Piano Technicians Journal

January 1988

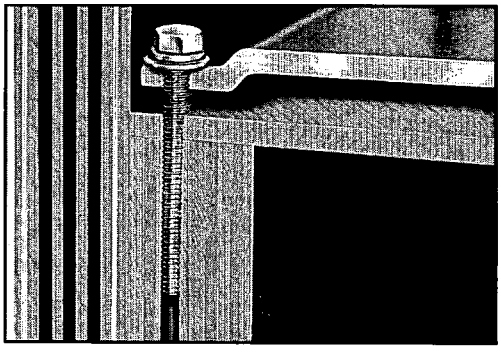
The Baldwin Piano...
You can see why it sounds better

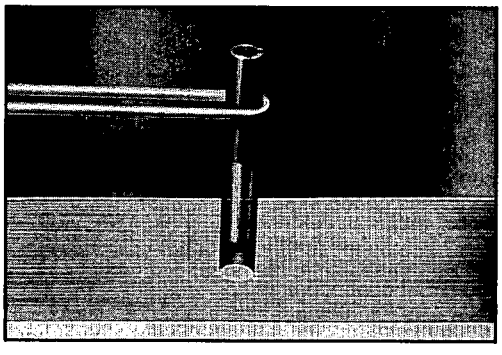
The precise setting of downbearing is extremely important to piano tone. Too much bearing inhibits tone because the soundboard cannot vibrate freely, while too little bearing does not provide good sound transmission. From our research we have developed a unique method of setting downbearing with a degree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

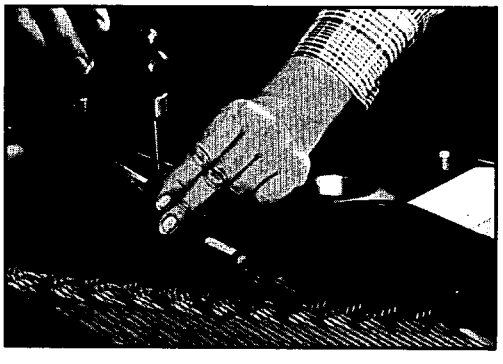
GRAND PLATE MOUNTING SYSTEM: Each mounting hole around the perimeter of the plate is threaded to accept a hardened steel bolt. This allows the plate to be set at the optimum height for bearing on the front side of the bridge (U.S. Pat. No. 3,437,000).

ACU-JUST™ HITCH PIN: Because this pin is installed vertically instead of at an angle, it is possible to raise or lower each string individually for ideal bearing on the back side of the bridge (U.S. Pat No. 3,478,635).

There are important advantages for the technician, too. 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 hoist it out. Tiny adjustments in bearing can be made without unstringing the piano or even lowering the tension. Since such adjustments are not normally necessary in the field, they should only be made after consulting Baldwin Technical Service in Cincinnati. When re-stringing a section or an entire piano, contact Baldwin for the loan of special bearing-setting equipment.







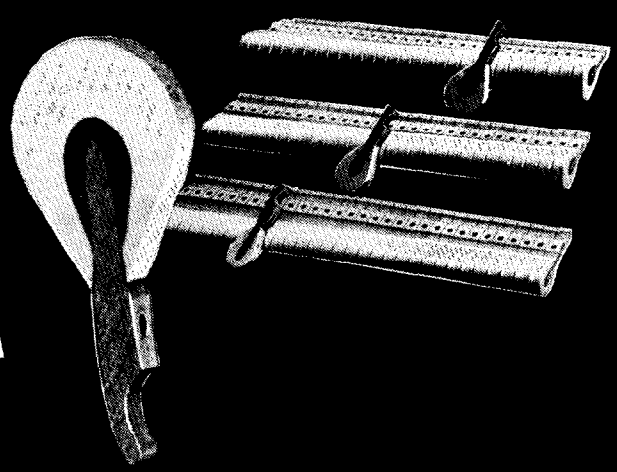
Second in a series of informative ads on piano tone published by Baldwin Piano & Organ Company exclusively for the benefit of piano technicians.

Baldwin® – *Leading the way through research*

Schaff

NOW HAS AVAILABLE...

IMADEGAWA
HAMMERS FROM JAPAN.



Due to the increase in popularity of Japanese-made hammers the last few years, Schaff has contracted with the Imadegawa Company in Japan to be a nationwide distributor. We will maintain a large stocking inventory which together with our years of replacement hammer expertise, will enable us to provide the finest hammer duplication service in the U.S.A.

Who else can offer...

1. A full range of wood moulding sizes and felt weights to accommodate almost any hammer duplication requirement.
2. Both upright and grand type hammers.
3. Either standard bore stock sets or custom made hammers.
4. A long standing history of providing reliable service and selling quality products.

CHARACTERISTICS OF STANDARD BORE STOCK HAMMERS

UPRIGHT HAMMERS—A set consists of 30 bass and 64 treble hammers. All bass section hammers are drilled at an 18° angle. Tenor section has 14 hammers at 12°, 10 hammers at 7° with the balance of tenor and treble at 0°. A 7/32" diameter drill is used for the bore hole. On a special order basis a type "B" set can be ordered with all tenor and treble hammers bored at 0° angle. On a stock basis upright hammers are available in the following striking distances (as measured at the treble end) of 2⅜", 2 7/16" and 2½". Also 12 Lb., 14 Lb., and 16 Lb. weights of felt available. All hammers are made of birch wood moulding, stapled throughout and have the option of being reinforced and unbored.

GRAND HAMMERS—A set consists of 30 bass and 65 treble hammers. All bass section hammers are drilled at a 9° angle. Tenor section has 8 hammers at 9°, 8 hammers at 6°, 10 hammers at 2° and the balance of tenor and treble at 0°. A .204" diameter drill is used for the bore hole. All hammer tails are shaped and tapered at no additional cost. On a stock basis grand hammers are available in the following striking distances (as measured at the treble end) of 1⅞", 2" and 2⅛". Also 12 Lb., 14 Lb., and 16 Lb. weights of felt available. Hammers come stapled throughout and can be provided unbored. Except for Steinway style, all grand hammers are made of birch wood mouldings and have the option of being reinforced.

STEINWAY STYLE—A set consists of either 20 or 26 bass hammers, reinforced with walnut mouldings and bored to Steinway specifications.

CUSTOM BORE HAMMERS

Both upright and grand hammers are duplicated from customer samples and bored to exact specifications. With our extensive inventory, we should be able to match 90% of the samples received for duplication. The samples we cannot match for Imadegawa hammers can be made from our high quality U.S. made hammers. Try Schaff and avoid unnecessary replacement hammer costs and order processing delays that occur in dealing with smaller suppliers.

WRITE OR CALL US FOR A COMPLETE PRICE LIST ON IMADEGAWA HAMMERS.

THE HOUSE DEDICATED TO SERVICE

Schaff PIANO SUPPLY COMPANY
451 OAKWOOD ROAD, LAKE ZURICH, IL 60047

Prices Subject To Usual Discount
For Same Day Service Try Our 24 Hour Phone
(312) 438-4556

The Piano Technicians Journal — **January 1988**

Official Publication Of The Piano Technicians Guild, Inc.

Volume 31
Number 1

IN THIS ISSUE...

PLUS...

THE COVER...

Next to a modern piano hammer, the original hammers, hammershanks, and dampers from Graf's fortepiano serial number 1594, now at the Smithsonian Institution in Washington D.C. The splices in the original hammershanks were designed to save as much of the original shank as possible. The bass dampers consist of a wooden wedge covered with soft sheepskin. The original treble dampers were made of a peculiar woven wool material which so far has not been identified. See page 23 for more on restoring antique instruments.

The Piano Technicians Journal (ISSN 0031 9562) is the official publication of The Piano Technicians Guild, Inc., 9140 Ward Parkway, Kansas City, MO 64114. The Journal is published monthly, with two issues in December. Second class postage paid at Kansas City, MO., US ISSN 0031 9562 foreign and domestic. POSTMASTER: send address changes to: Piano Technicians Journal, 9140 Ward Parkway, Kansas City, MO 64114.

Annual subscription price: $85 (US) for one year; $155 (US) for two years; $7.50 (US) per single copy. Piano Technicians Guild members receive the Piano Technicians Journal for $45 per year as part of their membership dues.

ROBERT CONRAD — KANSAS CITY
Authorized distributor for **Sanderson Accu-Tuners** and **Accu-Tech Tool Cases**

Accu-Tech Tool Cases for the Accu-Tuner Technician. Professional in appearance and quality. Lightweight, but made to take the punishment of everyday use.

Available In Three Sizes:
Large, 19"x13"x6".....$165
Medium, 15"x10 1/2"x6" $130
Small, 12 1/2"x8 1/2"x6" $80

After seeing the rest, Accu-Tech is still the best!
Robert Conrad.....(816) 444-4344
6405 Wyandotte, Kansas City, MO, 64113,
Collect calls accepted...VISA/MC

PIANO LOCATORS INTERNATIONAL
Locating pianos for the trade since 1913.
Second generation
FREE LISTINGS — WORLDWIDE SERVICE
We've linked buyers with sellers on over 25,000 pianos.
We locate all types of pianos. Specializing in concert and baby grands, vertical and player. Antique and coin-operated instruments. Art-case of all vintages. Special order and one-of-a-kind models also located.

Write: **JAY-MART** *Call:* **1-216-382-7600**
POB 21148
1568 SO. GREEN ROAD
CLEV. 44121 OH

NOT JUST FOR BEGINNERS...

THE RANDY POTTER SCHOOL OF PIANO TECHNOLOGY

Our basic and intermediate course in piano tuning, repairing, regulating, apprenticing and business practices training is not just for beginners.

In fact, half of our students are intermediate students — those who have previously taken another course (correspondence or residence), have a year of part-time or full-time experience or apprentice training with another technician.

Why would *they* take our course? To increase or upgrade their technical skills. To get business-practices training. To help prepare for their Registered Tuner-Technician exams. To use our *Apprentice Training Manual*, the only manual of its type published in English.

In fact, our course is the only one of its type: With video cassette tuning, repairing and regulating training including instructors like George Defebaugh and Jim Coleman. With more training material than has ever been offered in any home study course before.

One intermediate student says "Thanks for the goods, especially the lessons. You have done a first-class job of preparing this material. It is very professionally done. The best part is that it is extremely clear, quite concise and very understandable. It is definitely worth the money." Clyde Sayler, Associate Member, McMinnville, OR

Call or write for additional information:
Randy Potter, RTT
61592 Orion Drive
Bend, OR 97702
(503) 382-5411

Randy Potter School
Of Piano Technology

Hale Extension Tuning Hammer with Rosewood Handle

It has been 40 years since rosewood handles have been available on the Hale Extension Tuning Hammer. Now, we're making this beautiful looking tool available especially for those tuners/technicians who want the feel of wood—and appreciate added value!

You get the traditional Hale quality that has built our reputation, a choice of one head and one tip and a felt hammer bag #331T is included. The Hale Extension Tuning Hammer accepts Hale #21 Tuning Hammer Heads and #32 Tips.

Shouldn't you be ordering yours today?

Make it a Rule — Use a Hale Tool

Piano Tools Hale and Supplies

TUNERS SUPPLY COMPANY
Serving the Music Industry Since 1884

EASTERN BRANCH: 94 Wheatland Street, Somerville, MA 02145 • (617) 666-4550
WESTERN BRANCH: 190 South Murphy Ave., Sunnyvale, CA 94086 • (408) 736-2355

President's Message

M. B. Hawkins
President

Course Corrections

In January 1986, words such as "goals" and "blueprints" were the words around which much of this article centered. If you will recall, it was mentioned to be as specific as possible in defining what you want to achieve by formulating a plan from which to work. That article closed by suggesting you take full advantage of the early months of the year so that a strong finish could be anticipated at year's end.

Let me ask the question: did the year end as you had planned? Were you successful in making the necessary course corrections throughout the year in order to stay on track? There were any number of things that occurred during the year economically which made course corrections an absolute must. How did they work out for you? Whether it was your first time or fortieth time does not matter. There are always things to be gained from planning. I hope you have taken those items unique to your experience and recorded them so they will become plus items for you in the future rather than irritants.

No matter how the year turned out, we are now faced with another 12 months. It is in our hands once again. How do we deal with it? Shrug our shoulders and wring our hands because everything did not go as we expected? I would certainly hope not. By all means, back up – collect your thoughts and charge ahead. Not much was ever achieved by giving up. At the same time, there is so much to be gained by constantly looking for a new beginning. Actually, isn't that the situation we deal with daily? I would hope your thoughts this year will be surrounded by optimism as the following statement states so well, "an optimist goes to the window every morning and says, 'Good morning, God.' A pessimist goes to the window and says, 'Good God, morning!'"

We should always keep this in mind. We chose this line of work. We made the selection because we presumably enjoy doing what we do. Based on that, we can accept the statement made by Andy Granatelli, "When you are making a success of what you are doing, it's not work. It's a way of life. You enjoy yourself because you are making your contribution to the world."

Of course if you are not making a success of what you are doing, there is good reason to reevaluate what it takes to move ahead. You will no doubt discover that people who make things happen seem to posess a sense of urgency. I sense this sense of urgency in our members who can't wait until the next chapter meeting or where the next seminar is going to be held and how soon can I register for the annual institute wherever it is going to be. These seem to be the people who are moving ahead. They are making the sacrifices which bring them closer and closer to perfection, which we all know very well can never be reached. Nevertheless, we must continue to strive for excellence. So do whatever it is you must do in order to be present at the St. Louis arch in July of this year – the gateway to excellence.

Please know the shakers and movers will be there. I trust you will be among them.

May this new year bring the best of health and happiness to everyone.■

Tech Gazette

Yamaha Piano Service January, 1988

Parts, Etc.

ADJUSTABLE CHAIRS

A Practical alternative to the piano bench, the quiet elegance of the **adjustable chair** is available in two finishes — polished ebony and satin ebony. Our adjustable chairs feature a padded vinyl seat and can be adjusted in height from 16.5" to 21.5". They offer a welcome addition to teaching studios and recital halls. Adjustable chairs have all the features of an artist bench without the "artist" price. Available through our Parts Department, both finishes cost $145.00 each.

Yamaha in the News

COMMUNICATION CENTER

In a continuing effort to enrich and enhance our lives through the enjoyment of music, Yamaha Corportion of America recently unveiled the new **Yamaha Communication Center** in the Metropolitan Tower, 142 West 57th Street, New York City — just two doors from Carnegie Hall.

The first floor of the center is a product showroom open to the general public. A representative sampling of Yamaha products is available to be seen and heard. Admission by invitation is required for the second floor. This houses specialized facilities which allows Yamaha to gather critical and timely input from artists and educators. Information obtained using current products, prototypes, and innovative experimental techniques will be instrumental in future product development.

Devoted to research and development, the Yamaha Communication Center will use this data cooperatively with other Yamaha research and development facilities worldwide.

YAMAHA C3E MIDI GRAND

Of all the musical instruments used in the elaborate production of Michael Jackson's latest recording, "BAD," the only instrument listed in the credits is the Yamaha MIDI Grand Piano. We're sure this is only the beginnning for this exciting new instrument.

Personnel Profiles

MITCH ITO

Mitsugi "Mitch" Ito is from Toyokawa, Japan. Mitch started his career with Yamaha after graduating from the Chukyo University in Nagoya. After seven years in manufacturing and production control, he transferred to the Yamaha Hiroshima branch and became involved with piano sales.

In the early 1980's, Mitch served as an instructor at the new Piano Technical Academy in Hamamatsu. His technical expertise brought him to the Everett Piano Company in South Haven, MI in 1983. In the fall of 1985 Mitch transferred to the Yamaha Buena Park facility as Technical Manager for the Piano Division. Mitch, his wife, and two daughters reside in Anaheim, CA.

New Products

GH2 GRAND PIANO

The Piano Division recently announced the introduction of a new 5'7" grand piano, the **GH2**. It will be marketed as part of the "Home Classic Collection."

The new GH2 will be available in satin ebony, polished ebony, and satin American walnut. This new model features an entirely new scale design, and a natural wood finish inner rim.

M400 CONSOLE PIANOS

The **M400** series console pianos are now available at many dealerships across the country. A part of the "Gallery Collection," the M400 pianos are manufactured in Thomaston, Georgia by Yamaha Music Manufacturing, Inc.

The M400 pianos are available in three models and finishes. The M402 is a rich oak finish in Spanish styling. The M404 is an elegant walnut finish in Italian Provincial styling. The M405 is a warm cherry finish with French Provincial styling. Fine cabinet work and a competitive price make the M400 series consoles a welcome addition to the Yamaha Piano line.

Calendar of Coming Events

January 15-17:	Winter NAMM Anaheim, CA
PTG Conventions	
February 12-14:	California State Torrance, CA
March 11-13:	S. Central Regional Fayetteville, AR
March 19-20:	Central W. Regional Wichita, KS
April 8-10:	New Eng. Regional Newport, RI
April 15-17:	Pennsylvania State Altoona, PA
April 29 & 30, May 1:	Michigan State Livonia, MI
July 18-22:	31st Nat'l. Conv. St. Louis, MO

YAMAHA

From The Home Office

Larry Goldsmith
Executive Director

It's That Time Of Year!

There's something about this time of year that inspires in people a desire to do good, or at least better than they have in the past. Maybe it's the thought of starting a new year with a clean slate. Maybe extra, non-working time during the holiday season gives them the opportunity to reflect on their sins, although that extra time never seems to apply in the case of piano technicians or people with monthly publication deadlines. Maybe it's only a post-holiday hangover whose memory fades through the coming seasons until it rears its ugly headache again next January.

For whatever reason, everyone makes New Year's Resolutions. Usually they're already forgotten or broken midway through the first football bowl game. And perhaps it's better that way – imagine what the world would be like if everyone actually did all the things they solemnly vowed to do on New Year's Eve. If we were all perfect, there wouldn't be much point in continuing.

That doesn't mean we shouldn't try for improvement. The virtue is in the attempt, in getting up each of the next 365 mornings with a desire to be a better person and going to bed each of the next 365 evenings comforted with the knowledge that by our actions that day we have made the world a somewhat better place. And then repeating that activity every day of every year for the rest of our lives. Making a resolution and then quitting just as soon as we've broken it just isn't going to cut it.

So what do we resolve? If it's a personal habit like cutting out double-fudge blueberry-banana cheesecakes (it takes all kinds, right?) or picking up your socks, more power to you. You and those around you will probably be healthier and happier. But save one resolution for the Guild. Maybe this is the year you'll offer to share some of your hard-won knowledge by giving a chapter technical. Maybe this year you'll set aside the time and money to go to the St. Louis convention and see what the excitement is all about. Maybe you've thought about writing an article for the *Journal* – now's as good a time as any.

Look at any one of the above activities. They're all pretty public-spirited, right? But if you look a little deeper, it's not to tough to see a payback in each of them – a better chapter, more personal knowledge, the respect of your peers. Why waste a perfectly good resolution on cheesecake when you can shoot for something that will do everyone some good? ■

Kawai...
The Standard
of Excellence.

At Kawai, the tuner's hands and ears alone can determine the final "rightness" of a piano in the final tuning process.

KAWAI
The Master Builder.

The International Scene

Fred Odenheimer
International
Relations Committee

Thoughts On The Industry

We recently received the "*Music Trades* Purchaser's Guide" and naturally the first thing to do was look up American Piano manufacturers. There are exactly seven names listed and we can think of one, perhaps two, that are not mentioned. Many makers are just a memory of our recent or distant history. All that we can hope for now is that our manufacturers stay in business to their and our benefit for a long time to come.

In the September issue of the *Music Trades* is a report by various dealers throughout the country about the impact of digital pianos on sales. It is interesting to note that aside from some, one could say minor, differences of opinion, the general consensus seems to be that in a price range of $1,000 to $2,000-plus, the digital piano is doing well. If there are complaints, it has to do with the housing which some of the dealers think should be improved to better fit into the home. For most of the dealers reporting, the digital piano has not affected sales of acoustic instruments which are preferred at prices of over $3,000.

Continuing on electric pianos, I hope the *Music Trades* will allow me to quote verbatim from an article on "How Silicon Chips Revolutionized Electronic Pianos:" "'Within five years, a majority of all pianos manufacturered will be electronic,' this according to B.F. Meisner in a pronouncement made in 1954. It has not happened yet due to the complexity of an acoustic piano. Each of the piano's 88 notes can produce up to 100 different harmonics. Consequently an acoustic piano is capable of literally hundreds of millions of distinct sounds. Digitally quantifying and storing this immense volume would require millions of dollars of computer memory."

And finally in an article titled "Who buys digital pianos and what motivates them?" Yamaha research finds that purchasers of Yamaha Clavinovas are generally 40 years of age, mostly buying the instrument for their own use, but 25 percent purchased it for the musical education of their children.

This then lets us draw some conclusions. Without doubt a digital piano is better than a cheap acoustical instrument. For the future it may also mean that children growing up with digital sound may prefer this sound over an acoustical sound. As they themselves become parents later in life they in turn may purchase such an instrument, especially if cases are made more attractive. While in the immediate future the acoustical piano will, from all accounts, retain its place as a preferred musical instrument, in the more distant future we may have to expect a decline in the popularity of the piano as we know it today.

Finally with the October issue of the *Music Trades* came an advertisement and record of the Korg Company which makes fun of the piano technician in a, I would say, cheap way. Korg's digital piano indeed may not need any tuning, but does it also not need any service? ■

THANK YOU!

From Jerry, Jerry's Kids and Kimball.

We wish to thank you, the many piano technicians who participated in the recent Kimball Keys For Kids benefit program. The unselfish donation of your time and generous contributions will go far in assuring Jerry's Kids will receive the best in help and resources.

See You In St. Louis

Ernie Juhn
Technical Institute Director

The Return Of Three Instructors

"The return of John Ford, Norman Neblett and Chris Robinson". Remember these instructors? They all have one thing in common: they have a lot to offer. Well, all three of them will be back with the most interesting classes and – as promised – something they have not offered at any annual convention before.

John Ford is a man of many talents. His knowledge of piano manufacturing history as well as piano tools of the past is known. This time John will switch to another – new – topic, **"The Many Ways of Filing Hammers."** We all know that there are many ways to "skin a hammer." John Ford will show some of the many methods to wind up with a well-shaped resurfaced hammer.

Norman Neblett, who filled class rooms with his demonstrations on voicing as well as classes like "from the bottom up" is also a very busy and fine concert technician. This time Norman will present a national convention first: **"So You Want to be a Concert Technician."** To say the least, something to look forward to.

No doubt those who don't know Chris Robinson are missing something. I don't believe that anyone ever walked away from any of Chris's classes without gaining knowledge. This time Chris will offer **"The Voicing Project,"** an entirely new and different approach which will make you see as well as hear the results of voicing. Needle(ss) (pun intended) to say, there is no serious tuner-technician who can afford to miss Chris Robinson's "The Voicing Project." ■

Economic Affairs

Henry L. Jones
Chairman, Economic Affairs Committee

Are You Tired Of Playing Games?

The computer "revolution" has been with us longer than most of us care to remember. Do you recall the first computer application you were aware of? Do you remember the first time a computer affected you? I doubt it. Computers entered our lives somewhat gradually but dependence upon them has been growing at a rate that is nearly beyond our comprehension. Computers are in our automobiles, watches, banks, schools, kitchens, aircraft, telephones, hospitals, trains, gas pumps, space vehicles, IRS and all other government agencies, sports and you name it – it most likely uses computers. Without computers we would never have been able to put men on the moon!

Developement of useful computers for commercial and military applications really began a spurt of growth in the late '40s and early '50s. That growth hasn't slowed. In fact, it has grown exponentially! In the late '50s through the mid '60s I worked with a group of "brains" developing a computer system that would bring together vital information from military installations world wide to the Pentagon, compute it, and have results available to the Joint Chiefs of Staff and the Chiefs of the military services. The equipment to do the job required space greater than the size of the average home. It worked away constantly trying to complete its tasks, with a core memory of 32K (32,000 bytes of work space), the absolute largest available then. The first system we installed cost hundreds of millions of dollars.

My tiny desk top computer system, which cost about $1,000 almost two years ago, has a core memory of 128K (128,000 bytes of work space), four times the capacity of the then state-of-the-art giant of the '60s, and my computer computes at a rate some 20 times faster!

In the process of improving computers, operation times became super-fast, physical size and costs miniaturized to the extent an ultra-powerful microcomputer can fit atop our desk or table and also be affordable to us.

One important use of small computers today is very close to those of us in the piano technical business. Business is the key word here. It leads us right away to think of management skills. How could we operate a business without some sort of control and analysis process to guide us each day, week, month or year?

Over the years, small business management has been more of an individual thing, sort of a seat-of-the-pants operation. This is clear to me in our specialty – piano tuning and repair – where some are more successful than others. Have you stopped struggling long enough to notice that those of us who are more successful use better, more successful management procedures and techniques? Certainly, it is just not practical for most of us to go back to school or understudy a smart manager to learn up-to-date management skills that would apply and assist us in our small businesses. But, there is another way we can look for help.

Many of us have a "home" computer of one sort or another. Those who don't, can and will. After learning a few simple procedures and commands, we can write letters, play games, write music, develop simple programs and much more. Are you already tired of playing the games and simple stuff? Why not put the

Economic Affairs ...

"little" computer to work helping you manage your business?

Just what could you expect a small computer to do for you in the operation of your business? There are three general types of programs for small computers that should be considered.

The planner-type program can be used to develop and store customer records, to include as much or as little as you may need to help scheduling, such as location information, name and type of instrument, last service date, next service date, etc.

The spreadsheet type of program can be used to develop formats we need for recording receipts, expenditures and inventory. Associated periodic summary reports can be generated by the computer to help in the decision process relating to accounting, taxes, cash flow and business control.

The third category would be the word-processing type of program – letter-writing, editing, announcement development, flyer production, generating forms and formats and mailing lists are just a few of its uses.

These few programs will help tremendously in the era of ever-increasing costs and complexities of doing business. We are being forced to find new ways to reduce costs and maintain tighter control of our operations just to remain in business. I'm suggesting that an inexpensive small computer system can assist us immeasurably in both of these critical areas.

If you're interested, there is an abundance of computer talent within our own ranks – the Piano Technicians Guild. Every convention and most seminars I have attended in the past four years had classes related to computer use. Were you there? Will you be attending soon? Conversations I've had with appropriate people indicate more computer classes and more concentrated application classes are planned for state and international conventions coming up. Be there!! ■

Letters

A note of appreciation:

Words come hard at a time such as this, but we would like to try. As I am awaiting a heart transplant, it is very comforting to know that people take the time to care and share. We appreciate the friends who organized the "Bob Russell Fund"; the many gifts that were offered; all the thoughts and prayers that came our way and the many cards that brighted our days.

You light up our lives,
You give us hope to carry on,
You light up our days,
and fill our nights with love.

A big appreciation to all of you. Because of you and your support, we can face the challenge.

Bob & Ginny Russell

THE TECHNICAL FORUM

Installation Of Backchecks, Heavy Touch

Susan Graham
Technical Editor

Greetings to you all and best wishes for the coming year. Perhaps like me you were encouraged by a particular advertisement on network television during the holiday season. It featured a middle-aged man sitting at a grand piano, working on scales while his wife gently teases him for "really being serious." He replies "I should have done this long ago. Think where I might have gotten." This was not an advertisement for a particular piano. Rather, it was from a major credit company, promoting the use of its card to obtain something long desired. Regardless of how one feels about the credit industry, isn't it nice to see a grand piano is still symbolic of a lifetime dream? (No, it wasn't in tune, but I guess we can't have everything...)

As promised, this month's *Journal* features the beginning of a series by Edward Swenson. His academic background in musicology and his pratical background in restoring antique pianos make him a valuable person in our profession. I think you will find his articles useful as well as interesting.

Installation Of Backchecks

To continue with procedures featuring use of the key clamp, this month's column is on the installation of complete backcheck assemblies: new heads on new wires.

There were several reasons for recovering old backchecks heads: to save the time of obtaining parts; to preserve the look, shape or weight of a distinctive backcheck head; to replace inferior or excessively worn leather on fairly new backcheck heads. Similarly, there are a number of reasons for replacing the entire assembly. It may not be that a grand backcheck wire assists repetition with a "spring" action as it releases the hammer (as does a vertical backcheck wire) but the wire must provide solid support to the head to meet the pressure of the rebounding hammer. Old backcheck wires seem to soften; for instance, heavily played reproducing grand actions frequently have backcheck wires which are very easily bent and the checking is poor. There is also the sound philosophy of not putting new parts on old – new hammers on old shanks, new backcheck heads on old wires, etc. – when it is just as fast (or faster) to replace the entire unit. This eliminates any concern about compromising quality of the job. In every instance I have seen, the wire is pressed into the back of the key; some heads are threaded and some are also just pressed. It is as fast to remove the entire assembly as it is to pull or screw the heads off the wire. Finally, if installation is correctly done it is easier and may require less regulation than installing new heads on old wires.

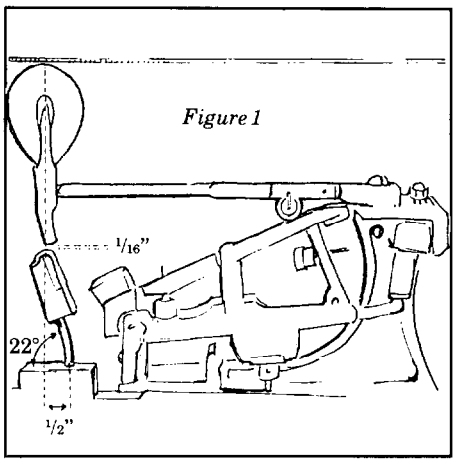


Figure 1

Removing old backchecks is easiest and results in the least trauma to the key end block if the keys are firmly clamped to hold the block while the wire is pulled out. If the key is not clamped, the block tends to come off the back of the key; it can be reglued but that is inefficient. Due to the angle of the wire and the relatively narrow space under the head, the long clamp is not applicable. Clamp the keys individually in a bench vise, with the key hanging vertically, the jaws of the vise clamped over the end block and the backcheck head hanging over one side of the vise. If pressure is applied against the head alone, it will pull off the wire before the wire comes out of the key. Vise-grips form an effective brace, firmly clamped into the wire just below the head so a crowbar can pry the whole unit loose. I use a substantial pair of 8"

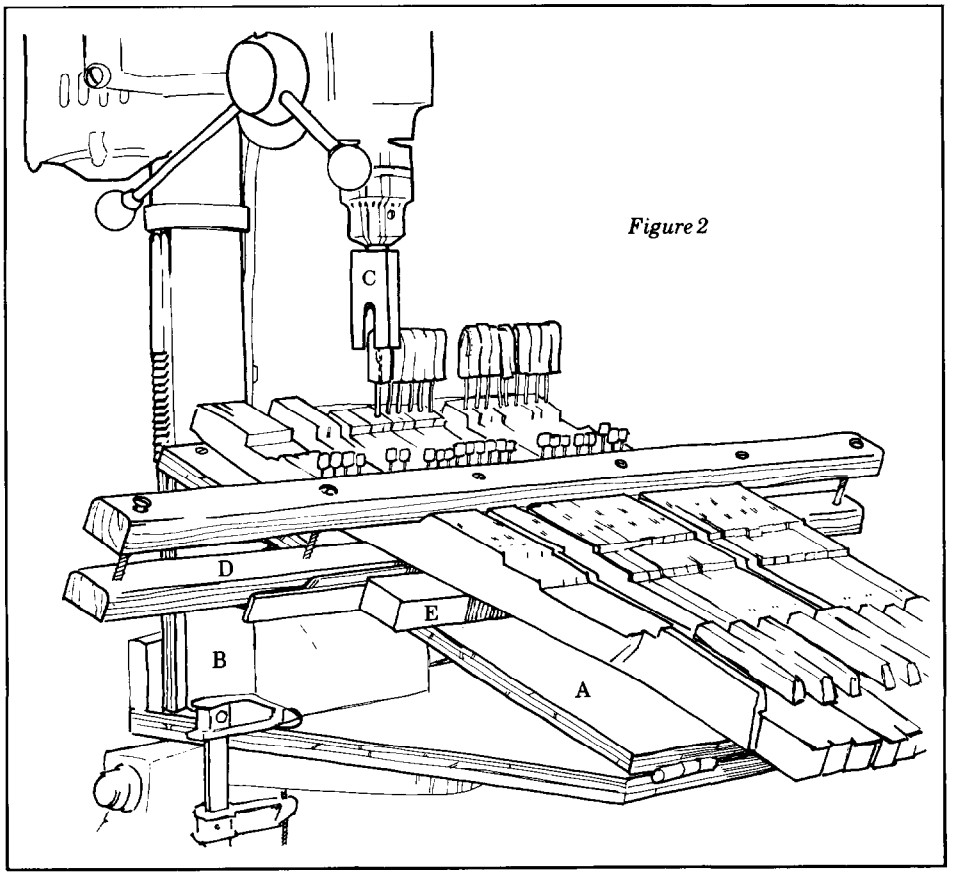


Figure 2

vise-grips and a large crowbar (2' long). (No point in fooling around with inadequate leverage.) The removal operation is very quick and rhythmic: a key is clamped, the vise-grips clamped to the wire, the backcheck assembly pried loose, the vise-grips released to drop into the trash and the bench vise opened 1/2 turn to release that key and receive the next.

The next step is to determine the correct location of the insertion of the wire into the key, and the height of the head. Bruce Clark, of the Sohmer Company (now in operation in the old Pratt, Read building in Ivoryton, Connecticut) has studied the matter and finds that locating the insertion of the wire 1/2" from the line formed by extending the midline of the hammer at strike, with the wire inserted at a 22-degree angle, yields a good result (Fig.1). He has a jig for factory use, but in the field we can make do with a square and a scale. Height is set so the top of the backcheck is 1/16" below the hammer tail at let-off (a figure adapted from the Hamburg Steinway specification of 2mm). Depending on the style of the hammer tails, therefore, the level of the backchecks may graduate slightly from section to section.

If the original backchecks were inserted at the 1/2"-from-midline location, one can simply proceed with installation of new backchecks. If not, the keys can be plugged with hardwood shoepegs and redrilled. Drilling is also done at 22 degrees, utilizing the same clamping and support system used in installation.

It is possible to make a block of wood into a holder to protect the head and pound the backcheck (wire) into the key. However, Wally Brooks has a simple and efficient way of using a drill press to press the backchecks into place (where would we all be without the Connecticut chapter?). I have adapted this method to utilize the key clamps and an adjustable angle support stand.

The angle stand is another piece of simple construction (Fig. 2). It is a three-sided box made of two pieces of 3/4" plywood joined with hinges at one end (A), and a variety of removable third sides (B), the height of which determine the angle formed by the other two pieces. The dimenions of the two hinged pieces can vary, of course; this happens to be 20" long. To raise the top to 22 degrees, a 7 5/8" back piece was cut with a square edge at the bottom and a 22-degree angle to the top. The original use for this stand was to provide angled support for the drill press so pinblocks could be drilled in the piano. At first, I questioned whether the extra time of hinging it for easy adjustment was worthwhile. It certainly was: so far there has been need for back pieces to set five and seven degrees for pinblocks, for 13 degrees to drill out and plug old Steinway keys when I replace square capstans with round ones, and the 22-degree piece for backchecks. To calculate the back dimension needed for a particular angle, a 20" baseline was drawn on a workbench top and a protractor and straightedge used to draw the top line so the back dimension could be measured. The top piece of the stand is drilled in various places to accommodate the bolts for the drill press stand or to allow cross pieces to be screwed on as guiders and holders for work.

The only other piece of equipment for the backcheck operation is a amall block of wood, cut out to accomodate a backcheck head and mounted on a dowel so it can be chucked into the drill press (C).

To make the keys easier to handle, they are clamped in three groups. They are plugged and redrilled if necessary, then sample backchecks are installed at the correct height for each section. The wires of the samples are checked to be sure they do not protrude from the bottom of the keys; if so, all the wires are clipped with the Starrett wire cutters. The clampload of keys is placed on the stand so the lower bar of the clamp (D) rests against the crossbar fastened to the stand (E). In this illustration, it was necessary to add small shims to locate the holes directly under the chuck. It may also be necessary to add another crosspiece for support under the backs of the keys. Remember to keep the surface of the keys parallel to the stand to maintain the angle of 22 degrees.

The drill press is *not running*. It is simply being used as a press: a backcheck is inserted into the holding block and the chuck is lowered by its handle to press the wire into the key. The clamp is not fixed to the stand, so it can slide sideways to align the next key under the chuck. The stop of the drill press is adjusted so the insertion height is uniform. If the press has a means of fixing the chuck so it will not rotate, the job is a little easier. Otherwise, take care

to align the holding block so the backchecks alignment is not twisted. Whether the backchecks align squarely with the back of the keys or are angled is determined by the hammer tails. Most grand hammer tails are shaped so the line of the tails is parallel to the ends of the keys and the action rails (in cross section, the tails of the angled hammers are triangular). Some actions, particularly those in European pianos, have the hammer tails shaped so they remain rectangular in cross-section. The line of the tails form a zig-zag, and the backchecks should be angled to match.

Often when backchecks are installed at 22 degrees, no further beveling is needed, but it should be checked. Check bevel by reinstalling the keys and the stack on the frame and "rocking" a key and hammer: depress the key and hold the hammer firmly so its rise is slightly retarded. Depress first one then the other, keeping force on both to "rock" them and be sure the tail does not catch on the backcheck on the way up. There is usually a scant 1/16" clearance between the two at the closest point. There is also a "feel" test: put the hammer into check, and, still pressing the key, try to force the hammer down the face of the backcheck. If the bevel is correct, it will be possible to force the hammer down, but it will meet with great resistance. If the hammer won't force at all, the backcheck is beveled too far back and the tail is digging in. If the hammer slides past freely or with minimal resistance, the backcheck head is too upright. In either case, checking will be unreliable. Bevel is changed by bending the wire with a larger aperture. It is used to grasp the wire just under the head and bend it so the head is tipped forward or back. This changes the angle of the head on the wire, not the angle of the wire in relation to the key (which is how the checking distance will be set later). Samples are set and a straight edge is used in aligning the remainder.

Backchecks are spaced side to side to the tails using bending pliers. Two bends are required: one at the base of the wire (near the key) to move the head to either side, and another just under the head to square it to the tail. It is done with the action assembled (and after hammer-to-string spacing is correct). Work from behind and push the back of the key up to space the head to the hammer when it is let off, since this is a more accurate representation of the "working" spacing of the hammer. Aligning the backcheck with the hammer raised also indicates where compromises are needed to keep the backcheck from interfering with neighboring hammers. Make these spacing bends exactly parallel to the back edge of the head so no twisting results. The face of the backcheck should be square to the hammer tail, and the back edges form a straight line. Grasp the backcheck heads with a parallel-jaw pliers and turn them if necessary. Turning press-fit heads must be kept to a minimum, however, or they may loosen on the wire. These heads require extra care in alignment during installation. Incidentally, check the shape of the hammer tail at the lower edge. Many hammers end with a sharp corner. Even if the backcheck is correctly beveled, this corner wears the leather very quickly. One stroke of a sandpaper file knocks off that edge and extends the life of the backcheck.

Finally, the checking distance is set. Samples are found – a checking distance of 5/8" is usual – and the remainder are set to match by pushing or pulling the head by hand to bend the wire where it inserts into the key. Raising the checking distance may help in problem areas such as the bass but it is not always a good compromise. When the hammer is held in check the repetition spring is compressed, readying it to return the wippen and key as the key is released. A close backcheck distance may help insure checking, but it may adversely affect repetition since the spring is inadequately compressed. The simple fact of the matter is that it is not always possible to get all hammers, particularly large ones, to check on soft blows. Adequate strength and compression of the repetition spring takes priority. As long as the hammers do not actually rebound and restrike the strings there is little else to do, except to be sure the tails have been slightly roughened. In most cases, new backchecks, properly installed and regulated, will do so much to improve this function within the action that an occasional miss will not be noticed. New backchecks may not be as glamorous as new hammers, but they are part of good quality action work.

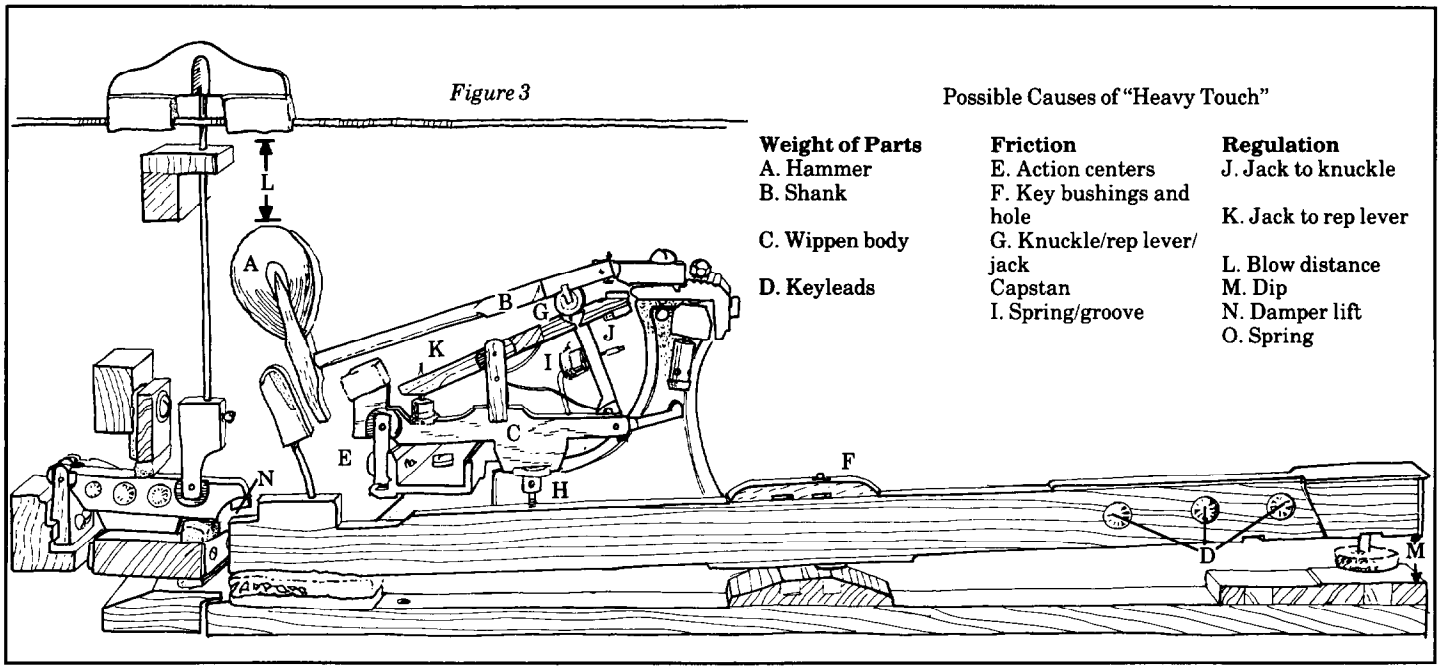
Too-Heavy Touch

Q: *I've a customer with a rebuilt Steinway M and a too-heavy touch. I have determined with a reasonable degree of certainty that the hard touch is primarily the result of friction, and that the friction is primarily between the repetition lever and knuckle. (Sample checks of upweight and downweight show a large but inconsistent difference.) The piano has new shanks (from Steinway) and original wippens, they being the old style with a block of felt in the repetition window to hold the jack's position. The repetition edges and jack tops still have the old graphite which has transferred, to some degree, onto the new knuckles. Assuming that you agree with the diagnosis of friction at the knuckle-repetition interface, what is the procedure to correct it? Should old graphite be completely removed? by scraping? Is there a procedure to clean graphite out of buckskin? and should the knuckles be lubricated with anything? What lubricant should be applied to the reps and jack tops? Would you recommend a spray lubricant if all else fails? Any other likely points of friction? (I have buffed the capstans and added powered soapstone to the new wippen support cushions.)*

Michael Tocquigny
Pocola, Oklahoma

A: Let me commend the technician for not jumping to the conclusion that heavy touch in an action is only to be cured by adding lead to the keys. He takes the sensible approach of looking for more common causes of trouble, and friction at the knuckle is indeed a likely candidate. He also wonders if there are other possibilities. Since there are many, and since we all need to deal with this problem effectively many times in our careers, answering this question is worth considerable space. All good repair starts with good diagnosis, so I'll start my answer with a general discussion of diagnosing "touch" problems.

To define the scope of this discussion, let us think of "touch" as the force necessary to impel a grand



key and its related action parts from resting point through damper lift, let-off, drop, checking and that final key travel which indicates aftertouch. Since we are dealing with humans as well as mechanisms, we must include the way the action feels as this happens – smooth, heavy, bumpy, unreliable, and so forth – all those adjectives we hear from our customers. Finally, we must include the reverse cycles: the way the action returns to its initial position. Any time there is a problem with heaviness (or lightness) of "touch," it is necessary to consider factors within all three categories.

The questions mention downweight and upweight. Taking three measurements is a diagnostic tool: it isolates the first phase of that first category of "force necessary" and gives us a standard by which to measure it. Downweight is the actual weight, in grams, needed to move the key downward from its rest position to the beginning of let-off; upweight is the amount of weight the key will lift from that same point back to its rest position. Measuring is done with a set of graduated weights which are available from our suppliers. They may come slightly overweight and should be weighed and material removed to bring them to specification.

Downweight in a grand action is determined as follows: the action may be on the bench, or in the piano *with the damper pedal depressed.* Weights are placed on the front edge of the key and a bump is delivered with the hand to the bottom of the bench or keybed to break inertia. Weights are added (or removed) until a combination is found that will cause the key to drop slowly to the point that the jack toe just touches the let-off button but does not begin to trip. Sample keys are weighed throughout the action; it is important that the weights are placed in the same location on each key by aligning to the front edge or keypin so placement is uniform. A practical starting weight is 48 grams, since this is made up of the two largest weights and most grands will run slightly above that figure.

Upweight is also measured with the pedal depressed and from the beginning of let-off (jack contacting the button but not tripped). Hold the key down at that point, place the weights on the front and see if the key will return completely. Starting with 15 grams is practical. Obtain upweight for all the keys for which a downweight has been measured.

The current trend in action manufacture is toward a slightly lighter downweight than in the past; each manufacturer is the best source of weight specifications for his piano. In general, grand actions have a downweight in the 48-56 gram range. Within a given action, the downweight may graduate slightly from heavier in the bass to lighter in the treble, but the change should be gradual and uniform. Upweight usually ranges from 15-25 grams: 15 may result in complaints of sluggishness; the closer to 20 or higher the better, making for a snappy return.

These measurements represent opposing movement of the same parts. Changing one changes the other, and the two are analyzed in conjuction. A downweight and a low upweight usually indicate friction: something is creating excess resistance to the key/action on its way down, and also on the way up. A high downweight and a high upweight indicate that the problem may actually be one of weight: the key is difficult to depress but returns quickly and easily. The keys are not in balance with the action parts, often due to new, heavy parts. A low downweight and a low upweight is a sign of a similar imbalance: the action is easy to depress but returns slowly. It may be that the hammer has lost so much weight from wear and filing it no longer counterbalances the key. Finally, a low downweight and a high upweight frequently indicate a worn action: weight of parts and friction are so reduced it produces a "flyaway" action which offers little resistance and is uncontrollable: keys are easy to depress and return so quickly there is bouncing and noise.

The figures give us clues to diagnosing touch problems. Weighing an action which has not been pre-

pared is only an approximation, however. Do not let the fact that you are using weights and that the word "heavy" is being tossed around induce tunnel vision. If the action is out of regulation any of these weight combinations may occur. Not only that, but the figures may seem correct and the action is still unsatisfactory. It is extremely unwise to jump to conclusions about key leading until fit and condition of parts and the state of the regulation examined. We must continue to analyze the action before we consider drilling holes in keys and adding lead, or we may be in for an unpleasant surprise. We look for factors which affect feel and return as well as actual weight.

Since this action has just been rebuilt, one source of trouble may actually be the new parts. I would hope that these are fairly new Steinway shanks, with a good buckskin knuckle and not the brown cowhide variety with which we all suffered for some years. If it is the Hamburg shank, however, the knuckle is located slightly farther from the centerpin and closer to the hammer than it was on the original New York shank. This may cause several problems: it can result in a lighter feel, since the leverage advantage of the jack is increased by moving it back under the knuckle and farther from the hinge (centerpin). It may instead result in a heavier feel, though, since the top of the jack is now tipped back and likely to have greater surface contact with the knuckle, and more friction. This tipping of the jack also changes the relationship of the toe to the let-off button and often requires installation of new, thinner buttons, which Steinway will supply. I would recommend that anyone needing information on use of these parts contact Bill Garlick at Steinway.

The new hammers may be enough heavier in actual weight to throw the action out of balance. A difference of one gram of hammer weight becomes four to five grams at the key, so it does not take much to produce a very heavy downweight. I routinely sand the sides and taper the tails of the hammers before installation and usually redo the curve of the tail afterwards. Removing some of this wood mass helps weight as well as voicing, especially in the treble. So reducing the sides of the shanks in the treble (Hamburg shanks come with reduced shanks for the top section and I reduce shanks for the next section as well.) Another major problem with parts, new or old, is action center pinning. Do not assume that just because a part is new the pinning is correct. Unfortunately, this is not so, and the problem does not go away if ignored. Always check and correct pinning of new parts before installation (you may want to send them back...) and check and correct old parts before attempting any regulation.

There are a couple of details of regulation which are suspect when an action has either actual or perceived excess weight. In this case, we have the old style wippen without a spoon and button to adjust the forward and back position (although such an arrangement is shown in the drawing). It is possible that the jack has compressed the felt block against which it rests and is now too far back under the knuckle. This can result in a "heaviness" which does not show up in the downweight, since the range of movement that downweight measures do not include any jack movement. This condition is a prime offender in the second category of "touch" factors: how the action feels. The jack too far under the knuckle creates a great deal of drag as it works its way out. The back edge of the jack should be aligned with the back edge of the core wood of the knuckle but without the adjustment button there is a tendency to compromise a little on adjusting this. Shim behind the felt (and then peel it) if necessary. Since the jack lifts away from this felt as soon as it begins to move, it is unlikely that there is friction between the two unless the parts are contaminated and actually sticking together.

We are dealing with new knuckles, so we can assume the shape is correct: the knuckle, in profile, forms a circle, and the top of the jack creates a tangent to that circle, so the contact area is very small (the illustration has the side of the wippen cut away to show this). Since the surface of the buckskin is level, the repetition lever height/jack top relationship can be properly regulated. The jack can be "winked" out from under the knuckle by gently pressing on the toe. This should cause a slight movement of the hammer and a feeling of wood brushing buckskin. There should not be a large drop in hammer position, or a complete lack of contact between jack and knuckle. The "wink" indicates that the weight of the hammer is supported by the repetiton lever and by the top of the jack.

Finally, the regulation adjustments may include: incorrect dip, blow distance or spring tension (frequently accompanied by a lack of aftertouch), too early a damper lift, or possibly keys raised at the balance rail so high they tip the capstan too far toward the wippen flange center, causing loss of mechanical advantage.

We conclude the diagnostic phase of this job by observing the action for other sources of friction. Wippen/capstan contact is suspect, but this particular action has new support cushions and the capstans have a tiny burr of metal like a collar around the top edge which creates friction as it contacts the cloth. Another likely trouble source is in the keys themselves: balance rail hole and bushing, front bushings, and nicked or corroded keypins. In this action with the butterfly-type repetition springs, the spring heads and grooves are often gummy with old grease graphite contamination on the knuckles is also a likely culprit, and they must be cleaned and lubricated. Next month I'll discuss the details of this.

To finish this month, let me pass on a suggestion from Mr. Tocquigny: "Here's a tip I got from Bill Yick, which he got from our area dealer. For those of us who sometimes move pianos in an open truck, covering material can be nicely held down by one or more bicycle innertubes used as giant rubber bands around the piano. They are just the right size and prevent a flapping tarpaulin."

He also asks if there is a source for coarse-threaded tuning pins for a Broadwood grand with threaded plate holes. I would suggest that he try some of the suppliers which Edward Swenson lists at the end of his current article, or, failing that, contact Ed for further suggestions. Any other ideas?

Questions, Answers And Comments

Rick Baldassin
Tuning Editor

Some time ago I received a letter from Past President Charlie Huether which presented some interesting topics for discussion. I presented just part of the letter at the time, and promised that I would address the questions at a later time. As promised, I will now tackle Charlie's questions. Since there are several questions and topics, I will present the letter a paragraph at a time, and insert my answers or responses between them. Charlie writes:

CH: I wish to comment on your series on tuning, it is a welcome addition to the *Journal*. However, the first article struck me as great. The message I got was that theory and practice are not the same, and that calculated beat rates are reliable references only insofar as they demonstrate a "trend" or progression. As absolute numbers they are not reliable. But then came disappointment. Subsequent articles are full of test beats. Tests and more tests, plus Michael Kimbell's "Encyclopedia of Tests" which, incidentally, includes the 4th beating one beat per second, the very thing you disproved in your original article.

RB: I would hope by now that everyone knows that the beat tables are unreliable as absolutes. When I see an interval test or temperament procedure with a beat speed, I assume it is approximate, and is intended to give us a starting point to work from. In the case of Michael Kimbell presenting a test showing the 4th beating one per second, Michael prefaced the series by stating: "The beat rates are approximate, since the beat rate will vary slightly from piano to piano due to inharmonicity." He further states: "In reality the most appropriate beat rate for any interval is determined through comparison on relative basis with the beat rates of other intervals...." (*PTJ*, June 1987, p. 24.) The beauty of Michael's tests lie not in the approximate beat speeds, but in the spaces labeled "Comments." In Test 4 on page 25 of the June 1987 issue is listed the 3rd-10th-6th test. Under comments, it states "10th intermediate" and gives approximate beat speeds of 5, 5+, and 6. The principle here is that the 10th must beat faster than the 3rd, but slower than the 6th. This should hold true on any piano. The approximate beat speeds help us by letting us know that the speeds should be about 5 to 6 bps, and not 12 to 13. In this way, the speeds do indicate the "trend" we are looking for.

CH: Articles on tuning are overloaded with tests and beat rates with little exposition on how one manages to achieve perfection in an imperfect environment. It has been my belief, reached from observation and experience, that the hardest part of learning to tune is overcoming the discrepancy between what is taught and what actually works, and then overcoming the guilt feelings because one does not follow exactly what is printed.

RB: It is my belief that to tune, one must have a model or system to follow. If the model does not work in practice, then it must be altered until it does work. Interval tests provide a foundation upon which to build the model. The more tests we know, the stronger our foundation is, because we understand how and why our model works. If there is a discrepancy between what is taught and what actually works, then we must change what is being taught. It might appropriate in addition to say that we must change what is perceived as being taught. In the past few years, several of the terms we associate with piano tuning have been redefined. A term such as "octave stretching" may mean something entirely different today than it did 20 or 50 years ago. We must always strive to employ the current usage. To

me, the hardest part of learning to tune was learning what sounded right, and why.

CH: The paramount objective is consistency and to achieve this consistency in a reasonable length of time. One cannot make a living taking all day to tune a piano, and using the many tests outlined requires at least a day. Plus the fact that the longer you work on the instrument, the more likely that the first notes tuned have drifted.

RB: I think the paramount objective should be to achieve something that sounds good musically, consistently. We could not be proud of our consistency if our pianos sounded mediocre every time. Hence we must build a model which sounds good musically. Once we have our model, we then can be consistent. A reasonable amount of time is relative. To a beginner, tuning in four hours may be reasonable, whereas 90 minutes may be more reasonable to one more experienced. As far as the comprehensive use of the tuning tests taking all day, this may indeed be true. Knowing all of the tests does not necessarily dictate their use in all situations, however. I had a bass student who played a very difficult piece for a recital. During the performance, he was able to play all of the notes. After the performance, I inquired of another faculty member what he thought of the performance. He responded that the student had played at 100% of capacity. By this he meant that it was all the student could do to get the notes out. There was no room left for expression, dynamics, or musicality. The student would have been better off to either have worked longer to increase his technical capacity, or to have chosen an easier piece which would not have pushed him to the limit. As far as the tuning tests are concerned, if we can go out and work at 30 percent of capacity because of what we know, we can do a better job than if we are working at 110 percent. With experience we learn to discriminate which tests to use, and when. The fact that we know several other tests only strengthens our foundation.

CH: What we need is something which teaches the practical aspects of the art. As one studies painting and masters the intricasies of color blending and brush work, one can become bogged down in those technical details. But when one masters the "art" one breaks free of those concerns because they have become a part of the work process. The final result, real "art" may often seem to go contrary to what is popularly held to be appropriate.

RB: An artist having fully mastered color blending and brushwork would likely be at a total loss if they had not first mastered the basic elements of point, line, plane, space, and composition. Knowing how to do it is of little use if you do not know what it is you are trying to do. The more technique an instrumentalist has, the better able he is to express himself musically. The key here is knowledge. Freedom comes from knowledge. Knowing what will and will not work leaves us free to work within the limitations of our situation. If we lack knowledge we are then left to guess and hope for the best. It does not follow that because we know a lot of tuning tests we need be bogged down by them. This should instead instill in us a sense of security in that if we do need to use them, we know which ones to use, and how they work. They become, in essence, one of the elements of our technique.

CH: There are certain basic practical aspects of our work which are rarely mentioned. BEATS: Beats are only generated when the beating partials are strong enough. Therefore certain intervals which beat clearly and well when certain notes are struck may not be audible when the same interval is played using two neighboring notes. For example, the C-E third beats audibly, but the C#-F third does not. Why? Because one or both of the necessary partials are not strong enough to produce the sound. One must be alert to this possibility and have other options to verify what is happening. A well-voiced piano tunes easily. A poorly voiced one does not. In fact, poor voicing is probably more of a handicap than inharmonicity.

RB: BEATS. It seems impossible to talk about piano tuning without mentioning those darned beats. It is true that we will not hear the beats if the partials are not strong enough. This is in some cases an advantage. If the beats of the 3rds in the top octave were audible, it would make tuning impossible. The fact that these beats cannot be heard allows us to place emphasis on the beats we can hear. The idea that we should have options to verify what is happening seems to agree with the concept that we are better off if we are working at a lower percentage of our capacity. A well-voiced piano does tune more easily than the same piano poorly voiced, just as a well scaled piano tunes more easily than a poorly scaled one.

CH: VARIOUS TYPES OF OCTAVES: These are often mentioned but no one mentions the fact that most of us are probably tuning some sort of compromise. Where does the tuning fall which reconciles the specific "types" of octaves? And how reliable is that classification when that measure is controlled by the inharmonicity which varies from piano to piano?

RB: Even if we tune a specific type of octave, we compromise the other types. If we compromise between a 4:2 and 6:3 octave, we should do so because it sounds best, and best fits our model. Knowing that there are 4:2 and 6:3 octaves allows us to understand what we are compromising, and how to do so controllably and consistently. This to me is better than saying "tune the octaves beatless" as the octaves cannot be tuned beatless. Even if they are beatless at one level, they will be beating at all the rest. In the past five years, there has been a dramatic increase in the quality of piano tuning within the Guild. This is in large degree due to the tuning exam, and to the level of education being offered in our institute classes. Applicants taking the tuning exam are invariably shown several tuning tests, both for the temperament and the extension of the octaves. This coupled with tuning classes and material printed in the *Journal* has helped to raise the level of knowledge of our membership in general. The end result is that the quality of tuning in the guild has improved. As to the reliability of a classification which measure is controlled by the inharmonicity which varies from piano to piano, the classification of octaves as 2:1, 4:2, etc., is valid because it is controlled by the inharmonicity. Matching the second partial of a

lower note to the first partial of an upper note can be executed regardless of the inharmonicities of any of the notes, hence the classification is valid. This is much more accurate than to choose an arbitrary amount for stretching octaves, either aurally or electronically. The further beauty of these classifications is that they can be executed either aurally or electronically with extreme precision and consistency. Even a compromise between two of the types can be accomodated in like fashion.

CH: EFFECTS OF THE PIANO "TALKING BACK." No one ever discusses what the piano is doing as you try to do something to the piano. Is there a difference in the piano reaction to stress changes depending on the order or sequence of tuning? What happens when you tune the piano, redistributing the stress over the plate and rim, and that distribution of stress does not reach equilibrium? When does the structure react to those stress and tension changes? Immediately, or the next day? How is it that some parts on the piano seem to go out of tune by growing sharp while others go flat? And sometimes it happens while you are tuning, so that as you manage your temperament you find it has drifted, albeit only slightly, but enough to make you adjust and readjust until it stabilizes.

RB: It is my belief that the piano reaction to changes in stress is dependent on the order of tuning. Take for example the two pitch raising procedures presented in the September issue. On page 25, it states: "It was noted that the percentage [of overpull] changed depending upon which system, primarily of unison tuning, was employed. In general, the percentage of overpull is 1/3 or 33 precent if all of the center strings are tuned first, followed by unisons after, or 1/4 or 25 percent if unisons are tuned to the center strings as you go. Therefore it is important that the correct unison tuning procedure be employed for the percentage chosen." Here it is evident that the order of tuning makes a difference, as with either percentage, the end result is the same, if the proper order of tuning is used. Another example would be whether to strip mute the entire piano or not. If you are tuning aurally, it is more critical to tune the unisons as you tune your octaves, to make sure that your reference notes have not drifted. This makes strip muting the entire piano impractical. If you are tuning electronically, this is not so much of an issue, as your reference is in the electronic device, and should not be drifting. Strip muting in this case is very practical. Some tuning electronically prefer to tune the unisons as they go. This is a matter of preference, as the results are the same either way. In terms of when the structure reacts to changes in stress, Dr. Sanderson's research indicates that the reactions occur immediately (or nearly so). This is demonstrated by the fact that one can perform a semi-tone (100 cent) pitch raise, followed immediately by a tuning which will hold. As to some parts of the piano going out of tune sharp and others flat, I have seen this happen over a period of time with changes in humidity, which cause the low tenor strings to go sharp (with increased humidity) because the soundboard has swollen up. The tenor strings cross the board where the greatest rise has occurred, therefore the most change occurs there. The extremes of the piano are often relatively unchanged. Sometimes the treble of the same piano will be quite flat, either because the piano had not been tuned for some time, or the previous tuner left it that way. The last two notes (B7 and C8) are always sharp, regardless. Another cause of uneven pitch changes that I have noticed is an uneven change in temperature cause by directional lighting. This occurs primarily on stages where the lighting is very intense, but could conceivably happen in a customers home as well. The areas where the light hits get very warm, and those strings will go flat. This can be caused by direct sunlight, either indoors or outdoors, as well. The primary cause for instability in the temperament, beside poor hammer technique, is trying to tune a piano that is too far away from pitch. Different people have varying opinions as to how far away from pitch a piano can be successfully tuned without a pitch raise. It has been my experience that the limit is about four cents, or one beat at A-440, without spending an undue amount of time getting the piano stable. For concert instruments, the amount is even less, because the instruments are less forgiving, and the performance demands are greater. To me, stability is the most crucial aspect of our work. Recently in a convention brochure I read a promotion for a class on hammer technique which stated quite accurately, "It doesn't matter where you put it if it doesn't stay there." Through experience we learn that two quick passes over the tuning are more profitable than one slow one, and our stability increases at the same time.

CH: COPING WITH THE DIFFERENCES BETWEEN THE THEORETICAL AND THE "REAL" BEAT FREQUENCIES: How does one decide when to stop fussing and to accept the relationships which seem to work? What are the criteria for adopting one order of testing over another? Preferences of "color" of the interval? Ease of playing? Ease of manipulation and efficiency in the operation?

RB: Once the relationships work is the time to stop fussing. We need not concern ourselves with the theoretical beat rates, except to the extent that they show us a trend or pattern to emulate. When one has established a temperament which all of the interval relationships work with each other, the correct beat rates for that piano have been established as well. The order of testing to follow should be those tests which prove the model that we have established sounds good musically. If we have established that 4:2+ octaves sound good in the midrange, then we should test for such. Since there are multiple tests for the 4:2 octave, we should choose the test(s) which we can hear most easily, and that we are most comfortable with. Ease of playing is also a factor. Some technicians have hands big enough to play parallel M10ths with one hand. A technician who does not can accomplish the same thing by playing parallel M6ths.

CH: HOW DOES ONE TEST THE COMPLETED TUNING? By playing a song or two? Playing a series of intervals over the whole keyboard? What kind of music, what kind of intervals?

RB: I test the final tuning by playing a series of intervals to

ensure that my tuning conforms to my model which I have previously determined sounds good musically. The tests are many, but a few basic tests are to be sure that the parallel major intervals (3rds, 6ths, 10ths, and 17ths) progress smoothly up and down the keyboard, that the 5ths sound smooth in the bass, and that the double octaves sound good in the treble. The final test is when the artist plays, and I listen. It is difficult to be objective listening to your own tuning while you are playing. Beside this, I do not play very well.

CH: HOW CRITICAL ARE REFINED COUNTS OF BEATS, especially when one rarely hears a note in performance being held for longer than the briefest time? As someone said to me once: "How can you say that beats three beats in five seconds? You did not listen to it for five seconds!" Which brings up a point. Since the frequency of a note varies as it is sustained, and each string varies differently, how can one gauge the beat speed by listening for a second or more? You have to guess its speed in a very short time after the initial impact. Listening to the interval overly long only confuses. All notes should be tuned within the same time frame, say a half-second, for that is the longest time most intervals will be held in performance.

RB: Refined counts of beats are not critical to the establishment of a third beating exactly 6.93 bps. They are critical to the extent that we may determine that a third is beating at the same speed as a 10th, or that one third is beating faster than its lower neighbor, yet slower than its upper neighbor. Determining exact speeds is not important, but determining proper relationships is extremely important. It is true that the pitch does change if the interval is held for a long period of time, but not drastically until the decay. It has been my practice to listen to intervals for the duration of two beats of sixteenth notes. This allows the establishment of the pulse of the quarter note, which seems to be easier and more accurate than counting the individual beats. It is also true that in most cases, intervals are held for a very short period of time. In some cases, however, there are open, exposed intervals which are sustained for several measures or at the end of a piece, such as an open 17th in Chopin. Here it is critical that the beat speed be fast enough, so that we can sit back, listening and thinking as George Defebaugh often says, "Now that's beautiful (beautyful) music!"

CH: That's about it, Rick. I am only trying to offer some of the problems and confusions which I feel tuners must learn to cope with. Beat rates and intervals are fine, but they can be overdone. What one needs is a basic set of tests which achieve the basic criteria of equal temperament and can be applied all over the instrument as one expands out of the temperament. Using the same tests achieves consistency which is the most important quality one must strive for. This is not intended to criticize unfairly. I am trying to point out some practical aspects which I believe (and others who have spoken to me believe) are more important or at least of more concern to them than learning the total of test intervals. In fact, one can devise a test for just about every interval available. One friend uses a 2nd as a test. Keep the articles coming, and don't let the critics upset you, especially me.

Sincerely Yours, Charlie.

RB: I thank you very much, Charlie, for your letter. The questions and topics you raised were valid and very thought- provoking. I have enjoyed being able to respond to them. I think it is important to remember that we have readers at all stages of learning. What may seem old and rehashed to some, may be brand new and eye-opening to others. I will try to present material to keep every interested. I am not paid enough to let anyone upset me, and as always I hold you in the highest regard.

Sincerely, Rick.

P.S. Have your friend send me his test using a 2nd so I can print it.

Until next month, keep those letters coming. Write to me at:

Rick Baldassin
2684 W. 220 North
Provo, UT 84601

ANTIQUE

RESTORATION

Restoring Antique Pianos Introduction and Sources, Part I

Edward Swenson
Ithaca College School of Music

The purpose of this series of articles is to consider the techniques and materials used by the restorer of antique pianos. Although this introduction is devoted to general issues, subsequent articles will follow the course of specific restoration, preservation and documentation procedures using instruments from my workshop as models. Some of the information presented here should be useful, even to those technicians who do not regularly work on antiques.

The difficulties associated with restoring antique instruments are considerable: replacement parts, including hammers, dampers, action parts, and even strings which match the originals, are difficult or impossible to find. Every instrument presents its own unique problems and challenges. If an antique instrument has already been extensively altered, it is often necessary to travel wide distances to museums or private collections to study instruments by the same maker. It is helpful to know as much history as possible about the builder, the period in which he lived and the musicians for whom he was supplying instruments. Restoring antique pianos requires research and careful planning before work actually begins. Time for this sort of study has to be figured into the overall expense of a restoration project. Those who seek easy solutions and quick results will find restoration work frustrating and unrewarding. Above all, early instruments have to be restored with caution and respect because they are monuments of our common cultural heritage. Some piano technicians undertake the repair of antique instruments with reluctance. Legitimate concern that an antique instrument after restoration is likely to sound as good as a modern piano often leads to attempts to "improve and modernize" antique pianos, using new soundboards, pinblocks, modern music wire, and oversize felt hammers and dampers in place of the original materials.

"

Those who seek easy solutions and quick results will find restoration work frustrating and unrewarding. Above all, early instruments have to be restored with caution and respect because they are monuments of our common cultural heritage.

"

My personal opinion is that any antique instrument is reduced in value in direct proportion to the number of original parts which have been removed. The task of the restorer who hopes to retain the value of the instruments in his care is to preserve as much of the original instrument as possible. Modern piano technicians see a great number of historical pianos and are often called upon to repair, tune and even rebuild them. The type of repairs which are appropriate in a modern piano are frequently completely out of place in an antique. Many museums and musical instrument collectors are even beginning to question whether rare instruments in their trust should be played or restored at all. Playing them inevitably results in deterioration and wear and tear on original parts. Our right to hear the sound of historical instruments often conflicts directly with a museum's obligation to preserve instruments for replica builders and historians who have the right to study rare instruments in their original condition. This view is motivated by the sad fact that museums are full of pianos which have been greatly reduced in value through past attempts to restore them and make them play. Unfortunately it is often the rarest

and most valuable instruments which have suffered. None of the three remaining Cristofori pianos has been preserved intact. As historical documents these instruments tell us much less about their original condition than if they had been left alone. We don't even know for certain whether Cristofori pianos were originally strung using iron or brass wire. The Graf piano once owned by Robert and Clara Schumann was "restored" in the 19th century by replacing the original leather hammers with hammers made of felt. No doubt the person responsible for this change hoped to improve and modernize the instrument, yet the characteristic sound of the piano was destroyed and its historical value diminished.

As a music historian and piano technician I have always loved old pianos. I love the way they look and sound and I admire the great care and skill with which they were made. Moreover, I am fascinated with what they can tell us about the music which was written for them. Twenty-five years ago, after taking a piano tuning and repair course at Oberlin College, I rebuilt my first piano. It was a Baldwin grand, with loose tuning pins and a worn action, which I had purchased from my employer, Lyon-Healy in Chicago. After working as a tuner-technician in Chicago during the summer of 1963, I left for a two-year period of graduate study at the Akademie Mozarteum in Salzburg, Austria where I continued to tune and repair pianos. As I continued my education, eventually receiving a Ph.D in Musicology from Cornell University, I also worked on pianos as much as time permitted. In 1970 I joined the faculty of the Ithaca College School of Music, began to raise a family and still found time to work on pianos. Currently I continue to teach and I manage a small piano rebuilding shop in Trumansburg, New York where I specialize in restoring early pianos.

During my student days in Austria I worked for a time in the music archive of a Benedictine Monastery, where I helped catalog the manuscript music. In the room where I was working there was an old grand piano turned on its side. One afternoon I overheard the Abbot mention to one of the monks,

Conrad Graf in 1835 miniature in oil on ivory painted by Kriehuber.

"have the cabinet maker strip the veneer from that old piano and throw the rest away. It doesn't hold tuning anymore and it's in the way."

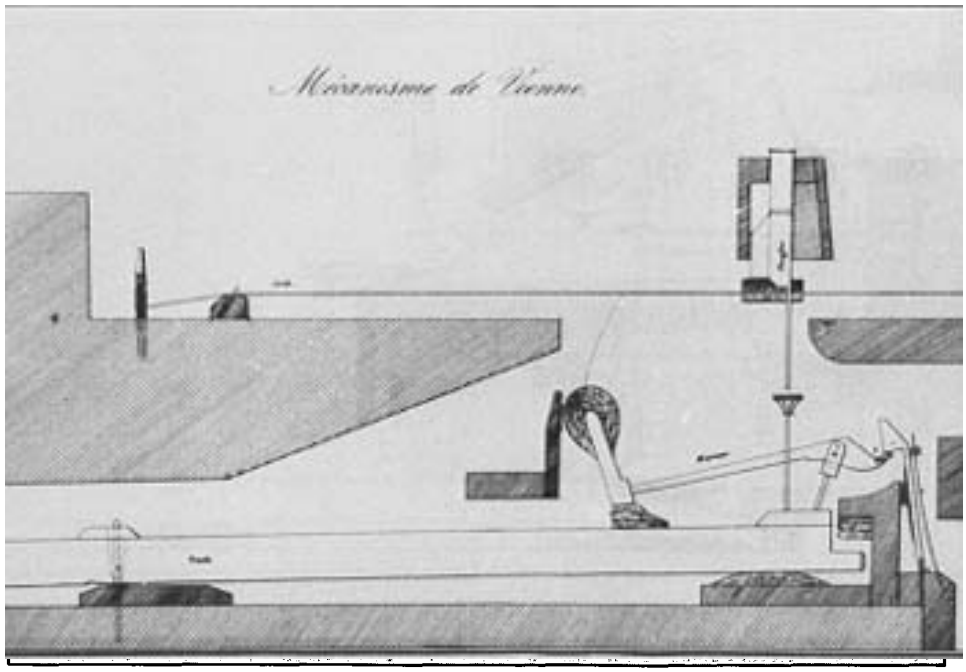
I hadn't looked at the piano closely, but the idea that it should be thrown out horrified me. I said to the Abbot, "Instead of discarding the piano, will you sell it to me?"

"Sell it! You can have it, if you take it away."

Some friends stored the instrument for me for several years until I could afford to ship it home. It arrived in New York in 1970 and my first adventure with an historic piano had begun. More careful examination of the instrument revealed that it had been made in Vienna by the famous builder Conrad Graf who had built instruments for Beethoven and Schumann and whose instruments were preferred by Chopin and Liszt during their early concerts in Vienna. Of the 3,000 pianos built by Graf during his 30-year career, only about 60 are still extant. Shaped like a harpsichord, the eight-foot long concert instrument was remarkably different from the modern pianos I had been trained to tune and repair. The hammers were made of laminated layers of leather and the frame of the instrument was entirely of wood without metal reinforcing. The hammer shanks were attached directly to the key by curious brass forks or *Kapsein*. The case was beautifully made with book-matched Carpathian walnut veneer.

The restoration of the piano took nearly 10 years, primarily because I decided to wait until I had enough information to allow me to begin work. I made several trips to Vienna, in order to learn about the unique tools, regulating procedures and special materials used in restoring early Viennese-action instruments. I am not shy about asking for help, particularly when I am responsible for the preservation of a valuable instrument. In any case, this rare piano, which could have landed on the scrap pile, is now in the collection of a major museum and has been used in a series of recordings by pianist Peter Serkin.

During my studies I was invited one evening to have dinner with the harpsichord builder Frank Hubbard. He had come to Ithaca to inaugurate a new harpsichord which he had built for Cornell. In our conversation the subject of my early piano came up. We agreed that the early piano without metal reinforcement was a totally different instrument from the modern grand. At that time, although the harpsichord was commonly being used to perform music from the Renaissance and the Baroque periods, the piano music of Mozart and Beethoven was only being performed on instruments which had developed late in the 19th century. Why had we forgotten the early piano? Much of the most admired piano repertory (Mozart, Haydn, Beethoven, Schubert, Schumann, Clementi, Mendelssohn, Weber, Chopin and early Liszt and Brahms) was composed for instruments which had little in common with the modern concert grand. It was the last time I saw Frank Hubbard, but I remember distinctly the motivation I received from his comments. He left me with the idea that it was essential to revive the Classic and early Romantic fortepiano. Today the fortepiano is making a comeback similar to the revival of the harpsichord 60 years ago. Recordings by Malcolm Bilson, Paul Badura Skoda, Jorg Demus and many others, using either period instruments or modern replicas, attest to the growing interest in hearing piano music



An extraordinarily detailed drawing of the Viennese fortepiano action from Erard's book: Perfectionnements apportes dan le mecanisme du piano par les Erard, depuis l'origine de cet instrument jusqu'a l'Esposition de 1834.

played on the instruments for which it was originally composed. It is becoming increasingly essential for the modern piano technician to know something about tuning and repairing the fortepiano.

What features help us identify an old piano as an instrument worthy of preservation and restoration? Age is not the only consideration. Rare instruments often have special qualities such as elaborate cases, limited production, unusual, experimental features in their construction, manufactured by famous makers and, of course, outstanding musical qualities. Instruments owned by illustrious people also have historical importance. The Broadwood, Erard and Graf fortepianos owned by Beethoven, the Pleyel owned by Chopin and Paderewski's Steinway are obviously important as they provide a direct link to the timbre and dynamic range of the composers' music. Concert instruments from any period are worthy of preservation because they reflect the highest standards of piano tone for the period in which they were produced. Many pianos built in this century are already historically important.

There are conflicting points of view regarding the restoration of early instruments. One view is that a musical instrument is essentially a tool through which music is produced. Accordingly, any repair or alteration to the original instrument may be justified if it helps the performer or composer produce better results. A different view is that a rare instrument is a work of art, a valuable historical document and part of our cultural and technological heritage, which should be preserved intact. Old pianos are often treated as tools, while rare and valuable violins are regarded as irreplaceable instruments and works of art. It would be unthinkable today to replace any of the essential components of a Stradivarious violin, yet the soundboards and pinblocks in antique pianos are regularly replaced and discarded.

Several important considerations enter into the question of whether an instrument should or should not be restored and made playable. The age, condition and rarity of the instrument is of foremost consideration. If the instrument is one-of-a-kind and still in original condition, every caution must be taken to preserve and conserve the original parts. The goals in restoring a rare antique have to include preserving the instrument in original condition, saving anything which has to be removed and protecting the instrument against further deterioration. *Not every piano can or should be made playable.* In other circumstances the restoration may not result in one hundred percent satisfactory playablilty. The preservation of the original is always the first consideration. Above all, one must take care not to tear down and replace parts in rare instruments which have never been altered, as the resulting changes may actually diminish the instrument's value. Still it is usually not a satisfactory solution to do nothing at all. Many antique instruments can be restored to playability while retaining most of the original parts, including the original strings. Those parts that are deteriorated or broken and cannot be used, should be preserved and documented. Similarly an antique piano is also a piece of antique furniture. To strip away a deteriorated shellac finish and replace it with sprayed lacquer is unnecessary and again diminishes the instrument's value. I will devote an entire article in this series to the techniques used in furniture museums for repolishing and preserving antiques.

One of the most vexing problems for the piano restorer is the frequent changes in the metallurgy of 19th-century music wire. There were dozens of wire makers in the early 19th century and the early piano builder had a wide selection of wire from which to choose. There is also evidence that some early piano builders produced their own wire, using secret drawing and annealing procedures in their own shops. With the introduction of cast-iron reinforcing plates in pianos, it became possible to use cast-steel wire, which was much stronger and could be tuned to higher tension. The total tension on the frame of a Graf concert piano from about 1830 was approximately 9,950 lbs, or just under five tons, while the modern concert grand has a total string tension of nearly 30 tons. It is not surprising that pianos in 1830 had a lighter, more delicate tone than the brilliant, powerful voices of 20th-century instruments. Music wire went through many different transformations in the course of the 19th century. *Modern high-*

Drawing wire by hand in Germany in the 17th century.

carbon, cast-steel music wire should not be used in restraining keyboard instruments built before 1860. The early piano was strung with iron or low-carbon steel wire, which was softer, more elastic and produced a different sound than modern piano wire.

The chart on this page shows the increased percentages of carbon and the greatly increased tensile strength of music wire from 1827 to 1913. The load capacity of the wire in measured in Newtons.

It is interesting to note that the wire used by Steinway (tests 6 and 7) at the turn of the century has a much lower carbon content and yet a higher tensile strength than contemporary Roslau wire (test 12) which we might elect to use in restring a "modern" Steinway. Incidentally, the strength of the wire does not necessarily determine high quality. A high percentage of Sulfur (anything over .030 percent) is usually regarded as a metallurgical defect in the manufacture of wire. Graf's wire had very little sulfur, while a few years later the wire used by Bosendorfer and Chickering has a very high sulfur content by modern standards. The carbon content in the Graf wire from 1837 (test 2) seems impossibly low. A second test of wire from this instrument will obviously be necessary. Malcolm Rose in England currently manufactures wire for use in harpsichords and early pianos. Test 9 and control test 10 are from the same, testifying to the accuracy of the Roslau testing equipment. This wire compares favorably in carbon content and tensile strength to the Graf, B.G. and Bosendorfer wire in tests 1, 3, and 4. (The author would be very grateful to receive other samples of 18th and 19th century music wire from Guild members who would like to contrib-

Wire Tests
Preliminary Results

Wire Sources	*Diameter*	*Min. Load Cap.in N (Newton)*	*Tensile Strength N/mm2*	*Carbon %*	*Sulfur %*
1. Graf 1594 (c.1827)	0.772/0.777	560	1,189	0.3150	0.0154
2. Graf 2627 (c. 1837)	0.886/0.885	530/540	882/898	0.077	0.008
3. Bosendorfer 167 (1841)	0.790/0.802	580/590	1,170/1,190	0/370	0.045
4. B.G. Wire (Vienna, 1840)	0.730/0.735	400	950	0.0553	0.0044
5. Chickering, c. 1850	1.150/1.190	1,815/1,910	1,690/1,780	0.720	0.052
6. Steinway (NY) 89867 (1897)	1.130/1.148	2,540/2,560	2,490/2,510	0.740	0.032
7. Steinway (NY) 160445 (1913)	0.965/0.969	1,860/1,925	2,530/2,620	0.770	0.034
8. Malcolm Rose Type B	0.693/0.695	340/360	900/950	0.120	0.018
9. Malcolm Rose Type C	0.893/0.900	720	1,140	0.450	0.022
10. Malcolm Rose Type C (Control test)	0.900	720	1,132	0.4380	0.0240
11. Graf 2627 (Brass Wire)	0.995/0.940	610	830	-----	-----
12. Roslau (1987)	0.900	1457	2290	c.0.85	?

About tests 1,2,3,5,6,7,11: These tests were fragments of old, original strings which had already been under tension.

About Test 4: In a drawer next to the keyboard of an early square piano built by Joseph Knamm in Vienna (c. 1840), I found a small spool of wire, stamped with the initals "B.G.," which appeared to contain spare strings, possibly included with the instrument by the original builder. These test results are interesting because the wire has never been under tension. The test results show that this iron wire has a very low carbon content and a correspondingly low tensile strength.

The author thanks Dr. Hans Joachim Kruger of the Roslau Stahl - und Drahtwerk for his help in preparing these test results: ***Guild members are invited to collaborate in this study. The author would be grateful for original wire samples from other instruments. Please send two complete strings with the name and serial number of the piano to E. Swensen, PO Box 634, Trumansburg, NY 14886.***

ute to this ongoing study on early wire. We obviously need many tests to answer some of the questions which remain. Samples of original iron, brass and steel wire should be sent to the author at P. O. Box 634, Trumansburg, NY 14886. Please include the maker's name and the serial number of the piano.)

Part I of this series concludes with a short list of supply sources.

Annotated List of Supply Sources For the Restorer of Early Pianos

IRON AND BRASS MUSIC WIRE

Remy Gug
2, Rue des Ecrivains
F6700 Strasbourg
France

Remy Gug is an harpsichord maker who makes his own iron harpsichord wire by hand using traditional methods. More than any other researcher, he has uncovered fascinating documentation on the history of music wire which has been published in his article, "En Remontant La Filiere De Thoiry A Nuremberg," in Musique Ancienne, *No. 18 (September, 1984), pp. 477. His wire is used by some harpsichord makers, but is too soft for use in most pianos. It is also very expensive.*

Microfil Industries SA
Avenue Longemalle 22
Case 95
1020 Renens UD1
Switzerland

Many European restorers and replica builders are using this Swiss wire. I have no experience with it.

Malcolm Rose
1, The Mount
Rotherfield Lane
Mayfield, Sussex
Great Britain

The harpsichord builder Malcolm Rose has been making iron, brass and red brass wire in his Mayfield workshop since 1981. The iron wire comes in three types: Type A, for harpsichords, virginals and clavichords; Type B, for fortepianos and square pianos up to c. 1820 (See test results of Rose type B wire given above.); and Type C, for pianos from c. 1820–c. 1850. (See test results of Rose type C wire given above.)

Brass wire comes in two types:
1. English Brass "A ductile 70/30 brass of the correct microstructure."

2. Red Brass "is a 90/10 brass to match the usual 18th century specification; in harpsichords it will give the best possible focus to the sound in the bass." Red brass also occurs on some pianos during the period 1800-1825. Malcolm Rose also makes copper, silverplated copper and softdrawn yellow brass wire for making overspun bass strings. Also watch for his forthcoming book A Handbook of Stringing Practice for Keyboard Instruments.

I have used Malcolm Rose type B and C wire with excellent results in fortepianos, occasionally even mixing Rose wire with original wire in the same unison. Although very good, the sound quality still does not quite match the tone of Graf's original wire.

SUPPLIERS OF PARTS, FELT, TOOLS, AND MISCELLANEOUS SUPPLIES

In the constant quest for suitable materials, it is important to have as many specialized supply catalogs as possible.

Fletcher and Newman Ltd.
Unit 10A
Dartford Trade Park
Powder Mill Lane
Dartford, Kent DA1 1QB
Great Britain
Tel: (0322) 26441

Heckscher & Co.
75 Bayham St.
London NW1 OAA
Great Britain
Tel: (01)3871735

The Instrument Workshop
318 N. 36th St.
Seattle, Washington 98103
(206)6327918

Alfred Jahn GmbH
D8621 Grub am Forst
Coburgerstrasse 43
West Germany
Tel: (09560)555588

Louis Renner GmbH
D7000 Stuttgart
Postfach 423
West Germany
Tel: (0711) 65 30 65

KEYBOARD MAKERS AND RESTORERS

Hermann Kluge GmbH
Wuppermannstrasse 2327
Postfach 20 07 23
D5600 Wuppertal 2Barmen
West Germany
Tel: (0202) 55 01 08

This highly respected company is the largest keyboard maker in Western Europe. Custom keyboards can also be made to order. Kluge will also restore and replace ivory.

Aug. Laukhuff
D6992 Weikersheim
Postfach 80
West Germany
Tel: 07934 611

This company makes keyboards and supplies for organ makers. Many of their products are also useful for the piano restorers. They make "Kapsels" for viennese fortepianos.

GENERAL CONSERVATION SUPPLIES

Conservation Materials
240 Freeport Blvd.
Box 2884
Sparks, NV 89431
(702) 3310582

Materials, supplies and tools for the professional conservator and archivist. They publish a fascinating catalogue.

SOCIETIES WITH PERIODICALS USEFUL TO THE RESTORER

American Musical Instrument Society
USD Box 194
Vermillion SD 57069
Publishes a quarterly journal Early Music

Oxford University Press
Ely House
37 Dover St.
London W1, England
Fellowship of Makers and Restorers of Historic Instruments (FOMRHI)
Publishes a quarterly bulletin

Hon. Sec. J. Montagu
c/o Faculty of music
St. Aldate's
Oxford
OX1 1 DB United Kingdom

Galpin Society
Rose Cottage
Bois Lane
Chesham Bois
Amersham
Buckinghamshire
England

International Association of Musical Instrument Collections
c/o Musikhistoriska Museet
Scottsbacken 6
S-III 30 Stockholm, Sweden

Arbeitsgemeinschaft der Restauratoren
Bamberg, Memmelsdorf
Schloss Seehof
West Germany
Gruppe 13 – Musikinstruments

Publishes *Arbeitsblatter fur Restauratoren*

SELECTED BIBLIOGRAPHY

Berner, A., J.H. van der Meer, G. Thibault. *Preservation and Restoration of Musical Instruments* Provisional Recommendations. London: International Council of Museums, 1967

Clydesdale, Amanda. *Chemicals in Conservation – a Guide to Possible Hazards and Safe Use,* Edinburgh, 982.

Plenderleith, H.J., and A. E. A. Werner, *The Conservation of Antiquities and Works of Art: Treatment Repair and Restoration.* London: Oxford University Press, 1971.

Mayer, Ralph. *The Artist's Handbook of Materials and Techniques.* New York: Viking Press 1982.

Hellwig, Friedemann. "Restoration and Conservation of Historical Instruments," in *Making Musical Instruments,* ed. by Charles Ford. New York: Pantheon Books, 1979.

OTHER USEFUL BOOKS

Dolge, Alfred. *Pianos and Their Makers,* New York: Dover, 1972 (reprint of the 1911 edition).

Harding, Rosamond E.M. *The Piano-Forte: Its History Traced to the Great Exhibition of 1851.* Cambridge: University Press, 1933. (Now also available in a more recent second edition).

Good, Edwin M. *Giraffes, Black Dragons, and Other pianos,* Stanford: Stanford university Press, 982.

Hirt, Franz Josef. *Meisterworke des Klavierbaus* (History of keyboard instruments from 1440 until 1889 with stunning pictures). Olten: URS Graf-Verlag, 1955.

Patents for Inventions...Relating to Music and Musical Instruments, A.D. 1694-1866. London: George Eyre, 1871. Reprinted by Tony Bingham at the Sign of the Serpent, 11 Pond St., London NW3 2 PN. ■

Installing The Soundboard

Nick Gravagne
New Mexico Chapter

The one essential tool for gluing a soundboard to a rim is not a tool at all. It is a work habit called organization. The dry-fits and run-throughs discussed in the previous article of this series have all served as dress rehearsals: Soundboard installation day is opening night.

If this all sounds a bit dramatic, it should. A lot of work has gone into the installation up to this point and now there is only one chance to glue it in right. Everything must be ready and in place, particularly the clamps, blocks, and cauls. The dry-fits should have thoroughly prepared the rebuilder as to the most logical and comfortable clamping sequence. Now is not the time to vary it.

There should have been one complete dry installation with all clamps, etc., in the place where they will be used in the final gluing. This precaution ensures that there will be no surprises later on such as too few clamps on hand, ill-fitting cauls which went previously unnoticed, or the beveled press blocks being put in upside down or backwards. Be prepared and on top of the situation.

Furthermore, the fit of the soundboard to the rim should not be at all in doubt. If there were any trouble spots in the dry-fits they should have been taken care of, to complete satisfaction. Such a trouble spot, for instance, is a rib fitting to a notch just a bit too tightly at the sides of the notch. Assume the condition was known throughout the dry-fitting process but was ignored as inconsequential. However, when it came time to glue in the soundboard, the rib swelled in the presence of glue almost preventing it from properly mating with the notch. Such occurences can abort an installation.

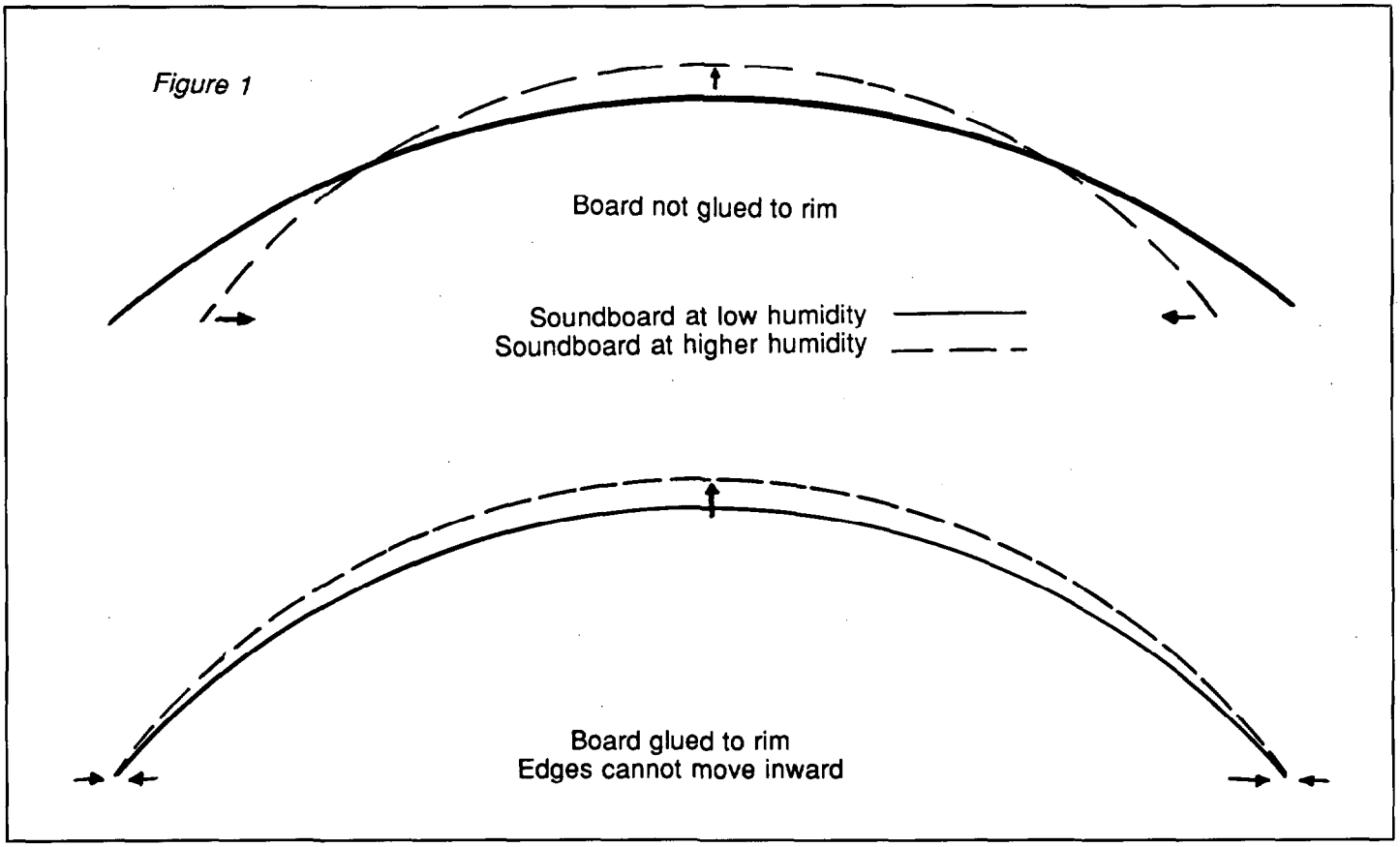
"

The dry-fits and run-throughs discussed in the previous article of this series have all served as dress rehearsals: Soundboard installation day is opening night. If this all sounds a bit dramatic, it should. A lot of work has gone into the installation up to this point and now there is only one chance to glue it in right.

"

Another potential trouble spot can occur on those pianos which have a dumb-bar in the upper bass corner. In this type of design the board is not only glued to the perimeter of the inner rim but to the dumb-bar as well. In fact, the soundboard fit and glue joint at the dumb-bar (dumb-bars are notched) is more important than the fit of the triangular dead spot which that dumb-bar partially encloses. Clamps cannot be used at this glue joint. Weights are only partially effective. The most effective way to glue the soundboard to the dumb-bar is with go-bars.

Depending on the length of the dumb-bar, four to six go-bars are all that will be necessary. These can be pressed right to the shop ceiling if that ceiling is at eight or 10 feet. If higher than that, some other ingenious device needs to be rigged up. If the ceiling is sheetrock, a two- by six-inch board of suitable length should be tacked in place on the ceiling so as to receive the top ends of the go-bars. The two-by-six board should be long enough to cross at least three ceil-



ing joists (the sheetrock is nailed to these joists). The lower ends of the go-bars should not press directly on the soundboard, but, rather on a caul strip sitting on the board and directly over the dumb-bar. Again, failure to have everything ready, in place and completely tried is to invite a frustrating experience at best and a poor installation at worst.

With a completely tried dry-fit out of the way, attention can be turned to the actual gluing considerations. These are: one, heating the soundboard, two, choosing the glue, three, applying the glue, and four, installing the board.

The soundboard should not be glued in cold. Throughout the entire dry-fitting process, the board will have been living in varying ambient conditions (these conditions should not be extreme, though). Once the fitting process has been completed, the soundboard should be placed back in the hot box and thoroughly warmed. Opinions vary as how long to leave the board in the box and at what temperature. Some say overnight is enough and others say two or three days for insurance. A temperature of 100 to 120 degrees Fahrenheit seems to be standard procedure. In any event, the purpose of heating the board should be understood. That purpose is simply to shrink the soundboard down to a smaller dimension by driving moisture out of the wood.

Gluing the hot and shrunken soundboard in the piano serves at least two functions. First, it makes sense from a mechanical point of view. The warmed soundboard at installation is less susceptible to cracking later on. Since it is going into the piano in a dry and shrunken condition it is not likely to become any drier or smaller under normal and reasonable ambient conditions for the useful life of the piano. The same cannot be said for gluing in a cold and relatively swollen soundboard. It is the judgement of many that there is an acoustical benefit as well. Any soundboard, whether glued to the rim or not yet installed, crowns higher with a rise in relative humidity. Notice that as the center of the board rises, the edges of the board move inward. The wood fibers are primarily in compression everywhere and the board is relatively relaxed as its movements to and fro are unrestricted. Although the center of the board still can rise, the edges cannot move inward. This peculiar condition sets up various and opposing forces of compression and tension in the soundboard which are said to enliven its responsiveness. So, if the board is glued in when it is dry and shrunken it can only react in one direction: it will rise at its center while the edges are securely prevented from moving. The net effect should be a more responsive soundboard.

Climate control in the shop is also a consideration. Here again, opinions vary but many believe that the relative humidity in the shop (or installation room) should be a maximum of 40 percent. (Some insist it should be lower). Since the board will be coming out of the hot and dry enviroment of the cooker, it will react less quickly or severely in a dry shop enviroment than a moist one. It should be noted that, although the spruce begins its reactive swelling immediately upon removal from the hot box, it takes hours for the soundboard to fully acclimatize to the shop's ambient conditions. (In my own practice a hygrometer and a crossbanded spruce lath strip are placed in the hotbox along with the soundboard. These also come out of the hotbox with the soundboard.

The hygrometer adjusts to the shop conditions within 15 minutes while the crossbanded lath strip, which went into the hotbox flat but bends while it is in there, takes two or three hours to flatten out. This is certainly enough time for a proper installation and gluing set-up time.)

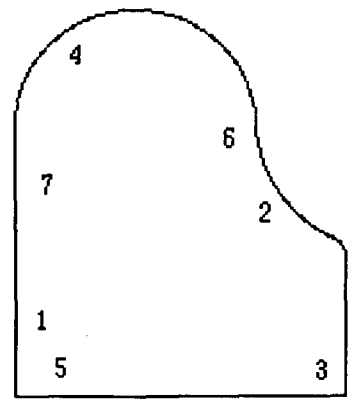
The choice of glue is a matter of preference but there is something to recommend the hide glues. The yellow wood glues of today have great holding power but are not known for their gap filling characteristics. Considering the nature of the soundboard-to-rim glue joint, a good gap-filling glue seems an obvious choice. Both liquid and hot hide glue are rawhide tough and are considered good gap fillers.

If using hot glue, use a drying retarder such as thio urea (check with your local chemist or the glue manufacturers). If the piano was sitting in a 60-degrees F. temperature overnight the rim will be too cold. Raise the shop temperature and heat the rim with a heat gun (not a hair dryer) before applying glue. A helper is almost certainly necessary. Have one person apply the glue as quickly as possible while the second person follows up with a brush making sure that the glue is covering the entire inner rim and notches. Time is of the essence. The soundboard is then quickly removed from the cooker and installed. Here, also, helpers are an advantage but only if they were part of the dry-fit run-through.

Liquid hide glue has the great advantage of a long drying time. Neither the rim nor the liquid hide glue should be cold: warm both if necessary. The glue can be warmed by placing the plastic bottle under hot water. Squeeze a glue bead on the inner rim and spread in any convenient manner. One person can apply liquid hide glue and install the soundboard unhurriedly, an advantage which not even yellow glue offers, since it could "skin over" too quickly for a satisfactory one-man job.

Clamping the soundboard in place is relatively simple if the board has been properly fitted, dry-run tested and everything is in place. The clamp and press block arrangement appeared in the last issue of this series. There should be at least one clamp per notch. If the wooden caul strips are being used under the press blocks they should be as wide as the inner rim. Too wide is of no advantage. Caul strips placed at the curves of the rim should be cut to the contour of the rim on the band saw. The contour is easily picked up by the placing the wood on top of the outer rim and drawing a line on it using the contoured rim as a guide. Cauls can be made of plain one- by two-inch pine. These cauls should have been part of the final dry-fit test. The soundboard goes in on the glued rim; cauls are next, followed by press blocks and clamps. Start by placing six or seven clamps in an opposing sequence, i.e., don't start by placing them one by one and moving around the rim. See *Figure 2* for a clamping sequence of the first seven clamps. After these first seven or so are on, the sequence doesn't matter much. When all clamps and necessary go-bars are in place a final turn at each clamp screw should leave the clamps as tight and secure as they were in the dry-fit. Leave clamped overnight in the 40 percent relative humidity (or lower).

Figure 2



Clamping sequence for first seven clamps

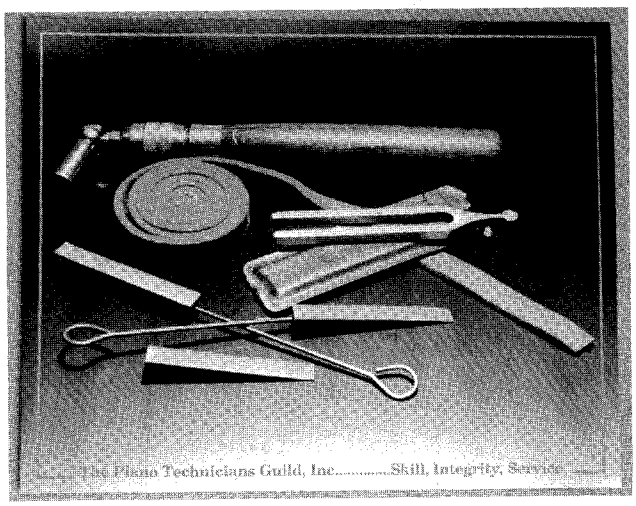
Some rebuilders find it preferable to support the piano case on three small sawhorses for soundboard installation. If the legs are left on for support there won't be enough clamping area for the lower clamp jaw to grab. Placing the entire case on a shop truck allows for proper clamping but usually restricts working or inspecting from underneath. Three small sawhorses positioned where the legs would be offset inward a few inches, allow easy clamping, underneath inspection and manuverability, and easier glue-squeeze cleanup.

There is nothing mystical or magical about soundboard installation. In the final analysis, it is the close adherence to fundamental practices which yield good and predictable results.

This issue marks the end of soundboard discussions for the time being. The subject will come up again relative to other aspects of piano technology, however. The next topic of discussion will be downbearing. ■

Tools Of The Trade

A fork. A hammer. A handful of mutes. The basis on which a piano technician builds his business. But there's one tool on which the most successful technicians have relied for years — their membership in the Piano Technicians Guild. Show your pride in your Guild membership by displaying this poster. It measures 16 by 20 inches, and is printed on heavy enamel stock, suitable for framing. To order yours, send check or money order for $9.95 U.S. plus $2.00 per poster shipping and handling to: **Piano Technicians Guild, 9140 Ward Parkway, Kansas City, MO 64114.**



Calendar Of Coming Events

Date	Event
Jan. 8-9, 1988	**Arizona State Conference** Aztec Inn, Tucson Arizona Mark Peele; 2204 E. 6th St.; Tucson, AZ 85719 (602) 362-4528
Feb. 12-14, 1988	**California State Conference** Torrance Marriott, Torrance, CA Anthony Pascone; 895 N. Calle Circulo; Camarillo, CA 93010; (805) 482-3513
Mar. 11-13, 1988	**South Central Regional Spring Seminar** Fayetteville, AR Denele Campbell; 541 W. Meadow; Fayetteville, AR 72701; (501) 443-2457
Mar. 18-20, 1988	**Central West Regional Seminar** Wichita, KS Marty Hess; 4031 N. Harding; Wichita, KS 67220; (316) 744-0564
March 26, 1988	**Northern Virginia Seminar – Grand Hammer Installation** Wolf Trap Park, Vienna, VA Jack W. Sprinkle; 6033 N. 19th Rd.; Arlington, VA 22205; (703) 538-2728
April 8-10, 1988	**New England Regional Conference** Viking Hotel and Conference Center, Newport, RI Kirk Russell; 13 Liberty Street; Wakefield, RI 02879, (401) 783-1966
April 15-17, 1988	**Pennsylvania State Conference** Sheraton, Altoona, PA Fred Fornwalt; 1333 Logan Blvd.; Altoona, PA 16602; (814) 942-1489
April 22-24, 1988	**Northern Illinois Seminar** Northern Illinois University, DeKalb, IL Jack Greenfield; 259 Riverside Drive; Northfield, IL 60093; (312) 446-9193
April 29 - May 1, 1988	**Michigan State Conference** Holiday Inn West, Livonia, MI Hugh Gulledge; 175 Degross; Walled Lake, MI 48088; (313) 669-4325
July 18-22, 1988	**31st Annual Piano Technician Guild Convention & Institute** Adams Mark Hotel, St. Louis, MO Home Office: 9140 Ward Parkway, Kansas City, MO 64114, (816) 444-3500.

Membership!

Challenges: A Chance To Grow

Ron Berry
Vice President

The other day I was tuning a piano in a church choir room. Among the posters on the wall was one that said, "Don't pray for an easy life, pray to be a strong person." This struck me as being relevant to our profession in many ways, the idea being that rather than avoid challenges we can learn to conquer them and have the feeling of satisfaction that we have done so.

All of us have felt overwhelmed during our early years in the business by the vast amount of knowledge waiting to be learned. We wished there was an easy way to just learn enough to get by, figuring that our customer would not notice the difference. Luckily, most of us had someone around to keep us from getting complacent. We either had examples of those who took on each challenge and enjoyed it, or those who would prod us with questions like "wouldn't it be better to do it this way even though it seems a little more difficult?" Of course there is always the extreme of people who look for the hard ways to do things without really gaining any quality. A favorite quote from Barbara Martin in my chapter is "Why do things the easy way when the hard way works just as well?" By always answering the call to become a better technician, we increase our pride in our work and end up enjoying it more. After awhile, those jobs that seemed so difficult will become routine.

Challenges present themselves on the business side of our work also. We have all had that customer who just can't seem to be satisfied and may have been through several technicians already. Instead of getting upset and saying, "Since I was just there, I'm sure that your piano is in tune," take the time to work on the situation with the customer. These situations are almost always a lack of communication and customers don't know the technical terms to describe what they hear. They just know that something isn't right. I have found that very often the complaint about a note that still isn't in tune is really a complaint about voicing which is usually easily solved. By learning more about voicing and becoming aware of it during regular tunings, you may suggest voicing work before they notice it and prevent problems. I have often had cases where I pointed out voicing problems they had not mentioned only to have them say, "Oh, yes, I've noticed that but I just figured that there was nothing that could be done about it.

We run into challenges daily in both our business and personal life. Let's look at these challenges as a chance to conquer them and grow. By tackling them we increase our self-esteem and become stronger people and better technicians. Then, don't forget to participate in your chapter and share your new success with others.■

New Members During November 1987

REGION 1

Boston – 021

David E. Sanderson
71 Birch Drive
Concord, MA 01742

Maritime Provinces – 050

Joseph Kelly
Box 364
Hampton, NB E0G 1Z0
CANADA

Montreal – 060

Eric E. Labbe
1324 Place Quintal, 302
Fleurimont, QC J1H 5H2
CANADA

Ottawa – 061

Roger F. Bertrand
PO Box 416
119 Nipissing St.
Sturgeon Falls, ON P0H 2G0
CANADA

Toronto – 062

Per Brendstrup
175 Greyabbey Trail
Scarborough, ON M1E 1W2
CANADA

James Craig
44 Kappele Ave.
Toronto, ON M4N 2Z3
CANADA

Herbert Egerton
100 Rowena Drive, 224
Don Mills, ON M3A 1P9
CANADA

William A. Goodfellow
275 Blantyre Ave.
Scarborough, ON M1N 2S2
CANADA

Max Littlejohns
134 Spadina Road
Toronto, ON M5R 2T8
CANADA

Connecticut – 064

Michael K. Johnson
65 Whiting Ave.
Torrington, CT 06790

David G. Ponder
59 Wakefield Circle
East Hartford, CT 06118

New York City – 101

Buckner F. Gibbs
67 Villa Avenue
Yonker, NY 10704-2

Long Island – Cristofori – 118

William C. Cox.
PO Box 523
Central Islip, NY 11722

Rochester – 144

Scott D. Hoffman
117 East Avenue
Hilton, NY 14468-1

Pittsburgh – 151

Daniel F. Casdorph
22 Marcus Drive
Morgantown, WV 26505

Central Pennsylvania – 166

Timothy Dykstra
223 William Street
Scranton, PA 18508

Charles A. Norris
12 Crystal Spring Ave.
Lewistown, PA 17044

Reading-Lancaster – 195
Deborah S. Kinkaid
343 North Sixth Street
Reading, PA 19601

REGION 2

Richmond – 231

Kenneth R. Carbaugh, Jr.
c/o Richmond Piano
2916 W. Marshall St. (rear)
Richmond, VA 23221

Central North Carolina – 274

Ralph S. Slote
140 N. Walnut Circle
Greensboro, NC 27409

Palmetto-Florence – 292

Carl A. Eisenstadt
1801 Carter Street
Columbia, SC29204

South Florida – 331

Armond D'Ambrosio
8303 Coral Lake Lane
Coral Springs, FL 33065

Sarasota-Ft. Myers, 335

Edward T. Celedonia
3000 Round Table Court
Naples, FL 33962

Debra L. Tucker
4021 Duncan Road
Punta Gorda, FL 33982

Nashville, – 372

Daniel R. Rembold
3914 Sulphur Springs Rd.
Murfreesboro, TN 37130

REGION 3

Dallas – 752

Alan K. Whitaker
810 Barnes Street
McKinney, TX 75069

REGION 4

Chicago – 601

Lorenzo A. Washington
5469 S. Everett, Apt. Basm.
Chicago, IL 60615

REGION 6

Vancouver – 011

Henri J. Perreault
3004 Alderbrook Pl.
Coquitlam, BC V3C 4B4
CANADA

Golden Gate – 945

Edward T. Jewett
18841 Serpilio Drive
Sonoma, CA 95476

Santa Clara Valley – 951

J. Bingham Gibbs
10530 Barnhart Court
Cupertino, CA 95014

Seattle – 981

Charles J. Flaum
11016 29th Drive SE
Everett, WA 98204

Alaska – 996

Dan S. McElrath
7221 Foxridge Circle, Unit 1
Anchorage, AK 99518

Reclassifications

REGION 1

Boston – 021

Julia D. Lee
145 Galen St.
Watertown, MA 02172

Syracuse – 131

Paul Kupelian
RD 1, Box 50-B
Constantia, NY 13044

REGION 2

Thomas M Austin
219 Old Marion Jct. Rd.
Selma, AL 36701

The Auxiliary Exchange

Taking A 'Constitutional'

In this year's celebration of our country's Constitution, I could not resist the play on words. The first topic of interest I shared with you was stress and its effects. Now I wish to share my research and personal feelings about walking.

Walking is a natural and pleasurable alternative to exercise routines that may cause injury, or exhaustion that prohibits the benefits of regular exercise.

Losing weight, relieving stress, strengthening your heart, slowing down the aging process, improving your state of mind and gaining self-pride are but some of the benefits of regular walking.

Depression (the catch-all that includes everything from the blahs to psychosis) is a serious problem in today's society. Current reports seem to show that exercise such as walking can relieve depression by transforming a negative addiction into a positive one. Walking requires patience and time to make a significant physical change which causes an appreciation of patience thereby reducing depression. Walkers learn they are sufficiently in control of their health, appearance and self image. Thus they develop a feeling of success and accomplishment.

When problems seem overwhelming, go for a walk! Exposure to fresh air and new scenery have proven themselves excellent stimulants to solving problems.

"Walking is a man's best medicine" – words attributed to Hippocrates over 2,000 years ago. Enjoy the benefits of a walking program. Walk with a brisk steady pace, at least four time a week and in comfortable shoes.

Why not set an exercise resolution for the new year and consider the following: Set a goal; record your progress; make a time commitment; choose the best time of day; think and dress the part; walk tall with a companion and select a pleasing route. Happy walking and Happy New Year!

Judy White
Corresponding Secretary

President's Message

PTGA has reached a milestone. Congratulations are in order for both the PTGA Board and Council, and you, the members. To the former, for authorizing the PTGA scholarship program in 1986 and their relentless efforts in securing funds for this most worthwhile project, and to you members for providing those funds. The first PTGA-sponsored scholarships were awarded in Columbia, MO, the site of this year's Missouri Music Teachers Association competition. The winners were: **Derison Duarte,** senior division, and **Aaron Topfer,** junior division. Both recipients are from the St. Louis area.

Our congratulations go to these two fine young pianists, and it is expected that we will have the pleasure of hearing them perform during our international convention in St. Louis this July. The awards were presented by **Diane Hennessy,** wife of **Frank Hennessy, RTT.** Diane and Frank have a dealership in Columbia, and Diane is a member of MMTA. Our thanks to Diane for representing PTGA and doing a fine job.

I strongly recommend that the awards program be continued in this manner, utilizing the existing competitions already established in the state or region where our next convention is to be held. This will aid PTG with their teacher relations program and will allow the possibility of hearing the recipients play at your convention. State and regional competitions are preliminary to national competitions to which qualifying participants often must pay their own way. Our awards might allow someone to enter who might not otherwise, knowing they could not proceed to the next level.

If you are not among those who contributed to the fund this past year, perhaps you can do so this year. We must not lose our enthusiasm to increase the monies for this fund as it affects all aspects of our business. For the piano to maintain its rightful place in the music world, there must be persons who play them and play them well. If not, the day will soon arrive when you will hear someone say, "Piano technician? What were they?"

Ginger Bryant

Diane Hennessy with Aaron Topfer, left, and Derison Duarte

Gold Bricks At Work!

Last August this writer and a few friends toured the Federal Reserve Bank in New York City and its famous gold vault. "More gold in there than in Fort Knox" is the common observation made by one New Yorker to another. This is a fairly accurate assesment. According to our tour guide, about a third of the official monetary gold reserves of the non-communist nations is stored in the bank's most unusual vault, 80 feet below Nassau Street – one of the busiest streets in the Wall Street district. Deep in the bedrock of Manhattan Island, this largest known accumulation of gold in the world about 345 million troy ounces – rests on Manhattan's schist under extreme and mandatory security. Only a very small fraction of the gold in the vault is U.S.-owned. More than half of the United States gold, which totaled $11 billion last July, is kept in the depositories at Fort Knox, Kentucky and West Point, in New York, as well as some stored at the Denver and Philadelphia mints. The remaining deposits are at the San Francisco Assay Office.

The factual data took a while to sink in one's memory but our guide reiterated his statements when fellow tourists would ask him to repeat or clarify a comment. We received a very brief history of the metal and learned that payments were made in gold hundreds of years before 550 B.C. when the first known gold coins were cast. Today the "coin" is a gold bar, about the size and shape of a building brick, weighs about 400 troy ounces (about 27 avoirdupois pounds) and valued at about $17,000. All the values and weights are estimated due to current fiscal conditions and the country to which the brick belongs. U.S.A. bars are brickshaped, Canadian bars are trapezodial.

When bars of gold arrive at the bank they are carefully checked and weighed on a scale so precise it can weigh the metal to the nearest 1/100 of a troy ounce – equal to one-third the weight of a dollar bill! The bars are then stacked and stored in one of 122 compartments which are identified by numbers, not by the names of the countries. The Federal Reserve Bank does not charge for holding the gold, but say when Canada pays a debt in gold bullion to a debtor country, the gold bars are relocated from one compartment to the other wired steel compartment, then there is a nominal charge for the service.

At first one is awed to peer through the heavy steel mesh and see bars and bars of gold. A display compartment facing visitors entering the vault has been set up as a display and its size, volume of gold bricks is mind-boggling. We were told the compartment contains 5,160 bars, valued at about $88 million! After a time the visitors were surfeited with the "Croesus treasure" and what had at first seemed like a glamorous job became instead a dull, hard and tedious one.

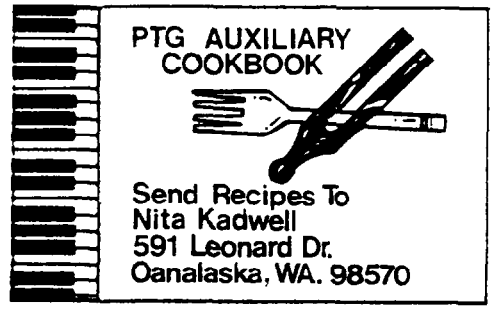
All vault workers are screened carefully, their backgrounds scrupulously explored and their work closely supervised. The employees who stack and transfer the gold bars work in shifts that allow them frequent rest periods and they must wear lightweight, but strong, magnesium shoe covers to protect their feet against accidentally dropped bars. They work in windowless surroundings, four floors below street level in caverns unlike anything seen by James Bond of 007 fame. There are no doors into the gold vault.

"Entry is made through a narrow passageway cut in a delicately balanced 9-foot tall, 90-ton steel cylinder that rotates in a 140-ton steel frame. This entrance is opened by turning the cylinder until the passageway is lined up with openings in both sides of the frame. The cylinder is also slightly tapered, so an airtight and watertight seal is achieved by lowering it three-eighths of an inch in the frame–as you would push a cork into a bottle. The cylinder is thus secured in place until a series of time locks controlling the combinations permit its opening the next day. The opening is under "multiple control" – that is, no single person knows the combination necessary to open the vault."

South Africa is the largest gold producer in the world, turning out about 50 percent of all new gold reaching world markets. The U.S.S.R. is second, producing about 23 percent. Canada ranks third, producing about four percent and the U.S.A. is fourth with about three percent.

All in the tour were glad to eventually come top-side into the daylight, collect our personal items which had been checked before we were admitted through the metal-detector screener, and enter the world of paper currency, charge coins and subway tokens. Now we must confront all the bills from department stores and specialty shops resulting from our holiday shopping. *Bonne Annee* and Happy New Year to all.

Agnes Huether
Editor



Exchange Editor:
Agnes Huether
34 Jacklin Court
Clifton, NJ 07012

Piano Technicians Guild Foundation

Your profession needs your help...

Give something back to those who made a difference in your career — a teacher, friend or mentor. Your contribution to the Piano Technicians Guild Foundation ensures that their work will continue.To contribute, complete this form and mail to: **Piano Technicians Guild Foundation, 9140 Ward Parkway, Kansas City, MO 64114.**

YES!

I WANT TO CONTRIBUTE TO MY PROFESSION!

I wish to contribute $_____._____ in memory of__ to honor__

Honoree's name: _____

Chapter/State: _____

Acknowledge to: _____

Address: _____

Your Name: _____

Address: _____

Index of Display Advertisers

Classified Advertising

For Sale

Superb hammers, shanks and flanges, and specialty tools. Tungsten carbide sanding file you must use to believe, $7 plus postage. You will wonder how you survived without our wood formula super glue, $3.25 plus postage. We offer the new Isaac "solo" hammers and accurate boring, etc. Write or call for info: **Steve Pearson Piano Service, 831 Bennett Ave., Long Beach, CA 90804, (213) 433-7873.**

SIGHT-O-TUNER SERVICE. Improve the accuracy of your tunings with a correctly calibrated SOT. Also do repairs and modifications. **Richard Weinberger, 18818 — 142nd Drive, Sun City West, AZ 85375. (602) 583-0083.**

FINE QUALITY PARTS AND SERVICE need not be a thing of the past! They are alive and well at your parts alternative-PIANOTEK. 2-day service guaranteed/Next day air available. **Phone: (313)545-1599, PIANOTEK 307 West Sixth Street, Suite 206, Royal Oak, MI 48067.** Visa/MC Write for '88 catalogue.

VICTOR A. BENVENUTO VIDEOTAPES. PIANO TUNING AURAL/ELECTRONIC...$175. The most accurate approach in fine tuning. KEY MAKING...$124.75. GRAND REBUILDING (2 tapes)...$225.75. Preparation, pinblock replacement, damper installation, restringing. GRAND REGULATING...$175.75. SOUNDBOARD REPLACEMENT...$94.75. Ship old board - new board comes to you ready for installation. Please specify VHS or Beta. All prices include shipping. **THE PIANO SHOPPE, INC. 6825 GERMANTOWN AVE., PHILADELPHIA, PA 19119. (215) 438-7038.**

RESTORATION OF CARVED WORK, turnings, inlays, and marquetry, including repair of existing work and reproduction of missing pieces. **Edwin Teale, 19125 S.W. Kinnaman Rd., Aloha, OR 97007, (503)642-4287.**

2 SIGHT-O-TUNERS; knobpots; recently recalibrated. $450. 1-PT3 Yamaha tuner. $200. **Paul Magee, P.O. Box 20082, Sacramento, CA 95820, (916)457-4317.**

RESCALING AND CUSTOM REBUILDING and manufacturing. Soundboards, pinblocks, bridgecaps, actions, etc. **Ed Buck, 171 Lincoln St., Lowell, MA 01852, (617)458-8688.**

PIANOTEK HAS MOVED! Please note our new address/phone for your records. **Phone: (313)545-1599, PIANOTEK: 307 West Sixth Street, Suite 206, Royal Oak, MI 48067.**

ADD ONE MORE RESOLUTION to your New Year's list! Make a change to PIANOTEK for 1988. Call or write for our new '88 catalog. **PIANOTEK 307 West Sixth Street, Suite 206, Royal Oak, MI 48067, Phone: (313)545-1599.**

ATTENTION CTE'S AND TRAINEES: Tuning Exam set up (complete) for sale. Includes SOT, TI 59 and Printer (both completely rebuilt by Texas Instruments). All used less than 20 hours. $450 or offer for all. **Tom Lowell, 2360 Galls Cr. Rd., Gold Hill, OR 97525.**

NOTICE!! PIANOTEK has moved to provide you with better service. Please note our NEW address/phone. **PIANOTEK 307 West Sixth Street, Suite 206, Royal Oak, MI 48067, Phone: (313)545-1599.**

COMPONENT DOWNBEARING GAUGE OWNERS – convert your style 1 gauge to a style 2 gauge with this easy to install kit. Style 2 gauges have an added interchangeable magnetic base. Send $9.00 to **Tom Lowell, 2360 Galls Cr. Rd., Gold Hill, OR 97525.** Style 2 gauges can be ordered on account from the following: ASPCO, Ford, Itoshin, Pacific, Pianophile, Randy Potter School of Piano Tech., Renner, Schaff, and Tuners.

OPPORTUNITY: Wise investment in an established piano tuning and repair business with over 1,000 clients currently on file. Will yield a lucrative profit. Servicing Rochester, Michigan and the surrounding Oakland County area which has one of the highest business growth rates in the United States. Tentative advance scheduling. Begin work immediately. Make me an offer I can't refuse. I am relocating and taking bids. Contact **ROSE WINSTANLEY, 214 Pinewood, Pontiac, MI 48054, (215) 237-8411**

LENOX BANDSAW BLADES U.S. made, long service. Wood, metal, any size, length. Carbon steel, or Bi-metal. Guaranteed welds. **(301)283-4390, Bandsaw Blade Connection, 17710 Indian Head Hwy., Accukeek, MD, 20607.**

PIANO KEY CLOCKS, quartz battery movement, made from upright piano keys. Unique functional gift for keyboard artist or technician. $39.95 plus $3 S&H (IL residents add $2.50 sales tax) to: **Kuhns Key Klocks, R.R. 4, Box 107B, Geneseo, IL 61254.**

A CAREER in Band Instrument Repair or Piano Tuning and Repair can be yours! Enroll in Western Iowa Tech Community College's programs and develop skills from tuning to rebuilding pianos, or overhauling and repairing brass and woodwind instruments. Specially designed facilities include individual work stations and up to date equipment. In state tuition is $270.00 per quarter; out of state tuition is $540.00 per quarter. Most students qualify for in state tuition by the second quarter. Employers: contact our placement office about availability of graduates. For more information, contact **Admissions Office, PO Box 265, Sioux City, IA 51102 or call (712) 276-0380 collect.**

SANDERSON ACCU-TUNERS from Authorized Distributor. The most accurate and advanced tuning aid available. Tuning lever note switch for Accu-Tuner $25. Consignment sale of used Accu-Tuners and Sight-O-Tuners for new Accu-Tuner customers. Call for details. **Rick Baldassin, 2684 W. 220 North, Provo, UT 84601, (801) 374-2887.**

LIQUIDATION OF KEY BUSHING CAULS! Full sets only of brass cauls in all six sizes until stock is depleted, now only $39.00 each plus shipping. Also, amazing new tool: Electric Key Bushing Iron allows you to completely fit set of keys to frame in less than ten minutes and reduces friction too! **Key Bushing Supply, Box 56, Kingston, NH 03848 (603) 642-3633.**

WENOL – W. German metal polish, contains jewler's rouge, no ammonia, cleans, polishes, protects. Mentioned at PTG convention. Great for capstans, balance rail pins, bottoms of studs. Price break in case lots. Case equals twenty 3.9 oz tubes. Also in 39.3 oz cans. Write for prices and order from **VANCE PIANO SERVICE, 300 N.E. Belinda Ave., Port Charlotte, FL 33952.**

NEWTON HUNT can have A. Isaac or Ronson hammers to you in 48 hours with custom boring, tapering and shaping. **(214) 352-6846, 3253 Lockmoor, Dallas, TX 75220.**

A SERIOUS NOTE: We at Pianotek are deeply saddened by the news of Bob Russell's medical condition and would like to offer our assistance by donating a portion of every order to the Bob Russell Fund. This is not a gimmick or an enticement to get you to order from us – we want to make that clear. We want to help. **PIANOTEK 307 West Sixth Street, Suite 206, Royal Oak, MI 48067, Phone: (313)545-1599.**

THE PIANO BOOK A Guide To Buying A New Or Used Piano, by Larry Fine, RTT. Candid brand reviews by technicians, sales gimmicks exposed, how to find and inspect a used piano, a complete list of old Steinway models compiled from archives, much more. Useful for both technician and customer. "The most comprehensive guide yet published" – from the Foreword by Keith Jarrett. "A thorough job of presenting information that the public should have had available long ago – Arthur Reblitz. "The best-researched, most accurate, most honest writing about pianos I have read – Frank Hanson. 200 pages, 81/2x11, 100 illustrations. Postpaid $16.95 paperback, $26.95 signed hardcover. Mass. residents add 5%. **Brookside Press, Dept. J1, P.O. Box 178, Jamaica Plain, MA 02130.**

LEARN PIANO TUNING – Small classes: Personal attention: Calif. State approved: Veterans approved: Not a mail order course. Call for free brochure. **S.F. School of Piano Tuning. 967 Airport Blvd., South San Francisco, CA 94080, Tel. (415) 871-4482.** "Our 8th Year".

52 Piano keys recovered — .050 — $40.00. .060 — $45.00. .075 with fronts — $65.00. New sharps — $30.00. Sharps refinished — $15.00. Keys rebushed — $45.00. New fronts — $20.00. Return freight paid with prepaid order. **Charles Wilson, 1841 Kit Carson, Dyersburg, Tenn. 38024.**

PLATING — PIANO HARDWARE. Stripping, buffing and NICKEL plating, with hinges up to 60" lengths $125-$225/set, depending on quantity of parts included. Enclose packing list indicating number of screws with description and quantity of items. REFERENCES AVAILABLE. COD delivery in 2-3 weeks. A.R.O.M. throughout the U.S.A.! We will serve you with quality & reliability. **CRAFTECH ELECTROPLATING, #46R Endicott St., Norwood, MA 02062, (617) 769-0071 days, (617) 469-9143 eves.**

CUSTOM REBUILDING of fine grands. Soundboards, pinblocks, action restoration or replacement, refinishing, etc. **J. Krefting Pianos, PO Box 16066, Ludlow, KY 41016. (606) 261-1643.**

NEW SOUNDBOARDS MADE FOR YOU. Ship old board. New board comes to you ready for installation. Send for instruction on: **Victor Video Tape, $94.75. Victor A. Benvenuto, 6825 Germantown Avenue, Philadelphia, PA 19119. (215) 438-7038.**

GRAHAM ANDERSON, Piano Rebuilding and Repair, **3632 Fernway Drive, Montgomery, AL 36111.** 20 years' experience with Steinway - London. Specializing in replacement of action rails. Also available GENUINE IVORY KEY TOPS replaced. Call or write for free estimates. **(205) 284-0197.**

JOHN TRAVIS PUBLICATIONS going out of business. *"A Guide To Restringing"* for sale by the book or by the dozen. Paperbacks each $16.50 postpaid, hardbacks each $21.50 postpaid. Order now. No COD. Make check or money order payable to: **JOHN W. TRAVIS, 8012 Carroll Ave., Takoma Park, MD 20912.**

JOHN TRAVIS PUBLICATIONS going out of business. *"Let's Tune Up"* for sale by the book or by the dozen. Paperbacks each $17.50 postpaid, hardbacks each $20.00 postpaid. Order NOW. No COD. Make check or money order payable to: **John W. Travis, 8012 Carroll Ave., Takoma Park, MD 20912.** "A Guide To Restringing" still available. See this month's CLASSIFIED.

AUBREY WILLIS SCHOOL Our home study course in Piano, tuning, repair and regulating has been used by hundreds to learn the basics. Accredited member National Home Study Council. No cost information. **Aubrey Willis School, 301 W. Indian School Road, Suite B-111, Phoenix, AZ 85013. (602) 266-1640.**

NILES BRYANT OFFERS TWO HOME STUDY COURSES: Electronic Organ Servicing: Newly revised. Covers all makes and models - digital, analogue, LCI's, synthesizers, etc. Piano Technology: Tuning, regulating, repairing. Our 87th year! Free booklet: Write or call **NILES BRYANT SCHOOL, Dept. G, Box 20153, Sacramento, CA 95820 - (916) 454-4748 (24 hrs.)**

THE RANDY POTTER SCHOOL OF PIANO TECHNOLOGY — a complete home study course for beginning and intermediate students, in piano tuning, repairing, regulating, voicing and business practices. Top instructors and materials. Call or write for information: **RANDY POTTER, RTT; 61592 ORION DRIVE; BEND, OR 97702; (503) 382-5411.** See our ad on page 15.

PIANO STORE FOR SALE. Excellent area for potential customers located in between the 7th and 8th fastest growing counties in the East Coast. We offer sales and service with 3 full-time piano tuners and we have 87 pianos in stock. The building and business are both for sale. The building has 10,300 sq. ft. (includes house on 2nd story). We also specialize in refinishing, rebuilding, moving. The price for 3 vans, building, home and garage, piano tuning business and pianos etc. is $450,000. If interested call **Kramer's Piano Shop, located near Frederick, MD. (301) 775-7393 or 898-3245.**

KORG AT-12 AUTOCHROMATIC TUNER, Play instrument; tuner shows note, octave, cents sharp or flat for seven octaves: C = 32.70 Hz to B = 951.07 Hz.(On some pianos, listens best to middle five octaves). Plays four octaves: C = 65.41 Hz to B = 987.77 Hz. Calibrate A = 430-450 Hz. Batteries, AC adaptor, earphone, case, year warranty, 1lb. Introductory offer: $135 postpaid ($190 list).**Song of the Sea, 47 West Street, Bar Harbor, Maine 04609, (207) 228-5653**

HARPSICHORD AND FORTEPIANO PARTS and kits, original factory materials from the finest early keyboard suppliers in the world. Also Troubleshooting and assistance to fellow RTT's on harpsichord problems. Authorized Zuckermann Agent. Lowest Factory Direct Prices - buy from the source. Catalogs, price lists free. **Yves A. Feder RTT, Harpsichord Workshops, 2 North Chestnut Hill, Killingworth, CT 06417 (203) 663-1811.**

THE GUIDE. $10. The Piano Technicians Guide. A job time study and work guide. Revised and printed to fit a pocket. **Newton J. Hunt, 3253 Lockmoor, Dallas, TX 75220. (214) 352-6846.** TX residents add appropriate sales tax.

Wanted

WANTED!! DEAD OR ALIVE "Steinway Uprights" Call collect, **Ben Knauer (818)343-7744.**

WANTED: STEINWAY PLAYER GRAND in fancy case (prefer unrestored), will also consider Mason-Hamlin, Wurlitzer or Apollo. Reward for successful leads. **Kavouras, 2740 Lighthouse, Lynwood, IL. 60411 (312) 474-8787.**

Up To $1000.00 Finder's Fee will be paid for successful purchase of a Mason and Hamlin Ex-Player. I have mechanism to install. Pls call collect (317) **259-4307 or evenings (317) 849-1469. Jim Brady 4609 Cranbrook Dr., Indpls., IN 46250.**

DANISH PIANO BUILDING SCHOOL requires piano builder/piano technician, with factory experience, who can take charge of our students' basic education. Work area: You will be expected to lead the every day routine of our school, instructing our students in piano building/piano repairing, assist in further development of our present instrument and help in the construction of new instruments. Conditions of employment: You must be prepared to move to Denmark, where you will be employed under Danish conditions: 39 hour work week, 5 weeks paid holidays, 9 days paid national holidays, free social services: schools/universities, medical services/hospitals. Further information can be obtained by contacting **Egtved Piano Building School, telephone, no. 00045 5 883455.** Application: Written application together with references are sent to: **Egtved Piano Building School, Bindeballevej 62, DK-7183 Randb01.**

TUNER-TECHNICIAN WANTED 25K Guaranteed and references required. **(201)462-4730 – Irene.**

WANTED Steinway, model A,O, or L. The case condition is not important. **(206)547-9676.**

WANTED: A.K. VIRGIL CLAVIER. This keyboard is designed for finger practice, patented, U.S. 1892. Send info to: **Scott Mills, 1160 Birch Lane, Provo, UT 84604 or call collect: (801)373-7069.**

WANTED-VORSETZER PIANO-CORDER KITS- Miscellaneous parts, tapes, etc. Let me know what you have. **Charles Fleck, 318 O'Donnell Lane, Cinnaminson, NJ 08077.**

PIANO TUNER – TECHNICIAN seeks professional position in the piano tuning and rebuilding business in the USA. Graduate of piano technology at Western Iowa Tech Community College in Sioux City, Iowa. Have several years tuning experience in the piano factory. Fluent in English. Please write **Jan Rybicki, Kartanontie 31A7, 04400 Jarvenpaa, FINLAND.**

COLEMAN-DEFEBAUGH Video Cassettes

- ***Aural & Visual Tuning*** ***$79.50***
  Pitch raising, temperament setting, beat counting, Sanderson Accutuner, etc.
- ***Grand Action Rebuilding $79.50***
  Hammers, shanks & flanges, wippens, key bushing, backchecks, etc.
- ***Upright Regulation*** ***$65.00***
  Troubleshooting, refelting, etc.
- ***Beginning Piano Tuning $55.00***

VHS or Beta **(213) 735-4595**

Superior Instruction Tapes
2152 W. Washington Bl.,
Los Angeles, CA 90018

EDUCATIONAL CASSETTES

30TH ANNUAL PIANO TECHNICIANS GUILD

THE PIANO TECHNICIANS GUILD, INC.

Convention & Technical Institute
Constellation Hotel
Toronto, Ontario, Canada
July 20-24, 1987

MEETINGS INTERNATIONALE

Cassette Tapes Are $7.00 Each

- ☐ PTG-401 "SERVICING THE STEINWAY GRAND - PART I" - Fred Drasche and Bill Garlick
- ☐ PTG-402 "SERVICING THE STEINWAY GRAND - PART II" - Fred Drasche and Bill Garlick
- ☐ PTG-403 "SERVICING THE STEINWAY GRAND - PART III" - Fred Drasche and Bill Garlick
- ☐ PTG-404 "SERVICING THE STEINWAY GRAND - PART IV - Fred Drasche and Bill Garlick
- ☐ PTG-405 "VERTICAL RECONDITIONING — PART I" - Sid Stone
- ☐ PTG-406 "VERTICAL RECONDITIONING - PART II" - Sid Stone
- ☐ PTG-407 "NEW APPROACH TO POLYESTER REPAIR - PART I" - Cheri and Dwight Pile
- ☐ PTG-408 "NEW APPROACH TO POLYESTER REPAIR - PART II - Cheri and Dwight Pile
- ☐ PTG-411 "FELT FACTS" Peter Van Stratum, Tim Waters
- ☐ PTG-412 "TUNING PIANOS IN RUSSIA" Isaac Sadigursky
- ☐ PTG-413 "RELATIONSHIPS IN AND OUT OF THE PIANO" Otto Keyes
- ☐ PTG-414 "PIANO TOUCH-UP AND FINISHING" Angelo Mastagni
- ☐ PTG-415 "GLUES AND PIANO REPAIR" Andre Bolduc
- ☐ PTG-416 "KEYTOP AND SHARP REPLACEMENT MADE EASY" Howard Jackson
- ☐ PTG-438 "BIRD-CAGE ACTIONS" Ralph Long
- ☐ PTG-417 "REBUILDING THE PLAYER PIANO — PART I" Dan Gates, Raye McCall
- ☐ PTG-418 "REBUILDING THE PLAYER PIANO - PART II" Dan Gates, Raye McCall
- ☐ PTG-419 "UPRIGHT DAMPERS: INSTALLATION AND REGULATION" - Paul Koktan
- ☐ PTG-420 "THE ART OF 'UNSALESMANSHIP' " Susan Graham
- ☐ PTG-421 "GADGETS AND TOOLS" Francis Mehaffey
- ☐ PTG-422 "BETWEEN A ROCK AND A HARD PLACE" Tom Cobble
- ☐ PTG-423 "TECHNIQUES FOR DOWNBEARING" Tom Lowell
- ☐ PTG-424 "HUMIDITY IN REBUILDING" Wendell E. Eaton
- ☐ PTG-425 "KEY BUSHING AND WEIGHING" Bob Russell
- ☐ PTG-426 "PEDAL WORKS" John Zeiner
- ☐ PTG-427 "ART AND SCIENCE OF PIANO SOUND" Alan Vincent, Rick Wheeler
- ☐ PTG-429 "PROFESSIONAL SERVICE: THE YAMAHA WAY - PART I" - Bill Brandom, LaRoy Edwards, Lloyd Whitcomb, Mitch Ito
- ☐ PTG-430 "PROFESSIONAL SERVICE: THE YAMAHA WAY - PART II" - Bill Brandom, LaRoy Edwards, Lloyd Whitcomb, Mitch Ito
- ☐ PTG-431 "ACTION DESIGN: SCHWANDER-LANGER ACTIONS — PART I - Roger H. Weisensteiner, David Martin
- ☐ PTG-432 "ACTION DESIGN: SCHWANDER-LANGER ACTIONS — PART II - Roger H. Weisensteiner, David Martin
- ☐ PTG-433 "NEW TAXES IN THE USA" Randy Potter
- ☐ PTG-434 "YOUNG CHANG'S PIANO SERVICE" Ray Chandler, Paul Gilchrist
- ☐ PTG-435 "DAMPER LEAKS" Ernie Juhn
- ☐ PTG-436 "VOICING IN THE FIELD" Ben McKiveen
- ☐ PTG-437 "CHAPTER PROGRAMS" Sid Stone
- ☐ PTG-440 "MOVING PIANOS" Jim Geiger and Crew
- ☐ PTG-441 "BLIND TUNER'S FUTURE" Graeme MacGowan, Martin Nemecek, Bill Vaisey

PACKAGE SPECIAL

ANY THREE TAPES $19.00 • ANY SIX TAPES $38.00

ANY TWELVE TAPES $75.00

☐ 6 Cassette Storage Album $5.00 ☐ 12 Cassette Storage Album $6.00

Please Check Tapes Desired (Does Not Include Sales Tax Or Postage And Handling)

Ordering Information: Cassettes may be ordered and picked up at the Meetings Internationale booth near the registration area. Send mail orders directly to Meetings Internationale at the address below.

Payment method: ☐ VISA ☐ MASTER CARD ☐ AM EXPRESS

☐ Cash ☐ Check

Card or Purchase Order Number Exp. Date

Signature (required on charges)

OFFICE USE ONLY

☐ Picked Up	☐ Send
☐ Paid ☐ Bill Sent Bill ☐ Cash ☐ Charge ☐ Check	
Check Number	Delivered
Deposited	Mailed

Delivery & Shipping: We pay shipping on orders placed at the convention on any tapes we are unable to deliver at the convention. If for any reason you do not wish to take delivery of your order at the convention or if you are mailing this form in, please add fifty cents (50¢) per tape to your order for shipping. $1.00 Minimum and $5.00 Maximum. Double overseas or air mail.

Name

Address

City, State, Zip

Amount for Tapes, Accessories $

Shipping $

Sales Tax 5% (KY Only) $

TOTAL OF ORDER $

SEND TO

MEETINGS INTERNATIONALE

1200 DELOR AVE. • LOUISVILLE, KENTUCKY 40217

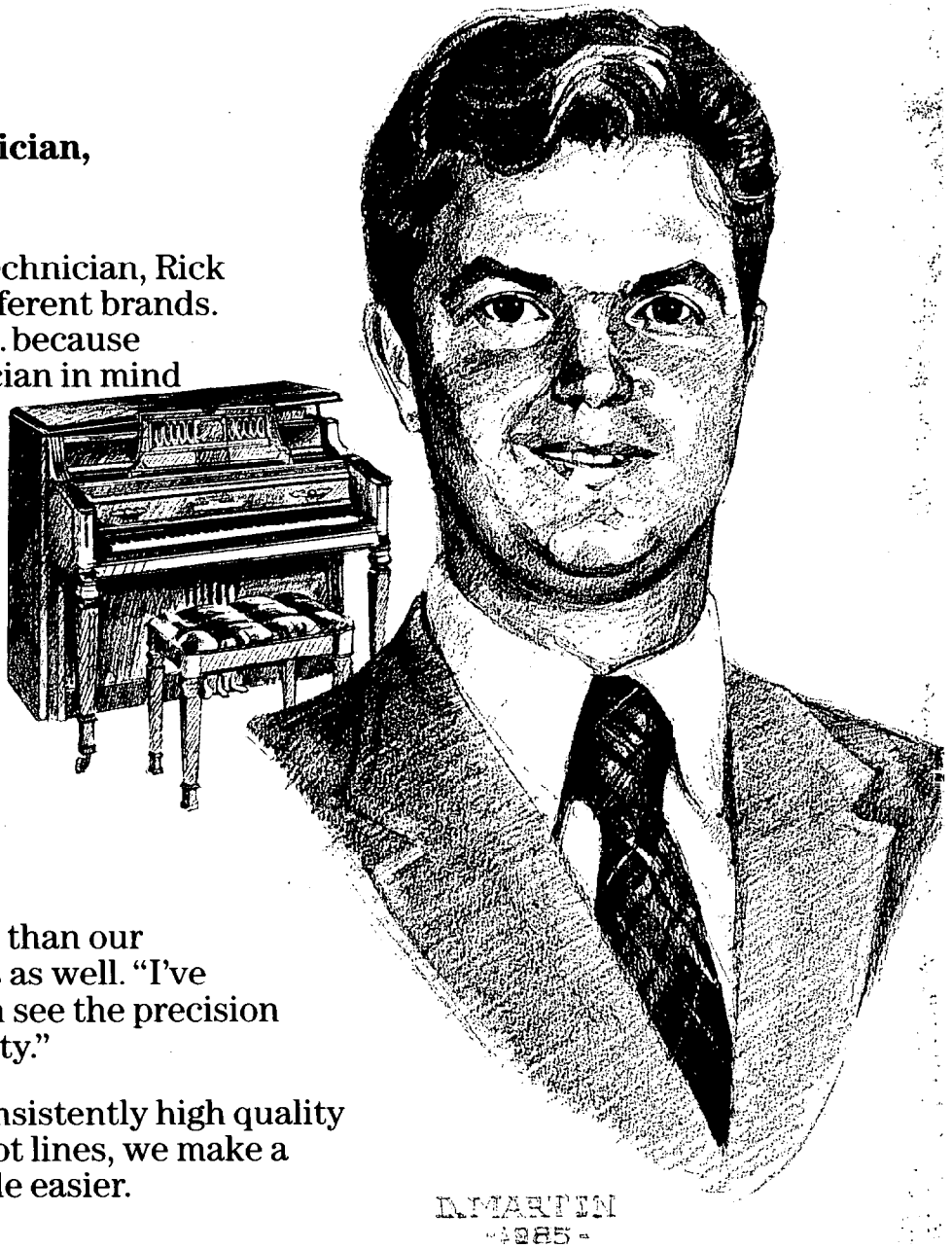
502-634-8229

GUARANTEED POLICY: If for any reason you are not happy with the tapes you have received from Meetings Internationale please advise. It is our policy to refund your money, replace a defective tape or allow you to select another tape from the listing. Your satisfaction is guaranteed.

"Wurlitzer really stands behind their products."

Rick Sletten—piano technician, performing musician.

As an independent piano technician, Rick Sletten works on a lot of different brands. He prefers to service ours... because Wurlitzer keeps the technician in mind when establishing service programs and policies.



"Wurlitzer has gone the whole nine yards. I never have any problems... with technical information or parts. If you're working in a customer's home, you can call Wurlitzer toll free and get technical help. With a lot of pianos, you're on your own."

But Rick Sletten likes more than our service. He likes our pianos as well. "I've been to the factory. You can see the precision work. You can see the quality."

By building pianos with consistently high quality and by providing service hot lines, we make a piano technician's life a little easier.

WURLITZER®

DeKalb, Illinois 60115

January **UPDATE** 1988

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

Pacific Heritage Offers Individual Conversion Policy

Pacific Heritage Assurance Co., the carrier for the Guild's former group health insurance policy, agreed in late November to convert existing group health insurance policies to individual ones. The agreement was arranged by the company, the Washington State Insurance Commissioner's office, and the Guild.

Guild members who were covered by the group plan at its termination date, Nov. 30, were offered the opportunity to convert to individual policies providing applications and premiums were received by the company by Dec. 31, 1987. The agreement gave members under age 65, particularly those who had been unable to find other coverage for health reasons, the opportunity to purchase an individual health plan.

For those who did not elect to convert to an individual policy and have not arranged other coverage on their own, a temporary plan is being offered through Security Financial Group of Lewisville, TX. For more information about this short-term coverage, members should call Security Financial Group at 1-800-332-3870.

Since the cancellation of the 20-year-old Guild group health insurance program in September by PHA, no new, ongoing health insurance program has been put in place. However, several insurance-related issues, including the question of a new Guild health insurance program, are on the agenda for the Board of Director's meeting in St. Louis this month.

Trade Publication Features Guild Convention

Meetings & Conventions, a major trade magazine in the meeting/travel industry, focused on the recent Piano Technicians Guild convention in Toronto, ON, in a story in its November issue.

The magazine, which is read by more than 80,000 meeting planners, hotel representatives and others in their industry, used the three-page article to launch a new feature, "Meeting Spotlight," which focuses each month on the activities that go into producing one organization's convention.

The story, by *Meetings & Conventions* Senior Editor Susan Crystal, focused on the integration of activities designed for visually impaired registrants into the mainstream of the convention and institute. It provided tips for meeting planners on making convention activities accessible for the visually impaired.

Crystal, who spent two days at the Toronto convention, obviously enjoyed her stay with the Guild. Discussing the "drop-in center" operated by the Guild Visually Impaired Committee, she wrote, "The courses — taught by sighted and blind instructors alike — were informal. The easy atmosphere encouraged participation even among the shyest of the attendees. In fact, students felt so comfortable that they shouted questions from their chairs and came up front to touch and feel exhibits."

Crystal quoted Institute Director Dick Bittinger, Host Committee Chairman John Lillico, Oklahoma member Robert Qualls, Nebraska member John Klingman, Visually Impaired Committee Chairman Stanley Oliver, and Toronto member Ari Isaac, who also exhibited and taught at the convention. Also quoted were Guild Executive Director Larry Goldsmith, Director of Meetings Rosemary Hall, and Gabriela Zelinger-Falkowski, convention services manager of the Constellation Hotel where the convention took place.

The story cited Lillico's work with the Canadian National Institute for the Blind, which provided braille signage for the hotel elevators and printed braille room service and hotel directories. It also discussed the total program for the visually impaired, as organized by Oliver and the Visually Impaired committee, and offered a few anecdotes.

"...blindness has had a bonding effect, generating camaraderie and gentle joking among delegates. Everyone, for example 'had a good laugh,' says Lillico, when a bellman unwittingly turned on guest room lights for a blind couple."

In Respectful Memory...

James Leroy Collier

Jim Collier, 57, an RTT member of the Houston Chapter, passed away Nov. 1, 1987. A native Houstonian, Jim learned his craft 35 years ago from his uncle and had served the Houston area ever since. He is survived by Florence Margarite, his wife of 37 years, their two daughters and two grandsons. Jim was a good friend and a fine craftsman. He will be missed.

— Keith Matis

Styrk "Ty" Reque

Ty, a member of the Phoenix Chapter, died November 22 of a heart attack sustained a few days earlier.

He was a chapter member for 10 or more years and at different times held all of the various offices of the chapter. He also helped to organize some of the Arizona State Seminars which were sponsored by the Phoenix Chapter. It is obvious that he was an enthusiastic member of the Guild.

He got into piano work after his retirement from his previous scientific work. He graduated from Penn State with a major in physics and did graduate work at the University of Chicago. He was employed in the Research Laboratory of General Electric in Schenectady, NY. There he was active in pioneering color television and other electronic devices. He was involved in establishing the General Electric computer department in Phoenix which was at Arizona State University and he also taught there at that time. He was recognized for his scientific achievements by being listed in the "Who's Who of Science."

Ty was always a warm, friendly person who was willing to listen and help others. He will be sorely missed by the Phoenix Chapter and by all who knew him. He is survived by his wife, Ann, and two sons, Karl and Jon.

— Wirt Harvey

Harold E. Miller

Harold E. Miller, 69, of Richmond, UT, died Nov. 28 following an illness. Harold was noted for his unselfish contributions in time and service to the Guild and his fellow technicians. During his numerous years as a Guild member, his name could be found connected with various official capacities from president to technical director, from Guild examiner to national delegate.

Perhaps his greatest forte will be remembered as his empathy toward a friend in need. Because of his wealth of experience, his advice was constantly being sought in matters relating to the piano business. No matter how busy he was, he would take time to share his knowledge.

He is survived by his widow, Elda; four sons and three daughters, H. Edward Miller and Mrs. Calvin (Janice) Swendsen, Richmond; Lynn A. Miller and Charles W. Miller, Logan, UT; Jerry Lee Miller, Kearns, UT; Mrs. William (Donna) Akers, Garland, UT; Mrs. Alain (Shirley) Paulus, Hyrun, UT; 43 grandchildren and 13 great-grandchildren.

Also surviving are his mother, of Logan; two brothers, Clyde A. Miller, Salt Lake City, and Keith C. Miller, Payson, UT.

— Wilford Young

An Open Letter To Guild Members

Members of the Piano Technicians Guild:

Kimball Piano Division has just completed a week long extensive seminar in the field of piano technology that we call Kimball University.

Kimball University has been taught by the staff and management of the Kimball Piano Division. This opportunity has been presented to invited technicians through the Kimball Dealer Network, contacts and field seminars through PTG. Kimball University teaches piano design, manufacturing, grand regulation, upright regulation, polyester patching, lacquer patching, upright troubleshooting, grand troubleshooting, tone regulation, voicing, transportation and moving.

Because of the success of this program over the last several years, Kimball Piano Division in a joint effort with Kimball Sales Division has now made a commitment to take this Kimball University Show on the road. We therefore will be offering through Dealer Network and your PTG network any or all of the above subject matter.

We are pleased to announce, Jon Light has been named the New Kimball Technical Training Director and will coordinate all efforts in presenting these programs to you, the field service technician. These programs can be presented at local chapter meetings, state seminars, regional seminars and will continue at the national conventions. We invite the program chairmen of any of the above functions to send their inquiries directly to:

Kimball Piano Division
PO Box 432
French Lick, IN 47432
Attention: Piano Service Department

Thank you for considering Kimball for your future technical support.

Kimball Piano
Roger Weisensteiner
Technical Manager

Hail, Western North Carolina Chapter PTG

John Travis
Past Co-President

Thursday, November 5, was a beautiful fall day in Takoma Park, MD. Michael drove up about 7:30 a.m. Genevieve had made us a good breakfast of ham and eggs. She also fixed us a good lunch basket consisting of two ham sandwiches each, an apple and a banana and other "goodies." By 9 a.m. we were off to the North Carolina Regional Conference of PTG, 480 miles away.

It was to be my first regional conference since the formation of the Guild in 1958. I had been invited, mind you, many times to attend various regional conferences or seminars in Connecticut, and Pennsylvania, the Florida and California state conferences and others, but somehow never got around to attending any of these. So, with great anticipation on this day, on to North Carolina with Michael.

We arrived at 6 p.m., having been on these beautiful Virginia and North Carolina highways for exactly nine hours of hard, fast driving. On the way down, we had a few rest stops, some lunch and one refill of gasoline.

Having come to the spot where Black Mountain was supposed to be, we encountered some difficulty with darkness all around us, but thanks to the North Carolina Chapter, we followed the PTG signs all the way up the mountain, parked the Nissan, went inside the big hall and, guess what? The first person we encountered was my old friend, Clayton Harmon, from Ashville, NC, who, in turn, introduced us to the chapter president, Don Valley, and other officials standing in various small groups. After picking up our registration packets and checking in, we were settled in our room, but not for long, for there were already over a hundred technicians all around us. Permit me to say honestly, that these men and their lovely wives were some of the nicest people I have ever met, for their welcome hospitality really touched me deeply, not only on this first meeting, but throughout the three-day conference. In addition to North Carolina tuners and technicians, there were others from Virginia, Tennessee, Florida and surrounding areas, including our own international vice president, Ron Berry, and our regional vice president, Larry and Mrs. Crabb.

There were classes all over the place during the next three days. May I say the lodging was great, the food excellent and the good old Southern hospitality was felt all around. Being a native Kentuckian from 'way back, of course I doubly appreciated this from start to finish.

The next day, I set up my book and other goodies exhibit along with the other exhibitors, including Dr. Al Sanderson and his accu-tuner, Ford Piano Supply Co., Dampp-Chaser, Inc., and two or three others whom I am unable to recall as of this writing. I had time to attend one of Dr. Sanderson's classes, but from what I could hear, all the classes were excellent indeed, with specialists as instructors in their fields. I also enjoyed some chats with various people at my exhibit. On Saturday evening, we enjoyed a prime-rib banquet with many, many door prizes won by the people holding the lucky numbers. This was followed by some live entertainment from the area.

Well...this is getting to be a lengthy display of my heart-felt appreciation and congratulation to the Western North Carolina Chapter Regional. They did a beautiful job, as everyone in attendance there can testify. As for John Travis, you can look for me next year, fellows, wherever it will be. Thank you so much.

Dates And Deadlines

Jan. 1, 1988
1988 membership fees due

Jan. 22-23, 1988
Board of Directors Meeting
St. Louis, MO

Feb. 1, 1988
1988 officer nominations due
Susan Graham, 2967 Madeline St., Oakland, CA 94602

Proposed bylaws amendments due
Sharla Kistler, RD #8, Box 461, Allentown, PA 18104

Feb. 6-7, 1988
CTE Training Seminar
Tacoma, WA
Michael Reiter (206) 847-6009

Mar. 5, 1988
Detroit Test Center
Hugh Gulledge (313) 669-4325

March 25-26
RTT Tuning & Technical Examinations (Pacific Northwest Exam. Board) Seattle, WA

April 15-17, 1988
CTE Recertification
Pennsylvania State Conference
Chuck Erbsmehl (716) 759-6126

April 28-May 1, 1988
CTE Recertification
Michigan State Conference
Steve Hornbeck (313) 627-6128

June 18-19, 1988
RTT Tuning & Technical Examinations (Pacific Northwest Exam. Board) Tacoma, WA

Chapter Notes

A Compendium Of News And Opinion From Chapter Newsletters And Officers' Reports

Richmond

The Richmond Chapter is in transition. We are changing. Are we ready for it?

At our next meeting we will be trying to have a shorter, more concise business meeting. This will leave more time for the technical session and our "bull session" coffee time. How can we shorten our business meetings? The minutes from the September meeting will be printed and handed out to everyone for inspection or correction. The board, which meets before each general meeting, will work to present the business in a simple and logical order. And finally, with your help in our general discussion, things can move smoothly.

At the October meeting, we will have reports from our Christmas Party committee, the committee on a memorial awards plaque, and the committee looking into a Richmond-sponsored seminar. We are meeting in a new location, so be sure to leave a little early in case you are not familiar with the area.

With everyone's help and cooperation, we can have a good year with good business meetings, as well as good technical sessions.

Jesse Williams

Los Angeles

Meeting highlights: 1. Never bend or disfigure the Steinway-type repetition spring to increase its tension. It should be expanded at the coil like you would increase tension on a safety pin. 2. Some unusual causes of buzzes: a. loose wall paneling, b. piano legs that don't quite touch the ground, c. the lock. 3. For buzzing strings, check for loose copper wrapping, loose ribs, check agraffes and capo d'astro, unglued bridges, unglued soundboard, loose soundboard buttons, etc., and when all else fails, get a cork.

Dallas

Del Fandrich of Baldwin, who is involved in research and development, headed a class called "What Kind of Glue Did You Use?" This was at a week-long school at Memphis State Univesity sponsored by Baldwin. Those attending also toured the Baldwin factory at Trumann, AR.

His class discussed the adhesive and bonding theory. Surface to be bonded must be saturated so that the adhesive soaks into the wood surface and establishes molecular closeness with the wood cell structure. Surfaces are brought together, usually by clamping, leaving the glue line normally at only several thousandths of an inch thick.

Various classes of glue were discussed and the brand names within these classes. The idea that no one glue should be used for every application was well-demonstrated. For instance, Titebond, which is a synthetic adhesive and also known as aliphatic resin, was not recommended for gluing ribs to soundboards or bridges to boards. It has a higher creep factor than some other glues or, in other words, it withstands stress less well than some. Exposure to heat will increase this tendency. One piano he checked for a customer had lost its crown due to ribs being glued to the board with Titebond and exposed to heat via sunlight. Titebond is okay though for gluing the board to the rim or gluing in shims.

Adhesives are not generally expiration-dated. He says to buy them from a source with a high turnover. Buy the product with the highest price. It is quite possible to buy a glue that is beyond its shelf life or that has been exposed to damaging temperatures. he recommended buying animal-hide glue from Garret Wade in New York. He uses hot hide glue for hammer hanging, among other uses.

Fred Yonley

Washington, D.C.

As I start my duties as the chapter's newsletter editor, I'd like to thank Colette Collier for her help. I'm hoping to continue the precedent that she and others have set in putting together a useful and interesting newsletter.

I'd also like to encourage everyone to give me feedback, articles, letters to the editor, cartoons — whatever you think is interesting. The deadline for copy remains the Monday two weeks before the scheduled meeting.

I'd like some response on an idea I have for a technical column on temperament sequences. I think it would be interesting to include sequences, tests, and reasons for use. I'll have the first column in the October newsletter, but let me know what you think.

Any credit due for success of the newsletter goes largely to my wife and co-editor Laura. Complaints can still be directed to me.

Rick Von Behren

Connecticut

The one-day seminar at Sohmer & Co. should go down in history as one of the Connecticut Chapter's finest hours. More than 115 people attended from various east-coast states and beyond, yet everything took place as smoothly as clockwork, thanks to careful planning and the combined efforts of many chapter members. The event seemed to generate the kind of professional and social energy that we have come to anticipate and enjoy at state and regional seminars.

Approximately 60 of those who registered were also able to take part in Friday's tours of the Sohmer factory and the Pratt-Read Ivory Museum. A special thanks goes out to the people at Sohmer and to Edith DeForrest and Peter Comstock from the Ivory Museum for making the tours possible.

Saturday's activities began with Susan Graham, RTT from Oakland, CA, presenting a three-hour class, "Installation and Regulation of Grand Dampers." Susan is a delightful teacher — very knowledgeable, energetic and humorous, and it was an honor to us that she came across the country to share with us the fruits of her experience in the trade.

Chapter Mailing...

The December mailing to chapter presidents included:

1. A message from President M.B. Hawkins.
2. An update on the status of the Guild's health insurance program (see page 1).
3. Information on complimentary *Journal* advertising available for promotion of seminars and conferences.
4. Information on the Guild's recent survey of members and the membership directory.
5. Notification that all dues are officially due Jan. 1.