PIANO TECHNICIANS
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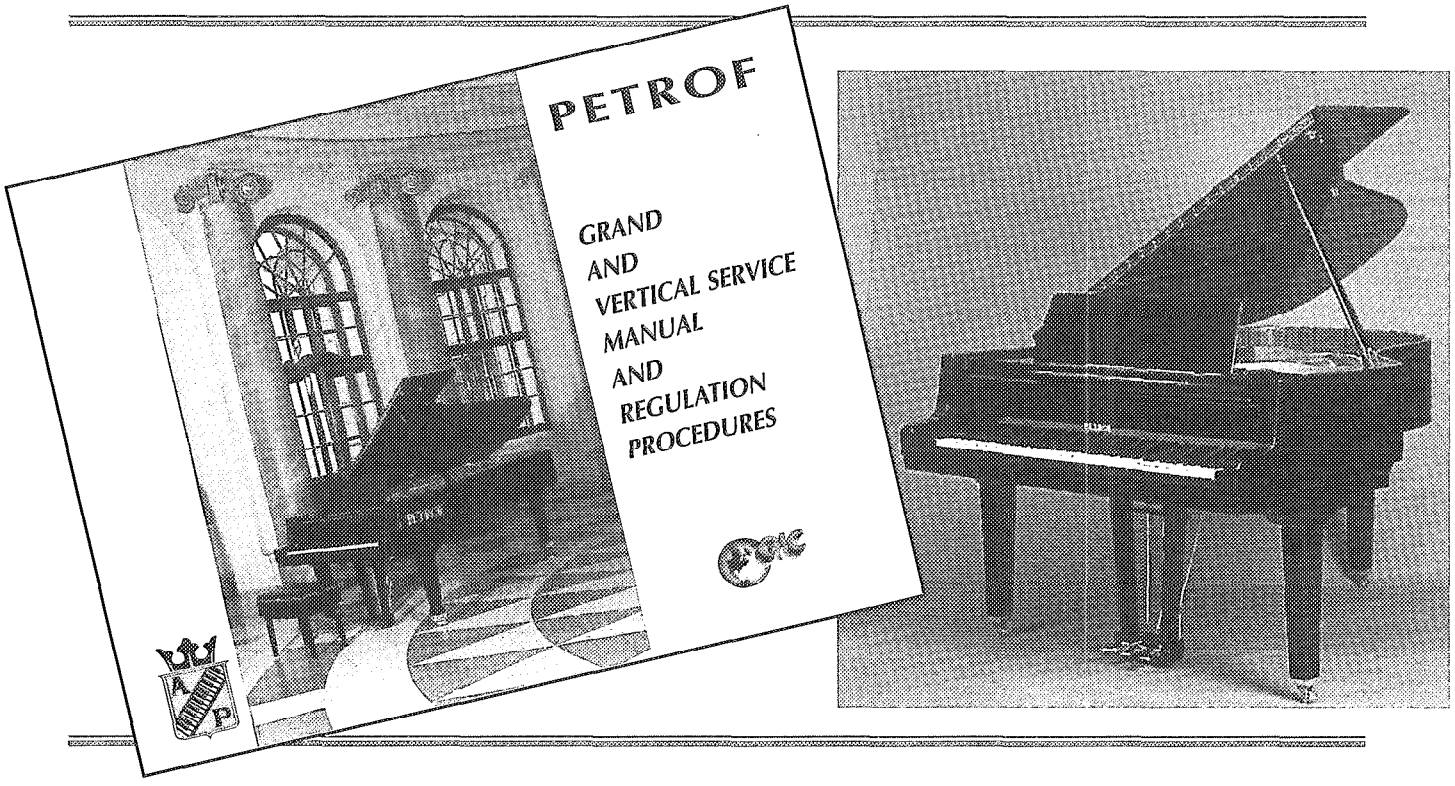

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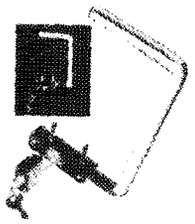

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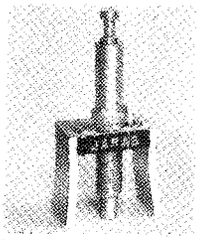

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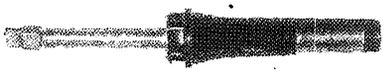

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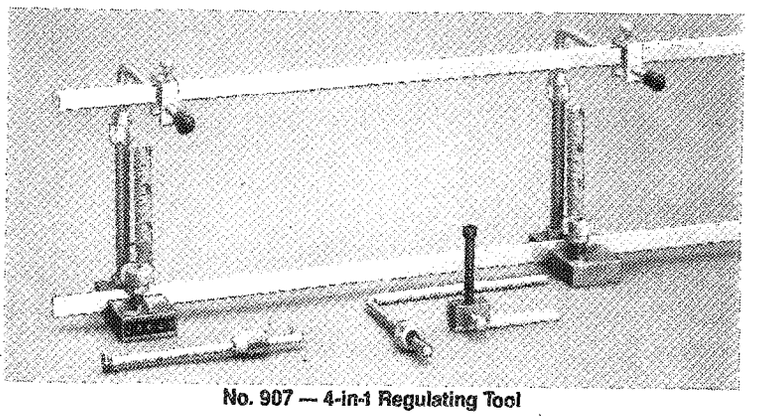

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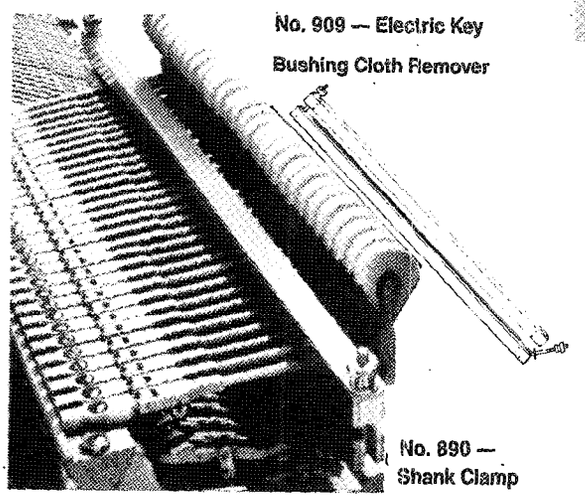

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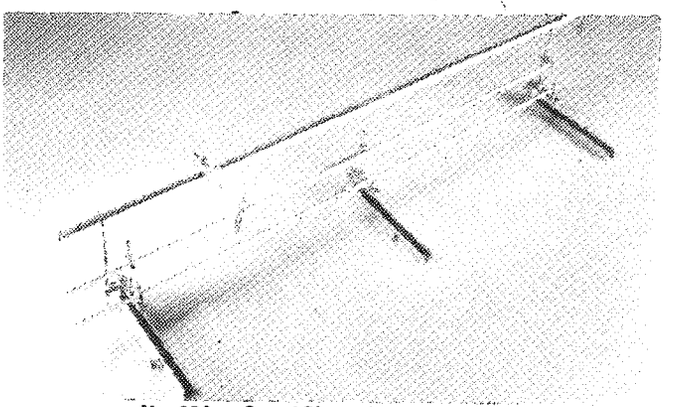

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Editorial Perspective

Technology: Threat or Menace?

Steve Brady, RPT
***Journal* Editor**

A common thread running through much of this month's issue is the word "technology." I remember when I first began my studies of "piano technology." I thought, well, that sounds more impressive than "piano tuning." Sounds kind of, you know, very 70s, very hip, very now. Obviously, technology affects not only our work on pianos (ETAs and computer rescaling programs), but our office work (managing clientele, scheduling, finances and more) and our entire lives as well. When I stop to think about how technology has transformed our lives in the past 25 years, I'm just plain amazed.

As I sit typing this on my personal computer, I am within arm's reach of a phone/fax machine, a laser printer, and a cordless phone from my other household phone line. I'm listening to a CD (!) which is playing on my computer's CD drive, which I can control on the screen with a mouse (a what?). A minute ago, I was logged on to the Internet via my computer's internal fax/modem which takes me through the phone lines to the University of Washington's really big computers, which access the Internet. Twenty-five years ago most of us had never heard of any of these things. Today, many of us take all these things for granted.

But all is not well in our technological Eden. As much as the personal computer has made things easier, it has introduced a new level of frustration into my life. The same machine which allows easy, efficient editing through the miracle of word processing, is the one-eyed digital bandit which earlier today locked up and deleted an article I had been editing for over an hour. The term "learning curve" developed as a description of the process we all must go through upon buying a new piece of modern technology.

The list of contradictions goes on. I admit that the cellular phone has streamlined my business and personal communications, but there is always that new bill in the mailbox which was never there before. While voice-mail is a real convenience to the busy entrepreneur, it becomes onerous for me to face four different voice-mail boxes each day. The so-called "paperless" society envisioned by Bill Gates has me wondering why there's a box of 10 reams of computer paper on the floor by my desk; I never bought paper in these quantities before the advent of the personal computer.

So, in the face of all this irony, will I soon be throwing out these tools of the devil? No. No way. I'm hooked.

To help all of us get off the ground with the Internet, Ron Berry has provided an excellent introduction with his article in this issue. Beginning next month, Bill Springer will be presenting an in-depth series on "Surfing the Internet."

As John Hartman points out, technology is defined as "applied science." My dictionary goes on to say that technology is also "the body of knowledge available to a civilization that is of use in fashioning implements, practicing manual arts and skills...." Technology, it seems to me, has two sides, the part you learn by reading and studying scientific principles, and the part you learn by doing.

Glen Hart wants to put the "ology" into piano technology, hinting that perhaps the use of the word "technology" has been slightly exaggerated in our field. And he's right. Certain bits of "conventional wisdom" in our craft have evolved by something resembling folklore to the point of being taken as absolute truth by many practitioners. Many have practiced "piano technology" for most of their adult lives, yet somehow neglected to pursue the "ology." This is wrong.

On the other hand, some novices in our ranks disdainfully brush aside the observations of experienced, expert piano technicians, simply because their comments are

not couched in the language of 20th-century physics or engineering. Some of these self-appointed watchdogs of our profession could no more tune, regulate, or voice a piano properly than fly to the moon. For such tyros to "diss" competent piano technicians, who often have more practical knowledge than their critics ever will, is also wrong.

Fortunately for all of us, there are a few individuals who are not only very able piano artisans, but who are also well-versed in the sciences of physics and engineering. What's more, some of these are willing and able to share their knowledge with the rest of us. I hope you enjoy the articles in this issue which follow this theme.

The balance between practical skills and theoretical knowledge is important to me as an editor, and to all of us as piano technicians. Practical skills, theoretical knowledge — the best technicians today are those who go about their work with a firm grasp on both.

PIANO TECHNICIANS
Journal
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COLUMNS & COMMENTS

DEPARTMENTS

IN ADDITION

FEATURES

PACE
Professionals Advance through Continuing Education
LESSON PLAN

COVER ART

The 10'2" Fazioli concert grand shown on this month's cover is the world's largest piano currently in production. According to importer Steve Witkowski, the instrument weighs in at 1650 pounds and carries a price tag of $147,000. It is the only one of its kind in the U.S.

Satoshi Ono, from left, Shozo Maede and Kenji Hata watch as Takahiro Natori plays the Fazioli in the exhibit hall at the 1995 PTG Annual Convention in Albuquerque. The piano has since travelled to Colorado for the Telluride Jazz Festival, to Los Angeles for appearances at the Hollywood Bowl and other venues, and to Utah for use in the B.Y.U. Fall Music Festival. It is currently in New York City, where it will be featured in a major concert in November.

Does the Status Quo Need a Change?

PTG President
Leon Speir, RPT

Man cannot fly! If man were meant to go to the moon, then God would have given us an easy to get there! Why change?, it works great the way it is! What is this crazy contraption called the automobile, it will kill you! You can't do that! PTG is doing well the way it is, leave it alone!

How many of these have *you* heard; phrases which are all designed to maintain the status-quo. Maintain the status quo, you say? We can! We could have maintained the status quo when Ben Franklin discovered that electricity could be captured! We could have when the Wright brothers decided to risk their lives to fly! We could have when John Kennedy took the leadership to put a man on the moon! *Of course,* we *can* maintain the status quo. But should we? Well, maybe; but maybe not! Where would the world be today had inventors, visionaries and leaders not stressed progress and betterment?

PTG is a great organization! It has *no* flaws! It's perfect! Nothing can be done to make it better! Do you agree? If you do, then let's maintain the status-quo and we should survive forever. Well, I must confess, I don't totally agree! It's true that we have a very successful organization which represents the interest of piano technicians! Organizationally and financially, we are in the best shape we have ever been in. We have more members than ever. We have a very solid and reliable Home Office operation. We have an organization that we should be very proud of! But, can we do better? I think so!

Maybe we don't need to change anything, but we do need to examine whether or not there needs to be changes. What can *you* think of that would make PTG better? Can it be streamlined to meet *your* need more efficiently? Does PTG represent the majority of piano technicians? Is the political structure as efficient as it should be, or it a cumbersome, lumbering structure which is not representative of its members? Are products and services adequate to help you? Are educational opportunities adequate? Does it meet the demands of our industry in the '90s?

Of course, what I am talking about is Strategic Planning and your role in that planning. The process has begun. I encourage you to become involved in defining what PTG will be in the future. Contact your RVP, your committee chairs, and other leaders and let your views be known. Developing a strategic plan requires your involvement to succeed. Do get involved!

Leon Speir

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Letters

Golden Hammer an Honor

I wish to express my gratitude and thanks for being chosen to receive the "Golden Hammer" Award at our recent convention in Albuquerque. Watching recipients for over 20 years was no help for me when, as the presentation was being read, it suddenly dawned on me that I was the person that Ben was talking about.

The satisfaction and pleasure I have enjoyed working with and for PTG through the years has always been sufficient reward. Receiving the unique "Golden Hammer" and the recognition attending its presentation makes those times and that effort all the more satisfying. And most of all, none of it would ever have happened if not for the support and assistance of my wife Agnes. The award is hers as much as it is mine.

— Charles P. Huether, RPT

Thanks for the Convention

On behalf of the Canadian Association of Piano Technicians, I would like to thank the PTG for the wonderful experiences of the 1995 Albuquerque Convention.

The treatment we received, the wealth of learning, and the joy of sharing experiences, wisdoms and resources isn't something we'll soon forget.

We especially want the Albuquerque organizing committee to know that they did a magnificent job. Mr. Crabb's Barbershop Chorus was terrific. The A-440 band and the Steinway Concert were great. Where does one start? From start to finish it was a most auspicious occasion.

May the PTG continue to flourish. Hopefully, we can return again next year in Dearborn.

— Tom Thievin, RPT
President of Canadian Association of Piano Technicians

Ditto...

The opportunity is here for this committee to write an article which had disappeared for several years. The recent Annual Convention in Albuquerque, N.M., opened the doors for us to start reaching our goals for the present and near future. As chairman of this committee, I have an obligation to fulfill this goal. We the visually impaired would like to express our deepest thanks for all of the special instructors who gave us excellent classes at the convention. Brian DeTar gave a three-hour class on vertical regulation and was very informative. Harry Lyddal from Scotland spoke about European piano history and tuning. Ben McKlveen gave tips and demonstrations on repairing pianos in a home. We are grateful for his class and his volunteering to read our *Journal* tapes. We thank all of you for sharing your knowledge with us. In the near future you will receive another article concerning next year's classes. I would like to mention the committee members: Don Mitchell, Don Wigent, Mark Hass and myself, Roy Escobar.

— Roy Escobar, Chairman, Visually Impaired Committee

Glad to be Back

I am both pleased and excited to enclose my completed reclassification, upgrading myself from Associate to RPT status as a result of passing the technical examination in Albuquerque.

Thirty six years ago this past May, I had the privilege of finishing a course at Dr. William Braid White's School of Pianoforte Technology in Chicago. I understand I was one of Dr. White's last students since he passed away shortly after my completion. I can recall Dr. White's urging his students to become involved with an organization which was just starting to take root called the Piano Technicians Guild.

I returned to my home town of Xenia, Ohio and started working my new trade. With the encouragement of another piano technician, Mr. John Kohl, I joined the Dayton, Ohio chapter of PTG which was also just getting started. At some point during the next three-year period I attended a very small and scantily attended PTG convention in Indiana. I'm not sure if this was a state or annual convention. At this convention I took the examination for what, as I recall, was the title of Craftsman. I remember the test was in two parts: some tuning and some technical. I had just begun setting the temperament on an old upright when the test giver told me it was obvious I knew how to tune and moved me to an action model. I completed the whole examination in a very short time.

It wasn't long after this that Pres. Jack Kennedy decided that I was more needed watching the building of the Berlin Wall than I was tuning and repairing pianos. Being a member of the Ohio Air National Guard, in a short period of time, I found myself sitting in France and out of the piano business.

Like many young people, active military service sent my personal life in a completely different direction. This in itself is another story. Until five years ago, I had spent 30 years in various areas of the sales field. I did keep myself somewhat in practice over the years tuning and repairing my own piano. I always felt that someday I would return to this business.

A little over five years ago a company I was representing went bankrupt and I found myself in my early 50s looking for a job for the first time in my life. It was at my wife Cindy's suggestion that we decided that there was no better time to start tuning and repairing pianos. Shortly thereafter I joined the Columbus chapter of PTG as an Associate and started building my business.

I attended my first PTG annual convention July 1991 in Philadelphia, Pa. Leaving this business some 30 years prior with PTG just beginning, it's impossible to describe the amazement and excitement I felt seeing what had happened to this organization. I took every class I could at that convention and enjoyed them all. Needless to say, I haven't missed a PTG convention since and don't plan on missing any in the future. I would urge and encourage all Associates to do whatever they must to attend the conventions and take in all the classes they can. I have always made enough from the new ideas I've received to more than pay for the convention. The knowledge gained and the new friends made are priceless.

I don't know where to start when it comes to thanking all of the people who have helped me. A special thank

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you must go to all of the class instructors at the conventions and all those who write the PACE lessons and other technical material in the *Journal* for giving so unselfishly of their time.

Last but certainly not least, I want to thank all of my friends in my home chapter in Columbus, Ohio for all of their help and encouragement.

— Ron May, RPT

Feedback on Finishes

In the August 1995 issue of the *Journal*, Paul Dempsey asked for feedback on the use of water-based finishes. Having a background in aircraft, automotive and cabinetry finishing techniques, I found this an enthralling question. I have some hints and procedural information that may assist him and other techs who are moving towards water-based finishing techniques.

Until recently I have been a "Nitro Nut." I love nitrocellulose's forgiving nature and the variety of stain, dye and tone effects which have, until recently, been unavailable in water-based systems. However, just as Mr. Dempsey aptly stated, "The government's handwriting is on the wall."

My product of choice, after testing several, is the *Amity*® brand Tabletop finish in gloss. It is available through Minuteman in Waterloo, Wisc., phone 1-800-733-1776. A good customer of mine put me on to it. He builds acoustic guitars and has found that the crystal clear finish magnified the wood grain like nothing else. In addition it does not muffle the soundbox.

The secret I've found in spraying water-based finishes is basically to toss out all of the rules associated with nitro. As much as the manufacturers of water products have tried to make the transition easy, lets face facts, water just does not behave like petroleum solvents.

Clean, dry air in the mid-70s has proven to me to be the ideal spraying condition. Unlike nitro, high humidity will not cause water-based finishes to haze or "blush." Humidity should be kept low, however, due to the fact that the finish dries by the evaporation of water. The more water the air can hold, the shorter the drying time.

Start by spraying a light dusting of finish and allow 10 to 15 minutes to dry. This starts to seal the wood and allows for better adhesion of the finish. Proceed with light coats. Water-based products build very fast and do not shrink the way nitro does. Light coats speed the drying time as well as prevent sags.

The finish will go on looking "milky" and perhaps with a slightly blue-ish tint. Don't panic, this is normal to many of these products and will dry crystal clear. This can actually be used to tell you when it's dry as well as to locate any accidental sags that may occur.

One coat of the table top finish is the equivalent of two coats of nitro. The sanding sealer is the equivalent of two to two-and-a-half coats. Many people complain about the amount of time between coats, but 30 minutes for one coat of nitro vs. one hour for the equivalent of two coats and I just don't see the difference. Except, perhaps, that it is the same amount of time with only half of the work required. What should they do with the hour? Well, go regulate something. Maybe read the *Journal*. Cure time is 12 hours or basically overnight.

Sanding the finish was a nightmare at first. I went through sand paper like it was, well ... water. Dry sanding was, as usual, a joke. Mineral oil wet sanding did not do well at all. Never, ever use water as a lubricant. The water starts to reconstitute the dust back into a pasty version of the finish. A paste which then clouds the project giving a look very similar to "blush." Ask me how I know. One day I found the answer completely by accident. Having run out of lubricant in the midst of a project, I grabbed a bottle of Old English lemon oil. Serendipity strikes again. My 400-grit never lasted so long or stayed this clean before. To date there have been no adverse effects.

Another hint is to avoid brush application unless you have to. A disposable foam brush works best. Still, it is difficult to prevent bubbles, foaming or brush strokes. To avoid foaming (frothing), the best answer is to gently tap the brush against the inner side of the container instead of drawing the brush across the lip of the container. When applying the finish, draw the brush in one direction across the project uniformly. Never stroke back across the applied finish.

The product that I use can be either sprayed or brushed. A traditional compressor and gun system works just fine. The only drawback is the traditional problem of lost material through overspray. It is by no means necessary to convert to HVLP (High Volume Low Pressure) to spray water-based finishes. HVLP systems were developed primarily to rid us of the overspray problem. The benefit of using HVLP is that it can cut your material usage by a half or better. They are just as effective with nitro as with water. Reduced cost with no sacrifice of quality, gotta love it.

A cabinet maker friend of mine recently put me on to a new spray gun manufactured by GRACO® (gray-co). It will spray HVLP without a turbine to feed it. A normal air compressor, of 8 cfm or better, will operate the system as the venturi and other components are contained in the gun itself. It works well and costs about a third of a quality turbine and gun set up. The only other parts required are a regulator, in-line filter and a water trap. If you are spraying nitro you should have these already.

Water-based finishes have very low health risks. You should still wear a respirator and eye protection anyway, just as a good precaution. The fire hazards are, likewise, very low. The manufacturers of *Amity*® state that their product is not only non-flammable, but is also non-combustible. I was shocked to learn that most of the supposedly "safe" water-borne products on the market still contain enough volatile solvents to be combustible (explosive). The claims of non-flammability merely mean that you cannot set fire to them in their liquid state. The overspray and normal fumes will still ignite, given the proper situation. This group of finishes includes almost all of the kinds readily available in the hard ware stores — such as water polyurethanes and varnishes.

I have successfully used water-based finishes on several customers pianos. Use of the new micro-grits can provide a glass-like finish similar to

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polyester. Repairs are similar to nitro. Clean any oil or grease away from the damaged area with a gentle cleaner. Allow to dry. Apply the finish. Once dried, level and rub out. A damaged lid or keyslip can be refinished to match the piano's case. Use an amber toner to simulate the look of lacquer. Once sprayed, simply rub down to the desired sheen.

Customer response to the new finishes has been extremely encouraging. My only remaining use for lacquer is on steel or brass plated steel hardware. Water-based finish will cause rust spots to poke through the plating.

The often-voiced problem of these finishes flaking was also amongst my experiments. I have found that dust or, in some cases, an over-abundance of stain pigments on the surface of the project are what interfere with adhesion. The use of tack rags also will cause trouble. Tack rags are just cheesecloth with a type of varnish applied. They will leave a residue on a piece that will repel future coats. I just use a "lightly" water-dampened clean rag instead. It works great. If you cut back between coats and clean away the dust you should have no problem with flaking finishes.

Be they left-wing environmental over-reactivists or right-wing progress-at-any-cost types, eventually politicians will put a stop to the use of oil-based finishes. We must be ready to change when the ax falls. I hope that this has helped those who are wrestling with water-based finishes. Good luck!

— Douglas P. McMillin,
South Pennsylvania Chapter

Spray Away Breaking Strings

In the August issue of the PT *Journal*, there were several letters that spoke of excessive string breakage on certain pianos. It is very rare that I have a string break while I am tuning. Perhaps one or two in an entire year. I attribute this to the fact that I now use Teflon® on every piano that I tune. The procedure that I use is as follows:

I use dry Teflon® from a spray can. Two products of this kind are Slide-All® and TFL 50® (there may be others). In order for this material to be applied, the spray aperture must be modified.

In the case of Slide-All®, the white center on the nozzle must be removed. Insert a snorkel (I call it spaghetti) into the hole and secure it with glue. I use cyanoacrylate. This spaghetti is available from a can of WD 40® or LPS #1®. With the TFL 50® you will need to drill a hole directly into the nozzle in order to accommodate the snorkel. The reason for using the snorkel is to localize and pin point the spray so that you can work on the treble bridge by going between and under the bass strings.

I then spray all string contact points, which takes only a few minutes. This includes the pressure bar, V-bar, Capo d'Astro bar, understring felt and most importantly, the bridges. For the bass section, I carry a 1/2" brush to which I apply the Teflon®, and then I brush it on the upper bass section where the strings contact the bass top bridge. Brushing insures that the Teflon® will not reach the windings. The Teflon® is inert and will not travel, but it is always best to be on the safe side. On pianos where the string breaking factor is high, I also apply LPS #1® to the treble pressure bar, V-bar and understring felt.

When using Teflon® I find that the piano is also far easier to tune since the string then moves easily along all of its segments. Anyone who is tired of having strings break may want to give this method a try.

— Dennis Kurk, RPT

Thumbs Up for Franklin

I would like to introduce myself and give you some of my background. My name is Sal Verdolino, I was trained at Steinway & Sons in tuning, restringing, action regulation and dampers. I became the world's fastest piano tuner in 1978 and was listed in the *Guinness Book* for that year. I owned my own piano store, "Verdolino & Sons" and worked for half of the piano dealers in New York City rebuilding. I was a guild member in the early 60s.

I just received a new issue (May 1995) of the *Journal*, and I was very impressed with the article by Mr. Dan Franklin about the duplex scale.

While at the Steinway factory in Long Island City as a restringer, I was taught to put the duplex scale back by the hitch pins, and as long as it had three strings on each duplex, it was right. I noticed the same as Mr. Franklin that some pianos did ring out more than others. Ironically, I did experiment with this myself, but not to the extent that Mr. Franklin did, and I find that by tapping them backward or forward it did improve the sound. I believe Mr. Franklin is on the right track. I hope he will be able to convince Steinway and other companies that his theory does work.

— Sal Verdolino

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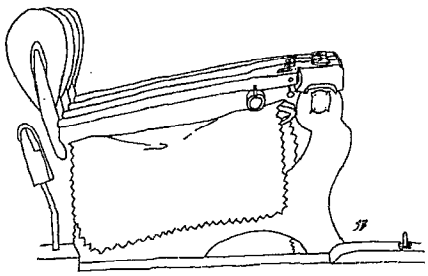
TT&T

Easier String Leveling and Hammer Spacing

Once in a while a class will have one tip that makes the whole day worthwhile. Such was the case at the Albuquerque Institute class, Regulating the Kawai EX Concert Grand, sponsored by Kawai America. The instructor, Takanori Otake, shared several valuable tips, but this one had most of the audience slapping their foreheads and muttering, "Why didn't I think of that?"

When spacing grand hammers or checking hammer-to-string fit, we normally raise the hammers by lifting the jack tenders. We have to press the jack tender into the let-off button to delay let-off, while also pressing midway along the jack tender to lift the wippen and block the hammer against the string. This will only work if let-off is set fairly close, otherwise the jack trips and the hammer never reaches the string. Mr. Otake's method is to first raise all the shanks and lay a piece of bushing cloth or thin felt over the tops of the repetition levers, the full length of the action. Now when the hammer shanks are laid back down, the knuckles sit on the felt strip. This delays let-off, so the jacks never trip. Even if let-off is already set very close, this method makes the job much easier and faster because no special technique is required. You can reach in with four fingers and block four or five hammers against the strings at once. If you are lucky enough to be working on a piano with V-shaped or narrowed flanges, you can use a flange spacing tool with one hand while holding the hammers blocked with the other, and space hammers in a matter of minutes.



The felt strip can be any thin material about 2" wide and 54" long. A strip of muffler rail felt makes a good ready-made piece. Bushing cloth is also ideal. [***Editor's note:*** *Brian DeTar adds that certain makes of pianos come with a ready-made piece of cloth that works well here: the key-cover cloth.*]

Thanks to Ray Chandler and Kawai for arranging and sponsoring this class.

— Bill Spurlock, RPT

TT&T

Quick Method for Let-Off

Here's a trick to set rough let-off by comparing how hard it is to press the jack through let-off. Press the jack tender into the let-off button while rolling your finger to the midway point along the jack tender to lift the wippen and block the hammer against the string. Continue to roll your finger forward along the jack tender until you push it through let-off. By adjusting the let-off button, you can change how much of a "bump" you feel as let-off occurs. With a little practice, you can rough in let-off to about .5mm tolerance.

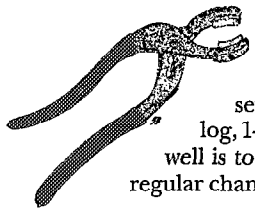
If let-off is too wide, the jack trips before any "bump" is felt. If let-off is too close, the "bump" is quite pronounced or it's even impossible to press the jack through let-off! The only danger in using this technique is that it's very easy to get let-off too close.

Have fun!! [***Editor's note:*** *don't use the cloth between balancier and knuckle when using this technique.*]

— Brian DeTar, RPT

TT&T

Another Tool for Removing Steinway Shoulder Nuts

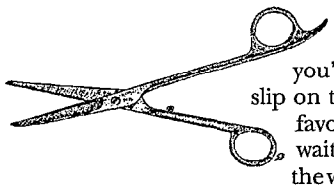


These specialty pliers make the job (see March, 1995 PTJ, Q&A section) a breeze. Their jaws are lined with tough plastic that won't mar the brass nut. They were available several years ago through the Brookstone catalog, 1-800-846-3000. An alternative which also works well is to slip pieces of plastic tubing over the jaws of regular channel-lock pliers.

— Isaac Sadigursky, RPT

TT&T

Special Scissors for Trimming Damper Wedges



So, there you are, sitting at home with the wrapper off that new CD you've been waiting two months for. You slip on the headphones, ease back into your favorite chair, take a sip of your tea and wait for the first notes to meander through the wires. And then you hear it—"**whoosh**" — as the dampers lift off the strings. Throughout every lilting passage, this infernal "**whoosh**" can be heard, almost covering the subtle nuances of each harmonic ... another Frisbee® for the dog is born.

So, what happened? Simple. There is a portion of the bichord and trichord damper felt that is protruding through the strings. As the dampers lift off the strings, the fibers of the "extra" damper felt scrapes the strings, much the same as plucking them with a soft pick. The resultant "**whoosh**" can be very distracting, to the musician as well as the audience.

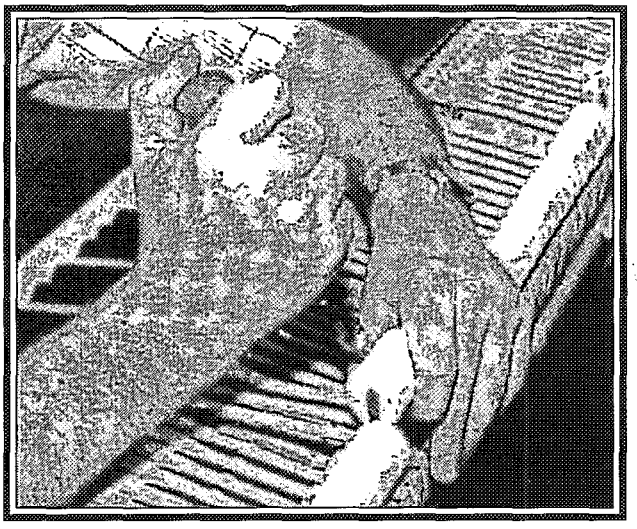
Fortunately, the solution is quite simple as well. Using a pair of barber shears (Solingen shears #3976, about $60 at a beauty supply store — or ask your hair stylist), remove each damper and cut the excess felt off. The excess felt is everything located at the **bottom** of the string mark on the damper. The closer you trim the felt to the string line, the more of the "**whoosh**" you will eliminate. Be careful here, as you don't want to remove any felt **above** the string mark. Doing so will cause the string(s) to bleed through. The trick is to cut **exactly** at the bottom of the string line. After you have cut off the excess felt, use the scissors to round off the sharp, square edge left by the scissors. Don't forget the dampers with "flat" felt on the front and trichord felt on the back.

The whole job (including re-regulation of the dampers) should take about 2-3 hours, depending on the number of dampers involved.

The procedure in a nutshell: turn the damper pedal adjusting cap nut up until the dampers just start to move; loosen the screws of the dampers you're going to trim; trim the dampers (return each damper to its respective lever after you trim it); when all dampers are trimmed and back in their respective lever, **finger tighten** all loose damper screws; align dampers to strings. Check and adjust for twisting and even lift; lightly tighten screw with a small screwdriver; recheck and adjust for alignment and twist; final tightening of screws. Snug but not overly tight; **re-record CD!** And enjoy **really** quiet damper lift.

As a side note, to minimize the "**thump**" heard by (yes, I'll say it) bad pedaling (usually, but not always), try changing the front/back angle of the damper so that the back of the damper comes in contact with the string **very** slightly before the front of the damper. The caveat here is to not create a zing. Keep changing the angle until you get the desired effect. It won't take much!!

— Brian DeTar, RPT



(Editor's note: The following questions and answers were taken from the Internet discussion group, "pianotech.")

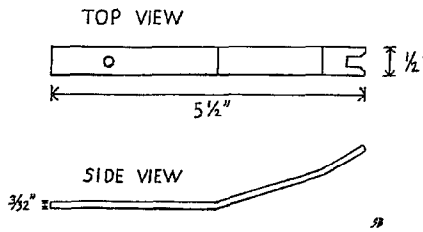
Q — A Better Capstan Wrench

I have never figured out how to avoid dragging my knuckles over the tops of the balance rail pins on certain pianos. OH!, and how are you supposed to adjust the capstans on those 1950s vintage Kimballs. The kind that have the keys that drop down at a 45-degree angle in the back?!!!

— Gordon Large, RPT

A — From Allan Gilreath, RPT

The best solution (short of pulling each key out and guessing at the adjustment) is to use one of the Baldwin style capstan wrenches. The one that I have I got at a factory some years ago. The wrench is made of 3/32" aluminum with a 30-degree up bend behind the head and a second bend further up the handle (see illustration).



This design easily lends itself to fabricating your own with a hack saw and a file in just a few minutes to fit just about any configuration. The bend keeps you from barking your knuckles on the balance rail pins and lets you reach down to get the capstans on the sloping keytails. Being made out of aluminum, the head will eventually wear, but it is easy to hammer the sides closer together and then clean up and square the insides with a file; plus it won't round off the shoulder on the capstans. I don't know if this wrench is still available from Baldwin, but it might be worth giving a call to Linda in Parts. Hope this helps.

Q — Muting "Shallow" Strings Wrench

One of the instruments I face next week is a console with an extremely short distance between the strings and the plate, making it difficult (if not impossible) to keep the mute strip in. Grateful for any suggestions or ideas....

— Lloyd Schultz

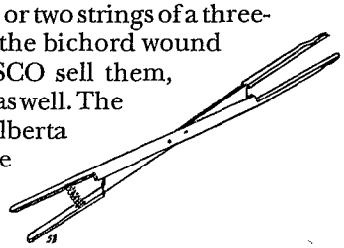
A — From Phil Sloffer, RPT

I stopped using strip mutes about 10 or 12 years ago. I just use one or two rubber mutes all the time. In the treble section on uprights I use a 1/4" dowel stick which has one end carved flat to fit between the strings. It is about 6 or 7 inches long and has a couple of tuning pins taped on the other end to give it some weight as well as to provide a handle of sorts.

A — From Rob Kiddell, RPT

Try a Papp's mute. The thing is worth its price ($15.00 Canadian, less in the U.S.).

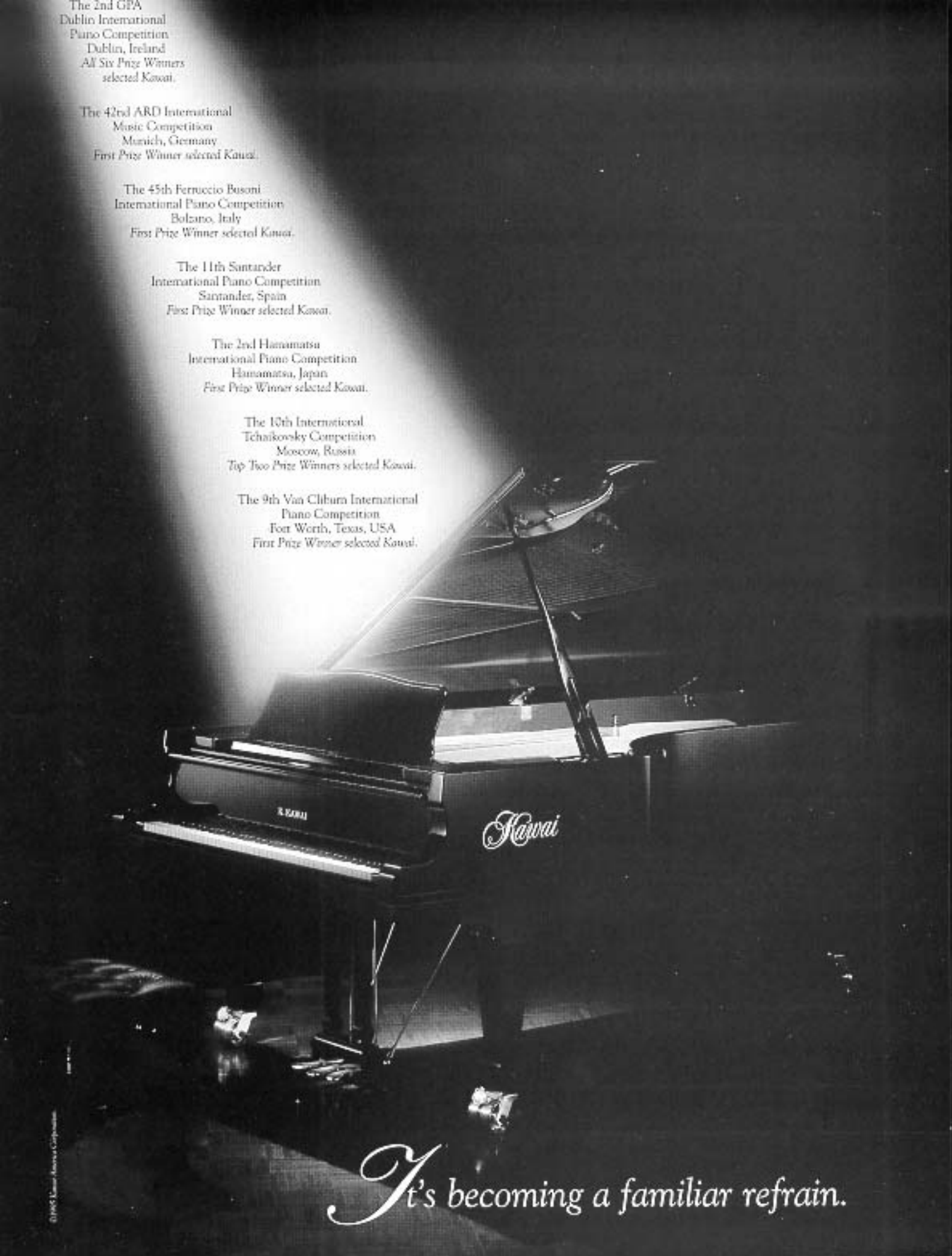
I've been using one for about eight months now, and have wondered how I worked without it. Basically, it is a plastic tweezer affair that can mute one or two strings of a three-string unison, and can work in the bichord wound strings as well. Schaff and APSCO sell them, and Pianophile in Canada does as well. The technician at the University of Alberta gave me one of his, and now I use my rubber mutes to fish out change that careless students have dropped onto grand soundboards.



A — From Tom McNeil, RPT

There are several other situations where strip muting is difficult, including most uprights above the treble break to the end of the dampers.

I carry a strip, 18 inches or so, of key bushing cloth. This is inserted in the small space between center string and either left or right string, leaving the other outside string open. On uprights, even spinets, there is usually just enough space between the tops of the dampers and the bottoms of the hammers in striking position to accommodate the strip. This may also work on birdcages. It is also handy for Baldwin Electropianos!


The 2nd GPA
Dublin International
Piano Competition
Dublin, Ireland
All Six Prize Winners
selected Kawai.
The 42nd ARD International
Music Competition
Munich, Germany
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.
Kawai
It's becoming a familiar refrain.

1995 PTG Technical Institute
Class Reviews ... Part 1

Editor's Note: *Although time and space permit us to present reviews of only a fraction of the classes presented at the Annual Convention in Albuquerque this past July, these reviews should give some idea of the flavor and insights of the excellent offerings which attendees of the convention were able to get firsthand. Thanks to our reviewers: Bill Ballard, RPT; Doug Kirkwood, RPT; and Eric Schandall, RPT, for their hard work and astute observations. This article will conclude in next month's* Journal.

How Firm a Foundation

Instructor: Jack Stebbins, RPT
Reviewed by Doug Kirkwood, RPT

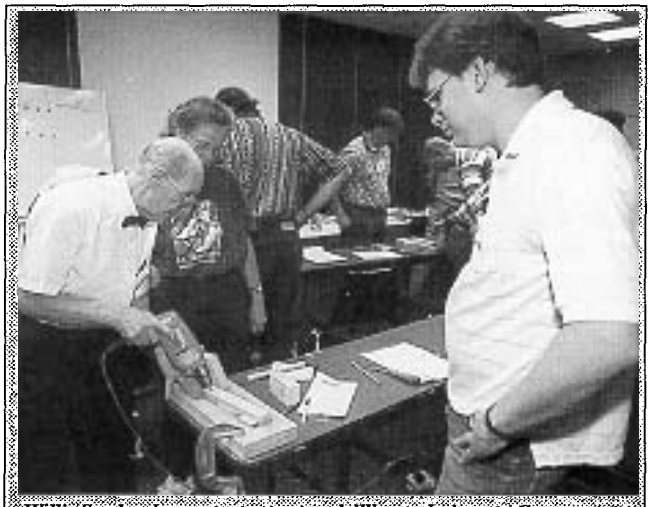
We are all in search of the ideal piano with no inharmonicity — right? Well, until it comes along, we'll have to be content with imperfection and its attendant challenges. Since there are as many degrees of inharmonicity as there are pianos, setting a temperament is really a guessing game, particularly at the start. Wouldn't it be nice if we could work with comparative beat rates rather than count them absolutely. If the piano told us where to set up the superstructure for a temperament (where to place a series of contiguous M3rds, for example), then there would be a lot less "fudging" in setting the temperament and the tuning would be a lot more efficient. This was what Jack set out to do. This was not a class in setting a temperament, but in establishing that superstructure — what he referred to as a firm foundation.

The idea came from a student of Jack's, David Sumrell, who outlined a process which allows the piano to set the position of the intervals. Inherent in this approach is the notion that within an octave, in a stack of contiguous M3rds, if the middle M3rd is halfway between the upper and lower M3rds (beatwise), regardless of how narrow or wide they are, it is in the correct position for that piano. The only requirement is that one has the ability to segregate beat rates into slow, medium and fast!

Here's how it works. Set A4 to 440 Hz. Then tune A3 from A4, choose whatever octave you want — probably a 4:2 octave. Set C#4 from A3 to a comfortable beat rate and then tune C#3 to C#4. Again, choose whatever octave you want. Now, tune F3 such that the F3-A3 M3rd is midway between C#3-F3 and A3-C#4. This fixes A4, A3 and F3. Then tune F4 from F3 and follow the same procedure to set C#4. Retune C#3 from C#4 and check the contiguous M3rds from C#3 to A4 making adjustments where needed to get a smoothly rising stack. Now you have your foundation. On further review, one might see a resemblance between this approach and the start of the Baldassin-Sanderson Temperament, though the two were arrived at independently.

The discussion then moved to tuning unisons where Jack shared his newly acquired skill of tuning the high partials in the "meow" area. This proved to be more effective and faster. The class was also enlivened with Jack's own brand of humor. Ask him about hardened criminals sometime.

Overall, Jack demonstrated a painless way of setting a foundation for a solid temperament in any piano because it is the piano, not the tuner which dictates the placement of the notes. Bravo!



Willis Snyder demonstrates proper drilling technique to Carmen Anderson, Houston, and Wade Morougham, Lanham, Md., during the Applied Bridge Capping — A Practical Approach advanced hands-on class.

Voicing the Boston Piano

Instructor: Scott Jones, Steinway & Sons
Reviewed by Doug Kirkwood, RPT

This class was unique in several ways, the most important of which was the time spent listening to the hammers rather than to verbal descriptions of what one should hear. It seems that, in the past, many classes on voicing spend 90 percent of the time describing what happens as a result of needling or juicing various parts of the hammer and 10 percent of the time listening to the results. This class was the reverse. Scott spent the bulk of the time listening to the effect of his work in the hammers, getting the class to describe what they heard and then telling them what he heard. It is remarkable how many different ways there are of describing the same sound.

The class started out with a brief description of the "factory" voicing procedures for both the New York and Hamburg Steinways. New York uses a soft-pressed hammer while Hamburg uses a hard-pressed one. The New York voicing starts with filing, juicing the shoulders and radial needling of the crown (11 o'clock to 1 o'clock). This is followed by juicing and needling the crown, finishing with single needling of the string cuts. In Hamburg (using the more traditional methods), the hammers are first needled heavily in the shoulders (at least 150 sticks each) followed by filing to restore shape. Then there is some light needling in the crown area and possibly one or two drops of juice (collodion-ether solution!) there as well. The

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voicing is done five times by different voicers. This class would focus on the soft pressed hammers from New York.

Six hammers were installed in the fourth and fifth octaves, each with different treatments. The first was untreated — right out of the box. The second was needled in the shoulders only, while the third was needled in the shoulders and then filed. The fourth had the same treatment as the third plus two drops of "juice" (acetone-keytop solution) on the crown. The fifth had the same treatment as the third plus four drops of juice on the shoulders. Finally, the sixth had the same treatment as the third and was flooded with juice. The goal was to bring all hammers to the same level of tone production and tone quality. Following the idea that shoulder needling was necessary to cause the tone to bloom and sustain, Scott needled the third hammer. After over 1,200 sticks in the shoulders and filing to restore shape, the process was abandoned as there was little change from the untreated hammer. Filing brought things out a bit, but it was not until we got to the crown that we realized significant changes. Even with the sixth (juice flooded) hammer, it was not until the crown was needled that any real changes took place. Shoulder needling only made a marginal difference. In the end, all hammers were brought up to the same level by working on the crown.

With the soft-pressed hammers (from Steinway, at least), it was clear that the farther you moved away from the crown, the less affect you had on the hammer's tone. This was confirmed in a later class by Ron Coners, head of Steinway's C&A division, who works only on the crown. So much for conventional wisdom. Scott did say that he had not had enough experience with other brands of hammers to generalize this technique, but one could reasonably expect that similar results should be achieved.

While some time was spent discussing needling and juicing techniques, most of the time was spent listening and describing what was heard. Being able to concentrate on the tone, identify its characteristics, have it confirmed by Scott that he was hearing the same thing, and relate that to the voicing techniques was most instructive. Without the aural reference, verbal descriptions of tone are vague at best. Understanding how different ears described the same tone, differently; and how, at the end, those same ears converged on a common set of descriptions was clearly a bonus. Though it is probably not possible to standardize the aural and verbal vocabulary of voicing completely, this class made giant strides in that direction.

Gary Nete has a full house for his class, Hospital for Hopeless Pianos, where he demonstrates methods for salvaging an upright.

The Art of Bedding the Key Frame

Instructor: Paul Monachino (Connecticut Chapter) Reviewed by Bill Ballard, RPT

Paul Monachino started working at the M&H factory in 1946. He started on vertical key leveling, and from there went on through every aspect of the action work including grand dampers, learning by watching the older guys. The class was liberally sprinkled with winks towards them: "If the older timers saw me doing this with a machine...," "...the old Swedes would have made me take the part of the piano to do this...."

But the class kept right on course, referring back to two recent pieces of keybed work, one ferreting out a "rack" in the keyframe in a piano teacher's studio and the second starting from square one with a water-damaged Mason & Hamlin. In the first case, the frame may have been racked from the beginning. In the second, Paul advised his friend Shawn they'd best not do anything on the badly soaked piano until two years of airing out.

Ordinarily the mating of frame and bed won't change drastically, but when it does you should know the assembly procedure to locate the problem. The keybed should start out true, and you confirm (or correct) this with a long straightedge, a portable florescent light and a plane (or scraper, depending on the situation). Any rack will show up with the straightedge laid corner to corner. By the way, when the hardwood plugs on which the glide bolts ride are inset, their grain is perpendicular to the frame shift (for lowest friction). On the old Mason & Hamlin keyframes, the back rail was ash which was strong and stood up well under friction. Both front and balance rails were a combination of pine and maple laminations (the former being lightweight, and the latter being tough so as to hold the key guide pins). Both front and back rails have their undersides relieved so that only the outside 3/4" sits on the bed. These plus the balance rail glides are the frame's only contact with the bed. If, on first assembly, the frame is racked, this is corrected by locating the rail with the bow (however subtle), sawing a kerf across the rail at that point going through 50 percent of the thickness, and inserting a slim wooden wedge. (This is a common technique: you'll even find hammer rails corrected thus.) When mating the back rail, you can gently lift up on the balance rail at the center of gravity to see which corner of the back rail lifts first.

With a stripped frame the balance rail glides are set using paper strips. With the fully loaded frame and top action, Paul has a nifty little maple pry-bar which presses down from the plate flange onto the hammer rail. If the studs are too high, he'll see keys wink downwards. If the studs are too high, the keyframe will pivot on the balance

rail, the back rail will go down and at the front the keys will go up. With the back and balance rails on firm footing, the front rail is duck soup. One word of advice: in any of this fitting work, Paul never uses sandpaper heavier than medium grade (120). In fact he's so wary of loosened abrasives that he does most of his work with a well sharpened scraper.

Paul didn't stop there, and with the original hand-made gauges from the factory, walked us through the remaining details of the keyframe (frame guide pins and shift lever slot), the support blocks for the feet of the action brackets, and the frame's side walls. He then located the top action frame in three directions (including the hammer strike, capstan, and backcheck lines). One action axis that was new for me went from the keytouch spot at full dip through the hammershank center to the hammer strike point at let-off.

Tim Rainwater and Jim Geiger demostrate how to move pianos efficiently during the Piano Moving class.

At the end of the class he handed out a set of regulating specs for the "current" Mason & Hamlin. Working at the side of and gaining the respect and wisdom of the old-timers at the M&H Rochester plant, Paul is one of our last remaining links to the skills at work in the original Boston M&H factory. Any class he wants to give, you should go see. He loves to pass on knowledge.

Solving Voicing Problems with a Second Action

Instructor: Ken Sloane, RPT
Reviewed by Bill Ballard, RPT and Eric Schandall, RPT

Eric Schandall: The voicing problem which needed to be solved was caused by the double duty which a Steinway D was being asked to do. It had been used for solo recital work and with the orchestra. It then was required to be used with smaller ensembles and for accompanying as well.

Bill Ballard: Ken Sloane told his department head at Oberlin Conservatory that his major headache was the roller-coaster of voicing requests on this 1979 Steinway D in the main hall. His superior said, "If it would make your job easier, go ahead and make a second action for the piano." Ken had his marching orders.

What arrived from the Steinway factory was the top action frame with all associated parts, a Kluge keyset mortised and bushed for the guidepins (but with no caps or checks even drilled for), and one oversized keyframe. A certain amount of fitting the frame was copying crucial dimensions from the old frame, such as the distance from balance pin #1 to the side wall. He also made sure that the new bass and treble sides were at the same angle to the front rail as the old. The side walls themselves were blank and oversized and the front corner of the key frame needed to be cut out for the keyblocks. All detail to be copied.

ES: Ken led us through the process of assembly with a slide presentation. First, the placement of the hammer action had to be determined up-and-down, front-to-back, and side-to-side in relation to the keyframe.

BB: As for locating the top action, lateral was no problem. Height and fore/aft was a matter of balancing a good key fulcrum-to-wippen center axis, a good keylever ratio (and thus a good overall action ratio), all the while keeping the hammer and shank within reach of the desired strike point on the string. Fortunately, he found enough wiggle room in all of these measurements. The stack height could actually change quite a bit before the key/wippen axis strayed badly. Changing the shank length of #88 by 1/4" would only make a 2 g change in the downweight. To simulate capstans of varying location and height he used a series of short dowels (stubs, really) of slightly increasing height. One indication that he was closing in on the proper location was that vertical lines drawn on the dowel and the associated wippen heel stayed together throughout the stroke.

ES: One broad theme of the class was that in looking at an action assembly, a lot is taken for granted. On a new keyframe and keys you soon discover that little is solved for or machined and it's up to you to do that. With the hammer held at let-off, you can determine both the height of the backchecks and the placement of their wires. Backcheck height should be about 1/16" lower than the bottom of the hammer tail. The wire should enter the key 1/2" nearer the front of the key than a plumb line drawn through the center of the hammer molding to the key (this was attributed to Bruce Clark).

BB: The new Kluge keyset was 7/16" wider over the 88 notes. (From the back of the room, Michael Mohr of Steinway confirmed this, adding that their only pianist to be bothered by this was Eugene Istomin.) With a keyframe (and action) located from the bass side, Ken would need a new treble keyblock. This seemed simple until we followed him through all the details required, such as locator dowels, recessed mortise to hold a properly located keyframe guidepin plate, a slight trim on the back of the left side for clearance of the fan of the keys, the notch in the back of the top for the fallboard, installing the fallboard pivot plate, and let's not forget the mahogany face veneer to cover the end grain at the front of the keyblock. All this done, the block was sealed with shellac, giving a golden glow he grew quite fond of before finally finishing it off with the standard black lacquer.

As it worked out, the new action needed a 1.95:1 key ratio instead of the hoped for 2:1. The original action had previously been refitted with Renner post-84 shanks (high leverage) and Ronsen hammers (for lightness), and had a balance weight ranging between 35-40 g. The new one, with current NY hammers, weighs in at slightly above 40 g of BW. The touch difference is noticeable but not objectionable. Part of the touch difference comes from a measure of Kluge's O.E.M. key friction which Ken retained. Ken ex-

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plains, "pianists like the feel of tightly bushed keys as long as friction levels in general do not get excessive."

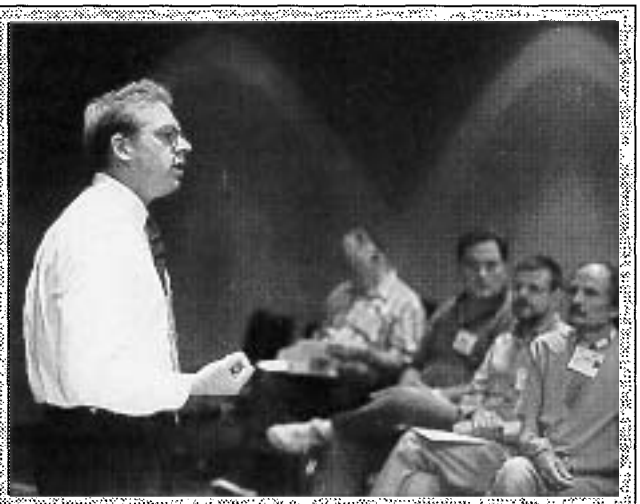
His observations of pianists' reactions to different keyleading reassures us. Earlier he had tried his pianists out on a new keyset which, albeit with the action regulated, was as yet without leading. This action, with downweights around 100g, was called "light" by some pianists, presumably because of the acceleration available with such low inertia. Another issue not settled by the response of pianists is whether a keyboard accelerates better with less leads closer to the fulcrum or fewer farther out. Physics would recommend the former. However, Oberlin was loaned a Yamaha CFIII with downweights around 60g and the leading way out front. Again, some pianists called this light. Ken uses Jiffy-Leads, which are quick to install, easy to reposition later on, and don't make Swiss Cheese of the key.

But in this business, sound rules. Ken can now offer pianists performing in that hall a choice. The original action, with smaller yet harder hammers is the one to cut through in a concerto situation. The second action has the warm sound required for chamber music. For a solo recital either has something to offer. Ken had all this well documented with audio recordings of each action (Schubert B flat Trio with the new, warmer sounding action and the Rachmaninoff concerto "Paganini Variations" on the old, bright action).

ES: The class was enjoyable for several reasons. First, the things necessary to think about were presented in a sequence that related to the assembly and overall functional relationship. Second, Ken told us about things that went wrong and how he got them to be right. Third, he was pleased with his work and it was enjoyable to share that satisfaction. Although this might not be a common job it was a great way to explain elemental principles of action and keyframe design, and how these components are placed in relation to the rest of the piano.

BB: An accurate accounting of time was not a part of the job this first time out, and he says next time, he'll buy the keyblock from Steinway. There will always be the logistical constraint that the piano with its original action has to remain on duty throughout the process. He lost quite a bit of time in the half-mile commute between his maintenance shop and the piano's hall.

Regardless, I'm sure he'll be doing this again. When he does, I hope he makes a 37-step instructional video for the rest of us.



Alan Vincent discusses bridging the gap between technicians and the clients they service pianos for in Artist/Teacher vs. Technicians — Bridging the Gap.

"From NY to Hamburg" A Profile of Steinway & Sons Sister Factories

Instructors: Michael Mohr and Hartwig Kalb (Steinway & Sons)
Reviewed by Bill Ballard, RPT

After John Bayless's rousing demonstration of the NY and Hamburg Ds at Steinway's Saturday evening concert, we had many questions about these two separate operations. In their class, "From NY to Hamburg," Mohr and Kalb, the respective service managers, made the case that any difference between the two manufacturing processes are mainly due to the local availability of materials. With a few well-known exceptions, most patents secured by NY were implemented by both factories, although in a reflection of the continental custom, Hamburg didn't begin patenting until after World War II.

The twelve-page handout provided an excellent chronology of historical moments and patents, a table of the grand models produced by each factory (with the years involved), followed by a brief description of selected major patents. The slide show alternated between pages from the original patents and shots of production from both factories. Many of the by-gone patents were illustrated with photos of the original pianos as being rebuilt by the factory's restoration center.

Immortal among the patents was the tubular action frame, originally appearing in the vertical in 1868 and in the grand the following year. Hamburg happens to use a bubinga dowel instead of NY's maple, as an example of the best materials available at each location. We also saw laminations of bubinga in a model D pinblock about to be glued in at the Hamburg factory, as well as their notorious dowels going from the ends of the pinblock into the rim.

The original duplex scale as patented in 1872 made its subdivision of the speaking length solely into fractions of 2 (1/2,1/4, 1/8, etc.) The description relates, "pianos made prior to this DUPLEX were said to contain a 'whistling sound being inharmonic to the fundamental character of the instrument." Neither factory now tunes these duplexes; the locations are by similar linear measurement.

Mohr is eager to know whether a patent from 1873 for hardwood inlays to stiffen soundboard ribs was ever used. Give him a call if you ever turn up such a piano. Nose bolts were introduced in 1876 as a means of regulating downbearing after a newly strung piano was at pitch. We find these beams not sunk directly into the beams below but into blocks scabbed onto their sides. Apparently nose bolts broke regularly enough that a quick way of extracting them was needed. What we know as keyframe glides were originally patented in 1879 as "key

Brian DeTar explains and demonstrates upright regulation techniques to visually impaired tuners during his class, Upright Regulation for the Visually Impaired.

leveling devices" (we know better now).

Electric arc-hardening of the capo bar has been done in Hamburg since 1931. At some point NY dropped the process and resumed it in the mid-1980s. We saw the Hamburg equipment in which a template guides the electrode by remote control along the capo.

The diaphragmatic soundboard sought to limber up the edges of soundboards, and indeed was patented right after the arrival of the S scale. The largest of the boards for the D even have this feathering, but only up at the treble rim. Conspicuously absent in the parade of patents were Vietor's two patents in the 1930s comprising the Accelerated Action and the 1962 Permafree action. NY learns from Hamburg and Hamburg learns from NY.

Much of the Hamburg factory was destroyed during World War II aerial bombardment, and with it most of their engineering archives. Thanks, NY, for the memories. NY also sent its one remaining casting pattern for the C plate to Hamburg about 20 years ago. On the other hand, NY will now use Hamburg's belly rail mounted sostenuto assembly, as well as Hamburg's approach to locating the capstan. But Hamburg will curtail its use of native beech, partly from concern for the sawdust's toxicity and for its vulnerability to certain tropical pests. NY is right there to tell Hamburg anything it needs to know about North American maple. In a private conversation, Kalb ruminated on the offspring of the two sister factories: could the Hamburg workforce follow NY procedures and produce a successful piano (and visa-versa)? No, it's a human thing, as it must be with the creation of a piano. We shall continue to monitor the difference between the NY and Hamburg pianos as these sister factories agree more and more on materials and procedures. By the way, that's a handsome soundboard decal being put on the new historical replicas from New York listing all of the immortal pianists. But where's my man, Ramsey Lewis?

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Putting The "Ology" Into Piano Technology

By Glen Hart
Salt Lake City, Utah Chapter

A Note To The Reader: This is not the type of article that can be read once and understood. It must be re-read and studied. Please don't get discouraged half way through and stop. Some of the principles might not be clear at first until you read further into the text. Then the second reading will be much clearer.

Over the last several years I have read and heard many times at seminars that piano strings do not stretch. I expected this doctrine to die a quick death, but since it hasn't, it is now time for euthanasia. In fact, piano wire continues to elongate throughout its entire life due to the combination of two different processes. I have done "Hooke's Law" experiments on piano wire in a physics lab and would like to submit my observations and conclusions. I have deliberately omitted the math as I don't think it would add to the purpose of this article. Formulas can be found in any college physics text.

Steel is a very elastic material. If you drop a piece it will bounce, not shatter. If piano wire were inelastic it would not be able to be pulled up to any pitch at all but would instantly break upon being pulled beyond its length. It also could not bend.

Hooke's Law states that strain (deformation) is proportional to stress. As weight or tension is added to the wire, the wire elongates. If the wire is getting longer and no steel is added, then where is the extra length coming from? Simple — the wire is getting thinner. The wire is stretching. The ratio of transverse deformation to longitudinal deformation is known as Poisson's ratio. This amount of thinning is so small that we don't worry about it as technicians, but it is there. The more weight that is put on the end of the wire the more it stretches. As tension (weight) is removed, the wire returns to its original length. This is elastic deformation, the measurement of which is known as Young's Modulus. Young's Modulus is a measurement of Hooke's Law. It is a ratio of stress to strain. Since strain is a pure number, the units of Young's Modulus are the same as those of stress, namely, force per unit area, e.g., psi.

Every substance has a limit to which it can be deformed and still return elastically to its original shape. This point is known as the elastic limit. When a piano string is pulled past this limit and then let down and measured it will have a new, longer length. In theory, the entire string is thinner as the wire deforms along its entire length. This is plastic deformation. In practice, however, this is not what occurs. The wire is not perfectly homogeneous and there are always places that are less strong. Before the wire will deform along its entire length, all of the deformation will occur at the weakest spot. The wire will "neck" at this point. At the neck the wire thins approximately 25 percent of its diameter and the neck length is twice the diameter of the string. This is permanent deformation caused by molecular flow and is the deformation found at every bend in the piano wire, i.e., hitch pin, bridge pin, V-bar, tuning pin, and becket. This is also how steel is machined by cutting tools.

When the wire undergoes plastic deformation it work-hardens and becomes brittle. The neck now has a lower breaking strength and smaller diameter than the rest of the string, and if tension continues to increase, the string will snap at that point. The two pieces of wire will have thinned ends with a cup and cone structure which is indicative of ductile rupture under tension as opposed to the longitudinal shear pattern of brittle rupture (we've all seen wire that has split down the center). Incidentally, there are many different numbers floating around the industry on the ratio of elastic limit to the breaking strength of piano wire. The amount I calculated from my data is 70 percent, and this is in agreement with data in engineering reference manuals. This is a constant for music wire and is independent of wire dimensions. Some piano scales are designed such that the string tension is over 60 percent of the breaking strength when at pitch. You don't have to raise the pitch very much to go from the normal A-440 tension to the 70 percent limit, so be careful about pulling strings sharp when restringing, especially in the treble. This will be explained later. The wire may not break but it could easily neck and you would never know it. Also, be very careful with string stretching and false beat eliminator tools. In the tenor there is a lot more margin for error as tension is staying relatively the same (approximately 160 pounds per string), but string diameter, i.e., breaking strength, is increasing.

I once had a five-year-old piano with a broken plate in the treble end. I lowered the pitch, welded the plate, and upon tuning, the crack reappeared. I then raised the tension in the treble until the strings started to break. I then welded the crack, which was opened up. When the tension was lowered, the stresses were such that there was compression on the weld. Every string in the high treble had been pulled past the elastic limit and had necked. I decided to tune it before restringing. What I found was exactly what I expected. There was a preponderance

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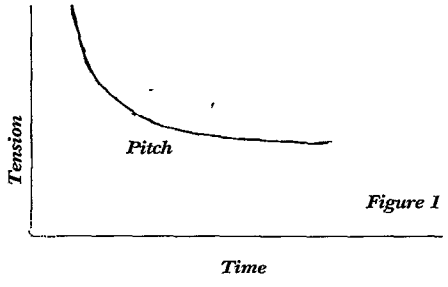

Figure 1

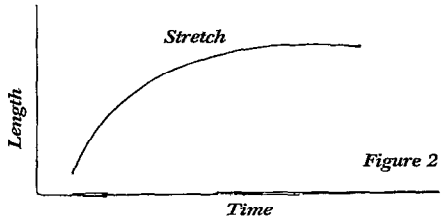

Figure 2

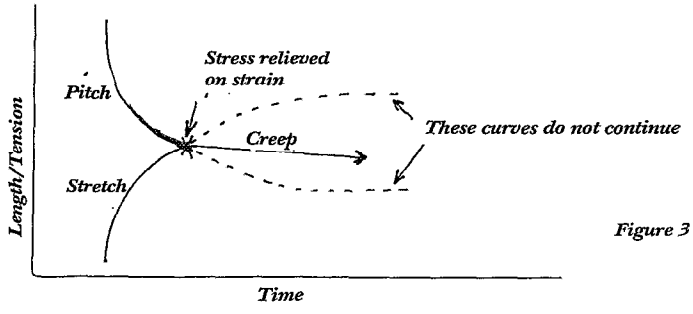

Figure 3

Putting The "Ology" Into Piano Technology

Continued from Previous Page

of new false beats and the effect on the neck was as if there were now two strings butted end to end. This destroyed the fundamental and resulted in a very thin, poor tone.

As mentioned earlier the elastic deformation occurs as tension is being applied. So why then does new wire go out of tune so quickly. We all know that when we replace a broken string it needs to be retuned several times while the rest of the strings remain stable. This is proof that this out of tuneness has nothing to do with humidity changes, soundboard movement, tuning pins turning, etc. Actually not all of the elastic deformation occurs immediately upon the application of tension. The release of elastic deformation is negatively exponential. The negative exponent doesn't mean that the quantity is negative but that the amount is becoming increasingly less per unit of time (exactly the opposite of exponential growth of an exploding population). The shape of the curve is a function of the properties of the material and amount and rate of stress applied. If you superimpose a graph of pitch relative to time onto a graph of stretch relative to time, the ordinates of each being tension and length respectively, equilibrium will occur at the intersection of the two curves (See Figures 1,2, and 3).

This is why it is so important to tune frequently when the strings are new. If the pitch drops too much before the stretch is complete, it will reach an equilibrium and stop stretching (See Figure 4).

Any elongation after this point is due to a different process known as creep. This is why we rarely find pianos much more than 1/2 step low in the mid-range even if they haven't been tuned in 50 years. The decreasing differential between tension and breaking strength as we move up the scale is the reason that the strings may be 1/2 step flat at A3 and greater than 1/2 step flat at A6. When retuned, these pianos quickly go out again from renewed stretching because they never reached equilibrium at A-440 tension. Remember, one-half step of pitch is only a few degrees of rotation of the tuning pin. I have repeatedly heard the argument that strings do not stretch because if they did, there would be four or five coils around the tuning pin. This is not true.

Now, why is it that we can remove a string, put in an oversized pin, and put back on the original string and it will stay in tune (relatively speaking)? We say that the "stretch has gone out of it," whatever that means, but it has never been pulled past the elastic limit. Franz Mohr tells the story of having a bass string break right before a concert. A new string would have to be tuned several times during the performance. He took a string from an identical model piano and installed it on the concert piano and it held a tune during the performance. What causes a string to not have to go through the entire stretching process every time it is removed? Rebound is also a negative exponentially curved line with rebound time being proportional to the amount of time under stress. The reason why the curves of stretch and rebound are exponentially curved is called hysteresis (accent on 3rd syllable with a long "e"), which by definition is "a lagging of elongation behind tensile stress and of contraction behind release from stress in an elastic solid due to internal friction." I believe that this is one of the reasons why if you tune unisons one at a time as you go up through the treble, the end result will be cleaner unisons than if you strip mute and then tune the outside strings several minutes after the center strings, unless the piano is very nearly in tune to start with.

I should make the point that much of the foregoing academic discourse explains only a small percentage of the total out-of-tuneness that actually occurs when the strings are new. Most of what gets called "string stretch" is really string straightening. The amount of stretch after initial loading to A-440 is minimal compared to the excess string length where the wire is not straight due to poor stringing techniques, such as where it leaves the hitch pin. The singing portion of the string is not straight either, even at full tension. When we seat strings at the agraffes and capo bar to eliminate false beats what we are really doing is making sure that the string comes off the termination in a straight line towards the bridge. Also (and I don't care what anybody says), it is okay to give the string a little tap in front of the bridge as well as on top to make sure that the wire leaves the bridge pin in a straight line and doesn't sweep around it. I like to stroke the string along its entire length with a string hook, first pulling and then pushing. In machining if you straighten a piece of bent metal by tension and then release the tension the bend returns, but if you tap it while under tension it will become "internally" straight and will not rebend when tension is released (very common in auto body repair). In doing "this" to the string by rubbing it, the tuning becomes more stable and the false beats disappear. I think this is what the string stretching and false beat eliminator tools are really doing, which shows that many false beats come from unstraight wire. Remember to not go too far or the wire will neck, eliminating one false beat while creating another. It is amazing how these simple string voicing procedures improve the tone and stability of the piano. It is these procedures that eliminate almost all of the noise out of the tone and they must be done before a needle ever touches a hammer. If they are not performed, it takes years for the strings to straighten out by themselves and many never do. The tuning is never stable and the tone is never good.

If a DC current is run through the wire the steel heats up by induction. If

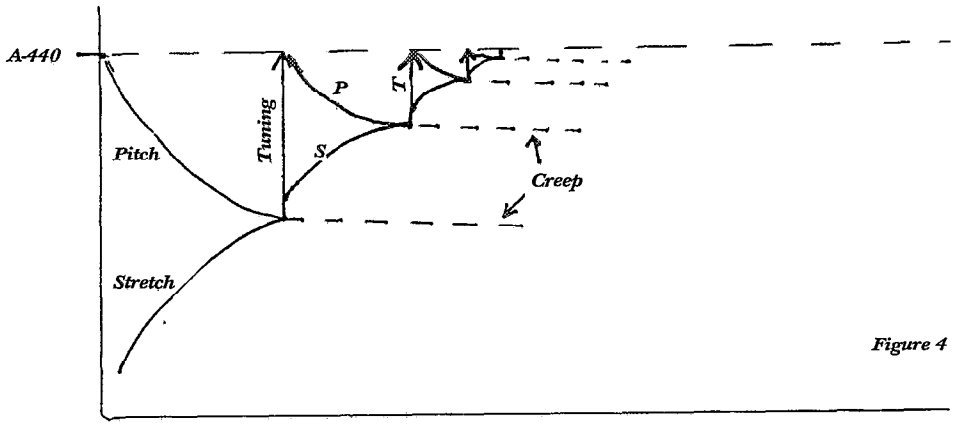

Figure 4

Effect of frequent tuning on new wire to equilibrate stress and strain at A-440

done with the string at tension, this would greatly accelerate all of these processes, especially hysteretical stretch. I've never done this but have heard of some people who have, and they swear by it. I think that this might be a great idea, but extreme care would have to be taken because it is also prematurely aging the steel. Now back to the academic discourse.

At the point where hysteretical lag approaches zero, and the strings are straight, and the wire is no longer elastically elongating because strain has relieved the stress, but at A-440 tension, (a good argument for tuning the piano above A-440, letting it sit for a while and then lowering it to A-440), another process known as internal molecular creep becomes significant. It has been written in PTG publications that creep only occurs in areas that have undergone previous plastic deformation (the "necks"), or in other words, where there is a bend such as at the becket, V-bar, bridge pin, hitch pin, etc. This is only partly correct. This principle is true only for stress-strain situations where the stress continues to increase until fracture. Figure 5 is a typical stress-strain curve of a ductile metal under tension. Point A is interesting. It is called the proportional limit. Here, Hooke's Law no longer applies. The stretch becomes greater and greater for a given unit of stress. Remember that the higher we go in the scale, the closer the tension is to the elastic limit, and somewhere along the scale point A tension will be exceeded. Is point A the reason we must anticipate and compensate for excessive drop in the treble when raising pitch? Also, could increasing hysteresis be a factor in this phenomenon? Supposedly, the soundboard is moving back from increased tension, but in a well made piano I don't believe it is significant. Maybe a scale designer could tell us

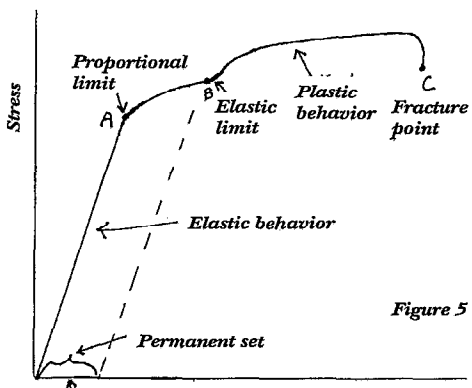

Figure 5

Elongation if string is let down after reaching point B

Typical stress-strain curve of a ductile metal under tension

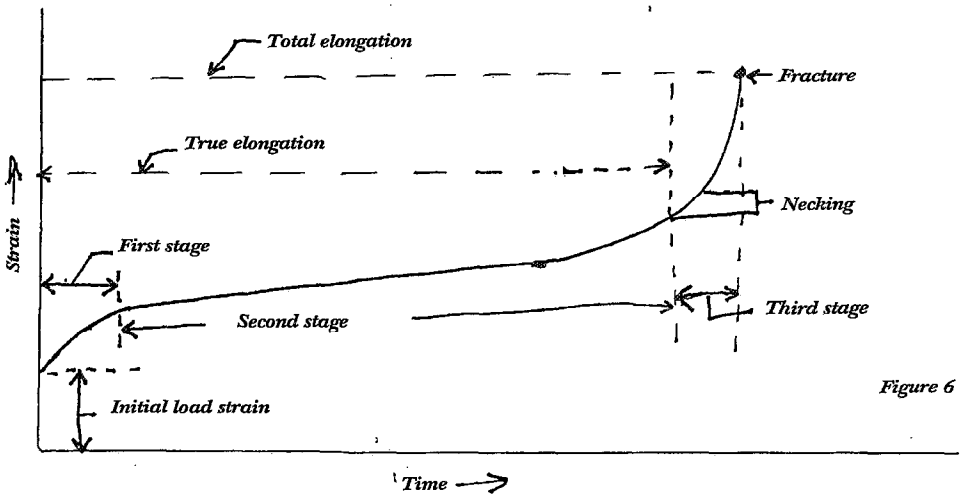

Figure 6

Schematic tension-creep curve showing the three stages of creep

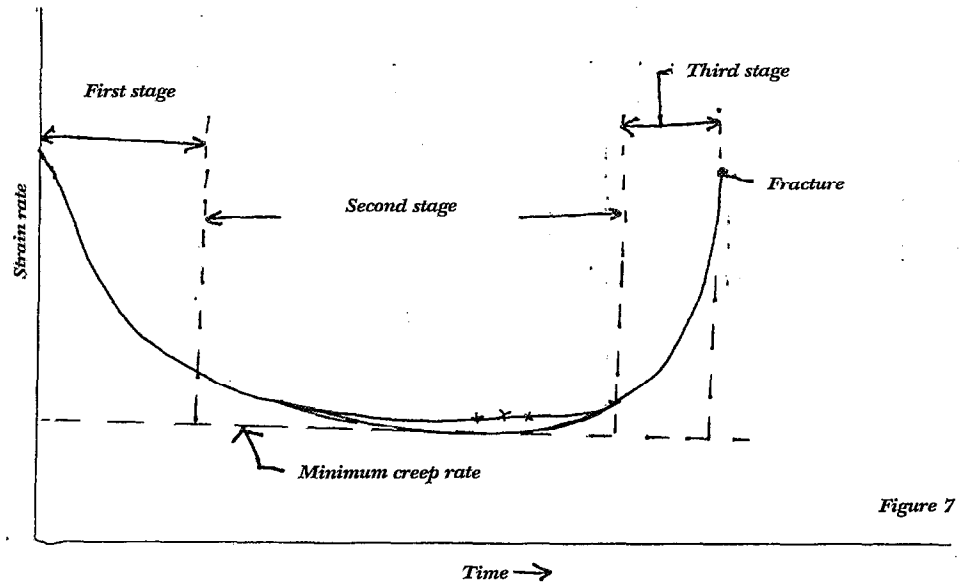

Figure 7

Relation of creep rate and time during a constant-load creep test

if this point is ever considered in design. A test such as is in Figure 5 may last for only a few moments.

Under these conditions, it is true that plastic deformation occurs only in the areas that exceeded the elastic limit; however, these are not the conditions that concern us. Only the first part of the curve applies to the piano. When tension reaches A-440 at a point slightly before point B (elastic limit), stress ceases to increase and is then held at a constant. The parameters that then apply to piano strings are strain and time, not stress and strain. Creep, by definition, is time dependent strain occurring under stress. This is closely related to and in some cases identical to stress relaxation. After a period of time, creep may terminate in fracture by stress rupture (also called creep rupture) provided that the strain (deformation (pitch drop)) occurring during creep does not relieve the stress. While under tension the molecules in the wire will migrate and realign by plastic deformation (age hardening) resulting in a longer string. This accompanied by recrystallization caused by continuous string vibration (work hardening) results in a ductile-to-brittle transition ending in rupture.

Most time-strain creep curves consist of three distinct phases. See Figures 6 and 7. Following initial elastic strain resulting from the immediate affects of the applied load, there is a region of increasing plastic strain at a decreasing strain rate. Following this stage, called primary creep, is a region of nominally constant rate of plastic strain called secondary creep. Finally there is a region of drasti-

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Putting The "Ology" Into Piano Technology

Continued from Previous Page

cally increased strain rate with rapid extension to rupture. The graphs do not take into account the elastic hysteretical lag that occurs at the beginning of the primary stage.

Secondary creep is an equilibrium condition between the mechanisms of work hardening and recovery; it is also known as steady state creep. This constant creep rate is generally known as the minimum creep and occupies the major portion of the creep cycle. This is the stage when the piano strings will have the greatest tuning stability. Primary creep has no distinct end point and tertiary creep has no distinct beginning. Tertiary creep may be accelerated by a reduction in cross-sectional area resulting from localized necking. This necking is not a result of excessive tension on the piano wires but of a gradual reduction in tensile strength during the ductile-to-brittle transition over the life of the string. It does not occur quickly as in tension overload. This is a cause for false beats that become abundant in old pianos and consequent excessive string breakage. Pianos are designed to have fairly equal tension from string to string but as the string diameter increases, the ratio of tension to elastic limit/breaking strength becomes much larger. Since the tension in the treble is much closer to the elastic limit, there is a greater propensity for necks, false beats, and broken strings the higher we go in the scale.

Creep must be seriously considered if DC current is going to be used to heat the string. Heat rapidly accelerates the creep rate and if the wire is heated too hot or for too long a period of time we could be putting it into the tertiary creep stage prematurely. I must say that I have no idea what too hot or too long might be.

Environmental affects such as oxidation that reduce cross-sectional area will increase tertiary creep rate—hence necking and fracture. Rust is not just on the surface but penetrates the steel several mils deep causing pitting and minute fractures which reduces the effective diameter of the wire and gives the same effects as increasing the string tension past the elastic limit. Usually when rusty strings break we attribute it to excessive friction at the contact points such as the capo bar but this may not be the cause at all in many cases.

I sometimes get into some interesting situations with the "Aspen, Colorado type" crowd. One was where a grand piano was in a large living room which also contained a full-sized swimming pool. The owners went on a six month vacation and before they left they placed several silica gel desiccant bags on the strings and then closed the top. The bags continued to collect humidity until they were saturated. In that short period of time the strings rusted so badly that they broke in the middle of the singing portion where the bags had been placed.

To summarize, piano strings continue to "stretch" indefinitely, as long as they are under tension. This stretch consists of:

A. Elastic deformation, similar to stretching a rubber band. This occurs quickly after tension is applied. When stress is released the body returns to its original shape.

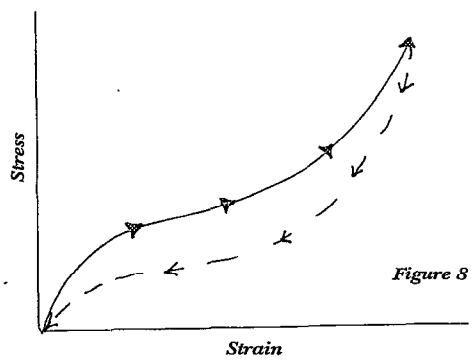
B. Plastic deformation. This is permanent. Some of this occurs quickly as the wire bends around bearing points. As long as the wire is kept up to correct tension, the elastic deformation and initial plastic deformation will stop.

C. Creep. This is further deformation due to molecular movement in the wire and will proceed slowly over the life of the string. The wire undergoes a gradual ductile-to-brittle transition resulting in necking and ultimately string breakage.

In conclusion, I would like to stress the importance of considering Hooke's Law/Young's Modulus and creep in other aspects of piano rebuilding, leaving you with some food for thought. (The forum for these "factoids" may not come up again.) I believe that soundboards that have the ribs attached with yellow or white glue or any other adhesive that will creep under stress, are destined to go flat. (It's illegal to use these adhesives in structural beams because they will sag). It is the reason why we use a larger drill bit for the same size tuning pin when drilling a compressed beech or "densified" pinblock and why these blocks are much less forgiving of errors. It is the reason why it is okay to snug up the tension resonator on Mason & Hamlins (stress relaxation). Compression ridges are caused when the fibers of the wood are pushed beyond the limits of compression. It's why screws and tuning pins can get loose after numerous expansion/contraction cycles (compression set of the wood fibers pushed past the elastic limit). It is why you must be careful not to use reaction wood (wood from trees pushed beyond the elastic limit by high winds) in making soundboards and especially ribs. This is extremely important for the ladder rung industry and can be difficult to detect. I once saw a soundboard that had undergone brash failure. It broke cleanly in half at the same point along each of the ribs. Brash failure is "textbook" evidence of reaction wood. If you cut ribs from the same stock, turn every other one end-for-end.

Hysteresis is carefully studied in the vulcanized rubber industry. Figure 8 shows a hysteresis curve of the storing and release of potential energy in elastic materials such as a rubber shock absorber on an engine mount. In the discussion on elasticity, the forces are conservative up to the elastic limit, that is, when the material returns to its original shape, work done in producing the deformation is recovered.

In Figure 8 there is no portion of the curve where strain is proportional to stress. The substance, however, is elastic in the sense that when stress is released, the body returns to its original shape. Now, keep in the back of your mind the non-lineal stiffness coefficient properties of the flexing piano hammer, which are needed for good power and tone throughout the dynamic range. On removing the load, the stress-strain curve is not retraced but follows the dashed curve. The lack of coincidence of the two curves is the elastic hysteresis. When the stress-strain relation exhibits this behavior, the associated forces are not conservative since the work done by the material in returning to its original shape is less than the work done to deform it. The area bounded by the two curves, that is, the hysteresis loop, is equal to the energy dissipated by elastic material. The shape



Typical stress-strain diagram showing elastic hysteresis of non-conservative force

of this curve is what we are actually trying to control when we voice hammers. The area inside the loop is equal to the energy imparted to the string plus the energy expended in accelerating the hammer off the string. It is impossible to have even tone if the hammer shank flange pinning is loose or inconsistent. We say that power is lost but it is not really lost, it's just not going where we want it, i.e., into the string. Now, how does hammer mass or, in other words, "inertia during rebound" fit into all of this? Well, I just don't know! That should give you something to think about while lying awake at night and would be a good topic for another article if the inertia issue were ever solvable, which I don't think it is because there are too many variables. Be careful about jumping on the anti-inertia bandwagon. PTJ

The Noise Clinic — Part 3

By Ernie Juhn, RPT
Long Island-Nassau Chapter

In this concluding article, I would like to concentrate on some of the less-known noise problems we encounter in our craft.

There is one noise problem which has always been avoided by the knowledgeable and ignored by the ignorant. It is the subject of hearing loss. Many people begin to lose full hearing capabilities when they approach an older age. Even though it may not manifest itself clearly in everyday life, there is a pretty good chance that certain frequencies will be affected when you reach a certain age. On the other hand, some hearing specialists claim that constant "training" like tuning pianos, may preserve "hearing youth" for a long time. Whether or not that is true is certainly not my place to decide, but I am convinced that constant exposure to excessive noise will ruin your hearing. There is no doubt in my mind that frequent visits to noisy discos are harmful to the human hearing. I have never been able to get an explanation why some people play their car radios for others rather than for their own enjoyment. The logic of my being forced to listen to certain music without having the choice of turning it off escapes me. I doubt that some of these people would like to be forced to listen to my favorite music. What does all that have to do with piano noises? Quite a lot.

Over the years, I have learned to diagnose complaints which are not "piano problems" but people problems. I have learned that as much as we may be aware of what is going on, we cannot tell the customer to have his/her ears examined. Consequently, we have to use diplomacy. As you know, when listening to a note on the piano, we not only hear fundamentals but also a variety of "byproducts" which make the piano tone so unique. Terms like "overtones" and "harmonics" come into play, but what it really boils down to is quite simple. The customer plays a note, hears the fundamental plus a combination of some rather high-pitched (high-frequency) sounds. If the customer's hearing is in good shape (young, responsive), the perceived sound will have a musical quality. If, however, our customer has lost the ability to recognize these important "byproducts" due to a hearing loss, there is a good chance that he/she will complain about a "buzz."

At this point I would like to issue a warning. The above-described buzz is not the kind of buzz that plagues us in everyday life. It has nothing to do with coins on the soundboard and loose ribs. It is important to recognize that our hearing, just like other functions of the body, is subject to variations. It is quite possible in marginal cases that some of these symptoms can be noticed only on certain days. (And here comes the funny realization; the piano may not do it only sometimes — it does it all the time — but maybe the customer hears the problem only on certain days.)

A final note on the above subject. We all know that when people suffer from a head cold they can have problems with their hearing. In fact, a piano tuner might consider taking sinus-draining cold medicine in order to be able to tune. I guess it would be carrying it too far if a customer would ask the piano tuner, "Did you take your tuning pills today?"

Occasionally pianists complain about certain notes standing out as "louder than the rest," "brighter than the rest" or "just different," and yet, we may not be able to hear what the customer hears so clearly. It may well be that we hear just what the customer is complaining about but on different notes. If you are having thoughts about your own hearing, or if you are puzzled, first consider the following:

Start with the seemingly unrelated gruesome request to visualize a human skull. Remember the various cavities? We all have them. Let's continue this morbid hypothetical for a moment and suppose we could pick four or five of those, each resonating at a different pitch. We would now have a grotesque kind of Temple Blocks, each tuned to different frequencies. (Remember the original complaint? "You hear what I don't — and vice versa." The answer may well be, "You just are not on my frequency.")

Spring Noises

Springs in pianos can cause a lot of noises. Let us start with simple leaf springs used in upright pedals and grand trap work. I've found VJ-lube® or Lubriplate® to be the most practical lubricant. Some of the old "pelican" style

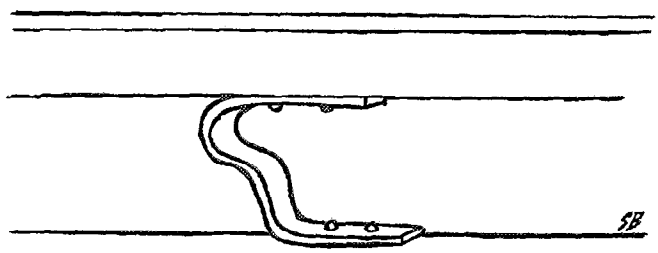


Figure 1

pedal lever springs can fool you quite nicely (See Figure 1). One would believe that they have no moving parts and cannot squeak, but yet you may hear an honest to goodness squeak come right from that spring.

The secret is that if one of the mounting screws has loosened up and is positioned "just right" it may produce a squeaking noise which may puzzle some technicians for a while.

Some of the newer Asian grands use coil springs in the trap work. If you hear a hard-to-find sympathetic ringing on certain notes, and the sound seems to come from under the piano, check these coil springs. The simplest procedure is to "pluck" the spring and listen if it produces the same note as you have been hearing. The cure is to weave a small piece of

bushing cloth into the spring.

Another kind of spring noise can often be produced by (vertical) damper and hammer springs as well as repetition lever springs. In all these cases let us first diagnose the problem. Noisy coils make a noise which I will describe as a groaning squeak. To make sure that you are on the right track, move the spring manually using your finger(s) or tweezers. If the noise is still there, you can most likely blame the coil itself. If the noise disappears, there is a good chance that it is coming from the area which is contacted by the spring. That may be a wooden groove, lubricated by graphite or Emrylon®, or a wooden groove which has been covered by a felt punching. In either case you must first remove all gooey and sticky lubricants that may have been applied to these parts. Then I suggest a dry Teflon® lubricant. Some of them are now available in "dry spray" cans. Make sure that it is Teflon®. Some of the available cans do not have plastic tubing, also called "spaghetti," to direct the spray because the nozzle is too small. A ground-off #20 X 3½ spinal tap needle works like a charm (from your friendly neighborhood spinal tap needle store). The Teflon® spray works best when applied sparingly but while the part is moved. I suggest that you move the damper lever, hammer butt or repetition lever while applying the lubricant.

A different kind of noise which often puzzles technicians sounds like "walking on snow" when keys are slowly depressed on a vertical piano. If the noise disappears when you depress the sustain pedal, you can be sure that it is caused by the spoons rubbing against the damper lever felt. If you get a similar noise while slowly depressing the sustain pedal, chances are that it is caused by the damper lifter rod rubbing against the damper lever felt. In both cases the cure is the same. Remove the action and while on its back, push down on the dampers and apply a small amount of VJ-lube® or Lubriplate® ***sparingly*** on the spoons and/or the damper lifter rod. If you feel like preventing future problems, you might want to lubricate the damper lifter rod hooks (hangers).

And Now, The Mystery

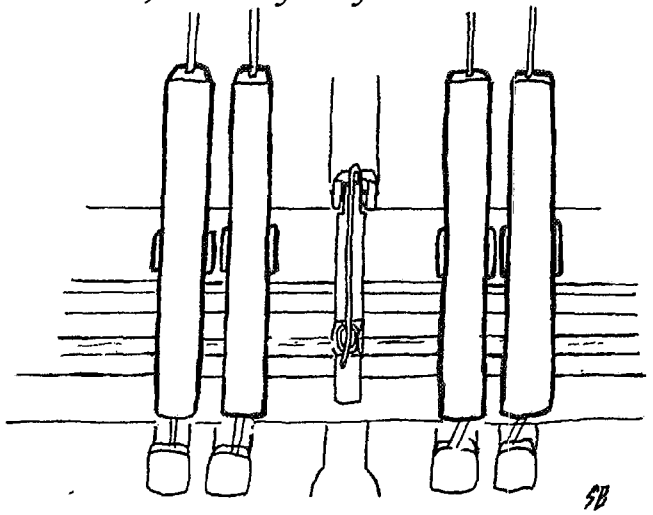


Figure 2

After having done all that, depressing the sustain pedal (or pushing the damper lifter rod manually) still produces a noise. ***Solution:*** Some vertical actions have a so called "helper lever" or "monkey" which looks almost like a cut-off damper lever without the wire and damper attached (See Figure 2).

The spring is heavier than the regular damper spring and the purpose is to help push back a split damper lifter rod into position. The noise is generally caused by the spring or the felt that contacts the rod. The cure, of course, is the same as above — lubrication.

The Pedal Noise That Is Not

Quite often we get complaints about noises in upright pedals. At first, all standard remedies seem to fail, especially when we are dealing with a creaky kind of noise, and it happens when the pedal is pushed down rather hard. It might be a good idea to try the other pedals and push them down just as hard. It might well happen that they, too, will make a similar kind of noise. That points toward a different area than the pedals or pedal hinges. In fact, it is quite likely that the noise is caused by some kind of a movement in the bottom board. There is, however, a possibility that even tightening the bottom board ***and*** the pedal strip will not remedy the problem. Here is something that could be the cause. You may remember that I mentioned the so called "polyester noise" in one of my previous articles. If the upright is of the glossy, polyester type, it is quite possible that the creaky noise is caused by the pedal rail rubbing against either the toe or the end strip (or both). This, of course, could happen on either side or on both. The reason is that all these parts are generally finished first and assembled later. I've found the most reliable cure to be using a Teflon® spray and "working" the moving parts at the same time. It requires quite a bit of this spray in order to be effective. Make sure to use only a "dry Teflon®" spray; the white residue can be wiped off easily.

A Key Experience

I was called to a customer's who heard "tremendous noises" on certain days only. There were no clearly defined circumstances. It did not do it on the same notes all the time, it had nothing to do with the weather, pedals did not make any difference, it was so loud that it bothered everyone in sight. The customer had removed everything from the piano like metronome, clock , lamp, etc. My procedure: First ask questions, like, "Do you keep the piano open or closed?"

Answer: "Like it is now — always."

The fly (lid) was folded over. I proceeded to close the lid — ***and the key was in the lock.*** I asked: "Do you keep the key in the lock all the time?"

"***Yes, always!***"

The Effects of Downbearing On the Tone of the Piano — Part Three

By John Hartman, RPT
New York City Chapter

Downbearing - Achieving Tonal Balance

The piano's vast range, from the lowest to the highest notes used in music, makes it a rather complex musical instrument. We can not fully appreciate the subtle use of downbearing without studying the strengths and weaknesses in each area of the scale. In a sense, each note of the piano is a separate instrument with its own unique tone. From note to note the tone may sound similar, but comparing the tone of a bass note to a treble note will reveal large differences in both tonal colors and sustain. The primary cause of the disparity is the difference between the vibrations of bass and treble strings. Bass strings are heavy, long and flexible, producing vibrations that are powerful and well sustained, containing many audible overtones. In contrast, the treble string's vibrations are much shorter in sustain and have fewer overtones; the excessive stiffness caused by their short length creates a great deal of internal friction and much of the energy imparted by the hammers is lost before becoming audible. The tone becomes progressively weaker and shorter in sustain the further up the scale we play.

Although not directly related to the strings, another factor affecting balance of tone is the considerable loss of volume in the fundamental and lower partials of the bass notes. The strings are not defective, as is sometimes thought, but rather, the low-frequency sound waves produced in opposite phase by the top and bottom surfaces of the soundboard cause interference. If opposing waves are long enough, as they are below 100 Hz, they will pass around the soundboard and case and cancel each other. This classic example of sound interference, found in many stringed instruments with soundboards, often deprives the bass of clarity and power. The most direct solution to this problem would be to provide the piano with a larger soundboard. An indirect solution, described in more detail below, is to increase the volume of the vibrations received by the soundboard from the bass strings.

These tonal differences from bass to treble contribute to the character of piano tone. They challenge both piano builder and restorer with creating a cohesive musical instrument from a very diverse tonal spectrum. Designing and building a piano having good transitions from register to register and where each register — although dissimilar in tone, power and sustain — is acoustically balanced, is one of the important achievements of the 18th and 19th century piano builders. I believe that downbearing is one of the many small adjustments that we can use to improve this balance. Many technicians will benefit from knowing how to adjust the downbearing in order to boost the power of the bass and improve the clarity and sustain of the treble.

To increase the volume of the bass notes, less, not more, downbearing is suggested. While this may seem illogical to suggest, it is precisely what the theory supports. Less bearing will lower the impedance of the soundboard and the vibrations in the strings will pass into the soundboard more rapidly. There is, however, a trade-off between increased volume of tone and a shorter sustain. In regard to the bass strings, this shorter sustain will not be problematic. In addition, the likely loss of efficiency in the soundboard will not be a problem because the soundboard's efficiency is primarily an issue with the higher frequency vibrations. Bass strings generally have little difficulty producing higher partials. In some cases, the deliberate damping of these partials would improve the tone, lessening the tendency toward a metallic sound. These conclusions suggest that the tone quality of the bass can be harmed more by excessive downbearing that by too little bearing.

At the other end of the scale, we find that the theory of impedance suggests the opposite solution: additional bearing will improve sustain, the treble's major weakness. As more bearing is applied, the soundboard and its bridges are stiffened, impedance is increased, and the vibrations in the strings travel into the soundboard more slowly. Additional bearing also improves the efficiency of the soundboard, allowing more high frequency vibrations to become audible. This will boost the over-all volume of sound as well as making audible some of the short-lived partials. Increased bearing in the treble will also improve sustain, volume, and clarity.

Another aspect requiring special consideration is the amount of bearing needed where bridges are close to the edges of the soundboard. Impedance is naturally higher near the heavy and stiff rim than it is in the middle of the board. This is not a problem at the treble end of the bridge where high impedance is desirable. However, problems are often found at the bass ends of the bridges. One remedy is to thin the soundboard additionally and apply only minimal downbearing in these areas of the scale.

Even though factors such as piano make and model, design, and soundboard condition influence how downbearing is set in a particular piano, a number of general rules apply. Downbearing in the treble should be greater than in the other areas of the scale in order to improve sustain and clarity. The bearing in the bass should be less, helping to boost the volume of the low frequency fundamentals and low partials. The bearing in the middle of the scale should be in balance with the soundboard crown (more on this in part four). The actual suggested numbers for setting downbearing are given in part four of this article.

We have now answered all but one of the questions that were posed at the beginning of this article. How do tonal changes occur as the piano ages and downbearing decreases? The loss of bearing is an inevitable and natural process. The most obvious cause is the fluctuation in relative humidity. The average piano soundboard can expand and contract almost half an inch across the grain in the average home environment. When the relative humidity strays outside of the norm, (between 30 percent and 65 percent), the soundboard will soon show signs of stress such as ridges, cracks and unglued ribs. Even in the best environment, all pianos will eventually succumb to a deterioration of soundboard crown and the resultant loss of tone and vol-

ume. Interestingly enough, the combined downbearing exerted by the strings, equaling an average of 1,500 pounds of force, is insufficient to permanently distort the soundboard when applied for only a short period of time. If downbearing force is removed after a short time the board will return to normal. If, on the other hand, the strings are at full tension for an extended time, say 40 or 50 years, the distortion is permanent and little crown or downbearing will remain. This factor is known as time dependent deformation. When an object is stressed for an extended period of time, the object will behave as though it were a weaker structure and will readily be plasticized by normal forces. The affects of time-dependent deformation may be seen in soundboards having no cracks, ridges or other signs of deterioration. After removing them from the case, one discovers non-existent and even counter-crown.

It is my experience that pianos with loss of downbearing and crown resulting from age and deterioration will develop tonal problems primarily in the upper tenor through the low treble registers. In fact, the first signs of trouble usually appear in the octave C5-C6, a critical patch of notes in the classical repertoire. It is interesting to note that a piano with an uncrowned soundboard can still have a respectable bass and high treble, the reasons for which are apparent in light of the theory we have discussed previously. The bass is unaffected because it functions well in a low-impedance environment, it may even improve a little. How many times have we heard owners of perfectly dreadful sounding old pianos say "are you certain my 80-year-old brand X piano needs a new soundboard, it still has a wonderful bass." The high treble with its secure footing close to the belly rail and rim is also affected less by an aging soundboard. It is just too rigid to change much over the years. In fact, downbearing measurements at the top of the treble bridge are often found to be unaltered from the original setting. It is in the middle of the keyboard that we find the tone most changed by the affects of time. Many old pianos have a tone that is thin and hollow or metallic and cheap. In the first case the hammers are too soft, in the second, too hard, either way, the real cause of poor tone lies with the soundboard. A beautiful quality of tone — round, full and clear — cannot be achieved without a soundboard that is adequately and evenly compressed. The bearing must be sufficient and the crown full enough to distribute the pressure evenly throughout the surface of the soundboard.

Understanding tonal problems in the high tenor and low treble will require a slight elaboration of the theories that we have already covered. To clarify the situation, imagine a string stretched between the agraffe and the bridge. As the hammer strikes the string it begins to vibrate up and down in the direction it was struck. As these up-and-down motions die down a side-to-side motion gradually takes over until it decays completely. A piano string can and does vibrate in all of the planes surrounding its center, including a combination of vertical and horizontal motions best imagined as a circular motion. The vertical motion produces the attack part of the sound we hear, while the circular and horizontal motions produce the body and after sound. (See Figure 1) Each of these motions, considered separately, reacts in a different way to the stiffness of the bridge. The vertical motion attempts to move the bridge up and down and the horizontal motion tends to move the bridge from side to side. You can imagine that moving the bridge up and down will be easier if there is little

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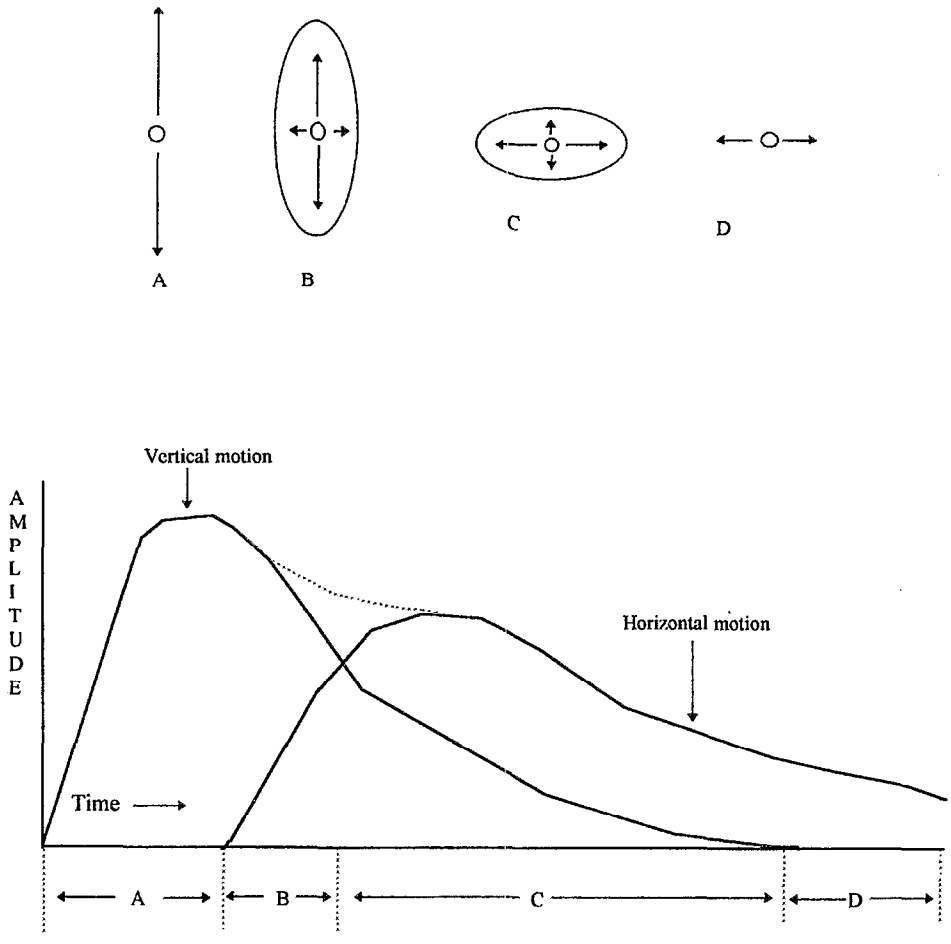
Vertical and Horizontal String Motions

Illustration #7



The development of vertical and horizontal components of string motion. Top, the string's motion is viewed in cross section. Figure A shows the string vibrating with a pure vertical motion. B and C show the motion of the string with both vertical and horizontal components. Figure D is a representation of the string vibrating with a pure horizontal motion. The amplitude-time graph shows the development and interaction of the vertical and horizontal string motions. Due to the vertical impact of the hammer the attack, A, is comprised of vertical motion. The body, B and C, is comprised of both vertical and horizontal motions. The decay, D, of the string's vibration is made of horizontal motion.

Figure 1

The Effects of Downbearing on the Tone of the Piano — Part Three

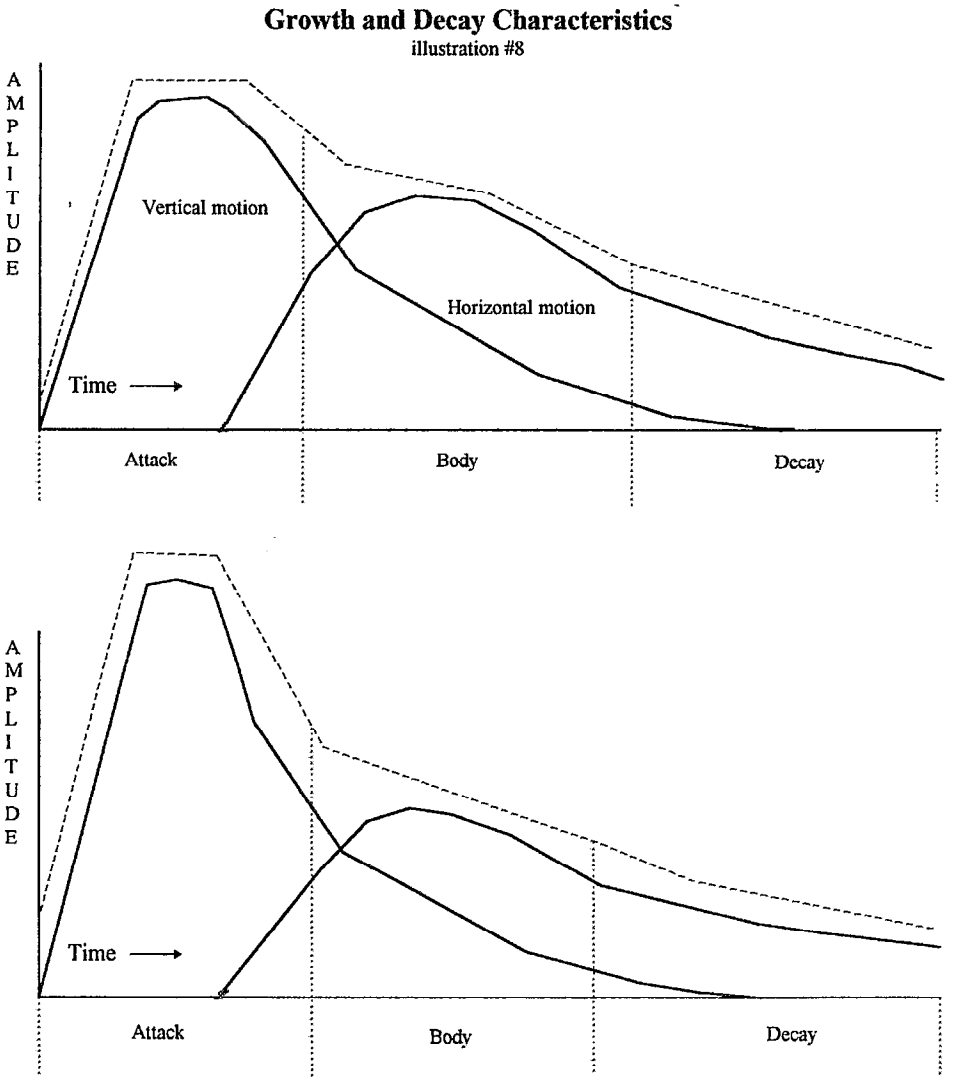
Continued from Previous Page

bearing and more difficult if there is more bearing. The stiffness and impedance of the vertical motion of the bridge are variable by the amount of bearing. The stiffness and the impedance of the bridge in the horizontal plane remain high regardless of bearing and crown.

In the case of a healthy soundboard with adequate bearing, the hammer strikes the string generating the vertical motions which, because of high impedance, do not dissipate into the bridge very rapidly. This leaves more energy for later when the circular and horizontal motions of the string will dominate. The sound we hear will begin with a modest attack, and have a full and broad middle and decay. In other words the tone will be full and round. A string attached to a bridge with inadequate bearing, or low impedance, will send most of its energy immediately to the soundboard, leaving little energy for the body of the sound. The tone produced will have a loud attack with little to follow. No matter how the hammers are voiced, an imbalance in the attack, body and decay of the tone will exist. A simple test will show if inadequate bearing is the cause of insubstantial tone.

On a piano 40 years or older find the weakest area of the scale, usually in the C5-C6 octave. Pick a particularly lifeless note for your test, lift the damper with one hand, and pluck the string in a vertical direction. Listen to the growth and decay characteristics or the relationship between the attack and body of the sound (See Figure 2). Compare this with the sound produced by plucking the string in a horizontal direction. If both sounds are well-balanced producing a full and round tone, the downbearing is adequate. If the vertical motion produces a poor tone while the horizontally plucked string still sounds fine, there is very likely a problem with downbearing. It is important to be consistent in how and where you pluck the string. Weigh this evidence along with other tests such as direct bearing and crown measurements.

These tests, as important as they may be, are not the most important criteria in judging the condition of downbearing and soundboard crown. Developing the skill to hear some of the tonal problems I have been describing is essential. As difficult and uncertain as this is, it will focus your attention on the important issue of quality of tone, rather than on arbitrary and often conflicting specifications. Developing this skill will take time and experience, but knowing what to listen for and where in the scale to look for it, will greatly speed the process. Pay particular attention to the aspects of balance in the attack and body. Look for these in the low treble and upper tenor areas of the scale, remembering that bearing and crown problems show up primarily in these areas. The most difficult aspect of an aural evaluation of tone is learning to differentiate between the aspects of tone caused by the condition of the hammers from that which is the result of soundboard crown and downbearing. Eliminating the hammers from the process by using the string plucking test will help a great deal. In addition, I have found that in the case of an underlying soundboard problem, a lack of fullness in the tone will be apparent no matter what the condition of the hammers. Playing chromatic scales throughout the keyboard will reveal an area of weak, thin tone usually in the low treble and upper tenor. Manipulating the voicing on a few of these notes will demonstrate that while the volume of the notes can be changed, the all important profile of the sound remains the same: a loud attack with little to follow. It is rare to find problems in the high treble attributable to bearing unless the piano was built or rebuilt incorrectly. As mentioned before, the



The influence of downbearing on the growth and decay characteristics. Top; shows the growth and decay of a low treble note when the soundboard has adequate bearing. The distribution of energy is well balanced between the attack and body. Below; the sound shape of the same note is shown when the soundboard has inadequate downbearing. More energy goes into the attack and less is left for the body.

Figure 2

high treble is usually stable as the piano ages. The same can be said of the bass. Unsound building or rebuilding, not age, is usually the cause of a tonal problem. In this case, excessive bearing will produce a weak and possibly distorted tone. I have found it unnecessary to worry about minimal or no bearing in the low bass.

In evaluating the condition of downbearing in the piano the subject of front and back bearing is often raised. Front and back bearing refers to the angles formed by the deflection of the string over the front of the notch and the back of the notch, respectively. These two angles, combined, form the complete bearing on the bridge. Front and back bearing, considered separately, are relevant only if one believes that the function of downbearing is to make a connection between the strings and bridge, creating a better termination for the vibrating strings. As we demonstrated in the experiment at the end of part two, side bearing does this adequately. However, there may be a need for positive front bearing in the treble, to counteract the possibility of displacing the string from the top of the bridge with a forceful blow. Examinations of previous quality work show that front and back bearing were divided about equally from the low treble to the top, while no front bearing was the norm in the lower areas of the scale. It is much more important that the overall bearing be correct in each part of the scale, doing its job of compressing the soundboard. As of yet, I have not encountered a tonal problem that was caused directly by a lack of front or rear bearing. This whole issue is complicated by the mistaken notion that an imbalance between front and back bearing will result in a rolled bridge. To set the record straight, a rolled bridge is caused by friction between the strings and the top of the bridge that prevents the strings from sliding over the bridge when the piano it tuned. When we raise the pitch of an old piano with rusty strings the bridge is pulled and twisted. The result is negative front bearing and excessive back bearing.

The basic concepts in this article can also shed light on another misunderstanding. Many technicians find themselves compelled to measure the downbearing on practically every note and they panic if they find a few notes not coming up to specification. It should be clear, however, that downbearing is not a note-by-note process, as if each note needed its own separate bearing to function normally. The misconception comes from thinking that downbearing's role is to clamp the strings to the bridges. The right idea is that downbearing is part of the soundboard, and only after it alters the soundboard does it influence the strings. Bearing is a cumulative process. It does not matter that a few notes stray, but only that each area of the bridge has the appropriate amount of bearing. My suggestion is to evaluate the bearing condition by averaging the amount of bearing in each area of the scale. From experience I have found that appreciable tonal problems will only arise when a number of notes in a row, spanning six to eight inches on the bridge, have excessive or minimal bearing.

I hope that the trip we have taken so far has not been a useless study in trivial scientific facts (what one colleague of mine refers to as "rocket science"). My intention has been to provide a solid base of information for future experience. The wise and proper use of general scientific information will promote an improved focus of attention and enrich the quality and quantity of our experience as well as the integrity of our craft. Without this kind of focus we will waste our efforts on erroneous and ineffectual theories. All of us have witnessed this reliance on mystique in our profession: technicians stuck in the trap of trying every brand of hammer on the market and never being satisfied with the results, rather than developing voicing skills with one brand of hammer. The misconception is that the tone he or she is after is somehow in the hammer, not in the skills of voicing. Another example: the individual who believes that older pianos with original soundboards are categorically better than new pianos or pianos with replaced soundboards. The idea is that, for some unknown reason, the old wood was better, again placing the responsibility on something in the materials. Underlying this attitude is the idea that our experience, skills and knowledge do not really matter; if only we could find the right pieces of wood, hammers, strings, tuning hammer, etc., etc. I cannot think of a more negative thought process than this. It is anti-science, anti-technique and destructive to the individual and collective progress of our profession. Another arena of disingenuous beliefs and theories — these not childishly naive but blatantly cynical — is in the marketing of products and services to our trade. All of us are aware of these types of claims made in the area of piano sales promotion. Inaccurate claims are made using the latest research, manufacturing change or pseudo-science to validate them. Unfortunately, this is also happening within our profession, in our classrooms and exhibit halls. We hear about the piano rebuilder with the latest in improved rib curvature and nickel-plated bridge pins, claiming to remarkably improve the tone; a secret "patent pending" process that claims to improve the response of the action by eliminating the effects of gravity; last but not least, the latest improved hammers made from a once-thought-extinct breed of sheep miraculously found living off the cost of Iceland.

Breaking this cycle requires that we make an effort to research the principles that are fundamental to our technology. While at first this may seem difficult, with consistent effort over a period of time, the simplicity and order of fundamental ideas will become apparent. I have included a list of useful material for further information. I hope this approach to understanding will encourage and facilitate the effort of those who wish to pose and answer the many questions remaining in our field. Consider that the definition of the word "technology" is "an applied science."

References

- Anders Askenfelt (editor), *Five Lectures on the Acoustics of the Piano*, Royal Swedish Academy of Music, 1990.
- Arthur H. Benade, *Fundamentals of Musical Acoustics*, Dover, 1990.
- Sir James Jeans, *Science and Music*, Dover, 1968.
- Hermann Helmholtz, *On the Sensations of Tone*, Dover, 1954.
- Harry F. Olson, *Music, Physics and Engineering*, Dover, 1967.

Behold The Upright ... The Wippen

By Don Valley, RPT
Western Carolinas Chapter

The wippen is the subject of this article. Having duly taken care of the sticker last time, let's move upward and take care of the repair and rebuilding of the item that controls the thrust that supplies the energy to the hammer. Because of the number of console-size vertical pianos in homes today, that style of wippen will also be covered alongside the upright. Incidentally, considerable discussion has arisen in the past over the spelling of our subject matter, whether it be "wippen" or "whippen." In the best interest of being consistent in our nomenclature, I have chosen the spelling given in "Piano Parts and Their Functions," a valuable publication compiled by Merle H. Mason, RPT, and published by the Piano Technicians Guild. This is an invaluable source when you are determined to be correct in your references to piano parts.

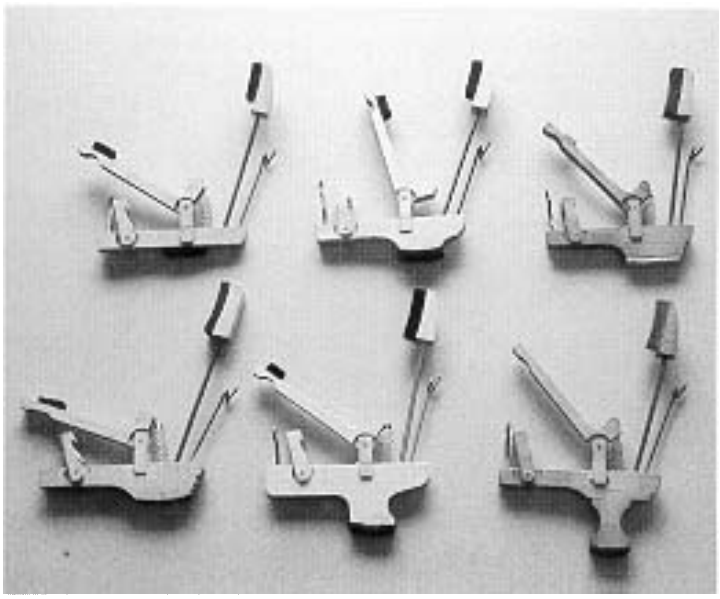


Photo 1

We have seen many upright pianos fully rebuilt. They are beautiful to look at and the action is a work of art as far as the eye can see, yet the piano is unresponsive. Perhaps this is because the wippen did not get the same attention as the rest of the action parts. Although the condition of the wippen might look good, the action needs just as much careful attention as the other areas. (See Photo 1)

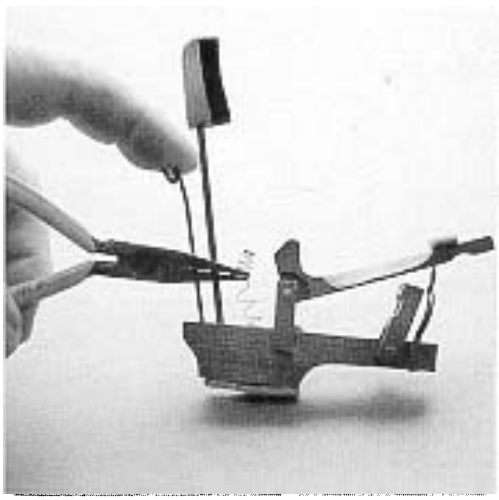


Photo 2

Prior to removing the wippens from the main action rail, be certain to number them. Then remove the wippens for cleaning in the sand blaster. As you are placing them in some sort of holding tray, look them over carefully checking for felt wear, action center condition, jack spring and backcheck condition.

At this time you will want to remove the old jack springs because of the strength they have lost over the years. I find the handiest tool for removal is a small set of pliers such as hobbyists use. It is sort of a flat, long-nose tool with no ridges for gripping. (See Photo 2) Simply grasp the lower portion of the coil and pull straight up. If any break (and many most certainly will), you know it is past time for replacement. Just keep grasping those broken remains and lift up until the entire coil is removed from the well in which it sets. I feel it is best to also remove all the glue from that well at this time so it can be further "touched up" in the blasting process. There is a jack spring hole reamer available from the supply houses explicitly for this chore. A great way to expedite this procedure is to use your automatic screwdriver with an accessory chuck. Place this reamer in the chuck; the speed of the screwdriver is just right to do the job efficiently. The faster speed of your drill will heat up the glue and cause a mess instead of doing the cleaning job you are attempting.

Check the spoons for corrosion and rust. Check the flanges for freedom and restriction. Test the jack flange by pressuring it from side to side with your fingers to see if you can break loose the glue in the saddle area. Do this to each one to determine the need to remove and reglue them. This is preventive maintenance. After the action is finished and delivered, it will keep you from that sickening telephone call informing you of some notes that do not play.

The loops of the bridle wires are often very rusty or even jammed with decomposed leatherette from the old straps. This is an area needing special attention while in the sandblaster. Also, sometimes you will find this loop has been pinched tightly in order to keep the bridle strap in place. You will need to simply take a thin-blade screwdriver and expand this loop open again so new bridle straps can be inserted when it is time.

Photo 3

As you are progressing through the blast-cleaning process, be careful to leave the areas of the spoon and graphited jack top and tender alone. Blasting these surfaces serves to create an abrasive surface that will cause premature wear of the felt or leather surfaces against which they slide. On rare occasions I have seen spoons so corroded by chemical contamination (See Photo 3) from dyes and glues

that it was best to lightly blast it away and then follow it up with polishing each one on the cloth wheel, using a very fine compound last so as to keep that surface polished smooth. The rest of the cleaning is the same. Be sure to attack the surfaces of hardened felt — such as the backcheck felt and wippen base cloth — as it serves to restore the resiliency somewhat and does not cut away what is already there. Many times material has not been worn away at all but has just been compressed and has formed a brittle surface; this is what you want to dispose of. Yet, there are those actions where the backcheck felt has been "used up" and must be replaced in order to maintain proper regulation. At this juncture you can determine needed replacement. So, removal is the next step. Two types of removal are good; it depends on your preference. You may soak these felts heavily with a mixture of vinegar and water (wallpaper remover will do the same), or you may use the heavy-duty razor knife followed by sanding to remove the glue left on the wood. I personally prefer cutting the felt away and sanding with the moto-tool drum sander. It doesn't take much sanding and the wood is not water stained in the end.

Once the wippens are completely clean, step number one is to check those jack flanges once again to see if any others will break loose. Proceed to remove these jacks, one by one. Check each removed flange for freedom, working it and forcing any particles out with air. Then inject a center pin lube of your choice into the bushing cloth. If it runs onto the wood, you have used too much. A great needle for this application is the extremely small type used for insulin injections; (See Photo 4) you can easily control it for just the precise amount. Once the lubrication detail is complete, glue the jacks back in place, each on the same wippen from which it was removed. Set it firmly into the mortise, and saddle it firmly over the sides. Center the jack by checking its position against the backcheck, or inverting the wippen flange and laying the jack back against it, centering it at that point. Because the new jack springs have yet to be installed, there is no pressure against the glue joint, so it can be glued without clamping.

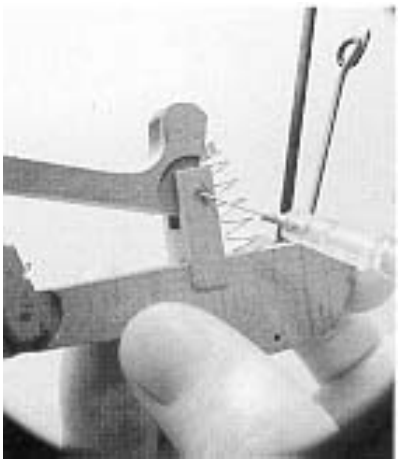


Photo 4

The wippen flange has to be as free as any other. The attitude that this — with all the pressure and weight it carries — does not need much attention, is totally in error. Treat this flange just as explained above for the jack flange. Many times a determination will be that the hammer flanges need freeing up. That job gets done. A problem still exists. Surprisingly, it is discovered that the wippen flanges are almost frozen. Correcting this area puts the freedom back into the action. Let us not be guilty of ignoring any one detail in the action.

Being certain that those items we have glued are firmly set, this is a good time to polish the bridle wires, the loops, and the backcheck wires on a fine wire wheel. This will especially help the insertion of bridle ends when the time comes. It does not take much pressure on a wire wheel to do this job. Undue pressure will only serve to bend those wires as well as grab that wippen out of your hand and throw it most anywhere, causing needless breakage. If you are not familiar with this process, it would be wise to first try your art on one or more from your "used parts" file. *Whenever you are working on a wheel, **always** use protective eyewear.*

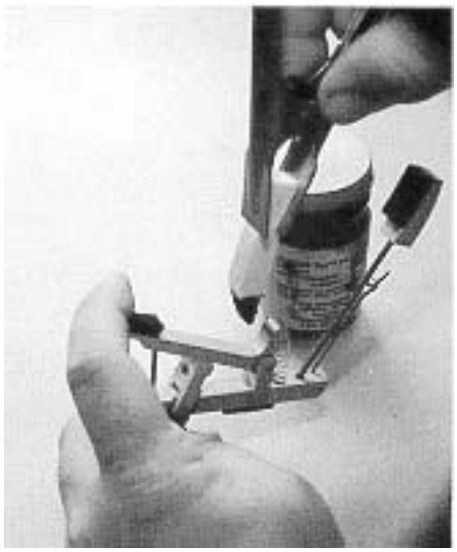


Photo 5

Now it is time to begin to put it all back together. First, the tenders and the tips of the jacks need regraphiting. For this I recommend a product called DAG®, and it is available from your suppliers. It goes a long way and should not be applied too heavily. It dries amazingly fast. I find the easiest applicator to do this most exacting job is one I cut myself from firm felt, such as hammer skivings. (see Photo 5) Even old, used hammer felt is fine. I cut a piece I can hold in my hand or a small spring clamp. I cut it the width of the item to be painted. Then I cut the painting end into a chisel point. It makes a very precise and dependable applicator. The Q-tip® method is messy and uneven; the little brush method tends to splatter and paint adjoining surfaces. Holding it with a small spring clamp keeps your fingers from being messed up. Because the evaporation process is so fast, you will find your DAG® getting thick, so do not leave your bottle open; keep the lid on it. Even then, you may wish to thin it after a while. And sometimes, when you first open the new bottle, it appears to be thick like the consistency of an egg white. A good thinning agent is regular household alcohol (isopropyl alcohol). If you put it on and the application is too heavy, allow it to set for a few seconds (15 - 20), and then buff the excess off with a dry, soft cloth. What is left is plenty; there is no need to apply more. As you do each jack, just lay it back to make ready for the new jack springs to be installed.

Installing the jack springs is very simple. They can be placed with the fingers, but because of the closeness of the parts on the tray, I use long tweezers. This allows me to keep from burning myself with steam from the glue pot. Simply hold the spring top with the tweezers; touch the bottom coil in the hot glue and set it down into the well. You may need to keep it in place for about fifteen seconds before going on to the next. This is a quick job and the rewards are much greater than perhaps you imagined.

Replacing a set of jack springs in the home is not time-consuming either. There are a few differences in approach since the wippens are still in the action. The one important thing to remember is that you will need to work from the side of the bridle and backcheck wires rather than from the top of a removed wippen. Using the same small flat-nose pliers, go in

Continued on Next Page

Behold The Upright ... The Wippen

Continued from Previous Page

from the right side of the wires, remove the spring top coil from the jack, compress a few windings of the spring near its base, grip tightly and lift up to remove it from its glued seat. Any broken pieces will be removed just as described before. Excess glue will, of necessity, have to be removed by hand work since the automatic screwdriver is too large to work in the limited space allowed in this situation. Once the wells are clean, insertion of the new springs is almost the same. The only difference is that it is necessary to compress that spring with long tweezers, apply glue to the base coil, set that base in its well and release the compression while you allow the top coil to fit into its position in the jack.

The backchecks, if this is a necessary step, are now to be glued in place. Assuming the backcheck felts are all cut, the least messy procedure is to apply your hot glue to the wood and then fit the felt to its base, being very careful to keep the sides and top flush with each one. Since the wood of many backchecks is concave, a clamp as simple as a clothespin will serve to seat the felt and hold it in place as well.

Up until now the consideration for rebuilding wippens has been the same, whether the piano be a full sized upright, or a smaller vertical. However, since console pianos and pianos with dowel capstans have cloth on the base of the wippen itself, this additional step is necessary on those types of wippens. On the bottom of the wippen will be a mortise into which a cloth piece is fitted and glued. Your choice of a removal method makes no difference in the end product. However, as you remove these pieces of cloth, keep one as a pattern for duplication. Usually this area is convex in order to provide more of a rocking motion rather than sliding in order to reduce friction. Many times when there is no convex shape, a small thin piece of cloth is inserted at the center point in order to replicate that shape. Besides, it acts as a cushion serving as a noise reducer. This cushion is usually not glued in place; it is compressed there by the larger cloth.

As pictured in last month's article covering the "sticker," this wippen base cloth is usually dimpled very deeply, has packed very hard, and produces a lot of noise as it returns to the capstan.

Cut your cloth the width of the wippen. I do this most accurately and easily with a roller cutter. These can be purchased from your local fabric store along with a cutting pad that will serve to preserve the blade as well. Supply houses also stock this item now. By using a straightedge backed with abrasive paper you will be able to always cut clean straight lines without your cloth shifting because the abrasive paper holds it in place. Whether your cloth is thin, thick, narrow, or wide, you will always be able to achieve exact results. With a guillotine type cutter, cut these strips into the proper length to fit into this mortise. Use the same procedure for stripping the cushion cloth as well; do not cut the cushion cloth in pieces but leave it in strips. Now you are ready to glue and fit these pieces to each wippen base.

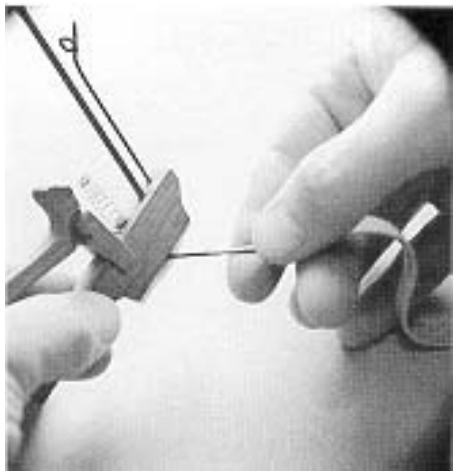


Photo 6

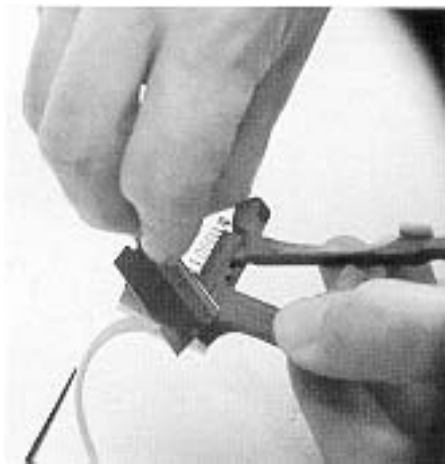


Photo 7

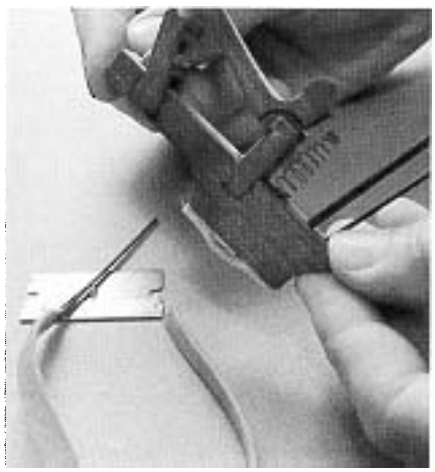


Photo 8

With your wippen upside down, you will glue only the ends of the base cloth; do not glue in the middle. Leave at least one-quarter inch without glue. As each one is glued, using hot glue, give it some pressure for a few minutes. Spring clamps are very good for this. Continue this until all eighty-eight are glued. Allow them to dry completely — even overnight is good because the glue joint will be tested with the next step, in the event the cushion is necessary. Some pianos have no cushion but have the cloth glued only on the ends anyway.

Installing the cushion is similar to the round hole bushing technique. Take a strip of that thin cushion cloth (it will be about one-quarter inch in width). Cut it to a point on one end. Attach the strip using a glover's needle to grip the point. Take one wippen at a time (or you can actually do several), fit the needle between the wippen base cloth and the wood. (See Photo 6) Pull the strip of cushion through until it has come to the end. Take a razor blade and cut it off flush with the wood (see Photo 7). Repeat this procedure until all cushions are installed. You may not want to cut with each wippen; you may wish to pull it through one, then another, and another until you have an octave or more tightly laced onto the cloth. Then, just take a razor blade (I prefer double edge blades) and slice between the wippens. You will achieve very exact, clean, professional results (See Photo 8).

Alas! When you first looked at a wippen you probably did not think there was so much to attend to because the grand piano wippen seems so much more sophisticated. Well, now you know. Even though the upright wippen appears somewhat simple, the functions it performs are critically meaningful to the total performance of all other piano parts.

The Designer's Notebook

By Delwin D. Fandrich, RPT
Contributing Editor

If It Ain't Broke — Break It! Or ... There Is No Such Thing As A Finished Product

Introduction

My apologies to Robert J. Kriegel for borrowing the title of his book for my column, "If It Ain't Broke — Break It!," published by Warner Books, Inc. and available in the business section of any good book store. It is a book I highly recommend to anyone who is trying to break out of the straight-jacket of conventional thinking into the fascinating world of unconventional creativity.

This is the article with which I had intended to start my column before I got sidetracked into V-bars, Capo d'Astro bars, etc. I'd like to take this opportunity to introduce myself at least a little bit and let you know where I'm coming from and where I'd like to go with this column. To do so, I'll also have to take a brief look at the state of the piano's development at this point in history, at least as I see it.

The Problem of the Locked Room

I've been at this crazy business for something over 30 years now (never mind how many over!). Through many of those years I was taught, and accepted, the basic premise that, for a given piano, the original manufacturer's design was close to sacred. It had been created — in an atmosphere of secrecy that would have done the CIA proud — by geniuses working away in a securely locked back room of the factory, to a level of refinement and perfection that was unfathomable by us mere mortals. We were allowed only to wonder at the results of their work by admiring the perfect pianos built by their factories; the *why* of what they had done was simply beyond our understanding, so don't ask. The subtleties and nuances of piano design were so complex that any deviation from the original would have catastrophic results and would totally destroy the performance of the piano. It was not to be touched. I simply assumed that any problems I was unable to tune out, voice out or otherwise bring under control were simply there to remind me of my own inexperience and/or incompetence. Indeed, in the early 1970s one beleaguered industry executive told a member of the press that his company did not have any problems other than the general incompetence of the technicians in the field who were incapable of properly maintaining the pianos in their care.

There actually was some truth to the "locked back room" stories. In his book *Piano Scale Making* (written in 1927), Albert B. Vant tells us, "The Drawing of a Scale is generally made in a Locked Room, by one of the very few Scale Makers, and a great secrecy is made of their work." It is also true that piano design can be very subtle and complex. This does not mean, however, that the basic principles of good piano design must remain secrets that are to be forever locked away somewhere in a back room. Progress is being made. If nothing else, an examination of the *Piano Technicians Journal* over the past few years will give an indication of just how much progress has been and is being made in demystifying the design and assembly principles of the piano.

I have been privileged over the years to attend a wide variety of PTG classes and lectures taught by some very dedicated (and patient) technician-teachers. I was able to discuss some of the problems I was having with various pianos in my care with some very skilled and knowledgeable people with both field and factory experience. More often than not I found that others were having the same problems with the same pianos. Gradually, I came to realize that the piano probably had not yet advanced up the evolutionary scale quite as far as it was capable of going. I began to suspect that the men who guided the piano's development through the 1800s and into the first third of the 1900s may not have had all the answers. Indeed, after reading all the commonly available reference books from the period, I'm not even sure they knew all the right questions. I rather suspect we still don't. This sort of thinking was — and still is, in some circles — considered somewhat heretical. I must confess, though, I found the notion somewhat challenging. Kind of like waving a red cape in front of a rather angry bull. Stick with me long enough and you'll find out something else I discovered: sacred cows do make the most wonderful hamburgers.

It seemed to me that the piano's development had reached a plateau of sorts and then leveled off. Indeed, in 1979 I was told by one company president that they had perfected the piano by the mid-1930's and there was now no further room for improvement. It was his job simply to continue building what had been handed down to him, and he was not interested in meddling with perfection. Given this "truth," the best that any other company could do would be merely to copy their designs as best they could. While this gentleman was perhaps a bit more outspoken than most, this perception was shared by many industry leaders, at least those in the American part of the industry.

(Note: There are a number of business, sociological and political reasons why our industry has arrived in the predicament it finds itself in today that are way beyond the scope of this article — not to mention being way beyond my capabilities as a writer — but it would make a fascinating study for someone to take on.)

The attitude was very much, "If it ain't broke, don't fix it." Much has changed since then. There is a general acceptance that there may indeed be something amiss with the status quo (steadily declining sales throughout the industry may have something to do with this new enlightenment), but what

could it be? Positive steps have been taken. Some pianos whose quality had slipped rather badly have noticeably improved. There is a much stronger commitment on the part of most manufacturers to work with piano technicians and to help them do their jobs better.

Yet, in spite of the many positive signs, there is still something that ain't broke that needs to be broken. The basic design of many, if not most of the pianos on the market today has not changed fundamentally for more than a century. Even new pianos being introduced today continue to use some of the very design elements that are responsible for many of the tonal and voicing abnormalities that have frustrated technicians and musicians for decades. It is time to take a serious look at the fundamental design of the piano, and to introduce another period of design renaissance such as we had from 1870 through 1930. This suggestion might be scary to some. Risks will have to be taken. And, yes, mistakes may well be made. The mystery of piano design has been locked away in a box for some time now, and there seems to be a genuine fear of what might happen if we open that box — as much in the minds of technicians as in the board rooms of manufacturers. "Play it safe, and don't touch the perfection of the masters" seems to be the name of the game. Unfortunately, playing it safe is the most dangerous game in town!

Piano Design Is A Mystery

Of course, there ***are*** a number of interrelated design and mechanical elements that combine to determine the acoustical performance of any given piano: the plate design and stringing scale, the bridge and soundboard design, the overall rim design and belly bracing structure, etc. The list goes on and it is a long one, but it's not infinite. And one doesn't have to get very far into the field of piano design to learn that to a very large degree the many different elements of any given design are dependent on one another. Sometimes changes in one element of a design can cause unexpected effects in areas far removed from those that were intended. Often, piano design does seem to be a mystery. But, as any student of Sherlock Holmes well knows, a good mystery is meant to be solved and it always contains the clues needed for its unraveling.

To a beginner, tuning a piano — at least tuning one aurally — also seems a mystery. But with time, study and practice, the mysteries of tuning become clear and then the technology of the trained ear takes over. Just like learning to tune a piano, understanding the basic principles of piano design and learning to manipulate them properly doesn't come easily. It also takes time and study and practice, but the mysteries of how pianos work are not impenetrable.

Once I became interested in the piano's design, I began to study the raw material I had available: the pianos I was rebuilding. I would approach each instrument from the standpoint of trying to figure out why it sounded the way it sounded, both before and after rebuilding. Which design features were responsible for which sounds and why? Which design features were responsible for which problems, and again, why? In time, I began to recognize some of the basic relationships between design and sound. These discoveries often led me to various academic studies and research projects that helped me understand how different design elements affected piano sound. I had no idea what I was getting into; understanding piano design requires some knowledge from a wide variety of disciplines ranging from basic acoustics through mechanical and structural engineering to vibration analysis of driven mechanical systems, to name just a few.

"The attitude was very much, 'If it ain't broke, don't fix it.' Much has changed since then."

Little by little, at least some of the "secrets of the masters" began to reveal themselves. As I began to understand more of the basic technology of the piano, I discovered that many of the things that had been troubling me about piano performance actually did have explanations and, to some extent, solutions. Fixing them, however, would often involve some degree of change to the original design. Sometimes the solutions were fairly obvious and easy to accomplish, such as correcting the worst of the string scale abnormalities found even in some new pianos. Other problems can only be dealt with if a piano is being extensively rebuilt. For example, it may be possible to resolve a chronically short sustain problem by redesigning an inefficient rib scale and making the change while installing a new soundboard. In some cases, though, the correct fix for a problem is simply impractical to accomplish on existing instruments; it's hardly practical, for example, to change a plate from a 20-note bass section to a 26-note bass section even though that may be the only way to improve a truly horrible bass-tenor break.

(A note about experimental work. I encourage anyone interested in learning more about piano design to experiment. But, unless and until you really understand how all of the many different design elements fit together to make the whole, you should probably leave well enough alone in your normal work. Indeed, no matter how advanced you become in your studies and design experience, you should ***always*** *approach with caution any deviation from the original design that might adversely upset the often precarious balance of the different design elements of a given piano. Unlike tuning, where mistakes are easily corrected, a mistake made here can be very difficult to make right. If you're serious about this, then buy the pianos you experiment on. If they don't work out, you can either do them over or throw the pianos away and charge it to education expenses. Don't do this stuff on your customer's pianos! DDF)*

Some History — Where Did We Come From?

Unlike instruments such as the violin, the origins of which are somewhat obscure, the history of the piano is fairly well-documented. From its

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earliest invention in about 1700 by Bartolomeo Cristofori, it developed from what was basically a modified harpsichord through the eighteenth and early nineteenth centuries until it reached its current form in the late 1800s. Both the grand piano and the upright piano as we know them reached their current configuration around 1860 to 1870. There was a tremendous amount of patent activity from 1850 through roughly the 1930s; during this period much refinement to this configuration took place, after which both the acoustical development and the associated patent activity seemed to level off. Since then, improvements in the actual performance of the instrument have been incremental at best. In some cases, ground gained has been lost. One conclusion that could be reached is that the piano was perfected by that point and there was simply no room for further improvement. Another is that it had reached the highest level that empirical development could achieve and that further improvements would have to wait until the analytical technology and tools became available to take it beyond that level. Still another is that as those original designers and innovators grew old and retired or died, their secrets went with them. There were rarely apprentices or students to continue their work after them. As business people took over the companies they were afraid to allow any changes to be made to the "original" design, for fear of upsetting something they didn't understand. Actually, no company in existence today builds pianos to the "original" design. The early piano designers and builders were constantly developing and innovating in an attempt to improve their instruments. They knew full well that their designs weren't perfect, but that innovation stopped when they were no longer with their companies.

Until well into the 1940s and 1950s, piano design was mostly empirical and intuitive — indeed, much of it still is. Consider, for example, how bass string scales were developed on pianos well into the mid-1900s. The following exchange is taken from *Piano Tone Building: Proceedings of the Conference of Piano Technicians,* March 5, 1919 (the discussion is about "Bass Strings: Their Manufacture and Proper Use."):

Frank E. Morton (American Steel & Wire Company): "Mr. Ramacciotti, do your customers specify tension or give you information relative to tension?"

F. Ramacciotti (F. Ramacciotti, Inc.) [a bass string winding company?]: "Only in one case."

Morton: "How about you, Mr. Schaff?"

W. G. Schaff (John A. Schaff Company, Chicago): "Very rarely do I come in contact with a real scientific piano man. I think the tribe is dying out."

Morton: "Mr. Holz, you have numbers of sets of strings established. If a new scale is brought in, don't you have one on hand with about the same lengths and take that one and move it up or down to the right point?"

George Holz (Mapes Piano String Company): "As a rule I do."

Morton: "Mr. Schaff, if you were given lengths and weights you would work from such specifications gladly?"

Schaff: "In a few instances we have. We sometimes give the customer our experience to arrive at a satisfactory break, and in most cases the customer has deferred to our suggestions. *I can truthfully say there are very few who give us specifications as to wire, weights and tensions."* (Emphasis mine, DDF.)

In other words, for any given scale the lengths of the bass strings, their relationship to the tenor strings, their core diameters and their wrap diameters were all derived empirically, as the result of guess work. Educated guess work, to be sure, but guess work still. Even when information about the string tensions of a particular scale was furnished by the piano designer or builder, it was based on the interpolated results of multiple experiments set up to experimentally measure the tensions of different combinations of string lengths using varying core and wrap diameters.

In the 1927 supplement to *A Treatise on the Art of Pianoforte Construction,* Samuel Wolfenden said, "It is remarkable that, at this date, after spun strings have been in use for, say, a matter of two centuries, neither in this country nor in any other, as far as many inquiries have shown, is there in trade use, a method by which the tensional stress upon a spun string, tuned to a given pitch, can be approximately ascertained.... *It does not comport with the dignity of such a trade as ours that there should be items in use which are not understood."* (Emphasis mine, DDF.)

Even today, with the mathematical tools we have available to us and with computers which can do in seconds what a piano designer would take days or weeks to do, we still don't have adequate principles of design to guide us in developing bass string scales that work. But we are much closer to understanding what Mr. Wolfenden could only dream about.

Back to *Piano Tone Building.* Skipping down a bit, the discussion shifts from bass strings to different types of piano tone and how to achieve them. This brought up the subject of downbearing, or soundboard loading:

Dr. Floyd S. Muckey: "How do you determine the proper degree of [string] stiffness to give best results?"

Morton: "The types of construction differ materially. Rarely do you find two makers who use the same caliper of sounding board in different parts of the instrument or the same bridge and rib work on crowning."

Muckey: "Any way of determining the pressure on the bridge for bass bearing?"

Morton: "That is directly [related to] the crowning and the ribbing. If very heavily ribbed, it requires greater bearing. When highly crowned, it requires greater bearing."

If It Ain't Broke — Break It! Or ... There Is No Such Thing As A Finished Product

Muckey: "Any standard measures?"

Morton: *"None that I have ever heard of — only the results of individual experimentation. None have been published to my knowledge."* (Emphasis mine, DDF.)

Remember now, this is a discussion among the designers of some of the pianos that are still in production today — designs that until recently were considered inviolate. Still are, by many.

Where Are We Now?

Much effort was made to improve — or at least "modernize" — the piano manufacturing process in the past several decades, particularly in Japan, Korea and, to a lesser extent, Germany. This development has made it possible for piano builders to provide instruments today at costs that are a fraction of what they would be if they had kept pace with inflation for the past hundred years. Unfortunately, the 20th century has not seen the kind of development in the performance of the instrument that access to modern equipment and technology should have made possible.

Far too often, when a "new" piano is "designed" and introduced today it is simply a re-interpretation of an early 1900s piano (usually German, sometimes American) adapted to be built on new automated or semi-automated machinery. Since the original materials and style of manufacture are no longer available or practical, the results are quite often less than musically satisfactory. There are a number of patches that are available to the builder which will make the piano acceptable on the showroom floor, but which do little for the piano after it has been played for a couple of years.

Even with the pianos that are still being built as closely as possible to the same quality and materials standards of the early 1900s, there are problems. Some of the materials that were available 75 years ago are not available today, just as some of the processes used to prepare materials 75 years ago are also not available today. So the instrument that was designed in 1910 simply cannot be built in 1995 the way the designer and original manufacturer intended for it to be built, no matter how dedicated and responsible the builders of today are.

The position this leaves us in today is both good and bad. It is good for piano rebuilders in the sense that the strongest competition some manufacturers have comes from pianos of their own manufacture that are now 50 to 100 years old and are being rebuilt and placed back in service in lieu of being replaced with new instruments. That these instruments often out-perform new instruments of the same design says as much for the knowledge and skill of the rebuilder of today as it does for the design integrity and manufacturing quality of the original instrument.

"Until well into the 1940s and 1950s, piano design was mostly empirical and intuitive — indeed, much of it still is."

It is not so good for the viability of the piano industry of today, however. It means that a fairly large part of the overall piano market is not considering the purchase of a new piano as an option. If these people are not buying new pianos, then there is no need for manufacturers to build them. It follows that if manufacturers do not build new pianos, then there is no need for them to stay in business. And in the end, if enough of the manufacturers of new pianos do not stay in business, there will soon not be a piano industry. Once there is no longer enough demand for the parts that go into new pianos, the parts suppliers will begin to close their doors or go into other lines of work. Once that happens (and the process has already begun, actually) the piano will take its place along side the harpsichord as one of those very interesting ancient instruments which are no longer really "relevant" to the 21st century society. And that will be sad. It is also avoidable.

The Future: Will There Be One?

If the picture is really that gloomy, can there be a future for the piano? My answer is a qualified yes. True, there is much more competition for the consumer's disposable income dollar today than ever before. It is also true that the electronic keyboard provides some stiff competition to certain segments of the piano market. For the most part though, they compete with the "low-end" instruments that have always left much to be desired acoustically, mechanically and structurally. It is still generally conceded, however, that a good acoustical piano has tonal subtleties and nuances that are not obtainable by synthesis and that situation is likely to remain through the foreseeable future. Let's keep in mind, though, that many millions of dollars are being invested in the continuing development of the electronic keyboards.

In contrast, a few thousands of dollars are being spent on the development of the acoustical piano. Where a so-called "high-tech" company may have an R&D budget of 3 percent to 5 percent of its annual sales (sometimes more, sometimes less, depending on the maturity of the product), a piano company might spend 0.1 percent of its annual sales on R&D, if that. Many, if not most, piano manufacturers have no R&D budget or staff whatsoever. By R&D I mean research and development devoted to developing the design and performance of the piano, not just in learning how to build it cheaper and faster. *(Don't misunderstand me here. The engineering work necessary to improve manufacturing efficiencies is also vital to a company's health, but that is not product R&D.)* Even when there is an R&D "department," much of the amount budgeted may well go to service-related and troubleshooting projects to track down various manufacturing problems brought about by the need or desire to build units ever faster and ever cheaper. This work may well be necessary, but it is a mistake to call it R&D and feel secure in the myth that product development is taking place. There may well be exceptions to this scenario; I certainly hope that there are.

Don't get me wrong. There are many good pianos being built today, but none of them are as good as they can be. The standard of performance should be a constantly evolving one.

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The Designer's Notebook

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Had the auto industry treated auto design the way the piano industry has treated piano design, we would all be driving clones of the Model T or Model A Fords. They would be available with leather seats and genuine plastic steering wheels and polyester finishes, but they would still have hand cranks and mechanical brakes.

The auto makers survive and thrive by continuing to offer better and better automobiles to their established customer base. They constantly draw their customer base back inside their dealerships because this year's product is better than that offered five years or 10 years ago. Piano makers have suffered because the instruments owned by their established customer base are perceived to be as good as or better than the product being offered today — not in terms of assembly and materials quality but in terms of acoustical performance. Whether this is true in fact or not is irrelevant; it is true in the mind of the current piano owner. There is, unfortunately, a finite customer base for pianos. While there are obviously many first-time customers for new pianos every year, there are many more potential customers who are already piano owners and who would be back in the market if they found one that substantially outperformed the instrument they currently own. There are a lot of piano fanatics out there!

There are many very good pianos being built today in terms of quality of workmanship (or should I say, "machineship") and materials. What I'm referring to here is their musicality. For when it is all said and done, ***it's the music that counts*** because, quite simply, if a piano is not able to produce music that is pleasing — no, not just pleasing but compelling, gripping, addictive — to the artist, it is completely irrelevant how many features it has or where the components and raw materials came from or how good the workmanship is. Even the best piano in the world today is not as good as the piano that can be made tomorrow. It is possible today to design and build pianos with greater power and sustain than ever before. It is possible today to design and build pianos with bass/tenor breaks that are essentially undetectable to the ear and which are completely free of the need for voicing heroics. It is possible today to design and build pianos in which the so-called "killer octave" is just as clean and bright as any other section of the piano, again without the need for voicing heroics. It is possible today to design and build pianos which have a window of acceptability that is much broader than anything currently available. It is possible today to design and build pianos that can produce bright, clear sound from hammers that are far softer that those being used on the majority of pianos in current production. The list goes on and on.

Piano design is not a "black art." It is not a discipline which companies — or for that matter, technicians — need to be fearful of. It is also not a discipline which should be locked in concrete, not even historical and traditional concrete. ***But it is a discipline that today is "not broken" and we will have to "break it" to make it better.*** Conventional thinking is not going to snap us out of the ruts of traditional lethargy we have dug for ourselves. Conventional wisdom is often an idiot.

Our industry must begin to offer something better than what has gone before. It must once again offer its market of existing piano owners and players a reason to replace that old piano with a new one. That will only happen when the new piano being offered is demonstrably superior to the old one that has been in the family for umpteen-eleven years. It must play better and sound better than anything the company offered in the past. It must play and sound better that the rebuilder can make that old one play and sound, no matter how skillfully the rebuilding job is done. Otherwise, it will continue to be more attractive to the piano owner/musician to simply rebuild that old piano and place it back in service.

Where Do We Go From Here?

I am in no way an "industry spokesman." I speak for no company. Nor do I speak for the Piano Technicians Guild. The ideas and thoughts presented here are my own and do not necessarily represent those of PTG, or any other company, group or organization. They are simply my observations of the state of our industry, based on many years of working both as a private, self-employed technician and as an employee of, and consultant to, piano manufacturers.

What I would like to accomplish with this column is to generate a dialog about piano design. I have no intention of providing all of the answers to all of the design problems of the piano. I don't have them all. Like my predecessors, I don't think I even understand all of the questions yet. Besides, I, too, have my "locked room" in the back — those ideas I'm not yet ready to share — and it is not my intention to teach anyone how to design a piano. But I do intend to tackle a fairly wide variety of subjects from a design standpoint rather than from a "how-to" standpoint. This will not be a "hands-on" column in the sense of presenting-step-by-step repair or servicing techniques. Instead, I will attempt to explain, in principle, how the various design elements of the piano work together to produce the types of sounds that we hear. It is my hope that what will be presented in this column will increase your understanding of how the piano works, and that it will open your minds to new ideas and new concepts — think new thoughts, try new ideas. If you find something that ain't broke yet, break it! Then fix it in some new and creative way that no one else has thought of before.

Along the way, I will attempt to answer some of the questions you may have about piano design if you care to submit them. (Please don't call me with them; I'd love to chat, but I have to get my work done, too. Either send them to me via Steve Brady at the *Journal* or fax them to me at (360) 532-6582. No, I don't have an E-mail address yet, nor am I on the Internet. Maybe one day soon.) Again, I don't promise to be able to answer all of your questions, but I'll do my best.

If what I have to say makes sense to you, great! Take the knowledge you've gained and use it to make the pianos you work on more musical. If it gets confusing, sorry! Let me know and I'll try to be more clear in my explanations. If you disagree with me, well, let me know and we'll try to work it out and hopefully find some truth out of our disagreement. As I said, I don't have all the answers, and I too, hope to keep learning along the way.

The Internet and You

By Ron Berry, RPT
Indianapolis Chapter

Since the days of the Pony Express, man has looked for fast, dependable communication. Our present telephone system now lets you direct dial almost anywhere in the world for reasonable prices. But you couldn't send documents over the phone, so in came the fax. But then you couldn't edit that document and reprint it, so along came computer file transfer. As more and more businesses became computer-equipped, developing a system to exchange computer information was inevitable.

The Internet was born as a military communication system. Not only did they want fast communication, but they wanted a system that was redundant so that if some lines were destroyed in an attack there were always alternate routes for the message to get through. Universities began connecting to share research among their faculty. In a very ungovernmental move, the government gave the Internet backbone to the public, and it came to be managed by the National Science Foundation. This started electronic communication on its way to stardom. Until recently the Internet was the domain of computer techies in university computer science departments. With the development of commercial on-line services and new Internet software, electronic communication began to grow at a phenomenal rate.

E-mail

Probably the most basic and most used service on the Internet is e-mail. Each user is given an electronic address in the form of 4 numbers like: 198.70.148.80. Because these are hard to remember, the Domain Name Server (DNS) was developed to translate these numeric IP addresses into easily remembered names. For example, my e-mail address it RonBerry@iquest.net. Addresses are broken down into large groups like, .edu, .gov, .org, .com, .net, .mil (educational, government, organization, commercial, network, and military). Upper or lower case letters don't usually matter, but addresses cannot contain spaces. When you send e-mail it first goes to the DNS which looks up the proper IP to send the mail. E-mail is usually fairly fast, but not always instant. Depending on the traffic, it may float around in Cyberspace (the nebulous unknown where mail exists after it has been sent and before it has been received) for a while before it is delivered. Basically the mail makes the round of all the computers on the Internet and asks each one if it is the right address. It's like dropping a letter on the sidewalk and having everyone who walks by look at it until the right person comes by and picks it up, but the people passing by are going at the speed of light. Virtually every on-line service and many local Bulletin Board Services (BBS) offer Internet e-mail so you can send mail to anyone on any other service.

E-mail programs have some nice features to make communication easier. Most have a reply function: you press a button and get a new mail window addressed to the person you received the mail from. Most have an address book so you don't have to remember addresses; you just select from a list. Many can set up groups where you send a newsletter to "Chapter" and it sends it to the list of addresses you have defined as "Chapter." (Now I'm

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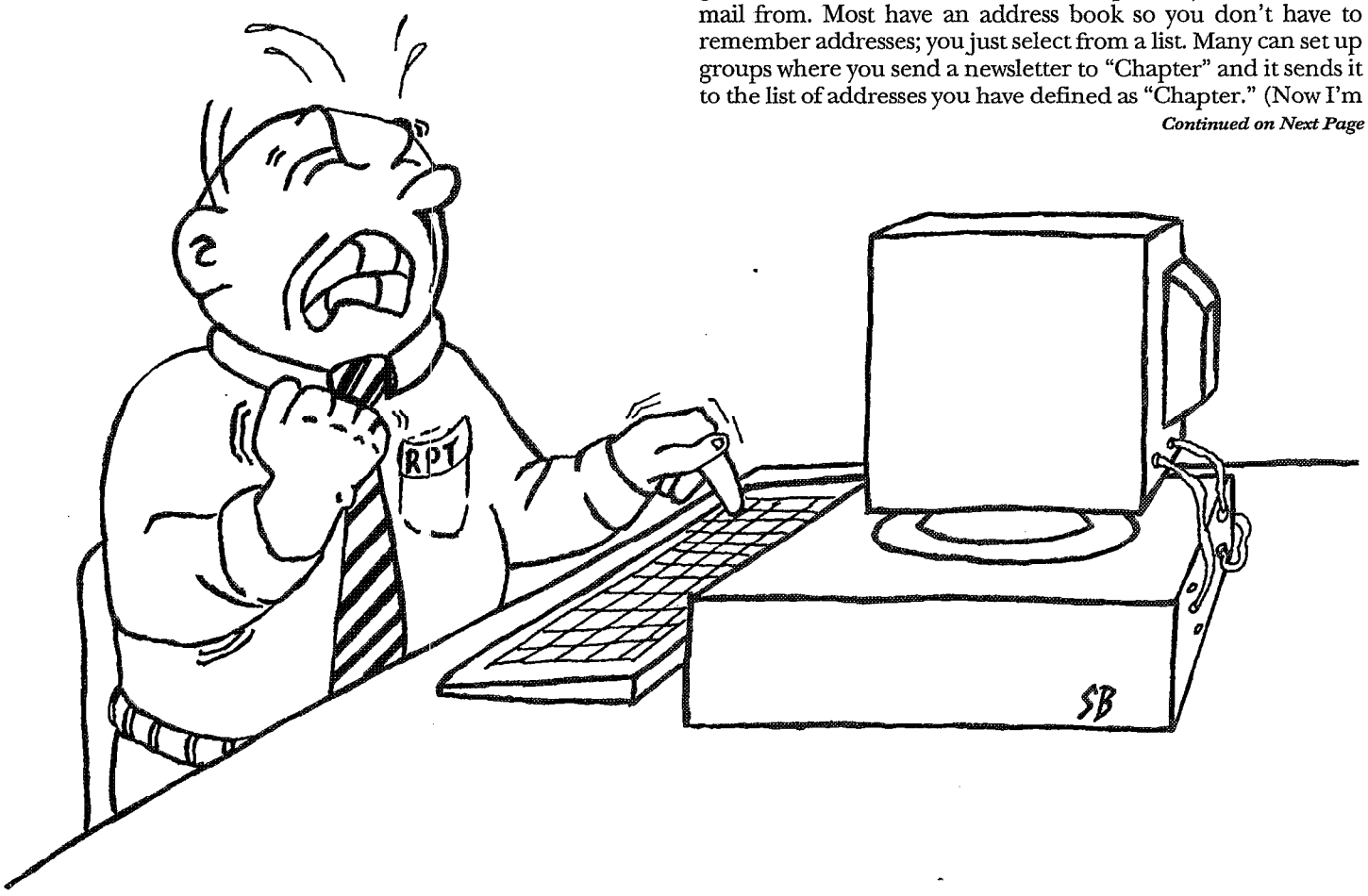

The Internet and You

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waiting for the day when the whole chapter is on-line so I don't need printers or stamps.)

Other helpful services using e-mail are mailing lists. These are set up on a server (a computer online all the time which provides information on demand). You subscribe to the list (usually by sending commands to an automated listserver program), and then any mail you send to the list address is copied to everyone who is subscribed. This makes for a huge international bulletin board.

There is a mailing list just for piano technicians that started among the university technicians. This list is housed at Brigham Young University in Utah, which provides the computer space. Like most listservers there are two addresses, one for the listserv for commands to subscribe, unsubscribe, etc.; and one for the list itself. To subscribe you send mail to listserv@byu.edu with the body of the message (not the subject line) reading "subscribe Pianotech Ron Berry." (Don't type the quotes or the final period.) After that your mailbox should start filling up with the daily dose of piano talk. Discussions have ranged from industry news to string breakage, to hammer installation, to touch weight, and beyond. You can send mail to the listserv address with the message "help" and get a full list of the commands you can send. The other address associated with the "pianotech" list is pianotech@byu.edu. Mail to this address will be copied to everyone, so don't send your listserv commands to this address, send them to the listserv address. This is probably the most valuable resource for piano technicians because it is a continuation of the discussions that happen in the halls between classes every day! See the sidebar for some other Internet mailing lists and directions for subscribing.

FTP

People on the Internet found themselves needing to send large files and programs as well as simple text e-mail messages. Thus developed File Transfer Protocol (FTP). FTP is a protocol, a set of rules for interpreting data that is sent, so that it can be reinterpreted correctly. All digital data is a series of on/off bits, but it requires a protocol to group them together into the right arrangements. FTP is used to transfer large files and programs. Many servers set up anonymous FTP sites so that anyone can log on to get the files. A good example of a use for FTP is a site containing hundreds of shareware programs. Sites can password protect certain directories to make them available to specific people only.

Archie

As FTP sites developed, the problem became finding what you wanted on them (this has been a continuing problem with the Internet since it has no central control). Archie is a software tool that collects the contents of FTP sites and offers a search function. With Archie you can search on any word to try to find the file you are looking for. The Archie servers also check around the Internet for FTP sites and collect the lists of files they find.

Gopher

While Archie searches the huge field of files, Gopher was developed to provide information in a hierarchical manner. It is more like an outline which groups like subjects to help searching. It was developed at the University of Minnesota and was named for their mascot. Most universities maintain gopher sites with substantial information about the school and its activities. As the companion to Archie, Veronica was developed to search through the gopher menus. Veronica makes the rounds of all gopher servers collecting the menu information. The archives for the Pianotech mailing list are stored on a gopher server since they are larger than regular e-mail files.

Usenet (Newsgroups)

Mailing lists help develop an on-line community among their subscribers. With mailing lists, all letters received are copied and sent on to you. Usenet groups are more like bulletin boards. Messages sent to them remain available for those who want to read them. The subject line filled out by the writer gives you some idea of what the letter is about. Usenet groups are organized by subject. The last time I got the whole list of them there were only 12,648 different groups. Fortunately the software lets you search the titles for words like "piano." One group that is of interest to piano technicians is rec.music.makers.piano. The rec. stands for recreation. This group has a broad spectrum ranging from how to find a piano teacher, to how to improvise, to questions about particular brands of pianos, to how to reach those difficult intervals in particular pieces of music. Newsgroups range in topics from Bosnian politics, to pictures from the Hubble space telescope, to erotica, to the Green Day Fan Club (that's a rock band, for those of you who are my age). The people who frequent the newsgroups often become a community because they share common interests. If you post something that is too commercial or off the subject of the group, they will certainly let you know.

Internet Relay Chat

Internet Relay Chat (IRC) is a service where many people are on-line together and everyone can see any typing done by anyone. This is the digital equivalent of a conference call. The Electronic Communications Committee has used a similar conference feature on CompuServe to have monthly meetings. While this type of meeting is a little slow and stilted, it can be useful for well focused discussions or committee voting. Both CompuServe and America On-line have many of these conference areas arranged by subject.

World Wide Web

The newest and most exciting part of the Internet is the World Wide Web (WWW or W3). This began at the European Particle Physics Laboratory in Switzerland. By introducing a new generation of software called "Browsers" it allows information to include text, graphics and even sound in the same document. WWW pages contain information and links to other information. This means that highlighted words or graphics can be clicked with the mouse, and will retrieve information from another file or another computer anywhere in the world. What has made the WWW so popular is its ease of use. You can just point and click your way around the world of information. If you have ever used a CD-ROM encyclopedia and followed the "See Also" links, you will have some idea of how this

works. Web pages can include text, graphics, videos, and sound, although all of these require large amounts of data and can be very slow if you have a slow modem. The minimum modem speed for adequate performance on the Web is 14,400 Kbs.

PTG literature is now on-line on the WWW at a site called the Piano Page at: http://www.prairienet.org/arts/ptg/homepage.html.

This site has all the PTG Brochures and Technical bulletins, plus information about piano manufacturers and teachers. The computer space is being provided to us by Prairienet in Champaign, Ill., thanks to member Ron Torrella, RPT. The Piano Manufacturers Association is currently developing a Web site which can have links to and from the Piano Page. The Web is growing incredibly fast and what is wonderful about it is that anyone can create the same presence as the large corporations. Thus the Piano Page is just as accessible as the Microsoft Page. There are search sites which provide no original information, but let you enter search words to search all the WWW pages. One such site searches over 4.5 million documents.

Web browsers let you access all types of Internet information from one program. You can get FTP, as well as newsgroups and gopher, with a point and click. Even e-mail links can be put on Web pages so you can send feedback to the author or subscribe to a mailing list while you have the address and instructions right there. For example, on the Piano Page you can click the address ptg@prairienet.org and get a window where you can write a note to the home office which receives it from their CompuServe account. Because of all the people who are connected to the Internet, Web pages can get a lot of exposure. By the 23rd of the month I checked the number of times the Piano Page had been accessed for the month and it was over 1,700. The potential here is enormous! And all of this access is by people who are interested enough in pianos to have been looking for information.

Getting On-line

Okay, so, now that I've told you about all the things you can do when you are connected to the Internet, how do you get connected?

At the moment there are three basic ways to get on-line: Internet provider, commercial on-line services, and local Bulletin Board Services (BBS)

Probably the easiest way to get going is to sign on with one of the commercial services. CompuServe, America On-line, and Prodigy are the big three. You can get an America On-line (AOL) disk with almost any computer magazine you buy. This has all the software you need and you just put it in your disk drive and run the Setup program and you are off and running. (Of course, you have to have a mo-

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Some Related Mailing Lists

Hammond Organ Mailing List

The Hammond Internet mailing list is for the discussion of technical aspects of Hammond organs regarding their playing, servicing, modification, and rebuilding. In addition, extensive discussion and information is available regarding Leslie organ amplification systems. Also included in discussions are issues related to various "clones" of Hammond organs using modern synthesizer technologies. A FAQ and international repair shop listing are available.

Subscribers simply send mail asking to join the Hammond list to: hammond-request@zk3.dec.com

This is not a list server, but is a simple mail-echo distribution system with technical documents available on request. The mail volume on this list averages less than 10 messages a day and the technical content is generally high.

Harpsichord Mailing List

Harpsichords And Related Topics (HPSCHD-L)

HPSCHD-L is devoted to early stringed keyboard instruments: harpsichords, clavichords, fortepianos, virginals, and all similar instruments except the modern piano. The list is an open forum for all topics related to these instruments, including their theory and principles of construction, decoration, and history and evolution from their earliest beginnings through modern times. Other topics for discussion include performers on these instruments, performance practice, literature, pedagogy, care and ownership. We may also stray to include ads of instruments/music/recordings for sale or wanted, discussion of performances or recordings, and musical editions.

listserv@albany.edu or LISTSERV@ALBANY.BITNET<P>

To subscribe, send e-mail to: listserv@albany.edu
send the following command in the body of your message:
SUBSCRIBE HPSCHD-L yourfirstname yourlastname

Piano-L Mailing List

PIANO-L is a list for pianists and piano teachers. All aspects of performance and pedagogy may be discussed in this open forum. Potential topics may include (but is not limited to) the following: Literature; accompanying; editions; memory and practice techniques; chamber music; pedagogical techniques; announcements of interest to pianists; recordings; history and theory; performance anxiety; injury (including how to avoid it, how to treat it, and what to do in the meantime); composition; competitions...topics are endless!

To subscribe send email to: Piano-L-Request@uamont.edu
with body of the message reading Subscribe Piano-L
If you wish to write to a human, please contact: Dr. Paul Becker, becker@uamont.edu

Reed Organ Society Mailing List

This is a mailing list for reed organ enthusiasts in general and members of the Reed Organ Society in particular.

To subscribe send the message text "subscribe ros" to majordomo@mrc-bsu.cam.ac.uk

Pipe Organ List

Pipe Organs And Related Topics (PIPORG-L)

PIPORG-L discusses musical, technical and historical aspects of organs of all kinds — classical, theater, electronic, reed, tracker, electropneumatic, etc. Stoplists, recitals (past and future), recordings, jobs (wanted and available), restoration hints, news of progress in restoration projects are all interesting. Requests for advice or information are encouraged, and stories of your experiences and knowledge are eagerly consumed. In short, if it is interesting and about organs, this group would like to hear about it.

To subscribe, send mail to: listserv@albany.edu
with the following command in the body of your message:
SUBSCRIBE PIPORG-L yourfirstname yourlastname<P>

The Internet and You

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dem in your computer connected to your phone line.) Commercial services have a basic monthly charge which includes some service. All these services include e-mail connections.

AOL charges $8.95 a month, including five hours of usage, then a per hour charge after that. AOL has excellent Internet services except for a WWW browser, but that should be in place by the time you read this.

CompuServe charges $9.95 a month including unlimited use of certain basic service, like news and weather. Then they charge $4.95 per hour for extended services. CompuServe has forums similar to Usenet groups as part of the extended service. There is activity in the Music/Arts Forum among many of the on-line piano technicians. There are some Navigator programs available on-line from CompuServe that automate much of the searching in the forums and keep the bills down. CompuServe has many Internet services including the WWW with 3 hours per month of time included in the basic fee.

Prodigy is a service that caters to education and kids, but it provides a complete range of services. Their pricing is comparable.

The cheapest way to get on-line is with a local Bulletin Board Service (BBS). I subscribe to one for $25 per year which has tons of shareware programs and unlimited e-mail. However, e-mail is the only Internet service it has. It is not a very pretty connection, and is a bit tricky to use. You need generic communication software like, Crosstalk, Procomm, or Quick link, but you probably got one of those with your modem. In Indianapolis I found a list of over 100 BBS offering various services.

If you work for a university or a government entity, you may be able to get an account from them for free. Universities typically give free accounts to their students.

Internet providers offer full Internet access for a flat fee. They typically charge around $20 per month for unlimited use. If you think you may use the Internet much at all, this is the cheapest way to connect and then you have all the services.

I mentioned earlier that 14,400 is the minimum speed for browsing the Web. There are modems that run at 28,800 and this speed is the highest that can be supported over regular phone lines. Until we have fiber optic cables we can't go much faster. Some areas offer ISDN lines which use regular phone cable but use four wires instead of two for increased speed. If all this sounds overwhelming, remember that you can send e-mail and be on mailing lists with a very basic computer and a slow modem. Then once you are bitten by the Internet bug you will want to upgrade.

The Internet will continue to change things in a dramatic way. It allows people to express their ideas to millions of people easily. This creates an atmosphere where we can almost have true democracy with millions of people. There is lots of government information available, including full text of all legislation. We can now keep in touch with friends in far away places easily and inexpensively. It has brought back the need to spell correctly, a skill which has waned during the age of voice mail. The Internet will play a role in video conferencing once it can transmit larger amounts of data. Even the arts have found their way to the Internet. There was a two piano concert where the two pianists were in different cities with MIDI pianos. The Internet is already allowing many office workers to work from their home and allowing meetings to take place without the people having to travel. We've only seen the beginning!

Industry News

Mair Named Sales Manager For Dampp-Chaser

Dampp-Chaser Electronics Corporation of Hendersonville, N.C., recently announced that Gayle R. Mair, formerly of Denver, Colo., has joined Dampp-Chaser as its sales manager. Ms. Mair has more than 14 years of experience in oil exploration, hazardous waste management and environmental consulting and sales. She will be responsible for both domestic and foreign sales of Dampp-Chaser products.

Dampp-Chaser manufactures humidity control systems for pianos, closets and other confined spaces. The company's products are currently marketed in the United States, Canada, Mexico, Central America, South America, Europe, Asia and Japan.

Gayle R. Mair

PACE

Professionals Advance through Continuing Education

LESSON PLAN

Technical Lesson #25

Grand Regulation - Part 6: Choosing Hammer Blow & Key Dip Settings for Proper Aftertouch

By Bill Spurlock, RPT
Sacramento Valley Chapter

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

In Brief

This lesson will explore the relationship between key dip, hammer blow distance and aftertouch in the grand action. Participants will test various settings of key dip and hammer blow distance on action models, or on sample notes of a piano and note the effect upon aftertouch.

Getting Started

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

Hands-On Session Setup

This lesson is best taught using action models, so participants can get a good side view of the parts. Alternatively, grand pianos in good condition can be used.

Estimated Lesson Time

One to two hours, depending upon the number of participants.

Tools & Materials Participants Must Bring

For this lesson, participants should obtain the following tools:

- capstan adjusting tools for both square and hole types.
- let-off adjuster
- drop-screw adjusters (small flat-blade screwdriver and clinch-head type)
- 6" steel rule, graduated in millimeters and inches
- assortment of front rail paper punchings.

Assigned Prior Reading For Participants

PTG Technical Exam Source Book (PTG Home Office, 816-753-7747), pgs. II.15–17; April 1994 PT *Journal* pgs. 29–33.

General Instructions

Aftertouch is that part of the cycle of motion of action parts which occurs after the jack disengages from the knuckle. By depressing a key very slowly, aftertouch can be observed in the various action parts: in the key, aftertouch can be felt as a release or slipping past a tight spot near the bottom of its travel. In the wippen, aftertouch can be seen as slight continued lifting after the jack trips out from under the knuckle. In the jack, aftertouch can be seen as continued rotation away from the knuckle after the jack trips and the knuckle drops onto the repetition lever. And in the hammer, aftertouch is evident as the hammer rises slightly after let-off and drop.

This "extra" parts travel after jack escapement and hammer drop is necessary to ensure the jack completely disengages from the knuckle so it will not interfere as the hammer rebounds from the string. For the pianist, the extra key travel provides a zone — rather than a fixed point — at the bottom of the key stroke in which the pianist can end the key movement and still make the note play properly. Technically, the key only needs to be depressed until the jack disengages from the knuckle and no further. However such an exact key dip leaves no "cushion" or margin for error in the key stroke. A slightly incomplete stroke (such as when attempting to play very softly) would not trip the jack adequately and the hammer assembly would bobble between the jack top and the string. So, aftertouch allows the pianist to achieve complete jack escapement regardless of playing force.

How much aftertouch should there be? To answer that, let's look at three ways of measuring or sensing aftertouch in the grand action, and the parameters for each:

1) Aftertouch at the front of the key: aftertouch might be defined as "additional key movement after the hammer drops" (just after let-off, when depressing the key very slowly). Aftertouch can be felt by depressing the key very slowly to the point of resistance where the jack begins to trip, then pushing it past that point. This gives the feeling of overcoming a friction point, like flipping a light switch. Ideally, this sensation should feel comfortable. That is, the key should slip past the point of resistance and move a small but definite amount before stopping on the front rail punching. With too little aftertouch, the key bottoms out immediately after (or during) the point of resistance. The end of the keystroke feels mushy and uncertain because there is no feeling of release. And with too much aftertouch, the key moves farther than necessary after the resistance point, making the end of the keystroke feel hard or abrupt.

The feeling of aftertouch in the key is subjective, and also varies with action design and condition. One way of quantifying it is to measure the amount of key

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movement remaining after hammer drop. To do this, you must control the key movement very carefully by placing the tip of the index finger beneath the front end of the key while slowly pressing the key downward with the thumb. As the key nears the let-off point, slow the hammer movement further by squeezing the tip of your finger between the key and keyframe. Stop the key movement just as you see the hammer let-off and drop, then look for any remaining space (aftertouch) between the key and the front rail punching.

A more precise method is to insert an additional cardboard punching under the front rail felt punching, and depress the key slowly again. Try different thicknesses until all aftertouch is eliminated — in other words, until the hammer drops at the precise moment the key reaches the end of its travel. Then the thickness of the additional punching represents the aftertouch that existed before adding that punching. Some manufacturers publish specifications for this distance. However, the measurement is still fairly subjective because it depends upon the softness (compressibility) of the front rail felt punchings and how hard the key is depressed.

2) Aftertouch at the jack top: aftertouch can be gauged as the amount of jack rotation after let-off. Ideally, the wippen will lift sufficiently to push the jack far enough against the regulating button to cause the jack to rotate completely out of contact with the knuckle. With too little aftertouch, the jack will not rotate clear of the knuckle. During very soft playing, this can cause the hammer to bobble against the string or fail to check, as the hammer rebounds from the string and the knuckle bounces off the jack top. With too much aftertouch, the jack can rotate so far that it is forced against the jack stop felt in the repetition lever. This can break the jack or at least cause a mushy feeling at the end of the key stroke, as the key is stopped by the jack instead of the front rail punching.

Thus there are mechanical limits to the acceptable range of jack rotation which then help to define the limits of aftertouch. These limits can be wide or narrow, depending upon the design and condition of the particular action.

3) Aftertouch at the hammer: aftertouch can also be gauged by the amount the hammer rises after drop, visible when the key is depressed very slowly. If any aftertouch exists, the hammer will rise to the let-off point, drop, then rise slightly further until the key reaches the end of its travel. (Even though the jack has tripped and one end of the repetition lever is stopped by the drop screw, the other end of the repetition lever is still being pushed upward by the remaining key travel. Thus the knuckle continues to be lifted during the aftertouch phase and the hammer rises slightly.) If there is no aftertouch, hammer drop coincides with the end of the key travel, and there is no further hammer rise. If there is excessive aftertouch, the hammer may rise back up very close to the string or even into contact with the string. This can cause the hammer to mute the string if it fails to check. Thus hammer rise after drop provides another limit to the allowable amount of aftertouch.

These three methods of evaluating aftertouch — the "bump" feeling near the end of the key travel, the amount of jack escapement, and the amount of hammer rise after drop — help us to determine the correct amount of aftertouch for a given piano. The feeling in the key is subjective, while the jack escapement and hammer rise impose mechanical limits. By evaluating all three, we can easily determine an acceptable range of aftertouch.

Adjustments that affect aftertouch: several adjustments in the action affect the amount of aftertouch. These are:

- Key dip: increasing the key dip results in more key travel at the end of the stroke, after let-off and drop, and thus more aftertouch.
- Hammer blow distance: the amount of wippen travel is determined by the key dip. It must push the hammer to the let-off point, then continue to rotate the jack out from under the knuckle. Increasing the hammer blow distance (lowering the capstan) requires the wippen to begin its travel at a lower point; therefore, it ends its travel earlier in the cycle as well, thus reducing the amount of key travel that remains after drop (less aftertouch). Decreasing the blow distance (raising the capstan) causes the wippen to begin its travel at a higher point, which causes it to end its travel later in the cycle, increasing the proportion of key travel occurring after drop (more aftertouch).
- Key height: raising the key height shifts the capstan slightly closer to the wippen flange; and vise-versa. This changes the leverage between the key and wippen slightly, causing a small but noticeable change in aftertouch.
- Repetition lever height: if the repetition lever is well above the jack top, lost motion can exist between the jack and knuckle. Some of the available key dip is then wasted taking up this lost motion before the hammer can begin to move, and less dip remains to go into aftertouch. Lowering the repetition lever closer to the jack top, then raising the capstan to restore the original hammer height, corrects the problem.
- Let-off: the let-off distance determines the point in the key stroke where jack escapement occurs. The farther from the string let-off occurs, the more key travel (aftertouch) remains after drop, and vice-versa.
- Drop: lowering the drop screw delays the observed drop point very slightly later in the key stroke, causing aftertouch to feel slightly less at the key. It has no affect upon the amount of jack rotation.

Although key height, repetition lever height, let-off, and drop adjustments affect aftertouch, they are not used for that purpose. They have their own criteria for adjustment — proper action function, maximum power, and reliable repetition, among others. These adjustments must be correct before evaluating aftertouch, but the actual adjustment of aftertouch is done by regulating key dip and hammer blow distance. The correct measurements for dip and blow on any action can be derived by testing different settings on sample notes, then evaluating using the three methods discussed earlier.

It is the ratio of key dip to hammer blow distance that determines the amount of aftertouch. For example, a key dip of 9 mm paired with a blow distance of 42 mm might result in the same amount of aftertouch as a dip of 10 mm and a blow of 47 mm on the same action. However, since the key is the one part of the action that the pianist feels, key dip should be kept within a "normal" range for a given type of piano. Thus, when evaluating blow and dip dimensions for a given action, you should use manufacturers' specifications for key dip as a starting point when available, and rely more on altering the hammer blow distance to obtain the correct aftertouch. At the same time, it is important to remember that a small change in key dip causes a big change in aftertouch. Therefore varying

key dip slightly in combination with a modest change in hammer blow distance is usually preferable to a large change in the hammer blow specification.

Check manufacturer's service manuals, or the PTG Piano Action Handbook, for regulation specifications for specific models. Also note where on the key the measurement is to be taken—at the very front end or part way back.

Exercises

The following exercises will demonstrate the affect of key dip and hammer blow on aftertouch. They can be performed on action models or on sample notes of a piano (one note per person). Instructors should make sure that the models or actions used are basically in good regulation.

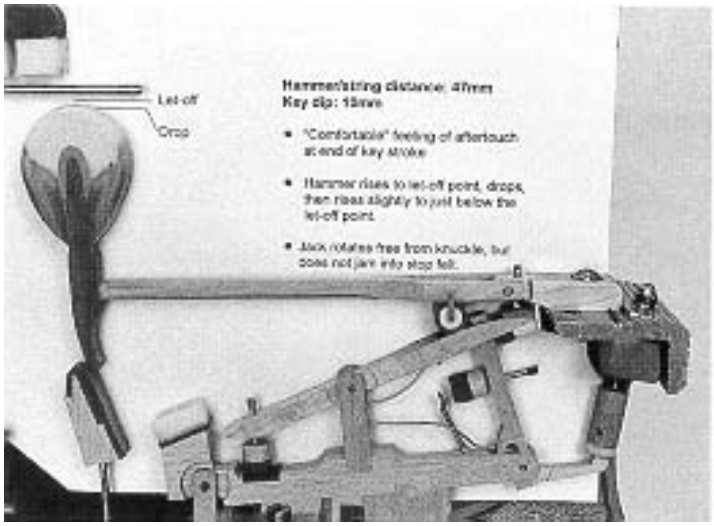

Photo 1

Exercise I

1. Adjust dip to 10 mm, measured at the front of the key.

2. Adjust the capstan for a blow distance of 50 mm or more.

3. Evaluate the aftertouch by the three methods: feeling at the end of the key stroke, amount of jack rotation, and hammer lift after drop. On most pianos, these dip and blow settings will result in little or no aftertouch, as shown in Photo 1. There should be a shallow, mushy feeling to the end of the key stroke, the jack will probably not be rotated away from the knuckle, and the hammer will probably not rise after it drops. Getting the hammer to drop at all may require forcing the key down against the front rail punching.

4. Increase dip slightly by removing a thin card punching from the front rail pin and retest. Notice the increase in aftertouch evident in all three areas.

Exercise II

1. Replace the front punching removed above to restore dip to 10 mm.

2. Reduce blow distance to 47 mm.

3. Check aftertouch again. It should be increased over that in Example I, as shown in Photo 2. If there is still too little, reduce the hammer blow and/or slightly increase key dip until you feel aftertouch is optimum.

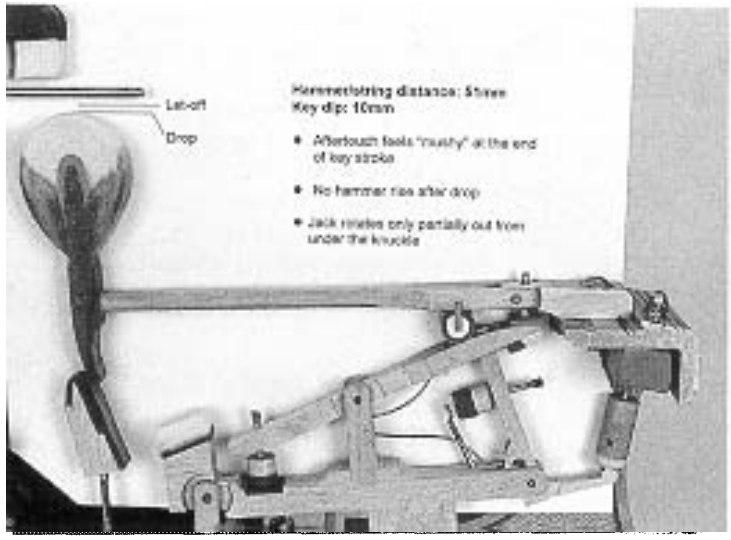

Photo 2

Exercise III

1. Restore key dip to 10 mm.

2. Reduce blow distance to 43 mm or less.

3. Check aftertouch. It should now be excessive, as shown in Photo 3. If not, continue reducing blow distance until aftertouch is excessive. Test whether the jack is jamming into the stop felt by holding the key down after a firm blow and trying to wink the jack tender. If the jack will not move, it is being forced into the stop felt, indicating excessive aftertouch.

4. Reduce blow distance again until aftertouch is optimum. Recheck using all three tests.

Conclusion

Returning to the regulation sequence begun in Lesson #20, once the keyframe is bedded and all parts are aligned, the tests above can be used to determine appropriate settings for key dip and hammer blow for a given piano. Although specifications may be available from the manufacturer, the aftertouch test should be used to confirm them. Worn parts, design changes, or manufacturing variations can all cause the book specifications to give a less-than-optimum result. And for the older piano where no published specifications are available, the aftertouch test allows the action to tell you how to best regulate it. PTJ

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LESSON PLAN

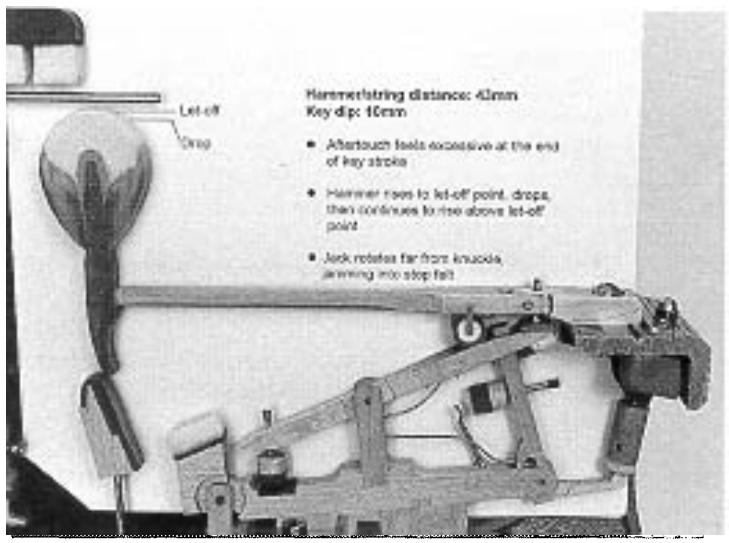

Photo 3

PACE

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LESSON PLAN

Tuning Lesson #25

Refining the Bass

By Michael Travis, RPT

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

In Brief

This lesson consists of practice tuning and refining the area of A0 to C3. Before proceeding, participants should have practiced PACE tuning lessons 6, 18 and 19 as indicated in the home study section below. The first part of the lesson will demonstrate how quickly you can get in the ballpark by tuning only single octaves. The rest of the lesson will consist of practice in nit-picking the fast single-octave tuning.

Chapter Meeting Set-Up

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

For this lesson, we need to have the midrange in tune at least up to C5, and the piano muted to single strings from A0 to the upper midrange. The open strings below C3 should be alternately raised and lowered a noticeable amount, similar to the PTG tuning exam detuning.

Tools & Materials Participants Must Bring

Tuning hammer

Home Study Assignment For Participants

Review and practice PACE Tuning lessons: #9 (5/94 *PTJ*, 6:3 octaves); #18 (2/95 *PTJ*, parallel interval tests); #19 (3/95 *PTJ*, 8:4 and 10:5 octaves).

General Instructions

In the first part of this lesson, participants will practice a fast octave tuning of the notes below C3, aurally focusing on the 6:3 octave partials while playing the octave notes together, and using no other checks at this stage. The instructor should demonstrate where the 6:3 octave partials are located by playing the corresponding note lightly just before tuning each of the first few octaves. Participants can then continue as a tag-team relay, switching off after tuning three notes each. Someone can time how long it takes to tune the bass this way. The goal should be to have acceptable single octaves, slightly wide of pure, in as little time as possible. If desired, you can repeat this part of the lesson simply by detuning the bass and starting over. It should go fairly quickly.

Once all the single octaves are acceptably in tune, the rest of the lesson will be to nit-pick, or refine this tuning. Each participant should be able to find three notes in octave 2 and three more in octave 1 that need improvement, looking first at consonant intervals, nit-picking each end where there is a problem, and similarly, nit-picking parallel strings of faster-beating intervals. Let each participant refine the tuning of three notes in octave 2 until this octave can no longer be improved before the group goes on to octave 1. Participants not tuning should be listening quietly.

Example: Playing a descending series of parallel fifths in the upper bass, suppose you find that the C2-G2 fifth is too noisy compared to its neighbors, and is confirmed narrow by the M6-M10 test. The octaves C2-C3 and G2-G3 sound similar. You might then play the lower parallel M3s, B1-D#2, C2-E2 and C#2-F2, and the upper parallel M3s, F#2-A#2, G2-B2, G#2-C3, to see which end of the fifth needs to be moved the most, according to the thirds. Check to see if the trios of parallel M6s around C2 and G2 give you the same indication. If so, go ahead and make the change to improve the fifth, compromising with the octaves as needed. It may be that both ends of the fifth need to be "spread" a tiny bit to quiet it down.

After each participant has had a turn in octave 2, and there are no more glaring errors apparent, go on to octave 1 and repeat the process. Make sure everyone understands the concept of refining a tuning by testing both ends of problem intervals with parallel interval checks.

Background

Generally speaking, what we first look for in a refined bass tuning are consonant intervals, the octaves, double octaves, fifths and twelfths, that are as beatless as possible. This is a higher priority than absolutely smooth progressions of faster-beating parallel intervals. Such progressions only indicate a certain consistency in the octaves, even if the octaves are all noisy! So tune first for clean-sounding octaves and other consonant intervals, and second, for smooth progressions. You need to have both.

Bass Interval Tests: A Brief Review

A pure 6:4 fifth is one in which the sixth partial of the lower note is the same pitch as the fourth partial of the upper note. The best test for this type of fifth is the equal-beating m3-M3 test, (the one we do *not* normally use in the midrange), testing interval ratios 6:5 vs. 5:4, with the test note is a m3 above the lower note, and coincident partials a double octave above the upper note. The 6:4 fifth will usually be slightly narrow in the upper bass (m3>M3) and nearly pure in the lower bass (m3=M3).

A pure 6:3 octave is one in which the sixth partial of the lower note is the same pitch as the third partial of the upper note. The best test for this type of octave is the equal-beating m3-M6 test, testing interval ratios 6:5 vs. 5:3, with the test note a m3 above the lower note, and coincident partials a twelfth above the upper note. Since narrow 6:3 bass octaves will usually not sound as good as those that are pure to slightly wide, m3≤M6 is a good rule of thumb. If m3>M6, the octave is narrow at the 6:3 level, and the lower note should usually be flattened to spread the octave.

A pure 6:2 twelfth is one in which the

sixth partial of the lower note is the same pitch as the second partial of the upper note. The best test for this type of twelfth is the equal-beating m3-M10 test (an octave wider than the 6:4 fifth test), testing interval ratios 6:5 vs. 5:2, with the test note a m3 above the lower note, and coincident partials an octave above the upper note. The 6:2 twelfth should be nearly pure throughout the bass (m3=M10), though tending toward wide in the low bass (m3<M10).

A pure 8:4 octave is one in which the eighth partial of the lower note is the same pitch as the fourth partial of the upper note. The best test for this type of octave is the equal-beating m6-M3 test, testing interval ratios 8:5 vs. 5:4, with the test note a m6 above the lower note, and coincident partials a double octave above the upper note. Since wide 8:4 octaves would be suspect except perhaps in the low bass, for the most part we would want to hear pure-to-narrow 8:4 octaves, so our rule of thumb here would be m6≥M3. If we hear instead m6<M3, we would have a wide octave at the 8:4 level, and would usually need to sharpen the lower note slightly. One common drawback to using this test for aural tuning is that often eighth partials are weak, so hearing the test interval beat rates may require a ghosting technique, which takes extra time.

A pure 10:5 octave is one in which the tenth partial of the lower note is the same pitch as the fifth partial of the upper note. The best test for this type of octave is usually the equal-beating M24-M17 test, testing interval ratios 10:1 vs. 5:1, with the test note a M17 above the upper note of the octave, where the 10:5 coincident partials are also found. Seldom if ever would we want to hear octaves wider than pure 10:5, except perhaps on the lowest few strings of the largest grands, so our rule of thumb for this test in the low bass would be M24≤M17. A faster M24 would indicate an octave wide at the 10:5 level, and we would usually want to raise the lower note to improve the octave. Except in the low bass, single octaves will always be narrow at the 10:5 level.

However we may decide to tune the bass octaves, we should bear in mind this important benchmark: do not exceed about 1 bps in the 4:1 double octaves. Playing parallel double octaves will quickly indicate where we have gone too wide in the single octaves and need to compromise further. Our 4:1 double octave test in the bass is the same as the midrange: M3-M17, test note an M3 below the lower note, testing interval ratios 5:4 vs. 5:1, coincident partials at the upper note of the interval. For most of the bass, M3<M17 by about 1 bps or slightly less. If M3>M17, the lower note is too sharp and you have a narrow double octave.

We sometimes would want to compromise the cleanest sound in the single bass octaves to avoid noticeable beating in the double octaves, especially in the low bass. As a matter of fact, it's a good idea to find a balance between the fifth, the single octave, and the twelfth that keeps the double octave "in bounds" in tuning the bass. One good approach would be to compromise between the 6:3 octave and 6:2 twelfth. This compromise rarely results in double octaves beating too fast. We combine the 6:3 (m3-M6) and 6:2 (m3-M10) test intervals to get a m3-M6-M10 test, where we want all the intervals to be as nearly equal-beating as possible. Any discrepancy should favor a slightly wide 6:3 octave (m3<M6) and pure 6:2 twelfth (m3=M10).

Example: Tuning A1, play the m3, A1-C2 vs. the M6, C2-A2 vs. the M10, C2-E3. Find a place for A1 that minimizes the differences among these test intervals. If m3<M6 and m3<M10, raise A1 to speed up the m3 and slow down the M6 and M10. If m3<M6 and m3>M10, move A1 as needed to equalize the differences, so that the octave is the same amount wide as the twelfth is narrow. Check parallel M10s down to C2-E3 to judge consistency of tuning.

In the lower bass, you probably won't want to go flatter than a pure 6:4 fifth (m3=M3). If your 6:4 fifths are wide (m3<M3) the lower note is probably too flat and your double octaves will probably be beating uncomfortably. Hearing the m3 beat rate in this area, however, may require a ghosting technique.

Another compromise tuning that works especially well for the lower bass is between the 8:4 single octaves, the 8:2 double octaves, and the 8:1 triple octaves. On many well-scaled pianos this boils down to nearly pure 8:2 double octaves from A0 to A1. The appropriate aural test for a pure 8:2 double octave is the equal-beating m6-M10 test (one octave wider than the m6-M3 8:4 octave test), with the test note a m6 above the lower note, testing interval ratios 8:5 vs. 5:2, with coincident partials an octave above the upper note. Most likely you will have to use a strike tone at the triple octave above the lower note of the m6 to ghost the 8:5 coincident partial beat rate. The 5:2 M10 beats are usually quite audible. Though the true 8:4, 8:2, 8:1 compromise is practical only with an electronic tuning method, a rule of thumb for aural tuning would be to go for nearly pure 8:2 double octaves to the low bass single strings (m6=M10). If m6>M10 (narrow 8:2), you're probably sharp, and if m6<M10 (wide 8:2), you're probably flat.

All the above notwithstanding, you should not be spending an inordinate amount of time interval testing the consonant intervals; just get most of them sounding good and then spend time nit-picking them with faster-beating parallel intervals. To nit-pick, play parallel series of slower-beating intervals, and test faster-beating parallel intervals on each end of any slower-beating intervals that jump out at you. Then check for smooth progressions in these faster-beating parallel intervals, where audible: m3, M3, M6, M10, m14, M17, m21, M24. The first four plus the M17 will be mainly useful in the upper bass, while the last four will be mainly useful in the lower bass. Nit-pick these as you did the slow-beating intervals.

Summary Of Some Approaches To Tuning The Bass

1. Tune for the best sounding octaves and fifths, and check for consistency with parallel interval tests. Start with 6:3 octaves (m3=M6), and make slightly wider (m3<M6) for smoother octave sound further down. Check mainly with parallel M10s and M17s in the upper bass, and M17s, m21s and/or M24s in the lower bass.

2. Tune for clean single octaves as above, but be sure to limit double octaves to no more than 1 bps width at the 4:1 level (M3<M17); check for consistency with parallel interval tests as above.

3. Compromise between 6:4 fifth, 6:3 octave and 6:2 twelfth (minimize differences among m3-M3, m3-M6, and m3-M10 test intervals). Upper bass: nearly pure 6:2 twelfths. Lower bass: nearly pure 6:4 fifths. Simplified version: balance the octave and the twelfth.

4. Compromise between the 8:4 single octave, the 8:2 double octave and the 8:1 triple octave from A1 down to A0 (minimize differences among m6-M3, m6-M10, and m6-M17 test intervals). Simplified version: tune nearly pure 8:2 double octaves from A1 to A0 (works OK for well-scaled grands).

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

TECHNOstuff

Richard Anderson, RPT • Chicago Chapter

Museum of Archaic Piano Technology

I've often wondered why we, who can recount in detail the difficult circumstances we've had to work under, judge our colleagues as if they've always had perfect conditions to work under? We're often quick to excuse our own work, but criticize the work of others when we have no information about the circumstances under which they did the job that we're judging.

There is, however, one legitimate complaint that can be made by one in any profession against another — the failure to keep up to date. Pianos haven't changed much in the last hundred years, but piano servicing surely has. Tools, techniques and materials have changed a great deal, and we've had the benefit of hindsight to discover that procedures that were once routine were ineffective at best, and often harmful.

Not too long ago, a good tuning was judged by only fourths and fifths. Today's tunings must have even thirds, sixths, and every other conceivable interval to pass muster. Twenty years ago we avoided replacing a pinblock for fear of altering the "character" of the piano. Today we know that pinblocks are just another part that wears out and we replace them routinely. Any rebuilding shop worth its salt has a pile of old blocks in the corner. Twenty years from now we'll deal with soundboards in the same way.

At the tool auction after last month's meeting I bid on several items that I joked were additions to my Museum of Archaic Piano Technology. Hammer voicing pliers, bronze tuning pin bushings, and key tensioners all look great in the catalog, and are tempting to try, but are only substitutes for the proper technique or repair.

In addition to my Museum of Archaic Piano Technology, I'm tempted to start a Tuner's Hall of Shame. We've all run across work that seems as if it were done by someone who hasn't poked their head out of their shop door in quite awhile. If we don't continue to keep current once we've learned initially, that someone will certainly and eventually become us.

Two of our favorite areas of analogies in thinking about what we do are medicine and automobiles. Like pianos, human bodies haven't changed much recently, but doctors don't do much bloodletting any more. We all want to be treated by a doctor who has the most current information and skills. Our customers deserve the same.

"Your brain is your most important tool. It pays to keep it polished."

Although automobiles have changed radically over the years, mechanics still get their hands dirty servicing them. But many mechanics now make a better rate for their time than we do because they've learned to deal with all the electronic doodads on today's cars.

The only constant in our profession is a love for the instrument and a desire to serve people by working on their pianos. Everything else is up for grabs and constantly changing. The best investment you can make in the future of your business is in yourself. Keeping current is far more valuable than all the fancy tools in the catalogs. Your brain is your most important tool. It pays to keep it polished.

Of course, the PTG is the best source for current piano technology. And the annual institute is one of the most efficient methods of learning that technology. It's where you will learn the technostuff that will save you time, make you money, and give you an advantage over the folks who didn't attend.

Looking Good in Print . . .

Incorporating the New Logo into Your Business Card and Stationery

By Bill Spurlock, RPT
Marketing Committee

Some members have asked for help in adding the new logo to their business documents. Since it contains a visually powerful graphic, it is seen by some to conflict with their existing designs. Others simply want advice on how best to lay out a new design. In this article, I'll present some guidelines on using the new logo, in combination with good graphic design principles, to create effective business documents.

Why is Design Important?

A business card, letterhead, and invoice header serve the obvious purpose of listing one's occupation, phone number and address. However, these documents also convey much more information to the viewer than what is written on the page. First, the eye appeal of the overall design (or lack thereof) determines whether it will even be read at all. The sheer quantity of written material passing before our eyes each day dictates that only the most appealing will be noticed.

Next, the style of the text and graphics conveys a message separate from the meaning of the words. For instance, a sloppy, hard-to-read design may give the impression of a technician who is sloppy and hard to deal with. A design cluttered with trite, predictable piano images and dense text can convey an unimaginative, dull technician. Conversely, a clean, simple design with a unique graphic and type style and ample white space conveys special qualities like confidence, expertise, and an artistic bent.

Finally, our business documents are tools all PTG members can use to promote public recognition of PTG and our member categories. By faithfully using our member logo versions and our membership title or RPT initials on our individual paperwork, we add to the impact of our PTG business aids in building public recognition. But to be recognized, a logo must be properly displayed.

Document Design Basics

Before looking at ways to add the logo to existing documents, let's look at some basic design considerations for business cards, letterheads, and other business items. Whether you order stock designs from your printer, have a graphics designer develop custom work for you, or do your own on a computer, the following guidelines will be useful:

- Develop a uniform style for your letterhead, envelope, invoice, business card, and other business documents. This creates a recognizable identity for your business, and makes it easier to develop additional documents by adapting the original design. While it may not be possible to include your entire letterhead design in your business card, you can at least maintain a consistent type style between the two, and can usually include a similar version of any graphic used in your letterhead.
- Use design elements appropriately. Features like large titles and headings, lines, boxes, bullet lists and graphics add visual appeal to your documents and attract the reader's attention. However, excessive use of these design elements works against you by distracting the reader's attention from the message you are trying to convey in the text.
- Maintain plenty of white space. A design with less text and more white (empty) space is much more likely to be read than one that is crammed full of text and graphics. The empty space frames and highlights the content, inviting the eye to explore the page, whereas a cluttered design often looks like it would be too much work to bother reading.
- You can add visual appeal to your designs by using two or three contrasting but compatible typefaces, as I've done in the header for this article. However, don't overdo it. Switching typefaces too often in one document gives a confusing, "ransom note" appearance and detracts from your message.
- A second color can really draw attention to your business name or other elements you wish to highlight, and add to the overall eye appeal of a business card or letterhead. Two-color printing adds to the cost, but once you see your design in color you may never be happy with all-black again.
- Business cards are a special case. They're too small to allow much text, so visual appeal is very important. Don't try to explain all about your business on a tiny card. Instead, use a unique and attractive design to convey your message of quality and reliability. You can use the back side to add a list of services, if needed.
- RPTs should always have the initials "RPT" printed after their name on business documents. The client logo survey, detailed in last month's article, clearly showed that the RPT initials and the words, "Registered Piano Technician" in the RPT logo reinforce each other. Many clients commented that initials after a name meant a "qualification," and because of the logo tag line they knew what those initials meant.
- The PTG Graphic Standards Manual (GSM) contains all rules governing the use of our logos, as well as sample letterhead and business card designs and camera-ready logos. If you don't have one, they're available free from Home Office. PTG also offers clean, professional business card designs custom printed with your name and address at reasonable cost.

Adding the Logo to Existing Designs

Unless your existing business card or letterhead designs have ample extra space, you will need to alter their design to make room for the new logo. This would be true when adding any new element, but is especially true for the logo. Since we want it to be easily recognized as a PTG symbol, it should not be blended into our personal

Continued on Next Page

Looking Good in Print ...

Incorporating the New Logo into Your Business Card and Stationery

Continued from Previous Page

business logos. Instead, it should have its own space on the page so it retains a separate identity. Following are some sample business card "make-overs" I've done to illustrate how the new logo and good graphic design can help your business stand out above the rest.

Example 1

Original design

This card illustrates many common design problems:

- The piano and swirling keyboard graphics are boring — they are easily recognized as representing pianos, but are too obvious to invite further study after the first glance. And since they are stock graphics found in any print shop's catalog, they are overused and thus don't distinguish this card from others.

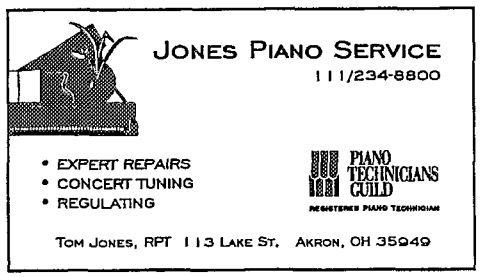
Example 1, Original Design

- The design is cluttered and has very little white space. In an effort to draw attention to everything on the card, almost every item is either bolded, in a box, or in quotes. The result is that each item competes for the reader's attention, and the eye jumps around the card not knowing where to stop.
- The typefaces send the wrong message. The business name is a casual, funky style better suited to selling hot dogs than professional piano service. The Helvetica typeface used on the rest of the card is a good choice for legibility, but is very common and in this already dull design it does nothing to add eye appeal.

Modified design

This redesign uses more sophisticated type and graphics, and some white space, to send a message that is both stronger and more memorable:

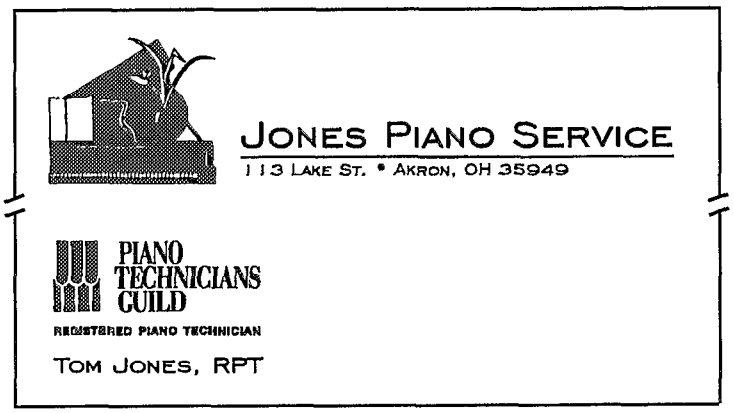
- The overused graphics are traded for a more elegant piano image. Though still a stock image from a printer's catalog, this graphic is much more appealing. Remember that marketing can only succeed if it addresses the customer's interests. This image does that — the open music book denotes the pleasure of playing, the flower arrangement suggests a comfortable home, and the attractive grand piano suggests a technician with an artistic side.



Example 1, Modified Design

- The addition of the RPT logo reinforces the artistic, professional image of the technician. Again referring to last month's article on the client logo survey, clients frequently commented that the new logo looked "professional" and "artistic."
- White space and more subtle formatting reduce the clutter while drawing more attention to the important points. Instead of a large business name in a black box, the name is smaller, stands alone, and is set in a more sophisticated style of type. The heavy, bolded list of services is replaced by lighter type set off with bullets.
- The type style (Engravers Gothic) is unique and attractive, inviting the eye to read it repeatedly.
- I created a matching letterhead by using the same graphic and typeface. Because a letter offers ample space, I usually prefer to move the logo and technician's name to the bottom of the page. This encourages the reader to view the whole page, and eliminates clutter at the top. The envelope design is similarly done. The point here is that a simple but unique design can be easily adapted to a variety of documents, from business cards to newsletters, and maintain a common look. That way, every one of your business documents reinforces your business image and each reminds your customers of you.

Example 1, Modified Design Used in Letterhead

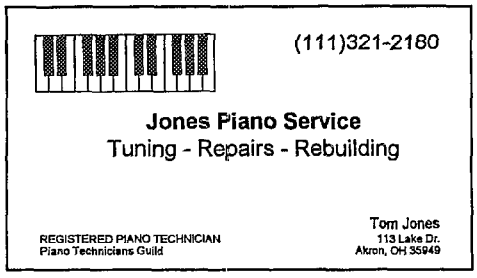


Example 1, Modified Design for Envelope

Example 2

Original Design

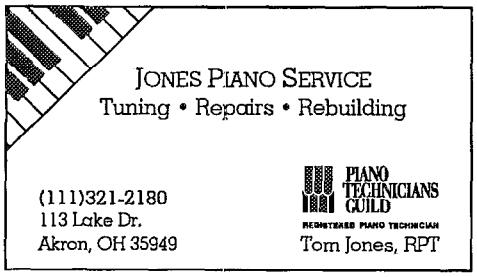
- The keyboard graphic is again very common and literal, leaving nothing to the imagination and thus discouraging further study.
- The typeface is also the very overused, dull and businesslike Helvetica.



Example 2, Original Design

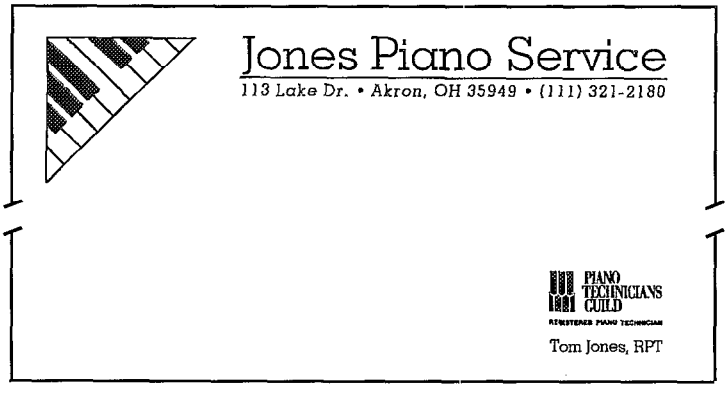
Modified Design

- By simply rotating the keyboard graphic 45 degrees, enlarging it, and placing it in one corner of the card, it becomes much more interesting. It's as though there is more to see but it's just out of view. The effect of this is to cause the viewer to continually look at the graphic, thus implanting it firmly in his/her memory.



Example 2, Modified Design

- The logo again adds a more professional and artistic look, and also reinforces the piano key image (in the client logo survey, clients commonly saw "piano keys" in the logo graphic). The logo and "Tom Jones, RPT" convey membership and classification in a much more attractive way than spelling them out as in the original.
- The typeface is changed to Geo Slab 703 Light, a style that conveys a feeling of craftsmanship and pride.
- The design adapts easily to a letterhead design.

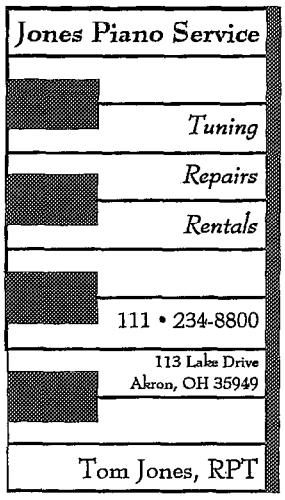


Example 2, Modified Design Used in Letterhead

Example 3

Original Design

- This design uses a stylized keyboard design that is very eyecatching. However, its many lines make it a bit monotonous to read. All elements look too much alike, with nothing to break up the design.
- There is no space big enough for the logo.

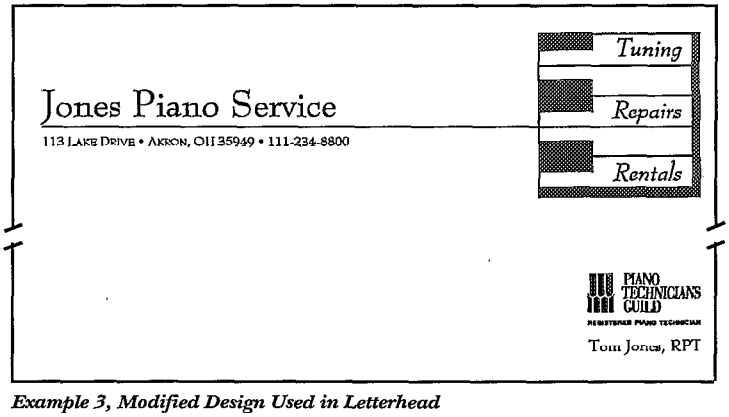


Example 3, Original Design

Modified Design

- By converting the bottom portion to a solid black box, space is created for a reverse-color logo (copy shops or printers can produce reversed logos for you from the logo clip art sheet in the GSM).
- The black area breaks up the monotony of the original design while giving the card a much stronger appearance.
- A portion of the card graphic is used in the letterhead, along with the same typeface, to maintain a common look.
- Note that although the design does not depict a correct keyboard layout, it still suggests piano keys. Often a stylized, non-literal design is more effective than a true version. Since the keys look "a little off, somehow" the viewer will spend more time studying them.

Example 3, Modified Design



Example 3, Modified Design Used in Letterhead

Conclusion

Our print image is an important one. When a client picks up our business card or a brochure from a music store or teacher, they get an impression of us even though they haven't met us. Our print image is a large part of that impression. When we service their piano we have the opportunity to create a firsthand impression, but we also have the opportunity to reinforce our strong points with an attractive and effective invoice, newsletter, card, or follow-up estimate printed on our letterhead. Every one of our business documents is also a tool for building public recognition of PTG and our membership categories. The more we do that, the more recognized the RPT standard becomes, and in turn the more we benefit personally from that status.

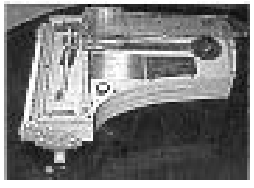
Albuquerque '95

On Board

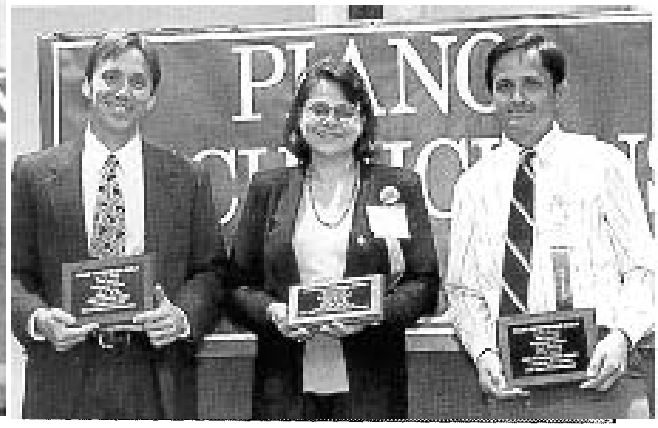
The 1995-96 PTC Board of Directors elected during the Albuquerque convention are: from left, Pacific Northwest RVP Ward Guthrie, Secretary-Treasurer Jim Coleman Jr., Vice President Gina Carter, Northeast RVP Chuck Erbsmehl, President Leon Speir, Central East RVP Laura Kunsky, Central West RVP David Durben, South Central RVP Jack Wyatt, Southeast RVP David Duncan, and Western RVP Paul Monroe.

Honors & Awards

Golden Hammer



Above, 1995 Golden Hammer winner Charles Huether and designer of the award, at left, Bill Smith, shared a laugh after Charles received the award at the Golden Hammer Banquet. Presidential Citation recipients, top center, were Fern Henry and Bill Spurlock. At right, Webb Phillips, from left, Fern Henry, Jim Gieger and Bruce Dornfeld were this year's Member of Note Award winners. David Vanderlip, far right, was named Examiner of the Year.



Wally Brooks, center left above, and Bill Smith, were named to the PTG Hall of Fame. They are flanked by Chairman of the Awards Committee Ben McKlveen, left, and PTG President Leon Speir. Chapter Newsletter Awards, above right from left, went to Partial Post of the Waukegan Chapter, Charlotte Eschman representing Alpha Bits of the Washington, D.C. Chapter, and Paul Brown representing The Vancouver Beat, Vancouver, B.C. Chapter. Chapter Service Award recipients, at right from left, were Virgil Smith, Chicago, Alan Hallmark, Richmond, Va., and Carl Messina, Pocono Northeast.

Opening Day

During the Opening Ceremonies, PTG President Leon Speir, top far left, presented a proclamation from the State House of Representatives of New Mexico welcoming the PTG Convention to Albuquerque. 1994-95 Secretary-Treasurer Collete Collier, top center, called the Roll of the States. Institute Director Fred Fornwalt, far left, announced additions and changes in the Insitutute schedule. Host Chapter Chairman Fred Sturm, left, welcomed members to the convention. During the ceremonies, John Travis, above, one of the first co-presidents of PTG, and his wife, Genevieve, were introduced.

Albuquerque '95

IAPBT

Members of the Japanese delegation, top, listen to a presentation during an IAPBT symposium. Kenzo Utsunomiya, president of the Japanese Tuners Association, above, greets delegates. Odd Aanstad, left in far right photo, representing Europiano, and Dr. Albert Sanderson, representing Britain's Pianoforte Tuners Association, as the groups were being considered for membership in IABPT. 1994-95 PTG Vice President Michael Drost delivered an address during a symposium on membership practices. Ed Hilbert, bottom right, International Relations Committee Chariman, welcomed members of the IAPBT to Albuquerque.

Technical Institute

Members of the 1995 Technical Insitute Committee, above from left, were Steve Brady, Assistant Director, Fred Forwalt, Director, and Assistant Directors Wally Brooks and Paul Olsen. Paul Olsen, left, discussed class preparation with Institute instructors.

Council

Roger Weisensteiner, Springs Valley, Ind., top left from left, and Lisa Londe and Ron Berry, Indianapolis, listen to speakers as a Council agenda item was discussed. Bruce Carter and Richard Bittner, representatives of the Detroit-Windsor Chapter, cast their votes during Council. Marshall Hawkins, above left, PTG past president and alternate delegate for the Washington, D.C. Chapter, takes a stance for an issue, while Bill Spurlock, above, delegate for the Sacramento Valley Chapter takes an opposing view as Gracie Wagoner and Jim Ellis (in the background) await their turn at the opposing microphone.

Distractions

Larry Crabb, far right at right, leads an international chorus of IAPBT and Barbershop Chorus members during the Yamaha Reception at the Albuquerque Hyatt. Above, international guests at the reception were entertained by Southeast RVP David Duncan, left, PTG past president Ron Berry, third from right, and his wife, Julie, right.

Albuquerque '95

Regional Meetings

RVP Chuck Erbsmehl conducts the Northeast Regional Meeting at the Albuquerque Convention Center.

Past Presidents & Golden Hammer Award Winners

Past recipients of the Golden Hammer Award, left from left, Norman Neblett, LaRoy Edwards, Bill Smith, who crafts the awards, Ben McKlveen, John Travis, Willis Snyder, Ernie Juhn and Don Morton, received new Golden Hammer pins during the Awards Banquet to note their status. Past PTG presidents, right from left, Nolan Zeringue, John Travis, Sid Stone, Ernie Preuitt, Charles Huether, Marhall Hawkins, Ron Berry and Don Morton were honored during the Opening Ceremonies.

Grand Opening

Past PTG presidents cut the ribbon opening the Exhibit Hall at the Albuquerque Convention Center. From left are Charles Huether, Ron Berry, Genevieve Travis, wife of John Travis, Sid Stone, John Travis, Ernie Preuitt, Don Morton, Marshall Hawkins, Fern Henry and Nolan Zeringue.

Exhibitors



Left, Gary Green and Bob Berger of Steinway & Sons. Center, Yamaha representatives, from left, LaRoy Edwards, Bill Brandon, Brian DeTar, Greg Frank, Andy Nishio, Tom Wilson, Mark Wisner and Steve Thatcher. Right, Debra Cyr of North Bennet Street School.



Left, David Abdalian with customers at the Spurlock Specialty Tools booth. Center, from left, Nolan Zeringue, Ernie Juhn and Ron Berry at the PTG booth. Right, Baldwin representatives, Frank Seta, Barry Bradshaw, Frank Emerson, and Kent Webb.



Left, Fazioli Pianos representatives, from left, Jerry Pace, Steven Withowski and Heiner Sanwald. Center, Carl Meyer of Meyer Enterprises. Right, American Piano Supply Company's Ed Schadler Sr.


Left, Kawai America's Dick Eckburg, left, and Ray Chandler, center, with international guests. Center, Heather, Stephen and Darrell Fandrich of Fandrich and Sons Pianos. Right, Ralph Onesti of Onesti Piano Restorations.

Exhibitors



Left, Wally Brooks of Brooks Ltd. Center, Barbara Fandrich of Fandrich Piano Co. Right, Bruce Genck of Genck Cases.



Left, Geneva International's Vince Grantano. Center, Boston Piano's Gary Conte. Right, Weber Piano's Robert Slayman.



Left, Peter Duetz of Sieler. Center, from left, Bob Marinelli, Jane Aisenbrey and Mark Bisso of Pianotek Supply Company. Right, Kirk, left, and Mark Burgett of PianoDisc.


Left, Reyburn Piano Service, Inc.'s Martha Reyburn. Center, James Reeder, left, Reeder Pianos, and Ingbert Bluthner, German Piano Imports. Right, Brookside Press' Larry Fine.



Left, Mary and Paul Sanderson of Inventronics, Inc. Center, Tom Bunker, left, and Lloyd Robbins of Young Chang with Brenda Dillon of the National Piano Foundation. Right, Story & Clark's John Omiatek.

Left, Renner USA's Lloyd and Michael Meyer. Center, from left, Gerry Cousins of Piano Mountain, Kevin Cory and Bernadine Luna of Cory Keyboard Products, and Jerry Kiser of Potter, Leonard and Cahan Insurance. Right, Schaff Piano Supply Company's Jack Raine.


Left, Webb Phillips and Ruth Brown of Webb Phillips & Associates. Center, Dampp-Chaser Electronics' Bob Mair, Gayle Mair and Bob Belmont. Right, Don and Randy Morton of Pacific Piano Supply Co.

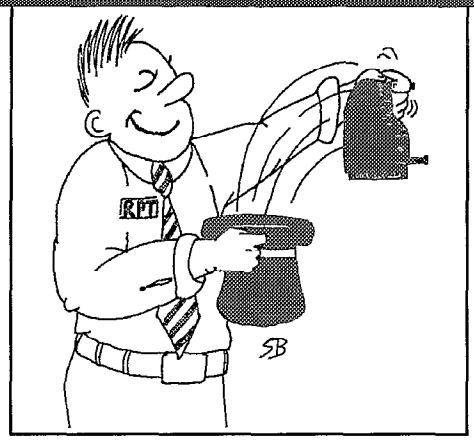


Left, Glen Hart of Hart's Piano Shop. Center, Dryburgh Adhesives' Toni and Ed Dryburgh. Right, Anne Fleming-Read of George Brown College.

Grand Illusions . . .
The Page for *Serious* Cases

Our Spring Catalog

By Doug McKay



In the fast-moving, ever-changing world of piano technology, if you're not constantly upgrading, you're falling behind. That's why we at Valley Hi are always adding cutting-edge items to our catalog.

First of all, we're proud to be offering Composer Bust Chia Pets by Bill Merchandise of Vacaville, Calif. Here's what Bill has to say about them:

I've just come up with a hot new product that I'm sure you will want to have: Composer Bust Chia Pets! That's right! Busts of famous composers with hair that sprouts and grows right out of their heads, right before your eyes! If I sound excited about this new product, it's because I am!

These are a real improvement over the standard composer busts that just sit there and frown. Still no arms, but at least they grow hair. Just soak the heads in water for one hour, spread the seeds over the hairline area (and eyebrows if desired), set on top of the piano and watch what happens.

Available in the Classical Series, featuring Beethoven, Bach, and Brahms, as well as the new Contemporary Series featuring Little Richard (add some fertilizer right on top), Tina Turner (add a lot of fertilizer), and Elvis (brush with salad oil for a realistic look).

On a more somber note: in the last several months, three of our brother technicians have passed away, leaving behind their tools. Many of these are handmade items with no obvious purpose. Rather than toss them away, we're offering them as Mystery Tools at $5 each. And while supplies last, you can get a Shopping-Bag-O'-Mystery-Tools, containing up to ten tools, for only $30.

I was just as upset as everyone else when I learned of the demise of Tuners Supply Company. (I knew something was wrong when all of my Hale Guaranteed-for-Life tools started breaking). You may be wondering if Valley Hi will be next (especially if you've been waiting for an order. We'll put it in the mail this afternoon! Really!).

Let me say this. We are devoted to serving our customers, and will continue to do so, even if we have to lie, cheat, and steal. Our motto is: "We'll tell our customers exactly what they want to hear." And that is my solemn pledge.

We still have a couple of bumper stickers in stock: "Tuners Do It Once Every Six Months," and "Tuners Do It Without Twisting Or Bending." Each is three dollars.

(Doug McKay may be reached c/o Mark Stivers, RPT, of the Sacramento Valley Chapter.)

Valley Hi Piano Supply
Customer Service Evaluation Form

1. You order supplies from Valley Hi, on the average:
   - ☐ When hell freezes over
   - ☐ When the mood strikes you
   - ☐ Once a month
   - ☐ Once a week
   - ☐ Several times a day

2. How would you rate the Valley Hi employees that you have dealt with?
   - ☐ Intelligent and incredibly sexy
   - ☐ Superhuman strength
   - ☐ Somewhat helpful
   - ☐ Short attention span
   - ☐ Want to hunt them down like animals

3. The products you ordered from Valley Hi:
   - ☐ Have made you rich and famous
   - ☐ Have appreciated in value
   - ☐ Made your dog's coat clean and shiny
   - ☐ Don't match the furniture
   - ☐ Melted in the hot sun
   - ☐ Resulted in a lawsuit

4. You prefer:
   - ☐ Steinway ☐ Yamaha
   - ☐ Baldwin ☐ Bösendorfer
   - ☐ Schimmel ☐ Falcone
   - ☐ Toyota ☐ '64 Dodge Dart

5. What do you like best about Valley Hi Piano Supply?
   - ☐ Really clever name
   - ☐ Doug McKay's friendly smile
   - ☐ Freeway close
   - ☐ That "new piano parts" smell

(please fill out, clip, and mail to Valley Hi c/o this publication.)

PTG Review

PIANO TECHNICIANS GUILD

Dedicated To PTG News • Interests & Organizational Activities

Continuing Education — Passport to Excellence

By Don Valley, RPT
Continuing Education Coordinator

Congratulations to John Haynes, RPT, Independence, Ky. John completed his Passport to Excellence requirements and was awarded the certificate at the Annual Convention in Albuquerque.

Yes, PTG has a Continuing Education program.

Yes, it is only for RPTs.

Perhaps you have recently advanced to the RPT status and are taken by surprise as you read this notice. Maybe you are one of the oldies who just assumed the Passport to Excellence program had seen its demise. After all, it has been overshadowed this past three years by emphasis on new education programs. These "new kids on the block" — the PACE family — are for associates to gain knowledge and skill to upgrade to RPT. But where does the RPT go after that "pedigree" is acquired.

Like any family, children learn to fit in and go along, living according to established guidelines. When the new baby comes along, all the attention, nurturing and emphasis goes into that child. The Passport to Excellence is one of those many children of the PTG that has not been in the limelight recently, even to the point that it has been almost forgotten by many. Well, let's take a look and refresh our memories.

In 1991, after a few years of struggling with developing the kind of program we would like, our format was determined. The basic structure is:

- Get a Passport to Excellence booklet at the annual convention or regional conferences, from the chapter secretary or Home Office.
- Attend functions — chapter meetings, regional conferences, annual conventions, special seminars or pursue independent study.
- Have attendance verified by the instructor, chapter secretary or Passport coordinator for independent study.
- Accumulate a total of 130 hours, mail booklet(s) to Home Office, and Passport Coordinator will verify and approve.
- Receive a beautiful frameable certificate of your achievement. Presentation of your certificate is made at the annual convention unless your prefer it be mailed to you, and the announcement of your achievement is made in the PTG *Journal*.
- Start a second one!

The value of Continuing Education is that it is a direct benefit to you. The value of a certificate is its verification to clients who see it on the wall of your office or shop. This speaks highly of you, indicating you stay on the cutting edge of your profession. It sets you apart from those who float in the stream of the ordinary. Don't you think you owe it to yourself? I do.

After getting your Passport to Excellence booklet, should you have any questions, please feel free to call Don Valley from 8:30 a.m. to 5:30 p.m. at 803-574-6165. At other times at 803-574-1201, or fax, 803-574-1203.

Testing and Regulating Tuners Varies by Country

How to regulate and certify piano tuners and technicians are global questions, and organizations within the International Association of Piano Builders and Technicians (IAPBT) answer that question differently.

In North America, the PTG sets the standards for Registered Piano Technicians, and only those technicians who pass a series of vigorous tests can claim to be RPTs, PTG Vice President Michael Drost told delegates to IAPBT's ninth biennial conference in Albuquerque, N.M., July 23-24. Drost's presentation was part of a symposium on IAPBT member's accreditation practices.

While the PTG actively discourages non-RPTs, either Associates or non-members from claiming RPT status, the organization does not have the legal teeth enjoyed by their Korean counterparts.

In Korea piano tuners are issued a government certificate after they pass a two-part test designed by the Korean Piano Tuners Association to indicate their qualification. The penalty for misrepresenting oneself as a certificate holder is one year in jail and a fine of two million won (about $2,600 U.S.), said Sung Soo Cho, president of the Korean Piano Tuners Association, during a presentation to an IAPBT symposium in Albuquerque in July.

The Korean test includes both written and practical exams covering topics such as structure, acoustics, tuning and repair for uprights and grands in the former, and adjusting and tuning uprights and grands in the latter.

In Taiwan, the regulations of the licensing system stipulates that no one can start a business without a license, but because many tuners are self-employed they are beyond the reach of the government, according to Tso-Hsium Liang, with the Taipei Piano Tuners Association, who delivered an address to an IAPBT symposium this past July.

Taiwan's licensing system divides professions into three levels — A, B and C, and while it has been in place for many years, it was not until 1982 that the government began issuing licenses for piano tuners. With an annual passing rate of 30 percent, there are approximately 200 licensed tuners in the C level. It is expected that they will take the B level examinations in several years.

Written tests and skills tests in every examination are held separately, and only those passing the written test can take the skills test, and the written test scores can only be reserved for three years.

In Japan, a tuner has to have five or more years of working experience or be recommended by a member of the Japan Piano Technicians Association in order to take their exams, said Kenzo Utsunomiya, president of the JPTA.

In the JPTA exams, technicians must tune an upright, regulate its action as well as a grand action and perform a restringing test. In addition, a tuner's tools are inspected. During the written exams, an examinee's common sense of musical instruments and music are measured as are their knowledge of piano design, manufacturing theory, structure, materials and technical skills.

While a license proving technical skill is not required to work as a tuner, customers will judge a tuner's technical abilities by their membership in JPTA or the company or shop they work for.

Editor's Note: Information for this article was taken from presentations made by representatives of member organizations of the IAPBT and compiled by Joe Zeman, PTG Director of Communications.

Addendum to the Guide to Resources in Piano Technology

Additions

Company:
"G" Piano Works
9349 N.W. Sargent Road
Gales Creek, OR 97117
503-357-4713
Contact: Joe Garrett, RPT

Parts & Services Offered:
Action Parts, Bass Strings, Computer Software, Consulting, Educational Materials and Literature, Hammers, Piano Hammers, Rebuilding to Trade, Strings.

Parts & Service: 503-357-4713
Technical Support: 503-357-4713

Company Description:
Custom scale evaluation, scale evaluation software, antique/used parts, custom hammer boring, complete rebuilding and restoration, Repair Labor Guide (accurate time study of piano repairs including "bird cage" pianos and square grands), antique piano/rebuilding/square grand, tool consultation, reproduction of antique/obsolete parts (action).

Company:
Geneva International
29 E. Hintz Road
Wheeling, IL 60090
708-520-9970
800-533-2388
Fax: 708-520-9593
Contacts: Alan K. Vincent or Vince Grantano

Parts & Services Offered:
Action Parts, Benches and Stools, Hammers, Strings, Case Parts and Technical Support.

Parts & Services: 800-533-2388
Technical Support: 800-533-2388

Company Description:
Exclusive U.S. distributor of Petrof and Weinbach pianos and Discacciati piano benches.

Company:
Pacific Piano Supply Co.
16153 Leadwell St.
Van Nuys, CA 91409
818-779-1586
Fax: 818-779-1354
Contact: Don Morton

Parts & Services Offered:
Action Parts, Adhesives, Bass Strings, Benches and Stools, Case Hardware, Consulting, Decals, Educational Materials and Literature, Electronic Tuning Aids, Hand Tools, Hammers, Humidity Control, Key Bushing Supplies, Key Recovering Supplies, Key Recovering & Repair to the Trade, Lubricants, Music Industry Associations, Music Wire, Piano Covers, Piano Hammers, Piano Hardware, Piano Moving Equipment, Pinblocks, Player Piano Supplies, Rebuilding to the Trade, Repair Materials, Tool Cases and Touchup.

Corrections

Company:
Hughes Piano Service
13228 Old Hanover Road
Reistertown, MD 21136
410-429-5060
Contacts: David or Judy Hughes

Company Description:
David G. Hughes, RPT, offers complete grand piano rebuilding to a growing number of technicians from across the country. Soundboards are crowned along the bridge line and are diaphragmized according to both case and bridge configurations. The panel is bellied with truly quartered ribs of Sitka, Eastern Spruce or Sugar Pine. ***Ribs from note number 1 through the low 50s are radiused, those in the treble sections through note 88 may be either radiused or straight.*** Bridges are thinly recapped as originally designed, and notching is executed to turn-of-the-century standards. Pinblocks are always fully-fit and fastened to both the inner rim and front stretcher. Services range from gluing the raw soundboard, rib, and bridge assembly into the rim to a completely finished topside ready for damper installation. Action replacement and satin case refinishing are also available.

Company:
Kasimoff-Blüthner Piano Co.
337 North Larchmont Blvd.
Los Angeles, CA 90004
213-466-7707
Fax: ***213-466-7708***
Bill Kasimoff

Company:
Randy Potter School of Piano Technology
61592 Orion Drive
Bend, OR 97702
503-382-5541
Fax: 503-382-5400
RndyPotter@aol.com

Company:
Richard J. Weinberger
18818 Grandview Drive
Sun City West, AZ 85375
602-584-4116
Richard J. Weinberger

Company:
Quiet Keys™
Rt. 3, Box 179 Austin, MN 55912
507-433-4835
800-777-5397
Laurence Langowski

Editor's Note: Corrections to information in the Resource Guide are set in ***bold, italic Helvetica type.***

Passages

Associates Re -Classify in August

REGION 1

191 PHILADELPHIA, PA

SOL E. KOHEN
18 SCHIAVONE DRIVE
AMBLER, PA 19002

REGION 4

431 COLUMBUS, OH

RONALD MAY
7778 CUBBAGE ROAD
WESTERVILLE, OH 43081

496 NORTHERN MICHIGAN

MICHAEL J. KURTA
512 N. HURON BLVD., BOX 310
MACKINAW CITY, MI 49701

New Members In August

REGION 1

117 LONG ISLAND-SUFFOLK, NY

MARK D. SCHUMACHER
7 NORWOOD ROAD
HAMPTON BAYS, NY 11946

195 READING-LANCASTER, PA

SHUANGXI GONG
1600 GARRETT ROAD, #F-111
UPPER DARBY, PA 19082

REGION 2

233 HAMPTON ROADS, VA

ROBERT W. CARTER, JR.
10 HAMILTON CIRCLE
POQUOSON, VA 23662

278 PAMLICO, NC

WILLIAM P COTE
15 GLENN CROW
MOREHEAD CITY, NC 28557

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COMING EVENTS

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 Home Office, your event will be listed through 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.

October 12-16, 1995 — **Texas State Association Seminar**
Clarion Hotel, Richardson, TX
Contact: Thom Tomko
114 S. Greenstone Lane, Duncanville, TX 75116
214-780-0143

October 21, 1995 — **San Diego Seminar**
Marina Village Conference Center, Mission Bay
San Diego, CA
Contact: Dan Litwin
2701 Elyssee Street, San Diego, CA 92123
619-565-7742

October 19-22, 1995 — **Central East Regional Seminar**
Mariott Hotel, Milwaukee, WI
Contact: Dave Hulbert
4760 N. 158th St., Brookfield, WI 53005
414-781-6343

November 2-5, 1995 — **North Carolina Regional Conference**
Omni Hotel, Durham, NC
Contact: Richard Ruggero
3504 Fairhill Drive, Raleigh, NC 27612
919-787-7123

November 18, 1995 — **Lehigh Valley One-Day Seminar**
Holiday Inn & Conference Center, Bethlehem, PA
Contact: John J. Zeiner
830 Hanover Ave, Allentown, PA 18103
610-437-1887

January 5 & 6, 1996 — **Arizona State Seminar**
Ramada Inn University, Tucson, AZ
Contact: Bob Anderson
5027 E. Timrod Street, Tucson, AZ 85711
520-326-4048

AUXILIARY EXCHANGE

Dedicated To Auxiliary News and Interests

President's Message . . .

Claudia and I are getting ready to go to Dearborn, Mich., next week to attend the PTG Convention Planning Committee meeting on September 9th. We are going a week early so we can visit my sister and her family, who live about 60 miles north of Dearborn. We will also visit Richard and Anne Doerfler, both RPTs and dear friends, who live about 50 miles south of Dearborn, in Toledo, Ohio. We will also be scouting the area for a great tour for you when you get there next July for the Annual Convention. You are coming, aren't you?

I'm hoping to win approval for us to have classes again next year. This year's classes were well attended. We learned about computer use, from the basics up through some very sophisticated stuff. We also learned a number of very useful business tactics, i.e., sales, customer service, taxes and how to minimize them, and we even learned about carving piano hammers into beautiful art pieces. I will also be asking for permission for us to attend a large seminar on business skills the PTG is putting on as a special feature in Dearborn. Those who want to attend that seminar will have to pay extra to attend if we are allowed to do so. This is because the PTG members who attend this special seminar will be paying extra, too. I just want to see us get more benefits from attending the convention. Many of you have been asking for a better education program at conventions. Wish me luck! What am I saying? By the time you read this I'll be back already! Oh well ... I'll give it my best. I'll let you know about how I did next month.

L. Paul Cook
PTGA President

The Scholarship Store has turned out to be quite a success! The mail order stuff didn't pan out, but the Scholarship Store at conventions is a big hit! Between the California State Convention and the Annual Convention we have netted more than $800. Then the 50/50 split netted us approximately $360! By asking the convention committee, I was able to secure a free table for us in the exhibit area to show and sell this merchandise. There was no other such store, and the attendees loved the merchandise. As you may know, the store is a consignment deal. We do not own any of the inventory, yet we offer a very wide selection of music-oriented items — many more items than what you may have seen in our mail order ad last year in these pages. We offer literally hundreds of different items. The lady who does own the merchandise, Natalie, went to both conventions in order to show and sell the merchandise. We made 25 percent on the California sales and 20 percent on the sales at the annual convention. We made less at the Albuquerque convention because she lives in California and her expenses were higher. Natalie cannot drive all over the country to come to your state conventions or seminars, but she will pack up and ship $1,500 to $2,000 worth of stuff for us to sell.

If your chapter or state is planning a seminar or convention, let me know ahead of time and I'll arrange to ship the merchandise out to you. Our cut then will go up to 35 percent to 50 percent!

By increasing the money in our scholarship fund, our goal is to give scholarships in many states each year rather than just one state per year, as is presently done. Giving scholarships directly helps the Guild by making piano teachers and their students take special notice of the Guild. We get free ad space in their publications and programs, and we make personal appearances and presentations at their place of final competition. We also help promote piano playing in general by encouraging the kids to get involved and try harder. Besides planning to entertain ourselves at the Annual Convention, this type of music and Guild promotion is what we are charged to do in our bylaws. Let me know if your are at all interested. Get involved, it's ***fun!***

— L. Paul Cook

Sander Brings Diversity to VP's Office

Hi, I'm your new Auxiliary Vice President, you know, from Louisville, Kentucky. My first assignment: "Carolyn, you need to write a one-page biography for the *Journal*." To sum up my 50 years of living in one page was not going to be easy, I thought. And I'm not very good at talking about myself either; however, I was sure I could write a more entertaining story about myself than some of the technical articles on pianos I sometimes attempt to read and understand.

By nature I always look on the positive side of life and savor the simple things in everyday life — a good cup of strong morning coffee, waving at my neighbors, visiting friends, writing a note of encouragement, sharing a bouquet of flowers — these are what give my life real meaning. However, there's a lot more to me. The great passions of my life (as I call them) have been blood, books, and education. For the past 20 years I have been active in the American Red Cross — in particular, blood donation and serving on the county board, chairing special events and my community bloodmobile. Through the program *Reading is Fundamental*, I have been instrumental with distributing more than 11,000 books to my community's children. This 1995-96 school year will mark the end of more than 30 years of assisting local schools in countless volunteer services as well as professionally for years as a teacher. I graduated from the University of Kentucky with majors in English and psychology and earned a secondary teaching certificate.

Diversity can describe the comings and goings of my life. I often refer to myself jokingly as the "glue" that holds everything together and keeps everything going. Between my husband, Hans, and myself, we manage four businesses. Hans manages our piano business and the German om-pah band he plays in, while I manage our various rental properties and the 100-acre farm we live on. I can assure you we do not have a boring life or even a boring day. Everyday being self-employed and juggling these very different businesses brings rich, fulfilling experiences as well as its set of problems to solve and plow through. Despite it all, we seem to thrive in its complexity. One day when I slow down I plan to write a bestseller on some of the unbelievable situations we have found ourselves in. I've concluded that I guess it helps that I am sort of made of steel even though I know I have a tender, compassionate heart, and because of my overzealous self-confidence, I still believe (most days) I can do most anything, even at 50.

I guess one of the most interesting things about me is the great guy I married who many of you know. Back in 1966 we met by chance for only two short hours, decided to correspond (it turned out to be four long years). It was a good thing I analyze handwriting for fun and had Hans pretty much figured out, because in 1970 we married and lived the first years of our marriage in Germany. Love conquers all, I guess. Would you believe I went to Germany as a young bride not knowing a word of the language! (*Not* a recommended method!) I guess you could say we are survivors or, maybe, strong-minded, because — now 25 years later — Hans and I celebrated our silver wedding anniversary this May. Now, figure that crazy love story out!

We make our home in the beautiful bluegrass state of Kentucky and live a little south of Louisville in a lush green valley surrounded mostly by hills. It is a great place (we think) to call home as we have all the peace of rural life, yet can be downtown in half an hour. My hobbies are cultivating flowers (perennials & cut flowers), arranging flower bouquets, and watercolor painting, mainly flowers (of course). Hans is still counting on retiring as soon as I paint something really great and sellable for big bucks (joke).

We are the lucky parents of two bright daughters, high-achievers in their own right. Our eldest, at 23, just graduated from college last year and works for a Louisville consulting firm, but still lives at home (we offered her a free U-Haul as a graduation present). Our youngest daughter (18) is busy as a senior this year in high school and hopes to be valedictorian of her class just like her older sister, and hopes to earn an academic scholarship. Two German Shepherd dogs and a couple of furry cats complete our family.

Finally, I promise to do my very best serving the Auxiliary. In particular, I want to dedicate this year of my vice presidency to the memory of Ginny Russell, who more than 20 years ago welcomed me to my first auxiliary meeting and who always, year after year, warmly inquired about my life and family. She was my mentor and the real essence and inspiration of what PTGA is all about. And so, Ginny, this year's for you!

— *Carolyn Sander*

Members of the 1995-96 PTG Auxilary Board, top left, are front row from left, Immediate Past President Phyllis Tremper and President L. Paul Cook, and back row from left, Recording Secretary Shirley Erbsmehl, Corresponding Secretary Judy Rose White, Treasurer Sue Speir, and Vice President Carolyn Sander

Michelle Yip, Albuquerque, and Matthew Hahn, Los Alamos, were the college and senior division winners, respectively, of the PTGA scholarship competitions.

Lue Preuitt, seated at table from left, Julie Berry and Pauline Miller during a PTG Auxilary meeting in Albuquerque.

The PTGA booth has netted the Auxilary $800 between the California State Convention and the Albuquerque Convention, shown above.

FOR SALE

SANDERSON ACCU-TUNERS from Authorized distributor. Consignment sale of used Accu-Tuners and Sight-O-Tuners or new Accu-Tuner customers. Call for details. Rick Baldassin, 801-292-4441.

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THE 1995 NORTH CAROLINA REGIONAL CONFERENCE will be Nov. 2-5 in Durham, NC. This year the instructors include Nick Gravagne, Bill Garlick, Wally Brooks, LaRoy Edwards, Scott Jones, Ray Chandler, Don Mannino, Kent Webb, John Hartman, David Stanwood, Webb Phillips, Dr. Al Sanderson, Bob Mair, Gina Carter, Gerry Cousins, Ed Dryburgh and others. For more information call Richard Ruggero 919-787-7123 or send a FAX with your address to 919-571-1531 and you will receive our newsletter.

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STEINWAY & MASON HAMLIN WANTED!! "Dead or alive." $$$ Grands, uprights, consoles—any size, cabinet style or quantity. Cash and immediate removal. Finders fee for successful purchases. Call us first!! 800-438-3814 toll free or write to be listed in our worldwide data banks. Piano Wholesalers, 5817 Wickfield Drive, Parma Heights, OH 44130. Call us first!! 800-438-3814.

WANTED! Donation of used Electronic Tuning Aid for Baptist Mid-Missions Missionary going to Central African Republic. Pianos at their College are receiving no service. FINE TUNING, 540-626-7202.

DISPLAY AD INDEX

Mini-Tech Instructors Wanted

WHERE: 39th Annual PTG Convention & Technical Institute, Dearborn, Michigan

WHEN: July 17 - 21, 1996

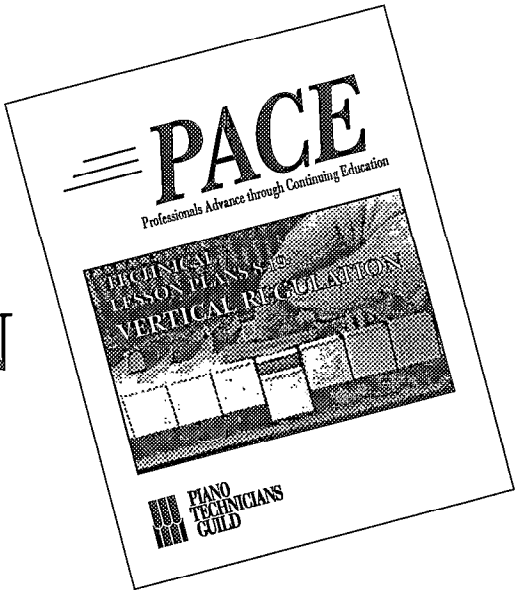
QUALIFICATIONS: Member of PTG and willing to teach a Mini-Technical

SUBJECTS: Tools, work techniques, business, short cuts, improved methods, and other topics related to piano technology

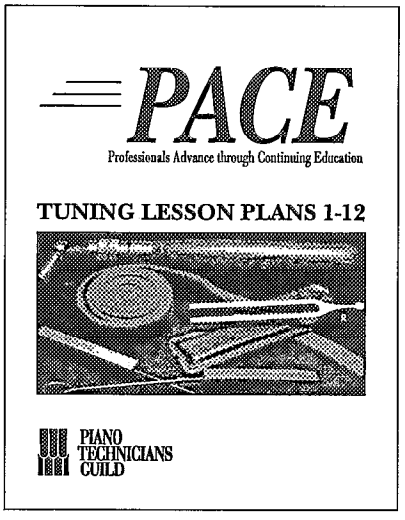
FOR MORE INFORMATION CONTACT:

Evelyn Smith
1041 South Aycock St. • Greensboro, NC 27403
910-230-1783

PACE
TECHNICAL LESSON PLANS 1-7
REPAIR



PACE
TECHNICAL LESSON PLANS 8-19
VERTICAL REGULATION



PACE
TUNING LESSON PLANS 1-12
TUNING

Also Available: Bound, reprinted articles from the *Piano Technicians Journal*

- DAMPERS, TRAPWORK & ACTION CENTERS
- GENERAL REPAIR — Reconditioning of Parts, Tools, Felt Work
- HAMMERS & TOUCHWEIGHT —Hammer Filing, Vertical Hammer Hanging, Hammer Boring & Shaping, Grand Hammer Hanging, Toughweight
- KEYS — Key Repairs, Key Bushing, Key Making, Ivory Work, Plastics

PACE Lesson Plan books and Reprint Kits are all available for $15 each, plus shipping and handling from the Piano Technicians Guild Home Office, 3930 Washington, Kansas City, Mo. 64111. Or by phoning (816) 753-7747, or fax (816) 531-0070.

PianoDiscussions™
October 1995
News From The World of PianoDisc

Steve Allen stars in PianoDisc sales video

Steve Allen shown performing during filming of PianoDisc video.

Product film features noted pianist, composer and television favorite

The term Renaissance Man is so often used to describe Steve Allen that it could have been created for him. One of television's most popular and enduring stars, he is also a prolific composer and author: over 5,300 songs written to date and 45 published books. Sir Noel Coward, noted actor, author, composer, lyricist and director called Steve Allen "the most talented man in America."

In January of this year, Mr. Allen paid a visit to the PianoDisc factory in Sacramento, California, to record a disk for the Music Library Artist Series. During the course of his visit, he had an opportunity to tour the factory. He has always found factories to be fascinating, and ours was no exception. In fact, he was so enthused after becoming familiar with our company and product, that he agreed to participate in a video project we'd been contemplating. On our part, we knew there could be no better nor more entertaining host for a film about anything, particularly a piano-related product, than the great Steve Allen.

The video features Mr. Allen both demonstrating and explaining many of the features and uses of the PianoDisc system. As an example, Mr. Allen composed a song in the video, and played it back to demonstrate the Record feature.

The video will be distributed to PianoDisc dealers and technicians all over the world. They should find it to be a very effective sales tool: one which both entertains and instructs. The expected release will be in mid-September.

Philly dealer shares secrets of huge PianoDisc sales increase

How can PianoDisc dealers more than double their sales? One dealership whose sales figures have done just that is Cunningham Piano Company of Germantown, Pennsylvania. We asked them to share the secrets of their success with other PianoDisc dealers: sales tips that have worked for them and will for others.

When asked how Cunningham salespeople demonstrate PianoDisc, spokesman Richard McIllhenny described two scenarios. "If the customer ... is just in to look at pianos, I love asking them to sit and play the PianoDisc piano and record them. When I play it back to them, their jaws drop. Before they have a chance to recover, I'll add a string accompaniment and they really go wild. If they come in looking for a player piano, I'll take them into our factory to see an installation in progress and then demonstrate most of what PianoDisc can do. **I'd say that maybe a third of our customers who buy a PianoDisc come in asking about a player system. The other two-thirds decide to get it after we show them."**

How much has demonstrating the product helped sales? **"We've probably doubled our sales since training and practicing a proper demonstration."**

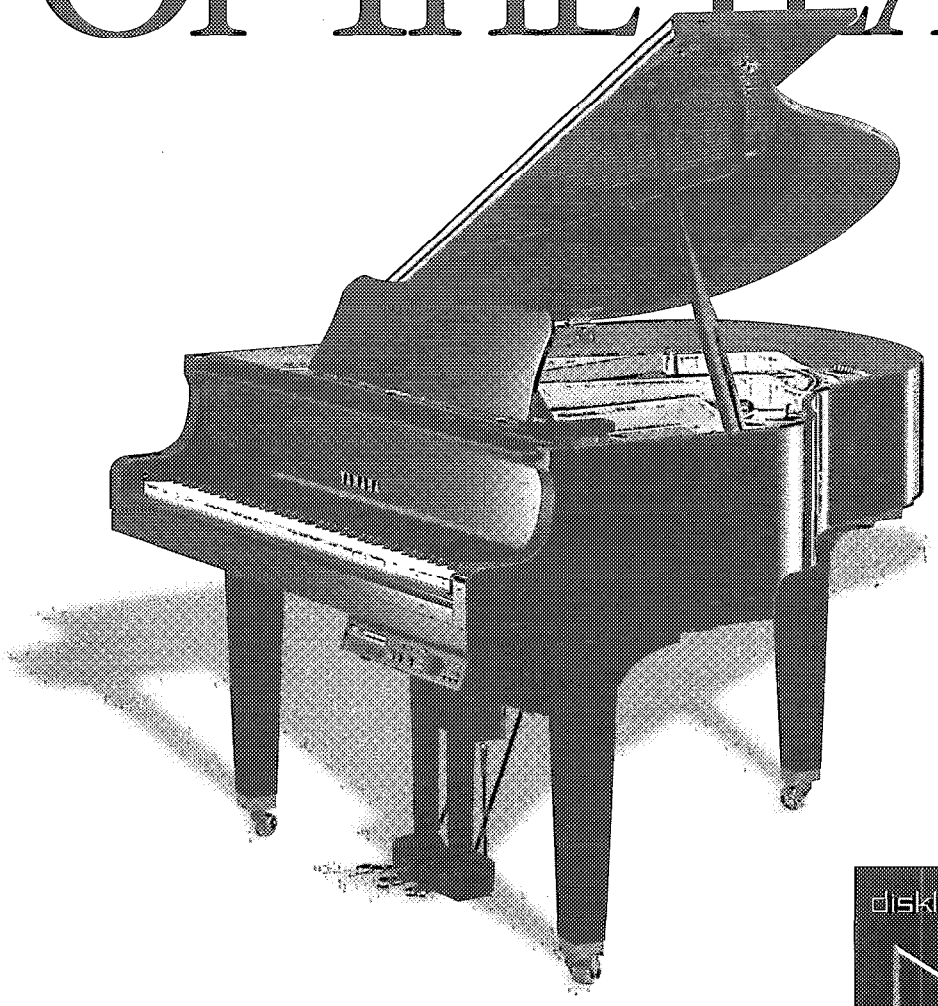
McIllhenny adds that "most people who buy a PianoDisc want more out of investing in a piano ... [PianoDisc] turns a piano into a full entertainment system."

His final advice to other dealers: "First and foremost, **treat every customer like they are your only one.** If you are good to them when it comes to service ... you'll end up with a lot of referrals. Secondly, **show all of them the PianoDisc system. The worst thing that can happen is that they won't buy but will tell 20 other people what they saw and how great it was."**

PianoDisc
4111 North Freeway Blvd.
Sacramento, CA 95834
Phone: (916) 567-9999 • Fax: (916) 567-1941
Tech Support: (619) 258-1460
(916) 567-9999
Our telephone lines are open daily (except weekends and holidays) from 8 AM-5 PM Pacific Time.

INSTALLATION TRAINING SCHEDULE
October 17-21
Nov./Dec. 28-2
CONTINUING EDUCATION
October 12-13
Call (916) 567-9999 for details

1994 KEYBOARD PRODUCT OF THE YEAR



Dealers have chosen the Yamaha Disklavier Piano as "Keyboard Product of the Year." It just goes to show that great craftsmanship, great technology, great dealers and great salespeople can make things happen.

YAMAHA®