

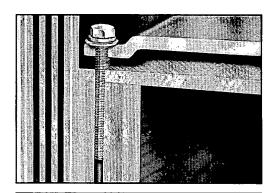
The Baldwin Piano... You can see why it sounds better

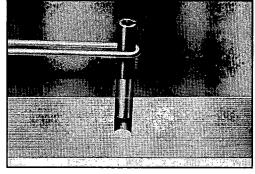
The precise setting of downbearing is extremely important to piano tone. Too much bearing inhibits tone because the soundboard cannot vibrate freely, while too little bearing does not provide good sound transmission. From our research we have developed a unique method of setting downbearing with a degree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

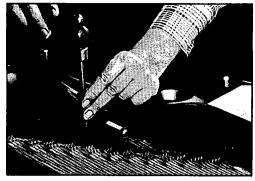
GRAND PLATE MOUNTING SYSTEM: Each mounting hole around the perimeter of the plate is threaded to accept a hardened steel bolt. This allows the plate to be set at the optimum height for bearing on the front side of the bridge (U.S. Pat. No. 3,437,000).

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 restringing 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 Introduces:

Polyking Polyester Repair Kit by König



The König Company of West Germany is the European leader in the development and manufacture of 'State of the Art' refinishing and touch-up materials. Over 40 years ago, German piano makers started using polyester finishes — just in the past few years, German chemists have found a fool-proof way to fix

In the past, polyester repair was complicated by long curing times, unpredictable chemical reactions and a short shelf life for the polyester. Nowadays, a 9 month shelf life is guaranteed, but realistically, you can expect the polyester to last 18 months. Also, the hardening process only takes twenty minutes so you can see same day results.

For the past few years, Schaff has been the exclusive U.S.A. piano industry distributor of König polyester repair products. Just recently, a two hour instructional video was made that coordinates with the 22 page polyester repair manual, to show all of the aspects of polyester touch-up. With the Polyking Repair Kit, everything except a chisel and some tape is included to make fast, "factory perfect" repairs.

Polyester repair is the perfect partner to piano tuning and repair. For the young technician, polyester repair opens doors to new piano dealers and their customers. For the veteran technician, polyester repair provides a break for the ears. Alternating your appointments between tuning and polyester repairs means fewer tunings with more profit, since the going rate for a one visit repair is about 75% greater than for a piano tuning. You cannot make a better investment, as the cost of a Polyking Repair Kit is about the same as a couple of piano tunings.

König has a full range of products for the lacquer and polyester industry. Schaff maintains a stock of polyester based wood fillers, stains, high gloss touch-up pens, rubbing compounds, polishing liquids and Lack 20 polyester. Call or write for a complete product listing and prices.

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PIANO TECHNICIANS OUTNal

JUNE 1991 — VOLUME 34, NUMBER 6

OFFICIAL PUBLICATION OF THE PIANO TECHNICIANS GUILD, INC.

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GRADE: A

KEYBOARD Magazine's November 1990 issue Includes a comprehensive review of home study courses teaching plano tuning. They gave our course an "A." (Other courses received grades ranging from C to F.)

"I think the Randy Potter course is an extraordinary achievement, a terrific investment for anyone who wants to become a plano technician or upgrade their professional skills, and an unbeatable value for the price.

"Not only does it bring together more information about piano technology than has ever existed in one place, it does so in a philosophical and ethical context conducive to producing craftspeople who will be a credit to their profession, and provides a firm practical foundation for their business success.

"Combined with plenty of practice, apprenticeship, and continuing education, this course is one of the best vehicles available today for learning plano technology." — KEYBOARD Magazine, November 1990

See us at the California State Convention, February 22-24, 1991; Pacific Northwest Regional Convention, March 20-22, 1991; the New England Regional Seminar, April 25-28, 1991; and the 34th Annual PTG Technical Institute,

Philadelphia, PA, July 13-17, 1991.

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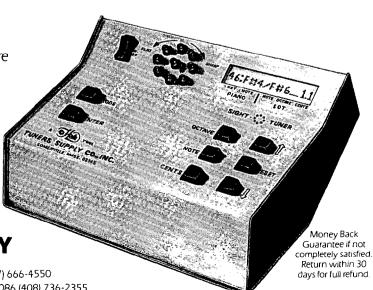
The Hale Sight-O-Tuner®

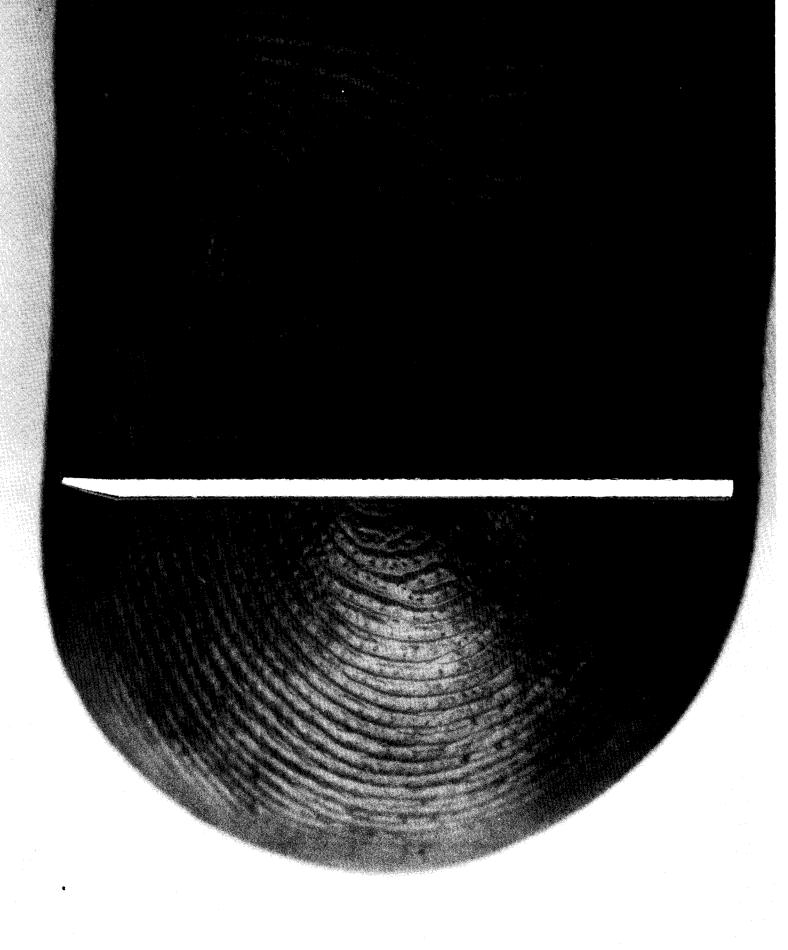
offers value & versatility and compares favorably with Electronic Tuning Devices costing much more.



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At Young Chang, there's nothing too small to improve.

No one notices a center pin until there is a problem.

Most manufacturers make them out of brass. Eventually they tarnish, and can cause verdigris to form. But it usually happens after the piano has left the sales floor. And often after the warranty has expired.

At Young Chang, we make our center pins of non-oxidizing German silver. They don't tarnish. So they move freely for the life of the piano. Chances are you will rarely need to repin or ream the bushings of a Young Chang action. And chances are our efforts will go completely unnoticed.

You also may not notice we coat many of our action parts with Emralon™ to reduce friction and noise and eliminate graphite penetration in felt and buckskin.

Or that we're using an improved premium English hammer felt that lasts longer and produces a bigger sound. Or that there's now whippen auxiliary springs on our 7' and 9' grands for finer touch adjustments.

Or that we've strengthened our grand keystop rails to prevent damage during moving, and steel-reinforced our grand keyslips to minimize warping due to changes in the weather.

We've also developed a moisture absorbent finish for our black keys and a new satin case finish to bring out more of the natural wood grain highlights.

While these recent improvements have gone largely unnoticed, our 12 year *full* warranty is getting all kinds of attention. It's the kind of promise people understand. And the kind of promise no other manufacturer is prepared to offer.

Little by little, we keep refining our pianos. Because it's the little things that make the difference between a good instrument and an extraordinary one.

For your free copy of our Service Guide & Technical Specifications Manual, write to Director of Technical Services, Young Chang America, 13336 Alondra Blvd., Cerritos, CA 90701 or call (213) 926-3200.



President's Message

Join Us In Philadelphia!

As I write this we are in the process of completing the preparations for the 1991 PTG Convention in Philadelphia, PA. For the most part the institute is complete and the many other meetings and social activities are all being placed in their proper time frame so that all runs as smoothly as clockwork, or so we hope.

Who knows how many people have a hand in making the conventions as successful as we have had them in the past few years. There is one thing that you must do to show your appreciation for all of those who have so unselfishly given of their time and effort on behalf of a suc-

cessful PTG Convention, and that is come to the convention.

There is still time to register for the convention and book a room at the Adams Mark. If the hotel is full, there is the Holiday Inn next door. I am writing this in the middle of April and we have had four or five requests for registrations to the convention from technicians from China who want to come for the first time. If they think it's going to be good enough to come from that distance, maybe you should plan to come too, if you haven't already done so.

You might want to come a couple of days early and sit



Nolan P. Zeringue, RTT President

in on the PTG Council even if you are not a delegate or an alternate. We have what I believe will be one of the most important proposals ever to come before Council, and that is the marketing and public relations proposal. This is the first time we have pursued a professional approach to marketing PTG. If this proposal passes in Council we will see it become a milestone in the history of PTG. We in PTG have to tell the world who we are, and what we represent, and this approach using professionals in the marketing of the Piano Technicians Guild is just the beginning.

Piano technicians throughout the world

must think we are a viable force in the piano industry, because they are maintaining contact with us and have shown great interest in our annual institute. We must enhance the image of the Piano Technicians Guild and proclaim our membership as the professionals in piano technology.

We are at the door, ready to reach for new horizons. Come and be with us in Philadelphia, support our new marketing campaign, and be part of one of the best conventions yet. Who knows? We may break 1200 this year.

■

INDUSTRY NEWS

American Music Conference Reports 1990 U.S. Music Industry Export Value Up 13%; Import Value Down 6%

Exports of U.S.-produced musical instruments, parts and accessories rose for the sixth consecutive year to surpass the quarter-billion-dollar mark in 1990; the 13% increase brought total value of exports to \$253,771,000, according to the American Music Conference's (AMC) annual interpretive analysis of U.S. Department of Commerce data.

While total value of musical goods imported to the American market was down in 1990 to \$592,000,000, the six percent decrease was substantially less than the 32% drop reported between 1989 and 1988.

The continued weakness of the U.S. dollar against foreign currencies was a contributing factor affecting both imports and exports during 1990.

Acoustic piano exports were down 13% to 7,300 units, but posted a one percent increase in total value to \$8.1 million. Vertical piano exports dipped 33% in units and 23% in value,

while exported grands were up 16% in units and 33% in total value. Canada imported the largest number of grands; 1,400 units valued at \$1.4 million.

Acoustic pianos (the second largest import category in terms of total value) were reported at \$126 million; a nine percent increase from the previous year. Unit shipments rose 13% to 64,700. Imported vertical pianos represented 56% of total acoustic piano units shipped in 1990, and 30% of total value. Grand pianos were up five percent in units to 26,500 and 12% in value to \$90 million. South Korea and Japan were leading importers of all acoustic pianos in 1990.

The two countries were neck-in-neck as leading importers of verticals (each reporting 14,000 units valued \$15 million); combined, these two countries' shipments accounted for 79% of all vertical units and 82% of their total value. South Korean and Japanese grands, combined, accounted for 50% of

continued on page 8

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Kimball's exclusive DIAIN DID

BEST IN THE INDUSTRY

- Full 15 year warranty
- Includes parts and labor
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For more information call Kimball Customer Service Phone 1.800.634.4737

KIMBALL

FROM THE HOME OFFICE

'Our Culture Is Dying'...

Larry Goldsmith Executive Director

"Our nation really suffers

from a cultural problem

more than a scientific one.

Whether we're behind the

Japanese people is second-

ary. Our culture is dying

from the inside" — Record-

Marsalis, in testimony be-

fore the National Commis-

sion on Music Education in

Los Angeles, CA, Sept. 18,

Wynton

Artist

1990.

More than a year of research, networking and grassroots consensus-building has culminated in the presentation March 6-7 of a 46-page report titled "Growing Up Complete: The Imperative for Music Education" to members of Congress and representatives of the Bush administration.

The report is the result of three public forums in Los Angeles, Nashville, and Chicago, a grass-roots campaign that gathered more than half a million signatures in a petition drive, and the symposium, which focused on three major issues: "children at risk," "cultural diversity, and "the needs of the future work force." The work

of the commission, a blue-ribbon panel composed of artists, educators, legislators and executives, was sponsored by Music Educators National Conference (MENC), the National Association of Music Merchants (NAMM) and the National Academy of Recording Arts and Sciences (NARAS). PTG was proud to be listed among more than 60 organizations that endorsed the report.

The report focuses on the current state of music education — only 29 states have graduation requirements that in some way involve music and the other arts, and only nine of those require pure arts courses rather than such substitutes as computer science — and the threat imposed by our society's focus on math and science courses at the expense of "curricular icing" such as music instruction. For example, the U.S. Government spends nearly 29 times more money in support of science education than it spends on arts education.

Three fundamental goals were proposed:

• Every child in every school must receive a balanced, sequen-

tial, high-quality program of music, taught by certified music teachers.

- Every school must receive what it is entitled to: the full support of local musicians, music organizations, indeed, the entire music community, in its efforts to provide highquality music education.
- Every community should have in place policies and strategies to assure that music education in the schools is integrated with significant opportunities for music experiences, through such community resources as music groups, vocal and instrumental concerts, and theaters.

It also provides a call to action to music-related organizations, parents, researchers, educators, school board members and elected officials to restore music to its proper position in our culture.

You might say that this campaign brought out the best in the music community. The organizations that represent the various large and small segments of the music industry worked together in a way that was completely unprecedented, and MENC, NAMM and NARAS — as well as the other involved individuals and organizations — are to be praised for their vision and hard work.

And to those of you who took the campaign to heart and beat the bushes for signatures go our well-deserved gratitude. You stood up and worked for something important to all of us, and you have a right to be proud.

If you're interested in reading the final draft of the report, copies are available for \$7.95 from MENC Publication Sales, 1902 Association Drive, Reston, VA 22091. It's worth a read.

■

all grands shipped to the U.S. and 91% of the subcategories total value.

Young Chang And Kurzweil Products Stolen

The following units have been reported as stolen from Young Chang America. They were contained in a trailer marked with Young Chang Pianos and Kurzweil Music Systems logos.

If you have any information, please call collect, (213) 926-3200. Listed below by model and serial number are the products stolen. Young Chang Pianos: E101 OP, 1623112; F108 TM, 1622156; F108 IW, 1641068; F108 MO, 1638752; F110 8 — June 1991 Piano Technicians Journal

MO, 1663404; F110 MO, 1650416; F116 IW, 1637044; F116 FC, 1634206; U107A, 1642741; U107A IP, 1621983; U107 OP, 1583861; U116S AO, 1625434; U121 EP, 1661577; U131 EP, 1627730; G157 MP, 0061554; G157 WS, 0058682; G157 IP, 0059341; G157WHP, 0059950; G157DQAM, 0056424; G185MP, 0051053; G185 EP, 006200.

Kurzweil Products: M532 VR, 910285070030; M532 MP, 910285100013; M532 EP, 910285040032; EG-20, 9011427479; EG-20, 9010427144; EG-III, 89011850; EG-IV, 290121923; EG-IV, 290121914; EG-IV, 90101297; EGP-K, 591020634; EGP-K, 591020630; EGP-K, 591020633; MS-1A, 90100191; MS-1A, 90100193.

■

Perfecting The Art Of Scale Design

lo produce a superlative plano, Samick sought out Klaus Denner, the world's preminent scale designer. Samick engineers gave him a straightforward directives create a scale; devoid of compromise, that would endow each Samick plano with a tonal quality and response capable of satisfying the most discerning musician.

KEYSTONE...

The Philadelphia Story

Ernie Juhn, RTT 1991 Institute Director

Well, here we are. Just getting ready to go. In last month's issue you had a good chance to decide that "There is no way that you can afford to miss the 1991 convention."

I can tell you that I am really looking forward to this event. You will like the classes, the facilities are better than we have had in a long time, and for your "spare time" enjoyment, Philadelphia has plenty to offer.

I thought it might be a good idea to reprint the actual

class schedule in this issue. As you might notice, there are hardly any changes. We have forgotten to mention the moderator of the Mini-Technicals, Dick Bittinger, and there a few minor corrections. I can hardly wait to see all of you.

The institute office will be in the Delaware 2 room which is on the lower level. Please come to see me and the institute staff if you have any questions.

See you in Philadelphia!≣

'Top 10' Philadelphia Attractions

By Ruth Brown, RTT SEPA Chapter President

Over the past few months, members of the Southeastern Pennsylvania Chapter have written about some of their favorite "sights and scents" of our intriguing area. As always, the difficulty comes to life when, confronted with 1,001 thoughts of "What I Love Most About My Hometown" and only one sheet of blank paper, one must choose what others may enjoy, and what they feasibly can get to in a few days of a convention trip.

By my own taste, and by consensus among our members, we now present you with a list of unbeatable favorites.

Top 10 Attractions

1. Atlantic City: Your April Leader Letter has all the lowdown on this once-in-a-lifetime chance to join your fellow PTG'ers for fun 'n sun. Your choice: casinos—elegant and luxurious or bold and brassy (\$100 bills or just quarters are at home here); try the famous Atlantic City Boardwalk, or stroll the pier. Don't forget the majestic Atlantic Ocean. Chapter bus leaves the Adam's Mark at 8:00 a.m., and will have you back at 4:00 p.m., in plenty of time to enjoy dinner and relax before the opening assembly.

Note: The bus company has extended our sign-up deadline to June 15. The bus trip comes with rebates of casino chips and food coupons, making it an exceptional bargain.

- 2. Longwood Gardens: Pierre duPont's masterpiece of horticultural splendor 300 acres of gardens among the 1,000 of the estate, including glorious indoor conservatories you must see even if the weather is picture-perfect. Fireworks and lighted fountains are featured on certain nights of the summer, including Friday, July 12. For those of you arriving early for the chapter-sponsored trip to Atlantic City, you may want to come one day sooner and visit Longwood. Call ahead for reservations: (215) 388-6741.
- 3. Valley Forge: This landmark national historical park, George Washington's winter-over site, is only 15 minutes from the hotel, a simple ride up the Schuylkill Expressway. Your interest may wander to studying at the museum, actually getting inside one of the many huts to see firsthand the conditions the troops met, pausing at the gothic-style chapel and the continental Memorial Arch, or just bicycling or walking along the miles of trails. Spend an afternoon, or just take a leisurely

drive through the park. Guided bus tours are also available.

- 4. Philadelphia Museum Of Art: The brightest jewel of the golden Benjamin Franklin Parkway, the PMOA contains over 200 galleries. Half a day will give you a small taste of the cultural diversity available here. A very special exhibit of 100 Picasso prints will be here during your stay. PMOA admission is free on Sundays up to 1 p.m.
- Benjamin Franklin Parkway/Kelly Drive: The "top 10" would have to be the "top 20" to concentrate on each spectacle in this area. Leaving the PMOA, pause on the main steps and take in the parkway view. You will be facing Eakins Oval, the first of the scores of fountains and sculptures on the Parkway and the Drive. Just two blocks away is the Rodin Museum. Alexander Calder's fountain adorns Logan Circle, the midpoint on your way toward City Hall. Surrounding the circle are the Free Library (said to match New York's and Boston's for magnificence and diversity), the Academy of Natural Sciences with its dinosaurs, the Franklin Museum — a perennial favorite, which includes an Omniverse Theatre, and the Please Touch Museum for children.

continued on page 12

10 — June 1991 Piano Technicians Journal





A Piano Worth Recommending.

The brilliant and innovative Paderewski would settle for nothing less than perfection when it came to the tone quality and responsiveness of his piano. According to his memoirs, Ignace Paderewski played many successful concerts on a Weber Piano.

Though the Weber Piano of today is different than the one used by Paderewski, it is still made of the finest materials from around the globe and is carefully crafted using the most modern production methods.

As such, the Weber of today is a piano that you can rely on to provide you and your clients with the consistent tone and responsive touch which comes only from total integrity in the scale and action mechanism.

Weber is a piano you can rely on to provide your clients with the most value in its price class, a piano with quality that belies its affordable price. The fact is, more and more of your customers will be seeing the Weber Piano. When they ask your opinion, give them an informed one by finding out for yourself what these instruments have to offer.

For more information call us at 800-346-5351.



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Even these two street names connote local history: Franklin's footprints are everywhere in Philadelphia, including the University of Pennsylvania. Jack Kelly, late brother of Princess Grace, was an Olympic athlete and local hero. The Kelly Drive used to be known as East River Drive, which includes Boat House Row. This stretch of riverfront property is home to the city's many rowing clubs. You will have a chance to witness the rowers in action on July 14, when the Philadelphia Sculling Regatta takes place. Take your blanket to the bank of either East or West River Drive and watch the sleek, highly-trained scullers compete. Bring your camera.

6. The Philadelphia Zoo: This world-famous zoo is forever achieving new heights of glory through more open exhibits, as close to natural surroundings as possible. This is the nation's first zoo, opened in 1874, and is considered one of the top three today.

7. Bills Of Rights 200th Anniversary: This time, I'm listing an event rather than a place, because it's all-encompassing. Part of the spouse program this year will be a tour of the historical Independence Hall area, including the Liberty Bell. Even to the seasoned locals, touring Independence National Historic Park rouses the spirit to a renewed awareness of our freedoms and responsibilities. A copy of the Bill of Rights will be on display during your visit, at the Old City Hall. While in this general area, you may want to wander through Society Hill, or Olde City — or let a horse and carriage do the walking for you.

8. University Museum: This outstanding world museum, part of the University of Pennsylvania, has its emphasis on anthropology and archaeology, and embraces examples from many ancient cultures, with a serious but approachable manner. You can see Mesopotamian artifacts, Egyptian mummies, Chinese court treasures, and jewels from burial sites in Ur. American Indian objects take up one wing, and a special exhibit of god statues is set up for the visually impaired visitor.

9. Wanamakers's/Reading Terminal: What's the correlation here? None but proximity, and I'm running out of numbers. They are both located on East Market Street. Wanamaker's, the nation's

innovator of the concept of carrying exclusive lines of merchandise (so unique and special that President Taft dedicated the building) is for those who appreciate shopping in a real city department store. The mall versions are fine, but this store is a real experience, classy and wonderful. "Meet you under the eagle" is a local tradition, and you'll see why, but the highlight for our musical guests will probably be the 30,000pipe organ, which is played daily at 11:15 a.m. and 5:15 p.m. Reading Terminal is the old main terminal of the Reading Railroad, and the building is now used as a main commuter terminal — in fact, it has been the recipient of major renovation, as part of Philadelphia's topnotch commuter rail system, one of the finest in the country. Long a favored spot of downtowners for lunches and specialty food shopping (such as the old Pearl's Oyster Bar, yummy Pennsylvania Dutch treats and deli delights), the original wonderful flavor of the Terminal Market has not been lost. There was a major battle when plans for a huge new Convention Center on this site were being developed, but to everyone's amazement and delight, it is only getting better.

different kind of shopping experience, go back to your March Journal, and read Sandy Hartman's excellent article on Bucks County. She does a much better job of describing Peddler's Village than I could, and it is definitely worth a day trip to venture into this area. While there, also see New Hope, an artist's colony. And last, but definitely not least, is the famous spot where Washington crossed the Deleware, aptly named Washington Crossing. There is a beautiful state park to accommodate your leisure hours between all these other activities.

17. King of Prussia Mall: Okay, Ilied. I just can't keep it to ten. But I know that many conventioneers enjoy shopping in extravaganza-style areas, and you just can't top this spot. There's not a store missed here. It's five minutes from the Valley Forge National Park, too.

I won't call it number 12, but remember Webb Phillip's advice to visit Gettysburg if you can. And, allow us the honor of assisting you at our booth. Welcome to Philadelphia!

GOING TO THE PHILLY CONVENTION?

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Auction Update

The biggest and best tool and parts auction in the history of the Piano Technicians Guild will be at this year's convention Sunday, July 14, at 7:00 p.m.! Our auctioneers, Joe Bisceglie, Larry Crabb, Jim Harvey, Ben McKlveen, and David Snyder will expose their tonsils! Not only the highlight of all conventions, but a great opportunity for craftsmen as well as others to pick up tools and parts at a real bargain. It is also a chance to get rid of the extras via our famous auctioneers. I just got off the phone with someone who is sending ten (10) sets of hammers, sets of shanks and flanges, and plus, plus, plus. Where is yours? Send it now!

How about this for a real first-class consideration: Randy and Lynn Potter have made available their famous Randy Potter School of Piano Technology Correspondence Course. This course sells for \$995.00. Of course he took the tuning hammer and a few tools out that you won't need. Can you imagine what a bargain someone will get when they buy this at the auction? This is the one Lynn calls their continuing education course—so it is a good course for everyone.

Stanwood and Company has donated the finest and most complete set of gram weights designed for piano use that I have ever seen. David Stanwood also included his very efficient action analysis program. Sells for \$185.00

VanVolkenburg has donated a full set of keys. I don't mean tops and fronts — he will duplicate your full set of keys, all new wood — tops, fronts and sharps; and all of his work is beautiful.

Wally Brooks has given me two \$100.00 gift certificates and says he is going to fill all openings in his truck with whatever when he leaves home. You may be able to get these certificates for \$10? \$20? \$30?

Dick Kreitz is sending his barrel of hard rubber casters and promises to include a variety of brass as well.

Ed Dryburgh will probably bring enough of his super glues to glue them all together.

Anyone know where you can buy a practice piano keyboard? I do—at the auction. Did you know that one of our great American piano companies still manufactures them? It's Baldwin. I'm ashamed to admit that I didn't know this

until Jamie Marks called me from the Mexican plant and said that Baldwin would be happy to send to us a practice keyboard for the acution. I'm sure they have more if you miss this one.

Willis Snyder usually clears his shop out for these auctions. Of course he usually buys more than he brings.

Dampp-Chaser is sending complete climate control units for both vertical and grand pianos. They may have a lot of other items as well, such as electronic screwdrivers.

Bruce Dornfeld has donated a bunch of tools that make taking off plastic elbows easy. I'm getting at least two of these.

My Canadian friend Andre Bolduc says he is sending at least 20 of something made of maple that will excite many of you.

Herb Johnson of Schaff Piano Supply really electrifies the air just talking about all the things he is thinking of bringing just for the auction. Other items already committed for the auction and raffle are: two piano trucks for grands; maple pinblocks; Delign-it pinblocks; Excalibur pinblocks; a VCR; computers; grand hammers; upright hammers; hammers by Isaac; tools by Joe Bisceglie; Lunsford pinblock restorer; tools by Hart's Piano Shop; other various tools; tape and transcript on refinishing; Vic Benvenuto's tapes; water-based finishing products; quiet keys kit; electronic keyboard; action models galore.

I think I have presented enough to prove to you that this is going to be one fantastic event that you will remember for a long time. A chance for you to sell that excess, and a great opportunity to purchase tools and supplies of all kinds.

There will be food, beverage and a super time for all. Bring cash, check, American Express, VISA, or Mastercard. Send everything you have to sell to: Webb Phillips; 1836 Stout Drive, #16; Ivyland, PA 18974 (215) 674-2555.



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1991 Technical Institute Class Schedule

Sunday-Tuesday

1st period 8:00-9:30 2nd period 3rd period 10:30-12:00 1:30-3:00

4th period 4:00-5:30

Sunday-Tuesday	8:00-9:30	10:30-12:00	1:30-3:00		4:00-5					
Wednesday	8:00-9:30	10:00-11:30	1 period clas	S		2 or r	nore p	period	dass	
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Hammer Tone Regulation - Wally Br				 .,	4					Grand Ballroom A
House Calls - Be Equipped - Isaac S			Ι Ψ	 \	4					Franklin 1
Keys To Where The Action Is - Jami			$$ μO	.						Delaware 4
Learn To Speak Piano - Ray Chandl		1/01						\mathcal{L}		Delaware 3
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4 — June 1991 Piano Technicia	NS IOURNAL					************	**********			***

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Mini-Technicals

Half-hour Mini-Technicals, moderated by Dick Bittinger, will run at various times during the 1991 Technical Institute. They will feature well-known instructors discussing specific, highly-focused topics. They offer the most possible information in the least amount of time. All Mini-Technicals will be held in Franklin 1.

	1st technical	2nd technical	3rd technical	4th technical	5th technical	6th technical
Sunday-Monday	1:30-2:00	2:00-2:30	2:30-3:00	4:00-4:30	4:30-5:00	5:00-5:30
Tuesday	8:00-8:30	8:30-9:00	9:00-9:30	10:30-11:00	11:00-11:30	11:30-12:00
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A New Approach to Hammer Shaping - Ruth McCall - Pomona Valley, CA Chapter								X		*		*							
An Alternative to Knuckle Bolstering - Vincent Mrykalo - Memphis, TN Chapter										❈	***	*			\bigcirc				₿
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Effective Multi-Ply Pinblock Procedures - Kent Webb - Baldwin																			
False Beats - Marvin Cornwall - Twin Cities, MN Chapter			O																₩
Finding the Way to Treble Sound - Willis Snyder - Reading-Lancaster, PA Chapter																	₩		M
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Preparing the Grand Action for Regulation - Wim Blees - St. Louis, MO Chapter				*						w	₩	₩		\cap			₩	****	▓
Repetition Springs - Their Strengths and Weaknesses - Keith Bowman - SC PA Chapter																			
String-Splicing Techniques - Yat-Lam Hong - Western Michigan Chapter													\bigcap						
The Eclectic Tool Kit - Leavitt Keener - Reading-Lancaster, PA Chapter																			
The G-A-K-F Keys - Bob Hundley - Detroit-Windsor, MI Chapter								Y									▒		
Tuning the Victorian Temperament - Owen Jorgensen - Lansing, MI Chapter	O					×										▩			▩
Upright Pedal Trouble Shooting and Repair - Ed Pettengill - Southern Tier, NY Chapter												W			₩				
Voicing Verticals - Gary Nelms - Erie, PA Chapter										▧			₩		▧			\bigcirc	

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Name That Noise - Sid Stone - Golden Gate, CA Chapter						
Piano Widgets - Mark Ritchie - Columbus, OH Chapter						
Professional Ethics, Credibility and Image - Jack Wyatt - Dallas, TX Chapter						
Termites in Pianos - Ben Kuraya - Hawaii, Hl Chapter						
Time is Money - Colette Collier - Washington, D. C. Chapter	O					
Your Career in Sales - Earl Orcutt - Pocono Northeast, PA Chapter						

TECHNICAL FORUM

Refining Lift Setting And Position Of Dampers

Susan Graham, RTT Technical Editor

L ast month we completed the first regulation of newly installed grand dampers: The desired lift with the key was determined and set. Wire bending was corrected to insure that dampers were level and evenly spaced over the strings, and that wires were traveling straight up through the guide rail and straight down into the top flange.

Now it's time to refine both the lift setting and the position of the dampers. For instance, some manufacturers prefer to set the fore-and-aft level of the head so the back (closest to the bridge) of the damper lifts slightly before the front: Steinway is a notable example. This makes a slight change in the damping character of the piano. They also adjust the wire as it travels through the guide rail to bear very slightly against the guide rail bushing, instead of being centered in the hole. This is to prevent the slight

"dancing" or wiggle of the damper as it is lifted, particularly by heavy blows in the bass. Skillful application of this procedure refines damper function even further: overdo it, however, and the dampers will bind and wear out guide rail bushings prematurely.

Sight down from above, looking through the strings at the line of sostenuto tabs. They should be in a straight line front-to-back (as well as level when observed from the front). If the tabs are out of line, so are the top flanges. Sostenuto adjustment becomes more difficult, and wire travel will be incorrect in the forward/back axis. Locate a damper which seems to be traveling well: if it were viewed in profile, the wire would go as straight as possible from the top flange up through the guide rail without forcing the flange to lean and without bearing against the front or

back edge of the bushing. The damper head should not travel forward or back as it lifts. Correct the top flange/sostenuto tabalignment by pushing or pulling on the flange to bend the wire slightly. Recheck the head for level afterwards.

Stop, stand back and look at the big picture: the appearance of the entire set of dampers as they sit on the strings. Are the front and backs of the heads level? Are any dampers leaning right or left? We've been focusing in on details and might be feeling a little cross-eyed. Now that gross errors in alignment have been corrected, it's a restful change to scan the overall appearance and minor

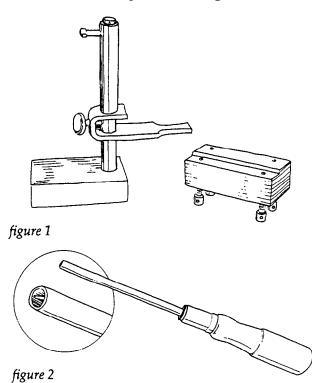
discrepancies will be easy to pick out. Be sure to walk around to the back and look at the dampers from the other side (this is the side the customer is most likely to look at once the music desk is back in place). These stand-up-stretch-and-takea-stroll breaks will also help your back (and mind) from developing cramps.

As we have discovered, each bend change may affect other bends: never assume that any adjustment is finished just because you've done it once. To really refine damper work, keep an open mind about the possibility that a thing may need doing several times over.

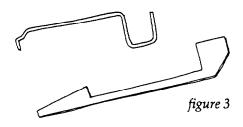
When you think you have the dampers spaced and leveled and otherwise set exactly as you want them, reset the lift. Changing bends in wires mysteriously lengthens or shortens them! It's not the actual length of the wire, of course, but the distance the wire covers which can change rather remarkably as bends are altered. Bear this in mind when installing new wires. They may have to be trimmed so they don't extend all the way through the top flange and bind on the underlever, but don't trim them shorter until the final bending is done.

In the same fashion, refining the bends will cause the underlevers now to be slightly out of level. I use a lift caul (figure 1) to simulate the back end of the key, although some technicians prefer to block up the damper tray (this works best if the tray is not warped and the felt is in perfect condition).

Some damper systems have spoons on the fronts of the underlevers which contact the key. In regulating these systems, the underlevers need to be fairly well aligned so the sostenuto tabs are correct. If the spoons have been bent badly out of alignment to compensate for faulty lift, even them out, set the underlevers in a straight line, and refine the spoon bending using the lift caul.



illustrations by Valerie Winemiller



Every time you loosen and retighten set screws, dampers are inclined to twist. After refining the lift throughout the system, straighten a few samples (by turning the wire with a pliers just above the top flange, as described last month) and put the action in to double check the lift with the actual key. This might seem unnecessarily timeconsuming, but you may be surprised... check it now before you commit any more time to final spacing.

If satisfied, go through and retighten all the set screws using either a captured screwdriver (figure 2) or a pliers. Don't overtighten the screws, especially in older systems with the screws threaded into wood (no metal collets). Make sure that they're good and tight, however. Those particular tools are recommended since they grasp the screw to turn it without exerting excess pressure against the top flange.

Correct twisting. A quick way to start is to depress the right pedal and go down the line of damper wires, sighting from above and reaching into the keybed with the pliers and aligning the felt to the strings visually. Then use the pedal to raise and lower the dampers very slowly, watching for that telltale movement of front one way, back the other which indicates a twisting damper.

If your first troubleshooting was properly done, this slight refinement of the lift should not affect the bends for spacing and travel — but don't take anything for granted. Again, use the right pedal to lift the dampers slowly. Watch the spacing between the heads if it changes, something's wrong. "Dance" on the right pedal: depress it just to the point that the dampers start to lift and tapit lightly up and down, watching for front or back uneven lift. We haven't regulated pedal lift, but it should be close enough to permit detection of imperfectly lifting individual dampers.

When you've got everything working well with the right pedal, put the action in. Check the lift with each and

every key, having learned (the hard way, of course) that keybeds or damper trays aren't quite level and a lift referenced to them may not be even with the keys. Pianists pick up remarkably tiny differences in damper timing.

Checking the lift key by key is easy with a little under-the-string gauge (figure 3). Baldwin supplies the gauge on the bottom; the homemade one is simply fashioned from a piece of wire. It is held between the hammer and the underside of the string and the key is depressed far enough for the hammer to hit the gauge. The damper will just "wink" the beginning of a lift. The gauge stops the hammer travel at exactly the same point for each key. That wink of lift is easy to detect, rather than squinting through the strings trying to see if each hammer really comes to 1/2 the blow and if the damper is really lifting at that point — or did it already lift?

Now comes the fun part — do the dampers work? When dampers don't work, they don't. Damp, that is. Leakage is the usual symptom. It may be either an after-ring which never stops, or what I call a "doink": the sound produced by a damper which works eventually but not as quickly as it should.

Mechanical sluggishness in the underlever or the guide rail can cause either problem. Eliminating this as a

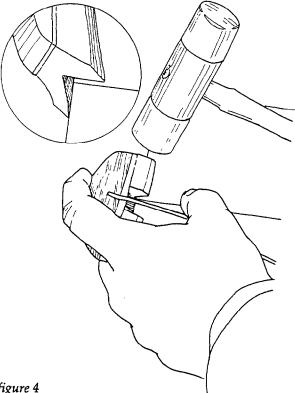
possible culprit was one reason we checked and treated underlever action centers as we rebuilt the system. If suspicious, release the wire from the top flange and check to see that the flange falls freely back and forth, and that the underlever appears to be free at its flange. Be sure there isn't something silly like a loose lead rubbing against a neighboring underlever or a prehistoric potato chip lodged in the system (it can be awfully dark in there — use a strong light and you may detect all sorts of foreign objects).

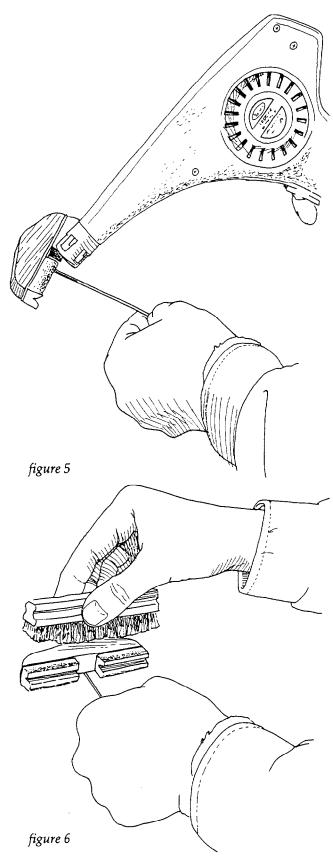
In the guide rail, the wire should have about the same amount of play as a properly bushed key — a little "click" of movement but no more. If you can figure 4

wiggle it this amount by hand but it still binds, the wire is not traveling correctly. Correct the travel rather than overeasing the bushing!

If sluggishness is not at fault but there's still an after-ring, pluck the individual strings with the damper at rest. This will determine if it is one string ringing on, or all three. In most instances, a continuous ring will be coming from all three strings, and will be a fairly obvious problem causing insufficient pressure. Be sure that it's actually coming from the note itself by playing the note and blocking off the strings with a finger as soon as the damper has settled. If the ring still continues, it isn't from that actual note. It may be the undamped high treble, or it may be activated waste lengths singing — is the stringing braid in place? If it is the damper itself, the head is somehow not in contact with all the strings of the unison-either out of level, badly spaced or tilted.

It can be a mismatch of wedge and flat felt in the combination dampers: if all three strings are ringing, it is usually the flat not seating. Deepening the cut between the trichord wedges may help, as may pounding or squeezing the felt. This is done by reaching up and grasping the entire trichord with a duckbill pliers and squeezing it, or by removing the damper, holding it across the edge of





a block of wood or other handy corner, and pounding on it with a small, smooth-faced hammer (figure 4). The object in both cases is to thin the legs of the wedge. Although damper felt can be burned and brushed to thin it, this tends to harden the felt (as well as stain it yellow)

and is not advised for this particular problem.

Don't be fooled by scaling changes. For instance, the break from trichord dampers to flats may make the first few flats sound like they're not working properly when they're actually just less efficient dampers. The shorter sustain in the treble makes the flat damper desirable, but the change to efficiency may not occur soon enough to suit some pianists — judicious changing of felt may be in order.

If just one or two strings ring — aha! This condition is more likely to "doink" and shut off unevenly than to ring on forever, since the damper eventually fights its way down to seating. Are the strings level?

Is a wedge or trichord twisting very slightly? A bothersome characteristic of dampers is that slight differences in travel occur when the underlever is activated by the pedal tray, a finger, or the key: a damper which doesn't twist when lifted by the pedal may very well do so when lifted by the key. Therefore, you may detect problems with the action which didn't show up before. I find it helpful to "tick" the head with chalk — mark the corner that the head is twisting toward. The same problem occurs with travel, and it can cause the same symptom of one wire ringing slightly longer than the others. Once again, make a chalk mark — this time in the middle of the head, on the side toward which the

damper travels as it is lifted with the key. These marks will guide you when you remove the action to correct the problems.

The aforementioned mismatch of flat and trichord usually causes the two outer strings to ring if the flat is too thick

and preventing the trichord from seating completely. Peeling a layer of felt from the flat may help. Putting a small piece of string (such as kite string) in the cut of the trichord will spread the wedges apart and may aid damping.

If the legs are uneven in width, usually just one string will be leaky. Pound the leg which contacts the strings which are damping properly, since that is the one which is thick enough to work but is preventing the other from seating.

Single string leakage can also be due to strings out of level or the twisting, leaning or traveling problems mentioned — check for those before you start mashing damper felt.

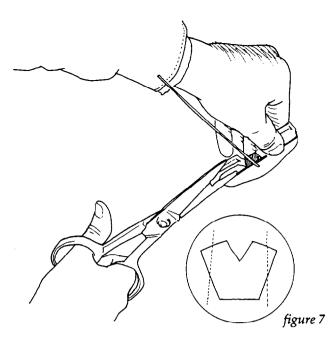
In the bass, watch the bichords as you slowly release the key. The wedge should spread the strings apart evenly. Here again, if there are problems, it's helpful to pluck the strings. The same causes apply.

Monochord dampers may interfere with each other — if the strings are so fat that the felt spreads apart far enough to rub against the neighboring damper, it can be sluggish and damp slowly or not at all. This time, the felt can be burned — the outer surface charred with a heat gun (figure 5), and then a wire brush used to remove the residue (figure 6) to thin it down. A quick application of heat after brushing will help to iron down stray fibers. Monochords which flare out and rub can also be trimmed with a very sharp scissors, cutting off the lower outside lengthwise edge (corner) of the felt (figure 7).

Each time you change the position of the heads or the bends of the wires, it may alter the underlever setting, so keep your lift caul handy for resetting.

When everything is working correctly with the keys, regulate the damper tray to lift and release all the dampers at the same time. This is done either by shimming under the felt, or adjusting capstans mounted either on the tray or on the underlever.

If there are no capstans, I find it easiest to locate the dampers which lift the earliest, and then shim under the remainder to get them to lift at the same time. Slowing down early lift is done by burning and brushing tray felt, or possibly scraping wood from the tray (never the underlever). Both of these are tedious and potentially harmful, so I prefer to shim late risers rather than try to slow



down early ones.

Unless the tray is warped (or the felt is very worn), regulating pedal lift shouldn't require a lot of shims. I use paper and / or strips of manila file folder. Shims can be small enough to fit under just one underlever, or can be in longer strips if needed. They are pushed in under the front (unglued) edge of the tray felt. Don't let them protrude, or they may brush the back of the key. I don't bother to glue them in, since the tray felt holds them in place. Avoid piling up shims on top of shims — this is unstable. In addition, the felt will distort and then settle down around a shim. If the shims are thick or widespread, stomp on the right pedal a few hundred times (after the upstop rail is adjusted) to settle the tray felt, and then recheck the lift.

My procedure is to set the initial pedal lift by regulating the lost motion (at the rod or its leather contact point to the trapwork) so the right pedal has free play for about 1/3 of its travel, and then picks up the earliest dampers. I shim the remainder with the action out, watching the underlevers and engaging the pedal just at lift point and "dancing" the dampers very slightly. Then I stand up and watch the damper heads themselves - some technicians find it helpful to look at the intersection of the felt and the wood block, particularly if there is a red backing. Work back and forth, watching top and bottom until the pedal lift is absolutely even.

Reinstall the action and set the travel of the right pedal so it lifts dampers the same amount as the key. To do

this, depress a chordful of keys and then depress the right pedal. The alreadydepressed dampers should not lift any further. Release the keys which you are holding — the dampers should not drop. As you continue to hold the pedal, play a fairly heavy blow on the keys-dampers should not move. The stop which sets the pedal travel is between the top of the trapwork lever and the bottom of the keybed. It may be a block of dense felt, or a capstan screw contacting a block of leather or rubber. It is not the blocks of felt

surrounding the pedals in the pedal box, and it is *not* the upstop rail which regulates pedal lift.

If you set the pedal lift to be exactly the same as the damper lift with the key, you can usually use the pedal to set the upstop. Specification for the upstop rail is usually that it should allow a very slight amount of play in the damper of a sharp key. Mark a damper so you know which is a sharp key, remove the action, and set the upstop by loosening the screws and stepping on the pedal to lift all the underlevers so the upstop rail rests on them. Push the rail up slightly to create that little extra space, tighten the screws, and check with your indicated sharp damper. If you want to put brads in as insurance, please don't drive them all the way into the rail, as they then are impossible to remove.

The purpose of the upstop is to keep the dampers from flying up and then rebounding onto the back of the key. It should not actually restrict their movement while they are being driven either by the key or the pedal.

There is a notable exception to this standard method of upstop adjustment, and it is the Steinway grand piano. Bill Spurlock has very kindly written one of his typically crystal-clear and succinct explanations of this system, which I reprint here:

The Steinway grand damper system uses a one-piece damper lift tray to which the damper lever flanges are attached. The unusual feature of this particular design is that the pivot point (flange centers) of the damper underlevers is not in line with the pivot

point of the tray. Therefore, since the lever flanges are mounted to the tray, they move up and down in an arc whenever the tray moves.

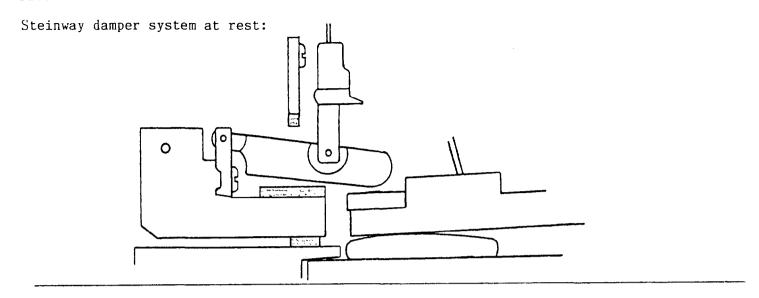
One consequence of this design is that the angle and position of the damper levers is different when lifted by the key compared to when they are lifted by the damper tray. Even if the trapwork is adjusted so damper head lift is equal with the keys and pedal, the lever positions will be different. The second drawing in figure 1 shows the damper lever lifted by the key. The lower drawing shows that when the pedal is also depressed the tray swings upward, lifting the damper lever flange and the rear of the lever with it. The amount of additional lift in the lever is progressively less going toward the front of the lever. As the rear of the lever is lifted by the tray, the front of the lever pivots on the end of the key.

Because the center of the lever is higher when lifted by the pedal than when lifted by the key, the damper stop rail must be set to the higher level. This leaves the stop rail with excessive clearance when levers are lifted only by the keys, and causes the typical bumping feeling in the keys on a moderate to hard blow as the dampers fly up higher than necessary, rebound off the stop rail, and fall down on the keys. This problem is unavoidable with this design. However, it can be minimized by careful regulation. Key dip must be very uniform, damper levers must all be level, and the stop rail felt and key end felts must be even. These precautions will minimize differences in lift from key to key, and allow the stop rail to be set as close as possible. In addition, lost motion in the lift tray should be set to a minimum. Since any tray movement changes the angle of the damper levers, eliminating excess lost motion minimizes total tray movement and therefore reduces the differences in lever position between key lift and pedal lift.

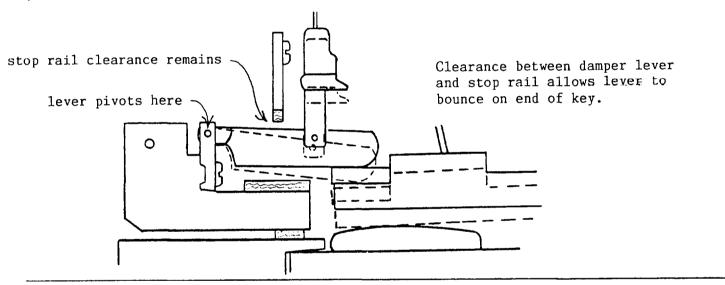
There is one simple modification that can be done which will reduce the bumping problem felt in the keys. By adding spacers behind the stop rail to move it forward as close as possible to the damper top flange, the rail can be set lower. This is because the additional lift when the pedal is used is less toward the front of the lever, as shown in the lower drawing in figure 1. In addition, the closer the stop rail is to the front of the lever, the less the lever can rise before hitting the rail.

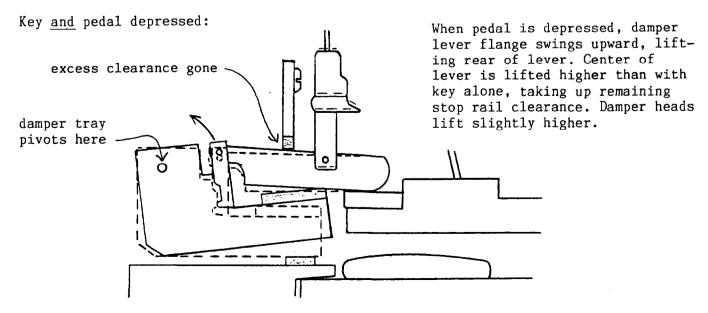
A second consequence of the Steinway damper tray design is that the height of the front ends of the levers varies depending

FIGURE 1.

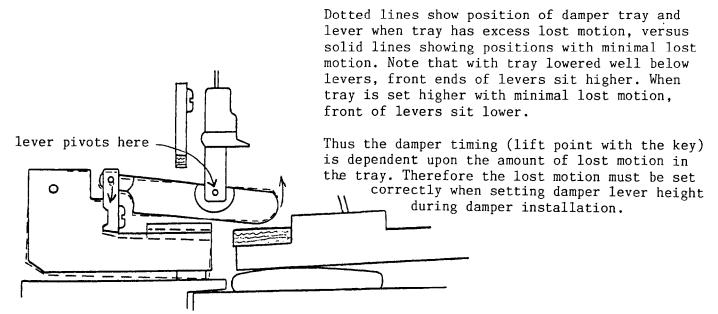


Damper lever lifted with key:





Steinway damper system at rest, damper lever hanging by damper head & wire:



upon the amount of lost motion between the tray and the levers. As shown in figure 2, the front ends of the levers rise as the tray falls away from the levers. This is because as the tray falls lower, the flanges swing downward. At that point the levers are hanging by the damper wires, so as the rear of the levers fall, their front ends rise. This is important to keep in mind during damper installation when you are choosing damper lever height for proper damper timing. If you happen to choose a lever height and install all the dampers when the tray is sitting too low, the dampers will lift sooner than intended when you then adjust the tray up close.

This brings us to sostenuto adjustment. If you get a chance to work on a grand piano which has the sostenuto blade hanging from the belly rail, experiment with it a little to familiarize yourself with the workings of the system. The Steinway style, which mounts the blade on the back of the hammer action, is far more difficult to adjust, since it must be done "blind" and may involve the rather intimidating process of bending brackets.

The basic adjustment starts by setting the blade so that at rest it hangs with the lip at about five o'clock. This is adjusted by pedal rod length. When at rest, the bottom edge of the lip should be about 2 mm above the bottom of the tabs (as stated, the tabs must be in a straight line). The edge of the lip should also be

about 2 mm away from the tabs. Sight down from above to observe this — and this is why the tabs must be even front to back. These adjustments are corrected at the brackets or hangers for the rod, moving them up and down or in and out as necessary. It may then be necessary to readjust the rod length to regulate the lip position at rest.

When the pedal is activated, the blade should swing up to three o'clock. It should not brush the tabs which are at rest. If it does, the rod is too close, or some tabs are out of alignment.

You should be able to depress the right pedal, depress the sostenuto, release the right pedal and have all the dampers remain open, held up by the sostenuto. All these settings can be made with the action out if the the blade is cavity-mounted. If not, a gauge to simulate tab height is used to set the rail with the action on the bench. It is also helpful to remove a few dampers so you can look down into the piano when the action is in place and see the front and back spacing and the blade in action.

The sostenuto, when activated, should not lift the dampers any farther than the pedal or key. Adjust the sostenuto stop — again, under the keybed — so this does not happen.

Frankly, (speaking of the real world) sometimes the sostenuto just has to have a little extra lift to make the darn

thing work reliably. Old systems with fixed sostenuto tabs which are not hinged to drop away if they contact the blade when it is already engaged are more inclined to "cheat" past an engaged blade. On these systems, the blade must be set to swing a little farther than normal, and the upstop must be adjusted with a little more play because the blade will lift the underlevers slightly more than the key. It is potentially damaging to force the underlever against the upstop with the sostenuto (they'll break at the flange). In addition, be forewarned that it is unavoidable for the player to feel a bump of contact if keys are held as the sostenuto is released. The more carefully these systems are regulated, the less noticeable this bump becomes, but it will always be there to some degree.

Put the action back in and make a few more pedal checks. One is to hold down the right pedal, bang a bunch of big chromatic runs up and down the keyboard to get all the strings really cooking, and then slowly release the right pedal. You'll hear any dampers which come down ever so slightly after the rest—and so will a good pianist. Fix it.

Engage the sostenuto without catching any dampers and once again make a chromatic run, giving each key a good strong pop. The tabs should not cheat past the blade and hang up. If they do, the blade may be too far away, it may



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not be swinging far enough, the tabs may be out of alignment, or the upstop may need to be refined.

Well, actually, yes, there is another pedal. Although shift adjustment isn't really part of damper regulation, it is an associated function. For one thing, check to be sure that the back ends of the keys aren't shifting so far they interfere or create noise against the neighboring underlever. For another, that perverse quality of slightly changing travel as the lift contact point changes may come into play with the action shifted, so check for it. The shift pedal should have no lost motion (although it should not hold the action away from the end block) and the stop is a screw either in the side of the case or the cheekblock. It contacts a leather or felt punching in the keyframe when the action shifts and stops it from going further.

We could troubleshoot forever, but I think this about covers what I have to say on basic grand damper work.

An advantage of stringing this series out over the past few months is that there's been time for some response mail. One was the contribution from Bill Spurlock. I'll finish off this topic with a handy and informative tip from Doug Wood re modifying pitman/tray intersection in the you-know-whose piano.

One of the classic damper system squeaks comes from the pitman (!). Thanks

to someone's encouragement along the way, I began to redesign these, at least in some pianos, to the way Steinway currently makes theirs. For those who may not be familiar with it, the Steinway pitman is now a 1/2" dowel with a 3/4" punching of heavy white action cloth on each end. The punchings sit in recesses in the trap lever and damper tray, allowing the pitman to go through a 1 3/8" hole in the keybed. Thus there is little potential for noise. (In fact, if anyone has had a noise problem here, I would like to hear about it!) It is a relatively simple process to install such a pitman, with the right tools. I first cover the floor under the piano, then remove the trap lever. This makes it possible to drill a large hole (1 1/4" to 1 1/2" Forstner bit, started carefully!) through the keybed, centered on the existing hole. It is then easy to reach through the keybed with a 7/8" Forstner bit to drill a recess into the damper tray (I use 7/8" thick white front rail punchings on a 5/8" dowel, since I have extras in the shop.) The depth should be approximately the thickness of the punching on the ends of the pitman. Then I drill the 7/8" recess in the trap lever, right where the old pitman was. Remove the remains of the old leather. The length of the pitman is the same as the original, if the recesses are just the depth of the felt punchings. It is, of course, important not to allow glue to work up through the center hole in the punchings when gluing them to the pitman. Good-bye noise.

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TUNING UP

Temperament Overdose

Rick Baldassin, RTT Tuning Editor

L ast month you may recall we had a letter from Christopher Day which raised a couple of questions concerning a temperament by Virgil Smith, which was published in the December 1990 Journal. I wrote to Virgil, and asked him if he cared to respond to Christopher's questions. Due to publication deadlines, there was not time enough for Virgil to respond in writing. He did, however, call me and respond to the questions. I will reprint the questions here, then do my best to relay Virgil's responses. Here are Christopher's questions:

I read with interest the tuning technique of Virgil Smith. I have always been concerned with the "chicken and egg" aspect of having to decide on the appropriate interval speeds before testing the result to see if the correct speeds were chosen. I have two observations concerning his procedure:

In step 4 his D3-D4 octave test is that for a 6:3 octave and he requires the M6 to be wider than the m3. This would set the octave wide of 6:3. I understand that most tuners set the temperament octave somewhere between 4:2 and 6:3, starting out with 4:2. Is

there a misprint here?

In step 2, he sets F3-A3 to seven BPS. This is then used once in the crucial setup for determining the speed of the fourths. On a piano with high inharmonicity, this speed can drop quite a bit for smooth interval progressions. Granted that this speed does get corrected in step 8, however nothing is suggested about modifying it in step 4 through 7, where it effects the setting of the P4 speeds, and thus the subsequent M3 speeds. It seems that this procedure has not overcome the "chicken and egg" problem, but merely buried it in a different part of the protocol. The answer may lie in the question of the sensitivity of the various tests to the setting of this beat frequency. Maybe someone has some enlightenment on the subject.

Virgil did confirm that it was his preference to tune the temperament octave such that the M6 is faster than the m3. He did concede that almost all of his work was on grands, and that this might not be possible on all pianos. I made another observation. While it is true that most technicians tune the temperament octave somewhere between 4:2 and 6:3,

the temperament octave is usually considered to be F3-F4. Virgil's temperament is from D3-D4, which is slightly lower in the scale. Since the octave width increases going down the scale, it could be possible that the D3-D4 octave would be wide of 6:3.

In regard to setting the FA third at seven BPS, Virgil did agree that this was a weakness in the system, but that in his experience, the FA third usually does not have to be changed much, and therefore does not pose a problem to the setting of the fourths. He commended Christopher for the analysis which he had done on the system, and stated that he felt the alternative which I proposed (setting a chain of contiguous thirds) would nicely solve the problem of the proper FA third width. Our thanks to Virgil for his response.

After writing last month's column, where I modified Virgil's system, it came to mind that this was yet another system which used contiguous M3rds to determine proper third width, then employed some other scheme to determine the

proper fourth width. This month, I would like examine three such systems.

The first system I would like to look at is Virgil Smith's system, which was printed last month. Virgil's system for determining the proper fourth width is accomplished by tuning a fourth up from the lower note and a fourth down from the upper note of a perfect fifth which has already been tuned. Two resulting minor thirds are compared to see if the fourths have been tuned correctly. If the EG m3rd is too slow as compared to the

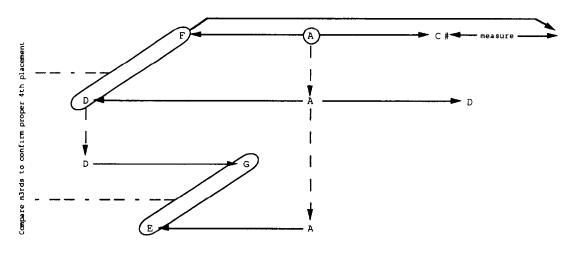


Fig. A shows the Virgil Smith system of determining proper 4th width.

DF m3rd, then the fourths are too wide, and vice-versa. Figure A diagrams the subdivision of the perfect fifth to determine the proper fourth width.

The second system I would like to look at is Dr. Sanderson's system, which was printed in the February 1990 Journal. Dr. Sanderson's system for determining the proper fourth width is accomplished by tuning up a fourth, down a third, and up a fourth from the lower note, and down a fourth, up a third, and down a fourth from the upper note of an augmented fifth (F3-C#4), both notes of which were tuned as part of the original chain of contiguous M3rds. The resulting GB M3rd must fit between F#-A# and G#-C. If GB is too fast, then the fourths tuned were too wide, and vice versa. Figure B diagrams the subdivision of the augmented fifth (two contiguous M3rds) to determine the proper fourth width.

The final system I would like to look at is the Foli-Baldassin system, which was also published in the February 1990 Journal, and more recently in the February 1991 Journal. In this system, determining the proper fourth width is determined by tuning two fourths up from the lower note, and two fourths down from the upper note of the octave. An additional M3rd (GB) is tuned such that it fits half way between two previously tuned M3rds (FA, and AC#). The resulting M3rd (BD#) must then fit between two previously tuned M3rds (AC#, and C#F). If BD# is too fast, then the fourths were tuned too wide, and vice versa. Figure C diagrams the subdivision of the octave to determine the proper fourth width.

In each of these three systems, a symmetrical series of intervals is tuned in the opposite direction, off already tuned notes, and some resulting intervals are compared to establish the validity of the fourths which were just tuned.

Prior to teaching at the New England Regional last April, I was able to spend a day with Dr. Sanderson, and ran by him the idea I had for this month's article, which was the comparison of these three systems. This allowed the two of us the opportunity to bounce a few ideas off each other. Some might say that

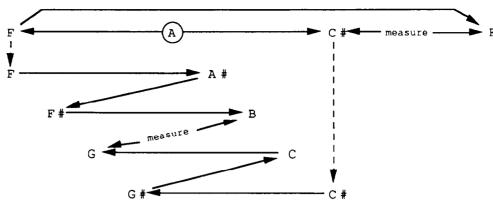


Fig. B shows the Sanderson system for determining proper 4th width.

the two of us sharing ideas created a great synergism, but I would simply say that we were able to come up with what is probably the most foolproof temperament scheme either of us has ever seen.

The system follows the Foli-Baldassin system of subdividing the octave, but the breakthrough came by modifying the steps to correct an incorrect guess for the width of the fourths. The object of the system is to place B halfway between the two F's. In the original system, this was accomplished by tuning B between G and D#, such that the M3rds GB fit between FA and AC#, and at the same time the resulting M3rd BD# fit between AC# and C#F. This being the case, the contiguous M3rds GB-BD# should at the same time be in a 4:5 ratio. When all of the above conditions occur, the fourths have been properly tuned. This is a sound theory. The problem was that if everything did not work out, the error had to be distributed among five notes until everything did work out. This was not an easy task. The same was true in Dr. Sanderson's system. Making these small adjustments on five notes just to get B in the right place could be a real pain.

This is where the the big light bulb came on. If the object is to place B in the middle of the octave, then get it there and leave it alone. The procedure is essentially the same — tune from F3 up to A#3, and from A#3 up to D#4, tune from F4 down to C4, and from C4 down to G3. The next step is to tune B3 halfway between G3 and D#4. This is accomplished by establishing the proper 4:5 ratio between GB and BD#. Once this relationship is established, B3 is left alone. The steps for correcting the fourths are altered. Instead of retuning F3-A#3, A#3-D#4, F4-C4, C4-G3, and G3-B3 (then retesting B3-D#4) as was done before, a new sequence was created. So far, notes F3, A3, B3, C#4, and F4 have been set

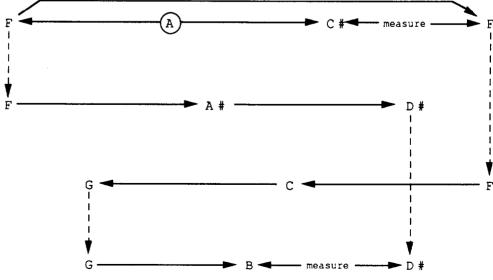
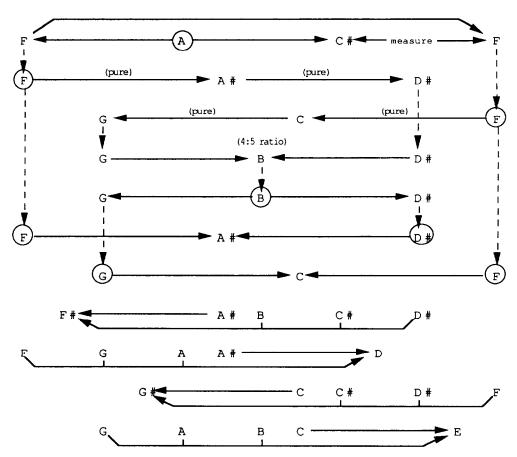


Fig. C shows the Foli-Baldassin system for determining proper 4th width.

Baldassin-Sanderson Temperament System



positively. The next step is to retune G3 to B3, such that the G3-B3 third fits half-way between F3-A3, and A3-C#4. The following step is to retune D#4 such that the B3-D#4 third fits halfway between A3-C#4 and C#4-F4. At this point F3, G3, A3, B3, C#4, D#4, and F4 have been set positively. These notes make up the whole-tone scale between F3 and F4.

The next step is to retune A#3 such that it is halfway between F3 and D#4. Since A#3 is the common note between the F3-A#3, A#3-D#4 contiguous fourths, this is a very sensitive adjustment, and is accomplished when the two fourths are essentially at the same beat rate, the upper fourth possibly ever so slightly faster. The following step is to retune C4 such that it is halfway between G3 and F4. Since C4 is the common note between the G3-C4, C4-F4 contiguous fourths, this is, again, a very

sensitive adjustment, and is accomplished in the same manor as was A#3. Once this has been accomplished, all four fourths should be nearly the same speed (the upper two may be ever so slightly faster than the lower two).

The key to this system is that note B3 must be placed precisely in the middle of the octave between F3 and F4. In the original system, a guess was made as to how fast the fourths should be beating. This introduces the possibility of an error in getting B in the middle of the octave if the fourths are not widened by precisely the same amount. In this new system, this error is eliminated by actually initially tuning the four fourths pure, such that the M3-M6 test is equal in each case. The error is eliminated because either the fourth is pure, or it isn't. Once the four pure fourths have been tuned,

note B3 is then tuned halfway between notes G3 and D#4, such that the contiguous thirds G3-B3 and B3-D#4 are in the ratio of 4:5. Because the fourths were tuned pure, these thirds will be beating rather slowly, which will make it easier to establish the 4:5 ratio. Once this is done, B3 is precisely in the middle of the octave, and the steps for retuning the notes of the four fourths can be executed.

At this point, notes F3, G3, A3, A#3, B3, C4, C#4, D#4, and F4 have been properly set. This leaves only four notes to be tuned — F#3, G#3, D4, and E4. With so many notes properly tuned, these remaining notes should fall into place rather easily. In each case, the note is tuned as a M3rd, fourth, fifth, and M6th. Note F#3 is tuned as a M3rd from A#3, a fourth from B3, a fifth from C#4, and a M6th from D#4. There will be one place which best satisfies all four intervals. Next, D4 is tuned as a M3rd from A#3, a fourth from A3, a fifth from G3, and a M6th from F3. Next, G#3 is tuned as a M3rd from C4, a fourth from C#4, a fifth from D#4, and a M6th from F4. Finally, E4 is tuned as a M3rd from C4, a fourth from B3, a fifth from A3, and a M6th from G3.

This completes the temperament tuning. At this point, there are numerous parallel and contiguous tests which can validate the placement of each of the temperament notes. Below is a diagram which outlines this system.

It is Dr. Sanderson's and my feeling that if the tuner can master the 4:5 contiguous interval relationship and will follow this procedure, he or she will have a hard time going wrong. For the teacher, this system is very easy to demonstrate to the student. I hope each of you will take time to try these various temperament systems.

Until next month, please send your questions and comments to:

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PRACTICALLY SPEAKING

Key Recovering, Part III

Bill Spurlock, RTT Sacramento Valley Chapter

Parts I and II of this series covered removal of old keytops and sharps, milling down the key wood, installation of new keytops and trimming the side overhang. This article will describe the remaining steps in the process of key recovering and sharp replacement, and includes a list of sources for the various tools needed for this system.

Router Step II: Trimming The Notches

In the first trimming operation, described last month, a table-mounted router and laminate trimmer bit were used to cut the excess side overhang from the new keytops. This process leaves the new keytops flush to the key wood in all areas except for the notches where the keytop heads and tails meet, as shown in figure 1. These notches need to be uniformly trimmed on all keys to provide clearance for the sharps and so notches of adjacent keys are even, forming a straight line across the keyboard.

For this operation the router is used again, this time with the key held horizontally and passed over a straight router bit as shown in figure 2. A trimming jig is used to hold the key at the correct height; an adjustable stop on the jig also locates the key endwise, ensuring that the notch length on each key is identical. The height of the bit is set even with the part of the jig where the key rests, ensuring that the top of the bit will cut flush with the side of the key tail regardless of which key is being trimmed. The bit runs in a tunnel within the jig, making this a safe routing operation.

Making The Trimming Jig

The trimming jig looks rather complicated but is actually quite easy to make using only a table saw and your table-mounted router. It consists of three parts: the main body, the top block that holds the adjustable stop rod, and the

strip that rides in the miter slot of the table. (Refer to figure 3.) To make the main body, start with a piece of wood 1 1/4" thick, then cut it 5 1/2" square with the table saw. Then cut a slot 1/4" deep and 1 1/4" wide across the center of one face, using either a table saw with dado blade or your router. (This slot is where the key rests.) Next cut the slot that houses the router bit. This slot should be about 1/8" wider than the bit you will be using for the key trimming, and should be 1 1/16" tall. If you use your router to cut this slot, make two or three passes with increasing depth rather than cutting to full depth in a single pass. Locate this slot close to one edge of the block, leaving about 5/16" thickness remaining on that edge. Notch out this side as shown for clearance of the key heads. Next, glue a thin wood cap on each end of the block to add strength to the narrow outer edge of the bit tunnel. Note that stop dowels are required in the table's miter slot to prevent the bit from contacting these end caps. Finally, bevel the opposite edge of the block as shown, using either the table saw or the drill press and rotary planer. This bevel provides clearance for keys that angle acutely just behind the key tail.

The top block is simply a block of wood with a 1/4" hole bored into the end to accept the adjustment rod. Bore a second hole, 3/16" in diameter, through the top of the block and intersecting the first hole, and thread it with a 1/4"-20 tap for a set screw. Bend the adjustment rod from 1/4" brass or steel; the end of the rod should contact the front surface of a key in the jig, and not the key lip. An alternative to the top block/adjustment rod is to just clamp a board to the table top to act as a fence. This is simpler to make, but slightly less convenient to use and not as elegant.

The last component needed is

the strip that rides in the miter slot of the table. Your router table might have come with a miter gauge. If so you can just remove the metal strip from that and fasten it to your jig. However, for accuracy the strip should have minimal side play in the table slot; if the metal one is sloppy it is better to make a wooden piece. Drill holes in the table's miter slot to drop in short hammershank dowels. These limit movement of the jig, and together with the end caps keep the bit completely enclosed for safety. One additional precaution needed is to clamp a hold-down block over the miter strip so that the jig cannot be accidentally bumped out of its slot and into contact with the bit.

Router Bits To Use

Any straight router bit can be used for the notching operation, as long as it is very sharp. Carbide bits are generally best for most applications, but will sometimes have a more blunt angle to their cutting edge than will a high-speed steel (HSS) bit. A blunt angle causes higher pressure against the material being cut and can sometimes cause chipping of the plastic, so HSS often works better here. However, the best results will be had with a spiral bit, either HSS or carbide, like that shown in figure 2. The spiral bit cuts with a shearing action, rather than a chopping action; since its cutting edge is angled it does not impact

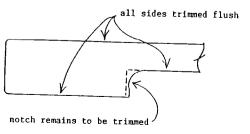


figure 1: key after trimming sides with laminate trimming kit

the entire notch edge at once and thus cuts with much less pressure against the plastic. I would strongly recommend using only a spiral bit for this job.

Spiral bits are only made in sizes equal to or smaller than the shank diameter. Thus if you have a 1/4" router you will be limited to a 1/4" spiral bit size. This will still work better than a larger conventional bit, but ideally you would use a 1/2" spiral bit in a 1/2" router.

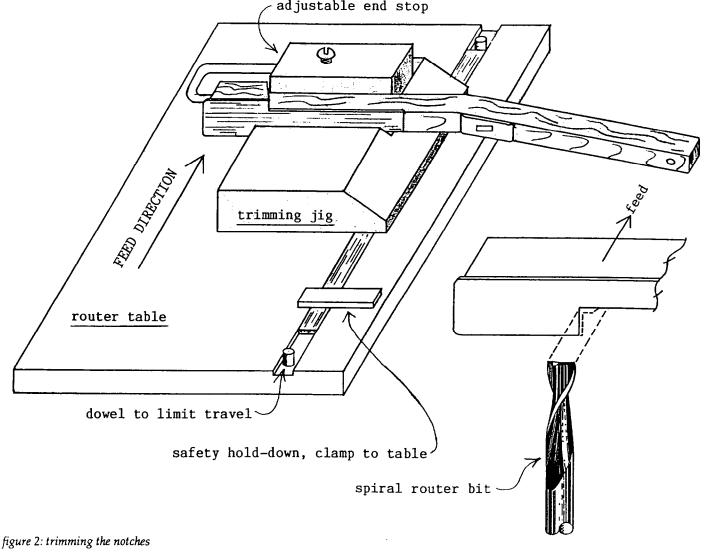
Using The Trimming Jig

Setting up to trim the notches requires making two adjustments. First, adjust the height of the bit level with the surface of the jig where the key sits. Test with scrap wood until the top of the bit just grazes the wood. Second, the end rod (or fence) needs to be adjusted so the notch is in the correct location. Normally, the plastic should be trimmed back to meet the key wood. However, remember that I recommend inspecting the keyboard before removing the keys from the piano, to see if an excessive or insufficient gap existed between the ends of the sharps and the heads of the naturals. Where such a problem does exist, you have a chance to correct it at this point in the job.

Once these two adjustments are made, you are ready to begin trimming. This is a fool proof operation, with one exception: You must feed the key in the correct direction, as shown in figure 2! When the key is pulled over the cutter as shown, the side of the bit that is cutting the notch (left side in the drawing) is moving opposite to the direction that the key is moving. This means that the key cannot get wedged between the bit and the fence or stop rod, because the bit cuts its own path as it goes and excessive cutting force simply slows down the feed rate. However, if the key were to be fed in the opposite direction, the edges of the bit would be cutting in a direction toward the front end of the key. This will force the key further into the bit. The result is that the next bit rotation encounters a bigger bite than it can handle and the keytop chips. Always slide the jig in the direction shown, regardless of which side of the key you are trimming.

Trimming Step III: Hand Filing

The last step in trimming is to reround the edges of the keys and remove any sharp corners. This is best done with a mill file about eight inches long, mounted in a file handle. First, with the key laid on its side on the bench top, lay the file flat on the key and smooth any bumps with one or two strokes. Then tilt the key to about 45° and file off the sharp edges along the sides of the tail adjacent to the sharps, including the notch area. There is no need to heavily round this edge. Do a more generous rounding as needed on the sides of the key heads or on the sides of the tails adjacent to other



white keys. I find it easiest to do this rounding by sliding the file lightly along the length of the key with one hand while rolling the key back and forth with the other. Do not over-do the rounding. If you were careful to center the keytop during installation there is usually enough of the original molded shape left after trimming that little file work is needed.

Cleaning And Buffing

At this point all that remains is to clean up the old fronts, assuming you retained them. For that finishing touch it's also nice to wash the sides of the keys to remove the black stains always found there. Both of these chores are quickly done using 50/50 ammonia and water and a Scotchbrite pad. For efficiency, I like to work on one octave of keys at a time as follows: Push the keys together, with their front ends overhanging the bench top. Bump them into line with a ruler, then hold them down with one hand while scrubbing all seven fronts with the cleaning pad. Then tip them on their sides one at a time as you scrub the key wood. Flip them the other way and scrub the other sides, then wipe dry with a cloth. Any solvent-based glue can be removed with naphtha without damaging the plastic, while the 3M waterbased adhesive can be rubbed off with the fingers.

For the deluxe job, you may wish to buff the keytops to remove any surface scratches and file marks. To do this you will need a soft cotton buffing wheel and some plastic or ivory buffing compound. Run the buffing wheel at a slow to medium speed and use light pressure, otherwise you may wear off corners and edges.

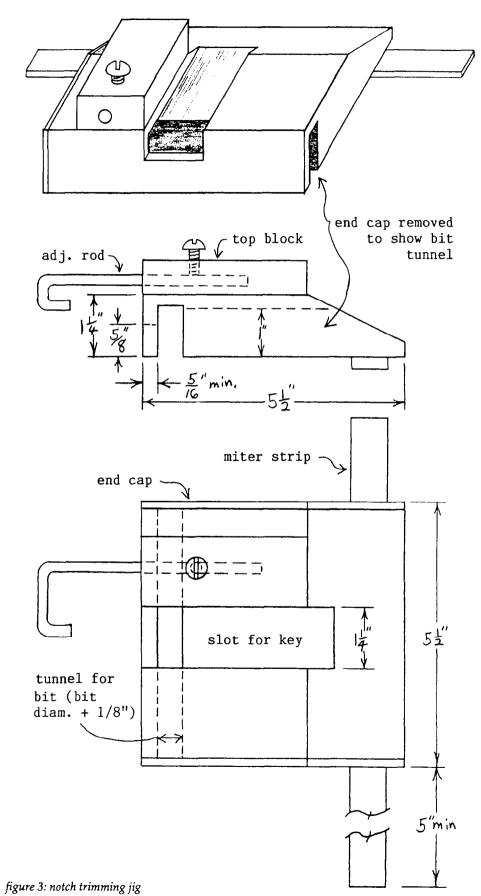
Installing New Sharps

Back in part I of this series I described the procedure for removing the old sharps and planing down the key wood to provide a good gluing surface and to maintain the correct key height. Here we will complete the sharp replacement.

As previously mentioned, older sharps are sometimes of slightly different length than the two standard sizes available today. From your initial observation of the the piano you will know whether standard-sized replacement sharps will work or whether they will

have to be shortened to provide adequate clearance for the fallboard. Sharps can be shortened by using a disc sander, pushing each up against the disc with a block until a stop is contacted.

New sharps come with their bot-



June 1991 Piano Technicians Journal — 31

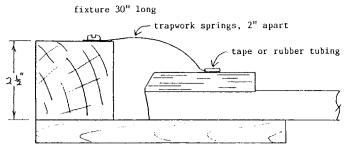


figure 4: clamping sharps

tom surface sanded. I have found that some brands are sanded crooked or unevenly so that they are not flat. Check yours by resting them on a smooth, flat surface; if uneven they can be flattened with the disc sander or by hand using a piece of 80-grit paper on a flat surface, or better yet — send them back and order a different brand.

I glue on my new plastic sharps with a yellow wood glue, applying it directly from a plastic squeeze bottle to the key wood in a thick enough layer that some glue squeeze-out is visible when the sharp is pressed into place. Fore and aft alignment is accomplished by seating the sharp side against the ledge at the back of the planed area. For side-to-side alignment the sharp should be centered on the key. Press the sharp down by hand but do not wipe off the glue squeeze-out at this time; it is easier to remove the excess with a chisel later when trimming the joint.

While you can get by without clamping, I prefer clamping lightly for a few minutes using the fixture in figure 4. This ensures that the glue line stays thin during the first few minutes until the glue begins to stiffen. The set-up shown holds 15 keys at once. When the 15th key is in place in the jig, I remove the first one, put another in its place, and so on until all sharps are glued on.

Trimming And Finishing The Sharps

After about an hour, the glue will be set, but still slightly soft; this is a good time to run a sharp chisel along each side of the sharp, trimming the key wood flush with the sharp and removing any glue squeeze-out. Choose your cutting direction so that the chisel does not gouge into the wood.

Sometimes the new sharp will be wider than the key wood, leaving a sharp plastic edge exposed at the glue joint. In this case you have two options: either

grind off this edge using a small drum sander in a mototool, or widen the key by gluing on veneer, then chisel or sand flush. Always check the lower front corners of the sharps; they will often be

pointed and need to be rounded slightly or else the pianist will feel them.

The last step in sharp replacement is to blacken the wood of the sharp where you have trimmed. This is quickly done with one of the giant-sized felt pens from a stationary store, or with a liquid black shoe polish.

Conclusion

Key recovering is a commonly needed job for everyone working on older pianos. Like many shop jobs it requires some specialized equipment and therefore is often farmed out to others. Where these services are available at reasonable cost and quality, doing your own key work may not be feasible, especially if you prefer tuning to shop work. However, for those who enjoy shop work, key recovering offers a clean, straightforward, and rather pleasant way to spend an afternoon at the workbench. For these technicians I offer the system outlined here.

Suggested Tool Sources:

P&R Tool Co.; P.O. Box 606; Sand Springs, OK 74063; (918) 245-8720; source for rotary planer

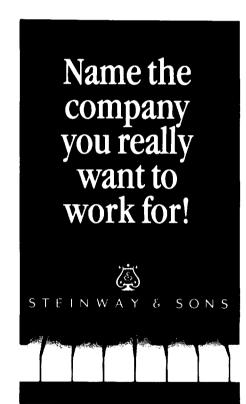
Grizzly Imports, Inc.; (800) 541-5537 (west); (800) 523-4777 (east); quick-release woodworking vise, #G1092, \$59.95; drill press vise, #G1499, \$11.95; power tools, router bits, etc.

Woodworker's Supply; (800) 645-9292; HSS spiral router bit, 1/2" x 1/2" #95-862, \$14.95

Trendlines; (800) 767-9999

Highland Hardware; (800) 241-6748; suppliers of power tools, router bits, router tables and router table kits and plans

MLCS Ltd.; (800) 533-9298; solid carbide spiral router bits, 1/4" x 1/4" #603, \$12.00, 1/2" x 1/2" #905, \$29.00; carbide laminate trimming bits, 1/2" x 1/4" shank #502, \$7.50, 1/2" x 1/2" shank #804, \$9.00



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AT LARGE

The Ideal Aural Tuning, Part II

James Coleman, RTT Phoenix Chapter

H ow many times have you set a beautiful temperament, and then as you progressed beyond that area, things began to fall apart? Maybe your Major thirds did not progress rapidly enough, or vice versa, perhaps they increased in beat rate too rapidly, and then just beyond your temperament octave, they had to slow down in order to maintain acceptable octave relationships. Outside of radically bad scale designing, this is usually caused by our imposing a particular set of beat rates upon a piano that was not compatible with the scale design of the piano.

In the tuning class given by Steve Fairchild at the Dallas 1990 PTG Institute, we were shown a method whereby one can achieve a perfect compromise for the entire piano, not just the temperament. The remainder of this series of articles will be devoted to explaining at least this author's understanding of what his approach accomplishes.

In the normal approach to aural tuning, we make a number of choices, judgements or decisions for each note of the temperament. If we make wise decisions, we finish earlier and usually with better results. In the novice stage, we all had difficulties making the right decisions, and this was further compounded by the fact that we had not at that time developed good hammer technique. In time, we learned (usually experimentally) how to manipulate the tuning lever so that the strings stayed where we decided they should. However, we still found it convenient to blame our lessthan-smooth tuning on poor scale design factors.

Computers are accurate and speedy decision makers when they are told precisely what the rules are. Various computer programs have been written to show that one piano may require slightly different beat rates in the tem-

perament region from what another piano may require. Table 1 shows some of the primary beat rate progressions required by various pianos that are commonly encountered in our practice.

The beat rates in Table 1 were determined by balancing single and double octave relationships and also balancing contiguous M3rds and maintaining a smooth progression of M3rds. In order to do this, it was necessary to know the inharmonicity coefficient or constant for each note of over a two octave range. One does not need to have an accurate electronic measuring device, such as an Accu-Tuner to determine these inharmonicity characteristics, but a computer is very helpful. One needs only to measure the various string parameters such as vibrating length, diameter, etc., in order to have them available for entrance into a well-designed computer program or spreadsheet. Once the inharmonicity constants are known, the computer can, through its various decision points, subroutines, or multiple iterations, find the ideal place for each note on the piano. A computer is a wonderful number cruncher, so after each note is properly located on the tuning curve which the piano itself largely determines, it is fairly simple to locate the position of the coincident partials of the various intervals and print out the beat rates for these intervals.

In order to give a number of examples in one table it was decided to show only three different types of intervals and include only those which are within the F3-F4 temperament range. In order to read the charts, you will notice note 37 at the upper left corner of each chart. This is the upper note of the F3-A3 Major third, and under the "thirds" column you see the value equal 6.5 BPS. At 38, the A# is the upper note of the F#3-A#3 M3rd with a value of 7.1. A# is also

the upper note of the F3-A#3 fourth, and it has a value of .7 BPS under the "fourths" column.

The main thing to notice in these charts is that none of the beat rates are identical to the theoretical beat rates we all learned in the early days of our practice. If one insists on having F3-A3 always beat at seven BPS, worse compromises will be experienced in the fourths and fifths, in octave matching, and in continuing the smoothness of the thirds outside the temperament octave. You may compare all of these charts with the one labeled "Theoretical Beat Rates" which shows what the beat rates would be if there were no such thing as inharmonicity.

Another interesting thing to notice is that there is much less difference between the lower fourths and the upper fourths within the octave. This is due to the slope of the inharmonicity curve of the particular piano. You will also notice that in general, the rates of the fourths are a little faster than theoretical, and the beat rates of the fifths are a little slower than theoretical. This one observation should help us in our approach to aural tuning.

A number of examples were used to show that these observations are not just special cases. These pianos are listed by name with no fear of reprisal because they all exhibit good qualities of evenness in this area, but they are different.

Next month, you will see how the temperament beat rates fit smoothly into the scheme of things as octaves are extended beyond the temperament area. Near the close of this series, you will discover how the individual formulas fit into the scheme of Einstein's E=mc²—oops, I mean Fairchild's T=(M+C)/12.

continued on next page

Table 1. S	Steve Fair	child		Kimball 6	6'7" Grand	d # T9110	9	Steinway	L #51756	6	
T=(M+C)	/12 Comp	arisons			thirds			-	thirds		
	pper note		al:	37:A3	7.0	fourth	s	37:A3	7.1	fourth	s
	eats per se		ш,	38:A#3	7.4	0.9	.5	38A#3	7.5	1.0	
units = be	eats per se	conu			7.9	0.9	fifths	39:B3	8.2	1.1	fifths
V 61	C 15	T 400150	\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	39:B3							
Young Cl	hang G-15	7 #03179	97	40:C4	8.4	1.0	0.5	40:C4	8.7	1.2	0.3
	thirds			41:C#4	9.1	1.1	0.5	41:C#4	9.1	1.3	0.4
37:A3	6.5	fourth	าร	42:D4	9.7	1.2	0.5	42:D4	9.6	1.3	0.4
38:A#3	7.1	0.7		43:D#4	10.3	1.3	0.5	43:D#4	10.0	1.3	0.4
39:B3	7.8	0.9	fifths	44:E4	10.7	1.4	0.6	44:E4	10.5	1.2	0.5
40:C4	8.3	1.0	0.4	45:F4	11.1	1.3	0.6	45:F4	11.2	1.3	0.6
41:C#4	9.0	1.1	0.4	10.1 1	11.1	1.0	0.0	10.1 1	11.2	1.0	0.0
				0	D #4640F	••				NO 11/0505	00
42:D4	9.4	1.2	0.4	Steinway		3		Young C	hang G-20	IU #6U537	23
43:D#4	9.9	1.2	0.5		thirds				thirds		
44:E4	10.4	1.2	0.5	37:A3	7.0	fourth	ıs	37:A3	7.2	fourth	S
45:F4	11.0	1.1	0.6	38:A#3	7.4	0.9		38:A#3	7.6	1.1	
				39:B3	7.7	0.9	fifths	39:B3	8.2	1.1	fifths
Yamaha (G2R Gran	d #47312	75	40:C4	8.4	1.0	0.4	40:C4	8.6	1.2	0.3
Turriaria (thirds	u 1111112	., 0	41:C#4	8.9	1.1	0.4	41:C#4	8.9	1.2	0.3
27 42		c									
37:A3	6.6	fourth	าร	42:D4	9.4	1.1	0.5	42:D4	9.3	1.2	0.4
38:A#3	7.4	0.8		43:D#4	10.0	1.2	0.5	43:D#4	9.8	1.2	0.4
39:B3	7.9	0.9	fifths	44:E4	10.7	1.3	0.6	44:E4	10.5	1.2	0.5
40:C4	8.5	1.1	0.4	45:F4	11.2	1.3	0.6	45:F4	11.2	1.3	0.6
41:C#4	9.7	1.3	0.4							-	
42:D4	9.6	1.5	0.4	Samick S	C155 # A I	RO622		Theoretic	al Beat Ra	itoc	
				Samuck S		00023		Theoretic		ites	
43:D#4	10.4	1.4	0.4		thirds			07.40	thirds		
44:E4	10.8	1.6	0.3	37:A3	6.9	fourth	ıs	37:A3	6.93	fourth	s
45:F4	10.6	1.4	0.5	38:A#3	7.2	0.9		38:A#3	7.34	0.79	
				39:B3	7.8	0.9	fifths	39:B3	7.77	0.83	fifths
Baldwin 1	R Grand #	[‡] 187227		40:C4	8.3	1.0	0.4	40:C4	8.24	0.89	0.59
	thirds			41:C#4	8.7	1.0	0.5	41:C#4	8.73	0.94	0.62
37:A3	6.8	fourth	15	42:D4	9.2	1.0	0.5	42:D4	9.25	0.99	0.66
38:A#3	7.4	0.8	.5	43:D#4	9.8	1.1	0.5	43:D#4	9.81	1.05	0.71
			6:6:1								
39:B3	7.8	1.0	fifths	44:E4	9.9	1.0	0.6	44:E4	10.38	1.11	0.74
40:C4	8.3	0.9	0.5	45:F4	11.1	1.2	0.6	45:F4	11.01	1.18	0.79
41:C#4	8.7	0.9	0.5								
42:D4	8.7	0.8	0.7	Yamaha	C7F Gran	d #48309	81				
43:D#4	9.2	0.8	0.7		thirds						
44:E4	9.7	0.9	0.7	37:A3	6.9	fourth	ıc				
45:F4	10.4	0.9	0.7	38:A#3	7.3	0.8	.5				
43.14	10.4	0.9	0.7				0.01				
				39:B3	7.7	0.8	fifths				
Yamaha (C5E Gran	a #49301	93	40:C4	8.2	0.9	0.5				
	thirds			41:C#4	8.6	0.9	0.6				
37:A3	7. 0	fourth	าร	42:D4	9.1	0.9	0.6				
38:A#3	7.5	1.0		43:D#4	9.6	1.0	0.6				
39:B3	8.1	1.0	fifths	44:E4	10.1	1.0	0.7				
40:C4	8.6	1.2	0.4	45:F4	11.0	1.1	0.7				
				45.14	11.0	1.1	0.7				
41:C#4	9.1	1.2	0.4	747 1. 46		^					
42:D4	9.6	1.3	0.4	Walter 43		U					
43:D#4	10.0	1.3	0.5		thirds						
44:E4	10.6	1.3	0.5	37:A3	6.9	fourth	ıs				
45:F4	11.0	1.3	0.6	38:A#3	7.3	0.9					
-	-		- · -	39:B3	7.7	1.0	fifths				
				40:C4		1.0	0.3				
					8.1						
				41:C#4	8.6	1.0	0.3				
				42:D4	9.1	1.1	0.4				
				43:D#4	9.6	1.1	0.4				
				44:E4	10.1	1.1	0.5				
				45.E4	10.7	1 2	0.5				

45:F4

10.7

1.2

0.5

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Flexing The Plate: Yes Or No?

Nick Gravagne, RTT New Mexico

Controversy swirls around the subject of plate setting; not just as to whether or not resetting a plate to a new location (usually lower) is justified, but more particularly whether flexing or bending a plate, usually at the hitch area by lowering nosebolts, can ever be recommended as due process for downbearing adjustment in either an old or new piano. The extreme positions held are thus. Conservatives insist that bending the plate anywhere, either at the hitch areas or along the perimeter, is not only necessary if other aspects of the job are properly attended to, but that the practice reeks of irresponsibility and dangerous intrigue. Plates are not meant to be flexed, they say, and only a rebuilder acting in desperation would consider the practice. At the other pole are the liberals claiming that plate flexing goes on all the time; although they allow that the official stance must certainly deplore the practice, the real world of piano rebuilding depends on it for a variety of reasons. Besides, they say, they have had excellent results as to bearing and tone, and not a broken plate yet.

Although there is something to be said in defense of these extreme positions, both arguments lack any real technical or mechanical substance since they derive their thesis more or less from handed-down attitudes, from experimentation, or first-hand experience with either success or horror stories regarding the handling of plates. Still, in perspective, these sources of belief are valid. But let's have a more technical look at the matter.

Cast Iron — Stronger Than We Think

The obvious first question we need to ask is how strong cast iron is in compression and tension (specifically bending); and the logical next question is what bending forces acting on the plate

can we consider safe? This inquiry can be greatly simplified by ignoring the compression characteristics of cast iron since, as in steel, they are exceedingly high, and, given a relatively defect-free casting, a plate will never fail in compression. This being so, tension remains our sole consideration. We all know that steel, due to its homogeneous molecular structure, is amazingly elastic in tension. Cast iron, on the other hand, due to its non-homogeneous salt-and-pepper molecular arrangement of iron and graphite, is relatively weak in tension, the usual ratio of compression to tension given at six to one. Said another way, the strength of cast iron in tension is only 1/6 of its strength in compression. Still, cast iron is extremely tough stuff and its modulus (measure) of elasticity is quite high at 20 million compared to the much more elastic steel at 29 million.

So within its elastic limit cast iron is reliable, indeed; the problem with it is that, unlike steel, no stretching deformations occur to warn of impending fracture. Cast iron will stretch to its limit — a higher limit than we psychologically allow — and then suddenly break. Although this fact attests to the brittle nature of cast iron, we should not infer that this material is weaker than steel, or worse, that it has no appreciable give in stretching, or that it is totally inelastic.

Plate Flexing — The Unstated Argument

Now, in order to continue, something must be said in favor of the liberal point of view mentioned above, although it is an argument they they seldom if ever use. Simply summed up it is this: "The bending stress (in psi) in the plate bars — for example, a two-foot long one as can be found, say, in many plates as the second bar down from the highest

treble in many grand pianos — is considerable. Since the strings introduce such a bending stress when pulled to pitch how can we say that a plate is ever stress-free of tension and bending, even if it was installed so on the pinblock, nosebolts and support dowels?" Essentially, this argument maintains that a strung piano plate is hardly stress-free, particularly regarding bending, or the tendency to bend, in the plate bars. This being the case, what's wrong with flexing the plate at the hitch areas, one might ask? Apparently the cast iron can take it. Let's develop this further.

Even if a plate could be installed completely stress-free on its supporting dowels and nosebolts, it will not long remain that way after 18 tons of string tension are applied to it causing it to stretch and compress and bend. This 18 tons of force must clearly transfer to the plate in equal amounts of tension and offsetting compression, although the distribution of the various forces on the plate are complicated indeed, frustrating any simple analysis as to their concentrations and magnitudes. Since compression is of no consequence to our study we must ask ourselves where those locations of tension in the plate exist. One obvious place exists in all the areas directly behind the hitch pins extending along the plate as it continues to the rim of the piano.

But, more to our purpose, another less-perceived area of plate tension exists (in the grand piano) at the top centers of the plate bars. Imagine a cast iron C-clamp: As the screw is tightened a bending force is introduced into the member of the clamp that is parallel to the screw. As always, this bending force has two components, tension on the inside edge of the member and compression on the outside edge. The conditions on plate bars are essentially the same

except that the piano strings are pulling the "C-clamp" shut instead of pushing it apart, the result being that tension exists on the top surface of the bar and compression on the underside. If there are six bars in the grand plate (and if we ignore the resisting work done by the hitch areas, which is not nearly enough to resist the string tension) we can see that 36,000 pounds of aggregate tension must be resisted by an average of 6,000 pounds of reacting compressive force in each bar. Were this force applied directly in-line with the pull of the strings the bars would be in compression only; but since they sit above the pull of the strings the tendency is for them to bend; i.e., to stretch along their top, tensioned edges and compress along the lower. In fact, the farther the bars are above the strings the more serious becomes this tendency as the bending action (called "bending moment") increases by multiplication.

Now does the plate move measurably under these forces? Certainly, although not grossly so as plates are usually designed, and nosebolts or other supports located. A fascinating, if not wholly useful, experiment could be made by attaching stress and strain measuring devices — called electric strain gauges as used in industry, particularly the aircraft industry - to plate hitch areas and bar tops in order to measure the amount of stretch introduced into the cast iron. But for us there is a quicker way to grasp at least in a relative sense the nature of cast iron in bending, and that is by considering how a specimen of cast iron representing the hitch area of the plate (dimensioned six inches wide by 5/8" deep by 24" long) will act under various center-loaded deflections, and comparing the bending stress in this specimen with that of a plate bar acting under the usual bending action of string pull. Since the mathematics of this analysis is a bit complicated it has been left out of this article, but the general concept and formulas are included in the "Computations" section which follows.

First of all, let's consider the plate bar in bending. The 6,000 pounds of tension causes the bar to react as a beam both in an axial direction (in compression along its length) and as a centerloaded horizontal beam (it wants to bend upward). If the bar is dimensioned (average) at two inches tall and 5/8" wide, and its axial center line sits at 1 3/8" above the strings, then the force tending to bend it upward at its middle (the bending moment) will be 8,250 inch pounds. Now factoring in the bar's cross section (its section modulus) the bending stress on the bar works out to be 19,643 psi. (Don't confuse a bending stress with pure tension). This bending stress in pounds per square inch acts along the length of the bar, and tends to bend the bar upward. This stress is then countered by an equivalent force internally generated by the strength of the cast iron which prevents the bar from seriously deflecting. Now since the bar can handle this bending stress we can compare it to our specimen hitch plate.

Imagine the specimen hitch plate which is conservatively small compared to the much larger and more forgiving areas of grand hitch areas - sitting horizontally as a simple beam supported at each end of its 24" length. According to the mechanics of deflection, if a sufficient force is applied to the center of the plate it will deflect downward by 0.153 inches. At this deflection the bending stress in the plate is roughly the same as computed above for the plate bar: for the specimen hitch plate it works out to 19,949 psi bending stress. Ignore that the dimensions of the plate and bar are considerably different, those factors are worked out in the computations. What matters is that in both cases the material is the same, and the bending stresses in psi are the same.

The conclusion is obvious. If in the strung piano the bar routinely takes that kind of bending stress without breaking, so can the specimen plate. The implications, too, are obvious. Flexing plates at the hitch area, or along the perimeter of the plate at the lag screws, if not overdone, will not break plates. Besides, how many Steinway plates have you seen that do not rise off the support dowels at the tail by 1/8" or more? Moreover, we have all marvelled when removing some plates that the nosebolts were "seriously" flexing the plate up or down. We usually say to ourselves "amazing it didn't break!" Not so amazing, really.

"Still and all," say the Conservatives...

Now equal time for the conservatives. Plate flexing, particularly at the hitch areas, but also at the plate perim-

eter, is many times an act of desperation by many rebuilders to achieve positive downbearing where the proper remedy should have been a new soundboard, or, if some crown was evident in the old board, a judicious lowering of the plate. In addition, there are unknown factors to consider when bending plates — suppose there is a hidden hairline crack where the bar meets the hitch area? Suppose the plate has a hidden internal defect such as a blow hole? Since a stressed piece of metal, especially brittle metal, is more prone to break if a jarring shock is delivered to it, suppose the piano is dropped? In any case, they continue, the piano was designed to accept a stress-free plate before stringing. Conservatives worry about such things, and, all things considered, their reservations are worthy of debate.

In The Final Analysis

So where does this leave us? I can only give my opinion. In my own practice I never lower a nosebolt by more than one full turn, or by more than 0.100". Although I'm certain that plates can take more bending stress than this will cause, I consider it to be my own arbitrary limit. On Steinway plates that bend down going around the back and tail, I simply re-install the plate, buckle it down and never worry about it. On new soundboards I sometimes flex the plate at the hitch area (up or down) in order to fine tune the bearing; this flexing, if I think it necessary at all, is generally never more than 0.050".

Noted economist J.K. Galbraith, in commenting on certain taboo subjects in his own field, said, "Some things which are wholly permissible in casual conversation are wholly impermissible in print." We all know that the official line has often nothing to do with the unofficial reality. Now I'm aware that the official line out of Steinway and other makers is that tampering with the nosebolts is accounted a serious transgression, and so it could (and would) be on a new instrument, especially one still under warranty. But I am speaking here mostly to the unofficial world of rebuilding, a field of endeavor in which most manufacturers have little interest. I think that the ideal plate installation is stress-free for the unloaded plate, and that any serious stress acting on the plate should come normally from the strings. But isn't it helpful to know when to bend the plate, along with the rules?

Regarding the whole subject, the irrepressible John Travis speaks to plate flexing in his book "Guide To Restringing:" "This is where 'the angels fear to tread'... I must caution you not to be too hasty. This is a treacherous operation, but not half so dangerous as some people would have you believe." Considering our experiences, our intuitions, and our computations—well said, John.

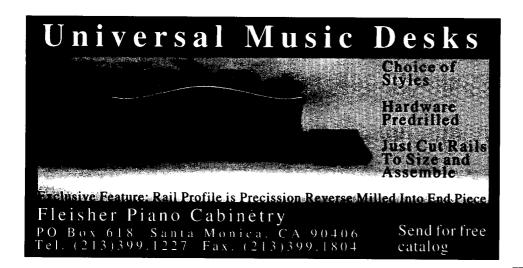
Computations

The bending stress figures given in the preceding article are intended as comparative and relative figures only. In order to assess the actual stress figures in a plate bar a far more comprehensive mechanical and mathematical analysis would have to be undertaken. As mentioned in the article, a piano plate is a complicated component, containing many and varied shapes and interconnections - it does not lend itself well to quick mechanical analysis. Still, the computed figure as to the bending stress on the plate bar as presented in the article cannot be far from the truth, while that of the specimen hitch plate can be considered exact.

The analysis begins by figuring bending moment (M) in a plate bar dimensioned two inches tall by 5/8" wide by 24" long, having its axial center line 13/8" above the pull of the strings. M =axial compressive force in bar times 13/8". Next section modulus (S) of the bar's cross section computes $S = bh^2/6$. Finally, bending stress, or stress in outer fibers (f) = M/S.

For the specimen hitch plate a similar analysis was used, with the difference that was M was found by first computing central deflections of the plate using $D = P1^3/48EI$ where: P = load in pounds; l = load in inches; l = load in pounds; l = load for cast iron; l = load for cast iron; l = load for the plate a similar speciment of the plate a speciment

By trial and error a 1,300 pound load was found necessary to deflect the plate down by 0.153". This being the case M = 1,300/2 times 12" = 7,800 inch pounds. The idea was to find an M that, when worked through the formulas for S and f, would yield a bending stress close to that of the plate bar. Again, although the plate specimen deflection of 0.153" is gross compared to the insignificant deflection of the plate bar, the fiber stresses are the same.



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SOUND BACKGROUND

Pitch Perception: Early Research

Jack Greenfield, RTT Chicago Chapter

Early Pitch Identification

The first significant advances in research on the determination of absolute frequency and the perception of pitch took place after the start of the 19th century. Investigators engaged in practical as well as theoretical projects recognized the necessity for accurate measurement of the frequency of vibration of sound waves producing musical tones. From the standpoint of psychoacoustics, while frequency is an aspect of sound which can be measured with instruments, pitch is the subjective or psychological sensation which can be identified as "high" or "low" or by relative position in a musical scale. Pitch and frequency are obviously related and the terms are generally used synonymously.

In early European music, musical tones were generally identified by reference to organ tones. The first investigator who undertook the task of establishing the measurement of absolute pitch by frequency of vibration was Marin Mersenne. During the first half of the 17th century he conducted experiments with long lengths of rope and music wire vibrating slowly enough for him to make a visual count of vibrations per minute. By application of the laws of vibrating strings he had established, he calculated the frequency of shorter lengths of wire tuned to specific organ notes (August 1989 Journal, p. 34). Around the close of the same century, Joseph Sauveur devised a more accurate method of determining frequency from the beating of organ pipes just a semitone apart (January 1990 Journal, P.31). Early in the 18th century, work by Newton and others established the principle that the wave length of a tone from an organ pipe was equal to twice the length of the pipe. Approximate frequency was calculated by the formula: frequency = (velocity of sound)/(wave length). Results were not accurate, however, due to the inaccuracy of the velocity figures then available.

Few details on the invention of the tuning fork in 1711 are available. It is likely that the design was developed empirically to match the specific organ tones. The pitchpipe, another type of pitch reference, was used mainly in Great Britain from about the mid-1700s to the mid-1800s in small churches with no organ. It consisted of a wooden pipe about 16" long with a plunger which could be set to sound the notes indicated by markings on the plunger.

The first procedure for direct determination of the frequency of musical tones, discovered more or less accidentally, was demonstrated by Robert Hooke in 1681 at a London meeting of the Royal Society. Hooke, interested in clocks and watches, found that if he placed a card or strip of brass against the teeth of a rapidly revolving brass wheel with evenly cut cogs, a musical tone was produced. He calculated the frequency of sound waves heard as the product of the (number of cogs) x (revolutions per minute).

Invention Of The Siren For Pitch Measurement

A more precise means for determining absolute frequency of musical tones appeared in 1819 in the invention of the siren by Charles Casgniard de la Tour (1771-1859), a French engineer. Sirens produce sound by emitting successive puffs of air. When these pulses in air pressure reach the ear, the listener hears a tone that corresponds to the frequency of the interruptions of the air stream through the siren. Before Cagniard's invention, the principle of generating tones by repeated uniform interruption of an air jet had been demonstrated by

John Robison in 1799. In Robison's experiment the discharge of air from a pipe connected to an organ windchest was controlled by a stop-cock which opened and shut very rapidly. Robison reported that at a frequency of 720 air pulses per sound, the tone G was heard, at the same pitch as sung by a clear female voice. At half this frequency, G an octave lower was heard, at the same pitch as sung by a male voice.

Cagniard's siren contained two matching perforated discs with holes equally spaced in concentric circles. The holes were drilled to slope in opposite directions. One disc was attached at the top end of a small cylindrical air chamber. The second disc, directly above was mounted on a shaft allowing it to rotate freely when driven by the air jets streaming from the holes of the lower fixed disc. The air chamber inlet at the bottom was connected by a pipe to the bellows which provided air under pressure. The speed of the rotating disc, measured by a mechanically driven counter, depended on the air pressure, difficult to control. A maximum rotation of 50 to 60 revolutions per minute was possible; (speed of rotation) x (number of holes in the circle) gave the frequency of air pulses.

Savart's Career In Acoustics

The French physicist Felix Savart (1791-1841), used a system based on the principle of Hooke's arrangement for accurate measurement of absolute frequency in his research on pitch perception. Specializing in the study of sound, Savart is credited with many important contributions to both practical and theoretical acoustics.

Savart was a son of an engineer at the military school of Metz. Although he had a brother who also became an officer in the engineering corps, Felix Savart studied medicine. He received his medical degree from the University of Strasbourg in 1816. Soon after leaving medical school Savart abandoned medicine and turned to the study of sound and musical acoustics. His first project, carried on independently, was a study of the physics of the violin. In 1819, he was invited to present an account of his work to a meeting in the Paris Academy of Sciences. His presentation was well received by the gathering of scientists. J. P. Biot, impressed by Savart's work, helped him to obtain a position teaching physics in 1820, his first. The two men remained friends and collaborated in some projects later. In the following year, he was appointed professor of experimental physics at the College de France where he remained, specializing in acoustics for the rest of his life.

Savart's Violin Research

In his early work on the violin, begun in 1817, Savart built an experimental instrument based on his theory that a regular symmetrical shape would produce the best tone. "Savart's box fiddle" had a trapezoidal shape with straight sides and rectangular soundholes. Its tone was judged clear and even but subdued. By means of the Chladni sand pattern technique (October 1990 Journal, p. 36), Savart demonstrated that the bridge and soundpost transmit string vibrations to the plates and that the plates can be made to vibrate at any frequency. In later studies, Savart had the unusual opportunity of checking his violin theories by examination of about a dozen disassembled fine Stradivari and Guarnieri violins.

Savart Measurement Of Audibility Limits

Savart gave an account of his research on determination of absolute frequency and audibility limits in a paper "On The Sensitivity Of The Ear" published in a scientific journal in 1830. He reported that his predecessors including Biot, Chladni and others, had agreed on the lower audibility limit, about 15-16 Hz in modern terminology, but disagreed on the upper limit. Savart believed that the conflicting results were due to the inability to produce accurately measured higher frequency sounds.

After unsatisfactory attempts in his

own research to produce tones at precise specific frequencies by means of the vibrations of small thin rods or air columns in pipes, he was more successful with Hooke's arrangement of a rapidly rotating cogwheel with a card or wedge mounted so that one edge struck the teeth of the wheel. The frequency of impacts, corresponding to modern Hz, was calculated as (number of teeth) x (revolutions per minute). His best results were obtained with an 82 inch diameter cogwheel with 720 teeth. Savart observed the following: 1. At frequencies up to 12,000-15,000 impacts per second, the sounds he heard had great intensity. Then as the frequency was raised still higher, the intensity diminished perceptibly. 2. In hearing tests with different people, he found that they differed in their ability to perceive sounds at upper frequencies. 3. As the low frequency limit of hearing was approached by gradual slowing of the cogwheel rotation and the rate of impact on the cogs, the tone acquired a "chopped" effect until finally at less then 15-16 impacts per second the sound was transformed into a slowing series of impact noises.

Savart's observations do not disagree with modern views. Many young people can hear tones up to 17,000-18,000 Hz. As people age however, the upper limit drops to 12,000 Hz or less. The ear is less sensitive to very low frequency sounds. Most musical instruments produce tones with fundamentals that fall with the range 27-4200 Hz.

Savart's Units Of Interval Size

Another important achievement of Savart was a system of logarithmic units he conceived for indicating the size of intervals. Savart originally divided the octave into 301.03 units — units which became known as savarts, s in abbreviation. Subsequently, for convenience in use with equal temperament, the division was changed to an even 300 modified savarts to the octave. Savart units were used to a considerable extent in France but after introduction later in the 19th century other countries adopted Ellis' division of the octave in 1200 cents.

Savart's Other Work

During his career Savart wrote about 27 papers, published in technical journals. His primary interest was in the physics of vibration — particularly in

the production of musical and vocal sounds. He conducted many experiments with strings, pipes, bars, membranes and plates. He began to write a book on acoustics but he never finished it

Scheibler's Tuning Forks

At a congress of physicists in Stuttgart in 1834, Johann Heinrich Scheibler (1777-1837), presented a new highly accurate method of determining frequency by use of a set of calibrated tuning forks. Scheibler was not a scientist but a silk merchant from northwest Germany who had an interest in piano and organ tuning and scales. Scheibler's Tonometer, the name he applied to the set, consisted of 56 tuning forks tuned precisely four Hz apart to span the range A = 220 Hz to A = 440 Hz. He had made a survey to gather data on the tuning of concert pianos in Vienna and A = 440was the calculated mean value of the figures he gathered for pitch level. His recommendation that A = 440 be made the standard was adopted by German physicists and it became known as "Stuttgart" pitch.

The combined sound of the tones of any pair of neighboring forks beat four times per second. An unknown frequency of any tone within the range could be determined by counting the beats resulting when the tone being checked was paired with the tuning forks above and below nearest in pitch. For piano tuning Scheibler recommended a separate set of 12 tuning forks, each tuned to a frequency four Hz lower than the corresponding figure for tones of the middle octave in equal temperament. The notes of the piano could then be tuned more accurately to four beats/ second than by tuning to unison.

While not practical for piano tuning, with some modifications Scheibler's system was found accurate and suitable for laboratory applications. A set of 56 Scheibler forks examined by A. J. Ellis about 40-50 years later included 32 forks producing exactly four beats/second and 23 forks producing 28/42 beats/10 seconds. Ellis reported that a set of his own tuning forks were accurate to within 0.1 beat/second.

The Mystery Of The "Missing Fundamental"

A. Seeback (1805-1849), another

physicist concerned with accurate determination and perception of pitch, reported his study in a paper published in 1840. He described the improved simplified siren he had designed and discussed his discovery of the phenomenon now known as the synthesis of the "missing fundamental." Seeback's siren contained a single thin perforated disc of cardboard or sheet metal rotating in a vertical plane, mechanically driven by a

cord looped to a drive wheel. As the disc rotated, a string of compressed air was blown through the moving holes passing in front of a jet on the end of an air tube.

Seeback observed that as expected, doubling the number of holes arranged in equidistant spacing raised the pitch of the siren's tone one octave. If the additional holes were spaced to give alternate intervals of two different dis-

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Steve McClintock 1869 Tipperary Lane Newbury Park, California 91320 (805) 499-2267 tances, the tone was heard at the lower pitch, the same as heard from the disc with the original number of holes. Seeback reasoned that the unequally-spaced puffs of air from the siren produced more a complex sound wave pattern whose period of frequency or repetition was the same as the simple pattern of half the number of air puffs at equal intervals. He also observed a difference in timbre and found that although the tone produced by unequally spaced air puffs was quite strong, its fundamental was relatively weak.

Seeback theorized that the dominant factor determining pitch judgement was frequency of repetition of the sound wave pattern or periodicity rather than the fundamental frequency. In later investigation, it has been shown that under some conditions tones may be perceived as low in pitch even though the corresponding fundamental frequency is missing. A familiar example is the sound of low notes heard in music from a small transistor radio incapable of emitting any frequencies lower then 200 Hz. Seeback's work initiated research on pitch perception that has been carried on and is still continuing. The periodicity theory as well as other theories offered leave unanswered questions and the phenomenon still remains a mystery. **≡**

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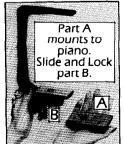
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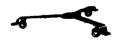


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COMING EVENTS

July 13-17, 1991	34th Annual PTG Convention & Technical Institute Adam's Mark Hotel, Philadelphia, PA Contact: PTG; 4510 Belleview, Suite 100; Kansas City, MO 64111 (816)753-7747
October 3-6, 1991	Ohio State Conference Truman Hotel, Columbus, OH Contact: Don Gagliardo; 752 Macon Alley; Columbus, OH 43206 (614) 444-9630
October 11-13, 1991	Texas State Association 1991 Seminar The Crest Hotel, Austin, TX Contact: Mary Smith; 2002 Oxford Avenue; Austin, TX 78704 (512) 462-0212
October 17-20, 1991	1991 New York State Conference Sheraton Inn, Buffalo Airport Contact: Robert Tarbell; 358 Bedford Avenue; Buffalo, NY 14216 (716) 873-5465
November 8-10, 1991	North Carolina PTG Conference Adams Mark Hotel, Charlotte, NC Contact: Eugenia Carter; 4317 Commonwealth Avenue; Charlotte, NC 28205 (704) 568-1231

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AUXILIARY EXCHANGE

President's Message

There is one last "goodie" to tell about which has just been added to the 1991 Auxiliary Schedule of the 34th Annual Convention in Philadelphia. Please cajole all spouses and friends into staying through Wednesday, July 17th. It really is worthwhile for the Guild members to attend the closing luncheon when many awards and various honors to individuals are presented. There is usually a most interesting door prize to be won by some lucky luncheon attendee. I just mention this as incentive or "bait" to permit Auxiliary members to be present for the 8:00 a.m. to 10:30 a.m. time slot on Wednesday, July 17, when we will be presenting a Scholarship Fundraiser offered by The Pearl in the Oyster Boutique, Ltd., of Elkins Park, PA.

Dotsy Laundau, president of this organization, will set up her "Traveling Boutique" on Wednesday morning, and it will feature unique wearables at affordable prices. Among these items might be found sensational dresses and sportswear, hand-painted silk and handwoven scarves, art jewelry, unusual gift items and childrens' wear. The Auxiliary would incur no expense for this event, and Ms. Landau has offered our Scholarship Program a 20% share

of her sales. She will also appear the morning of our opening assembly, July 14th, to greet us and give us a brief preview or teaser of what can be expected Wednesday morning. The program sounds exciting, different, and an interesting type of fundraiser for the Auxiliary Scholarship Program. You all come, now!

Let's not forget to reserve for the optional Auxiliary Tour of the Philly Historic Square Mile and the cruise aboard the "Spirit of Philadelphia" on the Delaware River which will provide a fun day on Monday. Pat Sierota will teach us how to create a counted cross-stitch keepsake on Sunday afternoon, and Ronald Berry, immediate past president of the PTG, will dispel some of the awe and mystique of fear that many technicians' spouses seem to harbor about computers as he presents his program "Computer: One Byte at a Time" on Tuesday morning.

In order to take advantage of these marvelous days, prevail upon one another to get your reservations in! Soon it will be too late, and some of us will only be able to experience them secondhand. Hope to see you soon.

Arlene M. Paetow

A Report From The 24th California State Convention

Driving through thousands of acres of almond trees in full bloom (which were pollinated by hives of rented bees) en route to the 24th California State Convention in Sacramento was like a beautiful dream in warm sunshine and full technicolor! More than 300 technicians and some 30 Auxiliary members and guests attended the convention where we were treated to many sights and pleasures in our state capital, all arranged by convention co-coordinator and national scholarship chairman, Ginger Bryant, who also made beautiful decorations for each banquet and luncheon table and baked lots of goodies for the Auxiliary hospitality room.

Assisting Ginger in carrying out the Auxiliary program were national auxiliary Treasurer, Barbara Fandrich, and local member, Carolynn Dwyer Fox. Carolynn guided our fantastic tour through Old Town Sacramento with highlights including: 1.)an old-time hardware store owned by partners Huntington and Hopkins, who proved that the real wealth of the gold mining era went to those selling hardware and implements to the miners rather than to the miners themselves; 2.) Sacramento History Museum (excellent);3.) lunch at California Fats Restaurant ("Fats" being the name of a Chinese family with a proven reputation for good food); and 4) The Crocker Art Museum featuring California artists and other American artists and European, modern and ceramic art as well. This fine museum was a gift to the city by Jenny Crocker, widow of Judge Crocker.

The bus driver for the tour generously diverted to show us the state capitol, the old governor's mansion (Victorian) and Sutter's Fort. John Sutter's son, James, laid out the city of Sacramento which is situated at the confluence of two important rivers, Sacramento and American Rivers, and, thus, being flat land, is subject to flooding. Three major floods caused the city to rebuild in the early days and dictated a distinctive feature of these beautiful Victorian homes—front entry stairs all lead to the second level.

Iampleased to give credit for much of this information to Carolynn Dwyer Fox, wife of a PTG member and descendant of both a pioneer family and a goldmining family. Carolynn's ancestors were prominent in early development in Northern California and once owned the famous paddle wheeler "Delta King"—now at permanent anchor near Old Town where it serves as a hotel/restaurant. Be sure to look up Carolynn next year when you attend the National Convention in Sacramento. She is a "live wire" with a rich and ready store of local lore.

Hostess Ginger and her hospitality committee served a marvelous assortment of nut breads and cookies along with coffee, tea, and good conversation throughout. They also staged a drawing

PTG Auxiliary Executive Board

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Treasurer Barbara Fandrich (Delwin) Immediate Past President Agnes Huether (Charles) for prizes in such a way that everyone received something. Out-of-town contributors to the cookies morgasbord were "Bee" Evans and yours truly.

Pauline Miller

Life Is Such a Moving Experience

Every time I move, which more and more often these days, I think about what you folks in the PTGA mean to me. It's not that I know so many of you — or that I know anyone so very well. It's the fact that you mostly stay in one place.

In other words, your stability lends stability to my life. Each year when I prepare the PTGA mailing for our renewal notices, I marvel at how few address changes we have. As for me, when I go to conventions and folks as me where I'm living now, I have to check my badge before I answer.

We started out innocently enough in Portland, OR, and managed to stay there almost ten years — moving four times, though, to improve shop locations — while Del developed a keen reputation as a masterful tuner-rebuilder. The world was his oyster, so to speak. But then the man decided that he'd had it with rebuilding pianos that were full of flaws that would have been designed out of them if the art of piano design hadn't died in the 1920s.

So when I received a lucrative job that would permit Del the time-out to study piano design, we jumped at the chance even though it meant a move to California — which involved two more moves once we were there. Thus ensued six years of study of design engineering and wood technology, while continuing hands-on research and radical experiments on pianos. This lead to a job offer as Director of Research and Development for Baldwin, who unfortunately wouldn't consider a plant site in Sacramento, so we moved to Arkansas. Add two more moves in 3 1/2 years, first to an apartment and then to a house.

Well, with all this manufacturing experience, including the thrill of redesigning the Hamilton and designing and prototyping the Baldwin "B" grand (Bis for Barbara, I say), Del decided to strike off on his own in the lonely field of piano design. You guessed it, another move. This time back to Portland, OR, where we learned with mixed emotions that many of our friends who had stayed in one place now owned their own homes.

Suffice to say if we ever buy again it'll most likely be a boat with a bedroom.

Our office/lab/shop is now based in Portland, but Del's work takes him all over the country, and I try whenever possible to go with, pursuing my own career as writer-editor via fax and Federal Express. (Although I secretly think I do market research for U-Haul.) Currently we live in Indiana while he gets the Walter Piano Company tooled up to build a grand piano he designed and prototyped for them last year.

It's truly a pioneer's life for us but I'm sure you know I wouldn't trade it for anything. Just remember, don't anybody move. As long as you all stay put, we'll be just fine!

Barb Fandrich, Treasurer, PTGA

Auxiliary Scholarship Travels To Pennsylvania

The two 1991 Auxiliary Scholarships were awarded at the Pennsylvania Music Teachers Annual Conference at Lebanon Valley College, Annville, PA.

The winners were Tsukasa Mizuguchi, Wilkes-Barre, PA, in the Collegiate Division, and Brian Farrell, Hurlock Creek, PA, in the Senior Division. The awards were presented by Mike Carraher, RTT, president of the Reading/Lancaster Chapter, and Keith Bowman, RTT, president of the South Central Pennsylvania Chapter.

When making the presentations, Carraher and Bowman made brief statements that explained both the history of PTGA and the history of the Traveling Scholarship. Keith Bowman was also given the opportunity to speak on the topic of the national campaign to promote music education, "Music Makes

Notice

This was to accompany the Proposed Bylaws in the May Journal:

Here are the proposed Auxiliary Bylaws and Standing Rules which are to be presented to the PTGA Council in Philadelphia. Please read them in a timely and informed manner.

Bylaws Committee
Ginger Bryant, Chair
Bert Seirota
Helen Desens
Ailisa Thompson, consultant,
Registered Parliamentarian

The Difference."

During the recital, both scholarship recipients exhibited good stage presence, excellent technique, and were well received by those attending. It is noteworthy to mention that both are students of the same teacher, Thomas Hrynkiw, of Wilkes University.

Auxiliary member, Jean Carraher, prepared press releases on the event, along with photographs, and distributed them to eight area newspapers. The releases emphasized PTG and PTGA to increase public awareness of who we are and our interest in contributing to the world of music.

Both Tsukasa and Brian have been invited to perform at the opening ceremonies of the PTG Convention, to be sponsored by Baldwin, and again at the Auxiliary Tea. I am happy to report they have accepted, and you will have the pleasure of hearing what your donations accomplish toward the future of these young artists.

Ginger Bryant, Scholarship Committee Chair



Keith Bowman, RTT; Tsukasa Mizuguchi, Collegiate Division Scholarship Winner; Brian Farrell, Senior Division Scholarship Winner; and Mike Carraher, RTT.

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June, 1991

Special Pre-Convention Issue!

As you all know, the 33rd Annual PTG Convention and Technical Institute is just around the corner. It has always been a pleasure to be a part of this event, and '91 will be no exception. This month, we're going to depart from our usual "Tech Gazette" format so we can give you an idea of what we'll be doing, where we'll be, and when we'll be there. We hope you'll be there too—for the most exciting PTG event of the year!

Yamaha Exhibits

We have been talking about the Disklavier[™] and our new Conservatory Collection Grand Pianos in recent articles. All week long, on display in our exhibit area, we'll be showing Disklavier pianos and the new Conservatory Collection series of grands. We invite you to stop by and experience the recording and playback capabilities of the Disklavier. See how MIDI ties into our business. Discuss servicing these new pianos with the experts.

The new Conservatory Collection not only shows the revisions of existing models, but the introduction of the all new 6'11" grand piano, the C6F. This piano completes the Conservatory line of Grands, and displays all the new technology that Yamaha has incorporated into these magnificent pianos.

Piano Cut-Aways, the PT-100 tuning scope, action models, technical literature, product literature. The list goes on and on. The Yamaha display will be the place for you to share your own experiences with our prod-

ucts. Staffed by the Yamaha Team, including experts on both Disklavier and acoustic pianos, you will have the opportunity to talk to the people who work with these instruments everyday. Make sure you put time aside in your convention schedule to visit us at the display.

Yamaha Institute Classes

Of course, the main focus of any Annual PTG Convention is the Technical Institute. Check your class schedule and plan ahead, because you won't want to miss:

"REFINING THE PERFORM-ANCE PIANO"

The Performance Piano. This entails high quality, well-placed pianos that deserve the best you can offer. Increase your knowledge of what to do, how to do it, and what good it will do for your customers and their musical tastes and abilities. This new class draws on the many years of experience that the Yamaha team has to offer. With the help of the Yamaha concert technicians, we have put together a class that will be of benefit to everyone.

"THE DISKLAVIER PIANO— AN OVERVIEW"

You walk in the door to tune the piano, and there it is—a Yamaha Disklavier. It may be an upright or possibly a grand. **Now** what do you do? This class will answer your questions about getting into the piano, running a test program, and then proceeding to tune, regulate, or voice as

you normally would. Although we won't have the time to delve into any electronic Disklavier repairs, you'll feel comfortable about normal service on the Disklavier by the end of the class. Yamaha dealers are reporting great sales of these instruments. You may find yourself servicing one sooner than you think. So, make sure you plan on attending this important class.

Yamaha After Hours

On Tuesday evening, starting at 9:00, we'll be hosting the Yamaha reception. Complete with the time-honored tradition of the A-440 band, we'll feature an evening of fun and conversation with the entire Yamaha Team and all your fellow technicians. This is an opportunity for you to bring along your "axe" (you'll find it either in the closet or under the bed) and sit in on a couple of sets. Even if you're not a player, you certainly won't want to miss this "once in a lifetime" style of entertainment, drawn from our own ranks.

The Disklavier Grand, accompanied by a host of new software, promises to excite everyone. Add to that some of the finest "closet musicians" you've ever heard, and we'll guarantee an evening you won't soon forget.

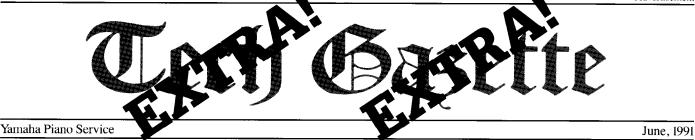
The Yamaha reception is our way of saying "Thank You" for supporting us throughout the past year. So, please join us.

All in all, this convention is adding up to be one of the best! So, be sure your plans include a trip to Philadelphia this Summer. Hope to see you there!

SERVICE: (800) 854-1569

PARTS: (800) 521-9477

FAX: (714) 527-5782



Introducing The Yamaha C6F Grand Piano

A visit to your authorized Yamaha piano dealer in the next few weeks will hold a pleasant surprise. It's the brand new Yamaha Conservatory Series grand piano, the C6F. ♦ You will be impressed at this piano's exceptional resonance and projection, which stems from a new Yamaha scale design. ♦ Newly designed to fit between the very popular C5F and the C7FII, the 6'11" C6F grand piano has been anx-

iously awaited by artists, institutions, recording studios and home musicians. This outstanding piano will be an ideal instrument for both rehearsal or performance use.

♦ The C6F has all of the traditional Yamaha quality features you are accustomed to. In addition,

new refinements include a precision plate mounting system, a boxwood capped treble bridge, a mortised pinblock and redesigned hammers for better overall tone and a wider range of voicing capabilities. ♦ Finish

choices for the C6F include satin ebony and polished ebony. Other finishes which can be special ordered are satin American walnut, polished white, polished walnut and polished ivory. Like all Yamaha pianos,

the C6F is seasoned for destination. ♦ The piano offers more options for the performer, too. The music

desk now has five steps instead of three, and a new lid

prop allows for three different lid positions. Of special note is the new soft-close fallboard. Because the fallboard now glides gently to a close, it can no longer fall shut on the unsuspecting fingers of performers and technicians. ♦ See the new addition to the Conservatory Series, the Yamaha C6F grand piano when it arrives at your local authorized Yamaha piano dealer.

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UPDATE

JUNE

1991

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

More About Marketing

Second In A Series Of Reports From The Marketing Study Group

Fern Henry Market Development And Advertising Committee Chair

Imagine this: you are in the exhibit hall at the PTG annual convention. You browse happily in search of new and fascinating tools to enhance your work. Suddenly, at one table you see displayed a wealth of innovative tools designed for use with clients: marketing tools! There are numerous brochures, attractive and easy to read, all designed to appeal to specific clientele. You note that you can purchase a newsletter,

customized with your name, to send to your customers periodically to remind them of the value of your services. New appointment reminder cards are available featuring several sophisticated graphic designs. As you look at the list of videos and slide programs designed for your use, you recall that a class is being offered to train you to present a speech to local groups of music professionals. The backdrop of the booth contains an impressive display of newspaper and magazine articles on piano care and on Guild personalities and activities. showing real progress at getting

PTG out in the public eye. The most recent PTG membership survey results are out, showing that members' income and job satisfaction have risen dramatically and that the entire piano industry has new respect for the work of the piano technician.

Does this sound like a dream? Actually, we could make it happen. The marketing proposal to be presented to Council in July is a potential first step toward making such ideas a reality.

Continued on page 2

The PTG Survey: The Needs Of The Piano-Owning Public

Carl Root, Chair Economic Affairs Committee

As we approach our midsummer ritual this year in Philadelphia, we have grown to expect some discussion on membership categories. We have considered separating Associates into two groups — non-tuning professionals, and entry level technicians. An analysis of last year's PTG survey results show that there are only a handful of Associate members who don't tune, but less than one third have 12 or more years of piano service experience.

The responses to question #98 provide some insight into how members feel about this issue. The results, as seen in the accompanying bar graph, suggest that no one structure will satisfy everyone. Our personal preferences should not be the primary concern, however. Please note that the question does not ask what structure would benefit you most. The focus is on the needs of PTG and the piano service industry.

PTG exists primarily because of the piano owning public's need for competent service. To that end, we offer technical assistance to our members through local, regional, and national classes, this Journal, and networking with members on an informal basis. Few would deny that these benefits to members are invaluable

The public's need to distinguish between those who provide competent service and those who do not is largely satisfied by our examinations and a title be-

stowed to those who have completed them. Our tuning exam has itself been fine tuned. It is now objective and sets a standard that most of us agree is appropriate.

Attitudes about the technical exam were explored in question #99. Although some felt that it should cover a broader range of skills, the majority thought it was fine the way it was. A few members have been exploring the possibility of another technical exam which might include rebuilding. The number of candidates who might reasonably pass such an exam would be very small based on the number of technicians who do rebuilding on a regular basis whether they

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Marketing...

The marketing approach to business is a natural match for PTG members because the marketer focuses on identifying and meeting the needs of the customer. Since our product is a service, we constantly are aware of the need to understand what our clients want and to explain the value of our services in terms they can understand. To get and keep customers, we need to constantly look for better ways to help them solve their problems. When we concentrate on our customers, identify with their goals, and develop innovative ways of demonstrating the benefits of our services, we are in the marketing business.

We in PTG have contributed greatly to progress in piano technology. The classes offered at our institutes are increasingly sophisticated and professional. Our Journal is recognized internationally as the premier publication in the field. And the stellar work done by the ETS Committee and our network of examiners has raised standards in our industry. So we are better technicians now than ever before. but unfortunately the piano public is not always aware of this progress. Our skills in communicating with our various publics need to take a leap forward in order to catch up with our technical achievements.

We have always, however, taken an interest in promoting our organization and members to the public. For example, the Trade Relations Committee represents us at industry shows like NAMM; the Teacher Relations Committee attends to the large teacher organizations and has developed a handbook for PTG member use. Further, the College and University Technicians have written a Guidelines document targeted at administrators and academic personnel who make decisions on piano maintenance budgets. Many fine articles on business and professional practice have come from the Economic Affairs Committee, as well as the

first ever demographic survey of PTG. The Cincinnati Chapter took the initiative in developing "The Unseen Artist" and now this year the Syracuse Chapter has restated the need for a Public Relations Committee.

All this activity demonstrates that we understand the importance of marketing our professional skills. However, we don't seem to approach marketing with the same zeal that we apply to technical matters. Indeed, this is understandable: we are professional piano technicians; public relations and business promotion classes at conventions don't draw the same crowds as a solid technical presentation. Some of us haven't even taken advantage of the tools provided by the committees named above. And these same committees rely on volunteers for energy and ideas, an approach which makes progress uneven and sporadic.

We suggest a new approach which rests on two assumptions. First, we need to plan a marketing strategy. In a volunteer organization like ours, with a diverse membership and periodic leadership changes, a lack of planning can waste a good deal of valuable energy and time. In the planning process we would state our goals, set priorities, outline strategies and commit to the task. Secondly, to plan most efficiently, we should seek professional assistance. This suggestion rankles with many in PTG, who believe that we can and should "do it ourselves." Actually, this proposal does not intend to replace the efforts of our members; rather a well-chosen professional should assist and enhance the volunteers and the staff we have in place.

At Council in Philadelphia this July, your chapter delegates will hear a detailed presentation and will meet an account executive from the the firm selected to assist us. The Board has suggested to Council to consider a budget allocation of \$50,000 to be spent working with this firm. Therefore, Council will receive an itemized accounting of the

services recommended and the costs attached; the billing and contracting procedures will be explained. Specifically, we are asking that three areas be addressed: PTG brochures, media coverage of PTG members and activities, and improved marketing tools for member use. Council will be able to see a sample PTG brochure done by the candidate firm; the philosophy and qualifications of this firm will be part of the presentation as well as their recommended approach to working with us. Naturally, a fully developed marketing plan will not be offered to Council for two reasons. First, it would be presumptuous to impose a plan upon us; we seek a professional partner who will work with us, not dictate from afar. Also, a professional charges for his/her services; we cannot have these professional services until we decide to pay for them.

If Council does decide to proceed with an integrated, professionally-assisted marketing plan, PTG will be looking forward, ready for a time of exciting new growth. Just think of how your own technical expertise has advanced during your years in PTG. Isn't is time to take action to assure that our personal and professional image has been upgraded to the same level?

Wanted: Guild Historians

PTG needs a few people interested in the history of the Guild and our craft. Preserving the past is something we need to do now, or else we will lose many opportunities. If you would enjoy video-interviewing some fascinating folks on their favorite subjects, digging through old PTG correspondence, photos, and clippings from newspapers and magazines, this could be for you! Please contact Nolan P. Zeringue, RTT, president, at (504) 446-6812, or Bruce Dornfeld, RTT, vice president, at (708) 291-9218.

Foundation Scholarship to Oklahoma Teacher

Venita G. Twyman, an Oklahoma City teacher of piano and music theory, has been named the recipient of the sixth annual Piano Technicians Guild Foundation continuing education scholarship grant. The \$750 award was announced during the recent Music Teachers National Association (MTNA) convention in Miami.

Twyman has been an independent music teacher for over 20 years. At her studio in Oklahoma City, she currently teaches piano, music theory, composition, improvisation, and accompanying in a combination of individual and group instruction. In the early years of her career, she also substitute taught in various public school music programs.

Twyman's degrees include an Associate of Arts from Oklahoma City Southwestern College (now Southwestern College of Christian Ministries); a Bachelor of Music Education from Bethany Nazarene College (now Southern Nazarene University) with a major in piano and minors in voice and organ; and a Master of Music from Oklahoma City University. She plans to use the scholarship in doctoral studies at the University of Oklahoma beginning this fall.

She is fully accredited by the Music Teachers National Association with national certification in piano and music theory; and the American College of Musicians (the National Guild of Piano Teachers) with teacher certification.

She has often served as adjudicator for the Oklahoma Federated Music Clubs, the Tulsa Accredited Music Teachers Association Festival, and the Oklahoma Music Teachers Association at both district and state levels. For the Oklahoma Music Teachers Association, she has served as an audition chairman; the Southwest District

President for four years; a member of the State Auditions and Theory Test Committee for the past year. In the Accredited Music Teachers



Twyman

Association of Central Oklahoma, she has held the offices of secretary, parliamentarian, and treasurer, along with serving on various committees. She attends professional conventions on the district, state, and national levels.

She was the "creative consultant" for the Great Start in Music educational video tape, establishing the program of music theory that was used on the tape. This product is currently in libraries, public school systems, and in use by independent teachers across the country.

Chapter Newsletter News

A chapter newsletter is one of the most important links of communication within a chapter. It announces upcoming meetings and chapter events. It allows members who are unable to attend meetings on a regular basis to keep abreast of chapter activities. And last, but certainly not least, it is a great way for technicians to share their latest technical or personal experience.

According to Chapter Newsletter Committee Chair Wim Blees, about half of the PTG chapters put out a newsletter. Unfortunately, there are quite a few active chapters that do not publish a newsletter. One of Wim's goals next year is to try to

get those chapters to start publishing one. Wim has contacted all of those chapters, and is working with some of them to get a newsletter started. Any members in chapters without a newsletter who are interested in trying out their journalistic skills may contact their chapter president or Wim Blees.

Wim is collecting newsletters from around the country, and will display them in the Exhibit Hall at the convention. Stop and take a look at what other chapters are doing with their newsletters. Wim will be available to offer his skills at publishing his own chapter's newsletter, the Gateway Tuner.

Help Wanted: Committee Members

If you are willing and able to serve on a PTG committee this next year, please let us know. A number of new committees could be formed this July to do important work. There are a lot of exciting possibilities for you, if you are willing to give something more back to the Guild. If you are not already serving on a committee, but would like to, contact Nolan P. Zeringue, RTT, president, at (504) 446-6812, or Bruce Dornfeld, RTT, vice president, at (708) 291-9218.

The Soundboard

To the Soundboard — Some background on the membership restoration proposal:

Since 1984, there has been a section in the Bylaws (now Article VI:6) governing the conditions for rejoining PTG, which currently reads:

Any former member wanting reinstatement must make application as a new member. The application fee will be assessed but back dues will not. Former Associate members may be readmitted to their former classification without examination. Former Registered Tuner-Technician members must take examinations and pay the required examination fees, unless their original examinations had the same form as those in use at the time of reinstatement.

The intent of Council in adopting this rule was to standardize a situation which had previously been confusing, with some chapters requiring re-testing upon reinstatement, and others not.

The meaning of the phrase "same form" seems clear with regard to the Written and Technical exams, since both of these were newly adopted since July 1984 (Written Exams in July 1985 and the latest Technical Exam effective June 1990). The Tuning Exam had been in effect since July 1980, but has changed significantly since its original adoption. Some might argue that it's still the "same form," but the consensus of examiners as reflected in our current policy is that it's not.

On a regular basis, questions arose over what we mean by the phrase "same form"; was this or that exam still valid? For several years now, we have been defining "same form" in terms of current version dates, but just hadn't gotten around to making the Bylaws change to reflect this. ETSC recently communicated to the Board through the Bylaws Committee the effective dates of what we consider the current versions of the RTT exams,

and the Board incorporated that information into a proposed amendment (see item 7 of the Bylaws report, page X.B.8-10, Council Agenda Book). Instead of the phrase "same form," we see here the phrase "current version," and the effective dates of the current versions of each exam are defined. This should prevent future disputes over which exams are still valid.

Since 1984, we have begun using brand new Written and Technical exams, and the dates in the proposal are the effective dates mentioned above. The dates for the Tuning exam are July 1986 for the aural-only test, and July 1990 for the electronic-aural test. Working backwards from the present, the Portland (1989) Council provided that effective Jan. 1, 1990, the passing score for part 2 of the tuning exam (the aural-repeat section required of those who tune part one with a visual display tuning aid) would be 80% instead of 70% as before. So exams originally taken using a VDTA between July 1986 and January 1990 would have to show a minimum 80% score on parts one and two to be acceptable as the current versions.

No tuning exams of any sort taken prior to July 1986 are now considered current versions, due to changes in the scoring which were put into place then, combined with other changes that had been accumulating until then. Though not a complete list, some of these (and their dates, if known) are: 1, the point multipliers in the temperament and midrange sections have changed from two to 2 1/2 and one to 1 1/2 respectively (July 1986); 2. the method of calculating pitch score now depends solely upon the examinee's setting of A4 and does not consider tuning fork error as previously (July 1986); 3. the severity of the stability test blow has increased (used to be six ounces from six inches, now is eight ounces); and 4. the time allowed for tuning has been shortened (used to be two hours in the early 1980s, now is 1 1/2 hours).

These changes have had the effect of making the current version

of the tuning exam measurably more difficult, at least in certain areas where direct comparison is possible. Some scores that might formerly have passed would now fall below the line, all else being equal. For example, what used to pass at 82% in temperament (nine penalty points) now fails at 78%, and what used to pass at 84% in midrange (16 penalty points) now fails at 76%. In other areas, the effect of the changes is less clear. For example, there is no direct way to convert an old pitch score to a new pitch score (though it could be calculated if you had the original master tuning and test tuning data). Nor can we really know whether the examinee can do the same work in the shorter time allowed, or whether the midrange strings would remain within the stability tolerance under the heavier eight-ounce stability test blows.

This is what we mean right now (and for the past several years) in saying that the current version of the tuning exam is no longer the "same form" as before, and why we are using the July 1986 date as the cutoff for the current version.

Some may argue for accommodating individuals who had, say, scored 90% or better in all categories in an earlier version of the tuning exam by writing an exception into the proposed language. For example, one could argue that, aside from the educational value, it is probably a waste of time to retest former CTEs. However, why muddy the waters with exceptions that would accommodate so few? You've either taken the current version of the exam or not. If you haven't, and you did well before, then repeating your effort now will at worst be a minor inconvenience. Let's keep it simple.

It's also true that the proposed item seven, if adopted, should provide a clear incentive for RTTs to keep their up their membership and not drop out or resign, since you avoid the necessity of retesting if and when you return to PTG.

Michael R. Travis, RTT Chairman, ETS Committee

Continued on page 7

Focus On Ethics

Merrill W. Cox Staff Piano Technician. **Brigham Young University**

Ethics. Definition: Relating to morals or moral principles. Synonyms: conventions, ideals, morals, scruples, standards. Many words with many thoughtful connotations. but in the final analysis, ethics is nothing more or less than basic honesty. The simple choosing to do what is right after recognizing that there is a choice in the situation at hand between right and wrong.

Of course, rationalization usually enters in to the picture to stir and muddy the clear and pristine waters of truth. There are so many factors to be considered before a choice is made, aren't there? For example, the pressures of bringing in a few more dollars in order to support a large family (which is arguably a worthy goal) seem to justify hiking the fee just a little. Or perhaps in looking around at the furnishings in the lovely mansion where a piano is being serviced, one might be tempted to charge a higher fee than in the typical working-class home where the furnishings are shabby.

Or time pressures. Each of us have them. Is it strictly ethical to leave a piano without repairing a pedal squeak because one has an important appointment to keep with someone who has more status in our eyes than the present customer? For example, a well-known musical entertainer and her beautiful grand, compared to the average home owner's "el cheapo" with the noisy pedal?

Surely all agree that a circumstance can be strictly legal and still not be ethical. For example a postage stamp that brings a letter, yet somehow missed the cancelling mark in the process. Perhaps legally it could be used again (at least no one else may know about it); but ethically it has already done the work that was purchased to do. To re-use it defrauds the postal service

and ultimately every citizen in this country.

Extreme? Perhaps, but every thought and action is processed through one's own built-in ethics "bank" and the balance is affected. The thought or action must pass through that "bank" and be measured to either add to the balance of ethical savings or subtract from it. In other words either rationalized or justified. Each "transaction" does its bit to expand one's character toward total honesty, or shrinks it toward the opposite.

I am not going to suggest a choice in these examples, but only want to present some ideas that may help all of us to build a more truly honest "ethical" base from which to function.

A basic feeling of true self-worth seems to be one of the most important psychological-emotional traits one can have in order to function in well-ordered progress in this life. It seems to me that this self esteem comes mainly from feeling happy with our basic acceptance of ourselves as good, honest, and giving individuals. Of course, if this is true, then one must spend some time in establishing some foundational thoughts and concepts as to what these traits (good, honest, sharing) are and how to acquire them.

Let me quote from a paper by a famous author/poet Edward Hart presented at the Centennial Celebration of Brigham Young University. September 11, 1975, to help us find a framework upon which to base our ethical foundations. "The true meaning of integrity, in terms of personality, is being one person: not believing one thing and doing another, not going off in more than one direction. Integrity is an older and more comprehensive term than the modern phrase about "getting it all together." If a person has integrity, he will have it all together... by a process of composing, of organizing everything he knew about life, including what he knew from sources of faith as well as from sources of empiricism, into a fairly simple pattern that if complete and meaningfully interrelated." (Emphasis added.)

Perhaps, a basic acquisition in the piano service industry is to gain the training, skill and experience to build confidence in one's work so that service can be proffered with the knowledge that the work performed and the advice given will be as good as can be had or given under the circumstances. We all recognize that an excellent technician is not born fully equipped with experience and tools, so the above observation must be qualified with the acknowledgement that these things take time and effort to acquire; and with the recognition also that the very most ethical decisions made at one time in our lives would possibly not be the same decision in another later time as experience and knowledge is gained.

With that thought in mind, we need all to remember and even frequently remind ourselves and each other that we must be tolerant of those who are new in the business in time or experience and cut them a little slack to make honest mistakes as most of us have made in the past. At the same time, we should be encouraging involvement in PTG chapter meetings, seminars, etc. as well as giving freely of our own personal wisdom so that the level of competency can continually be raised among those of our profession.

Ethics then becomes an extension of our character combined with accumulated experience and knowledge. The resulting trait needs to be used as a measuring rod in every conceivable situation of life. Most of us are still striving to reach that measure of perfection.

Survey...

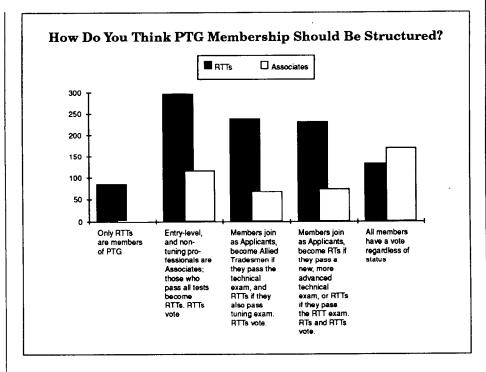
tune or not. A small segment of the public would certainly benefit from our efforts to regulate the few members who rebuild, but at present, the difficulty in determining content, standards, and practical administration have kept this option from becoming a reality.

That the public would benefit from an organization that has some control over the ethical and technical practices of its members is clear. We have been reluctant to provide this service except in rare instances, possibly because most chapters are unwilling to risk internal strife. I believe we can protect the public better than we have in the past without resorting to divisive Gestapo-like tactics.

The Marketing Committee has been working on improving or image and visibility with the piano-owning public, prospective members, teachers, manufacturers, retailers and other target groups. We believe that each group would welcome a campaign that makes it clear that we are able to provide them with benefits, and that the services we offer to our membership support our goals. The resources that we have allocated in the past — both money and man-hours - have been intermittent and embarrassingly small.

It is my hope that discussions in Council — on marketing, membership categories, and virtually all other subjects — will have benefits to the public as a primary objective. Some may argue that we should focus exclusively on direct benefits to our own membership rather than the public, but since we all have to market ourselves to someone, it would be helpful to have PTG working directly on our behalf as well as supporting us in our own efforts.

Our national economy is



currently in a recession. Our long-term financial health is threatened by a number of factors which include large budget and trade deficits and a declining manufacturing base. Our own financial security, and the long-term viability of our profession, must be managed

thoughtfully. The best way to insure the future success of our own businesses and of the Guild that supports us is to remember who writes the checks and make it as easy as possible for them to take advantage of the services we offer.

Correction

Editor's Note: The italicized paragraph below was inadvertently omitted from Carl Root's article in the May Journal Update. As it affects the meaning of the article, the preceding and following paragraphs are reproduced here as well.

A part-time job is often secondary to another job which takes up more working hours and provides most of the income. Piano service work provided less than half of the household income for over 40% of the respondents, but the rest of that income seldom comes from another job. Only 14% spend 25 hours per week or more doing other income producing work, and if you look at just RTTs, the figure is less than eight percent.

A part-time job need not be defined by another job. It simply involves fewer hours than the standard 9-5, 40-hour work week. How many hours do you spend each week on tuning, travel, office, and shop work? The sum of the weighted averages for each category in the PTG survey is over 37 hours so, at first glance, we appear to be a profession of full-timers.

There are several reasons for modifying the data, however. Shop time was unintentionally overstated by some members with little or no shop time because of the wording and limited number of choices for that question. More importantly, most members entered data for tuning, office, and travel time for a good week rather than calculating the average of all weeks. The data is more likely to reflect a September schedule without taking July and August into account. How many "slough" weeks do you have each year? ("slough" rhymes with both "rough" and "although").

Soundboard...

To The Soundboard:

As I observe the death of many respected and revered Guild members, I constantly prod myself to give thanks, in public, to the many great craftsmen who have nurtured me and allowed me to prosper.

Of course, Danta Raso, my closest friend for over 30 years, co-founder of Pro Piano, the most constant source and object of love in my entire life, helped and toiled every step of the way with me. Without Danta, Pro Piano could have never been built.

And in the beginning, there was Sheldon Smith. In his very special way, he's one who is still capable of revealing that side of the piano technical world that has more to do with genius than with bridge pins, agraffes, soundboards or sostenuto monkeys. Sheldon told me "you really look good (natural and comfortable) working at a piano," and I have never heard kinder words... especially from someone whom I respect so completely.

It's too late for them to read my thanks, but Vic Jackson, Bob Burton, and George Defebaugh loomed as great fonts of information when I came aboard in 1970. They somehow understood how blessed and beautiful the whole piano technical world looked to me, a hippie just trying to find a meaningful direction in his life.

I'll be forever grateful to two men that have sort of passed out of my immediate circle but whose memory and whose accomplishments are well documented within our industry. Richard Harris and Peter Wolford were, with me, an inseparable trio for two or three years in the early 1970s.

Richard Harris represents nothing less than my longest lasting friendship in this world. Dick, as I've called him since 1950, has been at my side through some of the most memorable times of my life. He is still the greatest woodworker in the piano business, and a craftsman and artist of unparalleled excellence.

It was Peter Wolford who made me realize that fine technical work and absolutely rock-solid piano tuning were attainable goals... within a brief span of time. Pete introduced me to the world of Yamaha; to Henry Haino, Kenzo Utsunomiya, and the Yamaha standard of excellence that is now so legendary.

Like any avid piano technician of the 1970s, my path was regularly crossed by Jim Coleman, Norman Neblett, Jack Caskey, and LaRoy Edwards. These fellows obviously embody all of the great traits of Guild membership: wisdom, vast knowledge, and the willingness to impart a combination of teachers' love with professional zeal to all of us who clamor for their truths.

So there it is. I've done it!!! Thank all of you for allowing me to make a wonderful life for myself in the piano business. I'm sorry that I didn't get to thank our deceased brethren in person, and I hope I've contributed in a small way to the overall greatness of our industry.

With kindest regards and greatest respect to piano people everywhere,

Ricard de La Rosa

To The Soundboard:

At the Council meeting in Dallas last year, an adequate amount of time was devoted to re, re, rediscussing the classifications of membership in our organization. It was promised that again it will come up for Council debate this year in Philadelphia.

Probably in every civilized country in the world today, the word Craftsman is well understood. Likewise the classification Apprentice. I think that merely the adjective of apprentice applies far more incentive to advance to the grade craftsman than we have presently. Thus Associates obviously want to be allied with the former two groups.

So far I fail to understand why we need to make a situation so difficult when it really should be so simple!

Jack W. Sprinkle, RTT — My customers do not understand these initials, even if I take the time to explain.



To The Soundboard:

My husband, Patrick Coleman, passed his final tuning exam and became an RTT in February, 1991.

We are so proud of him that we thought we would send a photo taken the day he completed and passed his test. (We were so confident we had him bring a camera.)

Perhaps it could be included

in the Journal as a surprise?

Pictured in the photo are James Gulino, RTT, New Jersey Chapter president; Charles Huether, RTT, CTE; Patrick Coleman, RTT!; Newton Hunt, RTT. Photo taken by Anthony Carducci, RTT. The exam was given at Rutgers University, New Brunswick, NJ.

Dorothy, Eric, Elizabeth, Christine, and Johnny Coleman

Corrections To 1991 PTG Membership Directory

Please make the following additions or corrections to the listings in the 1991 membership directory which was published as the April issue of the *Journal*. Remember to make changes in the chapter listing as well as the alphabetical listing where appropriate

Not listed:

Michael Duggan, RTT, Region 1, Chapter #151 - P. O. Box 476, Follansbee, WV 26037. (304) 527-4001.

Telephone changes:

Gino Bonfietti, Chapter #327 - 407-868-1783
Thomas Cashen, Chapter #337 - 813-872-8144
James Gridley, Chapter #337 - 813-773-6308
Martha Kilgour, Chapter #537 - 608-256-3230
Wade L. Mizell, Chapter #275 - 919-481-0009
Starr Taylor, Chapter #337 - 813-248-2553
Thane Yennie, Chapter #803 - 307-875-6172

Membership Status

Northeast Region824
Northeast RTTs529
Southeast Region599
Southeast RTTs388
South Central Region316
South Central RTTs208
Central East Region 630
Central East RTTs392
Central West Region371
Central West RTTs247
Western Region597
Western RTTs392
Pacific NW Region354
Pacific NW RTTs230
Total Membership3,691
Total RTTs2,386

Address changes:

Joseph Bacica, Chapter #041 -Add Box 208B Bernard Misbin, Chapter #078 -11A Rothwell Drive, Cranbury, NJ 08512

Chapter changes:

Wallace Greenlee, who was listed in chapter #803, should be listed in chapter #801.

Piano Industry Contact additions:

List under "Tools And Supplies" and "Other:"
GRK Manufacturing
The New Manual Arts
Gary Kilday, President
3474 Beekman
Cincinnati, OH 45223
(513)681-5821, (800)289-2362,
FAX(513)681-6049
Piano benches, artist adjustable benches, grand and upright piano dollies, Macintosh or quilted

covers, grand piano skid boards, bench pads.

List under "Instruction:"
Perkins School of Piano Tuning & Technology
Robert Perkins
225 Court Street
Elyria, OH 44035
(216)323-1440

Note:

On page 26 of the member listings is an explanation of directory listing codes. Please note that those with an "S" next to their classification code are considered "Senior" members as described in Bylaws Article VI, Section 1f.

Dates & Deadlines

June 8, 1991

RTT Tuning and Technical Exams. Puget Sound Test Center. Application deadline June 1, 1991. Contact: Wayne Matley; 2502 Harmony Lane; Enumclaw, WA 98022 (206) 825-6921

July 13-16, 1991

RTT Tuning and Technical Exams. 34th International PTG Convention and Technical Institute, Philadelphia, PA Contact: Michael Travis; P.O. Box 576, Greenbelt, MD 20768 (301) 441-3555

July 13-17, 1991

34th International PTG Convention and Technical Institute. Philadelphia, PA. Contact: Home Office, 4510 Belleview, St. 100, Kansas City, MO 64111. (816) 753-7747.

August 17, 1991

RTT Tuning and Technical Exams. Northern California Exam Board. Application deadline: July 17th, 1991. Contact: Neil Panton, 5 Cedar Court, Menlo Park, CA 95025 (415) 854-8038

October 11-13, 1991

RTT Tuning and Technical Exams. Texas State Seminar. Austin, TX, Chapter Test Center. Application deadline: Sept. 11, 1991. Contact: Bill Cory, 711 Landon Lane, Austin, TX 78705. (512) 472-9358.

RTT Tuning and Technical Exams. Dallas Chapter Test Center. Contact: for tuning, Walter Connell (214) 942-2827; for technical, Will Nieberding (214) 247-4084