer. Playing for fun was one thing, but for me, recitals on any instrument were agony.

I remember the time I got caught in a repeat on a sonata. I repeated it around, and around, and around until I could finally emerge and finish the durn [sic] piece.

Funny, I never remember the times things went well

But in spite of performance anxiety run amok, music has been a basic resource for me all my life.

When I first got married, right out of college and ill-prepared for the rough times ahead, my mother, understanding me well, footed the bill for the piano of my choice, up to \$1,000. I chose a Steinway practice piano, now worth many times more than its price new.

In times of tension, in times of frustration and anger, in times of happiness and when I was just killing time, I would sit down and play. The neighbors (we lived in an apartment) got so they hollered up requests for favorite pieces.

I don't play the piano too often anymore, but I think having a piano has been invaluable. Practicing taught me tenacity: if you hit a hard spot, you slowed down, figured it out, worked at it and got the job done.

It taught me to stick with things when they are boring: ever gotten excited by endless finger exercises and scales? And it taught me responsibility: I had to plan practice time and get myself to lessons on time for a lot of young years.

Pianos are expensive and music lessons are expensive, but they are an excellent investment.

Learning the piano will make it easier to learn any other instrument. And once you can play, it means hours and hours spent in personal joy.

You can buy an old piano and pay to have it restored. You can buy a new piano on time, or rent one, or borrow one from an aging aunt. If you have a kid with any kind of a musical ear, or if you always wanted to learn, go for it!

And happy September, National Piano Month.

Oldest Piano Technician School Received new "600-year-old"

Yamaha Piano

Vancouver, WA. — Representatives from Cascade Piano Company of Portland, OR and Yamaha offered the "Keys to a new Yamaha U3 professional upright piano" to the oldest piano technician school in the country, the Piano Hospital, at its annual graduation banquet held last June at Washington State School for the Blind in Vancouver, WA.

Emil Fries (pronounced FREEZE), the founder of the Piano Hospital, was the oldest living piano technician until his untimely death a few weeks before the ceremony. Blind from birth, Fries accepted visually impaired students to the school, where they practiced their craft of piano tuning and regulation. Among the instruments they used was a 27-year-old Yamaha M2H upright, which received the equivalent of 600 years of tuning and 100 years of use - hence the 600-year-old piano. Because it outperformed all the other pianos in terms of endurance and tuning stability, the Piano Hospital requested the donation of another Yamaha upright. Ed Tomlinson of Cascade Piano Company presented this donation at the Hospital's 1997 graduation banquet with Yamaha District Manager Bob Shriver.

The family that owns Cascade Piano Company has been servicing the Northwest for more than 70 years. The Piano Hospital regularly offers pianos to the local community for events and concerts.



Stolen Bösendorfer Grand Piano

Montreal, Canada — On December 13, 1996, our company delivered a Bösendorfer grand piano model 170 (5'8") polished ebony serial number 43964/1595, to a client. This was initially a gift for his wife who lived in an exquisite ski resort north of Montreal. We delivered the piano and were promised a certified (cashier's) cheque on delivery. The piano was delivered promptly on the morning of December 13, 1996, and we were given this cheque. Unfortunately, this was a fake certified cheque, and the thieves got away with the piano.

Our company is requesting your assistance. We are offering a \$2,000 reward to any technician who leads us to the location of the piano. We have already alerted the Canadian chapter of the PTG, several piano dealers in the Northeast, local piano technicians, movers, and Music Trade Magazine in the U.S. and Canada.

The police believe that this is a local theft and we would like to alert specifically Quebec and Ontario piano technicians. These thieves have hit electronic, construction material supply, furniture, and blinds and drapery stores.

Our company has been in business more than 20 years and this is our first major incident. We are the exclusive dealers for Bösendorfer, Steinway, Boston, MSR Piano-Disc, and Samick pianos in Quebec.

Thank you for your attention in this matter.

Contact: John Rizopoulos, Pianos Prestige (514)482-5304, Fax: (514)482-4138

Magazine for Refinishers

Los Angeles — *Professional Refinishing*, the new trade magazine specifically for those who strip, repair and refinish wood for a living, has just published its first monthly issues.

This much-awaited title is the first and only publication to deal with issues specific to the wood-restoration industry. Editorial content has been carefully tuned to incorporate all aspects of running a refinishing business, from perfecting the skills and artistry of the job, to the oft-overlooked details of managing a small business.

Eric Herman, the new title's editor, has pulled together a talented team of expert writers to provide regular columns and features for the magazine. Bob Flexner, renowned in refinishing circles, heads the list with his column "Straight Talk," in which he presents ideas designed to streamline basic stripping, repairing and refinishing operations. Other regular contributors include Alan Noel, a veteran refinisher who answers questions posed by the readers; Howard Scott, a recognized authority in small-business management; and Fred Steingold, whose column will focus on the legal issues facing small businesses.

The magazine is published monthly, except for combined July/August and November/December issues, by McCloskey Communications, P.O. Box 306, Woodland Hills, CA 91365 and is distributed free of charge to qualified professional subscribers. (Please include a business card with all qualified requests.) Paid subscriptions are available to non-professional readers: in the U.S., \$30 per year; in Canada and Mexico, \$48 per year; in all other countries, \$64 per year. Contact: Jim McCloskey, Publisher — (818) 715-9776. ₺

Nominations are Now in Order

Nominations are needed for President, Vice President, and Secretary-Treasurer. In addition to these top three offices, we also need nominations for Regional Vice Presidents. We encourage Chapters to present their nominations to me or through the Home Office. Any RPT may present a nomination for any qualified person or even for himself. All nominations should be submitted by Feb. 1, 1998 in order to be included in the Nominating Committee report which will be printed for the Council meeting in July 1998. Communication may be sent to any of the following committee members: Laura Kunsky, Jack Stebbins, Dale Probst, Larry Crabb, James Ellis (1st Alt.), or Bob Bussell (2nd Alt.).

— Jim Coleman, Sr., Chairman, Nominating Committee

Foundation Focus

Midwest the Focus of History

By Bruce Dornfeld, RPT

It's the story of building pianos in the United States told by focusing on the Midwest. From the first mass manufac-

turers to the end of operations at Kimball Piano Division in 1996, the

A History of Midwestern Piano Manufacturing by Jack Greenfield, RPT

companies, owners and influential people are all here. Total annual sales figures for many years and other pertinent data are essential for providing perspective on activity in different decades. This book fills a large void in the history of this

Piano Technicians Guild Foundation

Mission Statement

"The Piano Technicians Guild Foundation is formed to support the goals of PTG by preserving and displaying historical materials and providing scholarships and grants for piano performance, study and research."

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industry that was once at the forefront of world economy.

The book starts with the pioneers of the trade. John Britting in Cincinnati in

1834 is the first on record. Along with well-known names such as Baldwin,

Cable, Kimball, Story & Clark, and Wurlitzer are the less remembered names like Hale, whose influences are still felt. Joseph P. Hale originated the "stencil" piano in the 1860s. By 1869 he ranked seventh in dollar volume of sales among US piano manufacturers. His growth continued, and in 1876 he was the leading manufacturer producing about oneeighth of the country's total output. Some of the chapter titles include: "Chicago and Cincinnati Areas Become Major Centers of Piano Making," "Rivalry Between Eastern and Midwestern Piano Manufacturers, "and "Development of Instruments for Public Entertainment" (i.e. coin controlled, players, and orchestra pianos).

Jack Greenfield has written many articles for the PTG Journal. He has over one-hundred published articles to his credit. The new Jack Greenfield Award for best contribution to the Journal is the most recent honor underlining the importance of his writing. Jack's first research of this history appeared in the Chicago Chapter newsletter, the Wippenpost. Now he has put the history into book form, rewritten from what previously appeared in the Wippenpost or the Journal.

If you think you know the history of the piano industry from Alfred Dolge's books *Pianos and Their Makers* and its sequel *Men Who Have Made Piano History*, remember that these were published in 1911 and 1913 and have nothing of later years. Recently, a number of books have appeared about single manufacturers but the larger picture

Midwestern

turers, but the larger painted in A History of Midwestern Piano Manufacturing is not found elsewhere. We get Jack's careful research in this concise book and a story that's fun to read.



The PTG Foundation Needs Your Help!

The history of PTG and its predecessors is in danger of being lost. As part of its mission, the PTG Foundation has taken on the task of preserving that history.

The work of collecting, organizing and preserving our past must be an ongoing part of our present. Your donation of money or historical materials will allow us to continue this important work. You may also designate the PTG Foundation as the beneficiary of your PTG death benefit. Contact the Home Office for details.

Honor a mentor, friend or associate, either living or deceased, with a tax-deductible contribution. Three contribution levels have been established:

- Patron (\$100 or more)
- Contributor (\$50-\$99)
 - Supporter (\$35)

To make a contribution, or for more information, contact:

PTG Foundation 3930 Washington Kansas City, MO 64111 (816) 753-7747

40 Years Ago ... A Look Back at the Pages of The Piano Technician, December 1957

Next Month

The Piano Technician's Journal makes its debut.

This, the December number, will be the last issue of the Piano Technician in its present form, and at the same time the Tuners' Journal will suspend publication. In the place of the two magazines will appear the new periodical which will combine the best features of both as well as the many writers whose names have become a by-word for many years.

The new magazine, henceforth to be known as The Piano Technician's Journal, will be the official organ of the PIANO TECHNICIANS GUILD which, itself, is the result of the merged interests of the National Association of Piano Tuners and the American Society of Piano Technicians. All subscribers to either or both of the former magazines will automatically receive the new publication for the duration of their subscription or its renewal.

DON'T MISS Volume 1, Number 1, January 1958. Plans are to make this the most complete, educational and inspirational Journal, from the first issue on, that has ever been published for piano tuners and technicians. You will want this first number and every one thereafter, so if you are changing your adress be sure to make this known in plenty of time to be kept on our mailing list. And if your subscription is about to lapse RENEW AT ONCE.

A NEW YEAR

A NEW MAGAZINE

A NEW HIGH IN YOUR PROFESSIONAL FIELD

THE PIANO TECHNICIAN'S JOURNAL, January 1958

NA BANTAN RANGA RA

CARTOON

Beginning in 1947 the artist, Robert Glueckstein and editor Hoskins collaborated to produce a series of cartoons for the Piano Technician Magazine. As we now have a host of readers who did not see the issues of the earlier years, and as we will have several hundred more after January 1st, 1958, it has been decided to reprint the more popular of the cartoons. We hope you will enjoy them. The one shown here first appeared in December, 1953.



"Yeah; but where did ya get the screwy idea that I wanted a piano instead of a drum last Christmas?"

Calendar of Events

January 9 & 10, 1998

ARIZONA STATE SEMINAR

Arizona State University, Tempe, AZ

Contact: Rick Florence (602)926-4328 or (602)965-6760

119 E. San Angelo Ave., Gilbert, AZ 85234

February 20-22, 1998

CALIFORNIA STATE CONVENTION

Pomona Valley, Riverside, CA Contact: John Voss (909)794-1559 2616 Mill Creek Rd., Mentone, CA 92359

March 19-22, 1998

CENTRAL WEST REGIONAL SEMINAR

Clarion Hotel Airport, Wichita, KS Contact: Marty Hess (316)744-0564 3900 N. Parkwood, Wichita, KS 67220

March 26-29, 1998

PA STATE

Hotel Brunswick, Lancaster, PA Contact: James Bittinger (717)846-3589 43 N. Clinton St., York, PA 17404 April 23-26, 1998

PACIFIC NW REGIONAL

Banff Centre, Banff, Alberta Canada Contact: Chris Gregg (403)226-1019 or Fax (403)226-2430

11444 Coventry Blvd., Calgary AB T3K 4B1 Canada

May 1-3, 1998

FLORIDA STATE SEMINAR

Mariott Hotel, W. Palm Beach, FL Contact: Tom Servinsky, (561)221-1011 5271 SE Nassau Terr., Stuart, FL 34997

May 16 1998

NEW MEXICO SPRING SEMINAR

Piano Store (Vintage Piano Workshop) Albuquerque, NM Contact: Les Conover (505)255-0658 4805 Central, NE, Albuquerque, NM 87108

All seminars, conferences, conventions and events listed here are approved PTG activities. Chapters and regions wishing to have their function listed must complete a seminar request form. To obtain one of these forms, contact the PTG Home Office or your Regional Vice President.

Once approval is given and your request form reaches the Home Office, your event will be listed six-months prior and each issue until the month in which it is to take place.

Deadline to be included in the Events Calendar is at least 45 days before the publication date; however once the request is approved, it will automatically be included in the next available issue.

Tapping The Value Of Your Life Insurance Today

A Financial Option In Time Of Need

The Piano Technicians Guild offers a costfree member benefit that will change the way you look at life insurance and help you protect against financial uncertainties in the future.

The benefit, called a "viatical settlement," enables individuals facing a severe chronic disease or life-threatening illness, such as cancer, to sell their life insurance policy for cash. The money can be used for many purposes and in most circumstances if free of Federal income tax.

Viatical settlements are offered by PTG through Viaticus, Inc., an affiliate of the CNA Insurance Companies—one of the largest insurance organizations in the United States.

Anticipating The Need Today

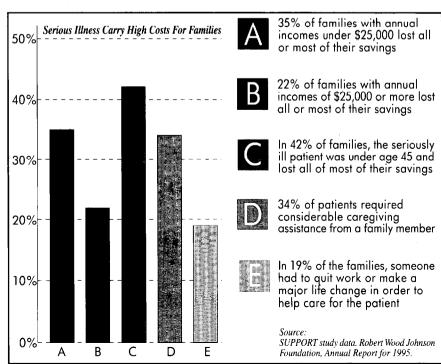
Each year, more than 2 million Americans are diagnosed with a life-threatening illness. Unfortunately, many of these individuals and their families will experience

financial difficulties. While health insurance may pay for many medical expenses, most severely ill individuals will eventually no longer be able to work. Yet these same individuals are still responsible for non-reimbursable medical expenses, mortgage payments, car payments and other day-to-day living expenses.

While a life-threatening illness is not something you want to contemplate, it is important to determine if you and your family will be financially secure in the event of such a circumstance. You have already started the planning process by saving and by purchasing life insurance. However, recent studies show that this may not be enough. According to the Journal of the American Medical Association, 33% of families depleted all or most of their life savings as a result of a life-threatening illness. Additionally, the results of another study, sponsored by the Robert Wood Johnson Foundation, on the financial impact of a terminal illness on 2,652 families. are summarized by the graph below.

Another Financial Option

The viatical settlement option is not the only option available to individuals facing a life-threatening illness. Some life insurance policies feature a rider called an accelerated death benefit (ADB) which enables the policy holder to receive a cash



"advance" of the policy's face value. This is not the same as a viatical settlement. The table below compares ADBs to Viatical Settlements.

As the table above illustrates, viatical settlements provide individuals with flexibility. Additionally, the viatical settlement benefit can be used to complement the ADB. For example, an individual may receive a cash advance on their policy through the ADB option and sell the remaining net face value to Viaticus.

Learn More About The Service

We encourage you to take time today to consider how you might utilize this service, should you or your family ever need financial assistance.

Please call one of Viaticus' customer service professionals at 1-888-200-5204 if you have any questions about this new benefit.

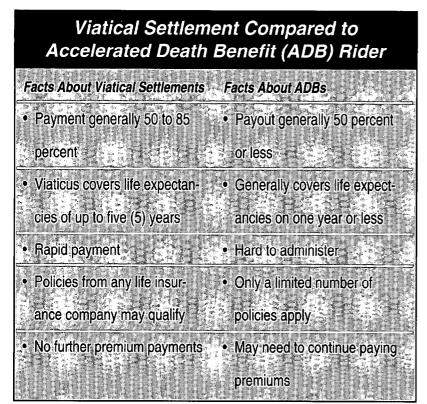
How The Service Works

The process of selling a life insurance policy through Viaticus is simple and non-threatening. Experienced insurance and viatical professionals will guide you through

every step of the process.

- If diagnosed with a lifethreatening illness an individual may decide to sell all or part of their group or individual life insurance policy in order to acquire necessary funds.
- The process of applying for the Viatical Settlement benefit is simple and completely confidential.
- There are no interviews, just a single application form to complete. Once this form is completed, and the individual authorizes Viaticus to proceed with the application, the life insurance policy and the medical records are obtained and reviewed by Viaticus.
- The amount Viaticus will pay for your life insurance is determined by several factors, including projected life expectancy and premium obligations. As a regulated industry, there are guidelines which have been established in order to ensure that individuals receive a fair price for their policies. These guidelines are established by the National Association of Insurance Commissioners (NAIC).
- Within an average period of 2-3 weeks, Viaticus evaluates the application, the

medical records, and the insurance policy and makes a decision. At this point, Viaticus makes an offer and the closing process starts and payment is made. As part of the closing, the following occurs: Viaticus becomes the beneficiary named on the life insurance policy; coverage is assigned to Viaticus; and, Viaticus assumes the premium payment responsibility, if applicable.





NEW RPTs

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October 1997

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142 Buffalo, NY

Graham J. Howes S-4618 Bayview Road Hamburg, NY 14075

151 Pittsburgh, PA

Daniel A. Alberts 801 N. Pittsburgh Street Connellsville, PA 15425

Region 2

325 Northwest Florida

Timothy P. Hollis 4309 W. 19th Street Panama City, FL 32405

Region 4

441 Cleveland, OH

Marilyn A. Eble P. O. Box 45608 Westlake, OH 44145

David J. Ireland 1038 Larchwood Road Mansfield, OH 44907

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Dan D. McClung 205 SE Wilson Avenue Bend, OR 97702

Jeffrey R. Moore 3121 S.E. Division, Apt. B Portland, OR 97202

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011 Southwest, BC

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Anne E. Solheim 10620-150th St., Apt. 800 Surrey, BC V3R 7S1 Canada

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061 Ottawa, ON

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871 New Mexico

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Andrew Thomas 10112 Aldgate Avenue Garden Grove, CA 92840

Region 7

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Elizabeth A. Baker 30 Reinig Street Belgrade, MT 59714

Passages |

The members of the SEPA Chapter were sadden by the news of the death of Richard Sivel. Richard has been an active member of the SEPA Chapter since its formation. For the

past 20 years he was an RPT, and held several offices in the chapter. Richard specialized in the rebuilding of player pianos.

Richard attended Delaware Valley College, and the University of Pennsylvania. He was a member of the Bucks-Mont Astronomical Society, Amateur Astronomers Association of Princeton, Peace Valley Nature Center and the Society of American Magicians. He was formerly active with the Boy Scouts in Philadelphia and Penns Park, Penn.

Richard (Dick) Sivel 1929 — 1997

Every one of us has such happy memories of Richard that we will always treasure. When the SEPA Chapter hosted the 1991 PTG Convention in Philadelphia, Richard played the

part of Ben Franklin and played piano to entertain the dinner guests. He always helped prepare for conventions, seminars, and helped with the auctions. He could be counted on to stuff envelopes, or anything that needed to be done. At local chapter picnics, he delighted the children with his stories and magic tricks.

The SEPA Chapter and the PTG will greatly miss a dear friend.

— Fred Raudenbush, RPT, Secretary of SEPA Chapter

PTGAuxiliary Executive Board

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AUXILIARY E X C H A N G E

DEDICATED TO AUXILIARY NEWS AND INTERESTS

Seasons Greetings & Centenarian Secrets

Can you believe that it is the time of year again to greet your friends with a "Merry Christmas" and/or a "Happy Hanukkah?" It just seems like



Phyllis Tremper PTGA President

yesterday that we were wiping our brow from the 90 degree heat in Orlando. Where does the time go?

As I stood reading and selecting birthday cards the other day, I saw one that said, "May you live to be 120, and the last words you hear be mine." In 1986, a man in Japan reached the age of 120 years and 237 days according to documents

that most experts believe to be authentic. Although this current record still holds, many persons have reached or surpassed the century mark. About 12 percent of persons in the USA (more than 35,000) are aged 100 or older, and it is estimated that by 2030 over 21 percent (435,000) of Americans will be centenarians.

Have you ever wondered what the secret was to reaching the age of 100 or beyond? Research studies, such as the Baltimore Longitudinal Study of Aging and the National Institute on Aging Biomarkers of Aging, followed a select group of

people for many years to evaluate their changes over time. These studies suggest that the secret to a long life is related to genetics, the environment, and our lifestyle choices.

Jim Heynen in his 1990 book One-Hundred Over 100: Moments with One-Hundred North American Centenarians provides additional insights. In his interviews with persons aged 100 and older, he learned

Happy Anniversary

Congratulations to Willis and Kathryn Snyder who are celebrating their 50th wedding anniversary.

In Memorial

We regret to inform our members that Bert Sierota passed away October 16, 1997. that some lived to be 100 by avoiding caffeine, alcohol and tobacco while others made it by drinking a dram of scotch every day and avoiding medications. Many recommended having an upbeat outlook on life, maintaining close relationships with family and friends, standing straight, and exercising. My personal favorite was the admonishment to keep your feet warm, your head cool, your bowels open, and to trust in the Lord.

Who would have thought it would be so easy? Now that we know the secrets, we too can live to be 120 ... and may the last voice I hear be yours.

Please have a wonderful and happy holiday along with a great New Year and remember to add music to your life. With all of the beautiful and great music composed for this time of year, it shouldn't be hard to do. Music is the Spice of Life so add it to your life generously.

The PTG Foundation & the Auxiliary By Fred Raudenbush, RPT

Yes, I am a piano technician with RPT rank. And yes, I am also a member of the Auxiliary. I am because I want to show them my support.

At our Orlando convention, we held a meeting of the Board of Directors of the PTG Foundation. Phyllis Tremper, President of PTGA, favored me when she asked me to be PTGA's representative to the Foundation. I felt honored to sit at the table with Nolan Zeringue, Foundation President (1996-97), and other dynamic members of the PTG. The presence of these active and very busy PTG members tells you how important the Foundation is to PTG.

The Foundation has a simple but clear mission: To support the goals of the Piano Technicians Guild. It does so by maintaining a museum that features archives, tools, parts, literary works, and items of historical value to the piano and the piano industry. We award grants for study and research and also maintain PTGA's scholarship funds. A Foundation scholarship, perhaps not very well known, is the scholarship given to

See "The PTG Foundation" on the Next Page

The PTG Foundation & the Auxiliary

Continued from Previous Page

worthy Associates to help them upgrade to RPT. It pays the convention registration fee and a test taken for upgrading. An outstanding recipient is Laura Kunsky, who recently retired as a Regional Vice President and was elected Foundation President.

The Auxiliary has always been active in PTG affairs. We offer a generous scholarship to young artists; these artists perform at the convention and the performance is open to all. When you pay your

annual dues, part goes into the PTGA scholarship fund. We have fund raisers during the year and that money also goes into our scholarship fund. You can make a donation anytime throughout the year. Perhaps you want to make your contribution to memorialize a loved one or a colleague, or honor any occasion that has special meaning to you. Your contribution is tax deductible.

Our new Executive Director, David Hanzlick, was also present at the meeting. He told us he is willing to help us anyway he can. On a personal note, I feel that all conventions, both international and regional, would be better attended if more spouses and interested persons came. There would be more family harmony if we included the whole family in our activities. I know it is much easier for me to "get away" if I have my wife and family with me when I go to a convention. With that in mind, attend conventions with your family. You will learn and have fun at the same time. The PTGA has many activities planned for you.

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		2 3/8" x I"	\$26	\$31	\$41
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FOR SALE

REYBURN CYBERTUNER State of the art piano tuning software from authorized distributor and author of its user manual, Mitch Kiel, RPT. Reyburn CyberTunerTM version 2.0 just released, includes Custom Equalizer (simple graphical interface lets you individually adjust stretch at A1, A2, A3, A5, A6 and A7 totally amazingly cool), Limits (automatically senses scale problems and adjusts octave widths as needed, spinets and short grands never sounded better), Pitch Raise (at every note, automatically measures and calculates overshoot using optimized overpull percentage from 4% to 38%), PianalyzerTM (specialized spectrum analyzer displays pitch, inharmonicity, sustain, and volume for partial 1-8, 10, and 12 for any note, great for voicing and scale design), PTG-approved for scoring RPT tuning exam (a CTE1s delight automeasures and records an aural tuning in 12 minutes or less), creates an editable spreadsheet and graph of any tuning, unlimited storage, and more. Read a review of RCT 1.0 in Jan. 1997 Journal. Reyburn CyberTuner 2.0 \$795 (Macintosh only). Upgrade from RCT version 1. x \$99. READY-TO-USE COM-PLETE PACKAGES STARTING AT \$1595 (Includes portable Mac computer & RCT 2.0). Try RCT at no risk with our 30-day money back guarantee. Mitch Kiel, RPT, 11326 Patsy Drive SE, Olympia, WA 98501. 360-264-5112. mitchkiel@revburn.comwww.reyburn.com

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DOING YOUR OWN KEYTOPS? For resurfacing your keys, the newly re-designed PETERSON Router Guide is now the finest, fastest and most accurate system going. Also, removes fronts slick as a whistle. \$125 plus \$7.50 S&H. Peterson Piano Service, 11530 North 6000 West, Highland, UT 84003. (801)756-9786.

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*Steinway Model L, 5'10", 1928 Mohagony, \$22,500; *Steinway 5'10" O, 1920, Light Mahogany, \$13,900! *Steinway 7' B, 1900 Artcase, \$25,000; *Mehlin & Sons, 1924, 9' Ebony Satin, \$7,500; *Kranich & Bach, 7'2", 1913 Ebony Satin, \$4,500; *Knabe 6'4" 1925, High Polished Ebony; *Schimmel, 6'9" 1976, Ebony Satin, \$14,900; *Yamaha C-3, Ebony Satin, 6', 1981, \$9,500; *Baldwin/Howard, W/Pianodisc & Orchestra, \$9,995; *Baldwin 7', Ebony gloss w/Pianocorder, \$14,000; *Fisher Bby Grand, 5'4" 1915 Circasian Walnut, \$4,895; Call SCHROEDER'S PIANOS for a complete list of used pianos, 800-923-2311.

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BALDWIN SD-10 CONCERT GRAND—Powerful and rich tone. Used less than 100 hours since professionally rebuilt and refinished. Will take trade-ins. Price negotiable. Hilton White, RPT, 801 Blake Avenue, Glenwood Springs, Colorado 81601 (970)945-9552.

HELP WANTED

TUNER/TECHNICIAN NEEDED IMMEDIATELY FOR PIANO SERVICE CO. / RETAILER in Miwaukee area. RPT preferred, but will consider all applicants. We are looking for someone with good tuning/people skills to grow with our fun company. Rebuilding and/or refinishing skills are a plus, but will train. Excellent pay and benefits will be based on experience. Salary package includes health/life ins., vacation, mileage, and 401k. Please send resume/cover letter to: Eric L. Carlson, RPT, 3550 Osborne Blvd., Racine, WI 53405.

CONCERTTECHNICIAN—With strong concert tuning background and expert technical skills to serve International performing artists and private customers is needed by Steinway's exclusive representative in the Philadelphia area. Salary + benefits. Applications confidential. JACOBSMUSICCO.,1718 Chestnut Str., Philadelphia, PA 19103. Phone: (215)568-7800, Fax: (215)568-0020.

VICTOR'S PAYS HIGHEST WAGE— For rebuilder to restore 200 grands. Spend winter in Florida and summer up North. 300 NW 54th Str., Miami, Fla. 33127. 305-751-7502.

GENEVA INTERNATIONAL CORPORATION, exclusive U.S. Distributor of Petrof and Weinbach pianos, is wishing to hire a manager/technician for our piano service center in the northwest Chicago suburbs. RPT preferred but not required. Strong rebuilding experience a must. Finish experience a plus. Salary based on skills and experience. Must be able to perform high level grand piano rebuilding and supervise others. Full health and retirement benefits offered. Please contact Alan Vincent at 1-800-533-2388 for more information or FAX resume to 847-520-9593.



PLAYER PIANOS Rebuilt bought & sold. Serving NY to GA. Will pick up system and re-install or send in mail. Nicholas Fiscina 1-800-862-2138.

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554 State Route 1907, Fulton, KY 42041, 1-800-745-6819.

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PIANO KEYS... We manufacture replacement keysets for nearly any piano. The cost is often less than reworking the old keys. We use the finest materials, and offer a number of options to suit your needs. Contact: Rick Wheeler at RoseLand Piano Co. (503)239-8554.

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THE RANDY POTTER SCHOOL OF PIANO TECHNOLOGY — Home Study programs for beginning students, associate members studying to upgrade to Registered Piano Technician, and RPT's wanting to continue their education. Tuning, repairing, regulating, voicing, apprentice training, business practices. Top instructors and materials. Call or write for information: RANDY POTTER, RPT; 61592 ORION DRIVE; BEND, OR 97702; 541-382-5411.

See our ad on page 3.

VIDEOS

INSTRUCTIONAL VIDEO TAPES.

Victor A. Benvenuto. Piano tuning, \$50.00*; Grand Regulating, \$50.00*; Grand Rebuilding, \$100.00 (2)*; Key Making, \$50.00*; Soundboard Replacement, \$29.95*. (*Plus S/H). The Piano Shoppe, Inc., 6825 Germantown Avenue, Philadelphia, PA 19119-2113; Ph. 215-438-7038, Fax, 215-848-7426

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WANTED!! DEAD OR ALIVE: "Steinway uprights and grands." Call collect, Ben Knauer, 818-343-7744.

WANTED—Old Chickering grand action parts and/or case parts. PTG member, technician. Contact Michael W. Hart, PO Box 268, Corbin, KY 40702 (606) 528-8760.

LOOKING FOR KEYFRAME with keyboard or if necessary, the whole action for an 88 key 6'1" Steinway A #121116. Call Leopold at N.Y. Piano Center at 1-800-642-5648.

WANTED: By PTG Member Technician—OLD ROSEWOOD VENEER. Any size or amount acceptable. Contact Michael W. Hart, P.O. Box 268, Corbin, KY 40702 (606) 528-8760.

WANTED: TINY PIANOS such as the Wurlitzer Student Butterfly or other small types. No more than 50 keys. Call toll-free: Doug Taylor, 1-888-895-6211. I'll pay shipping!

WANTED: Heintzman, Mason & Risch, Nordheimer, Steinway & Sons, Mason & Hamlin, Knabe & other vintage grand pianos. Call Karl Verhnjak RPT or Rod Verhnjak, Surrey, B.C. 1-800-240-7426. www.dirrect.ca/verhnjakpianos

WANTED: Very old Chickering Grands to restore. PTG member, technician would appreciate your referals. Contact Michael W. Hart, P.O. Box 268, Corbin, KY 40702 (606) 528-8760.

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An inexpensive and effective way to get the word out!

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Include your check or Visa/ Mastercard number (with expiration date), along with your name and daytime phone number.

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Piano Discussions

News From The World of MSR/PianoDisc, Knabe, Mason & Hamlin

Super-size or regular, PianoDisc's Installation Training classes deliver

Do you want your training class supersize or regular?

That's not usually an option for PianoDisc's Installation Training class: we believe in the adage "good things come in small packages." For 1997's last class of the year, however, we decided that "bigger is better" might apply — just this once. As a result, October's six-day class consisted of 14 technicians, nearly twice our usual limit.

Despite the challenge of a higher than usual student-to-teacher ratio, Instructor Mark Burgett still managed to give plenty of hands-on, individual training. Technicians appreciated the effort, finding the class well worth the time invested and miles traveled to attend. And considering that one class member came from Saudi Arabia and another from Barbados, that's saying something.

"News that we're reducing the number of Installation Training classes next year [to allow more time for Continuing Education classes] had a lot to do with the demand," explained PianoDisc's Tom Lagomarsino. "And of course, completing PianoDisc's installation training classes always means increased income. Who wouldn't want that?"

Technicians interested in attending our factory held classes in 1998 should call 1-800-566-3472 for more information and to make reservations now. As another old adage goes, "He who hesitates is lost."



October's Installation Training class, back row, from left: James Powell; Dan Paris; Michael Reitzer; Instructor Mark Burgett; Ron Kroenke; Scott Lundquist. Middle Row, from left: Frazier Baldwin; Neo Paris; Mel Edwards; Daryl Crabtree; Dennis Penney; Gregory Fisher. Front row, from left: Glenn Suyker, Fabian Morris; Marvin McDonald.

Steve Allen Update...

Steve Allen's PBS special will be shown in early December instead of November 28th, as we reported earlier. Please consult your local listings or PBS station for the exact airdate in your location.

PTG Florida to feature 2-day service seminar

The PTG Florida will offer a two-day PianoDisc service seminar during its state-wide convention in 1998. The class is open to any technician interested in servicing the PianoDisc system. No installation training will be offered, however the class will cover how to service all of PianoDisc's models, from the PDS-1000 through the PDS-128 Plus, as well as the GT-360 (PianoDigital with QuietTime). Successful completion of the two-day, sixteen hour course will result in certification as a PianoDisc Service Technician

The convention is scheduled for April 30th and May 1st and will be held at the Palm Beach Garden Marriott Hotel. Anyone interested in attending the PianoDisc seminar should contact both the PTG Florida and PianoDisc for information and availability.



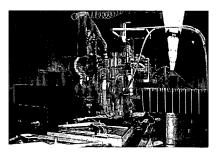
Tech Guzette

Last month, we discussed the need for skilled technicians to establish the exact position and elevation of the V-Pro plate in reference to the bridges.

Another "One-Of-A-Kind Machine"

Yamaha Service

In this article, the back assembly goes to the next computer controlled machine designed and built by Yamaha especially for this facility. This machine does a number of precise procedures.



First, the backframe assembly is locked into place and two "locator holes" are drilled into the upper back of the backframe. These locator holes will

be utilized to position the backframe precisely on all subsequent robotic machines as the backframe makes its way through the robotics line. (You may have noticed the large "wooden buttons" which are glued on the back of Yamaha pianos to cover the locator holes.)

Next, the machine will drill precise pilot holes for all of the remaining plate and pressure bar screws. Because various sizes of screws are utilized to



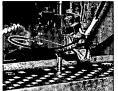
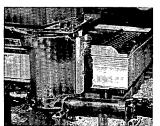


plate to the backframe, the machine sorts which screw is to be inserted in which pilot hole, then tightens the screw to its correct torque without marring the screw head.

The various sized screws are housed in bins and connected to the robotic machine by plastic tubes. With the use of air pressure, the screws are propelled through the tube to the head of the robotic machine for insertion into the backframe.

The third procedure is to trim the slightly oversized backframe



to its precise dimension. Since the case of the piano is glued to the backframe, the distance between the sides of the piano is determined by the size of the backframe.

Hence, you will never find a keyslip

December 1997

that binds, or an upper front board that fits poorly or is unsightly on a Yamaha piano.

The YMM "Tip of the Month"

To remove balance rail, pins from the rail, use a pop rivet tool. After drilling out one of the tips furnished to a size that will slip over the balance rail pin, put the tip of the tool on the rail (or punching)



and squeeze the handles. A pop rivet tool retails for about

\$15.00 at most hardware stores!

Stay tuned for next month's information from Yamaba Music Manufacturing.

Parts & Service: (800) 854-1569

YAMAHA"

FAX: (714) 527-5782