PIANO TECHNICIANS
Journal
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September 1995 Vol. 38 • #9

Inside:

- *How To Build A Vacuum Cleaner Carrying Case*
- *Inharmonicity & Octaves*
- *The Effect Of Downbearing On The Tone Of The Piano*
- *And More*

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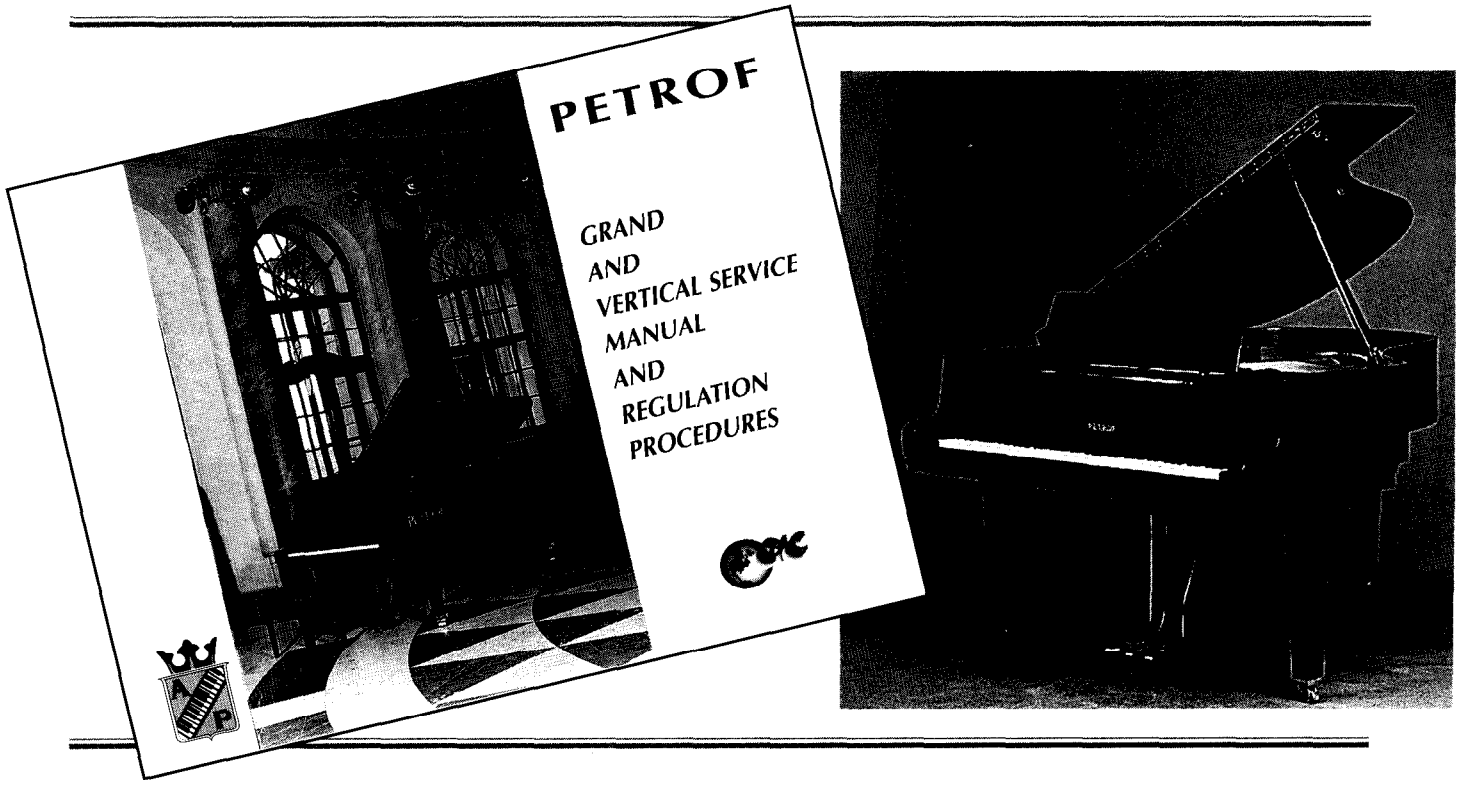

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Journal
Official Publication of Piano Technicians Guild

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Editorial Perspective

The Great Limerick Contest

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

Okay, you can stop counting the days. Stop tossing and turning all night with anxiety. The results of the great *PTJ* Limerick Contest are in.

Let me say first that we had dozens of entries, and ***many*** of them were quite good. It seems that the literary abilities of our readers are on a level few of us had imagined. This made it very difficult for our judges (who shall remain nameless) to narrow the entries down to the few winners we'll present here. The winning entries were selected based on the originality, cleverness and literary skill demonstrated in the limericks (willingness of writers to bribe the officials was only a minor consideration).

The winners are:

Grand Prize Winner — John Hartman, RPT

Some techs are lost in this mystery:
Should it be CristoFORi or CristOFFori?
It's a bone of contention
At local conventions,
But it's really a matter for history.

Bill Garlick holds for CristoFORi;
Now the fight could get really gory.
It sounds like a dish
Of pasta delish';
Is it noodles or just allegory?

Say! Hickory, dickory, dockery!
The academics claim it's CristOFFori.
L. Libin has said
"The issue is dead:
Further discussion is only a mockery."

While some will insist it's CristoFORi,
That isn't the end of the story.
In Florence they say,
"Pronounce it either way —
Not a whit will it tarnish his glory!"

Second Place — Gary Hammond, RPT

A tuner-technician named Pippin
From Miss Bambi's house came a zippin'.
For he was not banking
On getting a spanking
When he'd said that he needed a wippen!

Third Place — Gordon Large, RPT

The name on the fallboard said "Beckwith."
"O what'll I service this wreck with?!
The action is shot.
What's that smell? Is it rot?"
I finally just said, "Aw, the heck with..."

Honorable Mention — Joe Merando, RPT

A tuner named Clarence P. Stout
Had a reason to holler and shout:
When accused of pin bending,
He said, "I'm just mending;
I'm trying to straighten them out!"

Our grand prize winner will receive $50 in supplies from the supply house of his choice. The other winners will receive (besides publication of their limericks here) the undying gratitude and admiration of all our readers. Thanks to everyone who entered the contest — it was great fun.

PIANO TECHNICIANS
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COLUMNS & COMMENTS

DEPARTMENTS

IN ADDITION

FEATURES

PACE
Professionals Advance through Continuing Education
LESSON PLAN

COVER ART

RPT Terry Rood's custom-built vacuum carrying case ready and open for business. See Terry's article on Page 21.

Albuquerque Convention in Review

The 1995 Albuquerque Convention and Technical Institute is over. It's impossible to give proper credit to everyone involved in the planning and administration of this yearly event, but particular credit goes to **Larry Goldsmith** and the entire **Home Office Staff, Fred Fornwalt** and the **Institute Committee, Ed Hilbert** and all the **IAPBT personnel**. Thank you all for an outstanding job and a very successful program! Thanks, too, to everyone who attended this year's event. I trust your skills have been sharpened and your confidence improved by your participation.

PTG President
Leon Speir, RPT

Dearborn, Michigan will be the site of the 1996 Annual PTG Convention and Technical Institute. The Institute Director is **Paul Olsen** from the Twin Cities Chapter. Paul has some outstanding new ideas for classes and has already began preparing for the Institute. Dearborn should be a very attractive convention site. It is served by a major airport, and the convention hotel is very near. It's a short trip to Windsor, Canada, where I understand you can spend money in slot machines. **Richard Bittner**, the Host Chapter Chairman, informs us that you can park free at the hotel — they really do seem to like cars there for some reason. Mark your calendar and plan to attend next year. You will be glad you did.

The following is a brief synopsis of some of the actions taken by the Board and Council this year:

A. Convention site rotation plan adopted by the Board. Beginning in 1998 the convention site will be selected in the following regional order; 1998 — Northeast Region (Providence, RI selected), 1999 — Pacific Northwest Region, 2000 — Central West Region, 2001 — Southeast Region, 2002 — Western Region, 2003 — Central East Region, 2004 — South Central Region.

B. Vertical Regulation Curriculum completed. This course is now available for sale to anyone wishing to sponsor a seminar on vertical regulation.

C. Yamaha donated it course, "37 Steps of Grand Regulation," to PTG.

D. The **Education Goals Resolution** overwhelmingly passed by Council. This resolution states in part; "PTG hereby accepts and endorses the following educational goals and priorities: *1.* To define and promote minimum standards of professional competency; *2.* To outline the curriculum of study that leads to achievement of those standards; *3.* To work with piano technology schools, piano manufacturers and all subordinate bodies of PTG to efficiently deliver educational programs based on the curriculum; *4.* To provide technical information and business resources for the members of PTG." Action by Council on this resolution clearly defines the role of PTG in providing both entry level and continuing piano technology information to its members.

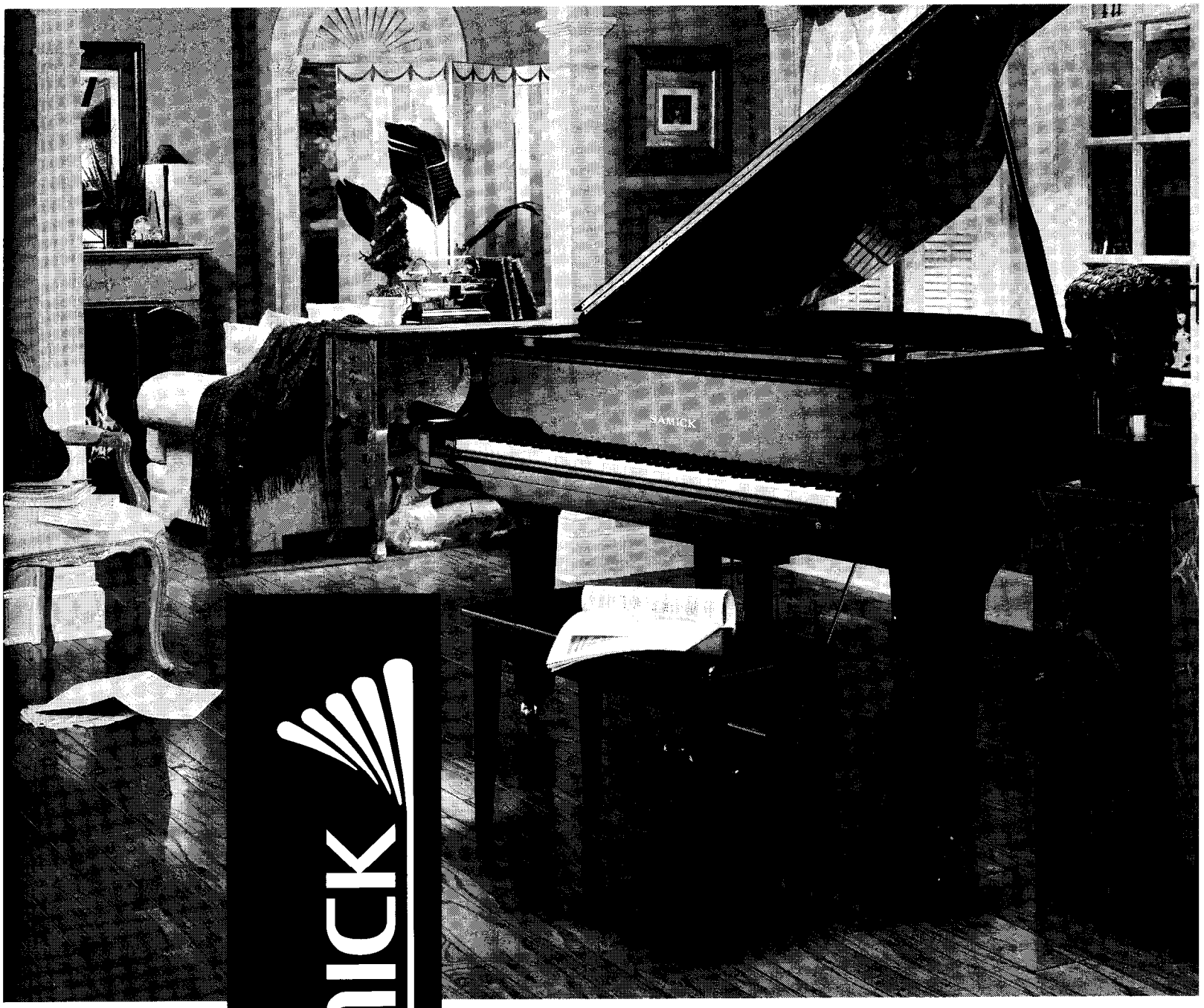
E. No action taken by Council on the Associate's voting rights proposals.

F. Cinda Rierson hired by the Board to aid in developing a strategic plan for PTG. Cinda's role will be to advise PTG on how to develop a plan. It will be up to us (the members) to develop that plan. You will be hearing a lot more about this in upcoming months.

G. A proposal to restrict the use of the logo was defeated by Council. The logo continues to be available for all members use.

Now we begin the new Council year. Commitment to strategic planning will be the underlying theme throughout this year. It should be a very busy and exciting year.

Leon Speir



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Letters

Non-parallel Bridge Notching

In reference to the May issue and the Q & A topic of non-parallel bridge notching. While it is true that there are no manufacturers of which I am aware that incorporate this system of bridge notching today, I am not sure that I agree with the procedure of notching these instruments in the conventional manner (at least on Steinway & Sons pianos).

The rear duplex bars on Steinways that have this type of bridge notching are specifically designed in these sections to match the bridge notching. The string rest areas of the rear duplex bars are parallel to the line of the bridge pins in these sections. Changing the bridge notching to be parallel to the Capo bar results in changing the relationship between the rear duplex scales and the bridge pins. If one is to notch these bridges in the conventional manner, I would suggest that the rear duplex bars also be taken into account.

The other concern that I have is that one does not know what other design changes were incorporated in ribbing, bracing, bridge crown, etc., in conjunction with the termination of non-parallel bridge notching. One does know that the rear duplex bars were revised. There may very well have been other subtle design changes.

According to Steinway & Sons, they *do not* revise the bridge pinning to run parallel to the capo bar on instruments taken in for remanufacturing for the exact reasons that I have mentioned.

— Peter Mohr, President
New England Classic Piano Restorations

Del Fandrich Responds:

Peter Mohr is correct in pointing out the relationship between the back row of bridge pins and the rear duplex bars. The rear duplex bars in these pianos are often — though not always — parallel to the center line of the bridge pins. It was Steinway's practice to compensate for the bridge pin offset in the rear duplex bearing bar so that the duplex string length, or tail length, of each of the three strings was the same. Baldwin, along with several others, did not; the rear bearing bar was more or less parallel to the V-bar. A few pianos seem to have partial compensation. Certainly, changing the bridge pin notching to the now conventional style will change whatever relationship existed in the original design.

My question is simply how important is it to keep these tuned duplex string segments tuned? It is at least debatable that this is a major factor in a piano's tone performance. But then I think the whole question of using tuned duplex string segments — either front or back — is open to some debate. In the end we may well come back to the original conclusions, but even then the debate will have taught us much. I should say that my own experiments have indicated that finding the ratio of tail length to speaking length that will allow the optimum degree of soundboard mobility in the desired frequency range along with keeping the tail length non-resonant (i.e., untuned) will provide better power and sustain through these sections of the scale.

Regardless, Mr. Mohr's comments do raise a very legitimate concern. When rebuilding, remanufacturing or restoring a piano — whatever you choose to call it — is it ever appropriate to deviate from the original manufacturer's design? The question is a complex one; sufficiently so that I'm certain I'm not going to resolve it here. Suffice it to say that in our shop, we have one guiding and over-riding objective: to make each instrument the most musical instrument possible within the framework of the original instrument (i.e., the rim, plate, etc.), the budget provided and the constraints imposed by the customer. If it is the customer's desire that we maintain the historical accuracy of the instrument's design, then that is precisely what we do. If it is the customer's desire that we do what we can to improve upon the original (and is willing to pay the additional cost for the work involved), then that is what we do. More and more of our work is beginning to fall into the latter category.

Certainly, if historical authenticity is at all a factor in rebuilding any particular piano — and I'm sure this would be the case with any Steinway piano being rebuilt by the Steinway factory — then by all means every element of the piano should be restored as closely as possible to its original condition and design standard, which would certainly include duplicating the bridge notching and pinning pattern as it was done originally. If, however, you are given the freedom to do what is necessary to provide the highest possible level of performance from a particular instrument, then I stand by my original recommendation. Drill and notch the bridges in the conventional manner.

In this case our past experience has led us to the conclusion that this particular change to the bridge pin pattern has had no detrimental side affect on any piano's tone performance — indeed, we can demonstrate that the overall performance of the piano has improved, or else we wouldn't bother doing it. Certainly the tone is clearer, the pianos are somewhat easier to tune and the perceived tuning stability is improved. (With different values of inharmonicity present in each of the three strings their harmonic structure is already out of tune. Any slight detuning of one or more of the three tends to magnify the perceived "out-of-tuneness" of the unison.

As far as the alignment of the rear duplex bar to the bridge is concerned, one way to accomplish this is to record the length of the center duplex string of the end unisons and use that distance to set the location of the rear duplex bar during stringing. It would be a good idea to record a couple of other duplex string lengths at various points along the bridge to check against as you string to be sure that the alignment of the duplex bar is not drifting, i.e., to be sure the bar is not bending out of alignment while you string. Again, we have not found the "de-tuned" rear duplex string segments to be a problem.

Regarding the rest of Mr. Mohr's concerns: while it is certainly possible, I think it very unlikely that any changes would have been made to the ribs, the piano's bracing or bridge crown that would specifically correspond to, or would be affected by this type of bridge pinning. If anyone has any specific information to the contrary, I would

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Letters

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very much like to hear from them. Very little definitive information has been printed about this feature over the years.

More on Humidity Control

Thanks for the attention you have given to piano humidity control in the Piano Technicians *Journal* this year. It's an important topic that many technicians misunderstand. I also applaud your including articles by Del Fandrich. I'm a fan of Del's, and I follow his articles and his classes at PTG institutes and seminars with great interest.

However, in his article, "Tuning Stability in Pianos", (*PTJ*, Feb., 1995), he makes a serious error. After an interesting and informative technical presentation, he makes the following statement about humidity control systems:

"Use your own judgment as to how much of the system any given piano needs. For example, it's not likely that you'll need to add much moisture to the air in Missouri. So just install heat rods and a humidistat."

Let's slow down here and think. I know that wintertime in Missouri can get pretty cold. Is there anyone out there from the "Show Me" state who would disagree with me?

In his footnote #13, Del writes:

"During the winter the cold outside air brought inside will be quite dry once it is heated to comfortable temperatures even if the RH outside is high — cold air cannot hold much water vapor in absolute terms."

Well, I agree wholeheartedly with *that* statement. But if I lived in Missouri and someone told me "Just install heat rods and a humidistat," I would say, "Nope, I need a humidifier, too." How else would I be able to counter that "quite dry" winter air?

Del also writes, "On the other hand, in Arizona or New Mexico you'll probably not need to do too much to dry things out, but you may need to add moisture to the air just about all year."

I don't think anyone in Tucson, Arizona would want to add any moisture to the air from the 1st of July to the middle of September. Our summer monsoons can cause the humidity in the typical house to rise as high as 80 percent. I know this because I am out in the field tuning five or six days a week, I carry a sling psychrometer around with me, I keep calibrated hygrometers around my own house, and I frequently measure and record HR levels. I tune pianos in Tucson that have a pitch swing of as much as 50 cents from the driest to the most humid weather. As the years go by I encounter fewer and fewer of these instruments as I install more and more humidity control systems, *complete* humidity control systems.

It is important to realize that wherever people live, be it Missouri or Arizona, they create artificial environments to live in. Here in the desert, despite the popular conception of "the desert," pianos need *complete* humidity control systems. When Del wrote that misleading statement about Missouri, he was probably remembering the sweaty summers he spent in Arkansas. Nevertheless, pianos in Missouri also need *complete* humidity control systems.

The bottom line message to technicians and piano owners who want to control piano humidity levels should be, "Install a *complete* humidity control system."

I personally tend to think of Del as something like the commercials about E.F. Hutton — when he speaks, *I* listen. I assume that there are many others for whom his opinion carries a lot of weight. I hope he concurs with the argument I have presented.

— Bob Anderson

Del Fandrich Responds, Too:

All right, already! I confess! Bob is right. I have never lived in Missouri. But, as he does point out, I have lived in Arkansas where anything below 90 percent relative humidity at any time of the year was considered practically arid (now, before all my friends from Arkansas start to write, I'll admit that this might be a *slight* exaggeration — but not by much!). I thought that would be close enough to qualify. Apparently not.

I have also never lived in Arizona. It was simply the first state that came to mind when I was trying to think of some place that might be perpetually dry. It is, after all, the only state I have ever visited in which I was assured that an outside temperature of 107° F would really be okay since "it was a dry heat." Alas, I start to melt down to a formless blob at anything over 78° F, so you can imagine how enthusiastically I reacted to that!

But I should not have used those specific examples without first checking with someone who actually does live in those states and has experience dealing with the environmental problems affecting pianos in those areas.

I hope that my original point doesn't get lost in the shuffle. The individual technician must use his or her own judgment in determining how to approach each separate environmental problem. The way to get the experience and knowledge to be sure that judgment is sound is to do just what Bob is doing. Get a hygrometer, carry it with you and use it. Build up your own data base of information to use in making your judgment on how best to treat each situation. Each locality and each climate will have its own individual idiosyncrasies. If you don't have enough personal experience in a particular locale to make a well-founded determination, then do what I should have done — check with someone in the area who does before putting your foot in it.

I can only add that if a given situation comes down to a judgment call, it is always best to err on the side of safety. It is far better to provide a little too much protection than not enough.

Perceived Loss of Power

The purpose of my remarks on page 8 of the June issue of the *Journal* was to give a straightforward answer to a straightforward question. After reading Ken Sloane's reply that followed, I now feel constrained to offer a few more words to prevent someone out there from mistaking me for one who is knowledgeable in "high school physics" but ignorant of piano technology.

The question in the March *Journal* was: Does reducing hammer-blow

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Heat Gun Alternative

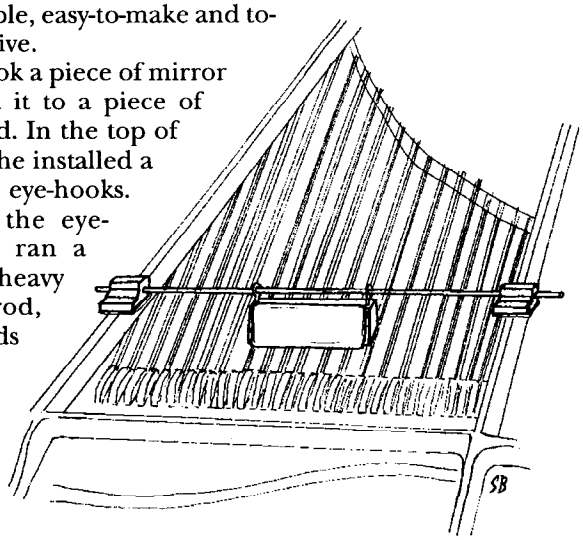
I recently purchased a Makita HG 1100 heat gun as a replacement for my ailing "Princess" heat gun. Costing me only about $60, it has two fan speeds and variable heat settings from 250° F to 1100° F. For under $10 I got the 3/8" adapter, which directs heat at a shank through a smaller nozzle than the Ungar. I am delighted to heat shanks enough to bend them without *burning* them first.

— David Stocker, RPT

Mirror, Mirror

[*Reprinted from The Richmond Update, Richmond, VA chapter newsletter*]

One of the prized tools in my toolbox is a mirror Joe Bisceglie of Steinway made back in 1947 for help in damper regulation. It ain't much, as they say ... just simple, easy-to-make and totally effective.



Joe took a piece of mirror and glued it to a piece of scrap wood. In the top of the wood he installed a couple of eye-hooks. Through the eye-hooks he ran a piece of heavy welding rod, on the ends of which he placed small wooden blocks with a felt piece glued to one side for finish protection. With the blocks sitting atop the plate struts, the mirror is just a minute distance from the strings, giving a birds-eye view of the backs of the dampers.

— Bob Bartnick, RPT

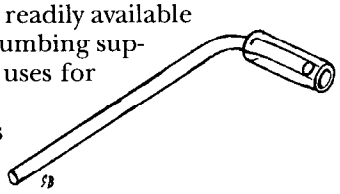
Smoke Residue on Finish

Today I was tuning for a long-time client who is a good housekeeper type. She is also a heavy smoker. Anyway, I decided to clean her piano as a thank you for being a long-time client. What I didn't know was that for the past 10 or 12 years she has been using Endust® to polish her piano. The combination of that and the smoke residue made for an interesting situation. I started the cleaning process with thorough vacuuming and then pulled out my trusty Cory's® products. I instantly had a "slurry" of gook that the Cory's® only exacerbated. Usually, when I run into this situation, I will hop out to the "rig" and get my can of denatured alcohol, which will do a really nice job of stripping off wax, etc. Unfortunately, I had forgotten to put the alcohol back in the rig. As I was searching about for ***anything*** that would undo the slurry, I spotted a bottle of 20/10 windshield cleaner — the kind you put in your window squirter. I have to tell you, it cut right through that mess in no time. Of course I checked the label and did a test spot before going at the whole piano. 20/10 is non-toxic, compatible with lacquer finish and non-corrosive on metal. Although this may not be my first choice in the future, it definitely did the job and got me out of a tight — if not very messy — spot.

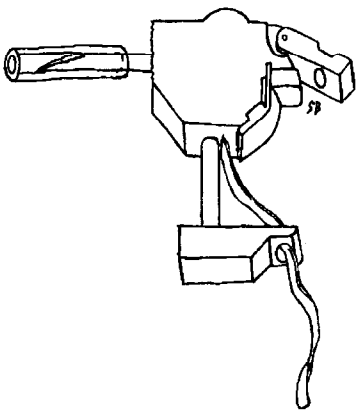
— Joe Garrett, RPT

Clear Plastic Tubing

This very useful material is readily available at good hardware stores and plumbing supply stores. Here are just a few uses for clear plastic tubing:



To protect piano finishes from the end of the hinge pin. This tubing is 1/8" inside diameter, 1/4" outside diameter.



For quick emergency field repair of broken hammer shanks, cut a piece of tubing, apply glue to broken shank, slide broken piece of shank into tubing, which provides clamping until glue is set. Then, just slice tubing off with a razor knife. This tubing is 3/16" inside diameter, 5/16" outside diameter.

Continued on Page 19

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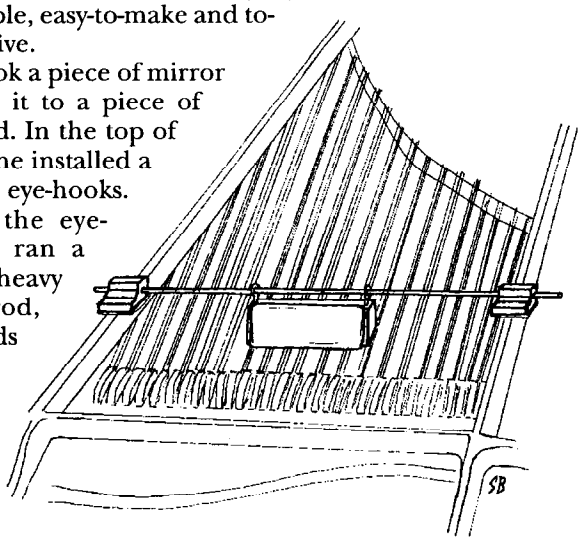

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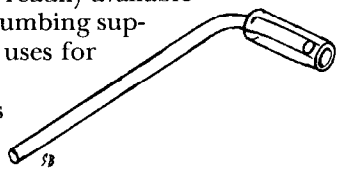

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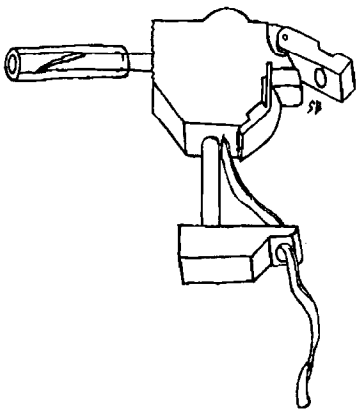

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(Editor's note: The following questions and answers were taken from the Internet discussion group, "pianotech.")

Q — Steinway Hammer-Flange Rails: Cloth, Sandpaper, or Nothing at All?

What do you use to replace the cloth on a Steinway grand action hammer rail? Even the .85 mm flange bushing cloth is pretty thick and spongy. Two days ago, I tried out some nameboard felt but suspect that by the time this action change is finished, I will have replaced it with something stronger. (Maybe I should just order Steinway's 004430 at $10 a strip. But it's black, and black is for widows and scarlet is sexier....)

— Bill Ballard, RPT

A — From Ron Torrella, RPT

I find that the damper guide rail felt (#004407-black) works wonderfully. It's self-adhesive, thin and not spongy. Only $2 per strip (I think it's 56" long). Ask Glorie LeFrak at Steinway about it. I don't know of any red stuff like that. Maybe Fletcher-Newman in the UK?

A — From John Minor, RPT

Bill Garlick once suggested buying old worsted wool trousers from the Goodwill and cutting strips for the action rail. I've done this, and it works great! Now ***that's*** recycling!

A — From Vince Myrkalo, RPT

I like to use 100-grit sandpaper.

A — From Phil Sloffer, RPT

Here at IU we use sandpaper. The stuff we use comes in a roll about 1-inch wide, has a cloth backing and is used by plumbers to rough up fittings for soldering. We tear it lengthwise to get the right width and, after marking the screw holes, we use an old paper punch to make the screw hole through the sandpaper. Once the flanges are in place they will not move and that is what we want.

A — From Dennis Johnson, RPT

I urge you to try using nothing. I quit using rail felt a few years ago and am convinced that it is not needed. The rail will stay cleaner and look better, and the flanges will seat just as well, if not better. It also makes future regulation of hammer traveling more pleasant.

A — From Steve Brady, RPT

In my work, I go back and forth between using nothing and using sandpaper strips. Using nothing probably results in the most work when spacing hammers, because you can't "fudge" the spacing much at all. You pretty much have to cross-paper the flange corners. This, however, gives more permanent results than just twisting the flanges and relying on the felt to hold the spacing. When you use sandpaper, you get kind of a compromise between the other two methods, with some advantages of both.

A — From David Stanwood, RPT

I once assumed that cross-papering to space a Steinway hammer flange was common knowledge, but I've recently met some experienced technicians who have never heard of it. Perhaps a photo or drawing of the technique would be helpful.

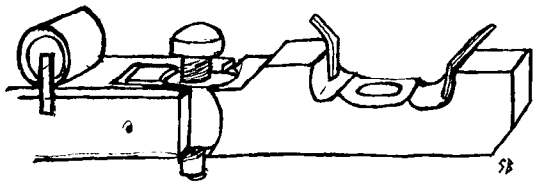


Figure 1: Cross-papering Steinway flanges to space hammershanks. A small piece of travel paper is applied to the underside of the flange in the corner (closest to keyboard) on the side you wish to space the shank towards. Then apply a similar piece of travel paper to the opposite corner on the hammer side of the flange. The paper forces the flange away from the front and back faces of the rail, not from the top of the rail.

Continued on Page 16

Continued from Page 14

A — *From John Hartman, RPT*

The hammer rail cloth serves at least two purposes that I can think of. First, the elastic properties of the felt help to keep the shanks from getting loose due to wood movement from season to season. When the flanges shrink in the dry seasons (this can be more than 1 percent in height) the felt acts like a lock washer keeping pressure on the screw. During periods of high humidity the felt compresses allowing the flanges to expand without becoming damaged. Examining flanges screwed to rails without felt liners will show the extent of damage that can happen. The screw heads deeply indent the tops of the flanges, the screws strip out their threads and the flanges become distorted (what does this do to regulation?).

As most of us know, in many cases, cracks develop. A second more obvious reason is that if and when a flange becomes loose, the felt will be there to dampen the noise.

I have in the past tried leaving the felt off and using sandpaper instead. Returning to the piano after six months or so I usually found the shanks rattling on the rail with nothing left of my careful spacing job. I have since gone back to the traditional felt. The advantages are more stable shank spacing and less damage to the flanges over the long haul. I seem to be in the minority on this subject but I can't help thinking that, in this case, tradition could teach us something. After all, what possible reason can there be for leaving this felt off except perhaps to save $10 or to show how clever we are?

A — *From Mark Story, RPT*

I've gone through this same sequence of procedures. I tend to agree with your theory. We may be in the minority here, but if you add S&S to our camp, I think that would tend to stack the opinion in our favor. I agree that bushing cloth is too thick and spongy for this — the flanges don't seem to stay put. We did a couple of rails with thicker wool cloth and no adhesive. We couldn't keep those hammer flanges in place for anything. I replaced them with a slightly thinner cloth and used spray adhesive (on the cloth, of course) and they are now very stable. This is the procedure I've settled on.

A — *From Dennis Johnson. RPT*

Who would believe the infinite details that experienced technicians can disagree on! If you have tried it without using hammer rail cloth, and disapprove, than I respect your choice. However, may I make just a few brief points:

1) Although the majority of S&S actions leave the factory with hammer rail cloth, it is not true that they all have, or always did. We have a D here, for example, from 1964 with original parts (until last year) that had no rail cloth, and I have also seen others.

2) After a year or so under the flanges, do you really think that this thin felt has any cushion left in it? The ones I see are hard.

3) Flange screws that are over tightened will damage flanges with or without rail cloth.

4) Provided the rail itself and the screw threads are good, after a follow-up retightening (when needed) these flanges will remain just as secure as the wippen flanges do.

5) The advantages in spacing and traveling have already been mentioned.

6) The new flanges from Renner now fit even better.

7) Because not doing it saves at least 30 seconds.

Q — *Pedal Problem*

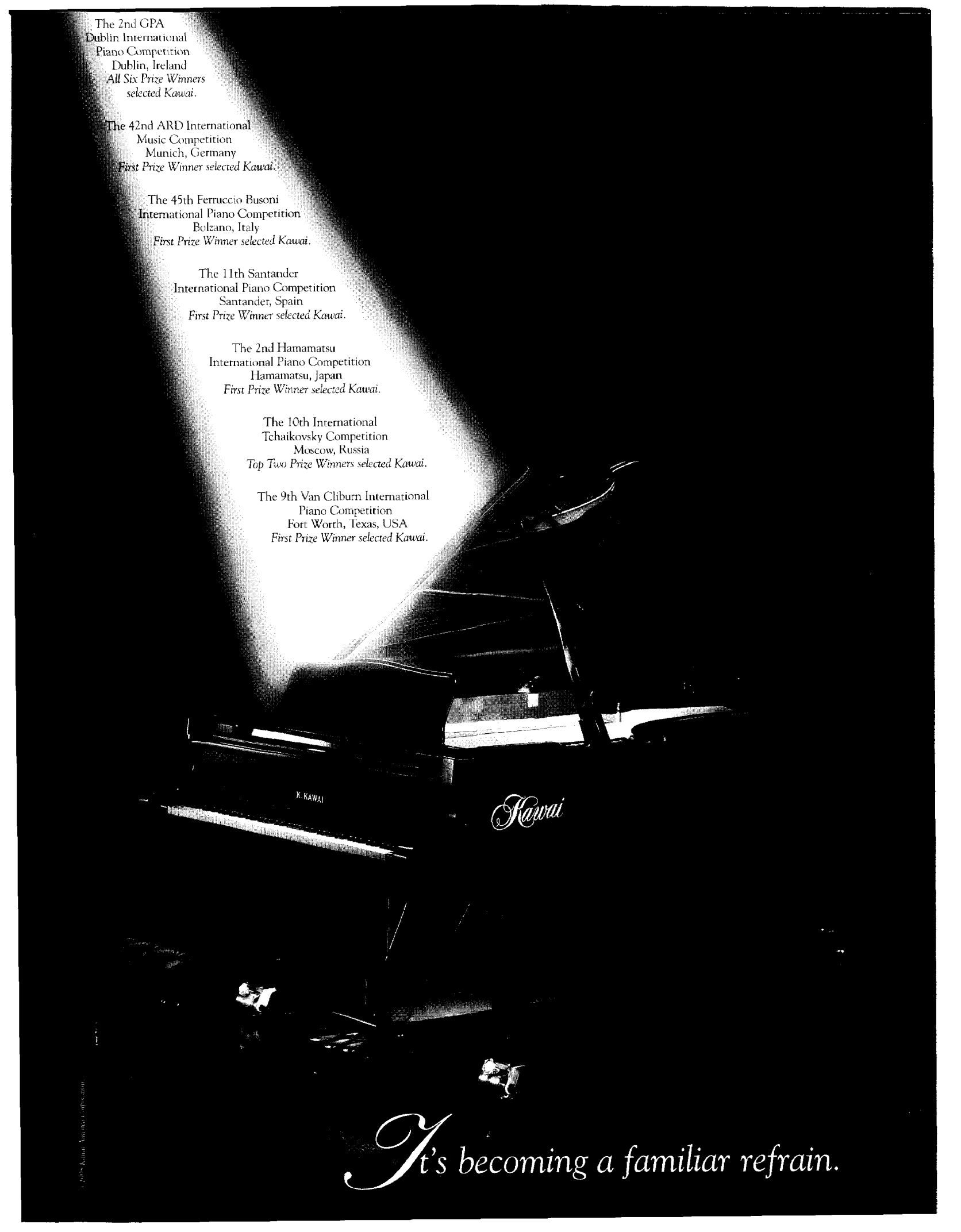
I have a problem with the pedal on a Conn console. The sustain pedal has worn quite a bit and ovaled out the hole in the pedal where the pedal pin is inserted. The pedal has a lot of play from side to side, and wobbles severely. Is there any way to repair this hole so that a new pedal pin can be inserted tightly, or should I recommend that they purchase a new set of pedals? I am looking for a cheap fix, if there is one. I would appreciate your input.

— David Vanderhoofven

A — *From Larry Fisher, RPT*

There are a number of catalyst-type repair substances out there that would most likely be a good choice for a cheap fix. One that came to mind right away, of course, was epoxy. However, I think I'd take the opportunity to venture out into some new areas, and explore the possibilities of MarineTex®. This stuff is hailed by sailboat owners as being the fix-all of marine hassles. One particular case cited the fix of an exhaust manifold crack that lasted for years. If the pedal is cast like the exhaust manifold, then MarineTex® would be my choice.

Continued on Page 18


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.
K. KAWAI
Kawai
It's becoming a familiar refrain.

Continued from Page 16

A — *From Ron Berry, RPT*

Remove the pedal pin and drill a small hole into the pedal from the top so that it comes into the hole for the pin at a perpendicular. Then tap threads in the hole and insert a set screw to hold the pin in place. This idea came from Jim Harvey and works very well. Be sure that there is room for the set screw to stick out the top a bit.

Some pianos have mounting blocks that go right over the middle of the pedal so this won't work on them.

A — *From Jim Harvey, RPT*

Thanks Ron, but although I've used this method quite effectively, I don't recall having mentioned it to the masses; i.e., in a class environment. What I have endorsed was a simple pedal pin inserter/extractor, when faced with the problem of removing a pin, then re-installing the repaired pedal through the pedal rail. (Even that idea is stolen — I just spread the tip around faster than the guy I stole it from!)

To keep from wasting everyone's time, I'll mention a repair I picked up from Fred Odenheimer. It may prove relative.

In this case, the goal was that of maintaining the integrity of the original pedals when duplicates could not be found. Cost was not the object, rather the lack of availability. Also, the pin was the least of the problems — the pedal was broken in half!

To effect a repair, he used a product called J.B. Weld®. It's widely available at automotive shops, not to mention my local piano parts supplier: Wal-Mart. This 'goo' is used to repair holes and fissures in cast-iron (hint-hint) engine blocks. Even butt-joining the two pieces, as structurally unsound as it sounds, the last I heard, the repair was still holding — and this was the damper pedal!

A — *From Rick Florence, RPT*

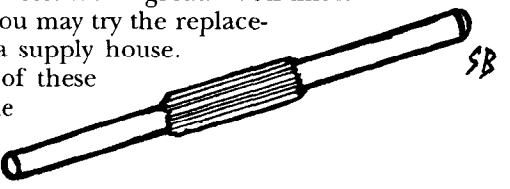
Try this: remove the pin and insert a long piece of music wire (the smallest size you have) on the front side of the hole (the top or bottom may crack the pedal). Replace the pin — you will have to hammer it in — and snip off the wire on both sides flush with the sides of the pedal. I have used this method on a number of practice pianos and it has worked every time. Good luck!

A — *From Frederick Scoles, RPT*

To repair a loose pin in a small Story & Clark church grand, I had a machinist friend drill out the damaged brass in the pedal and press fit a stainless steel rod, which was then drilled to accept the standard pedal pin. Possibly more expensive than the other solutions, but the pedal has worked fine under hard use for more than six years.

A — *From John Hartman, RPT*

Try soldering the pin into the pedal. Clean the pin and the inside of the pedal. Flux the parts and reassemble. Heat the area with a propane torch (map gas works better), and flow 50/50 solder into the hole. Works great! But if this is too much work, you may try the replacement pins from a supply house. The center area of these are fluted to provide a friction fit and will work on some brands.



A — *From Tom Seay, RPT*

Yet another method (similar to the music wire) — take one of those brass or aluminum tuning pin bushings (come on now, we all have a box of them somewhere!) and insert it into the ovaled out side of the hole part way. If the hole is severely ovaled, you can put a double thickness in. Drive a new fluted pin into the hole from the ovaled side and simply break off or hacksaw the remaining bushing. The brass/aluminum is nice because it compresses slightly, lessening the chance of anything splitting out.

A — *From Phil Sloffer, RPT*

All the repairs mentioned sound great to me. However don't forget that this repair often needs to be done on your hands and knees with the pedal inside the pedal rail, otherwise you cannot get the pedal and pin assembly back in the piano and have to drive the pin out and start over again.

A — *From Rick Florence, RPT*

This is the reason for my repair with the string. It is done in the piano. You can use a second hammer or other piece of metal as an anvil. Don't forget to block up (wedge up) the bottom board first.

A — *From Ron Berry, RPT*

And that's also one of the good things about using a set screw. You can take the pin in or out at will. You can take it out and put the pedal back then reinsert the pin and tighten the set screw.

A — *From Kent Swafford, RPT*

This may be too simple to mention here, and will only work to a point. (It sounds like the pedal on the Conn piano that David Vanderhoofven was working on may already have been too far gone for this — but maybe this could have helped temporarily.) Often, it is when we are looking for the cause of a squeak or other unwanted noise that we find a pin in a pedal that is just loose enough to slip around and cause extra noise. Remove the pin, and, using two pairs of pliers, put a bend in the middle of the pin, then put an additional bend on either side of the middle bend to return the ends of the pin to a straight, "in-line" status. The amount of looseness needing to be fixed will vary, so adjust the angles of the bends accordingly.

Editor's note: *As you can see, we have quite a variety of solutions to David's problem. It seems to me that any of these techniques would work very well. Some might be better suited to one particular kind of situation, and some to another. Thanks to David for his question, and thanks once again to the members of "pianotech" for their creative responses.* ***SB***

Letters

Continued from Page 10

distance reduce power, and what effect does that have on repetition? My answer was: It does reduce power but it improves repetition if the previous blow distance was excessive. If anyone doesn't believe that, just try driving a tight-fitting tuning pin using two-inch hammer strokes. It's obvious, but I didn't say that. Instead, I went on to give the scientific reasons why this is true.

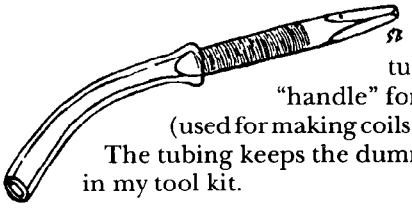
I said, "Friction does not play a big part in action response when the pianist is playing for power ... unless something is really wrong with the action." Ken left out the last half of my sentence when he quoted me. By my definition, excessive friction would constitute "something really wrong with the action." Under that condition, I would certainly expect the pianist to dislike the piano, if not to reject it outright. Under *normal* conditions, friction is a significant factor when one is playing very softly. That's why consistency is so important. When playing for *power*, however, overcoming *inertia* is the big item, *especially* in fast passages. I maintain what I said before.

I am very well aware of the subject approach taken by many pianists. They may sometimes say one thing when they mean something else. Their remarks sometimes require interpretation by the technician. In most cases, however, I find that task isn't too difficult when I remember that the pianist is an artist and not a technician. I know that uneven strings, excessive letoff, excessive friction, soft hammers, lopsided hammers that hit the strings unevenly and wobble, and all similar things cause a loss of power. That's obvious too, but that wasn't the question. The question was about power and repetition as a function of blow distance and hammer mass.

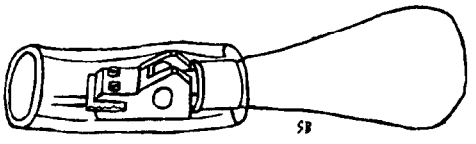
— Jim Ellis, RPT

Tips, Tools & Techniques

Continued from Page 12



The same size of tubing makes an excellent "handle" for my dummy tuning pin (used for making coils on replacement strings). The tubing keeps the dummy pin from getting lost in my tool kit.



5/8" inside, 7/8" outside diameter tubing protects the business end of a voicing tool much better than a cork or a front-rail punching.

— Isaac Sadigursky, RPT

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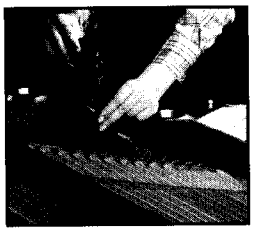
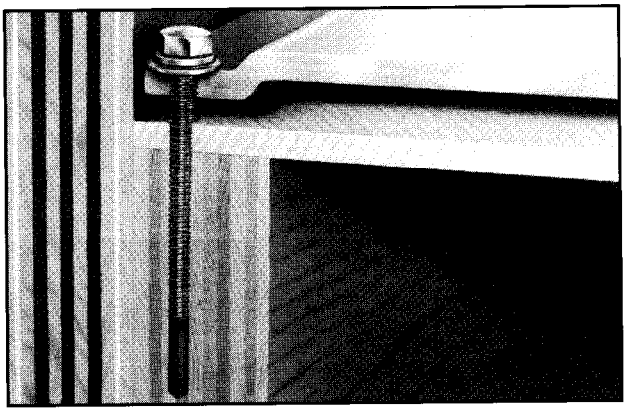


The precise setting of downbearing is critical for good piano tone. Too much bearing inhibits tone because the soundboard cannot vibrate freely, while too little bearing does not provide good sound transmission. From our research we have developed a unique method of setting downbearing with a degree of accuracy previously considered impossible.



Advantage #1

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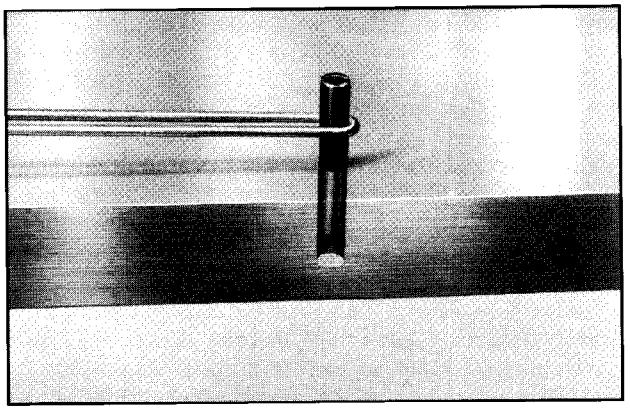
Each mounting hole around the perimeter of the plate is threaded to accept a hardened steel bolt. This allows the plate to be set at the optimum height for bearing on the front side of the bridge.



Advantage #2

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Because this patented pin is installed vertically instead of at an angle, it is possible to raise or lower each string individually for ideal bearing on the backside of the bridge.

These are two important advantages for technicians.

If major soundboard or bridge work is ever needed, it is possible to remove the plate, pinblock, strings and tuning pins as a unit. Simply lower the tension, remove plate bolts and dampers and pull it out. Minor adjustments in bearing can be made without unstringing the piano or lowering the tension.

To make this procedure even easier Baldwin loans technicians special bearing-setting equipment. Whether restringing a section or an entire piano just call Baldwin Technical Services at 800-876-2976.

Innovations in piano technology **Baldwin**

How To ...
Build a Vacuum Cleaner Carrying Case

By Terry Rood, RPT
Rogue Valley Chapter

In the interest of providing comprehensive piano service to my clients I always include a thorough vacuum cleaning of the instrument. I do this on the first visit and subsequently as needed. Providing this service serves several purposes. It improves the condition of the piano, it makes the piano more pleasant to work on, it impresses your client with the thoroughness of your service, it enhances your reputation and might give you a competitive edge, and it makes you feel good about yourself for having provided a complete service.

For years I carried my vacuum cleaner to my jobs in the cardboard box that it came in. In time this box became tattered, faded, and generally unprofessional looking. I would often need to return to the car to procure lights and extension cords. I finally solved these problems by designing and building a vacuum cleaner carrying case. This case is easy to carry, includes not only the vacuum cleaner, hose, attachments, and a cleaning brush, but a retractable cord, a power strip, extension cords, two lights, and if needed, an auxiliary work surface for tools or parts. My new case is very practical, and my clients are often delighted with its attractive appearance, usefulness, and careful construction.

The materials for my case cost about $60, but the plywood was sold to me as scrap pieces, and I already had the finishing products. I built my case using 3/4" hardwood (oak) plywood. The weight of the completed, empty case is 16 pounds, and 28 pounds when full. If the size and weight of this case seem somewhat excessive for your tastes, consider using 1/2" plywood, or another idea might be to use a thinner, softwood plywood and cover it with a quality hardwood veneer. Beware of reducing the overall internal size of the case; adequate room must be provided for the hose to clear the cord retracting unit and to coil around the body of the vacuum cleaner.

A materials and source list, and a detailed drawing with dimensions are included at the end of this article. Use them as is, or as a starting point of ideas for your own modifications.

Photo 1 shows the relative size of the case. A 3/4" hardwood dowel extends across the top as a carrying handle. Both ends of the case have a 2 1/4" hole positioned to allow attachment of the hose to the vacuum cleaner, in the front to provide suction, and in the rear to provide blown air if desired. On my vacuum cleaner the height of the suction hole is different than the height of the exhaust hole, so be mindful of this. My vacuum also has a retractable cover over the exhaust port, so sufficient space must be provided for the possible retraction of this cover should you desire to use the blown air feature of the vacuum cleaner. My vacuum is a 1988 Eureka Mighty Mite, 1.0 horsepower. It is 11" high, 6 3/4" wide, and 14 1/8" long. Should you choose to use the included case plans, verify that your unit will work with the given dimensions. Minor modifications may be needed.

Photo 1

Photo 2 shows the case with both side-leaves opened. On the right leaf, Velcro® strips hold the brush and crevice tool attachments, and a medium-sized paint brush for loosening dust from between tuning pins, etc. On the left leaf, Velcro® strips hold a small florescent light. I purchased this light from Wal-Mart, and in some situations I've found it to be quite useful. Also included, but not visible (beneath the top piece) is the more traditional clamp-on light, clamped to the handle of the vacuum cleaner.

Photo 3 shows the dual function capability of the right side-leaf. This leaf is hinged to a moveable 3/4" hardwood frame which pivots on 3/8" dowels, allowing the side-leaf to be swung up and level and locked into place with a slightly modified lid support. The right side-leaf now becomes a small work surface. This feature can be very useful in repair situations where tools and parts tend to get scattered all over the piano, and one never has enough room to put things.

Photo 2

The cord retracting unit is shown in Photo 4. Another Wal-Mart product, this unit was originally a 20' "Retractable Cord Reel." It had a "drop light" style light fixture on one end with the retractable 20' cord and a short grounded plug on the other end. I cut off and discarded the light fixture from the retractable end, and reattached a grounded plug. I cut off and discarded the plug from the other end, and reconnected it to the power strip. The cord from the power strip is too long, and must be cut, soldered, and taped to this non-retractable end of the cord unit. The cord unit is positioned so as not to be in the way of the hose if used in the exhaust port, or to interfere with coiling the hose around the body of the vacuum cleaner. The cord unit hangs from an eye screw attached to the top piece of the case. A Velcro® strip goes across and over the sides of the cord unit

Continued on Next Page

How To ...
Build a Vacuum Cleaner Carrying Case

Continued from Previous Page

Photo 3

to hold it in place, keeping it from knocking about when the case is being carried, but also allowing the unit to be tilted up a bit when the cord is being pulled out.

In Photo 5 the right side piece of the case has been removed, and the right side-leaf and frame locked into the up position so as to show the interior of the case. Note the side-leaf frame stop blocks mounted on both inside walls of the end pieces. 1/8" deep dado grooves are cut in the bottom piece for the vacuum cleaner wheels to sit in, keeping the vacuum stationary once a short bungee cord is stretched over the vacuum and hooked into the eye screws on either side. The height of the intake and exhaust port holes must be correspondingly lowered by 1/8" to accommodate the vacuum unit sitting in these dado grooves. The lid support for the side-leaf frame is seen to the left, locked into position. The point where the lid support is mounted to the inside end wall is important, so care and perhaps some experimentation should be taken to ensure that this point is correct. See Photo 6 also.

The lid support has been slightly modified. Drill out the rivet holding the upper arm of the lid support to the small mounting foot. Turn the mounting foot around so that it faces the other way, and reattach it to the other side of the upper arm. The screw holes will now line up more in the middle of the 3/4" side-leaf frame. Before attaching the lower arm of the lid support to the inside end wall, place a thin spacer washer between the arm and the wall.

Photo 7 shows how the right side-leaf hinges to the moveable frame piece (F). Shallow grooves, the thickness of the hinges,

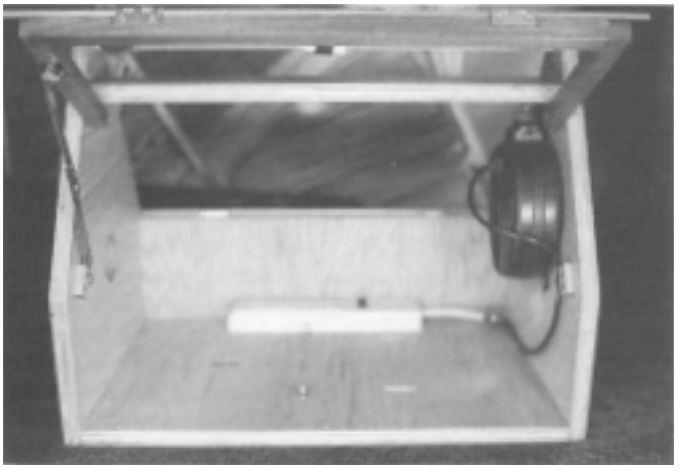


Photo 5

are routed where the side leaf hinges are mounted. This prevents the hinges from contacting the 30- degree angled top surface of the side piece (C). Small #4, 1/4" brass wood screws are used to attach the hinges (and the Velcro® strips) to the thin 1/4" hardwood plywood. Should some of these small screw holes in the 1/4" plywood strip out, apply a drop of epoxy to the hole, turn the screw back in, let dry, and it's fixed. Try not to turn the screws in so far as to poke out the other

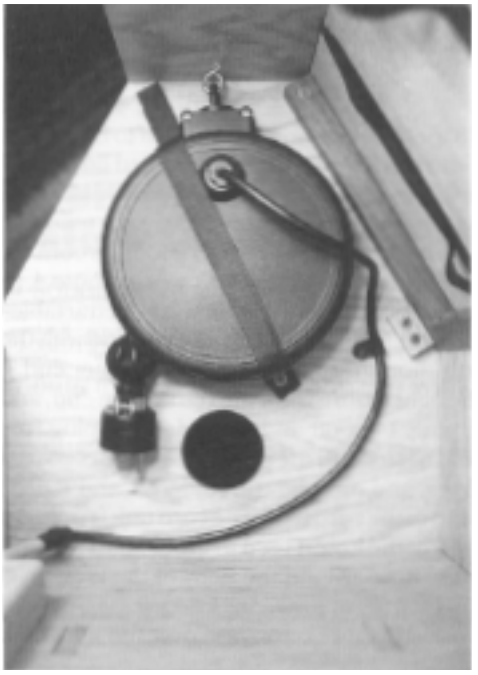


Photo 4

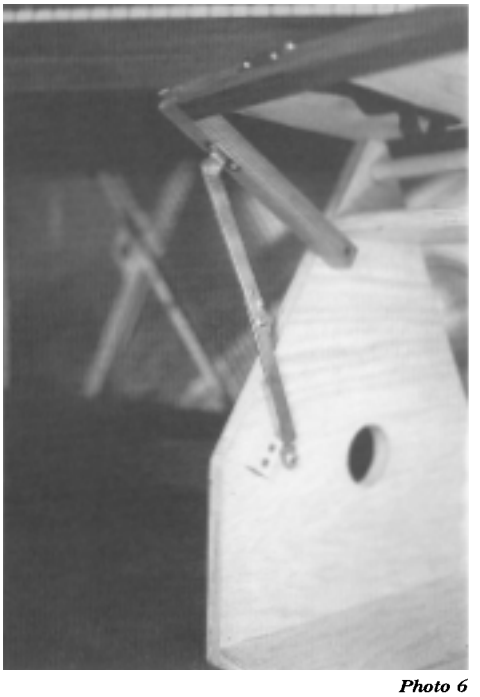


Photo 6

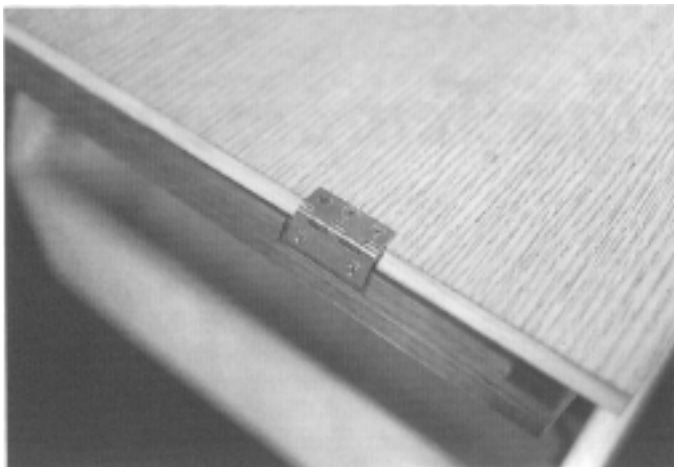
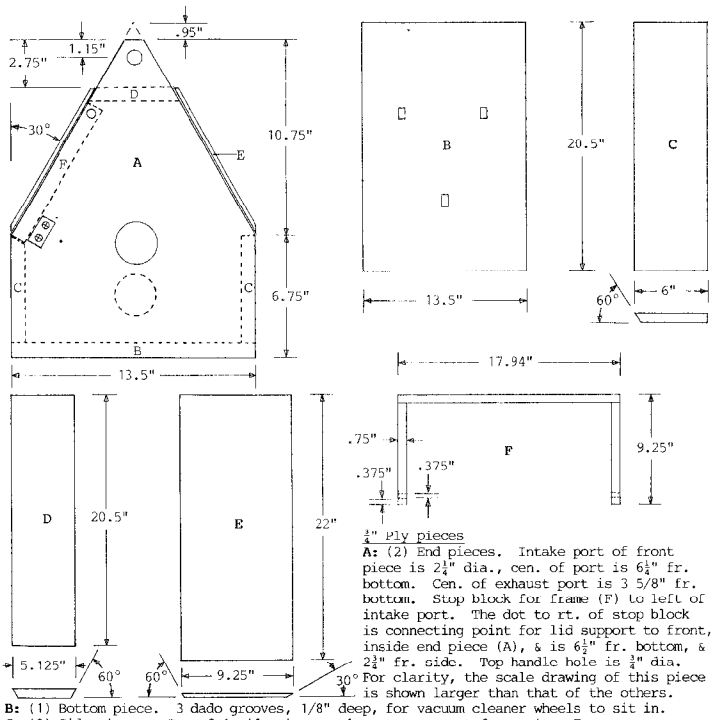


Photo 7

side. Regarding the frame (F), I used 3/4" walnut, tongue and groove style joints, and glue to join the pieces of the frame together. Make sure these pieces are square before the glue dries!

To finish the case I chose not to use a stain, since cut ends of plywood accept stain very heavily. I used a two-step finishing system which I mail ordered from The Woodworker Store. The products are made by General Finishes, step one is called Sealacel, a wipe-on tung oil sealer, and step two is called Royal Finish, a wipe-on glossy or satin urethane and oil finish. Another benefit of this finish is that additional coats can easily be wiped on to cover over the inevitable scuff marks.

This project requires some extra time, shop equipment and skills, but once completed, I think you will find it to have been well worth the effort!



¼" Ply pieces
A: (2) End pieces. Intake port of front piece is 2¼" dia., cen. of port is 6¼" fr. bottom. Cen. of exhaust port is 3 5/8" fr. bottom. Stop block for frame (F) to left of intake port. The dot to rt. of stop block is connecting point for lid support to front, inside end piece (A), & is 6½" fr. bottom, & 2¾" fr. side. Top handle hole is ¾" dia. For clarity, the scale drawing of this piece is shown larger than that of the others.
B: (1) Bottom piece. 3 dado grooves, 1/8" deep, for vacuum cleaner wheels to sit in.
C: (2) Side pieces. Top of 1 side piece angle cut to accept frame piece F.
D: (1) Top piece. Both sides angle cut to 60°.
¼" Ply pieces
E: (2) Side leaf pieces. 1 side angle cut to 30°, the other to 60°. 1 leaf hinges to a side piece C, & the other hinges to frame piece F.
Frame
F: ¾" hardwood, tongue & groove joined at corners. Hinges on 3/8" dowels thru end pieces.

Materials and Source List

- 1/2 sheet of 3/4" hardwood plywood
- 1/8 sheet of 1/4" hardwood plywood
- 37" of 3/4" X 3/4" walnut
- 22" of 3/4" hardwood dowel
- 3" of 3/8" hardwood dowel
- lid support, 6 1/4" long (Source: "folding support," National V1890R, right side mount, from Coast-to-Coast hardware stores, $2.09.)
- retractable cord unit (Source: Popular Mechanics #900GP-CB, 20' "Retractable Circuit Breaker Protected Cord Reel," from Wal-Mart stores, $14.96.)
- 4- or 6-outlet powerstrip
- 1, 110v. grounded plug
- 4 brass hinges, 1 1/2" x 1"
- #4, 1/4" and 3/8" flat head brass wood screws
- drywall screws, eye screws
- 1 short bungee cord

Inharmonicity and Octaves — Part 1 Extending the Temperament

By Dan Levitan, RPT
Contributing Editor

Introduction

There are certain words in the English language that seem to have a mysterious power over the mind. These words, through their association with intense emotional states, have acquired the ability to reproduce those states by their mere sight or mention. Once introduced into the mind, such words effectively block out the higher faculties, such as reasoning, making the use of them difficult, if not impossible.

One of these words, I have discovered, is inharmonicity. The word seems to produce in many of us a curious sensation of physical discomfort — clenched teeth, sweating palms, an overwhelming urge to flee. The roots of this association lie, I believe, in that pessimistic emotional state peculiar to novice piano tuners that is produced after half an hour of fruitlessly trying to tune the 13 semitones of a temperament into their correct relationships. At such times one feels in one's bones the truth that the universe is moving inexorably towards greater entropy rather than greater order. In a desperate search for something to blame for this panicked condition, a beginning tuner may be tempted to silently heap curses upon a vaguely understood phenomenon known as inharmonicity. No wonder the word provokes unpleasant feelings ever after.

At the same time, however, that we may hurry through a temperament as through a haunted forest, relieved to emerge into the light of day with the temperament section and our sanity reasonably intact, we may be utterly fearless when it comes to tuning octaves. Inharmonicity leads the search for pure octaves on a piano into just as many gray areas as it does the search for equal temperament, yet for some reason we tuners don't seem to be upset by the inharmonicity of octaves in the same way that we are by the inharmonicity of the temperament. Many of us even enjoy the challenge of octave tuning. We each tune octaves in our own way, almost as a matter of pride, and the elasticity of piano octaves that allows us this variety of styles seems to inspire more passion than consternation. We feel free to expound upon our favorite methods of stretching single, double, triple, quadruple, quintuple octaves. We are glad to fuss artistically over our own pet tests. And yet, we have to realize at some point that the reason we can carry on so about octave tuning is the same basic quality of piano tone that inspires such fear in the temperament — inharmonicity.

Inharmonicity is in pianos one hundred percent of the time, not just when we're tuning temperaments. It's our constant companion whenever we pick up a tuning hammer, not just when we face down the temperament section of a miserable little spinet. It should be an integral part of all our thinking about tuning, and rather than an obstacle, we should look upon it as an opportunity. Without it the highest standards of tuning both temperament and octaves would be dictated by science. There would be no pleasure, no art, no discussion — no articles! — it would all be easy, reliable ... and dull. In this two-part series on octave tuning, we'll explore some of the implications of inharmonicity for octave tuning, and take a look at some of the problems and possibilities that result.

Goals In Tuning

Let's begin by making a clear distinction between the two entirely different goals that we have when we are tuning octaves. First, and most obviously, we are trying to tune notes in as ideal a relationship as possible to notes of the same name that have already been tuned. In a temperament that covers the span of an octave, for example, we ordinarily tune the notes just above and below the temperament as single octaves to the already-tuned notes of the temperament. As more of the piano is brought into tune, we are able to listen as well to double octaves, triple octaves, quadruple octaves, and so forth.

If there were no inharmonicity in pianos, this process would offer little room for discussion. The science of acoustics tells us that two notes are in the relationship of an octave when the frequency of the upper note is exactly twice that of the lower note. For a variety of reasons, this relationship is considered the most consonant intervallic relationship other than the unison. One reason lies in the relationship of the harmonics of the two notes.

As we know, the sound of a string is composed of a number of pitches, known as its partials. There is a fundamental pitch, which is the pitch we identify as the pitch of the string; and in addition there is a series of pitches — called overtones — whose frequencies are integral multiples of the fundamental. The first is twice the frequency of the fundamental, or an octave above it; the next is three times the frequency, or an octave and a fifth above the fundamental; the next is four times the frequency, or two octaves above; and so on.

When two strings are at the same pitch, the pitches of their overtones match as well. Matching overtones are said to be coincident. When the pitches of two strings are in the relationship of an octave, all the partials of the upper string are coincident with the even-numbered partials of the lower. This great number of coincident partials is thought to contribute to the octave's great feeling of consonance.

Similarly, in a double octave, the frequency of the upper note is four times that of the lower. All the partials of the upper string of a double octave are therefore coincident with those partials of the lower which are a multiple of four. In a triple octave, the upper note has eight times the frequency of the lower; and so on.

In a piano without inharmonicity, these relationships among octaves would give us the means to determine the one exact theoretically ideal frequency for each note on the piano, and it would always be an integral power of two of the frequency of the note of the same name in the temperament. In such a piano we would have an absolute standard for an ideal tuning: every note on the piano

would have this power of two relationships with all the other notes of its same name. Any deviation from this standard, for artistic or any other reasons, might be acceptable, or even desirable, but in any event it would be exactly measurable.

Unfortunately, or fortunately, depending on your point of view, such is not the case for pianos in the real world. Each note of the piano has its own unique level of positive inharmonicity; in other words, its overtones, or upper partials, tend to be sharp of their ideal frequencies, increasingly so as the overtones ascend the harmonic series. This is the kind of inharmonicity I have referred to in previous articles as primary inharmonicity.

As a result of this primary inharmonicity, each octave, double octave, triple octave, quadruple octave, or what have you, has its own level of inharmonicity; this kind of inharmonicity I have called secondary inharmonicity. Secondary inharmonicity is the condition in which the coincident partials of an interval, such as an octave, fail to match up. In pianos, the secondary inharmonicity of the octaves typically ranges from zero to some degree of positive secondary inharmonicity, in which the coincident partials of the upper note are increasingly flat of those of the lower note as they ascend the harmonic series.

In order to tune an octave that exhibits positive secondary inharmonicity in a way that pleases the ear, the octave must be slightly expanded. As the upper note is sharpened, or the lower is flattened, or both, the coincident partials of the upper note rise in pitch relative to those of the lower note, so that successively higher coincident partials are brought into perfect unison. We ordinarily distinguish among these different degrees of expansion by referring to the pair of coincident partials that we have matched. If the second partial of the lower note is in unison with the first of the upper, we call the octave a 2:1 octave; if the fourth of the upper is in unison with the second of the upper, we call the octave a 4:2 octave; and so on. Unless there is no secondary inharmonicity in the octave, only one pair of coincident partials at a time, at most, can be in perfect unison. It is our job as tuners to find the degree of expansion for the octave that makes the octave sound best and fits in best with the rest of the tuning.

Because all pianos exhibit some degree of secondary inharmonicity in at least some of their octaves, there can be no one exact and final standard for tuning the octaves of any particular real piano. One of the challenges of octave tuning with which we are blessed — or cursed — is the challenge of making the conflicting demands of the different levels of inharmonicity in the various intervals of a piano work together to create workably harmonious octaves.

I'd like to postpone further discussion of this aspect of octave tuning for the next and final article in this series. Instead, let's turn to the second goal we have in tuning octaves, one which is quite distinct from the first. *That goal is to extend whatever tempered relationships we have set up among the notes of our temperament to the rest of the piano.*

> ***Without it (inharmonicity) the highest standards of tuning both temperament and octaves would be dictated by science. There would be no pleasure, no art, no discussion — no articles! — it would all be easy, reliable ... and dull.***

If pianos lacked inharmonicity, there would be no need to distinguish between these two goals. If we were to tune the notes within an octave on a celestial, non-inharmonic piano in a pure equal temperament — in other words, to divide the octave into 12 exactly equal steps — and if we were then to bring the rest of the notes of the piano into a pure power-of-two relationship with the notes of the same name in that temperament octave, we could then pick any octave on the piano and find that the eleven notes within its compass were in the same exact equally tempered relationship that we established in our temperament octave.

Many of us unconsciously assume that this is also the case in real pianos. It seems to make sense that if we tune a decent temperament, and then tune consistent octaves from that temperament, we will have somehow transposed our temperament out to those octaves. As it happens, though, in real pianos, because of inharmonicity (what else?), no matter how perfect the temperament, and no matter how exact and consistent the octaves, notes tuned as octaves beyond the temperament don't necessarily form equally tempered intervals with each other.

An Imaginary Tuning

To see why this is so, let's imagine that we are tuning a piano. We'll say that we've decided to begin with a temperament set between notes F3 and F4. This octave will probably have some level of secondary inharmonicity; therefore, before we tune the temperament we'll have to expand the temperament octave judiciously in order to make the coincident partials line up more fittingly. The degree to which we'll expand the octave might vary, depending on our taste, the pianist's taste, performance demands, and a variety of other factors. For argument's sake, let's say that we have decided that all the octaves between F2 and F4 on this piano sound best as 6:3 octaves, and so we'll tune the temperament octave F3-F4 as a 6:3 octave, matching the sixth partial of the F3 to the third partial of F4.

Once the size of that octave has been set, we have for all intents and purposes also fixed the frequencies of the eleven intervening notes of the octave. That's because there is only one sequence of pitches that exactly divides the octave into 12 perfectly equal semitones.

Note that this theoretically perfect tuning for these inner notes of the temperament is completely independent of their inharmonicity. It makes absolutely no difference at all what the levels of inharmonicity are within the temperament octave; the fundamental pitches of our perfect equal temperament are determined only by the distance between notes F3 and F4, and we set that distance when we tuned the temperament octave. Of course, from a practical standpoint, we could not tune the inner notes of the temperament without listening to beating intervals, and those beat rates will certainly be influenced by inharmonicity. In fact, once

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we start listening to beat rates, we may well choose to distort the temperament to make those beat rates more compatible with our ideas about what equal temperament should sound like. But that doesn't alter the fact that if all we want to do is determine the frequencies of the 11 notes that equally subdivide the octave, we can do so entirely independent of the inharmonicity of the notes.

Similarly, we can extend this temperament beyond the range of the temperament octave without taking into consideration the inharmonicity of the notes beyond the temperament. Remember that every semitone in our temperament octave is exactly the same size. To transpose our temperament down a half step and create a perfectly equal temperament between E3 and E4, for example, all we have to do is tune the fundamental of E3 as a semitone of that same size below F3. This may be difficult to do by ear, but it is perfectly possible to do with a good electronic tuning device. In fact, we could now tune every note in the entire piano, and spread our perfect equal temperament by semitones to the ends of the keyboard, all without the slightest regard for the inharmonicity of any notes except F3 and F4.

But would these notes outside the temperament form good octaves with the temperament section? What, for example, about the notes between F2 and F3? We had originally decided that octaves between notes in this range and notes in the temperament would sound best as 6:3 octaves, just like the temperament octave. Well, all we can do is keep our fingers crossed, because these notes have already been tuned, and there is one and only one level of primary inharmonicity for each note that will allow it both to form a pure 6:3 octave with the temperament section and to be a part of an equal temperament with its neighbors. If we're lucky, the note may indeed have that level of inharmonicity. Or, as is more likely, it may not. My point is that it doesn't necessarily have the correct degree of inharmonicity. The act of extending the temperament to the ends of the piano, in other words, is not necessarily compatible with the act of tuning harmonious octaves. The degree to which it is compatible is entirely dependent on the quality of the piano's scale.

Conversely, it is not necessarily true that a series of 6:3 octaves tuned down to F2 from the temperament octave F3-F4 will create a perfect temperament between F2 and F3. In fact, the smaller and more inharmonic the piano, the more likely it is that they will not. Furthermore, the imperfections in the temperament within the lower octave will be compounded when we use it in turn as the basis of octaves down to F1. (How much wisdom there is in the often repeated advice to check notes in every range of the piano directly against the temperament!)

> ***As it happens, though, in real pianos, because of inharmonicity (what else?), no matter how perfect the temperament, and no matter how exact and consistent the octaves, notes tuned as octaves beyond the temperament don't necessarily form equally tempered intervals with each other.***

Only if the inharmonicities of the notes outside the temperament are carefully and perfectly matched will we be able to have both the octaves we want and at the same time to maintain the notes we are tuning in an exact equally-tempered relationship. This matching of inharmonicities is characteristic of the midrange of most large pianos, such as a concert grands, which are usually carefully scaled to eliminate as much secondary inharmonicity as possible. On these pianos, we can indeed tune octaves out from the temperament and find that at the same time we are expanding our temperament virtually intact. This is what makes these large pianos so desirable for tuning exams. Their low secondary inharmonicity limits the range of acceptable sizes for their temperament octaves, and just beyond the temperament there is little conflict between the two goals of tuning good octaves and maintaining temperament-quality tunings. This eliminates most discussion about what pitch is ideal for the notes, and makes the examinee's accuracy and solidity stand out in clearer relief. Inharmonicity does come into play in the low bass and high treble on these pianos, though, and these are the very areas in which the exam allows more room for deviation from the master tuning.

Smaller Pianos

On smaller pianos, the practical impossibility of having at the same time both perfect octaves and perfectly tempered relationships would seem to be a serious sticking point; but it is a basic fact of piano tuning and should not cause us to despair. It's a problem only if we cling to the notion that there is a platonically ideal tuning for every piano, even the small ones — a tuning that, with enough practice, we may someday be able to approximate. Such notions can lead us into a fruitless search for holy grails, for particular routines, whether they be temperament sequences or techniques of octave tuning, that will somehow guarantee us consistently perfect results. But these holy grails do not exist. Just about any reasonably decent approach to temperament and octaves will work on a large piano with low secondary inharmonicity; but there is no single approach that always works on a small pianos. Nor should we expect there to be. Having that expectation only puts us in the position of constantly facing confusion and failure.

Instead, we should recognize the fact that, as inharmonicity climbs, the

less we can count on having the notes beyond the temperament fall easily into place. The smaller the piano, the more the simultaneous production of reasonable facsimiles both of good octaves — by which I mean relatively quiet single, double, triple and quadruple octaves — and of temperament-quality intervals — in other words, of evenly progressing beat rates in all the other intervals — will require an active effort on our part.

Fortunately, at the same time that inharmonicity presents us with this basic conflict in our octave tuning, it presents us with the means to work around the problem. It does this by creating a range of acceptability for the intervals, by giving us some room for compromise. An octave that has a high degree of inharmonicity will never sound clear and pure, but it will sound acceptably smooth over a wider range of sizes than an octave with low inharmonicity. This elasticity is invaluable when we are working on small pianos, because it makes compromise possible.

Compromise in piano tuning is not just what we do when we've inevitably gotten off the right track and have to patch up our mistakes as best we can. Compromise is basic to piano tuning and cannot be avoided. It allows us to exercise our judgment, to gather and draw on experience, and to take pleasure in the practice of tuning as an art. We welcome the necessity of compromise because it rescues tuning from being an act of drudgery, an entirely mechanical process driven by absolutes. It allows us to approach tuning a small piano as a creative act, a problem with many possible solutions that we can master in more and more sophisticated ways as we gain experience and knowledge.

There is, however, one characteristic of good octave tuning in large pianos that we can and must transfer to any small piano, and that is its consistency. When secondary inharmonicity is low, as on a large piano, the range of arguably correct tunings is small, and deeply consistent. As inharmonicity increases, the range of acceptable tunings increases, but the need for consistency remains unchanged. And inharmonicity becomes a strong ally in helping us to achieve that consistency, because it allows our intervals some flexibility.

Another strong ally in our pursuit of consistent octaves is the piano itself. Even the most depraved manufacturer of the most minuscule spinet is likely to have produced a reasonably consistent scale, for the simple reason that it's easier and cheaper to make a scale reasonably consistent than wildly inconsistent. After all, it's easier to cut a bridge along a relatively straight line than to cut it along a zigzag.

Electronic tuning devices take full advantage of the power of consistency, and they rely upon this general consistency of pianos to produce good results. Of course, there are many ways to use these devices as an aid to aural tuning. But even when they are used in the most basic way, to generate a template for complete tuning for a piano, as long as they produce a reasonably appropriate and strictly consistent set of compromises from theoretical equal temperament, and as long as we apply those compromises to a reasonably consistent piano, then the gray areas in the piano will usually be wide enough that the resulting tuning will be satisfactory.

> ***Only if the inharmonicities of the notes outside the temperament are carefully and perfectly matched will we be able to have both the octaves we want and at the same time to maintain the notes we are tuning in an exact equally-tempered relationship.***

Let's return to our piano and look again at the octaves just below the temperament. This area, the tenor, is one of the most consistently problematic in smaller pianos. Not only is this region home to some of the most inharmonic octaves in many instruments and not only does inharmonicity often change in this section both radically and suddenly, but this is also a register of the piano in constant musical use and its tuning is often the basis for the tuning of the low bass and the treble above the temperament.

In the smallest pianos the wound strings begin in the temperament area, but in most pianos above a certain size all the notes of an F3- F4 temperament lie on plain wire strings. In addition, there are frequently a few more plain wire notes just below the temperament. The larger the piano, the further into the bass the plain wire commonly extends, sometimes reaching down to F2. In almost all pianos below nine feet (and this includes every seven-foot instrument I have tuned) at least the last few notes above the wound strings can be counted on to have anomalously high inharmonicity.

Most of us, as we tune down from the temperament into these notes, will tune them as octaves and then, at some point, check the progression of other intervals that use the same notes — fourths and fifths as well as thirds and sixths. This approach makes a great deal of sense. It recognizes the necessity of compromising right from the start between the two goals of setting harmonious octaves and extending temperament-quality tuning beyond the temperament octave.

It's my feeling that the most efficient and productive way to overcome the obstacles to good tuning that are endemic to the tenor is to make liberal use of tests. Forget about the idea that it's more musical, more artistic, simply to rely on the plain sound of these tenor octaves and to tune each one individually for maximum smoothness. That is madness. Tuning octaves by feel in this area will give you inconsistency and waste your time. Relying on your tests, on the other hand, will give you consistency and save you time.

In a small piano inharmonicity sometimes climbs quite severely as the tuning moves down to the end of the plain wire section. At the same time that these may be some of the most glaringly inharmonic octaves in the piano, there may also be a huge potential range for their size. If you are playing octaves only and listening for the smoothest sound, you'll have a lot to listen to. You may decide that one octave sounds best a little wider, while its neighbor sounds best a little narrower. But keep in mind that this is also an area where the piano may be unusually inconsistent. Strike points tend to drift above the break, wire sizes change frequently, dampers

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get cut short, and so on. Maybe the strike point of the lower note of the neighbor octave is muting out a partial that seemed objectionable on the first octave. Who knows? If you were to stand back a few feet, or come back tomorrow, those octaves might sound different to you. And after you tuned those notes by instinct you'd still want to check their progression as parts of other intervals. When they turned out to be inconsistent you'd probably wind up going back and changing the octaves anyway.

Remember that, within a certain limit, none of these octaves is likely to be that much of an improvement over the others, so unless an octave absolutely cries out to be changed, take advantage of the flexibility of the octaves and go for consistency instead. Decide what octave size you want and then don't waste time fussing over each one; just use your tests to tune that size octave. Notes just below and above the temperament usually work best with the temperament if they are tuned as the same size octaves as the temperament octave. So find out what size that octave is, if you don't already know, and then rely on the appropriate test to recreate that size octave. Don't listen to the sound of the octave until after you've tuned it! And then just make sure it's consistent with the others and not too rough — or, be creative. For example, try going straight down to the lowest plain wire, tuning the octave to a spot you like, and then tuning the intervening notes as major sixths so that they progress smoothly from the temperament down to the last plain wire note. (You did take the time to tune a solid temperament, didn't you? That's the place to fuss; every second you spend perfecting your progression of intervals in the temperament will save you minutes later on.) Don't even bother to listen to the octaves formed by these other notes until you're done tuning the whole section. If they're acceptable, you're in business. And no, you won't have sold out your artistic ideals; you'll have achieved a very consistent set of octaves in a very brief time.

You'll want to check the progression of fourths and fifths, but don't worry too much about their absolute size; inharmonicity gives them a lot of flexibility, too. 3:2 fifths may want to be wide of pure, especially if you are tuning octaves on the wide side. This is not a problem, but they must be consistent. Narrow octaves may result in very noisy fifths; the only way to fix that problem is to widen out the octaves a bit, which you can do gradually if you must, in order to maintain consistency. Keep in mind that fourths can take a good deal of stretching before they sound noisy. When you have tuned down far enough, you will also be able to check your twelfths. These tend not to be as flexible as the fourths and fifths.

> ***Fortunately, at the same time that inharmonicity presents us with this basic conflict in our octave tuning, it presents us with the means to work around the problem.***

Wound Strings

As you continue to tune, you'll at some point come to the wound strings. Typically, inharmonicity drops at this point, and as a result the range of acceptable octave sizes narrows. This is good news, because it will now be easier to decide on a tuning for the octave; but it's bad news, too, because you won't have as much flexibility if you want to move those notes around.

The reason you might want flexibility is that you might be concerned about the progression of intervals over the break between plain and wound strings, particularly the progression of thirds and sixths. Many tuners feel strongly that thirds and sixths should progress smoothly over this break if at all possible; and it's true that that kind of progression best imitates the sound of theoretical equal temperament.

If you feel strongly about having a smooth progression of major thirds over the break, your best bet is to tune the octaves just above and below the break as 4:2 octaves using the major third-major tenth test. The reason is that the progression of major tenths does not cross the break, and so it is consistent; in following that progression, the major thirds will necessarily be consistent as well.

If, on the other hand, you must have a smooth progression of minor thirds over the break, you should tune your octaves in this area as 6:3 octaves, using the minor third-major sixth test. The major sixths don't cross the break, and so they progress consistently; by following that progression, the minor thirds will also be consistent. Obviously, the greater the inharmonicity, the less these two approaches are compatible with each other.

If you want a smooth progression of major sixths over the break, your best bet is probably to tune the first wound string as an octave, then listen to the beat rate of the major sixth it forms with a plain wire string and use that beat rate as a guide for the major sixth just above the break. Don't marry yourself to whatever tuning you may have already produced on the plain wire. If you have to change octave sizes, do so gradually and consistently.

Keep in mind that the octaves just above the break are more flexible than those below. Or you may want a compromise tuning such that none of these progressions is egregiously bad. If so, again, it's not a bad idea to start by tuning the first wound string; you'll have more room to compromise in the last few plain wire strings than in the first few bass strings. Or, you may decide that you prefer a tighter consistency within the separate plain and wound sections, and that you are willing to live with jumpiness over the break. Fine; the decision is yours to make.

If the wound strings start on the note just below the temperament, all these same principles apply. If there are wound strings in the temperament section itself, however, many of these compromises will have been made already in the process of tuning the temperament. But, however you tune this section, keep in mind that you won't get temperament-quality tuning no matter what you do. What you should demand of yourself is as much consistency as possible. To achieve that, use your tests liberally and take maximum advantage

of the flexibility of your octaves, fourths and fifths.

Tuning octaves just above the temperament usually presents fewer problems. There is no break here between plain and wound strings; and, as they become difficult to hear, the progressions of the major thirds, minor thirds and major sixths become less important. At the same time, fourths and fifths become more important and more sensitive; and there may be less inharmonicity in the octaves, giving them less flexibility.

Again, it's not a bad idea to begin by tuning the same size octave just above the temperament as was used for the temperament octave. If, for example, you used a generously wide temperament octave, your fourths, like all the other intervals, will tend to be on the wide side as well. Often, the last few fourths at the top of the temperament will be particularly wide. The best way to maintain that progression of wide fourths is to maintain a progression of wide octaves.

The usual octave test in this range is the 4:2 test, but a pure 4:2 octave will probably be too narrow; perhaps a 6:3 octave would be about right. Unfortunately, the most convenient test for the 6:3 octave, the minor third-major sixth, may beat too fast to be reliable. You can use the 4:2 octave test, but you will want the major tenth to beat more rapidly than the major third. How much faster? An excellent guide would be to apply the 4:2 test to the temperament octave and then reproduce in the octave you're tuning whatever difference you hear between the major third and major tenth in the temperament octave.

Alternatively, you may have chosen a narrow octave for your temperament, and in that case you will want to tune narrow octaves above the temperament, at least to begin with. Pure 4:2 octaves may serve the purpose. As part of your narrow temperament, your fifths will likely be a bit noisy. In that case, the noise level of the fifths above the temperament makes an excellent guide for keeping your octaves consistent.

The sound of the octave itself is a more useful guide in this section of the piano than it was in the area just below the temperament, but there is still a pretty wide range within which the single octaves will be acceptable. So don't imagine that you can get away with tuning a mixed bag of octave sizes, all of which sound pretty good. It's still vitally important to maintain consistency, and the best way to do that is to check the octaves after they've been tuned, using your fifth/fourth tests, and, when they are available, your progressions of tenths, twelfths and seventeenths.

If you have tuned below the temperament before going into the treble, you will also have double, triple and quadruple octaves to check. But these intervals are the subject of next month's article, so we'll put them aside until then. PTJ

The Effects of Downbearing On the Tone of the Piano — Part 2

By John Hartman, RPT
New York City Chapter

Downbearing And Piano Tone

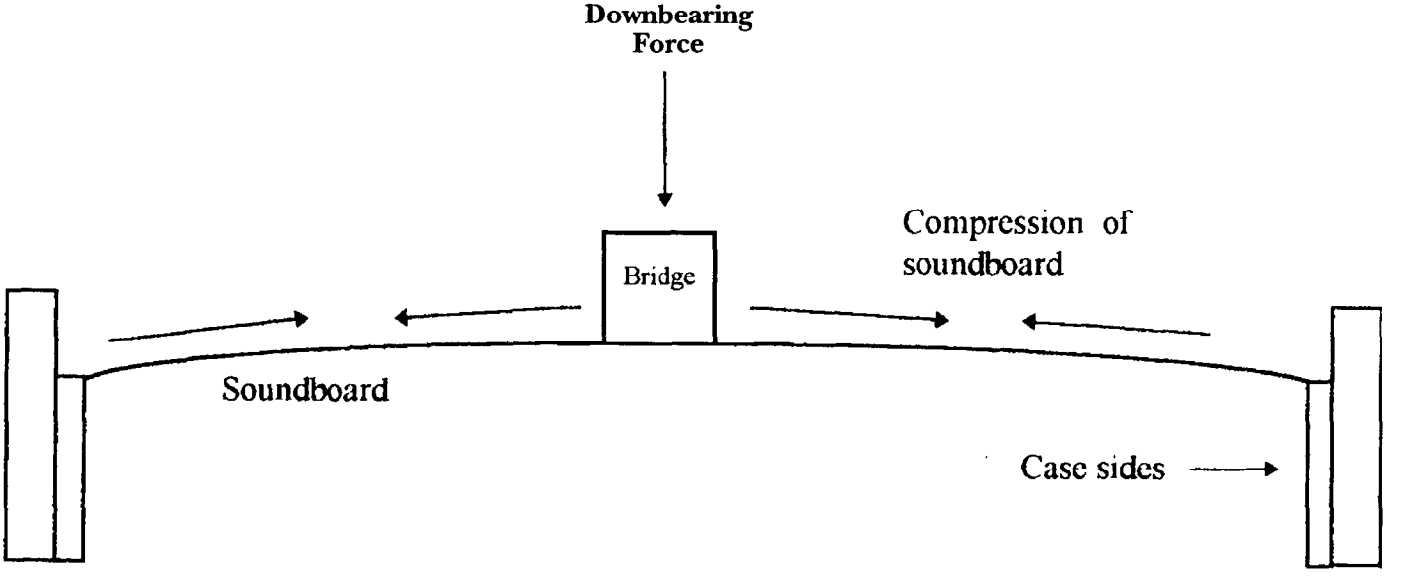
In part one we outlined some essential physics principals and explained how the soundboard moves when stimulated by the vibrations of the strings. In this part I will discuss how this information relates to the piano and how the amount of downbearing can affect the tone of the piano. Before embarking on this course there are a number of things to consider that will avoid confusion and orient the reader. The first part of our job is to define what we mean by downbearing. In its simplest definition, downbearing is a force applied by the strings, acting on the bridge/soundboard assembly. This force is established and maintained by the angular deflection, in the vertical plane, of the strings over the bridge. This force is directly proportional to the angle of deflection and is acting on the bridge in a direction perpendicular to the soundboard. The function of downbearing is to compress the soundboard. Modern piano soundboards are designed, through upward curving of the ribs and bridges (crown), to transfer the downbearing force into compression of the soundboard surface. This is the equivalent of a force exerted by a compressed spring and is elastic not massive. Compressing the soundboard in this way essentially makes it stiffer without making it heavier. There are two desirable tonal effects traceable to additional stiffness: an improved sustain of the strings' vibrations and an increase in the efficiency of the soundboard.

When the pianist strikes the key, the action propels the hammer to the string, the hammer impacts the string, the vibrating string transfers its vibrations to the bridge and soundboard, the soundboard transfers its vibrations to the air and finally we can perceive the sound. Downbearing affects two separate events in this series, the transfer of vibrations from the string to the soundboard, and the transfer of vibrations from the soundboard to the air. To explain each of these events one must apply different theories. First, we will study them separately, waiting until later to show their relative importance. Having covered the necessary background information we are now ready to discuss how the principles mentioned will help us to understand downbearing.

Efficiency Of The Soundboard

Compression of the soundboard, achieved through downbearing and soundboard crown, has beneficial effects on how efficient the soundboard will be at transferring the vibrations of the strings into audible sound waves. To explain this clearly I have divided the causes of inefficiency into two forms: internal damping, meaning the loss of energy from internal friction caused by the soundboard's motion; and external damping, loss through external sound wave interference. First, we will consider internal damping. The piano is played and the vibrations from the strings cause the soundboard to vibrate. As mentioned in Part One under "Soundboard-Modes of Vibration," all of the different vibrational modes of the soundboard will be activated to some degree. Low frequency vibrations will tend to activate the lower-numbered modes that move the soundboard in simpler and larger areas. The higher frequency vibrations, those coming from the higher notes in the scale, will tend to activate the higher-numbered modes that divide the soundboard into many small areas. These small areas, vibrating

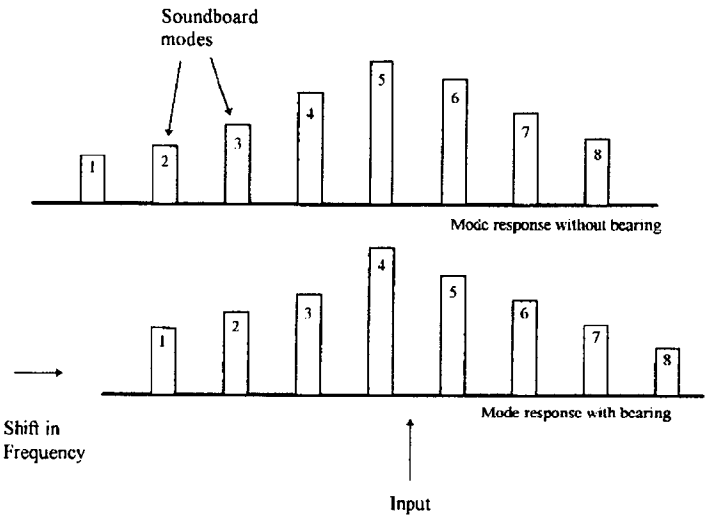
Downbearing and Soundboard Compression
Figure 1



The force of downbearing is transferred into compression of the soundboard. The soundboard crown allows for even and efficient distribution of forces in much the same way as an arch supports the load of a roof or bridge.

back and forth rapidly, and forcing the soundboard to bend in many places cause a lot of internal friction in the soundboard surface. This internal friction exists in all the modes. It is particularly troublesome in the higher modes. As mentioned in our discussion of damping, internal friction is similar to the cart having friction in its wheels; energy is lost in the system. The additional stiffness provided by downbearing can reduce this internal damping by making it possible for the soundboard to vibrate in lower-numbered, less restrictive modes. The increased stiffness of the soundboard will increase the response frequencies of the soundboard's modes. This means that, for any particular input frequency provided by the strings, lower-numbered modes become activated. (See Figure 2)

Frequency Shift of Soundboard Modes
Figure 2



As downbearing is increased the response frequencies of the modes increase. For any given input, lower numbered soundboard modes will be activated. In the upper graph of the modes before downbearing is applied, higher modes will be more active. In the lower graph, of the modes after bearing is applied, lower modes are most active.

The fact that the soundboard vibrates in a complex manner with numerous modes dividing the surface into many small sound sources provides an opportunity for external sound interference. Sound interference occurs in this situation because adjacent areas of the soundboards surface are vibrating in opposite phase. In addition, activation of higher modes makes for poorly spaced sound sources. The soundboard would be most efficient if it were to vibrate in its first mode only. Nature, however, will not allow this. Fortunately downbearing can, to some degree, change how the soundboard behaves. While the problems of external damping and internal damping are different, the solutions are the same. The soundboard will transmit vibrations more efficiently to the air, thus avoiding many sound interference problems when stiffened artificially with downbearing. As a result all of the frequencies of the soundboard's modes will increase. This means that the soundboard will have a tendency to vibrate in its lower modes, which are more efficient at producing sound.

Sustain And Volume

Stiffening the soundboard with downbearing can also affect the sustain and volume of the tone. Remembering the theory of impedance from Part One, we realize that stiffness is one of the factors controlling the amount of impedance. As we said, impedance is the measure of an object's ability to reflect vibrations. When there is more downbearing the soundboard will reflect more of the vibrations back into the strings. The vibrations in the strings will dissipate into the soundboard more slowly. Interestingly enough, this will result in a greater sustain in the sound we perceive. The opposite will happen if there is less bearing. The tone will be shorter. The other effects predicted by the theory of impedance will also hold true. The volume of sound we hear will decrease with more downbearing and increase with less bearing. Downbearing is not the only factor controlling the stiffness of the soundboard, other factors such as soundboard thickness, amount of crown, rib dimensions and the dimension and placement of bridges contribute to this property. These factors, while important, are not alterable during restringing or other minor rebuilding procedures. Downbearing adjustments, using a knowledge of the basic principles are relatively simple to make. Increasing the bearing will increase the sustain. The positive effects of downbearing on external and internal damping will increase the efficiency of the soundboard and compensate for the resultant loss of volume. If, on the other hand, sustain is not a problem and an increase of volume is needed, an easing off on downbearing is indicated.

Let's summarize some of the points made so far:

1. The effects suggested by the theory of impedance are such that, a) an increase in the downbearing will tend to produce a tone that is weaker but sustains longer, and b) decreasing the downbearing will tend to produce a louder but shorter tone.

2. The additional stiffness imparted to the soundboard by downbearing may increase the soundboard's efficiency in the higher frequencies, thus lessening the loss of volume and sustain due to internal damping in the soundboard.

3. Downbearing may improve the efficiency of the soundboard as a transmitter by helping the soundboard to respond in lower modes which minimize the effects of sound interference.

Experiment

The idea, often suggested, that the primary function of downbearing is to form a mechanical connection between the string and the bridge, is incorrect. This can be shown with the following experiment:

Lower the tension on all three strings of a lower treble note; E6 will do. Prepare a small piece of wood equalling the thickness required to eliminate the bearing on this note, and place it one the plate in front of the hitch pins. Use a thread or fine string stretched from the capo bar to the piece of wood to find the correct thickness. Place this block under the strings and retune the note. Be careful to respace the strings to the hammer. Listening to this note should reveal that removing downbearing from a single note has no consequence. Reposition one of the strings so it is lying on the bridge without passing around the bridge pins in the usual manner. Any firm blow from the hammer will cause this string to buzz on the bridge. Clearly, the side bearing provided by weaving the strings around the offset and angled bridge pins provides the necessary mechanical connection between the strings and the bridge.

The Noise Clinic — Part 2

By Ernie Juhn, RPT
Long Island-Nassau Chapter

The Polyester Groan

Some of the new, high-gloss polyester finished grands make "groaning" noises when the top is in the up position. The fly, which is resting on the back top, produces this so-called "polyester noise" when the open top is flexed. This flexing happens when the entire instrument shakes slightly as it is being played. Polishing the top of the piano with either a polish provided by the manufacturer or a solution of seven parts water and one part of Guardsman® furniture polish will provide enough lubrication to silence the noise. It might be of interest that my first encounter with this problem took place many years ago, with a famous German-made piano long before the Asian pianos became popular in the United States.

The Tenor Bridge Buzz

Quite often it happens that we come across a slight buzz in the tenor area of the piano. It almost sounds like an unglued bridge or rib, however nothing like that can be detected. We may try all kinds of tricks to pin down the problem and with some luck we can stop the noise by pushing down (with our finger) on the end of the long bridge. In almost every case that is a clear indication that the noise comes from the tapered down (unused) end of the bridge. First the explanation: when the bridge is glued down the clamps and/or screws do not cover this tapered down, unused end of the bridge. It is therefore possible that the bond between this part of the bridge and the soundboard is less than perfect. Now the simple, cheap, permanent, uncomplicated cure. Just apply a small amount of thin Hot Stuff® CA glue around the glue seam in this area. Do not use the Kick-It®. If your diagnosis was correct the noise will be gone in a few minutes. (At this point I have to state that I don't get commissions from the distributor of Hot Stuff®.)

Noises In Uprights

No article on the subject would be complete if it did not contain some of the classics. So here they are — some with a little twist. Yes, we should always tighten flange screws to eliminate clicks. But if you want to stay out of trouble, do ***not*** tighten the damper lever flange screws. After years of operation the damper felts fit the strings well. If you tighten the flanges, the dampers are moved out of their adopted position and they don't mute well. Besides, damper flanges are spring loaded and don't rattle to begin with.

Uprights on floors without carpets often rest on three casters only. The fourth one could rattle. Make sure that the piano rests firmly on all four casters. And yet — casters can still make noise. There is a kind which rotates on ball bearings. They are great for moving pianos around — but — they also can be the origin of noises. When these ball bearings become older they dry out and the little steel balls can vibrate very nicely. The cure is to pack the ball bearings with lubricating grease.

Squeaking pedals are easily taken care of if diagnosed properly. There is a kind of squeaky noise that comes from the pedal area but is not quite standard. It is caused by the head of the pedal prop rubbing against the pedal itself. The pedal prop head looks almost like a large inverted nail (See Figure 1).

Figure 1

Normally it is inserted from the bottom into one of the holes in the pedal. The pedal hole should be bushed. Often a punching is put on the prop head before it is inserted into the pedal. When this punching, or the bushing in the pedal wears out, metal rubs against metal and it makes noise. The cure is to rebush the hole in the pedal and put a punching over the pedal prop. Lubricating with VJ lube is a good idea, too.

Ornamental grill work in console music racks has been a classic source of vibrations for a long time. The simple cure is to spray the back of the offending grill work with clear lacquer. (Krylon® from a spray can will work quite well.)

A clicking noise when the sustain pedal is used may well be caused by the action being raised from the action "pivot" or bracket support bolt (See Figure 2). If the pedal rod is on the left (bass side), turning the bracket support bolt up or bending the action bracket bolt down will cure the problem. If, however, we are dealing with the rare case where the sustain pedal rod is on the treble side of the piano, the striking point of the hammers is quite critical. In that case it will be necessary to consider the hammer line when the adjustment is made.

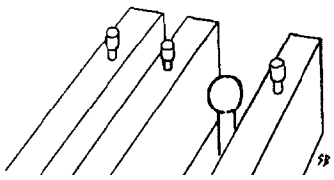


Figure 2

It's Not What You Think It Is ...

Noises can fool you. I always compare them to situations which we all have experienced with cars. Rattles or squeaks in cars often clearly seem to come from a certain area, but quite often we may be in for a surprise. With pianos that can be even worse. One experience which always comes to mind is a complaint about "vibrations all over the place." It turned out that the piano was in an exclusive home. The room had a brass ceiling. For those who are not familiar with brass ceilings, let me explain: it is a "suspended ceiling" except that instead of the fiber or foam which is usually used for that type of ceiling, they use brass plates. Naturally, the brass is resting on steel frames and produces a tremendous amount of vibration. The secret is to explain to the customer what the problem is. Fortunately, the room had rather large French doors and it was easy to move the piano into the adjacent room with a "normal" ceiling. Of course, the vibrations were gone. Luckily the customer understood and all was well.

Did you know that pictures, filaments in light bulbs, heater outlets and hundreds of similar items can cause sympathetic vibrations? Did you also know that almost inevitably people at first don't believe you when you blame these extraneous causes of noises. I once spent hours crawling inside walls of a large concert hall before I found a vibrating piece of aluminum (part

Continued on Next Page

The Noise Clinic — Part 2

Continued from Previous Page

of insulation). Of course the people blamed the piano. After all, the piano caused the vibrations....

Grand Lyre Noises

Some of the classic noises originate in the hinge area. The most common run-of-the-mill type is the kind which has the pedal pin rotate in a bushed dowel hole. Squeaking and grinding noises caused by the pin rubbing against the bushing can be easily eliminated by lubricating the pin with VJ lube or Lubriplate®. There is another noise which can be produced when the dowels dry out and consequently shrink, resulting in a loose fit which makes them move around in the mounting holes. The cure is to eliminate this looseness (by inserting a piece of string alongside the dowel) as well as up and down play (by shimming with small pieces of card stock) of these holding dowels.

While on grand pedals, let me point out another kind of problem which frequently happens to pedal rods which mount in rubber or neoprene cups in the pedals, go through bushed holes in the pedal rod guide and finally push up on the appropriate pedal function part. The pedal rod can produce a considerable amount of noise at three points: at the bottom in the neoprene or rubber cup (See Figure 3), in the bushed pedal rod guide area (See Figure 4), and at the contact point with the traplever. All these areas should be lubricated with VJ Lube® or Lubriplate®.

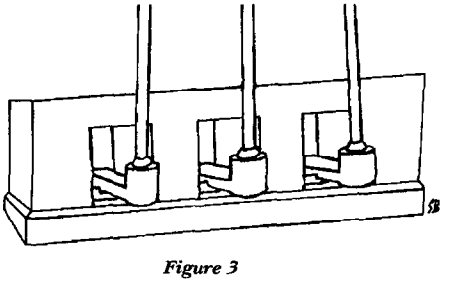


Figure 3

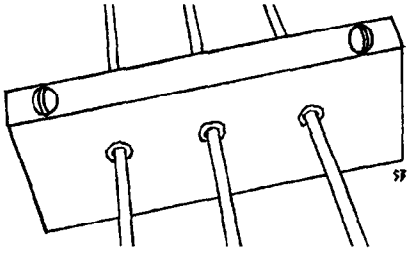


Figure 4

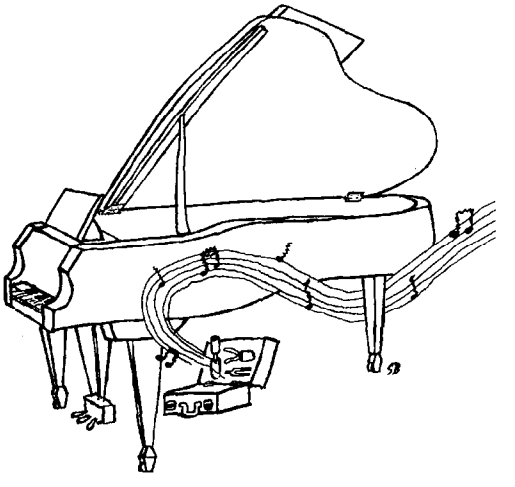
Lyre braces of all kinds can be the source of noisy disturbances. There is the wooden dowel type, the screw-on variety and the kind that folds back on its own hinge. No matter what the system, they can bother pianists to no end. Since there are so many different kinds, I will make the all-inclusive statement that they must be solidly attached to the lyre on one end and on the other end to the underside of the key bed or its extension. Look especially for sympathetic vibrations in the hinged metal kind and creaking noises coming from the wooden dowel type. It is not unusual for the screw-on type to rattle due to loose screws and of course, if the lyre braces are not solidly attached, the entire lyre may move and make noise.

Warning!

Do ***not*** bend all damper wires when you hear damper wires touching bass strings and producing a "zinging" noise. It often happens that we hear noises produced by damper wires touching or almost touching bass strings. If that happens, make sure that it is the case in the entire bass area. If so, it's likely that the damper guide rail is loose and has moved. The cure is simple. Loosen the screws which hold the damper guide rail, force the rail into the proper position and tighten the screws.

I often get calls from fellow technicians who ask me to help them find the cause of noises. I must say that even piano technicians often use terminology which does not describe problems appropriately and consequently makes it sometimes hard to know what they are talking about. Only recently I received a phone call from a colleague. He asked me for help. His problem was what he called a squeak coming from the white keys only. It was an upright piano and fairly new. When I asked about the squeak he described it as a squeak like from a mouse. He also told me that he did "all the standard things" to eliminate this type of noise, like lubricating the balance rail pins, etc. I wound up going to see the piano. I found that the noise did ***not*** sound like a squeak at all, it was a groaning noise, (mice produce high-pitched squeaks) and it came from the capstan dowel. The reason it did it only on the white keys was simply because the child who took lessons was a beginner and used white keys only.

I will close this installment with a funny but true "noise story." I was preparing a piano for a concert. Everything was going well and I was almost finished, when suddenly I heard a rather loud vibrating noise. It only did it on certain notes and seemed to come from under the piano. Obviously, I had to find it. I looked and searched. After quite some time I found it — it came from my own tool kit, which I had pushed under the piano in order for it to be out of the way of the stage people who were running around preparing things. Some of the loose tools like screw drivers, etc., were just barely touching each other and — vibrating, sympathetically, on certain notes only, from under the piano....



What's VJ Lube®?

VJ lube, named for its developer, piano technician extraordinaire Victor Jackson, is easily made in the kitchen. Start by melting about a half-cup of Vaseline in a double boiler. Next, stir in as much talcum powder as the liquified Vaseline will hold. Finally, add about a teaspoon of pure lanolin and stir the mixture thoroughly. Lanolin is available at your local pharmacy. Before the completed mixture has cooled, put it into 35 mm film cans for convenient storage and use in your tool kit.

Those who are "culinarily challenged" can find VJ lube in some of our supply company catalogs. VJ lube is useful for a variety of trapwork applications, in addition to the uses mentioned in this article.

—Steve Brady, RPT, Journal Editor

The Duplex Difference — Part 2

Dan Franklin
New York City Chapter

You may remember that the May issue contained an article which presented historical evidence supporting the belief that the duplex scale was an important feature of good piano tone and it is the tuner's task to tune it. My own personal experience strongly supports this point of view. However, in order to share this belief, I realized that some kind of objective proof would be invaluable.

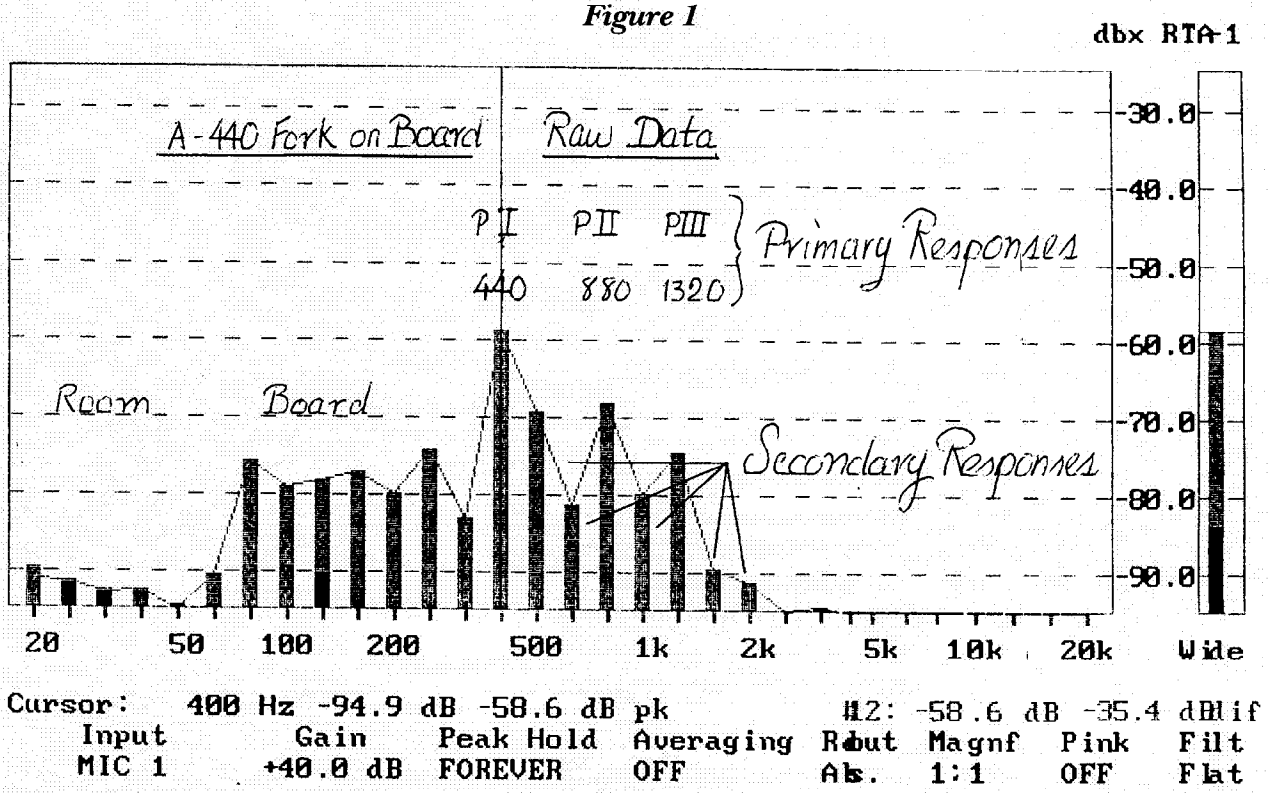
The material in this month's article is based on a field experiment that was made on a Steinway & Sons B, using an harmonic analyzer whose purpose was to isolate the elements of difference in a piano tone that could be attributed to the placement and tuning of the duplex scale. Actually, this was more a test than an experiment, and has limited scientific value. It was intended to be of practical value at the most, providing some tangible proof of difference that would verify my aural perceptions.

The Duplex Difference

There are three distinct intervals in the duplex scale of a Steinway & Sons tenor harmonic bridge. C40 is two octaves and a major sixth, C#41 through A49 is two octaves plus a perfect 5th, and A#50, B51 are triple octaves. These intervals are the Duplex Scale of the piano that C.F. Theodor Steinway designed, in the opinion of this writer. When the Duplex Scale Harmonic Bridge is placed at such a node that these consonant intervals are created, it is my belief that the tone of the piano is better acoustically than it is when the intervals are dissonant.

The test described below is an attempt to verify this opinion with objective evidence in the form of printouts of tone pictures taken of the sound of vari-

Figure 1



Testing the Tester:

In order to get an idea of what we're dealing with, we tried the analyzer out with a tuning fork.

The signal was too weak when hand held so we placed the fork on the sound board. Figure #1 shows what the analyzer heard:

It may be helpful to take a look at a few details in this tone picture:

1. The responses are uneven, some higher than their neighbors, some lower. It will be convenient for purposes of this analysis to call the higher ones primary responses and the lower ones secondary responses. This is appropriate to the function of the analyzer because the primary responses are the ones whose filter centers are closest to the input signal frequency; the secondary responses "hear" the signal from farther away.

For example: the signal of the A-440 fork, which is marked with a vertical cursor line, activates the 400 filter center and makes that the primary response as it is the closest center in terms of cycles per second to the fork. The secondary response to the right on the 500 filter "hears" the 440 signal from 60 cycles away and is therefore higher than the secondary response to the left of 400, which is 315 Hz and is 125 cycles away from the fork.

2. There are a number of responses to the left of A-440, lower in pitch than the fork. These responses are part of the tone picture, but are not part of the analysis because we frankly have no idea what they

ous piano tones with the duplex scale in two contrasting modes: dissonant and consonant. The purpose of the test was to discover the identity of the element or elements of piano tone that the duplex scale was designed to improve.

We began the test believing that the duplex scale could be tuned, and when tuned made a perceptible difference of the kind described by Helmholtz, C.F.T. Steinway, Liszt, et al, in their letters, testimonials and patent text. A number of duplex tuning jobs for artists and recording studios reinforced the conviction.

The Element of Measure

The test results are a series of printouts of the tone pictures of certain tones that were snapped before and after the duplex was tuned. We will attempt to pinpoint three elements of the tone pictures that reveal a difference. These elements consist of various interpretations of the data of an harmonic spectrum analyzer. The data consists of printouts of sounds received and analyzed in terms of their frequency and decibel intensity. By comparing data taken before the duplex scale was tuned with data taken after the duplex was tuned, it is our hope to be able to identify changes that can be attributable to the duplex tuning procedure.

Our analyzer is capable of describing sound in two terms, pitch and intensity; therefore, what we are looking for are significant differences in the tone picture based on changes in the pitch and the decibel intensity. As far as the quality of sound is concerned, the analyzer can only tell us about the frequency aspect of the sound. It breaks down the spectrum of an input signal into component frequency bands with a specific frequency range from 20 Hz to 20,000 Hz. These filter centers are as follows: 20, 40, 50, 63, 80, 100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1K, 1.25K, 1.6K, 2K, 2.5K, 3K, 3.15K 4K, 5K, 10K, 20K. The range of our test is principally from C40 to C88, 261 cps to 4K. We are looking for changes in the tone picture within these limits based on the differences of sound components and their intensity.

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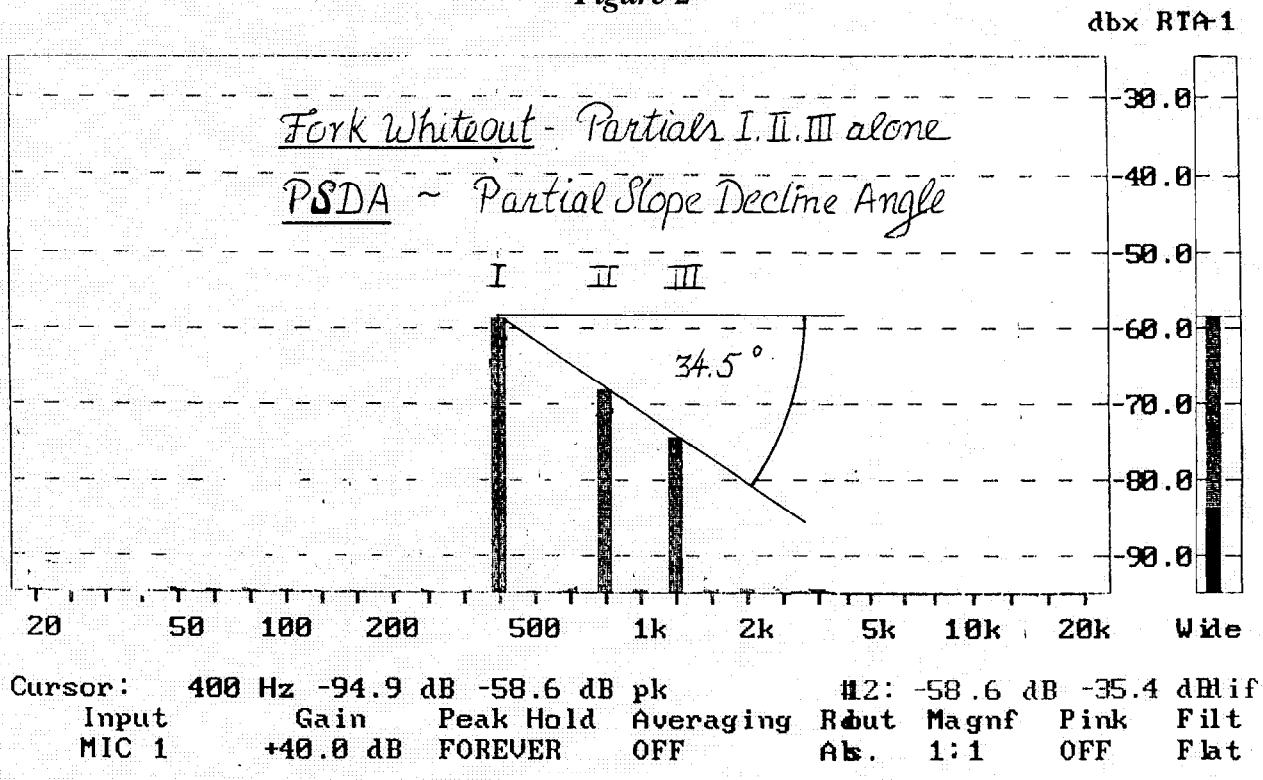
Figure 2



are. Our best guess in the lower group is room noise, as this pattern appears when no input signal occurs; and the second group in this printout is probably response to the sound of the fork on the board.

3. If we remove some the the brush, so to speak, and take a look at the primary responses by themselves, as in Figure #2, we will notice the relation between the primary responses in terms of their decibel intensity. Referring to the numbers on the right, which are in negative numbers, we will notice peak #2 which is approximately 10 decibels lower than peak #1. Peak #3 appears about four decibels lower than peak #2. It should be noted that these three peaks correspond to the first three partials of A-440, namely, the fundamental, Partial II at 880, and Partial III at 1320. The primary response of peak #2 is on the 800 filter, which is closest to 880, and the primary response of peak #4 is on the 1.25K filter which is closest to 1320.

Based on this analysis, it is possible to describe the tone of the fork as heard by the analyzer by a line or lines from peak to peak, and by an angle created by these lines with a horizontal line drawn across the peak of the fundamental. This will be the basis of our discussion. We will attempt to point out the differences in these elements that occur due to the tuning of the duplex scale. We will notice that the line from peak #1 through peak #2 to peak #3 is virtually a straight line. We will also note that the angle of decline of the peaks is approximately 33 degrees.

The Duplex Difference — Part 2

Continued from Previous Page

Three Differences

We will compare the data using three arbitrary, analytical strategies:

1 - The dominance of the fundamental.
2 - The total Partial tone picture of a piano tone.
3 - The relative intensity of Partials III through VI.

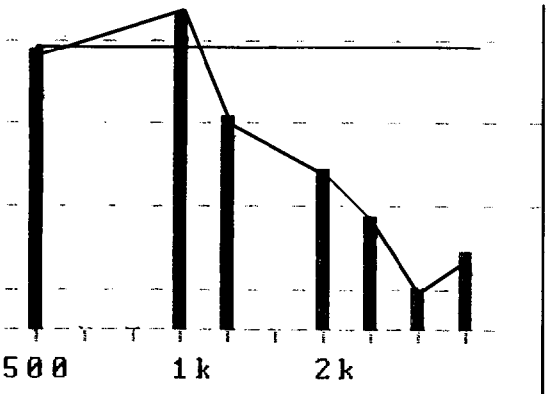
I — Dominance of the Fundamental

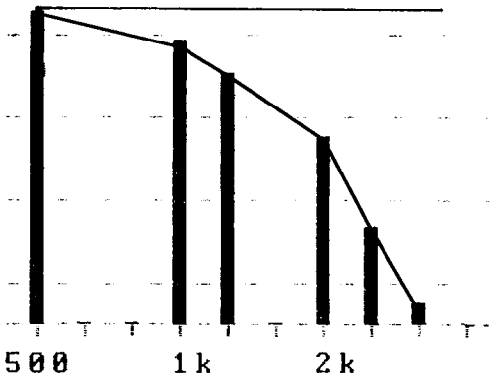
Dominance of the fundamental is universally considered to be one of the primarily desirable attributes of piano tone. Partial I, the fundamental, is distinguished from all other partials in at least one regard: the fundamental defines the pitch of the musical note being played. All upper partials determine characteristics of color, quality and purity. I believe it would be fair to say the musicians, physicists and the listening public generally agree that perception of the fundamental

See Text on Page 39 and 41

Before Tuning & Placement — *A# 50* — *After Tuning & Placement*

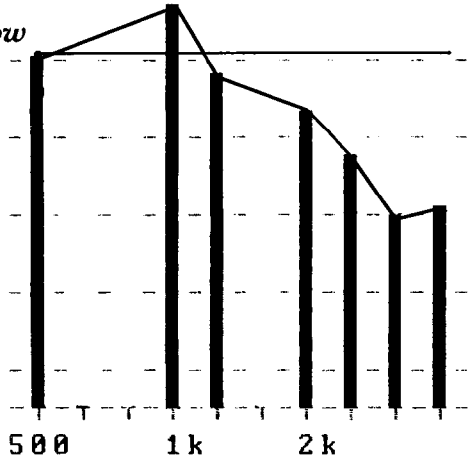
Soft Blow

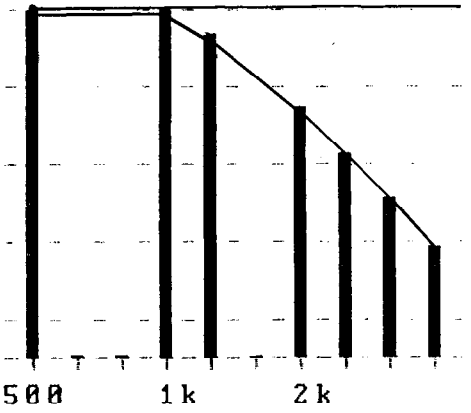




Soft Blow

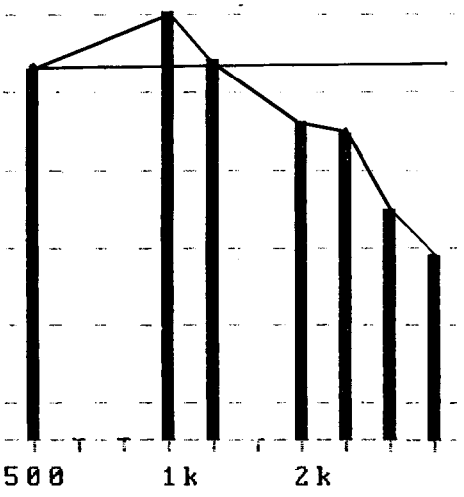
Medium Blow

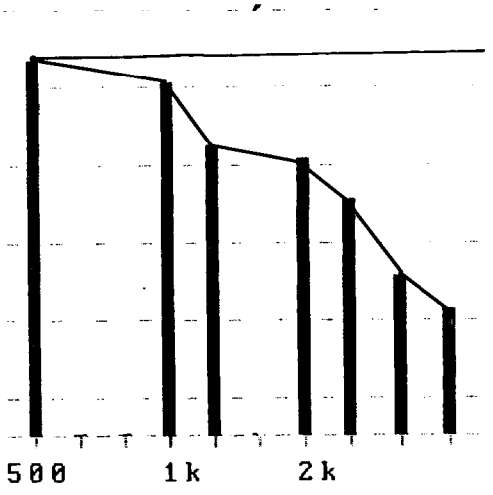




Medium Blow

Sharp Blow





Sharp Blow

pitch is critical to musical satisfaction.

In studying the effect of tuning the duplex scale we may find it helpful to compare samples of the same tone at three different blow intensities before and after the "harmonic bridge" (a bit more refined a term than 'push-plate') was adjusted. In the before samples the pitch of A#50 was two octaves and a major seventh. We moved the duplex bridge to yield three octaves in the after samples.

This small chart will serve as a rough (very rough) guide as to the identity of the partials as they appear on the various filter centers as responses:

Partial	Theoretical Partial Frequency	Filter Center
I	466	500
II	932	1k
III	1398	1250
IV	1864	2k
V	2330	2.5k
VI	2796	?
VII	3262	?

To facilitate our visual study of the printouts we have whited out of the original, 1) room noise, 2) secondary filter responses, and 3) responses above the 7th partial. One should bear in mind that the wideness of the filter response centers is greater than any possible inharmonicity differential between the theoretical pitch of these partials and the pitch of the response. With these factors in mind, let us analyze the printouts horizontally (Before and After Tuning and Placement) and secondly, vertically, according to increasing blow intensity.

Horizontally, in each pair of A#50 BTP and ATP, we notice that PII is higher than PI in the BTP samples, and either equal to or lower than PI in the ATP samples. This indiciates that according to our analyzer the tuning procedure has increased the dominance of the fundamental by specific decibel amounts mathematically deriveable by subtraction.

Vertically, we notice an increase of middle partials against the fundamental BTP. In Sharp Blow, BTP PIII equals PI. In the ATP samples a fairly regular slope decline of the responses indicates a consistency of tone regardless of the intensity of the blow.

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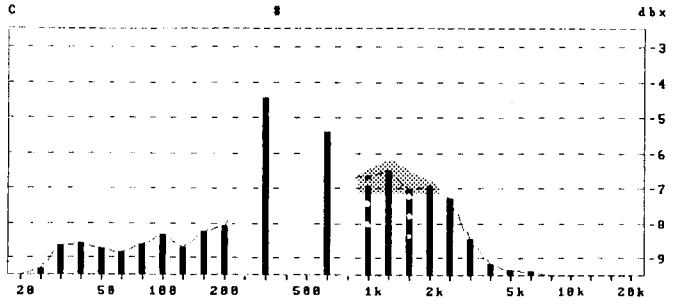
See Text on Page 41

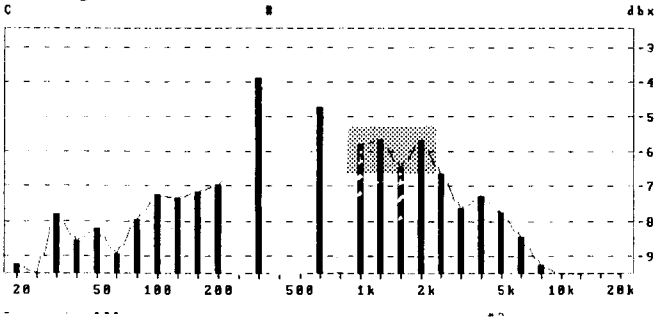
f 45

Before Tuning & Placement

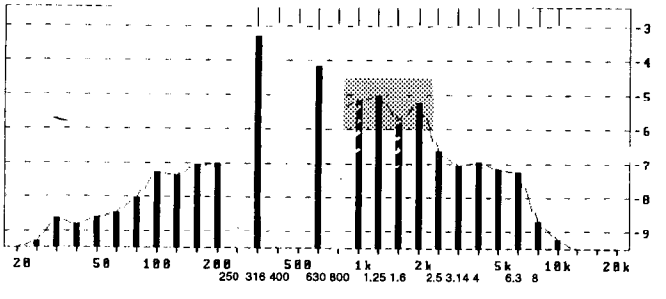
pianissimo



mezzoforte

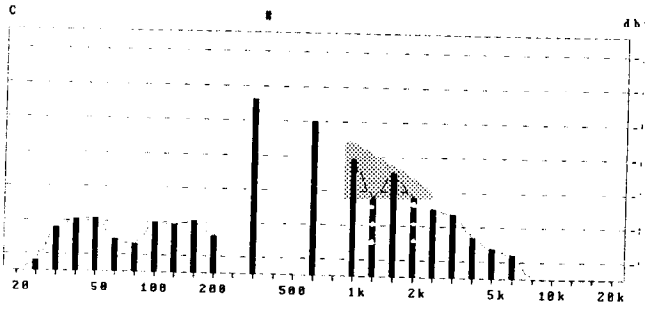


forte

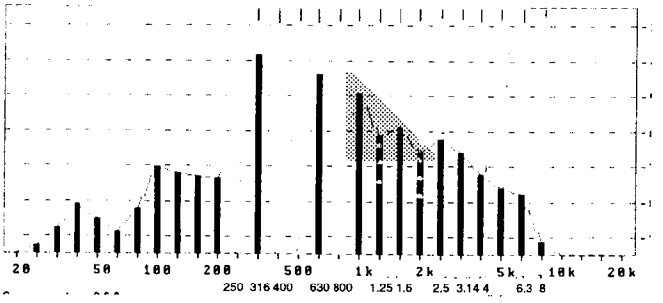


After Tuning & Placement

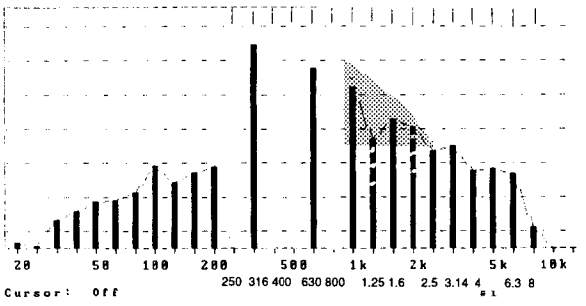
pianissimo



mezzoforte



forte



The Duplex Difference — Part 2

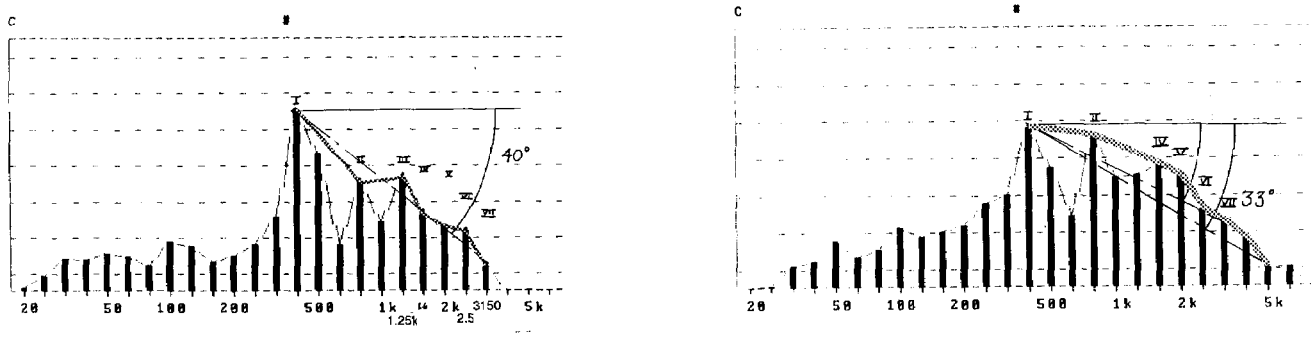
Continued from Previous Page

II — Total Partial Tone Picture

For this study we have chosen three pairs of before and after samples, one from each of three notes: A 49, A# 50, and C 52. While it is possible to go into great detail comparing these printouts, we will confine our study to one observation per pair which support the position that tuning of the duplex scale makes a difference.

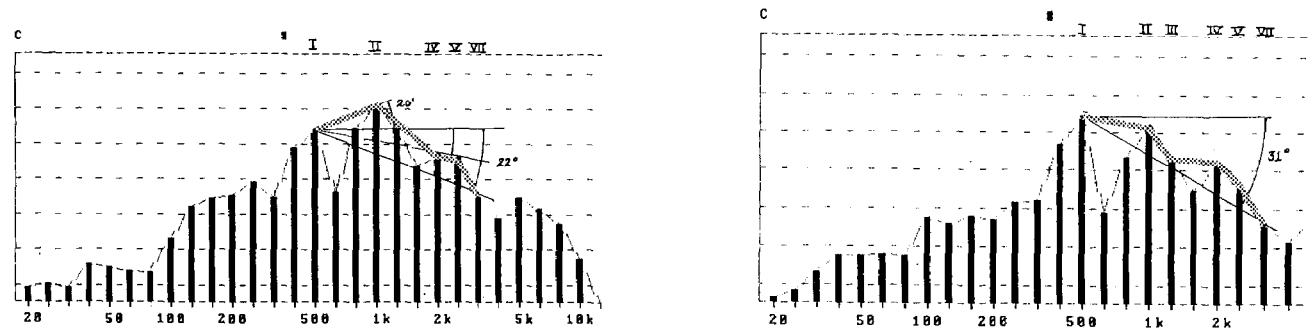
Before Tuning & Placement ***After Tuning & Placement***

A 49



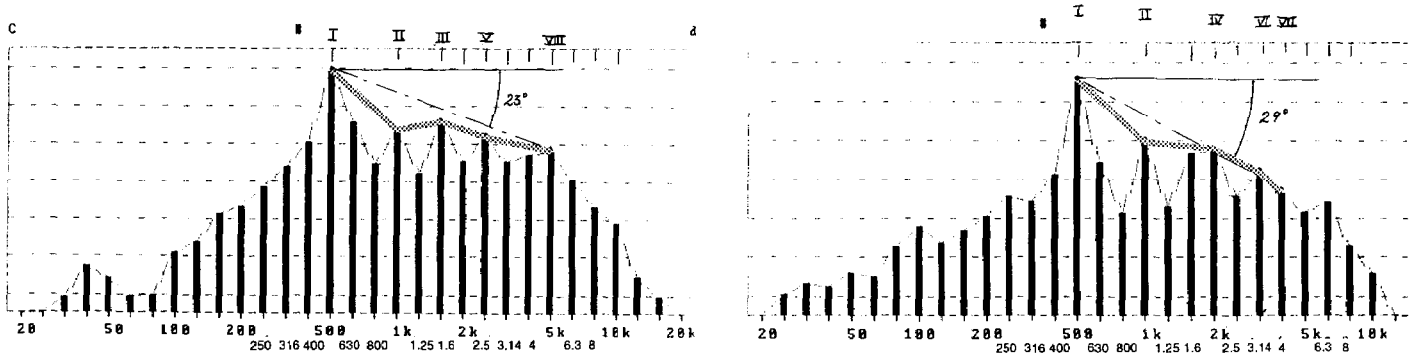
The peak-to-peak line drawn in the BPT samples is much more erratic than in the APT samples. In a word, it's a bumpy ride down the slope BPT, and a smooth ride APT down a 33-degree slope just about like the fork.

A# 50



A#50 BPT is a roller coaster with Partial II dominance and a cliff at the bottom; contrasting with this is a beautiful 31-degree "schuss" APT.

C 52



BPT the ride is flat from Partial II and goes nowhere; APT the ride has one bump and is otherwise a fairly smooth trip down a 29-degree slope.

The printouts of A#50 (on Page 38) compare the tone picture of the note before and after the duplex scale was tuned. In the before phase, called BTP (Before Tuning and Placement), the duplex scale of A#50 was two octaves and a major seventh. After the procedure, ATP, the duplex scale tone of this note became three octaves.

The most palpable difference appears to be the radical lowering of Partial II, the octave in the ATP sample. This indicates that the tuning of the duplex scale appears to have contributed to the dominance of the fundamental in this instance.

Another related difference may be noted by comparing the three BTP samples with one another to observe the effect of blow force on the dominance of the fundamental. In the BTP samples, the harder the blow the weaker the fundamental in relation to Partial II. In the ATP samples, Partial I maintains dominance to a greater or lesser degree.

III — Relative Intensity of Middle Partials

Note F45 (on Page 39) shows an interesting change in the tone picture in the inner partials. A shaded outline around these partials indicates the difference between the BTP and the ATP samples by the shape of the outline. In the BTP samples, the peak primary responses appear to be on the filters corresponding to the 4th and 6th partial. In the ATP samples the peak primary responses appear to be on the filters closest to the 3rd and 5th partials.

Another observation may be made regarding the intensity of the partials in relation to each other within the same printout. The decibel difference between peaks in the BTP samples is five or less decibels, and in the case of the mf blow appear to be the same. In the ATP samples there is a noticeable intensity drop similar to the decline in the peak responses of the A-440 fork.

Summary

How do you evaluate a difference if you don't know if more is better than less? Some of our data indicates more is better, other elements indicate less is better. To summarize, we have to stick to the bottom line, which is the difference itself: what and how much of it is actually in our printouts. Only future tests can evaluate the difference more substantially.

I find that there are three differences:

1. In the case of certain notes where the second partial appears stronger than the first, tuning the duplex seems to have reversed the intensity making the fundamental dominant.

2. Certain inner partials are apparently affected by tuning the duplex in such a way as to create a more even slope decline of their intensity as their frequency increases.

3. There is a decided movement in the partial slope decline angle of a note tuned by the duplex toward the angle of partial slope decline produced by a tuning fork-on-board signal.

My summary must conclude with a challenge. It has taken about 125 years for some of us to believe that the duplex makes a difference; will it take another 125 years to find out what this difference is worth? PTJ

Industry News

Geneva International Expands Tech Services, Names Vincent Director

Geneva International Corp. recently announced a major expansion of its Dealer Support and Technical Services Division. In conjunction with this move, the company has hired piano technology specialist Alan Vincent, a 20-year industry veteran who has worked for Baldwin and Young Chang, to serve as head of the expanded department.

In his new position as director of technical services for Geneva International, Vincent will be responsible for overseeing warranty work and developing technical support and education programs for piano technicians and dealers.

The expansion of Geneva's technical support capabilities is part of the company's support for Petrof and Weinbach dealers and consumers during this period of rapid growth. In each of the past two years, sales of Petrof pianos have increased by 40 percent.

Vincent, who has held the post of technical services department manager at Baldwin, and most recently was the production supervisor of Baldwin's Chickering Grand Piano Division, was selected by Geneva International for both his technical skills and extensive background working with technicians and dealers. A native of Memphis, Vincent studied piano technology at the University of Tennessee, before going to work as a technician and piano rebuilder for several keyboard dealers. He later served as head of technical services at both Baldwin and Young Chang.

To communicate with technicians, Vincent will conduct seminars at Piano Technicians Guild meetings across the country. "I'll be giving PTG members technical information about pianos in general and Petrof in particular," he said. "This way, I can familiarize them with the differences in quality."

Another of Vincent's responsibilities will be to administer the handling of warranty work on Petrof Pianos. His goal here is to make sure that the pianos, which carry a 10-year warranty, are serviced as promptly as possible by qualified technicians. To facilitate swift service, Vincent plans to develop a new inventory system for replacement parts.

For more information on Petrof Pianos and its expanded technical service program call Geneva International at 1-800-533-2388, or fax 708-520-9593. PTJ

New England Classic Piano Restoration Opens New Facility in Manchester

New England Classic Piano Restorations recently announced the opening of its high quality remanufacturing facility in Manchester, New Hampshire.

The company specializes in partial and total remanufacturing of high quality grand pianos, including Steinway & Sons and Mason & Hamlin.

"We saw a desperate need for consumers to be confident in trusting their instruments to a restoration facility that is committed to the optimum level of each individual instrument's design intent and performance capability for a reasonable and fair price," said President Peter Mohr.

Mr. Mohr was most recently vice president of manufacturing for Mason & Hamlin, and also held various positions at Steinway & Sons in New York over a 13-year period.

In addition to remanufacturing pianos for private consumers, New England Classic Piano Restorations sells instruments to the public that they have purchased and completely remanufactured. PTJ

Behold the Upright ... From the Ground Up

By Don Valley, RPT

AHHH! At last! Now we get to the action. We are now at that point in our ascent from the bottom up in the upright. In the way of introductory observations, I have found many instances of work performed on the action when other areas in the piano were left defeating the results of good action work. Whether or not it is more pleasurable to work on action detail is not mine to judge. However, it appears that many believe this area to be the only one needing attention. I would compare it once again to the automobile mechanic who is only interested in the exceptional performance of the engine, disregarding the wear and tear of the other working areas such as wheels, transmission, and body.

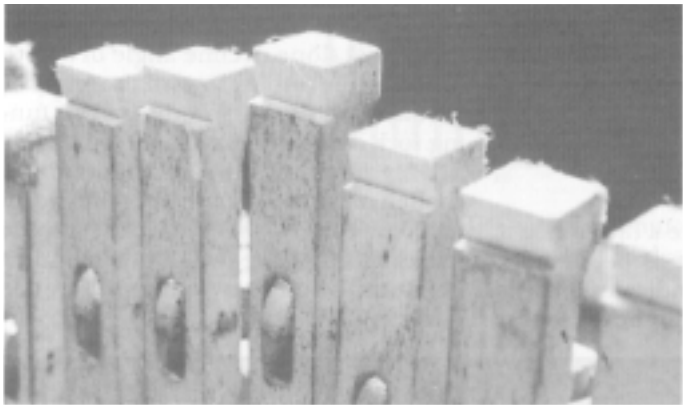


Photo 1

As a matter of integrity, one area restored to a point of excellence when different areas are unattended provides only an experience for the technician at the expense of the client as well as the total performance of the piano. One would not redecorate the interior of the home while ignoring a leaking roof. This is all said to bring back focus in our perception of the value of the work performed on this upright piano.

Later on toward the end of the series, the other versions of the "vertical" piano may be examined as to significant similarities and differences. For the purpose at hand, the full-sized upright will be the subject of these articles.

In repairing the action, the same direction will be taken — from the bottom up. Assuming the complete action will be rebuilt, the first procedure is to take note of any idiosyncrasies and write them somewhere. For each piano I rebuild I make a file folder in which I keep any information on the piano that I might need for later reference. Even if I think I can remember, I write it down anyway. Also, a detailed checklist of repair tasks is helpful in keeping organization in the process of all extensive repair jobs.

Disassembly

This is the beginning of rebuilding the action. We want to get right down to the framework so as to prepare it for reassembly. That means taking every item, one-by-one, off the action rails leaving only the rails attached to the action brackets.

First Off: The wippen & sticker

Prior to removing the wippens and stickers, take a sample bridle strap to keep for future reference. Another point to remember is to keep the action screws in order so they are returned to the same place. There are a number of ways to do this. Two suggestions are: 1) Set them in strips of masking tape, section by section, numbering the first and last screw position of each section. 2) Drill holes in narrow pieces of wood, such as yardsticks (similar to pegboard, but closer together). Also, remember to number each part you remove from the action. Put the number in a place where it will survive cleaning in your sand or bead blaster. When it is clean I like to stamp numbers back on the like-new wood parts.

Now that you have taken a sample bridle strap, just cut the rest of the straps and the wippen will drop. Starting with the lowest bass wippen, remove the sticker flange screw and the wippen flange screw, placing them in your screw retainer. Place the removed action part in position on whatever kind of holding device you have, and go on to number two. Continue until all of this type are off the rails.

Next, remove the regulating rail (or rails, as some are in sections). Now you can easily get to the hammer butt flange screws. In the same order, from the lowest bass, remove these and place them in or on your holder to await improvement.

The dampers are removed last because, with all other parts removed, there is no obstruction for getting at the flange screws. These dampers are removed, numbered, and stored just as other lines of action parts.

One more item to be removed now is the damper lifter rod. This is mounted in similar fashion to the hammer rest rail; all but one of the "L-hooks" are aimed in the same direction. By removing the brass retainer of the one in the opposite direction, you are now able to rock the rail while pulling the L-hooks from their bushings and removing the rod.

Now we are down to just the action rail (or rails), and the action brackets. If there is no major repair to be done, proceed with cleaning the wood by sand or bead blasting. Then check the action brackets for appearance. I have encountered the action brackets in such condition as to need only cleaning; then, on the other end of the spectrum, those needing blasting, buffing, and plating. When only basic cleaning, I recommend removing and cleaning and rebushing one at a time. Thus the

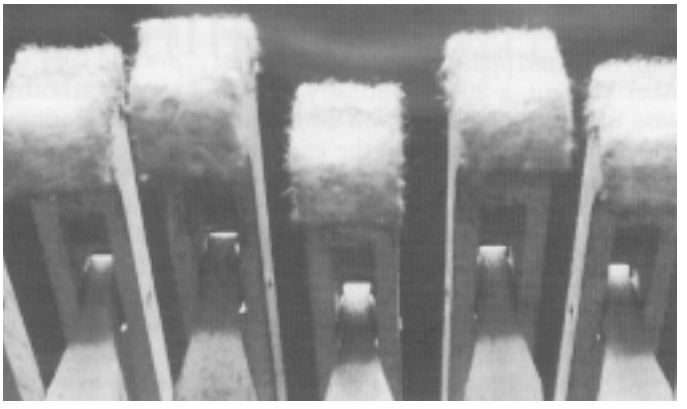


Photo 2

order and proper measurement are maintained.

Bead or sand blasting is the first step in attacking any piano part. At this point I will presume the cleaning of all the wippens is

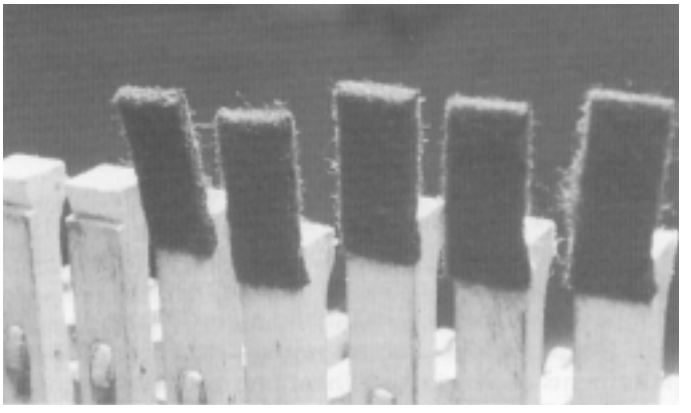


Photo 3

finished. The next step is to get any granules of sand or beads out of the pivoting areas of any part that moves — mainly the flanges. We use a fine stream of air forced into the bird's eye area while rotating the flange and working it on the pin from side to side. Your touch sensitivity will let you know when there is still even just one grain rolling around in there.

Following the above process for each action center of the wippen and sticker, it is advisable to lubricate these centers. Take care to apply just enough lubricant to achieve free movement. A hypodermic needle is extremely helpful here because most bushings are over-soaked if issued a full drop of lubricant. The overflow so often seen and thought to be good can cause swelling of wood fibers and, therefore, defeat your purpose. There are a number of fine bushing lubes available from your supply houses. Besides those, a number of "magic solutions" are talked about among your colleagues. Nevertheless, I prefer to use those tried and proven chemically proper lubes because sometimes that initial "quick fix" does not retain the effect that was so impressive on first trial. I prefer to stay away from any product using silicone at all costs because of the creeping characteristic of this liquid.

Spoons will often become corroded over the years and will show the effects of some of the chemicals and dyes used in the cloth-making process and the glues used to adhere them. The spoon must be very smooth. Take each one and apply it to one of your polishing wheels. If you use a compound, make sure it is extremely fine, not making abrasion lines in the spoon surface. Buff them with a soft cloth to remove any compound and then spray them with a good dry lube. You will love the effect.

Now you are ready to reattach the wippens to the action rails. Starting with #88 and working down to #1 will, in most instances, keep you from having to work as many screws around the shafts of the spoons.

With the wippens all attached and with the aid of some type of vise, clamp the action up-side-down so the stickers stand upside-down in a vertical position. (See Photo 1) Now you are going to replace the sticker-base felts. You probably noticed the hard-packed dimpled condition of the old cloth, which got into that condition by the repeated impact of the capstan. (See Photo 2) This is one of the big culprits when you are trying to identify all that rattle, knock, and click of the unrestored action.

If you have not done so up to this point, take that sample of sticker cloth you kept from tearing down the old action and set up your cutter tools to duplicate the exact size for replacement. With these felt cloth replacements ready to go, this procedure is usually a two-step process. Most of

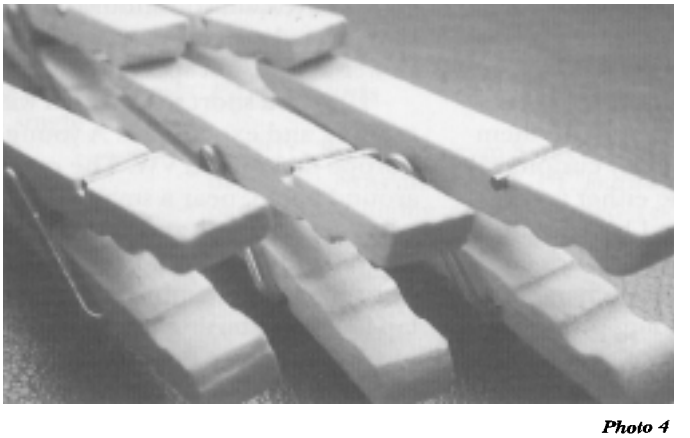


Photo 4

the stickers have cloth that is wrapped around the base with the glue applied to the front and back, not on the striking surface. The reason for this is to prevent noise from hardened glue in that cloth seeping down toward the capstan and then hardening.

The first step is to glue the cloth pieces at one of the ends and place them properly onto the sticker. (See Photo 3) Allow the glued cloth to dry thoroughly before wrapping it to the other side for gluing there. The reason to let this dry is the tension needed for securing the entire piece of cloth firmly onto the sticker. In some instances, extra cushions of thin cloth or felt are on the bottom of the sticker covered over by this piece of cloth you have just installed. Again, the reason is to reduce the noise factor as much as possible. Be sure to replace these items in your repair as the difference is worth the effort. In fact, it is not a bad idea to do the same to those actions without this cushion. I attend thoroughly to this detail because it is the combination of this point and the key returning to the back-rail cloth that produces much of the "key rattle" we so frequently encounter with the upright piano.

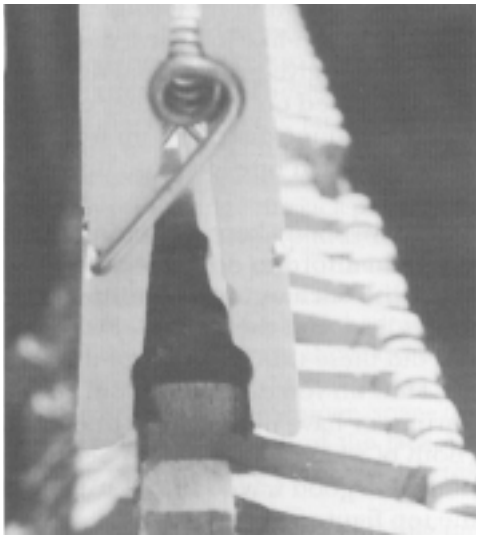


Photo 5

As to the technique of gluing this sticker felt firmly, I suggest some very inexpensive clamps easily created for just this purpose: these are called "clothes pins" in standard household terminology. These are needed for gluing the second end after the first one has dried. These should be of wood, not plastic, as it is best to flatten the rounded clamping surface (See Photo 4) a little to provide a more evenly and completely glued surface. (See Photo 5)

The wippen base cloth is now replaced. With this accomplished, next time we will move up to the wippen and replacing its parts as needed, making it like new again.

Pricing Guidelines — Determining Rates

By W.R. "Dick" Sullivan, RPT
Charlotte, N.C.

How about some ideas on a subject that has seemed almost taboo in my 26 years of Guild membership? Here are some methods for pricing that I have been using during these 26 years. So; without mentioning dollar amounts, here goes....

First of all, I learned in the beginning that you have to charge enough to do a good job. How many times have you tried to give someone a break in price — for whatever reason — and as the job progresses, things kept coming up that extended the time of the job? So you tend to hurry the job, or eliminate things that should be done, and you wind up losing money or doing less than a fine, craftsman-like job. Give discounts after the job is finished. Or give professional discounts — usually to teachers based on the number of students for whom you tune, or volume discounts up front — based on two or more pianos in one location, tuned two or more times per year.

I have always kept my tuning fee up to the nubs. That way I can afford to do a few extra things for my tuning fee. I dislike charging an additional $2, $3 or $5 for extra things here and there. But let your customers know that you did these things as part of the regular fee.

How do you determine your tuning fee when you are starting or have moved from one location to another? (Both of which I have done.) Setting your fee in the mid-range is a good way to start. I usually based my fee toward the top figure.

As for raising your tuning fees — about every 18 months I examine the cost of living increase in my area. (And I have never seen it go down!) That usually means an increase of 5 percent to 8 percent in 18 months. Then I will add 2 percent or 3 percent for an increase in skills. From these figures I will raise my fees in the next six months — based on the 18-month end figures.

My customers learn of an increase when I give them my next invoice. (An invoice is given to every customer!) I see no point in announcing an increase either verbally or by mail. In 23 years of full-time service I have found only about 20 percent of my customers ever notice an increase. And I have lost only a very few customers who want to look for a lesser fee. If you are doing prompt and reliable work at a fair and competitive price, you should have no problems. Most people understand inflation. So, just say that you are following these trends.

One final word on your tuning fee, remember that it must include the actual tuning times — usually within an hour, travel time to and from the appointment, and phone time, or if you work on a reminder basis (written method), include that time.

When it comes to longer jobs, restringing, new hammers, action regulation, etc., I will make a written contract with the customer and receive an amount equal to the cost of materials and 50 percent of the labor charges. This keeps my suppliers happy and gives me some cash flow until the work is completed. The balance of the contract is due then. Keep the contract simple and explain it verbally to the customer. How many of you remember when the RPT exam had a fourth part — verbal? Not a bad idea. I always schedule three follow-up appointments on restringing, hammer installation and action work. These appointments must be included — pricewise — in your contract. When I have estimated the contract price, I always add 15 percent to the final labor charges. This covers additional work and/or problems which invariably come up.

Now, what to charge for labor for this more extended work. You must have an idea of how many hours it will take you to do each procedure. In the beginning of my career I was fortunate enough to train in the shops of Leonard Hanitchak and Wendell Eaton, where I learned pianos from the inside out. This was under the old apprenticeship system. I was not paid for my work — Lenny and Wendell were. But, neither was I charged to work and learn in their shops! It seems these situations are increasingly hard to find.

From this type of work you gain experience, skills and an idea of the time or number of hours required for each procedure. And by this record of work, I mean steady, hourly work, with maybe a five minute break per hour, I charge an hourly rate which is 85 percent of my tuning fee.

One final word on tuning fees. When you have passed your RPT exam, you should charge appropriately. You have passed a rigorous exam and are worth it. You will be slower at first, but speed will come with experience.

Here is a short story which will illustrate the value to training and experience. A young couple was touring Europe in a rented VW. The car broke down one evening around 5 p.m. near a small town. They managed to push it to a local garage and asked the mechanic to look at it. He did and then went back to the garage and returned with a ball peen hammer. He went tap-tap, tap-tap and tap-tap. "Try starting it," he said. They did, and it started nicely. They were delighted and said, "That's wonderful! How much do we owe you?" "$85," he said. "That seems a little high. What's the breakdown on that?" "For labor, $15, for knowing where to tap, $70." That's how experience pays off.

PACE

Professionals Advance through Continuing Education

LESSON PLAN

Technical Lesson #24

Grand Regulation - Part 5: Jack Centering, Wippen Spacing & Backcheck Alignment

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 cover centering the jacks in the repetition lever "windows"; proper alignment of the wippens to the knuckles, capstans, and let-off buttons; and alignment of the backchecks to the hammer tails.

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

To teach this lesson in a hands-on format, you will need one or more grand pianos in good condition. New or almost new pianos on a showroom floor are ideal. Hammer to string spacing, and key squaring and spacing should have already been done.

Several adjustments are covered here, so to keep the lesson time within practical limits I suggest each participant perform the adjustments on only a few notes. This lesson may consist of participants working individually on separate pianos, or taking turns observing and adjusting on a single instrument.

Estimated Lesson Time

2 hours.

Tools & Materials Participants Must Bring

For this lesson, participants should bring the following:

- short straightedge
- parallel jaw pliers
- small hammer
- wire bending pliers
- flange screwdriver
- small flat-blade screwdriver
- travel paper (220-grit sandpaper, and brown gummed paper package tape, cut into 1/8" wide strips)

Assigned Prior Reading for Participants

PTG Technical Exam Source Book, page II.1; November 1993 PT *Journal*, page 32. A highly recommended resource is Yamaha's video & book set, *Grand Regulation in 37 Steps*, available from Schaff Piano Supply and Yamaha Corporation.

General Instructions

In our regulation steps so far, the hammers have been traveled, aligned, and spaced to the unison strings, and the keys have been squared, spaced, and leveled. Hammer spacing changed knuckle positions as the shanks were moved sideways. And capstans and backchecks were moved as a result of squaring and spacing the keys. Thus, only after those steps are done can the wippens be spaced to the knuckles and capstans, and the backchecks aligned to the hammer tails. Before spacing the wippens, it is a good idea to inspect for any jacks that are off-center in the repetition levers.

Centering the Jacks

Ideally, all jacks should be centered side-to-side in the repetition lever slots, or "windows." Personally, I don't feel it necessary or advisable to make a correction unless a jack is quite far off-center. In prepping a typical new piano, one might only attend to those jacks that are so far off they are likely to rub against the side of the window. There are two possibilities here: either the jack is tilted to one side, or the repetition lever is angled to one side. In either case, the usual remedy is to change the jack position by bending the jack centerpin, as described next, to center the jack in the window. However, in some cases the repetition lever is obviously at fault. Sight down the side of the wippen from above to check. If the repetition lever is clearly not parallel to the body of the wippen, space the repetition lever instead of the jack, using the same method as for spacing the jack.

Photo 1 & Figure 1 – Centering the Jacks: Stand all hammershanks up and note any poorly centered jacks. The correction is done by bending the jack centerpin as shown in Figure 1. Support the side of the wippen fork (the part containing the jack centerpin bushing) toward which you want the jack to move. Some technicians make or purchase a small metal block that sits on the keys and supports the wippen in place. Lacking that, remove the wippen and support one side of the fork on a solid, square metal edge. Photo 1 shows the metal hammer rail being used to support the bass side of the wippen fork, because the jack needs to be spaced toward the bass.

Next, tap the jack top with a small, smooth-faced hammer. This will bend the supported side of the jack centerpin, causing the jack to tilt to that side. Two

Continued on Next Page

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cautions are in order: First, tap very gently at first, gradually increasing the force until the jack finally moves. This will avoid moving the jack too far and having to space it back the other way. Second, tap squarely on top of the jack, not on an edge or corner, to avoid deforming the jack top.

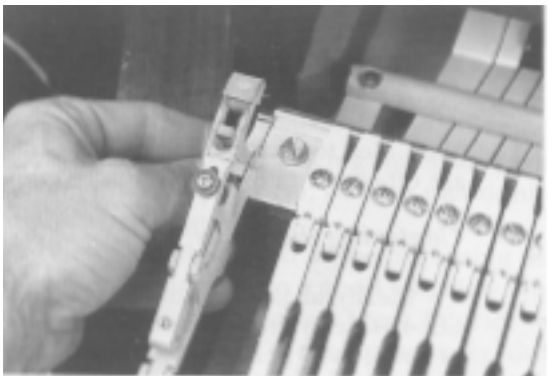

Photo 1

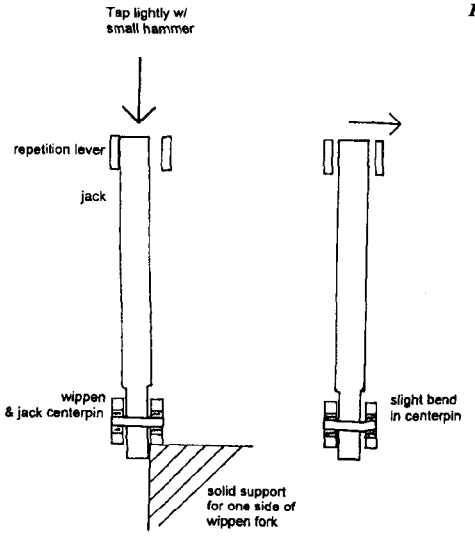

Figure 1: Centering a jack side-to-side in the repetition lever

Wippen Spacing

Wippens are spaced to satisfy three main criteria. In order of importance these are:

■ Centering the repetition levers under the knuckles — most important because this point has the most sliding friction, and because clearance between neighboring action parts is minimal here. Always center the repetition levers to the knuckles as well as possible.

■ Centering the capstan cushions over the wippens — the wippens are usually slightly wider than the capstans, so you might only make a correction here if part of the capstan protrudes out to one side of the wippen.

■ Centering the jack tenders under the regulating buttons — this is nice if you can achieve it, but the regulating buttons are much larger than the jack tenders, so function is not affected even if the parts are not well-centered.

Alignment of repetition levers to drop screws is usually automatic. And, of course, neighboring wippens should never rub against each other.

Wippen spacing is accomplished in three ways, as shown in Figure 2.

1) Loosening the flange screw and shifting the flange sideways: This moves the entire wippen; think of it as sliding a book sideways on a shelf. If both the top (repetition lever) and bottom (capstan cushion) of the wippen need to move the same direction, use this method first. There is usually enough clearance in the flange screw hole to allow some movement. However, often the flange will slip back to its original position as the screw is tightened. To avoid this, pry gently between two flanges with a small, thin screwdriver while tightening the flange screw. In some cases, the flange hole can be enlarged with a small round file to allow further movement.

2) Using spacing paper between the vertical face of the flange and the rail to swing the flange to one side: Think of this as swinging a door on its hinge. All points move the same direction, but by varying amounts. The jack tender, being farthest from the flange, moves farthest. The repetition lever/knuckle contact point moves slightly less, and the capstan cushion moves least. This method is useful when the jack tender or repetition lever are off center, or when the "jack end" of the wippen is rubbing a neighboring wippen.

The amount of change is determined by the thickness and width of the spacing paper, and by how far it is inserted behind the flange. Loosen the flange screw, and slip the paper all the way down to the bottom of the flange at first. Place the grit side (sandpaper) or the gummed side (brown paper tape) toward the flange, but do not tear off the excess yet. Retighten the screw and check alignment. If too great a change was made, loosen the screw and pull the paper part way out. If greater change is needed, use thicker paper or an additional piece.

3) Rotating the wippen around the flange screw: Think of this as leaning a book sideways on the shelf. By loosening the flange screw and leaning the wippen to one side, points low on the wippen are virtually unchanged, while the top of the wippen moves considerably. This method is useful when only repetition lever-to-knuckle alignment needs adjustment, or when fine-tuning methods 1 and 2.

Sometimes spacing paper must be inserted under one bottom edge of the flange to hold it in the rotated position while tightening the screw. However, the wippen should never end up looking visibly tilted. If an obvious tilt is needed

Figure 2: Three methods of spacing wippens

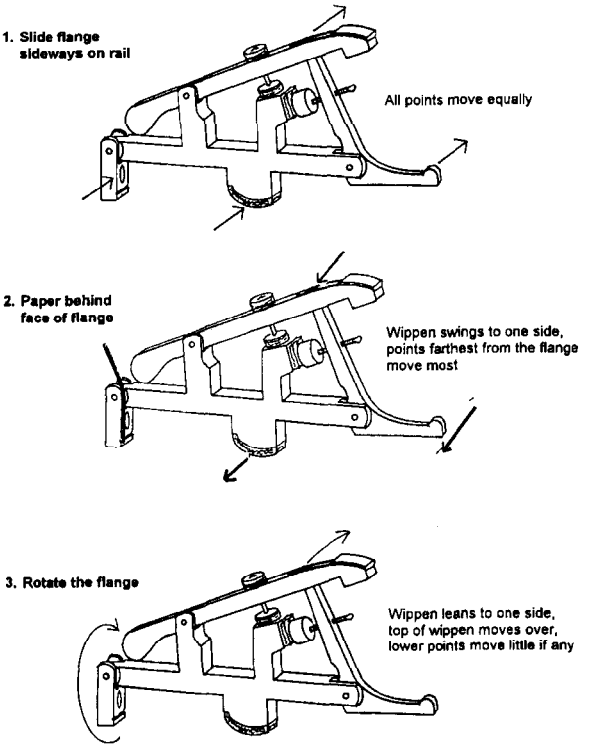

Figure 2: Three methods of spacing wippens

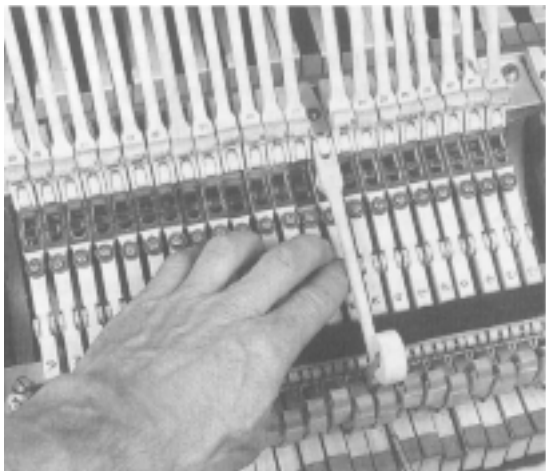

Photo 2 – Checking wippen alignment: Lower one hammershank at a time over its wippen. Check repetition lever-to-knuckle alignment and clearance between neighboring repetition levers in the drop screw area. Sight down the sides of the wippen to see if the capstan is exposed to either side of the wippen cushion. Most corrections can be made by simply shifting the wippen flange to one side. In this photo, the flange screw is loosened with one hand and the flange is pushed sideways with the screwdriver blade. Then the fingers of the other hand hold the top of the wippen in the new location as the screw is tightened.

to achieve alignment, check for other problems.

In reality, some combination of these three methods is usually used. And in the real world, it will seldom be possible to achieve exact alignment at all points, due to errors in key spacing, capstan layout, hammershank spacing, etc. Remember that avoiding rubbing of neighboring wippens and centering the repetition levers under the knuckles are the most important points.

Spacing versus Traveling: *Spacing* is the distance between neighboring parts, while *traveling* is the tendency of a part to veer to one side as it moves. When hammershanks "travel" we correct this by papering under the flange to tilt the centerpin back parallel to the hammer rail, so the shanks move only vertically with no sideways movement. Ideally, wippens would also be "traveled" to ensure they only move up and down in a perfectly vertical motion. This would be done by rotating the wippen flange as in Photo 3, to ensure the centerpins were exactly parallel to the rail.

However, traveling of wippens is seldom a practical issue. Unlike the hammer, which moves through about 22 degrees of arc, the wippen swings only about five degrees, less than one-fourth as much. Thus, unless the situation is extreme, it is very difficult to even detect sideways movement (traveling) in a wippen. Furthermore, any subsequent loosening of the wippen screw for spacing or other purposes would allow the flange to shift, losing the travel adjustment.

A practical approach is to avoid tilting any wippen more than just a slight amount when spacing, instead relying more upon methods **1** and **2**. Once all wippens are spaced, check for traveling problems by standing the hammers up, then rocking groups of keys up and down to move the wippens through their normal range of motion. If you do see a wippen moving sideways, rotate its flange to correct the traveling and readjust its spacing using method **1** or **2**.

Backcheck Alignment

Backchecks are aligned according to three criteria:

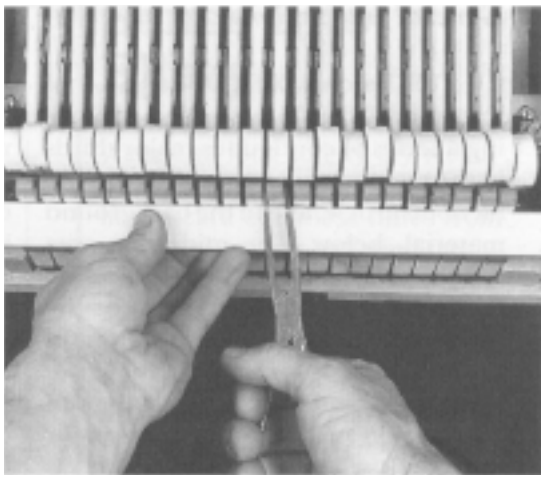

Photo 3 - Backcheck rotation: Hold a straightedge up to the backchecks and rotate heads square to the straightedge as necessary. Use parallel jaw pliers or a backcheck rotating tool. Note: the exception is that hammer tails on some older grands and some Asian imports are not shaped square to the hammer shanks. Thus, where the bass and tenor hammers are angled, the checking surfaces of the hammer tails are angled as well. In this case, the backchecks are turned to match the angle of the hammer tails, rather than square to the shanks.

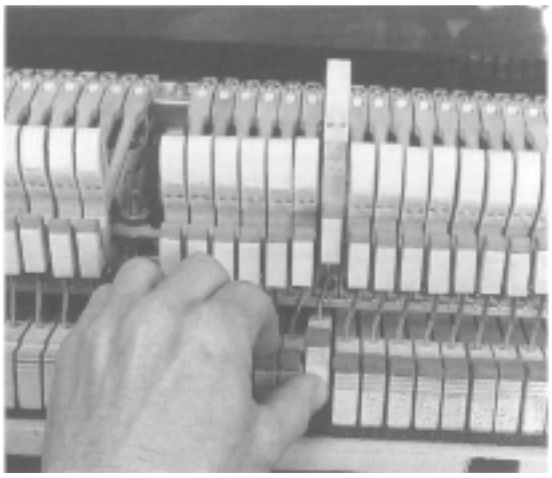

Photo 4 – Observing backcheck alignment: Facing the back of the action, note any backchecks that do not stand vertically; this is easiest to see by focusing on the spaces between neighboring backchecks when at rest. Then, observe side-to-side alignment by lifting the rear of each key, one at a time, to place its hammer in check. Hammer tails are usually tapered, narrower than the backchecks at the bottom and wider at the top, but they should be centered on the backchecks. Ideally, the hammer tails would be shaped square to the shanks and the backchecks adjusted normally.

■ Backcheck heads should be rotated square to the hammer tails, when viewed from above, for maximum contact area between the two.

■ Backcheck heads should be vertical and centered to the hammer tails, for maximum contact area and to prevent interference with neighboring hammers.

■ Backcheck heads should be angled to catch and stop the rebounding hammers reliably. (This adjustment will be covered in a later lesson.)

It is worth noting again that the side-to-side position of backchecks is drastically affected by key squaring or spacing, so those steps (as well as hammer spacing) must precede backcheck alignment.

Concluded on Page 49

PACE

Professionals Advance through Continuing Education

LESSON PLAN

Tuning Lesson #24

Tuning Contiguous Thirds to Start a Temperament

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 practicing setting up a series of smoothly rising contiguous major thirds as a framework for tuning an equal temperament. Participants will use a procedure we will name the Sumrell-Stebbins method after the student and the teacher who together brought it to our attention in a December, 1994 *Journal* article (see Home Study section below). Participants should gain an understanding of this useful method for letting the piano tell you what the speed of the F3-A3 third should be, and add it to their own temperament repertoire.

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.

Tools & Materials Participants Must Bring

Tuning hammer.

Home Study Assignment For Participants

Read "File T for Temperament ... Let the Piano Tell You" by Jack Stebbins, 12/94 *Journal* pp 16-18. Review PACE tuning lesson #15, part 1 of the Baldassin-Sanderson temperament, which involves a similar technique. See also "Optimum Size of A3-A4 Octave" by Rick Baldassin, 3/88 *Journal* pp 20-22 (response to letter from Paul Rice), reprinted as pp 111-113 of The PTG Tuning Examination: A Source Book. Using the Stebbins article as a guide, practice tuning a contiguous thirds framework on your piano. Experiment with different initial beat speeds for the A3-C#4 third (step 3 below).

General Instructions

This lesson will follow steps 1-8 of the Sumrell-Stebbins method for tuning a series of contiguous major thirds in the temperament, as outlined in the Stebbins article, and in the background material, below. The midrange area should be strip-muted for this lesson. Participants should take turns at the piano, switching off at each step until the procedure is completed (about two turns each) and all agree that an even progression of five contiguous major thirds exists, starting at C#3, as well as three good octaves starting at C#3, F3 and A3. Those who are not tuning should be quietly listening and observing, while asking any questions about the procedure. Instructors should have a good working knowledge of the method and the background material to be able to answer questions intelligently.

Background

The Sumrell-Stebbins method for tuning a contiguous major thirds framework early in the temperament is similar to, though more limited in scope (by one major third) than, the Baldassin-Sanderson temperament's part 1 procedure, and an alternative to it for those more accustomed to tuning a one-octave temperament. For a more complete background and explanation of the procedure below, please read Jack Stebbins' article in the 12/94 *Journal* from whence it comes, edited for this lesson.

We should note here that tuning the A3-A4 octave as a pure 4:2 type octave as in step 2 of the Sumrell-Stebbins method may result in a temperament with fourths too pure and fifths too fast (fourths, fifths and octave all too narrow), even though all the thirds rise very smoothly. A slightly wider A3-A4 octave at the 4:2 level would help to correct this problem, and in most cases is a better choice for step 2 anyway.

The Baldassin-Sanderson temperament requires choosing an appropriate A3-A4 octave that fits within the A2-A3-A4 octave framework before tuning any thirds, and therefore potentially involves less backtracking than the Sumrell-Stebbins method. However, for more experienced tuners who have a good feel for the size of the A3-A4 octave on a given piano, the extra steps involved may not be necessary, and the Sumrell-Stebbins method affords a convenient shortcut. It also provides a good lesson in letting the piano tell you how it wants to be tuned rather than trying to follow prescribed beat rates in some dusty tome.

1. Tune A4 to the fork. Using F2 as your test note, make F2-A4 beat the same as F2-fork (M17 test).
2. Tune A3 to A4 as a 4:2 octave. Using F3 as your test note, make F3-A3 beat the same speed on the wide side of pure as F3-A4 (M3-M10 test).
3. Tune C#4 to A3. It does not matter how fast this wide major third beats.

Make a guess. It will be corrected later.
4. Tune C#3 to C#4 as a 6:3 octave. Using E3 as your test note, make C#3-E3 beat the same as E3-C#4 (m3-M6 test).
5. Tune F3 so that the speed of F3-A3 is midway between the contiguous major thirds that flank it; C#3-F3 and A#3-C#4.

NOTE: Contingent upon your accuracy, the speed of F3-A3 is the only speed the piano will allow. Also, it could be midway up in a slow-medium-fast sequence, or midway down in a fast-medium-slow sequence, or equal-beating with both the upper and lower third, depending on your choice of beat speed in step 3 for the initial setting of the A3-C#4 third.

6. Tune F4 to F3 as a 6:3 octave. Using G#3 as your test note, make F3-G#3 beat the same as G#3-F4 (m3-M6 test).
7. Retune C#4. Move it to the point that the speed of A3-C#4 is midway between the two other contiguous thirds, F3-A3 and C#4-F4. If you have tuned accurately, you have now finished.
8. As a check of your accuracy, retune C#3 to C#4 (step 4) and play the five contiguous major thirds from there up to A4. Recheck and compare your three octaves from C#3, F3 and A3.

NOTE: What you hope to hear is a smooth increase in beat speeds of the thirds, and uniformly smooth octaves. If there is a discrepancy, repeat steps 2-8.

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. PTJ

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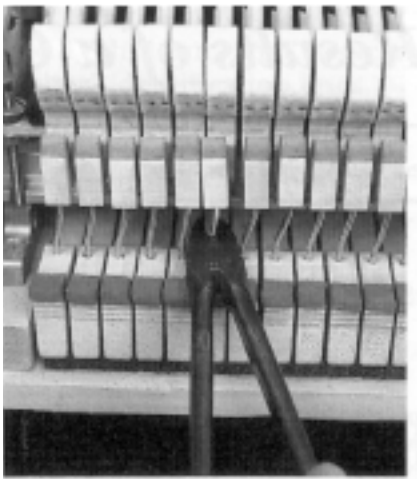
LESSON PLAN

Concluded from Page 47, ***PACE Technical Lesson***



Photos 5, left, & 6, right – Adjusting side-to-side alignment: Using wire bending pliers as low on the wire as possible, bend the backcheck to one side as needed. Then, with the pliers as high as possible, stand the head up vertically again. PTJ

PACE
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LESSON PLAN

How the Public Perceives Our Logo ...
Results of a Client Logo Survey

By Bill Spurlock, RPT
Marketing Committee

Many PTG members have strong opinions about our member logos. Some like the new Phelps-designed logos, which include versions for RPT and Associate members. Others feel these do not make an adequate distinction between Associate and RPT, and prefer the RPT circle emblem as an exclusive symbol for our registered members.

While it is inevitable that members' opinions on logos will vary as much as our opinions on good piano tone, what really matters is what the *public* thinks of our logos. Can our clients distinguish between the RPT and Associate versions? What other messages do our clients get from our logos? To answer these questions, the marketing committee and others recently conducted a survey of our clients. We showed them the three business cards to the right, and asked the question: "Based upon the impression you get from these business cards, which technician do you feel is best qualified?" The results were clear and surprisingly consistent among all

1) Favored by 82 percent —

Jones Piano Service

PIANO TECHNICIANS GUILD
REGISTERED PIANO TECHNICIAN

Keith Jones, RPT
Phone: 213/445-3839
780 Lakeshore Rd.
Miami, FL 03276

Most common comments: "I like the words 'Registered Piano Technician'"; "looks more professional"; "looks more artistic"; "I like that it says everything — piano keys, organization name, and member's title"; "more descriptive"; "tells what 'RPT' means"; "'Registered' sounds like someone who is qualified"; "carries more weight."

Card #1: Seen as the most qualified technician by 169 clients out of 205 surveyed.

2) Favored by 4 percent —

Jones Piano Service

PIANO TECHNICIANS GUILD
ASSOCIATE MEMBER

Keith Jones
Phone: 213/445-3839
780 Lakeshore Rd.
Miami, FL 03276

Most common comments: "Associate Member does not sound as qualified"; "sounds like someone who just sent in their 20 bucks but isn't qualified"; "sounds like someone on the fringe"; "not the real thing"; "someone who's an apprentice."

Card #2: Nine out of 205 chose this one, saying they preferred its looks, or not indicating any reason. These were generally inattentive or distracted clients.

3) Favored by 13 percent —

Jones Piano Service

THE PIANO TECHNICIANS GUILD INC.

Keith Jones, RPT
Phone: 213/445-3839
780 Lakeshore Rd.
Miami, FL 03276

Most common comments: "It looks old-fashioned"; "It looks like 1950"; "looks like a tradesman symbol, not as professional"; "It looks like a union symbol"; "I don't get any message from it"; "I can't tell what it means"; "It's hard to read"; "I assume those are your tools inside the circle, but I can't tell what they are"; "looks like the Mason's symbol."

Card #3: Only 27 out of 205 clients felt this technician was the most qualified, usually saying it reminded them of an official seal. Not a single person indicated the circle emblem denoted "Registered Piano Technician," and many had negative reactions to it.

the surveyors. A summary appears here, with more detail following.

How the Survey was Conducted

Eight technicians participated in the survey, working in six states and eight metropolitan areas. All are RPT members of established integrity. Participants were: Beverly Kim and Jeannie Grassi, both of Washington; Alan Hallmark, Virginia; Evelyn Smith, North Carolina; Richard Bittner, Michigan; Keith Bowman, Pennsylvania; and Margie Williams and Bill Spurlock, both of California.

I provided identical test cards to all participants, along with instructions to ask their clients the question, "Based upon the impression you get from these business cards, which technician do you feel is the best qualified?" Surveyors were to then ask them why they chose a certain one (although clients usually volunteered this answer), and what the other logos meant to them.

To see whether prior exposure to a logo influenced client impressions, I compared results between new piano owners and existing clients in my own 47-person sample. I found no correlation.

The number of clients surveyed by each technician ranges from six to 47, with an average of 22. Among the different technicians, clients' preference for Card #1 over Card #3 ranged from 3:1 for the very small sample of six clients surveyed to a high of 24:1. Overall, for all eight technicians, clients preferred Card #1 over Card #3 by a ratio of 11.4:1. They preferred Card #1 over Card #2 by 18.8:1.

Conclusions

• The vast majority of clients readily spotted the "Registered Piano Technician" and "Associate Member" identification lines printed below their respective logo versions. Exceptions to this were usually due to admitted poor eyesight or dim room lighting. Since these conditions are common, it is important to use the largest size logo for a given application, and to insist upon high quality printing.

• Virtually all clients felt that "Registered Piano Technician" meant some sort of qualification, and "Associate Member" meant no qualification, only membership. Thus it seems that the new logos do properly convey the meaning of our member categories to the public, and create a contrast between RPT and Associate that would not occur if only RPTs advertised.

• It was very common for clients to comment on the connection between the letters "RPT" after the name and the words "Registered Piano Technician" below the RPT logo. A frequent comment was, "Oh, I see, RPT means Registered Piano Technician." It became clear to all of us that using the initial reinforced recognition of the words and vice-versa. In addition, many clients state that initials after a name really mean something to them, like M.D. after a doctor's name. Several said something like, "I always look for some sort of qualification." All RPTs should be sure to include these initials, no matter what logo they decide to use.

• Most clients saw the circle emblem as more mechanical or technical, and the RPT logo as more artistic and professional. They saw tools in the circle emblem, but saw piano keys and an attractive design in the RPT logo. In general, they seemed more attracted to the RPT logo because it is the beauty and art of the piano that interests them, not the mechanical aspects. And thus, the RPT logo conveys, as one client put it, "more than a tuning service."

• The circle emblem clearly had "high negatives," to borrow a term from politics. While a few reacted positively, seeing a "seal of approval," most reactions ranged from a neutral "I can't tell what it is, it could mean anything" to "It reminds me of a union — I don't like unions!" In general, clients seemed to get a blue collar, union, tradesman feeling from the circle, as opposed to a modern, professional, musical feeling from the RPT logo. Most stated that the circle emblem looked "old." One client, a designer of logos from several Sacramento areas businesses, said, "Compared to Card #1, Card #3 looks like someone who has not kept up to date in the business."

• Although strong feelings surround the logo issue, and while we may discuss logos as though our very existence depended upon using one or the other, we must keep the issue in perspective. The value of any logo in building a positive image for ourselves and our organization pales in comparison to how we treat our customers. Possessing genuine concern for our clients' needs, doing quality work, and generally making piano ownership a positive experience is what really matters. This is true whether we are RPTs, Associates or non-members.

Next month I'll conclude with a look at how to incorporate the new logos in your business card, stationery and invoice designs.

TECHNO*stuff*

Richard Anderson, RPT • Chicago Chapter

R.I.P. Part III ... Laid to Rest

Once you've assisted the customer in deciding that a certain piano is not appropriate for their needs they will quite logically turn to you and ask, "So now what do we do with this thing?" It is important that you follow through and help them dispose of this piano and find another. If you don't, they will most likely drift along the path of least resistance and not end up as a happy piano owner.

They might do nothing—the easiest of all options for them, but the worst choice of all for everyone concerned. They won't have a usable piano, and you won't have a happy piano owner customer. They'll just continue to look at the rotting hulk and think bad thoughts about pianos.

They might sell or give it to someone else! That just shifts the problem and increases the chance for unhappy piano thoughts. And they might not replace it with something better, if at all.

They might trade it in on a perfectly good piano that's not appropriate for them. Although not as bad as the first two possibilities, they'll be even more unhappy and resistant to change after spending considerably more money on the new piano.

We can help them along the path of piano righteousness with these steps; disposal, education, evaluation, and consultation.

Disposal

In most cases a piano is condemned because it isn't repairable or worth repair. These are the pianos that need to be put out of our misery. Some piano shops will haul away such pianos for little or no fee if they think they could get some parts from them. This usually makes the customer the happiest because they think some good is coming out of the piano. Be advised that most shops get far more offers of pianos free for the hauling than they care to accept. I've often thought I'd like to start a piano salvage yard. It would be the perfect repository for these pianos.

Piano moving companies will pickup a piano and deliver it to the landfill for a fee. This gets the piano off the streets, but upsets the customer.

I have, on occasion, provided in-home demolition service. This is often the only method of removal for those old pianos that came with a house that the previous owner remodeled after the piano was in the basement. I unstring the piano, pull the plate, and chop up the case and plate into manageable pieces. I save the action and hardware, send the plate and tuning pins to the scrap metal dealer, and burn the case in my piano crematory in the pasture. I refer to this as piano recycling and it makes the customer almost as happy as giving it to that nice young family next door with the kids who want lessons.

Education

The first step in helping the customer choose another piano is getting them in touch with reality. They have to understand that for anyone to play or learn to play a piano, the piano has to work like a piano. Then they have to accept that an operating piano costs a certain amount of money, and they are going to have to spend that amount one way or another. They have to pay to play.

Evaluation

Next, you should help them evaluate their needs and decide just what kind of piano will fit those needs. Pianos vary in what I call the big three; how they look, play and sound. A piano that excels in all three costs more than one that doesn't. They must decide what their priorities are, and how many of the big three they are willing to pay for.

Consultation

Finally, after you've educated and evaluated the customer they will be receptive to your recommendation on the type and price range of a piano to look for.

The condemnation follow-through is essential in getting the condemned piano out of circulation, and getting the customer sitting on the bench of a piano that they can play and you can service. PTJ

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

THE WAY IT WAS

By Phillip Driver

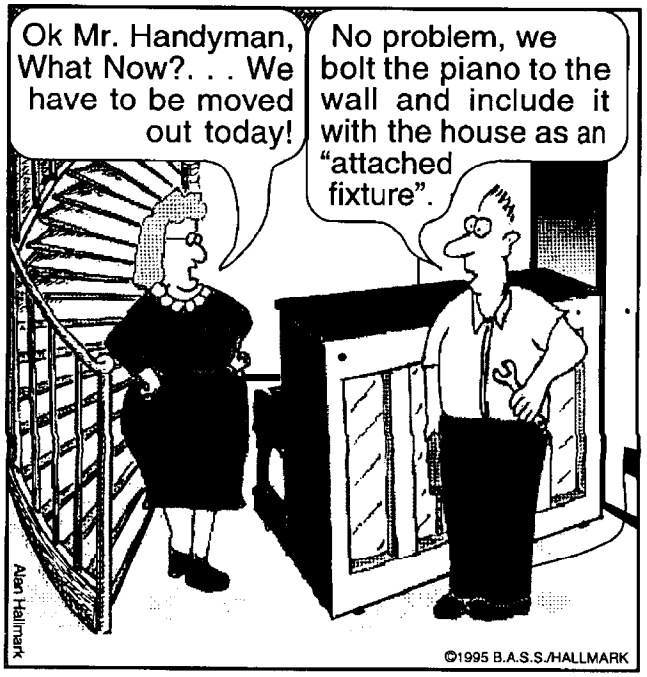
It really burns my behind when I hear one of the new guys saying that nowadays you need to have a computer to run a piano business. Back in the old days, we did everything with three-by-five cards. Not just keeping records, either; I mean everything: leveling keys, loose tuning pins, soundboard cracks, muting. A lot of those fancy tools you see in the supply-house catalogs are nothing more than glorified three-by-five cards.

I personally didn't use cards for records, anyway; I always worried about losing them. I wrote down my records on the plate of the customer's piano with a big carpenter's pencil. That way I always knew where they were, and I never had to worry about forgetting to take the card to the customer's house. And if I were at home and I needed to know something, I'd just call up the customer and say, " Could you open up your piano and look inside for me?" And half the time, while they were in there, they'd find a mute that I'd left inside the piano. It was a real good system.

It's a real shame that today's tuners are being deprived of these tried and true methods. It makes me so mad sometimes, I just have to sit down for awhile.

Editor's Note: *Phillip Driver is one of the legends of the piano industry. Besides teaching the trade to a whole generation of technicians, he was one the great trainers of tuning dogs.*

There was an old upright in a basement
Where the owner's remodeling caused encasement
When it came time to move
The doorway didn't approve
And the spiral staircase led to thinking–replacement.



Business Builders

By Joe Mehaffey

Success in the piano business is a matter of learning and using hundreds of little tricks. Here are a couple that you can add to your repertoire.

Can't afford an Accu-Tuner? It's a simple matter to construct a small black box with two wires leading out of it, ending in alligator clips. When you go to the customer's house, fasten the clips to two of the tuning pins on the piano. Then relax on the couch for a half hour. When the customer asks (usually nervously) why you aren't tuning the piano, you answer, "It's tuning itself."

This next one takes a little more effort. The next time you find a piano full of dead moths, collect them in a can and carry them on your next service call. When no one's looking, dump the moths inside the piano, then call your customer over. You should have no trouble selling a vacuuming job. Afterwards, you can empty out the vacuum into your can and use the moths again.

Editor's Note: *Phillip Driver and Joe Mehaffey may be reached c/o Mark Stivers, RPT, Sacramento Valley Chapter.*

PTG Review
PIANO TECHNICIANS GUILD
Dedicated To PTG News • Interests & Organizational Activities

Become a Perennial

By Willem Blees,
Economic Affairs Committee

Another convention has come and gone. For Jan and me it was one of the best ones ever. Maybe it was the friendships made and renewed. Maybe it was the balloon ride Jan enjoyed so much. Maybe it was the beautiful scenery and tram ride and wonderful dinner we had with the Trempers on top of Sandia Peak. And maybe it was the fun and relaxing time I had attending the meetings and classes. All of those reasons were the side benefits of going to a convention. The real reason the convention was a success for me was the new things I learned.

That is what conventions are for; to learn new things and how to better perform the many jobs we do, like managing time, tuning or fitting a pin block. We also learn about things, like what causes strings to break, or go sharp or flat, what affects torque has on a tuning pin, and how partials work. We also refine some of the skills we already use. We can also buy tools and parts from the supply companies.

A Positive Impact

The Economic Affairs Committee's responsibility is to write articles "on concerns which affect the economic well being of the piano technician." There is not one single more important event that affects the well being of piano technicians that the Annual Convention and Technical Institute. This year almost 900 people showed up to take advantage of Albuquerque's beautiful scenery and delightful weather, go to a multitude of classes, participate in hands-on learning and attend invigorating lectures. These were the technicians and guests who understand the importance of attending classes and talking "shop" in the hallways and on the streets around the convention center.

Plan Ahead

Next year the convention will be in Dearborn, Mich. I realize July of 1996 is still a long ways away, but it is never too late to start planning. I have heard that one of the reasons many technicians don't come to convention is the cost. Not only does it cost money to attend, but there is also the cost of getting there, staying at the hotel, and, of course, the money lost not working for a week. I will be the first one to say that all of that is true. I estimate that between the plane ticket, the hotel, meals and registration, the convention put me back about $2,000. Add to that that I could have tuned 25 pianos at $60 each and the total "cost" for the convention comes to $3,500.

How do I justify spending $3,500 on a convention, you ask? I justify the expense because maybe I won't tune one extra piano per week, or maybe I won't save an hour off the next pin block I have to fit, and maybe I won't be able to schedule my time better. But it is a combination of all of these things that is going to make me more money. It is the total learning experience that justifies the expense. I know I can make that money back in a couple of months. After that, it is all profit. Breaking it down, over the next 51 weeks, the convention cost me $68.63 per week. That is just a little over one tuning per week. Do I learn that much at the convention? The answer has to be a resounding, "Yes!"

Perhaps you have thought of attending, but, again, the money stands in your way. When compared to other industries, and even other conventions, the cost of going to a PTG convention is a bargain. For example, Jan and I are handbell ringers. The American Guild of English Handbell Ringers (AGHER), has conventions and seminars like we do. In June we attended the National Festival in Estes Park, Colo. We spent four days learning about playing techniques, handbell music and taking care of bells. We also attended four recitals and spent about 10 hours in rehearsal for a concert with 900 other bell ringers. The total "cost" of that festival was about $2,500. Can I justify that expense. ***Yes*** and

PIANO TECHNICIANS GUILD

PTG Review

Dedicated To PTG News • Interests & Organizational Activities

no. No, because I didn't learn to tune a piano better, or to regulate an action more efficiently or to make more money. It was a pure expense event. What we did learn was how much fun it is to ring handbells. We did it because we love handbell ringing. We went because we had a terrific time. We came to see the scenery and enjoy the cool mountain air. We also made and renewed friendships. That is why we spent $2,500.

The convention in Dearborn won't "cost" you $3,500. You can save a lot of money by staying at a less expensive hotel, eating out of a cooler and driving to Dearborn. But the important thing is that you go. It is never to late to start planning. Put the dates on next year's calendar and, every other week, put the cost of one tuning in a savings account. The next thing you know, the money is there, and you're on your way.

Become a Perennial

Several years ago I wrote an article for the PTG Auxiliary newsletter, of which Jan was the editor. I want to share that article with you. It explains my sentiments of why Jan and I attend conventions. I hope it will be the inspiration for you to come to Dearborn next year, and every convention from then on.

You know what a perennial is: it is a flower that comes up year after year. It is a sign of spring. The perennial flower comes back without being invited or planted. Best of all, it adds beauty and grace to a garden for years on end.

Every year there is an event in the PTG that is like a perennial flower. It is the Annual PTG Convention. It is at the Convention where friends "spring up" year after year. They come because of their interest in the profession, and because of the friends they want to see. They come with love in their hearts, a song in their voices and a smile for all to see. The friends you only see once a year are precious. Friends from around the country, and in some cases, around the world, share a common interest: the love of the piano.

An Annual Event

When Jan and I went to our first PTG Convention in Cincinnati in 1978, Jan mostly stayed in our room or did things by herself while I went to class. We didn't attend the opening ceremony or the banquet because we hardly knew anybody. At that time, the primary purpose for me was to learn more about piano tuning and repair. Over the years, however, as we got to know more and more people and made more and more friends, going to conventions started having a whole different meaning. Now the primary purpose of attending the convention has become socialization more than education. Although I do learn something new every year, the best part is the renewal of friendships and the making of new ones.

We have made every convention since 1978, often planning our family vacations around them. Now that the boys are grown and out of the house, we still plan our vacation around conventions and seminars. The PTG Convention is a commitment with us. We wouldn't miss one for the world. We want to see our friends. We have become perennials.

If you haven't already, I would like to encourage you to make plans now to attend the next PTG Convention in Dearborn. The hotel is grand, the atmosphere is downright upright and the friends you make will sustain you forever. If you haven't already become a perennial, start this year.

Deadline Set for Awards Nominations

December 31, 1995, is the deadline for nominations for awards to be presented at PTG's 1996 convention. The awards — the 1996 Golden Hammer and Member of Note Awards, as well as induction into PTG's Hall of Fame — are described in PTG Regulations, Article I.

The September LeaderLetter includes a form chapters can use to submit nominations to the Awards Committee. Nominations should be sent to Norman Neblett, RPT, Awards Committee Chair, P.O. Box 7000-65, Redondo Beach, Calif. 90277. Other members of the committee are Francis Hollingsworth, Richard Bittner, Jimmy Gold and Rick Baldassin.

New Members In July

REGION 1

054 VERMONT

ODD AANSTAD
HUSER, ASMALOY
VESTEROY N-1684
NORWAY

186 POCONO NORTHEAST, PA

LISE BOORSE
35 CLEVELAND STREET
PITTSTON, PA 18640

191 PHILADELPHIA, PA

MARTIN A. BEAUMONT
1225 PENN FOREST STREAMS
JIM THORPE, PA 18229

REGION 2

327 CENTRAL FLORIDA

DEBORAH M. WILSON
1410 BOREAS DRIVE
ORLANDO, FL 32822

381 MEMPHIS, TN

TOMMY H. BRASWELL
4905 OUTBACK DRIVE
JONESBORO, AR 72401

HENRY P. PFRIEMER
3004 WHIPPOORWILL CT.
JONESBORO, AR 72401

REGION 3

701 NEW ORLEANS, LA

L. IRENE FLYNN
119 S. SCOTT
NEW ORLEANS, LA 70119

722 ARKANSAS

JOHN T. EDGMAN
10 SEDGEFIELD DRIVE
CONWAY, AR 72032

727 NORTHWEST ARKANSAS

ROBERT K. WIDDING
2000 MAGNOLIA #236
LITTLE ROCK, AR 72202

741 TULSA, OK

CHERYL L. BURTON
RT. 1, BOX 150-3
COWETA, OK 74429

771 HOUSTON, TX

CHRIS M. GRIFFIN
9610 GREENWILLOW
HOUSTON, TX 77096

EDISON E. PASTOR
P. O. BOX 1398
NEW WAVERLY, TX 77358

SAMUEL A. RHODES
P. O. BOX 4226
HOUSTON, TX 77210

787 AUSTIN, TX

KENNETH M. COWICK
2604 FRAIR TUCK
AUSTIN, TX 78704

799 EL PASO, TX

DAVID W. LOVELACE
5820 BEAUMONT PLACE
EL PASO, TX 79912

871 NEW MEXICO

RHYTHM EARTHSONG
144 WILDCAT ROAD
DURANGO, CO 81301

REGION 4

467 INDIANA

SCOTT W. KITZMILLER
53568 HYDE PARK DRIVE
BRISTOL, IN 46507

481 DETROIT-WINDSOR, MI

DAVID V. ANDERSON
2850 LOWER RIDGE DRIVE, #12
ROCHESTER HILLS, MI 48307

RICHARD C. BOWEN
14994 WINSTON
REDFORD, MI 48239

489 LANSING, MI

JAMES A. THIGPEN
2309 MADISON AVE., SE
GRAND RAPIDS, MI 49507

543 NORTH CENTRAL WISCONSIN

DAVID E. ANDERSON
120 S. 2ND STREET
EAGLE RIVER, WI 54521

REGION 5

553 TWIN CITIES, MN

ROBIN H. FOX
1505 HYTHE STREET
ST. PAUL, MN 55108

DAVID C. RUNDQUIST
1426 FROST AVENUE
MAPLEWOOD, MN 55109

581 MINN-KOTA, ND

DARYL D. JOHNSON
823 - 9TH AVENUE
TWO HARBORS, MN 55616

803 BOULDER, CO

ANDREW M. RUDOFF
1406 SUNSHINE CANYON DRIVE
BOULDER,CO 80302

REGION 6

901 LOS ANGELES, CA

CLARENCE A. ROBINSON
13340 AZTEC STREET
SYLMAR, CA 91342

941 SAN FRANCISCO, CA

STEVEN V. DESROCHES
1210 ROSE STREET
BERKELEY, CA 94702

JAMES K. WIGGINS
116 S. BUCHANAN CIRCLE
PACHECO, CA 94553

956 SACRAMENTO VALLEY, CA

JOSHUA M. EDMONDSON
P. O. BOX 4146
AUBURN, CA 95604

REGION 7

841 SALT LAKE CITY, UT

ELAINE I. BECKSTROM
8605 S. SHULSEN
W. JORDAN, UT 84088

ROBERT A. HUSSA
835 4TH STREET
LANDER, WY 82520

Passages

JEANNIE K. JOHNSON
1040 W. 600 N.
WEST BOUNTIFUL, UT 84087

961 SEATTLE, WA

JULIE L. CLAYBAUGH
425 DEWEY PLACE, E
SEATTLE WA 98112

BRAD S. KELLY
2431 HUMBOLDT STREET
BELLINGHAM, WA 98225

Associates Reclassify to RPT Status in July

REGION 6

926 *ORANGE COUNTY, CA*

RICHARD A. CAYLOR
33858 ROBLES DRIVE
DANA POINT, CA 92629

FRANK L. STRNAD
P.O. BOX 91565
INDUSTRY, CA 91715

REGION 7

975 *ROGUE VALLEY, OR*

NORMAN V. ALBERS
1601 SLAGLE CREEK ROAD
GRANTS PASS, OR 97527

EVENTS CALENDAR

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.

September 30
POMONA VALLEY ANNUAL SEMINAR
Location: Unknown at this time
Contact: John Voss
2616 Mill Creek Rd.
Mentone, CA 92359
909-794-1559

October 5 - 8
NEW YORK STATE—NYSCON
Howard Johnson Plaza Hotel
Oakville, ON CANADA
Contact: John Lillico
605-200 Queen Mary Drive
Oakville, ON L6K 3L1
800-469-7266

October 12-16
TEXAS STATE ASSOCIATION SEMINAR
Clarion Hotel
Richardson, Texas
Contact: Thom Tomko
114 S. Greenstone Lane
Duncanville, TX 75116
214-780-0143

October 21
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
CENTRAL EAST REGIONAL SEMINAR
Mariott Hotel
Milwaukee, WI
Contact: Dave Hulbert
4760 N. 158th St.
Brookfield, WI 53005
414-781-6343

November 2-5
NORTH CAROLINA REGIONAL CONFERENCE
Omni Hotel
Durham, NC
Contact: Richard Ruggero
3504 Fairhill Drive
Raliegh, NC 27612
919-787-7123

In Memory . . July 1995

THOMAS MALONE, RPT
WESTERN MASSACHUSETTS

HOWARD MORGAN
NEW JERSEY

RALPH CASKEY, RPT
CENTRAL NORTH CAROLINA

E. BERNARD BAGWELL, RPT
KNOXVILLE, TN

HUBERT ANDERSON, RPT
SOUTH BAY, CA

AUXILIARY EXCHANGE

Dedicated To Auxiliary News and Interests

PTGA Announcements

By President L. Paul Cook

For a review of what happened at the National Convention this year read last month's President's Message, where I projected what would happen if it were a perfect world. For the most part everything went off as planned. We all had a heart-warming, wonderful experience. We saw many old friends we had not seen in a year or more and met many new friends from both here in the U.S. and from around the world. You just can't beat the fun we have at these annual conventions. I hope even more of you plan to be with us next year in Dearborn, Mich. To keep you up to date, I have prepared the following information. In addition, I thank each of you who helped make this year's Convention a huge success. Now for the announcements:

New P.T.G.A. Journal Editor:

Karen Dickson
Route 8, Box 8117,
Hayward, WI 54843
(714) 634-1334

New P.T.G.A. Newsletter Editor and Publisher:

Ed Morgan
900 Camellia Ave., Tyler,
TX 75701
(214) 597-5745

Thank you, Jan Blees, our past Newsletter Editor and Publisher, for all of your dedicated work for the past few years, it is very much appreciated.

New Vice President:

(all other board members remain the same as last year)
Carolyn Sander
204 North Madison,
Louisville, KY 40243
(502) 922-4688

Thank you, Debbie Johnson, for your hard work last year, we sure are going to miss you, too. Membership is now at 305, that's up from last years 275.

New Honorary Life Member:

Jewell Sprinkle, as nominated by Helen Person, Ginger Bryant and Debbie Johnson. Recommended unanimously by the PTGA Board and approved unanimously by the PTGA Council for her outstanding service to the Auxiliary over many years. Jewell is a past PTGA President, Sunshine Committee member and very active in our organization. She also assisted her late husband, a blind piano technician, in his business activities. Congratulations.

We welcome our new Honorary International PTGA members: **Sachiko Yonezawa, Japan; Fumiyo Nishida, Japan; Akemi Ono, Japan, and Britt Western, Norway.**

New Membership Rate:

$15 per year

New Membership Billing Method:

To be done by the Auxiliary, separate from the PTG office (like we used to do).

AUXILIARY

E X C H A N G E

Dedicated To Auxiliary News and Interests

New Limit to the Position of Immediate Past President:

One year.

New Job Description for Immediate Past President:

To turn over all materials, books, records, etc., immediately to the new president and to assist the new president in any reasonable way possible as requested.

New Nominating Committee:

Kathryn Snyder, Sandie Caldwell and Eileen Guthrie.

Scholarship Committee:

Ginger Bryant and **Julie Berry** are Co-Chairing this committee again this year.

50/50 Cash Split Winner:

Pauline Miller was the winner of our Scholarship 50/50 Cash Split drawing. Total sales were a little more than $720, so her half was about $360, of which Pauline donated $60 of her winnings to the Scholarship Fund! Congratulations and thank you, Pauline !!

Scholarship Store:

Due to the resounding success of the scholarship store at both the California Convention and the annual convention the materials to sell are available to any Chapter that wants to operate the store at their State Conference/ Seminar on a consignment basis. If your Chapter is willing to run the store for your State's Conference/Seminar, contact **Paul Cook**, our President, to have the stock shipped out to you. You will, of course, be responsible for the items to be sold while in your possession. All shipping will be insured. The Council approved 80% of the proceeds of this effort to go directly into the Scholarship fund, the balance (20%) will stay in the PTGA general fund to defray related expenses.

New Organization Committee has been Formed:

A committee was formed of five members to study our form of organization in hopes of finding a simpler yet safe way to conduct the business of the Auxiliary. The goal is to cut down on the convention time spent conducting business so we can have "more fun for everyone" and still maintain the checks and balances now in place. They will make their recommendations to the Board and Council at next year's convention in Dearborn, Mich., July 1996.

Second PTG Foundation Board Appointed by the PTGA President:

As permitted by the PTG Foundation Bylaws, our President, Paul Cook, was permitted to name a second PTGA member to the Foundation Board. Each board member will serve a two-year term with one member appointed each year. Last year **Pauline Miller** was appointed. This year **Agnes Huether** will join Pauline as our second representative on their board. Thank you both for your service.

PTGA Historian:

Once again **Ginny Schwinn** has agreed to be our Historian. She has all the old PTGA records and photos should you ever need to see them. This year she saved us the shipping fees by only bringing the old photo books to the convention. They were kept in the Hospitality room for our enjoyment and to try to identify some of the people in the old photos, what fun! Thank you for your service to us, Ginny.

Bylaws Committee:

Lue Pruitt was once again our Bylaws Committee Chair, she will be updating our bylaws as amended to date so we can publish them for each member this year. Thank you, Lue, for keeping us on track.

Reimbursement Approved for Every Committee:

For clarification, the Council approved reimbursement for any committee member for documented and appropriate expenses incurred on behalf of the committee efforts as approved by that committee's chairperson.

CLASSIFIEDS

Classified Advertising rates are 35 cents per word with a $7.50 minimum. Full payment must accompany each insertion request.

Closing date for placing ads is six weeks prior to the month of publication.

Ads appearing in this publication are not necessarily an endorsement of the services or products listed.

Send check or money order (U.S. funds, please) made payable to Piano Technicians Journal, 3930 Washington, Kansas City, MO 64111-2963.

GRAND PIANO STRING covers. Are you ready for an item that can keep the piano clean, prevent corrosion, improve tuning stability, make your clients happy and make you money besides? Custom made, it rests above the strings, covering soundboard, tuning pins and plate for complete protection inside the piano. Made from finest quality woven wool, available in black, brown and white. Personalized name applique also available. No inventory or investment required. For free brochure and samples call: Edwards Pianos, 408-426-1295, 145 S. River Street, Santa Cruz, CA 95060.

VOICING FILE...special design for verticals. Warm up the tone and color of hard, brassy, grooved, cupped hammers "in-the-piano" quickly, accurately. Instructions and voicing paper included. Try the best Key Spacing tool available. Fits above punching for rapid regulating. Won't mar keypin. These tools work! $16.00 ea. + $2.50 shipping. Craig Fehrenbacher, 10 Lakeside Rd., Effingham, IL 62401. Ph. 217-868-2440.

HAMMER BORING GUIDES. All metal, weigh 15 lbs. Accurate and easy to use. $180.00. Instructions and photo available on request. Kent Gallaway, 709 Thorne, Ripon, WI 54971; 414-748-3265.

GRAND PIANO STRING covers starting at $69.95 +s/h. Custom made from quality wool. Wool absorbs moisture and keeps strings, tuning pins, plate, soundboard looking new. Also, Accu-Tuner thumbswitches, $28.95. Action Piano, 714-364-1073.

WOULD YOU LIKE to have a way to keep your name and phone number literally in front of the customer? We can supply you with a useful giveaway item that costs under $1, that piano owners will keep on the piano, that never wears or runs out. Sound too good to be true? Write for free sample: PIANO NOVELTY, P.O. Box 328, Shelburne Falls, MA 01370.

HANDCRAFTED SOUNDBOARDS BY NICK GRAVAGNE. Ready to install crowned boards or semi-complete. Your choice. Ordering and installation instructions $15.00. 20 Pine Ridge; Sandia Park, NM 87047; 505-281-1504.

WONDERWAND: Try the Tuning Lever you read and hear about. Enjoy Less Stress; Better and Faster Tunings: $65.00 p.p. Charles P. Huether, RPT, 34 Jacklin Court, Clifton, NJ 07012

"SALE OF PIANOS" — All models and styles. Specializing in players, art case and conventional pianos. Floor ready and as is pianos available. We also specialize in one of a kind and hard to locate pianos. Call collect Irv Jacoby 216-382-7600. Jay-Mart Wholesalers — Pianos since 1913.

$100 OFF!! PIANO SERVICE MANAGER COMPUTER SOFTWARE by Dean Reyburn. Complete customer/appointment/service record management system for DOS. Was $295, now $195! 510-236-5338.

COMPONENT DOWNBEARING GAUGES (bubble type) give readings in degrees (string angle) and thousandths of an inch (dimension). Available at supply houses. Box 3247; Ashland, OR 97520

BOLDUC SOUNDBOARDS now available! The best rebuilders know the superior quality of Bolduc Pinblocks. Now you can experience this same superior quality with Bolduc Soundboards. Call for prices and details. Pianotek Supply Co., 1-800-347-3854 or Fax: 810-545-0408

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.

A new book! DIFFERENT STROKES: Hammer Techniques for Piano Technicians. 109 pages of techniques, illustrations and humorous anecdotes. Endorsed by Owen Jorgensen, Daniel Bowman, Taylor Mackinnon and Ron Giesbrecht. $13.95 plus $3.50 for shipping. Write Ken Burton, 1 Willow Cres SW, Calgary, AB, T3C 3B8.

STEINWAY K52, Serial #518851, walnut, $7000 o.b.o. Ph. 813-932-6745.

SUPERIOR INSTRUCTIONAL TAPES ** All videos at one price, $50 @ ** Beginning Tuning, Upright Regulation, Aural and Visual Tuning, Grand Action Rebuilding, Exploring the Accu-Tuner, Grand Action Regulation, Voicing, Pinblock Installation, A to A Temperament, Baldassin-Sanderson Temperament, Bass Tuning - 3-Ways. Superior Instructional Tapes; 4 W. Del Rio Drive; Tempe, AZ 85282; Ph. 602-966-9159.

SANDERSON ACCU-TUNERS NEW & USED. BOB CONRAD 800-776-4342.

ATTENTION!! CORY POLISH EAST COAST FACILITY is now opened to service all your ordering needs. Save on shipping! Our East Coast warehouse will handle all orders East of the Mississippi. East Coast 24 hr. TOLL FREE ORDER LINE: 1-800-582-3783.

KORG MT1200 TUNER. $299 p.p. (list $375) Hears A0-C8. Plays C2-B5. Shows pitch, note, octave. Can program calibration, temperament. KORG AT12 TUNER. $179 p.p. (list $250). SONG OF THE SEA. 47 West Street; Bar Harbor, ME 04609; 207-288-5653. Brochures.

UNUSUAL AUSTRIAN BABY GRAND circa 1886 Ignaz Berger, striking art case w/pearl and brass inlay, good sound, newly restored, excellent showpiece. (616) 942-8726.

COMPLETE RANDY POTTER SCHOOL OF PIANO TECHNOLOGY course materials including all supplies and Yamaha full action model. Original price, $1000; asking $650 or best offer. Call Andrew McMaster, 610-828-2760.

BUCKSKIN for recovering grand knuckles and backchecks, upright butts and catchers. The "original equipment" supplying the industry for 140 years. Richard E. Meyer & Sons, Inc., 11 Factory Street, P.O. Box 307, Montgomery, NY 12549; 914-457-3834

PIANOS FOR SALE — Spinets, consoles, studios, grands. One or a carload. Excellent brand names. As is or rebuilt. Lowest possible prices. Owen Piano Wholesalers; 2152 W. Washington Boulevard, Los Angeles, CA 90018. Telephones 213-732-0103, 818- 883-9643.

PIANO SCALING SOFTWARE for IBM & compatible computers. Plot inharmonicity, tension, break %, loudness/sustain, hammer contact, and more. 18 graph types, automatic bass rescaling, string winding data sheets, detailed users manual and money back guarantee. $80.00. Write or call: Tremaine Parsons, Box 241, Georgetown, CA 95634, 916-333-9299

PTOOLS - COMPUTER TOOLBOX FOR TECHNICIANS. Comprehensive Client/Contact Management System. Word Processor/Spell with Mailmerge. Supplies, Tools, and Resource Databases. Mailing/Custom Labels, Envelopes, Autodial, Local/National Zipcodes, Import/Export, Measurement Conversions. Trade Specifications, Bearing Calculations, Repair Formulas, and more. For MS-DOS with money back guarantee. $80. Tremaine Parsons, RPT; Box 241; Georgetown, CA 95634. Ph. 916-333-9299.

STEINWAY B, 7ft., Hamburg, Germany, #395776. Artist owned and selected from factory. Pristine condition and maintained to the highest standards, high gloss black. $29,500. 513-948-1367.

PIANO COVER CUSTOM MADE to your specifications. Rehearsal covers now available. Specializing in custom colors and fabrics. Call or write for brochure. JM FABRICations; 10516 Ohop Valley Extension Road, Eatonville, WA 98328, 360-832-6009.

SOUNDBOARD PRESS - Designed and built by Chris Robinson and his welder, Ned Lisella. Only two in existence, all custom clamps and bolts included. No reasonable offer refused. Call Brad at: 914-358-6995.

RELIABLE ACCU-TUNER NOTESWITCH! One year guarantee! Includes coiled cable, thumb switch and attaching hardware. Fits all tuning hammers. $49.00 includes s/h. Dean Reyburn, RPT, Reyburn Piano Service; 2695 Indian Lakes Road, Cedar Springs, MI 49319, 616-696-0500

*Bluthner 6'4" 1910 Ebony, ornate plate w/clouds and angels $12,995; *Steinway 7' B, 1896, Ebony gloss, $19,500; *Steinway 6'1" A, 1912, Mahogany, $15,000; *Steinway 5'10" 0, Dark Mahogany, $16,500; *Steinway 5'10" 0, 1920, Light Mahogany, $16,000; *Mason & Hamlin 5'8" A, 1916, Brown Mahogany w/Piano Disc, $16,000; *Mason & Hamlin 6'2" AA, 1928, Ebony satin, $8500; *Baldwin 7', Ebony gloss w/Pianocorder, $15,000; *Baldwin 5'8" R, Mahogany, $5,900. Call SCHROEDER'S PIANOS for a complete list of used pianos, 800-923-2311.

NEW FROM SPURLOCK SPECIALTY TOOLS—Soundboard shims to match my custom carbide bit and soundboard routing system. 39" and 78" lengths and three widths. Quality quarter-sawn Canadian white spruce made by Andre Bolduc. Spurlock Specialty Tools, 3574 Cantelow Rd., Vacaville, CA 95688, 707-452-8564.

PIANOS - Yamaha and Kawai grands $1850 and up. 23 Steinway grands and verticals. Large quantity of used American grands from $700 up. We buy pianos. Ed's 504-542-7090.

BEICHSTEIN 7'3" GRAND PIANO MODEL C, 1985. High-gloss black, mint condition, one-time owner, concert ready. Photo available, $28,000. 408-659-4715.

New from PROTEK: Pro*lube* Spray Lubricant. Protek Pro*lube* is an advanced state polymer lubricant. Designed around the successful CLP formula, Pro*lube* is for higher friction areas like the keybed and frame, shift and sostenuto mechanisms. Great for front and balance rail keypins and anywhere you would use a spray lubricant. Provides long lasting durable lubrication with virtually NO ODOR! With the addition of Pro*lube* along with CLP and MPL-1, Protek offers safe, high tech task specific tools for every lubricating need. Ask for Pro*lube* at the supply house you do business with.

REPAIR CHIPPED IVORY IN 20 MINUTES. "AcryliKey" ivory restoration system produces a strong, color-matched, nearly invisible repair. Kit contains material enough for 50+ repairs plus pigments, mixing utensils, sanding pads, and complete instructions. $39.95 ppd. Richard Wagner, RPT; 7709 S.W. Pfaffle, #40; Tigard, OR 97223; 503-624-7360.

NEW STRETCH CALCULATORS FOR SIGHT-O-TUNER USERS, $10 p.p.; Richard Weinberger; 18818 Grandview Dr.; Sun City West, AZ 85375.

VICTOR OFFERS 400 FINE 5 TO 9 FT GRAND PIANOS. Need Piano Technician & Church Organ Salesperson. Work in Miami this Winter. 305-751-7502.

HELP WANTED

CONCERT PIANO PROVISION COMPANY Seeks Journeyman Piano Tuner/Technician, Independent Contractor Status, Sanderson Accu-Tuner literacy appreciated, general and practical technical skills required. Positions open in San Francisco & New York. Contract pay from $125 per day & up. Call 800-367-0777 to inquire. Thank You!!

TUNER-TECHNICIAN NEEDED immediately to help service large established clientele. Also, technician openings in quality restoration facility. C. T. May Piano Technologies; Liberal, KS 67901; Ph. 316-626-5520.

TUNER-TECHNICIAN NEEDED — Steinway, Baldwin, Yamaha Dealership has immediate opening. Send Resume to: Bradford's Piano Company, 6222 Washington Ave., Racine, WI 53406, Attn: Duane Mischel.

PIANO TECHNICIAN: Half-Time. All aspects of piano services, including rebuilding. Steinway instruments. Minimum 3-5 years experience, including concert work. Registered technician or equivilant skills. Benefits. Beginning September 1995. Salary competitive. Excellent community opportunities. Strongly committed to affirmative action. Recruitment conducted without regard to race, color, sex, religion, age, disability, marital status, sexual orientation or national origin. Send resume and three letters of recommendation to David Clatworthy, Chair, Department of Music, PO Box 6000, Binghamton University, Binghamton, NY 13902-6000. Fax: (607) 777-4425.

SERVICES

STRAIGHT SIDES, SQUARE FRONTS and crisp notches are the benchmarks of our quality key recovering. Tops with fronts $100 plus return shipping and insurance. Call or write for free list of our key and action restoration services. Yvonne Ashmore, RPT and Associates, 12700 La Barr Meadows Road, Grass Valley, CA 95949, 916-273-8800

KEY BUSHING: We use over 20 different sizes of Spurlock Precision Cauls. Send the micrometer measurement of the key pins and we will give you a perfect fit. Both rails high quality felt $75.00 or leather $80.00 plus return shipping and insurance. Write or call for free price list of our key and action restoration services. Yvonne Ashmore, RPT and Associates, 12700 La Barr Meadows Road, Grass Valley, CA 95949, 916-273-8800

ADD ADDITIONAL $'s to your income. Rebuild player pianos for your clients. Send us the player parts. You restore the piano and we will return the mechanism in restored condition. We guarantee our work. For more details, call or write: Jim Brady, 2725 East 56th Street, Indianapolis, IN 46220, 317-259-4307

FOR THE HIGHEST QUALITY GRAND PIANO REFINISHING call 'ADEPT of Ft. Myers, FL. Bill Collins proprietor, 32 years in the craft. Licensed for 11 years at this same location. Specializing in exquisite, high quality and high gloss, lacquer finishes. Color and natural finish matching, case restoration, and invisible repairs. PH. 813-275-7170.

SOUNDBOARDS INSTALLED, topsides rebuilt. Bridge-conformed, scale-diaphragmized boards with truly quartersawn ribs (sitka, eastern, or sugar pine). You send us the case, we'll return you a piano. Quality's the bottom line. David G. Hughes, RPT. 410-429-5060. Baltimore.

REFINISH PIANO HARDWARE in nickel, brass, or chrome. Metal finishing specialists for over thirty years. Parts shipped back to you in 2-3 weeks. Rush jobs can be accommodated. Whitman Company, Inc. 356 South Ave., Whitman, MA 02382. Ph. 1-800-783-2433.

STEINWAY, MASON & HAMLIN and other high quality piano re-manufacturing specialists. Our commitment is to achieve each individual instrument's performance capability. This is achieved through the finest raw materials, processes and craftsmanship. The experience of over fifty years of manufacturing processes and concert service to the greatest pianists can be offered through no other restoration facility. Please contact Peter Mohr at 603-624-2077 for more information or a quotation.

SENECA PIANO KEY. Quality key services at competitive prices. Sharps replaced, key bushing and the finest key recovering at any price. Write or call for price list and information on quick return of your key work. Seneca Piano Key, Ted Oberhaus, 4977 Frontenac Road, Trumansburg, NY 14886; 607-387-3095

RESTORATION OF CARVED WORK, turnings, inlays, and marquetry, including repair of existing work and reproduction of missing pieces. Edwin Teale; 18920 Bridgeport Road; Dallas, OR 97338; 503-787-1004.

52 PIANO KEYS RECOVERED— .075 tops with fronts (molded plastic) - $95.00; .050 pyralin - $100.00; .060 pyralin - $105.00. Gloss sharps (3 1/2") - $50.00. Keys rebushed: premium cloth - $75.00; leather - $95.00. Other services available. Call or write for price list. FREE return freight on prepaid orders of $50.00. Walker Piano Service, 554 State Route 1907, Fulton, KY 42041, 1-800-745-6819.

SIGHT-O-TUNER SERVICE: Repairs, calibration & modifications. Fast, reliable service. Richard J. Weinberger; 18818 Grandview Drive; Sun City West, AZ 85375. PH. 602-584-4116.

TRAINING

WELL-TEMPERED TUTOR. Learn to tune by ear with your Macintosh computer. Use pre-programmed temperaments or create your own. If you have trouble hearing beats, this program can isolate the beats for you. Score yourself with the PTG exam. Twenty-one historical temperaments also available. Demo disk available. Mark Anderson, RPT: 510-524-0390 (California). Great teaching tool!

NILES BRYANT OFFERS TWO HOME STUDY COURSES: Electronic Organ Servicing: Newly revised. Covers all makes and models — digital, analogue, LCT's, synthesizers, etc. Piano Technology: Tuning, regulating, repairing. Our 87th year! Free booklet; Write or call NILES BRYANT SCHOOL, Dept. G, Box 19700; Sacramento, CA 95819 — (916)454-4748 (24 hrs.)

BILL GARLICK SEMINARS-Upgrade your skills at intensive six day resident seminars at Bill's home. Applications are invited for upcoming seminars in tuning, grand action regulation, historic tunings, harpsichord maintenance. Tuition includes instruction and use of facilities, private bedroom (share baths), breakfast and lunch. Write or call for information. Bill Garlick, RPT, 53 Weeks St., Blue Point, NY 11715; 516-363-7364.

THE RANDY POTTER SCHOOL OF PIANO TECHNOLOGY — Home Study programs for beginning students, associate members studying to upgrade to Registered Piano Technician, and RPT's wanting to continue their education. Tuning, repairing, regulating, voicing, apprentice training, business practices. Top instructors and materials. Call or write for information: RANDY POTTER, RPT; 61592 ORION DRIVE; BEND, OR 97702; 503-382-5411. See our ad on page 3.

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.

VIDEOS

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

PIANO TECHNOLOGY EDUCATIONAL MATERIALS. $49.95 each reel— Vertical Piano Regulation, presented by Doug Neal. Presented by Cliff Geers: Plate & Pinblock Installation Part I, Plate & Pinblock Installation Part II, Wood Repairs, Soundboard Repair, and Grand Hammer Replacement. Add $5 per order for shipping and handling. Questions? Call 712-277-2187. Mail orders to PTEM, 3133 Summit, Sioux City, IA 51104.

WANTED

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

PIANOS! PIANOS! PIANOS! !!!Free phone appraisal!!! Buying all types of usable pianos. Cash or bank check on pick up. Won't hesitate on price. Call us first for fast professional service. "Steinway, Mason-Hamlin command specialty prices." Jay-Mart Wholesale, P.O. Box 21148, Cleveland, OH 44121. Call Irv Jacoby collect 216-382-7600

JAY-MART WHOLESALERS — !!!Free phone appraisal!!! Buying all types of usable pianos. Cash or bank check on pick up. Won't hesitate on price. Call us first for fast professional service. "Steinway, Mason-Hamlin command specialty prices." Jay-Mart Wholesale, P.O. Box 21148, Cleveland, OH 44121. Call Irv Jacoby collect 216-382-7600

ANTIQUE GRAND PIANOS WANTED: Any restorable condition. Top prices for pre-1850, wood-frame grands in original condition. Ed Swenson; P.O. Box 634; Trumansburg, NY 14886; 607-387-6650; Fax: 607-387-3905.

WANTED: TINY PIANOS such as the Wurlitzer Student Butterfly or other small types. Call collect: Doug Taylor, 607-895-6278. I'll pay shipping!

DISPLAY AD INDEX

Mini-Tech Instructors Wanted

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

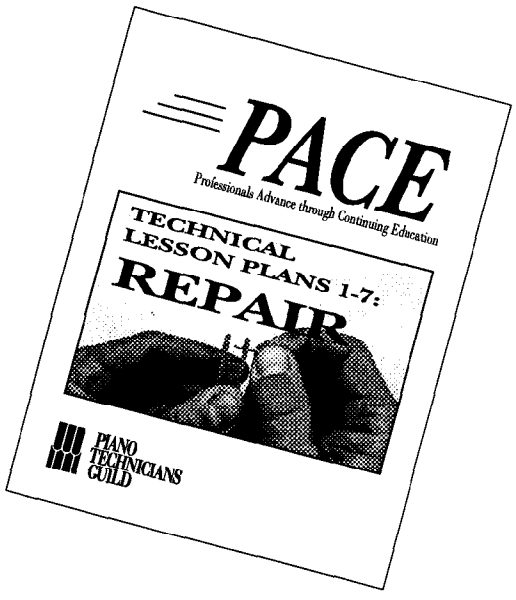
WHEN: July 17 - 21, 1996

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

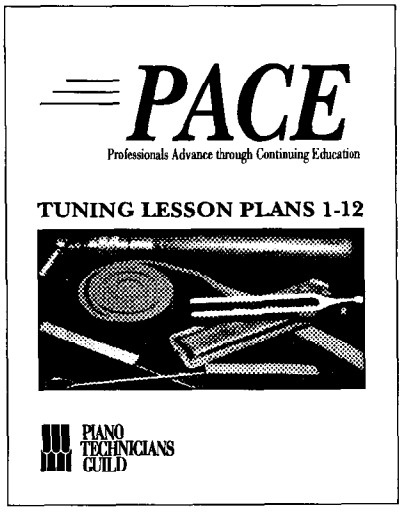
FOR MORE INFORMATION CONTACT:

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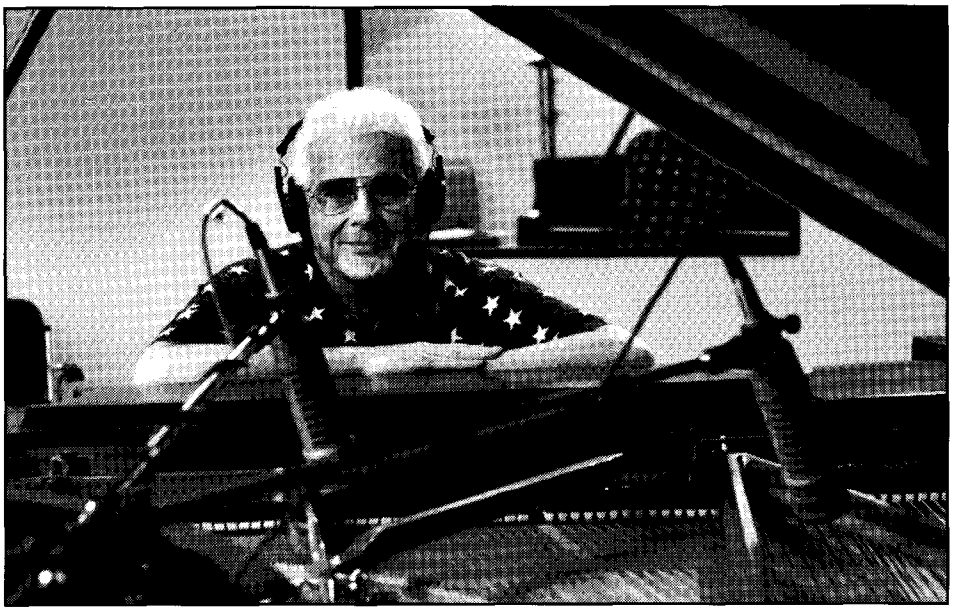
PACE Lesson Plan books and Reprint Kits are all available for $15 each, plus shipping and handling from the Piano Technicians Guild Home Office, 3930 Washington, Kansas City, Mo. 64111. Or by phoning (816) 753-7747, or fax (816) 531-0070.

PianoDiscussions™

September 1995

News From The World of PianoDisc



Steinway artist, Peter Nero, during his first recording session for PianoDisc.

Peter Nero Trio next attraction on Piano Video

Famed Steinway artist Peter Nero, widely acknowledged as the greatest pops pianist of this century, is set to return to PianoDisc in mid-August. Mr. Nero, along with Mike Barnett and Steve Pemberton, who make up the Peter Nero Trio, will be in Sacramento to make two PianoVideos.

PianoDisc dealers and technicians will remember the PianoVideo technology from previous NAMM shows and PTG conventions. Floyd Cramer starred in one which garnered a great deal of attention. Another featured Sacramento Symphony musicians playing a Claude Boling suite. As the artists are seen performing on video, the other instruments are heard through speakers and the piano is playing live, in perfect sync with the pianist on camera. The effect is mesmerizing, rather like virtual reality for the piano.

Mr. Nero will bring to the project the virtuosity and showmanship which have been the cornerstones of his very successful career. Record industry accolades include ten Grammy nominations, two Grammy awards and a citation from *Cashbox Magazine* as the "World's Number One Instrumentalist."

Mr. Nero has put his considerable energy and enthusiasm into the selection of material for the videos. Anyone who has heard his PianoDisc recording, or any of his records and CDs over the years, can attest to the style and taste he will bring to this project. It is with tremendous pride that we welcome Peter Nero back to PianoDisc.

PianoDisc sales surge in 2nd qtr

PianoDisc sales figures for the quarter ending June 30, 1995 have shown a dramatic increase over the same period last year. Total unit sales are up over 27 percent and sales of PianoDisc pianos are up an astounding 95 percent.

Our resounding success is not an unexpected phenomenon. Industry experts who are familiar with the range of products available, agree that PianoDisc packs more features, is more flexible and has more possibilities for the reproducing piano customer than any other product on the market today.

Piano retailers across the country have enthusiastically endorsed PianoDisc as their product of choice, citing significant increase in sales with the addition of PianoDisc to their product lines.

PianoDisc's position as the best selling player system in America is due to many factors: one touch record and playback; software upgradability; and the best compatibility with all marketed software. All these conspire to make PianoDisc the best value for the money on the market today.

PianoDisc Installation Training 1995

- Sept. 12-16
- Oct. 17-21
- Nov./Dec. 28-2

Continuing Education Series 1995

- October 12-13

Tuition for the installation and Continuing Education seminars is **free**, but a $50.00 refundable deposit is required for confirmation. The PianoDisc Continuing Education Series seminars are restricted to PianoDisc certified technicians in good standing. For more information about attending a PianoDisc Installation Training seminar or a Continuing Education seminar, call PianoDisc during our office hours (see below).

PianoDisc

4111 North Freeway Blvd.
Sacramento, CA 95834
Phone: (916) 567-9999
Fax: (916) 567-1941

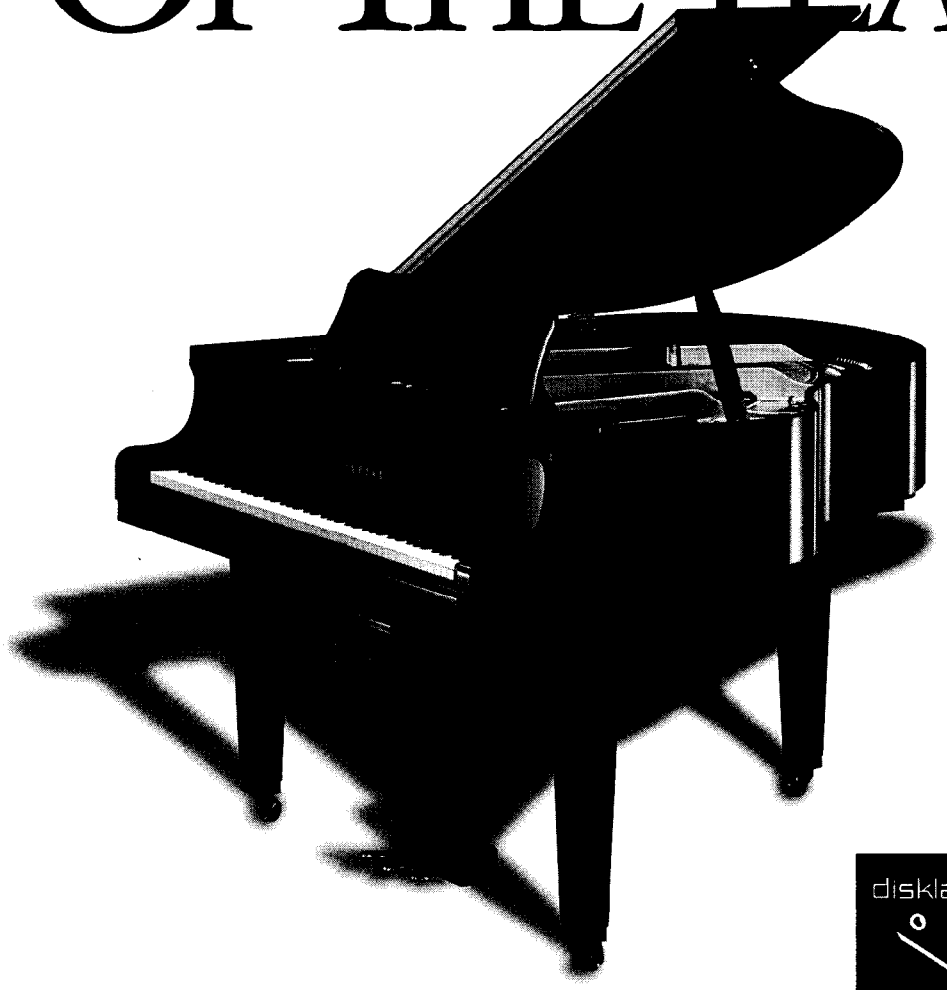
Tech Support: (619) 258-1460
(916) 567-9999

Our telephone lines are open daily (except weekends and holidays) from 8 AM-5 PM Pacific Time.

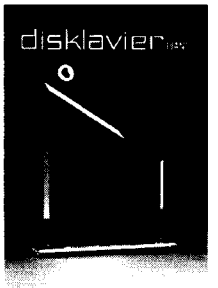
UPDATE

Be sure to look for *PianoDiscussions* October issue for some amazing news about composer, actor, comedian, author and pianist Steve Allen!

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.



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