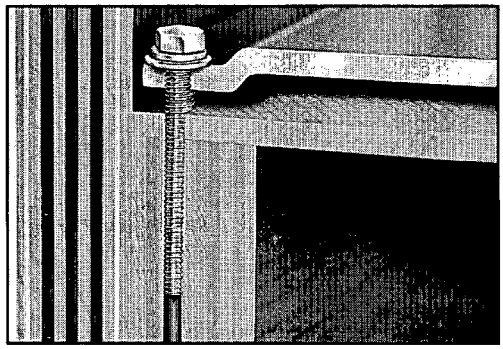
Piano Technicians
Journal
May 1988

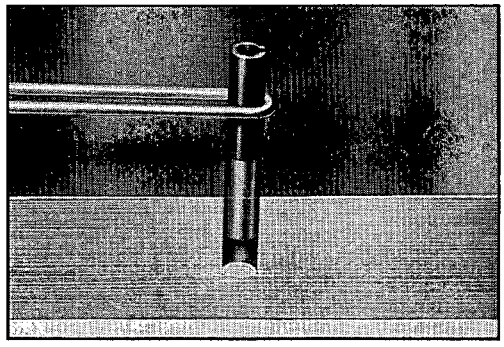
The Baldwin Piano...
You can see why it sounds better

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

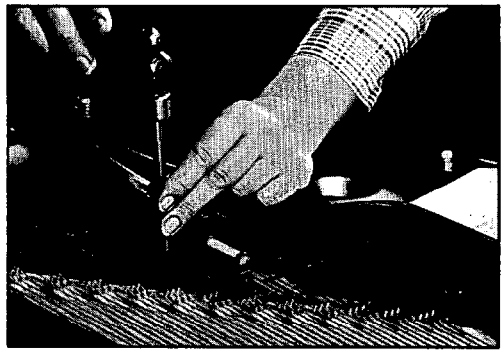
GRAND PLATE MOUNTING SYSTEM: Each mounting hole around the perimeter of the plate is threaded to accept a hardened steel bolt. This allows the plate to be set at the optimum height for bearing on the front side of the bridge (U.S. Pat. No. 3,437,000).



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



There are important advantages for the technician, too. If major soundboard or bridge work is ever needed, it is possible to remove the plate, pinblock, strings and tuning pins as a unit. Simply lower the tension, remove plate bolts and dampers, and hoist it out. Tiny adjustments in bearing can be made without unstringing the piano or even lowering the tension. Since such adjustments are not normally necessary in the field, they should only be made after consulting Baldwin Technical Service in Cincinnati. When re-stringing a section or an entire piano, contact Baldwin for the loan of special bearing-setting equipment.



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

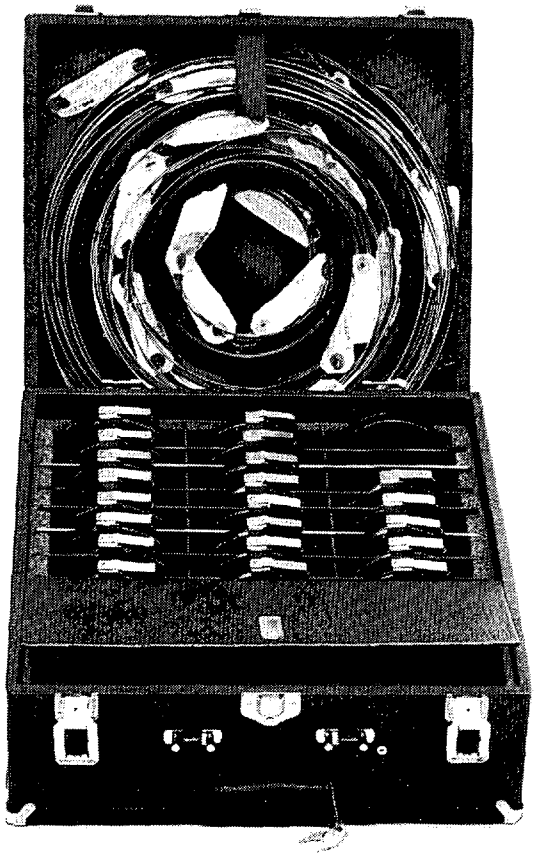
Baldwin® - *Leading the way through research*

CASES by GENCK

For the professional technician who demands the finest!

• ORGANIZED • COMPACT • LIGHT • DURABLE

Never before has a case been available to store both universal string sets and all of the common sizes of piano wire. A complete restringing case that is professional looking, organized and protects the strings and wire from moisture in the air. There are 24 compartments to hold wire, a top section that stores over 30 universal strings and a large open compartment, with inside dimensions 14"L x 5"W x 4½"D, for restringing tools and supplies. The empty case weighs 6 lbs., measures 16½"L x 15"W x 6½"D and is constructed with 3/8" thick hardwood covered with a black, leather looking high grade vinyl material. The case should last a lifetime. Patent pending. Wire not included.



No. 276 — Genck Universal String and Wire Case Only. Each Net.....$175.00

To our knowledge, this is the only case that has been completely organized and designed specifically for the piano technician. Genck case can hold over 100 different tools and supplies. Pouches are made to accommodate the standard tools of the trade. Case should last a lifetime. Tools not included.

This ultimate professional tool case is made of the highest quality materials. Case weighs 4 lbs. empty, measures 15"L x 10½"W x 4"D and is covered with a black, leather looking high grade vinyl material. Patent pending.

No. 275 — Genck Professional Case Only. Each Net $145.00

These cases created much enthusiasm and received overwhelming approval at the latest national P.T.G. convention. Many orders were placed after seeing the quality and attention to detail that the cases presented. Order now, you will not be disappointed.

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The Piano Technicians Journal **May1988**

Official Publication Of The Piano Technicians Guild, Inc.

Volume 31 Number 5

IN THIS ISSUE...

PLUS...

THE COVER...

"Copaloy" flush-cutting nippers for center pins from Diamond Tool & Horseshoe. (Photo by Susan Graham)

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

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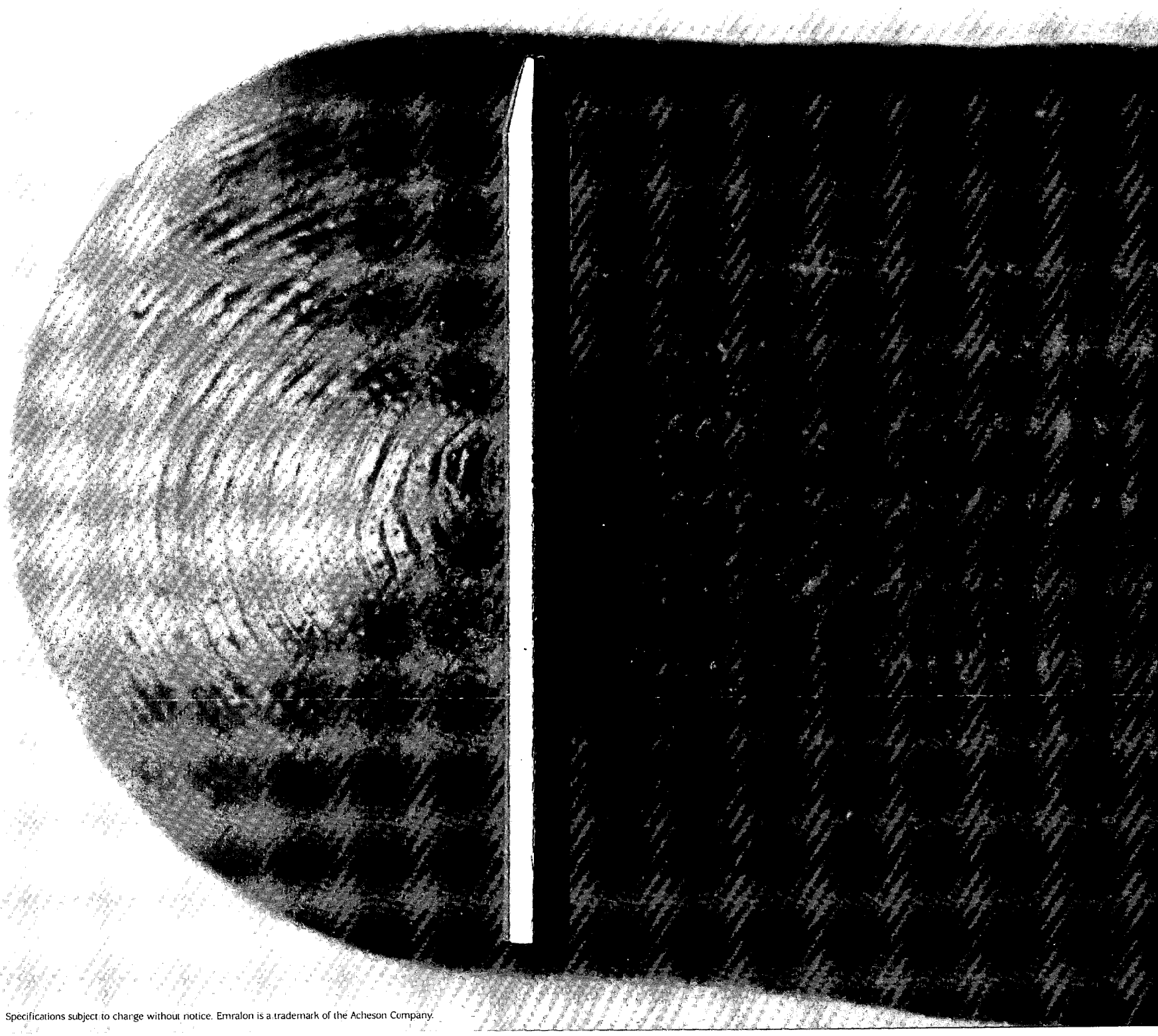


At Young Chang, there's nothing too small to improve.

No one notices a center pin until there's 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'll 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 auxilliary 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 more technical information, please call Ed Whitting at (213) 926-3200. Or write to him at Young Chang Technical Services, 13336 Alondra Blvd., Cerritos, CA 90701 for a free copy of our Service Guide and Technical Specifications Manual.

YOUNG CHANG

The best the world has to offer.

President's Message

M.B. Hawkins
President

Words Of Wisdom

Put some "spring" into your thinking. There is a book called *Think Like A Man, Act Like A Lady, Work Like A Dog* by Derek A. Newton. In this book Mr. Newton hits on a number of thoughts I believe will not only be of interest to our readership but when applied to daily situations, could be very helpful.

The first thought is about the word "word"...(Yours.) We use this word on a daily basis in one way or another and perhaps seldom stop to think about it. We use it in our businesses regularly and we also gave our word when we signed our membership application. Anytime is a good time to review Article V of our ByLaws. It deals with obligations, discipline, and good standing.

Anyway, the following is quoted from Mr. Newton: "Millions of dollars are exchanged on the strength of the spoken word. A gentleman's word is his bond. So must yours be. If you have given your word on a deal, and a better one comes along, you can't renege. If you do, your word will be worthless. You will have forfeited your integrity."

To continue, let's pick up on this, as quoted from the book.

"Generalizations — avoid them, particularly in reference to men and women. Generalizations are the sloppiest short cut in thinking. They cause bum decisions. Memorize the following: All Indians walk in single file; at least the one I saw did."

Not a bad piece of advice. All too often it is easy to make a broad generalization when we should be attempting to think the problem through.

The next bit of advice really does apply to true Guildsmanship. Mr. Newton's book refers to it in the Latin.

"Quid pro quo — don't keep score on people by computing favors given/favors received ratios. You will never be hurt by helping someone or caring for someone as long as you don't expect anything in return."

Somewhere in his book Mr. Newton talks about jealousy. He says one should think of jealousy as a perverted form of respect. It is the emotion that the incompetent people reserve for the competent ones. The following statement was also made relative to blame. "When something goes wrong most people will be looking for someone to blame it on when you should be looking for some way to fix it."

While this has been some bits and pieces of various thoughts, I hope some value can be gleaned from them.

To close I will use what Mr. Newton calls the most beautiful expression in the English language. He says use it whenever you can. I will use it now. It is "Thank You!"

See you in St. Louis! ■

Tech Gazette

Yamaha Piano Service May, 1988

MIDI Corner

Last month, we started discussing what MIDI is and how MIDI works. Now that we know that MIDI data is transmitted in "digital" language—the same language that computers use—we can begin to understand the real power behind MIDI.

The use of digital signals for this information transfer has many advantages. A digital signal is much more resistant to noise and signal degradation than a delicate analog signal. Further, while analog signals cannot be interpreted and modified as needed, digital information can, offering virtually unlimited control potential.

Let's take a closer look at the actual data format used by MIDI. Digital language is represented in the form of a series of *ones* and *zeros* known as the **Binary System.** Each place in a Binary number is called a "bit"—an acronym for **B**inary dig**IT**. A group of bits is generally required to make up a meaningful digital "word," and this is called a "byte." In MIDI, each data byte consists of eight bits, making it possible to represent 256 different values with a single byte. Since binary numbers are rather troublesome for humans to deal with, a number of systems have been devised to facilitate notation of digital values. Next month we'll try to further explain the MIDI format, and also define some commonly used MIDI terminology.

Yamaha in the News

ON TOUR WITH THE MIDI GRAND

Bruce Hornsby and the Range have become one of the most popular sounds on the pop charts during the past two years. Their first release "The Way It Is" soared quickly to the top and became a platinum album in 1987. Introspective lyrics and some very tasteful piano fills are this fine group's trademark. Bruce Hornsby and The Range will be touring with a C3E MIDI grand throughout 1988.

The name **Barry Manilow** has been synonymous with pop music for over a decade. Barry Manilow and a host of supporting musicians recently embarked on an extensive tour of the U.S.A., Europe, Japan, and Australia. The concert tour title, a spin-off on Barry's new album *(Big Fun On Swing Street)* is called *Barry Manilow: Big Fun Tour de Force.* Accompanying Barry and his *Tour de Force* is a C3E MIDI grand.

CALIFORNIA PTG CONVENTION

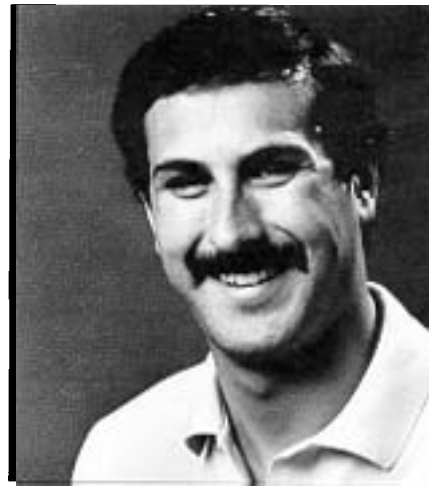
"Inspiring!" "Powerful!" and "Amazing!" were a few of the comments heard on opening night of the 1988 California State PTG Convention. Renowned keyboard artist, **Mike Garson** and the C7E MIDI grand (accompanied by the Disklavier™ piano keyboard) performed for over 250 technicians, industry representatives, and their guests. Mike, a well-schooled classical musician, has a phenomenal facility for contemporary stylings, often with a classical flair. Currently the pianist and keyboardist for the jazz group, **Free Flight,** he has a long list of credits including two years as music director for David Bowie, two solo albums, and a recent acoustic jazz album with bassist Stanley Clarke. One technician's comment about this premier performance for the Piano Technical Community was: "If Yamaha had a machine that would make the perfect musician to showcase the MIDI (grand), it would make a Mike Garson." Watch for Mike Garson and Yamaha at future PTG events.

Calendar of Coming Events

May 13-14:	Intermountain Seminar Salt Lake City, UT
June 24-26:	Summer NAMM Atlanta, GA
July 18-22:	31st Annual Convention St. Louis, MO
Oct. 20-23:	New York State Seminar Syracuse, NY
Oct. 28-30:	Central IL Seminar Normal, IL

Personnel Profiles

STEVE OZIMEK



In the last two issues of *Tech Gazette* we talked about the two people in our Parts Department who work directly with our dealers and with all of you technicians in the field who need parts support. Mark Wisner coordinates the different areas of the department so that things run smoothly, and Hortensia Tafolla handles the majority of the telephone and order origination duties. But someone has to physically find the items you want, pack them for shipment, and see that orders get from *us* to *you* in an efficient manner. That person is **Steve Ozimek**, Piano Parts Clerk.

Another California native, Steve grew up in Anaheim, California. After graduating from Loara High School in Anaheim, Steve gained considerable experience in parts and merchandise stocking, shipping, and receiving while attending Cypress College. After receiving his Associate Science degree, Steve started working in the Piano Parts Department in 1984. With his talent for organization, and his extensive knowledge of shipping and warehousing, Steve is an indispensable member of our team. Steve and his wife Anita enjoy many outdoor activities including skiing and cycling. They currently reside in Orange, California.

YAMAHA

From The Home Office

Larry Goldsmith
Executive Director

The Press Release

We were talking about public relations — call it marketing, image development, positioning or whatever you like, the goal is still the same. We want potential clients to recognize our expertise and become current, regular clients, thereby allowing us to do more of the type of work we like best and increasing our income.

We see cases where a local newspaper will run a large, splashy story about someone no technician in the area has ever heard of. The person featured may or may not be any good; that's not the issue. What's important is that a reporter has found this person's life and occupation interesting enough to write about, not necessarily that the reporter has gone looking for the best technician in town to be the subject of a story. Therefore, the person who has gone to the trouble of attending half a dozen annual Guild conventions and several regional conferences, and who has tested himself or herself by taking the Guild examinations, remains a well-kept secret while a relative newcomer gets the ink. The situation is made worse because many well-established technicians, arguably the best-qualified because of lengthy experience and training, do not promote themselves because they already have all the business they can handle.

The basic tool in media relations is the press release. The rules of constructing one are simple common sense, but speaking as an editor who has seen a few thousand of them go across his desk in the last 14 years, I can tell you that these points are rarely followed.

In my newspaper days, I received press releases from God — at least that's how he identified himself. He lived somewhere in Ohio, I think, and he just wanted to keep in touch to let me know what he and his son were up to. Mostly, he wanted to promote his new book. He did a good job of writing his press releases. All the information was there, they were clearly typed, and they were addressed to me by name. Meanwhile, the guy who had started a new business in town and had something I really needed to print left his address and phone number off the note he sent me. I had to track him down to get additional information.

Therefore, the basics of writing a press release: keep it simple, make it easy to read, make sure it's timely, include all relevant information but not so much that it's boring, and let the recipient know how to contact you. Oh, yes, there's one more thing, the most important, in fact: have something to say. Take some time to think it through before you begin to write.

Suppose you've recently expanded your business to include a new specialty. Here's how you would write the release. Use your letterhead or plain white paper. Put the date at the top. Also put your name, address and phone number at the top. Put a headline on it, making it as brief but descriptive as possible. Don't spend too much time making your headline a work of art, because it probably will be changed anyway. If it's a regional publication and you work in only part of the region, use your city as a date line in the text of the release. Then tell your story.

Begin by boiling down what you want to say into one or two concise sentences — the time-honored "who, what, when and where " You may also want to throw in "why" and "how." Then expand on that to tell more about what you'll be doing, how you'll do it and who you'll do it for. Give some biographical information about yourself to establish your own credibility — your Guild membership and activities, for example.. Again, don't try to make it a work of art. Use simple, declarative sentences, making sure of your spelling and your

Continued on page 10

Home Office . . .

facts. You're trying to catch their interest, not write the story for them.

Double-space your typing, so whoever reads it can mark it up for typesetting. Hold it to two pages, one if possible — if you don't have them by then, you won't get them with a 10-page release, either. Make sure your name is on the second page, too.

Send it to a person, not an office. Look on the publication's masthead for the address. You may find the appropriate editor's name there as well. If you have to, call the publication and find who should receive your information.

Should you call to see if they have received it and plan to use it? In most cases, no. If you've done the release properly, you've given them enough information to make a decision. Now it's up to the news value of the story, their news judgement and what other activities the publication has to cover.

In one case, Lloyd Cotten, a Guild member in Picayune, MS, sent a news release about his attendance at a Guild convention to his local newspaper. Nothing happened. The release languished in the newspaper's files until a new reporter looking for story ideas stumbled across it more than a year later. The result? A lengthy story, with plenty of pictures, about a professional technician's life and work. By the way, pre-written press releases are available to all Registered Technicians who attend the annual Guild Convention. All you have to do is fill in your name and address and put them in the mail. Many RTTs have reported good results from these.

As today's business climate becomes more competitive, the number of local publications is increasing. There are publications that cater strictly to the business community, there are "shopper" publications that rely on editorial copy to fill in the spaces between ads, and there are community papers that are carving out their own niche in areas formerly served only by large metro papers. They're not as glamorous, but they are read. Many publications print columns of brief paragraphs about local businesses. They're looking for news about people like you. It's also interesting to note that insurance agents, investment counselors and other business people use these columns for prospecting. Maybe...

There's more, much more, to say, but space is tight. I hope this information has been helpful — if so, please take a moment to drop me a note. ■

MOVING?

Be sure to let us know!

If you're moving, whether it's across town or around the world, be sure to let us know so your *Journals* can follow. To speed the change, send a mailing label from an old issue and your new address to:

Piano Technicians Guild
9140 Ward Parkway
Kansas City, MO 64114

The Piano Technicians Guild Foundation

Your profession needs your help...
Give something back to those who made a difference in your career — a teacher, friend or mentor. Your contribution to the Piano Technicians Guild Foundation ensures that their work will continue.

What does the Foundation do?
The Piano Technicians Guild Foundation is a separate, non-profit entity with its own board of directors. Contributions to the Foundation's Steve Jellen Memorial Fund for Research and Education are used to promote the piano and the professional technician.

To contribute, complete this form and mail to:

Piano Technicians Guild, Inc.
9140 Ward Parkway,
Kansas City, MO 64114.

Congratulations to Mary Alice Spencer, Brookings, SD

Winner of a $500 PTG Foundation Continuing Education Scholarship

Ms. Spencer, assistant professor of music at South Dakota State University and a Music Teachers National Association nationally certified teacher of piano since 1971, was awarded the continuing education grant during the Music Teachers National Association Annual Convention in Salt Lake City, UT, March 23, 1988.

*Thanks To These Recent Contributors**

W. Dean Howell
Wendell Eaton
Ernie Preuitt
Mr. & Mrs. Albert von den Driesch
Mr. & Mrs. Jeffrey Blonar

Marge Evans
Ernie Preuitt

Robert J. Russell Sr.
Ernie Preuitt
Jack Greenfield
Wendell Eaton

Andrew DeLong
Lehigh Valley, PA, Chapter

Robert A. Burton
Santa Clara Valley, CA, Chapter

**Note: Honorees' names are listed in italics*

YES!

I WANT TO CONTRIBUTE TO MY PROFESSION!

I wish to contribute $_____._____ in memory of____ to honor____

Honoree's name: _____

Chapter/State: _____

Acknowledge to: _____

Address: _____

Your Name: _____

Address: _____

Gateway To Excellence

The arch symbolizes St. Louis' historical role as the "Gateway to the West." It also symbolizes a gateway of a different sort — your gateway to excellence as a piano technician. In the shadow of the arch, you'll learn new skills and make new contacts that will help you become a better technician. In the pages that follow, you'll find descriptions of the classes that make up this year's Technical Institute. You'll be able to choose from more than 250 hours of educational presentations, as well as private tutoring in the subject of your choice. It's a one-of-a-kind opportunity that you can't afford to miss.

See You In St. Louis!

1988 Institute Classes

Ernie Juhn
Institute Director '88

Well, its ready, and it's here now. In this issue, I am happy to have the class descriptions of the 1988 Technical Institute. This will show you that I was right all along — you can't afford to miss it.

In addition to this, there will be mini-technicals and private tutoring in the subject of your choice.

To make it easier for you to plan your days, we will print the Institute schedule in the June issue of the *Journal*.

As I said: See you in St. Louis!

ALL ABOUT THE BALDWIN GRAND ACTION *Alan Vincent, Del Fandrich (Baldwin)*

This class will cover hammer location and installation, traveling and alignment; installation of keyframe, damper action, capstans and backchecks; key weighting; action center service; and voicing. This is not a regulating or voicing class but will contain information about both. Included will be charts from Baldwin's spectrum analyzer showing the harmonic content of piano notes with different hammers, and slides from the factory in Conway, AR.

AURAL FINE TUNING — FOR ELECTRONIC TUNERS *Al Sanderson*

Electronic tuners need to know some aural tuning techniques, not only for quality control purposes but also to be able to achieve true concert-quality tunings. Stretch tuning and generic tunings may only be good to within one or two cents. Aural tunings can be much better. Learn how to close this quality gap with aural checks and tests that work best on "nearly tuned" pianos. Aural tuners are also welcome.

BASIC PIANO TUNING *George Defebaugh*

This class will include all basics such as muting for most efficient tuning, setting the A with the fork, beat counting, unison tuning, hammer technique for solid tuning, temperament setting, etc. Nothing will be left to your imagination by the "master of pedagogy," George Defebaugh.

THE BOSENDORFER *Dennis Burger, Hal Vincent (Bosendorfer)*

During the first half of the class Dennis Burger (concert technician for Bosendorfer) will cover product features and service techniques and will show a video on manufacturing the piano at the factory in Vienna. During the second half, Hal Vincent (research and development) will cover the new Bosendorfer SE Computer Grand. These two instructors can answer all your Bosendorfer questions.

BUSHINGS, BUSHINGS EVERYWHERE *Sally Jameson*

A complete class on how to bush keys, guide rails, flanges and wippens, as well as what kind of bushing cloth and clamps to use and how. Also included will be related subjects such as the proper way to ease keys and key centers.

COMPUTER APPLICATIONS — FROM LEARNING TO EARNING *Henry Jones, Madelynn Manners*

Henry and Madelynn will introduce you to ways of using a basic computer to run your piano service business more efficiently. This class is for all tuner-technicians who have been considering using a computer but thought that it would be too complicated. Included will be information about equipment (hardware and software) and how to keep files and business records.

THE DISKLAVIER AND MIDI GRAND...AN OVERVIEW *Bill Brandom (Yamaha)*

Yamaha has recently introduced two exciting new pianos: the Disklavier and the MIDI Grand. Twenty-first-century electronic and fiber optic technology has been incorporated into these acoustic pianos, giving them musical potential never before possible. But because they are both acoustic pianos, they require the same service that other pianos need. This class, in addition to showing how to perform standard piano maintenance on these unique instruments, will give you a taste of their many performance capabilities.

EFFICIENT PIANO TUNING *Charles P. Huether*

This class will consider specific areas critical to efficient work, focusing on aspects infrequently discussed in depth. Emphasis will be on

helping the tuner-technician achieve maximum productivity and efficiency with minimal stress and wasted time.

THE END OF AGRAFFE AGGRAVATION *Isaac Sadigursky*

Working on agraffes is not as complicated as it seems — it's even more so. This fast, informative presentation will help to eliminate some of the mistakes and "mystique" of the subject. Isaac will cover invention, development, different types and removal of agraffes. Tools and techniques as well as "booby traps" will be discussed and shown. Also included are "war and horror stories" about replacing entire sets of agraffes (rebuilder's delight), and some hands-on experience.

GRAND PIANO REMANUFACTURING *Willis and David Snyder*

Willis and Dave will discuss and demonstrate techniques of piano remanufacturing. Included are soundboards, bridges and case. A "teardown" model of a grand piano, soundboard press, bridge press and rib press will be used to support the lecture.

GRAND REGULATION *Dale Lassiter, Roger Weisensteiner (Kimball)*

The instructors will use slides, action models, overhead illustrations, a high-speed film and regulating tools for hands-on experience that will take you through these detailed steps.

HAMMER FILING *John Ford*

There are many ways to "skin a hammer." Various techniques of hammer-filing will be demonstrated in this class. Filing "by hand" will be covered in a hands-on session with a tool and hammers supplied, using the "motor tool," other machines, the "ping pong paddle method," and the "shoeshine system." Also covered will be why hammers should be filed, what to expect, and how to deal with hammers that are difficult to file, plus — your own input.

INVENTING THE STEINWAY *Bill Garlick (Steinway)*

Many of the features used in today's pianos are Steinway inventions. During this session, Bill will "show and tell" about 50 patents received from the 1850s to the 1950s. You will be surprised at some of the facts Bill will discuss. A "must" class for the serious tuner-technician who wants to know more.

IVORY — THE GOOD, BAD AND UGLY *Gary Green (Sohmer)*

This presentation will include the history of the trade, including the development of the companies that utilized ivory. Problems of the hunters in Africa and the trading center in Zanzibar will be covered. Various samples of ivory products will be shown as well as a description of the way in which the tusk was cut to produce key fronts and tails. Some of the tools will be shown. As an extra treat, Gary will demonstrate how to tie a piece of ivory into a knot without breaking it.

JOINTS AND SPLICES MAY SHOW — BUT NO ONE WILL KNOW *Webb Phillips*

A properly repaired break or joint is stronger than the original. This class will focus on common, made-to-the-necessary-degree, in-home and shop repairs, starting with where a hinge has broken the wood on the rim or top of a piano/bench. Also included: simple in-home repairs of drop action wipps or acrosonic stickers without removing the action; repairing broken hammer shanks; making a broken key better than new; fixing a birds-eye, a split top, a keyframe; and getting more years out of that old pinblock.

LEARNING TO LISTEN *Joel Rappaport*

Learning to listen...to your fingers and to the artist when preparing a piano for stage, studio or musician's home. Joel will discuss experiences with famous pianists, as well as practical tips. This is a class for the serious technician who is interested in concertwork, studio and teachers as well as TV piano service.

THE MAGIC TOUCH *Ari Isaac*

This brand-new presentation covers step-by-step grand regulation using Ari Isaac's unique "sensory approach." The method stresses awareness of how each step feels rather than the rigid method of using prescribed measurements. Ears and hands are used to achieve the ultimate regulation to satisfy the pianist. Gauges and measurements are consulted, of course, but the guiding principle is always the way the action feels. Learn to feel a well-regulated action.

MAKING GRAND DAMPERS AND TRAPWORK WORK *John Zeiner*

This class covers grand damper work from start to finish. Repairs, re-felting, wire-bending, troubleshooting, installation and preliminary regulation to mate damper assembly with keyboard as well as fine damper and pedal regulation.

A MASTER CLASS IN TEMPERAMENT TUNING *Bill Garlick (Steinway)*

Whether a beginner or an experienced tuner, you will find this an instructive and entertaining class. The audience participates in the tuning and creates a cooperative temperament in a way you may never have seen or heard before.

THE MYSTERY OF AFTERTOUCH *Ed Whitting (Young Chang America)*

Aftertouch, what is it? How much should there be? Why is it necessary? How do we regulate it? All these questions will be answered and solutions demonstrated. Theory as well as the practical approach will be explored in detail. This class is a must for the technician who does more than "just tune pianos."

PIANO DIAGNOSTICS *Ray Chandler (Kawai)*

This class will help you recognize and identify frequently overlooked piano disorders (without the use of divining rods). Learn how to analytically approach and resolve idiomatic piano snafus.

PIANOS — A MOVING EXPERIENCE *Jim Geiger*

Jim Geiger is the man who has been moving pianos at our conventions for years. He and his team will cover who should or should not move pianos; what to wear; what equipment to use; exercise, balance and leverage; tight corners; stairways; whether to use a truck or trailer; preparing the piano; and tying it down. There will be a question-and-answer session.

PLEASE SPEAK UP — I CAN'T HEAR YOU *Dr. Barbara A. Bohne, Dr. William W. Clark*

Learn how we hear and why hearing deteriorates when we age or when we are exposed to excessive noise. Information on the delicate

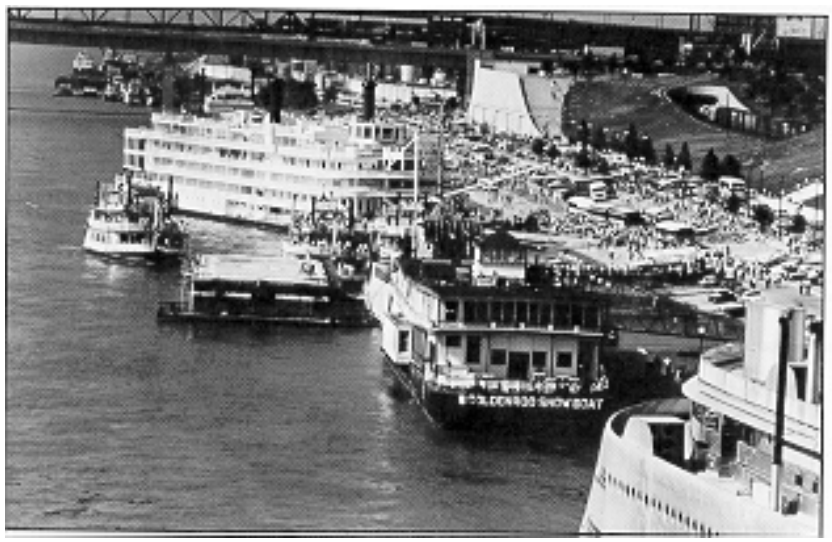
Views Of St. Louis

The Gateway Arch halos the Old Cathedral, the oldest cathedral west of the Mississippi, in the Jefferson Memorial area in St. Louis, Missouri.

An outdoor cafe setting provides respite for evening strollers in St. Louis' historic Laclede's Landing.

Busch Stadium is home to the Cardinals baseball team. It's a pleasant stroll from the Adam's Mark Hotel.

The Adam's Mark Hotel, St. Louis' largest, is located directly across the street from the city's famous Gateway Arch.



The St. Louis riverfront area, near the Guild's convention headquarters, is home to a host of riverboats.

and intricate structure of the ear will be presented with the help of slides. The effects of aging and excessive exposure to noise on both the structure of the ear and its hearing ability will be vividly illustrated. This class, presented by experts in the field, is essential to piano tuner-technicians. Don't miss it.

PRACTICAL APPLICATIONS OF DOWNBEARING THEORY *Jack Krefting*

The mystery of downbearing will be completely explored and explained, starting with the most important part — diagnosing. Jack will lead the class through procedures of measuring, determining whether changes should be made, whether downbearing should be blamed for certain tone qualities, and how to reset the plate to achieve the proper results. This is an important class for all technicians.

PRACTICAL TOUCH-UP AND PIANO CASE REPAIR *Angelo Mastagni*

Learn how to take care of rough edges, remove water marks, fix ugly dents and scuff marks, make dull finishes shiny or shiny ones dull, how to make an easy-to-use burn-in knife and torch, how to answer customers' questions regarding maintenance of finish, and much more — an absolute must for the technician who wants satisfied customers.

PROFESSIONAL SERVICE — THE NEXT STEP *The Yamaha Team*

The performance piano — remember? We started talking about it in Toronto last summer. We introduced the idea of a definite step-by-step service procedure — in an easy-to-follow checklist format — that you can use for servicing these special instruments. "So what's next?" you ask. Redirecting our focus from the little white grand they use for the summer concert series down at the gazebo in the park, we'll look perhaps at the more posh recital-hall variety, played by someone we may already have heard about. And we'll touch on some new levels of truly sophisticated service.

REGULATING THE VERTICAL PIANO *Richard Elrod (Wurlitzer)*

A very informative hands-on class. Action models with keys are used. In addition to complete regulation of the action, broken parts, squeaky springs, noisy damper rods and many other problems will be discussed.

SO YOU WANT TO BE A CONCERT TECHNICIAN *Norman Neblett*

All phases of concert work will be covered: pianos, artists, locations, contracts and working relationships. True experiences will be used to illustrate important points. Key technical items to check before concert, weather control, effects of lighting, moving and air conditioning will be covered, as well as advantages and disadvantages of a concert position.

SPINET REPAIRS — THE INS AND OUTS *Jim Hess*

A practical approach to common repairs encountered in servicing spinet pianos. Included will be action removal and replacement, elbow replacement, and other common problems, along with the appropriate repairs.

SUPPORT YOUR LOCAL GRAND PIANO *Susan Graham*

A brand-new class on repairing, refastening and solidifying grand legs and lyres. Techniques useful to the technician, who often is all alone in the field, will be emphasized, as well as methods for improving existing systems.

TONE AND FRICTION — FACTS AND FICTION *Rick Baldassin*

There are many factors that determine tone quality of a piano. In this brand-new presentation Rick will demonstrate the importance of *friction*. Too much or too little friction in the action of the piano may greatly influence the ultimate musical quality. This is another class that is an absolute must for those who pride themselves in doing "more than just tuning."

UPRIGHT HAMMER & DAMPER INSTALLATION — FACTORY STYLE *Priscilla Rappaport*

Priscilla will bring the factory to you in this very popular hands-on class. She will show you how actions are assembled. You will install dampers and hammers on full-size action models provided by the Feurich Piano Co. The presentation also includes upright action overhauls and replacing obsolete actions. Participants should be familiar with basic regulation and are required to bring the following tools: two screw drivers (3/16" and 1/4"), parallel pliers, wirebending pliers, backcheck bending tool, tweezers and flat bastard wood file 10-12" long.

THE VOICING PROJECT *Chris Robinson*

This is a class for advanced technicians. During the first part of the session Chris will cover the theory and description of his presentation. The second part will consist of practical application of voicing technique. A high resolution signal analyzer will be used to display the frequency spectra and time function of selected notes of the piano. "Before" and "after" will be examined by "ear and eye." Different techniques of voicing will be employed and analyzed. A brand-new class taught by an excellent teacher.

WHY HAS THERE NEVER BEEN A SUBSTITUTE FOR 'FELT' IN PIANOS? *Peter Van Stratum (Chas. House)*

In one form or another, felt has always been used in pianos. Here's an opportunity to find out more about this amazing substance.

WOOD, PIANOS AND HUMIDITY *Wendell Eaton, Richard Butler and Steve Smith (Dampp-Chaser)*

Wood — a complete synopsis of wood characteristics and what is happening to the forests of the world. Pianos — the woods contained therein and why pianos do what they do. Humidity — this unseen "character" that damages and how we can control it.

THE
TECHNICAL
FORUM

Repinning

Susan Graham
Technical Editor

The discussion of action center treatment will continue with the topic of repinning. But first, with apologies for the oversight, gram resistance recommendations for vertical action centers: hammer-butt flange, four to seven; wippen, three to six; jack, three to five; and damper flange five to eight. These figures are similar to corresponding parts in grand actions and, like the figures for grands, may vary somewhat for particular actions. If precision is desired, obtain specifications from the manufacturer. One significant difference between a vertical and a grand action is that the vertical damper flange is pinned more tightly than the grand, since it must stand up to the rather substantial return spring. The condition of all springs in a vertical action is a factor in determining appropriate pinning torque — more so than in a grand, since the vertical does not get the benefit of "gravity assist."

Repinning is regarded by many as the most crafstmanlike method of treating action centers. It is the only solution for loose centers (with or without rebushing, as circumstances dictate). If centers are too tight, disassembling parts and precisely fitting the pin to the flange and to each side of the bushed part yields an opportunity for very exact results. As outlined previously, however, there are a number of causes for action center problems. It is necessary to determine if excess moisture, corrosion, or unstable cloth or other bushing material is a problem, and to treat that. When these problems have been remedied it is time for careful repinning work.

Like key bushing, repinning can be either sloppy or meticulous, and the difference between the two and the effect on the performance of an action is remarkable. Given this, it would be nice to offer the definitive article on repinning. Unfortunately, I can't (and none of my colleagues seems to want to take on the challenge). There are so many factors involved that to list them all, explaining causes, offering solutions, and anticipating new problems, would run encyclopedic. It might also give an impression that there is one reliable system of diagnosis and procedure for repinning, and there is not. It is a task requiring skill — and the judgement that skill implies. As usual, I write what works for me and what I learn from other technicians, striving to be thorough and offer sound and helpful information.

It may seem like a lot of fuss over a little nickel brass pin (a copper-based alloy of nickel and zinc, sometimes referred to as German silver) and a tiny ring of cloth, but pinning is the foundation of control in an action.

Incorrect pinning contributes to problems in voicing, regulation, noise, and premature wear. Action centers which are too tight are readily apparent: sluggishness and bad repetition are difficult to ignore. The problems of centers being too loose are usually more subtle, especially before parts are installed. It can be tempting to ignore them, but experience proves that they will not cure themselves. We have to do it eventually, and it might as well be done immediately before it contributes to other problems.

Since our starting point in this series was a rebuilt Steinway grand action, let us consider first pinning in new parts. Whether the parts are already in new pianos or for sale to rebuilders, whether they are domestic or foreign, inconsistency in action center friction is so common it has become a constant. One must assume that controlling action centers in manufacturing is an extremely tricky business. In the field we often seem to receive our parts or find our customers' pianos in kit form: it is up to us to

see that the detailing gets done.

An advantage when working with new parts is that the manufacturer is still in production. Presumably, the maker of parts or pianos is aware of problems and is working on solutions: it is always advisable to consult with the source. They have the advantage of being able to concentrate on their particular product and may have specific advice regarding the cloth or wood being used. They may suggest returning parts for exchange, or may offer credit or reimbursement for extra work.

Before installing any parts, I test the pinning on every one, first sorting out those which are unacceptable. Those which are acceptable are divided into those which are tighter, which are put in the bass, and looser, for the treble. This allows for the difference in hammer weight and results in a uniform response throughout the action. (If a set includes a section of reduced treble shanks this will slightly complicate the sorting process, and probably result in a need to do more precise action center treatment). Parts which are not pinned acceptably are treated before they are installed so that they too can be sorted according to the final pinning friction. It is also most efficient to stabilize the action center before travelling or any other work is invested.

There are three possible solutions for new parts which are too tight. One is to shrink: apply pure methanol (no water added) and gentle heat and allow parts to dry overnight. This is the solution I prefer, because I feel it stabilizes the cloth and sizes it around the center pin.

Much of the bushing cloth I see in new parts has a somewhat spongy quality — even though it has the white-core appearance we associate with good cloth, it does not seem as dense as is desirable. Unfortunately, this cloth often overshrinks even when treated only with pure methanol. The parts then need to be repinned — but at least the cloth is stable.

Another treatment for tight centers in new parts is to use either the silicone oil/naphtha solution or the traditional mineral oil/naphtha solution. It is felt that these solutions not only lubricate the cloth, but may help to stabilize the wooden parts around the centers. One supplier is currently putting parts in a microwave oven for 30 seconds and then treating them with the silicone product.

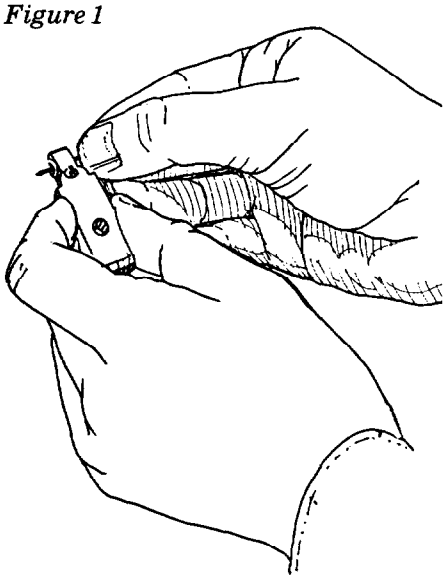
This is a method I haven't tried — but as long as this is not overheating the pin in the flange and scorching the wood there should be no problem. The silicone solution is also being used with success on graphite-impregnated cloth bushings. Since overshrinkage may be a problem and silicone is a lubricant and will not alter an incorrect mechanical fit (unfortunately, it may temporarily mask the problem), it may still be necessary to repin these centers.

There are correct and incorrect ways to remove center pins. The object is simple: to remove the pin without damaging or enlarging the hole in either the flange or the bushing. The two tools available have parallel-action jaws, which ensures that the pin is pushed straight out. To avoid damaging the hole in the flange with the pushpin of the tool, it is advisable to push the pin only until enough of it protrudes to be grasped with a pliers (the invaluable vise-grips) and pulled straight out the other side. If it seems impossible to do this without putting sideways strain on the pin, then pushing the pin all the way out may be the lesser of two evils (sometimes in repinning new or badly corroded parts it can be extremely difficult to remove those pins from the flange). When the parts are unpinned, check to be sure that the fit between the side of the flange (the birdseye) and the bushed part is correct — there should be contact between the two to maintain alignment, but not enough friction to interfere with rotation. It may be necessary to trim the bushing if it protrudes, or to sand *very slightly* the wood of the bushed part, *not* the birdseye. That raised edge of the birdseye is designed to help control friction and spacing between the parts and must be left intact.

The fit of the pin must be tight in the wood but allow rotation of the bushed part. Any time a center

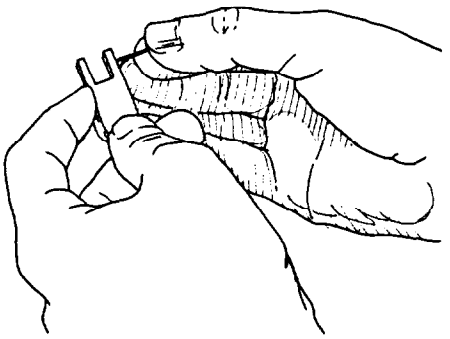
pin is removed, it must be replaced with a larger pin or it may be too loose in the flange. Therefore, the correct size of new center pin is determined by the fit in the unbushed wooden flange first *(fig. 1)*. Measure the pin just removed

Figure 1



with a micrometer, and, starting with the next larger pin, find the size which cannot be pushed in with the fingers. Then try the fit of that pin in the bushed part *(fig. 2)*. Depending on the particular desired friction, the pin should be able to be pushed in by hand but should meet some resistance — the degree of resistance is determined by the desired friction for the particular part. Skill and experience

Figure 2

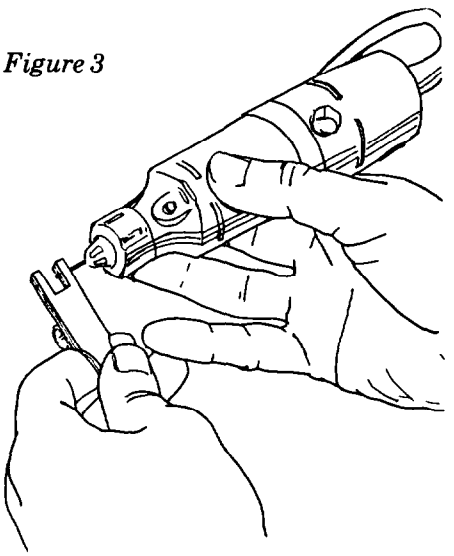


will develop a feel for this fit.

If necessary, the bushing is adjusted to fit correctly around the pin. In most cases, this will require reaming or sizing. It is easy to lose control of the process at this point. This is the time to try samples and honestly evaluate the success of any procedure before continuing with the job as a whole. There are several methods of sizing bushings which work in different ways and to varying degrees. Like the liquid action center treatments, no particular one will always be appropriate or effective (and some may be disastrous).

Repinning new parts bushed with conventional cloth (no additives such as teflon or graphite) can be done fairly quickly using a moto-tool reaming system *(fig. 3)*. When repinning a simple single-center part — such as a set of shanks and flanges — I unpin all the parts needing repinning at one

Figure 3



time. I use a small-aperture collet which will hold a center pin in the moto-tool (these can be purchased wherever accessories for the tool are sold). Since I am dealing with new parts, I know that I can uniformly ream and repin with one size of pin. The size pin which will be inserted is chucked into the moto-tool. It is *not* roughened. The moto-tool is turned on and the pin is run completely through the part — in and out of both bushings quite quickly. Heat produced by the friction between the pin (turning at 1200 rpm) and the bushing will size the cloth around the pin.

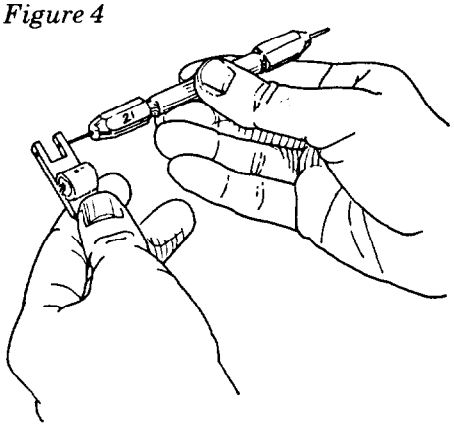
Experimentation will teach how long and how quickly to run the pin in and out; it is a matter of sec-

onds. After all the bushed parts have been so "reamed," the parts are reassembled. Each individual bushing is checked for fit with the pin and can be "re-reamed" if necessary. With practice, this can be a fairly fast method of repinning. A complete set of shanks and flanges can be done in 45 minutes. The same method can be used to size bushings in wippens, although since the friction specifications vary so widely (six to eight grams in the repetition post and one to three at the jack, for instance) I do only one part at a time. This mototool method works best on new parts with clean but unstable bushings (and thanks to Norm Neblett for introducing me to this technique). Do not attempt it on graphite-treated cloth; graphite will move around in the bushing, pool, and scorch.

The disadvantage of putting in a larger pin is that it already begins to move the parts toward the day that they will be too loose, but a larger size pin is simply too big (#24 center pins are for emergency only). This can be avoided by carefully pushing the pin halfway out one side, reaming the bushing this exposes, then pushing the pin back through the other side, reaming that side and then recentering the pin. The appropriate reamer for this method is a roughened center pin. I suggest using a pin one-half size smaller than the pin which is in the parts, since roughening a center pin makes it larger. Roughen the pin by rolling it between two files, and put it in a pin vise to hold it. (Pin vises are available through machinists' and specialty tool suppliers). This technique is often used in conjunction with the silicone/naphtha lubricating solution on new action centers which are too tight. The solution helps to stabilize the wood as well as the cloth, and the reaming readjusts the actual fit of the pin. It is, however, extremely slow and quite difficult to get an even fit on both sides of the flange with this method. I regard it as a technique best used in brand new pianos which require a minimum of repinning. Otherwise, the best result still seems to come from removing the pin, reaming the bushing, and replacing the pin with the next larger size. Some technicians prefer always to use a roughened center pin as a reamer, and may prepare two sizes and use them in a double-ended pin vise for efficiency *(label one end — see fig. 4)*.

Some who ream with a roughened pin find it necessary to burnish and some do not. The pins do clog and lose the edge off the roughness and need to be replaced periodically.

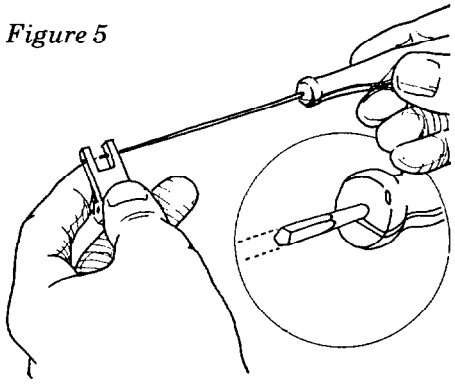
Figure 4



Repinning older parts to solve either tightness or looseness is done in much the same fashion. The rules are the same: insert a large enough center pin so it will be tight in the unbushed wooden part. Check the fit of the center pin to be inserted in *BOTH* sides of the bushing — it must fit properly in both sides or uneven wear and noise will result. If the bushings are very worn, it may be necessary to jump several sizes of pin. This introduces the risk of cracking the flange as the pin is inserted. Either push through an intermediate sized pin, or rebush the part and start over. Particularly in the case of renovating old parts as part of rebuilding, rebushing is a far more preferrable and craftsmanlike solution.

Any time that repinning requires working with several sizes of pins, the tapered reamer is definitely the fastest and most convenient method of enlarging the bushing *(fig. 5)*.

Figure 5

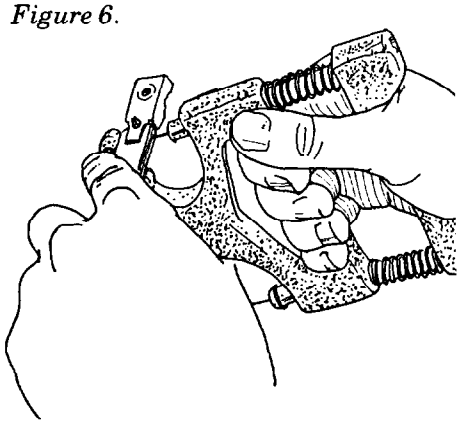


There seems to be a certain reluctance to advocate using this tool, probably because in unskilled hands it can do a lot of damage very quickly. It needs to be used with very little pressure, and must always be followed with the use of a burnisher (a yarn needle in a handle works well) to remove loose fuzz and pack the fibers. The two bushings of one part are not being reamed with one pass — the tool must be inserted from both sides and the bushings reamed, bur-

nished and checked for fit individually.

If realigning parts to reinsert the pin is troublesome (resulting in a lot of bushings being punched out the opposite side), try running a #18 pin through first to line up the parts. The pistol-grip style center-pin tool has a plunger with which to push in the new pin *(fig. 6)*.

Figure 6.



This ensures that it travels straight through the flange and into the opposite bushing. It is also possible to alter a simple pair of slip-joint pliers by cutting a groove in one jaw so the parts can be held but the center pin passes through the groove. Pliers for this purpose should be large enough so that the jaws, when opened wide enough to accommodate the part, will be parallel — resulting once again in the pin being pushed straight into the flange.

Although some advocate clipping both ends of a center to hold it in place, and others insist that only one end be cut and then carefully filed to remove any burr, I get good results with a high-quality pair of flush cutting nippers *(see cover photo)* and see no need for subsequent filing. In fact, I suspect filing may overcompress the bushing, altering that perfect fit we have striven so carefully to achieve.

Speaking of damaging bushings, what about teflon? This refers, of course, to the bushings of pure teflon (not the impregnated cloth) which were featured in Steinway pianos, roughly from 1961 to 1984. A lot of heated discussion has taken place over the merits and drawbacks of this system — some of it in this *Journal,* and we are not going to do it again. The fact remains that the pianos are out there, and we service them. In some cases, the actions are ready for rebuilding and parts can be completely replaced. One thing always to remember is that parts with teflon bushings have no birdseye in the flange. The inner surface of the bushing serves as the birdseye. Therefore, parts cannot be mixed — current production shanks, etc., cannot be pinned onto teflon-style action parts.

Teflon requires particular care in pinning. It would be easy to go on for several pages on this subject since it is so specialized; however, space is limited, so I refer you to either the manufacturer (Bill Garlick at Steinway has a recent service bulletin on this subject) or a local expert for complete advice, and will only outline the basics here. Special center pins, already cut and tumbled to smooth the ends are needed, since cutting pins leaves a rough burr which will damage the teflon. These pins are available from Steinway in two lengths. They are manufactured in 19, 19 1/2, 20 and 20 1/2 sizes. If the largest size is still too small, the bushing is replaced. The most reliable and effective reamers are small spoonbit reamers available from Steinway or from Johnson Carbide (1422 S. 25th St., Saginaw, Michigan 48601, 517/754-7496) in the appropriate sizes to fit these pins. In a pinch, most of us make do with a roughened center pin. The problem with this is that the teflon tends to give a little when this makeshift reamer is inserted, and then returns to shape later, making for a very unstable result. It is extremely important in teflon work that the pin is carefully fit to both sides. More than any other center these are capable of appearing to be correct in friction but will still make noise if one side is loose.

Hammer flange centers seem to cause the most trouble. The reaction of these parts to weather changes can be unique, since the teflon does not respond well to changes in the wood around it. These actions may be sluggish when the weather is dry, due to distortion, and noisy when it is wet, due to the teflon becoming loose in the wood part. As with all instruments, the more stable the climate around them, the better these actions (and your work on them) will fare. It may be that their single biggest problem was insufficient information when they first appeared. The subsequent years of desperate and uninformed attempts at service have not helped. If you need to work with teflon, get proper equipment and information first.

In the case of any repinning, just because it's been fixed doesn't necessarily make it right. Check the friction by the swing test or a gram gauge, work the parts, and check again. After reinstallation, regulation must be checked, of course. Factors such as alignment,travel and spring tension are likely to need readjustment.

From The Mailbag...

From Bob Grijalva comes a suggestion to use bamboo skewers to clean spring grooves in repetition levers. These follow the shape of the groove nicely and will not scratch the wood.

From Phil Warfield Huth comes the following information regarding Knight pianos:

It is now possible to order any of the wound strings for the Knight Kio 44" studio pianos (45" school model included).

Acting as Knight's U.S. agent, I had them make a scale pattern and also send a complete set of wound strings. I sent the entire package to Mapes, per Wayne Hicks. Later, I ordered some strings for my own use from Mapes by phone. The strings work well.

As you know, when the design is good, nothing fills the bill quite like the original. Certainly, many throughout the country can benefit from this service being available.

Last but not least, I am pleased to introduce a series of articles on computers and their use by piano technicians.

Apparently Ron Berry doesn't have enough to keep him busy and we are all the beneficiaries of his expertise.

TUNING UP

Interval Widths

Rick Baldassin
Tuning Editor

Last month, a letter was printed which led to a discussion of octave stretching. A graph was presented which showed the tuning curve for the Sanderson data, and modified curves tuning the treble as single, double, and triple octaves. As I have stated previously, a tuning curve tells us nothing about what is happening to the width of the various intervals which result from the various tuning curves. For this reason I have calculated the cent widths and beat rates for the single octave (2:1), double octave (4:1), triple octave (8:1), and Major 17th (5:1), which result from the original Sanderson data, and the single, double, and triple octave tunings. In each case, the note listed is the lower note of the interval. First, let us examine the cent widths of these various intervals.

The first graph *(Fig. 1)* shows the width of the single (2:1) octaves in cents. We see that the original Sanderson data (shown in bold) maintains a 2:1 octave plus one cent. The single octave tuning curve effects a smooth transition from a one cent wide single octave at F♯5 to a pure single octave at D♯6. Double octave tuning generates single octaves of steadily increasing width. While one cent wide at F♯5, the single octave grows to become about nine cents wide by C7 with double octave tuning. With triple octave tuning, the single octaves become wider at an even faster rate, reaching about 27 cents by note C7.

The second graph *(Fig.2)* shows the width of the double (4:1) octaves in cents. With the original data (shown in bold), the double octave decreases in width smoothly from over one cent wide at note C4, to about eight cents narrow at note C6. With single octave tuning, the

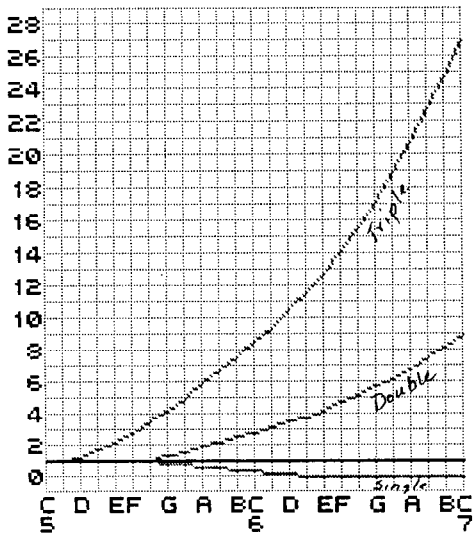


Fig. 1 shows the width of the single octaves in cents, where the treble is tuned as the original data (shown in bold), single, double, and triple octaves. In each case, the note listed is the lower note of the interval.

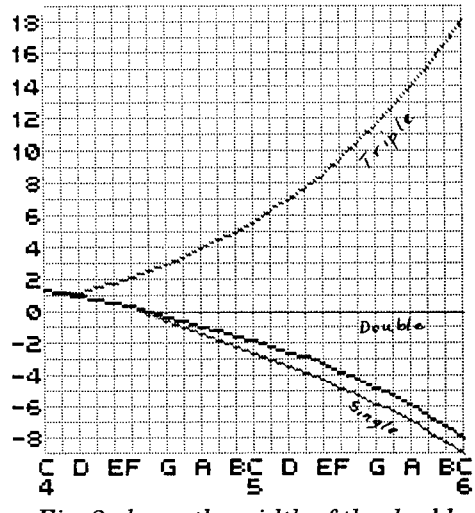


Fig. 2 shows the width of the double octave in cents, where the treble is tuned as the original data (shown in bold), single, double, and triple octaves. In each case, the note listed is the lower note of the interval.

double octaves become narrow at an even faster rate, and have a width of -9 cents at note C6. With double octave tuning, there is a gradual descent from over one cent wide at note C4, to pure at note F♯4 and above. With triple octave tuning, the double octave increases rapidly in width, being over one cent wide at note D4, and increasing to over 18 cents wide at note C6.

The third graph *(Fig. 3)* shows the width of the triple (8:1) octaves

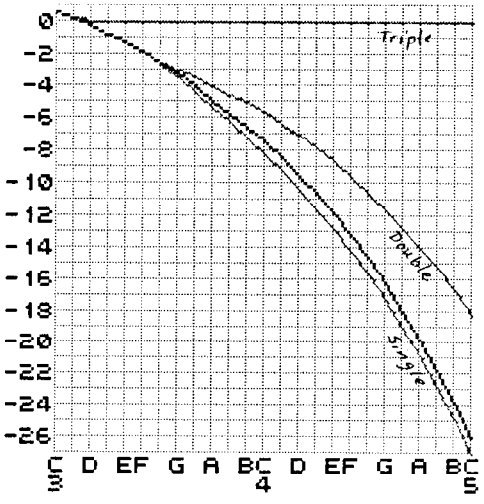


Fig. 3 shows the width of the triple octaves in cents, where the treble is tuned as the original data (shown in bold), single, double, and triple octaves. In each case, the note listed is the lower note of the interval.

in cents. We see that in all cases, the triple octave starts out slightly wide. It decreases in width rapidly, reaching -27 cents with single octave tuning, -26 cents in the original data (shown in bold), and about -18 cents with double octave tuning. The triple octave tuning, of course, maintains pure triple octaves.

The fourth graph *(Fig. 4)* shows the width of the Major 17ths (5:1) in cents. As mentioned in previous articles, the width of the Major 17ths should decrease as we ascend the scale. This happens in the original (shown in bold), single and double octave tunings. The type of tuning determines the rate of decrease, greatest with single octave tuning, and least with double octave tuning. When the treble is tuned as triple octaves, however, the width of the 17ths actually increases, from about 15 cents at

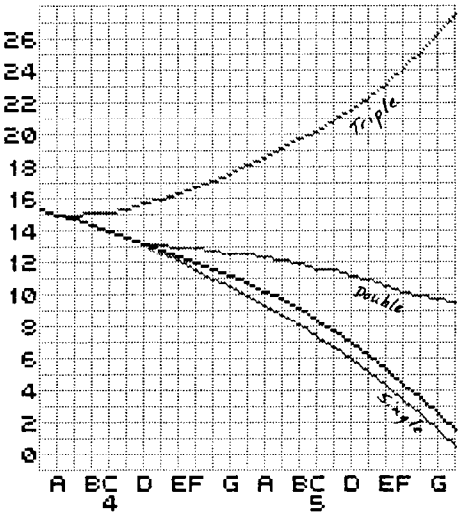


Fig. 4 shows the width of the Major 17ths in cents, where the treble is tuned as the original data (shown in bold), single, double, and triple octaves. In each case, the note listed is the lower note of the interval.

note B3, to over 27 cents at note G♯5.

The information concerning the cent widths is useful, insofar as we know that in a theoretically equal temperament, the cent widths remain constant throughout the keyboard. Previously, we have shown that because of inharmonicity, the cent widths do not remain constant, but generally decrease in width as we ascend the keyboard. Here we have shown that by tuning the treble in different ways, we can speed up or slow down the rate at which these intervals decrease in width. By tuning triple octaves, we can actually make the other intervals increase in width.

The interval widths, however, can be somewhat misleading as to what we will actually hear. This is because at different pitch levels, it takes differing amounts of cents to make one beat. At A4, for instance, it takes four cents to make one beat. At A5, it takes only two cents to make one beat, at A6 only one cent to make one beat, and so on. To help clarify what we might hear, I have included tables which list the beat rates for the single, double, and triple octaves as well as the Major 17ths, where the treble is tuned as in the original data,

Fig. 5: Single Octave Widths in Beats Per Second Where Treble is Tuned As:

	Original Data	*Single Octaves*	*Double Octaves*	*Triple Octaves*
C 5	0.6	0.6	0.6	0.6
C♯5	0.6	0.6	0.6	0.6
D 5	0.7	0.7	0.7	0.8
D♯5	0.7	0.7	0.7	1.2
E 5	0.7	0.7	0.7	1.7
F 5	0.8	0.8	0.8	2.2
F♯5	0.8	0.8	0.8	2.9
G 5	0.9	0.7	1.1	3.8
G♯5	0.9	0.7	1.5	4.7
A 5	1.0	0.6	2.0	5.9
A♯5	1.1	0.5	2.3	7.2
B 5	1.1	0.4	2.8	8.5
C 6	1.2	0.4	3.3	10.1
C♯6	1.3	0.3	3.9	11.9
D 6	1.3	0.1	4.7	14.0
D♯6	1.4	0.0	5.2	16.3
E 6	1.5	0.0	6.3	19.1
F 6	1.6	0.0	7.5	22.5
F♯6	1.7	0.0	8.6	26.4
G 6	1.8	0.0	11.1	30.7
G♯6	1.9	0.0	12.8	35.7
A 6	2.0	0.0	15.0	41.6
A♯6	2.1	0.0	16.0	48.3
B 6	2.2	0.0	18.2	54.9
C 7	2.4	0.0	21.2	64.3

FIG. 5 shows the width of single octaves in Beats Per Second where the treble is tuned as the original data, single, double, and triple octaves. In each case, the note listed is the lower note of the interval.

as single, double, and triple octaves.

If we consider only the single octave, the single octave tuning is the obvious best choice, as it eliminates all beats for nearly the last two octaves. In the original data, there is slight yet conservative beating in the single octave. The double octave tuning creates more beats in the single octave. The triple octave tuning is quite radical and leaves the most beats in the single octave.

Since it is necessary to consider more than the single octave alone, let us now examine the double octave.

Fig. 6: Double Octave Width in Beats Per Second Where Treble is Tuned As:

	Original Data	*Single Octaves*	*Double Octaves*	*Triple Octaves*
C 4	0.8	0.8	0.8	0.8
C♯4	0.8	0.8	0.8	0.8
D 4	0.7	0.7	0.7	0.8
D♯4	0.6	0.6	0.6	1.1
E 4	0.4	0.4	0.4	1.4
F 4	0.2	0.2	0.2	1.7
F♯4	0.0	-0.1	0.0	2.1
G 4	-0.3	-0.4	0.0	2.6
G♯4	-0.6	-0.8	0.0	3.2
A 4	-1.0	-1.4	0.0	3.9
A♯4	-1.3	-1.8	0.0	4.8
B 4	-1.7	-2.4	0.0	5.6
C 5	-2.1	-3.0	0.0	6.7
C♯5	-2.7	-3.7	0.0	8.0
D 5	-3.3	-4.5	0.0	9.3
D♯5	-4.0	-5.4	0.0	11.0
E 5	-4.8	-6.3	0.0	12.8
F 5	-5.8	-7.5	0.0	15.1
F♯5	-7.0	-8.6	0.0	17.8
G 5	-8.3	-10.2	0.0	20.5
G♯5	-9.8	-11.7	0.0	24.0
A 5	-11.6	-13.6	0.0	28.0
A♯5	-13.7	-16.0	0.0	32.3
B 5	-16.1	-18.2	0.0	36.7
C 6	-18.9	-21.2	0.0	43.1

FIG. 6 shows the width of the double octaves in Beats Per Second where the treble is tuned as the original data, single, double, and triple octaves. In each case, the note listed is the lower note of the interval.

When considering the double octave, we find that tuning in single octaves leaves the double octaves quite flat. The original data leaves the double octaves slightly less flat, while the double octave tuning gives pure double octaves. The triple octave tuning is quite radical, and leaves considerable beats in the double octaves.

Let us continue by examining the triple octave.

Fig. 7: Triple Octave Width in Beats Per Second Where Treble is Tuned As:

	Original Data	*Single Octaves*	*Double Octaves*	*Triple Octaves*
C 3	0.4	0.4	0.4	0.4
C♯3	0.2	0.2	0.2	0.2
D 3	-0.2	-0.2	-0.2	0.0
D♯3	-0.5	-0.5	-0.5	0.0
E 3	-0.9	-0.9	-0.9	0.0
F 3	-1.4	-1.4	-1.4	0.0
F♯3	-2.1	-2.2	-2.1	0.0
G 3	-2.9	-3.0	-2.6	0.0
G♯3	-3.8	-4.1	-3.2	0.0
A 3	-4.9	-5.3	-3.9	0.0
A♯3	-6.0	-6.6	-4.8	0.0
B 3	-7.3	-8.0	-5.6	0.0
C 4	-8.8	-9.6	-6.7	0.0
C♯4	-10.6	-11.6	-8.0	0.0
D 4	-12.6	-13.9	-9.3	0.0
D♯4	-15.0	-16.3	-11.0	0.0
E 4	-17.7	-19.1	-12.8	0.0
F 4	-20.9	-22.5	-15.1	0.0
F♯4	-24.6	-26.4	-17.8	0.0
G 4	-28.9	-30.7	-20.5	0.0
G♯4	-33.9	-35.7	-24.0	0.0
A 4	-39.6	-41.6	-28.0	0.0
A♯4	-46.0	-48.3	-32.3	0.0
B 4	-53.3	-54.9	-36.7	0.0
C 5	-61.7	-64.3	-43.1	0.0

FIG. 7 shows the width of the Triple Octaves in Beats Per Second where the treble is tuned as the original data, and as single, double, and triple octaves. In each case, the note listed is the lower note of the interval.

From the above, we see that the only way to approach pure triple octaves is with the triple octave tuning. Single and double octave tuning leave the triple octave quite flat. Tuning in triple octaves, on the other hand, leaves considerable beating in the single and double octaves.

Finally, let us examine the Major 17th to see how the various treble tunings affect the progression of beat speeds.

Fig. 8: Major 17th Width in Beats Per Second Where Treble is Tuned As:

	Original Data	*Single Octaves*	*Double Octaves*	*Triple Octaves*
G♯3	9.0	9.0	9.0	9.0
A 3	9.4	9.4	9.4	9.4
A♯3	9.7	9.7	9.7	9.9
B 3	10.1	10.1	10.1	10.7
C 4	10.4	10.4	10.4	11.4
C♯4	10.7	10.7	10.7	12.2
D 4	11.0	11.0	11.0	13.2
D♯4	11.3	11.3	11.7	14.3
E 4	11.6	11.4	12.3	15.5
F 4	11.8	11.5	12.9	16.8
F♯4	12.1	11.7	13.5	18.3
G 4	12.4	11.8	14.2	19.8
G♯4	12.6	11.9	14.9	21.5
A 4	12.8	11.9	15.6	23.5
A♯4	12.8	11.7	16.3	25.6
B 4	12.7	11.4	16.8	27.7
C 5	12.6	11.0	17.3	30.1
C♯5	12.2	10.8	18.3	33.3
D 5	11.7	10.2	18.8	36.6
D♯5	11.0	9.3	19.5	40.0
E 5	10.0	8.1	19.8	43.8
F 5	8.7	6.8	20.4	48.4
F♯5	7.4	5.3	21.3	53.6
G 5	5.8	3.6	21.8	58.4
G♯5	3.8	1.4	22.6	65.7

FIG. 8 shows the width of the Major 17ths in Beats Per Second where the treble is tuned as the original data, and as single, double, and triple octaves. In each case, the note listed is the lower note of the interval.

From the above, we see that the Major 17ths speed up, then slow down when tuned as the original data, or as single octaves. Tuning as double octaves preserves a nice, steady progression of beats. Triple octave tuning gives a steady progression, but the rate of increase is too fast, and the beat rates rapidly exceed the number which the human ear can detect as beats. In all, the double octave best preserves the progression of beat rates for the Major 17th.

I am sure by now you have figured out that it is impossible to satisfy all of these conditions. What makes for good sounding triple octaves makes for bad sounding single octaves. It is also equally impossible for me to state which way is best to tune. Perhaps if we look at the situation a little more closely, we can narrow our choices.

The ratio of a triple octave is 8:1. The eighth partial is not very strong in the treble region of the piano, so even if the triple octaves are beating, we cannot hear them. Looking at the data, we see that in each case, tuning by triple octaves disrupts the even progression of intervals, and leaves an incredible number of beats in both the single and double octaves which are audible. For these reasons, I think it is safe to eliminate triple octave tuning from among our everyday choices.

Single octave tuning has a sort of charm to it. It is very clean to listen to, and the upper treble notes are reinforced by the undamped strings an octave below. The drawbacks to tuning in pure single octaves are that the beat speeds of the Major 17ths slow down too much, and if arpeggios are played, the top note will invariably sound flat. Since the piano is often played this way, we ought to give this consideration. While it certainly could not be considered "wrong" to tune this way, the above musical considerations lead me to believe there may be a better way.

The tuning in the original data is an attempt to compromise between the single and double octave tuning. It is a conservative attempt, as it leaves the tuning closer to single octave than double octave. A "wide" single octave tuning helps to maintain the progression of Major 17ths, and helps the top note of the arpeggio from sounding too flat. It also maintains a reasonable sound to the octave. In a home situation, this is a definite advantage.

The double octave tuning provides the best progression of Major 17ths, and tunes the treble sharp enough that arpeggios do not sound flat. It can, however, create a lot of activity in the single octave. This is not entirely bad. This activity makes the tone seem brighter, and gives these upper notes the ability to cut through. This is a definite advantage when tuning in large rooms and concert halls.

In conclusion, it has been demonstrated that while each of the treble tuning curves presented last month were smooth, the curves alone do not tell us what is happening with the various intervals which result from these tunings. Information was presented which demonstrated the effects on single, double, and triple octaves, as well as the Major 17ths, when four different treble tunings were used. The cent widths as well as beat rates were examined.

It was determined that triple octave tuning was impractical because it disrupted the progression of intervals and left excessive beats in the single and double octaves. In addition, the tonal spectra does not support the eighth partial in this region of the piano, therefore, beats in the triple octave are not readily heard. Single octave tuning has the advantage of smooth sounding octaves, and sympathetic reinforcement from the undamped strings an octave below, but allows the beat speed of the Major 17ths to slow down, and leaves the top note of an arpeggio sounding flat.

A compromise between the single octave has the advantage of creating an octave which does not sound too sharp nor a double octave which sounds too flat. It helps to maintain the speed of the Major 17ths, and serves to keep the top note of an arpeggio from sounding too flat. In smaller rooms it is an excellent choice.

The double octave best preserves the progression of Major 17ths, and sounds great for arpeggios. It leaves activity in the single octave, which could be troublesome in a smaller room, but is helpful in a large room or concert hall as it gives the piano a brighter tone, which helps the tone to cut through.

Of course, the ability to tune double octaves without objectionable single octave, or to compromise effectively between the two is dependent upon the piano scale. Some scales allow a lot of stretching without any problem, while others hedge at the hint of it. Learn what sounds the best. Then when you have determined what sounds the best, stop and figure out what you did to get it to sound that way. That will help you to get the next one to sound good as well.

Until next time, please enjoy "Memories of Heifetz, Part III, Heifetz and Air Conditioning" by Norman Neblett. Please send your questions and comments to me. They add considerably to this column.

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Heifetz And Air Conditioning

Norman Neblett
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Late in the 1960's, Dean Raymond Kendall resigned his position at USC as Director of the School of Music. He subsequently became the Director of the Young Musicians Foundation, a non-profit organization devoted to promoting musically gifted young people. At the same time, he established a Performing Arts Academy under the sponsorship of the Los Angeles Music Center. His artist faculty consisted of Jascha Heifetz, violin, Wm. Primose, viola, and Gregor Piatagorsky, cello. He had convinced these great artists to leave the USC faculty and come downtown with him. Of course, USC was very unhappy about this.

An old two story structure named the De Liso building was acquired for this purpose. It was across the street from the Music Center on the north side. A great deal of money was spent to refurbish it, including the installation of air conditioning. It was the renamed the Music Center Annex. The rooms were tastefully decorated with Heifetz' room being the nicest. At his request, an individual air conditioning control was mounted on the wall in his studio.

Kendall engaged me to be the Academy's piano technician and to select three new Steinway Grands from the Los Angeles dealer. I was instructed to keep these instruments in top shape at all times. This was a pleasant job except for one thing. To prevent Heifetz' room from being dark, the building had been designed with a false peaked roof above the flat roof and vertical skylights installed. They were little more than sealed windows twenty feet above the floor which allowed natural light to come in from the sides.There was a shelf in front of them upon which the local pigeons roosted. Their mating cries and scratching made tuning and voicing extremely difficult even if their cooing was musical.

Enduring this problem in silence for about a month, I arrived one day to find no pigeons. Evidently our resident artist had also heard them. Orders had come down from above, and the pigeons had disappeared never to return.

Shortly thereafter, we experienced one of the Santa Ana heat waves for which Los Angeles noted. The air conditioning was strained to maintain a comfortable temperature. I noticed that Heifetz kept the thermostat at full cold. A panic call came from Dean Kendall a few days later. He said that Jascha had left the thermostat on full cold overnight and had frozen the entire air conditioning system. It would cost a fortune and take two weeks to repair. The immediate problem, however, was the piano tuning. The temperature had gone to twenty degrees overnight and the tunings had soured.

Dropping what I was doing, I arrived to find all three pianos sounding like they had just been restrung. It took all day to rough them in and a trip the next day to finish the job.

It became apparent after a few months that the Academy was not a success. It was a conservatory operation and needed a degree concept to attract students. Kendall offered it to USC as an adjunct campus. This offer required Board of Trustee action. Meeting in Palm Springs, the Trustees rejected the offer and the Academy subsequently closed. Kendall remained busy as the Director of the Young Musicians Foundation.

After a year's search, a new dean was hired at USC. Grant Beglarian assumed the title as the Dean of the School of Performing Arts. The School of Music was one of the Colleges in this complex. Beglarian was an able and well liked administrator and gifted as a fund raiser. He convinced Virginia Ramo to donate the funds necessary to build an applied music building. It was appropriately named Virginia Ramo Hall.

Beglarian convinced Heifetz and Piatagorsky to return to USC. Primrose would not. The red carpet was given these two men concerning the physical design of their teaching rooms. Heifetz was especially demanding concerning the furnishings, lighting, windows and air conditioning. The building had central air conditioning and sealed windows. Heifetz demanded larger windows that opened, furniture and lighting fixtures from his old studio, window drapes, special locks with non-duplicating keys and his own air conditioning control. Responsibility for these items fell upon the shoulders of Gary Campbell, who was Beglarian's special liaison assistant for school projects.

Because Gary knew that I was well acquainted with Heifetz, he called me into his office to discuss some of these matters.

"I can do it all except install the air conditioning control. It is central air and the master controls cannot be overridden by a single control. Heifetz wants his own control. How can I get around this?" he asked.

"You can't," I replied. "Just give him what he wants." Turning pale, Gary used the standard phrase of refusal at USC. "My God, we can't afford it!"

"Yes you can," I responded, "It will only cost you about $150. Go out and buy the best looking thermostat control that you can find and put it in a conspicuous place on his studio wall. Don't hook it up to anything; just put it on the wall."

Gary groaned, "What if he finds out?"

"I won't tell him," I said, "It is our little secret."

So the gold anodized, beautifully shaped thermostat went on the wall and Heifetz played with it until he retired from USC. He never complained, even when the central air failed during a heat wave and was out for two weeks. He demanded a fan, and merely opened his windows while everyone else with sealed windows fried. It was challenging to play games with Heifetz in fields other than music. I wisely never dared to venture an opinion. He generally treated his associates fairly and he was acutely aware of everything that went on around him. From the first time we met he knew we had a good game going and genuinely enjoyed the jousting.

COMPUTERS

AND PIANOS

How Can A Piano Technician Use A Computer

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This is the first in a series of articles discussing computers and their use to the piano technician in business. These days we find computers everywhere we go. Others have found it beneficial to use computers in their business. In this first article I want to analyze why we might want to use a computer.

A computer is an electronic device that can repeat only a series of commands already "programmed" in. Computers are useful for holding large amounts of data that we want to get at selectively. Computers are great at repetitive tasks. They will tirelessly repeat tasks exactly the same way each time. A computer can be thought of as a time saving device. You enter information into it once and numerous operations can be performed again and again without having to enter that data again.

A computer can't think or make decisions except for those tasks it has been preprogrammed to do. It can only respond to the commands it knows. Therefore, a misplaced comma or letter will cause it to stop.

Interestingly enough, there is a "fuzzy logic" society which is working on computers that can handle statements such as, "this is usually true." We are still a ways off from having a computer that will "do what I meant for it to do rather than what I told it to do."

How can a piano technician use a computer? For those who rebuild and rescale pianos, a computer is essential. The formulas for string tension, inharmonicity, percent of breaking point, and elongation are not terribly complex, but to punch buttons on a calculator 88 times is tedious to say the least. Human error is likely on such a repetitive job. A computer stores the formulas, you enter the data and the computer performs the calculations for each note very quickly. Programmable calculators (such as the TI-59 used for the tuning test) are quite able to do this but in the process they produce a long paper with all the data on it which is hard to work with. A computer has better input/output capabilities and can make a report out of the data in most any format you want.

The most common use technicians would have for a computer is to keep customer records. Let me explain the system we used for customer records before we got a computer and see if it doesn't sound familiar. After servicing pianos I would return home with checks and my copies of my billing forms. We kept a Rolodex with a card for each customer containing service information on the back. After making the file card, we entered the amount of the check and the customer's name and address which was then put in a box according to the month it needed to be sent out.

Now, because it took three operations, each repeating the same information, we often didn't have time to do all three. So, we would write the address and zip information from the check in the appointment book in order to deposit the checks right away. When we got the computer we were more than a year and a half behind on our records.

Setting up our computer system took a great deal of time. We keyed in all the old customer records which took several months

of working late into the night. You must decide whether you are going to put in all the old records or just start keeping computer records from the date you set up the computer.

Now at the end of the day we just type in the customer one time in one place. By using the computer we then have it available for service records, income reports, reminder card labels, how many Steinway grands we have in the 46220 zip code, how many customers have a first name beginning with "J" and a "3" in their phone number. Obviously these last two are tongue in cheek but it is possible to do with little extra work on our part. What is sometimes useful is the ability to look up a phone number received on the answering machine when you didn't get the name, or to produce a set of mailing labels presorted by zip code for a bulk mailing.

Aside from all these "straight" uses of the computer, there are lots of games and recreational software. Everything from home versions of video games to flight simulators and adventure games where you search for clues and the computer reacts to your decisions.

How many of you are great typists? Most of us are not but can be with a word processor program. You type and see everything on the screen first so you can correct the typos before it is printed. Or you can let a spell checker program find the typos and misspelled words. There are even grammar checkers which tell you if you're using a word too many times and then suggests other words with similar meaning. Word processors allow you to store blocks of text which might occur commonly in your letters. You could store a basic rebuilding contract, then call it up and add the information pertinent to the customer and print it. Form letters can be written with general basic information and coupled with the word processor you have the ability to personalize and individually type letters to a list of people.

Have you been involved with a newsletter for your chapter? Special programs are available for making newsletters which include graphics to jazz it up. We used to type a newsletter counting letters and adjusting spaces to justify the right hand margin. Now, with a word processor, all we need to do is say "Yes, I want it justified," and the computer does the rest.

In following articles I will discuss basic computer hardware and the main types of software used for business: Word Processor, Spread Sheet, and Data Base. I will also discuss how we might apply them to our businesses. ■

Restoring Antique Pianos Part III: Cleaning

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Work has progressed at a steady pace on the Bosendorfer fortepiano which I described in the March article. The case and action have been cleaned. The original strings have been measured, removed from the instrument, kept in order and preserved. The rusty tuning pins have been removed from the pin block, cleaned with a soft wire wheel and placed in their original order in a piece of pressboard. The cracks in the soundboard have been repaired and the soundboard, bridges, pin block, hitch-pin rail, hitch pins, key frame, keys and action have all been cleaned. Repair work has begun on the damaged spine of the instrument.

Cleaning the action: One can never say it too often: before removing the action from the case, be sure that all the hammers are completely down on their little rest pads. Needlessly breaking parts in an antique instrument can cause serious damage and can result in days of unnecesssary work. After removing the action from the case, a special pair of Veinnese action capsule pliers was used to remove the shanks and hammers from their brass capsules. The hammers were already numbered in pencil next to the axel pins, although the original numbering proved to be inaccurate and the parts needed to be numbered again.

In numbering parts use a hard, sharp pencil and do not make the numbering any more obtrusive than it needs to be. Rare pianos are not the place to leave behind grafiti. Rust and corrosion were cleaned from the hammer-shank axels by carefully turning them into the end grain of a block of soft spruce. After removing dust and dirt from the hammers and hammer shanks with a soft brush, the wooden parts of the action were cleaned lightly by rubbing them with art gum. The object here is to clean the parts, not make them look new. Sandpaper and steel wool are too abrasive and should not be used for cleaning antique parts. They leave fine scratches on the surface of the wood.

German restorers often use a special wallpaper cleaner called "Wishab" (manufactured by the Akachemie Co., D-7315 Weilheim, West Germany) for cleaning wooden parts. Art gum is easier to find in North America and works just as well. The leather hammer heads were cleaned with a very soft bristle brush and the sides of the hammers were cleaned with art gum.

Cleaning the keys: First the keys and key frame were cleaned with compressed air using a pressure of about 50 psi. The holes in the keys for the front and balance rail pins also were blown out with compressed air. A soft brush used together with the air gun speeds up the cleaning process. All the wooden surfaces of the keys were cleaned with art gum, although special care was taken not to erase any writing or numbering on the keys and key frame. (Any writing in an antique instrument which might provide clues about the instrument's genesis and history must be both photographed and transcribed for the restoration report.) The brass capsules on the keys were cleaned using a leather-covered wooden paddle. After cleaning, a drop of fine watchmaker's oil suspended on the tip of a very thin wire was applied to the dimples in which the axel pins pivot in the capsules.

Rust was cleaned from the front and balance rail pins with metal polish and a very fine steel wool pad. The original punchings on the balance rail were protected during this procedure by covering them with shields cut out of plastic food-storage bags. The backrail cloth was cleaned with compressed air and a soft brush. The entire key frame was cleaned with a very slightly moistened cotton cloth, rubbing with the grain, and immediately dried.

Cleaning the case: No single cleaning method can be recommended for all case finishes. The condition and composition of the original finish has to be the determining factor. The Bosendorfer has some case parts which are in excellent condition and others which are water-stained, extremely dirty and often with loose or missing veneer. All the case parts were originally finished with spirit varnish. There were many different formulas for these alcohol-base finishes and they do not all respond to the same methods of cleaning.

After experimenting with various cleaners on an expendable piece of broken veneer, it became clear that the finish of the Bosendorfer was very durable. Rubbing with the grain, the heavily soiled parts of the case were cleaned in small sections with a lightly water-moistened cotton pad and then immediately rubbed dry. This brief and very slight moistening of the finish produced no adverse effects, but I definitely do not recommend this procedure in every instance. After cleaning the case, a special cleaning emulsion was used to polish and protect the finish. Again, it is best to experiment on a small piece of broken veneer or on an unexposed surface before using a polish to clean a piano case. The cleaner I used for the Bosendorfer is recommended by some violin makers for cleaning valuable, antique string instruments. This emulsion can easily be made at home, using the following formula:

Refined linseed oil (Winsor & Newton, London): 12.5%
Lemon oil: 12.5%
English distilled turpentine (Winsor & Newton, London): 25%
Alcohol: 25%
Distilled water: 25%
(Winsor and Newton linseed oil and turpentine are available at good artist-supply shops.)

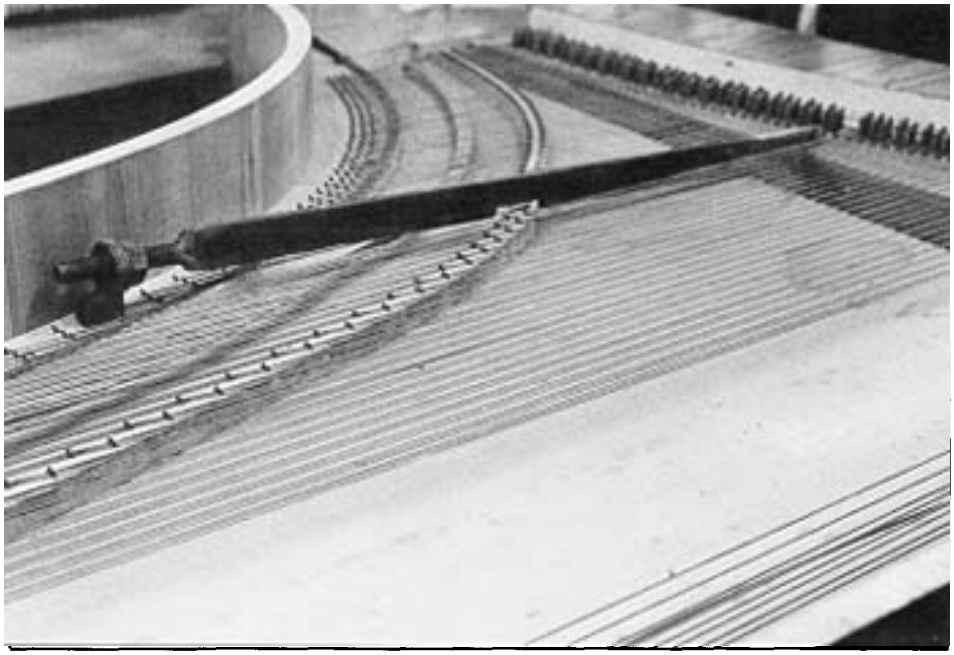
Another effective polish is recommended by the distinguished German restorer Friedmann Hellwig: *(Note 1)*

Olive or almond oil: 250 ml
Turpentine: 250 ml
Vinegar: 250 ml
Ethanol: 10 ml
Mild detergent: a few drops

Both of these cleaning emulsions need to be shaken frequently during use. Care should be taken not to clean any patches of loose veneer with these cleaners because the oil in the formula may seep through open cracks and make regluing impossible. Case and veneer repairs should be made before cleaning the finish. Still another polish for old piano cases was suggested by Edward Quincy Norton: *(Note 2)*

Alcohol and butter of antimony, each: 1 1/2 oz
Muriatic Acid: 1/8 oz
Linseed or sweet oil: 16 ozs
Acetic acid: 1 oz
Ammonia: 2 drachms

Cleaning the soundboard, bridges and pin block: Surprisingly, the soundboards in Viennese fortepianos were installed without a protective finish. The early piano makers felt that finishing the soundboard would inhibit its ability to vibrate freely. Another possible explanation is that fortepianos without metal reinforce-



1. The sounboard and bridges before cleaning

ment were very unstable when subjected to even slight changes in humidity and temperature. An unfinished soundboard could adapt very rapidly to climatic changes.

In cleaning an unfinished soundboard, a vacuum cleaner should first be used to remove loose dirt and dust. The Bosendorfer had several ugly water stains and discolorations on the soundboard. *(Illus. 1)* After removing loose dirt, art gum was again employed across the entire soundboard, rubbing with the grain and without exerting much downward pressure. These "dry" cleaning methods were successful, but had little effect on the stains.

The next step was to try various solvents. The best results were obtained with a mixture of equal parts of distilled water and alcohol. Again only a slightly moistened soft pad was used and the surface was immediately rubbed dry. The stains finally were removed to an acceptable degree and the entire soundboard surface was lightly cleaned with the same solvent. *(Illus. 2)*

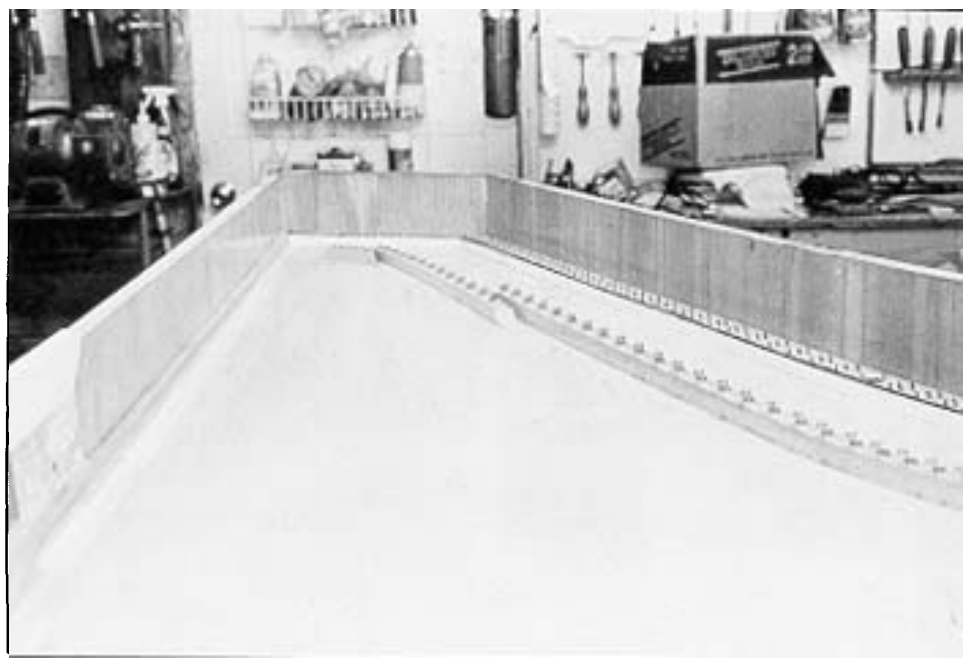
The nut and bridges and the top surface of the pin block were also vacuumed and cleaned with art gum. The tuning pin holes were cleaned with compressed air. The tops of the bridge pins were cleaned by carefully brushing them with a soft brass brush. (After cleaning the tops of the bridge pins, a building procedure unique to Bosendorfer could be observed: the front bridge pins, which mark off the speaking length of the strings, were made of steel while those which contact the waste length were made of brass. One can only speculate why this procedure was used.) The spirit-varnish finish on the top of the pin block was cleaned using a very slightly moistened cotton pad.

Cleaning the strings and tuning pins: Because of the extremely deteriorated condition of the original stringing, the decision was made at the beginning to retain the original tuning pins but to replace all of the strings. Soft steel and brass wire manufactured by Malcolm Rose in England will be used to replace the original strings.

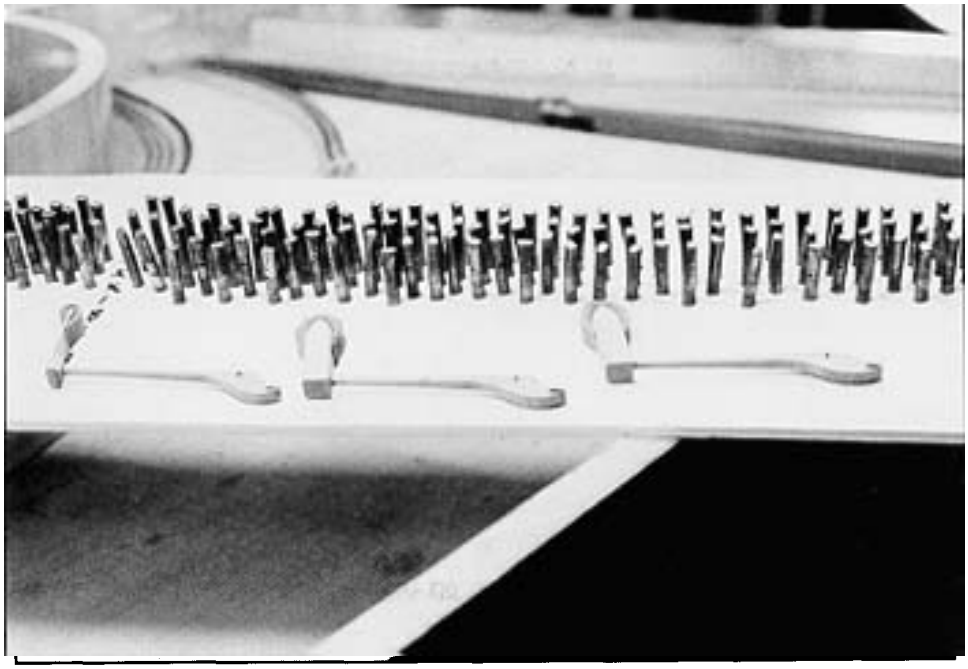
In a surprisingly large number of instruments built in the early 19th century, the original stringing is still intact and the best solution is to retain the original strings. Iron low-carbon steel music wire does not deteriorate or suffer from metal fatigue as quickly as modern high-carbon wire. (The original low-carbon steel cables which suspend the Brooklyn Bridge continue to do their job much to the amazement of modern metallurgists.)

After measuring and removing the original strings, the rusty tuning pins were slowly turned out of the pin block. The top half of each tuning pin was cleaned with a very fine wire wheel at slow rpm. Friedemann Hellwig recommends chemical methods for cleaning tuning pins, which one might also consider. *(Note 3)* In this instance, chemical cleaning was rejected as impractical.

A piece of pressboard with the same pattern of tuning pin holes as



2. Soundboard after shimming and cleaning. Note the new spruce fitted into the interior wall of the spine. The original veneer will be replaced making the repair invisible.



3. Original tuning pins arranged in order after cleaning. In the foreground three original hammers with shanks and axel pins after cleaning.

the pin block was used to store the tuning pins to ensure that they would be replaced in their original holes. *(See Illus. 3)* (Because of slight variations in diameter, it is essential that tuning pins and case screws be returned to their original holes.) After cleaning, the tuning pins were pushed into the press-board so that only the top half of each tuning pin was exposed. Then they were sprayed with two light coats of clear acrylic to protect them from rust. Acrylic should not be applied to the bottom half of the tuning pin.

Cleaning original strings: here one should observe the following procedures: If the original strings are to be saved, the tuning pins should not be removed from the pin block. The tuning pins and wire coils can be cleaned, if necessary, with a soft brass brush. Clean away as much rust and corrosion as possible from the bearing points where the wire crosses the bridge and the nut. To clean the strings, fold a square piece of soft leather and rub powdered tripoli or pumice stone into the folded leather. Slowly loosen the tension section of the instrument, turning the tuning pin as little possible. Never increase the tension before cleaning a string as it may have rusted to the bridge or nut pins. If so, even a slight increase in tension will cause the string to break. Loosen the tuning pin just enough so that the string can be lifted clear of the bridge and nut pins. Keep the string attached to the hitch pin and clean the entire string with the polishing leather. For particularly stubborn stains and rust on the wire, a small piece of fine steel wool can be folded into the polishing leather.

Early fortepiano builders polished each new string after installation. *(Note 4)* Before drawing the string back to tension, clean rust from the bridge and nut pins and clean the understring material. To clean each string in this manner is time consuming, but the rewards are usually worth the effort. We still do not appropiate replacement music wire for many instruments. After cleaning, the original strings usually sound clearer and louder than the modern wire which we might use to replace it. Moreover, it is always best to save the original componets of a historical instrument.

The wound strings in the bass can be cleaned with soft brushes, but not by brushing up and down the length of the strings. Instead, clean each bass string individually, removing dirt from between the coils by brushing in the same direction as the coils. After cleaning the top side of a bass string, turn the string loop one-half turn, rehitch the string on the hitch pin and clean the underside. Any broken original strings should be labeled, numbered and preserved in air-tight food storage bags.

In the next article in this series I will discuss shimming the tuning pin holes and restringing antique pianos.

Note 1. Friedemann Hellwig, "Restoration & Conservation of Historical Musical Instruments," in Making Musical Instruments, *ed. by Charles Ford, New York: Pantheon Books, 1979, pp. 167.*

Note 2. Edward Quincy Norton, Construction, Tuning and Care of the Piano-Forte, *Boston: Oliver Diston, 1887, p. 97.*

Note 3. Hellwig, op. cit., pp. 169-171.

Note 4. Beethoven's friend, the famous piano builder Nannette Stein-Streicher, mentioned on page 31 of her book Kurze Bemerkungen uber das Spielen, Stimmer und Erhalten der Forte-Piano, *(Vienna, 1804) "Every string which is to be installed should be drawn through a soft piece of leather until it is clean and smooth."*

G O O D

VIBRATIONS

Downbearing: Finding Dimension V

Nick Gravagne
New Mexico Chapter

This month's discussion on downbearing brings us to a practical look at downbearing angles or what has been referred to as the angle of deflection. So as to avoid a great deal of confusion, not to mention unnecessary and expensive embarassment in the field, it needs to be understood that the angle of deflection which is chosen and set for downbearing in the rebuilding process will be *larger* than what will *seem* to exist after the piano is strung and up to pitch.

As has been mentioned in this series, a soundboard with downbearing pressure is not at all unlike a compressed spring. In mechanical terms, the force from bearing is called the stress and the sinking and elastic behavior in the board is called the strain or deformation.

As we shall see in this as well as later articles, it is this strain condition in a compressed soundboard which makes perfectionism regarding practical downbearing a very abstract concept. This doesn't mean that elaborate guesswork or groping in the dark is the only option.

Whether we are considering a new soundboard and bridge, an old soundboard and bridge or some combination, downbearing is always "set" more or less in the same way, i.e., without the piano wires installed up to pitch. In this unstrung condition the soundboard crown is, for all practical purposes, as full as it will ever be. There is no pressure on the flexible board and the bridge relative to the front and rear string terminations (agraffe/capo to rear duplexes, etc.) is higher than it will be after the downbearing force convinces it otherwise.

What this all means is that downbearing, as a net force on the soundboard, is actually estimated at the outset — what is called *apparent* or *anticipated* bearing. An experienced rebuilder might say something like this: "Considering the average string tension at 160 lbs. per string and, since we have planed the bridge top to allow for 1.5 degree angle of deflection, we anticipate a total force on the soundboard of about 900 lbs." However, before the echo of these words has died out there is an eyebrow raising in mild disbelief somewhere.

The reason for this skepticism is understandable once we are reminded that the soundboard does not present a thoroughly rigid reaction to the applied downbearing force. Indeed, it wouldn't be much of a soundboard if it did. It is no secret that the board yields downward quite noticeably in the

stringing process as each string is put on with only enough tension to keep a neat coil.

I recently strung a six-foot grand which had a fully crowned soundboard. Prior to stringing I measured the height of the soundboard in its middle areas relative to its lower plane at the rim. After stringing the tenor up to the first duplex bar I rechecked the crown in the board and discovered that it had already sunk under pressure one-sixteenth of an inch!

Something of an eye-opener, even though more or less expected. Unless this condition is accounted for, the estimated pressure on the remainder of the yet unstrung bridge is going to be less than anticipated due to a resulting smaller angle of deflection. But this is a very practical matter and will be investigated a bit more in detail at another time. For now, however, it is enough to remember that a soundboard is an irresponsible rascal looking for any chance to shuffle away from its load-supporting obligations and that, insofar as string angles are concerned, what you see with a carpet thread test is not necessarily what you get at A440.

Having said all this, however, we do need a reasonable starting place. And, in order to take the practical approach to finding and setting these angles more intelligible, it is necessary to point out just under what circumstances the bearing is actually set. The typical procedure on a new piano is to install the plate over a crowned soundboard which has a too-tall bridge. By pulling a carpet thread or fish line through the agraffe (or under the capo bar) and positioning various thickness gauges, such as small steel blocks, at the rear string rest the bridge is channeled or ground down at selected places until the carpet thread is able to touch simultaneously the agraffe hole, the bridge top and the rear gauge block *(see Fig. 1)*. The thicknesses of the gauge blocks are chosen so as to produce the desired angle of deflection. The thicker they are the greater the angle will be and, as has been shown, (Feb. '88 *Journal*) the larger angle brings more pressure to bear on the bridge.

Figure 1

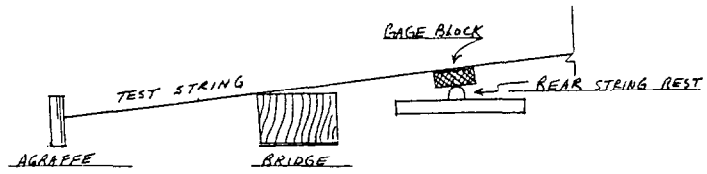
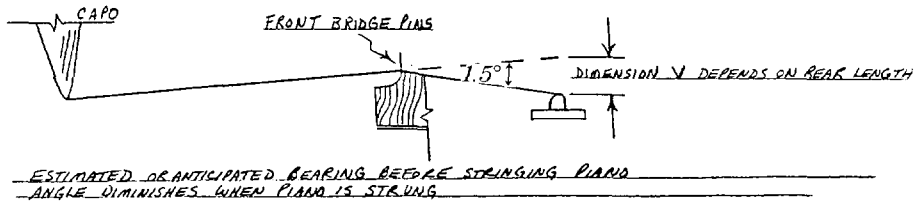


Figure 2



When the correct bridge height has been established and set at several places the plate is removed and the remainder of the bridge (the high spots) is planed down to meet the test surfaces. The bridge is then notched and pinned and ready for stringing. Piano rebuilders many times use this procedure when installing a new soundboard and/or bridges. Of course, this business of preparing the bridge to the correct height is all very simple to talk about but quite another thing to do. Nevertheless, what's important is to know how thick the gauge blocks should be. Or, said another way, how much space is required between the test string and the rear string rest for a chosen angle of deflection?

Math types love this sort of thing because it gives them one more reason to reach for their little science calculators. But, as we shall see, a working knowledge of trigonometry, although very interesting, is not necessary for figuring out the proper angles and dimensions, nor is any kind of a downbearing gauge (although these devices certainly have their place). Practical downbearing work begins by choosing a suitable angle of deflection in the *unstrung* piano. A case was propounded in favor of a 1.5 degree angle (April '88 *Journal*) on a new, or otherwise fully crowned, soundboard. Flatter soundboards require proportionately less of an angle for mechanical reasons if nothing else. But for now we are going to assume a 1.5 degree angle as a model example. By taking the one-fortieth rule into account (March '88 *Journal*) four pounds of pressure per string on the bridge will be designed into the rebuild by allowing for a 1.5 degree downbearing angle (average tension @ 160 lbs.)

In order to get a good mental picture of what is happening please refer to *Figure 2*. Consider the speaking length of the string as a straight line which, if it were not deflected downward after touching the bridge, would continue as the dashed line. Our angle of deflection enters into the picture when the small piece of string which runs from the *front* row of bridge pins (the speaking length notch)* to the rear string rest cuts downward and away from the speaking length. The size of that angle exists in the place indicated in the drawing. Simply, what we want to know is what dimension V should be for *any* desired angle. But, since rear string lengths are anything but uniform varying from nine inches and two inches long, for example, the determination of dimension V might appear to be an impossibly tedious task. In fact, it is wonderfully simple.

The following geometrical technique, although nothing new to the world of physics and mechanics,

allows for a very happy solution to our downbearing problem. The equipment and materials necessary to work this out are a two-foot ruler, a piece of paper more than 16 inches long, and, of course, a sharp pencil — all the high-tech stuff. The procedure begins by knowing the average tension of the strings.

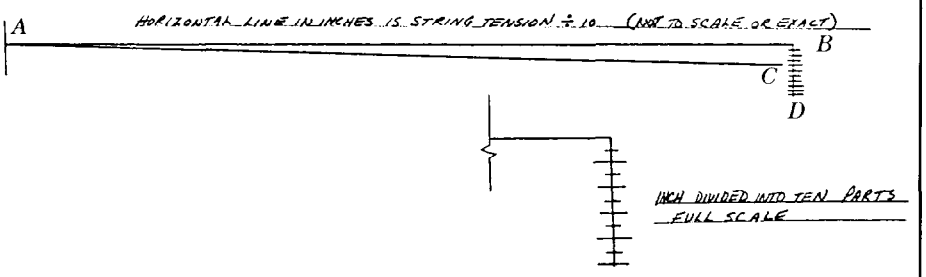
Say tension is 160 pounds per string. Draw a straight horizontal line 16 inches long on the paper. If the average tension is 170 pounds the line would be 17 inches. The tension is simply divided by ten. So the drawn 16-inch line represents 16 units of tension at ten pounds per inch unit. *(See Figure 3AB)*. Next, draw a line one inch long at the end of, and perpendicular to the 16-inch line *(BD)*. Divide the one-inch line into ten equal parts as shown to scale. This one-inch line also represents a ten pounds per inch unit and the ten divisions represent one pound each.

Since four pounds of pressure on the bridge has been calculated in the one-fourtieth rule (160 lbs. tension divided by 40 equals 4), count down four units on the one- inch perpendicular line and draw another line between that point and point A of the 16-inch horizontal line *(AC)*. The angle thus defined (which will be very near 1.5 degrees) will be constant no matter what length of rear string is being considered.

Now go to the piano and measure one selected rear string length from the front bridge pins to the rear string rest (not the hitch pins). Presume this length is four and one-half inches. Take this dimension back to your drawing and measure four and one-half inches on the horizontal line from point A. The space which exists below this point and the angled line AC below it is our required dimension V in Figure 2. It is obvious that shorter rear lengths will have smaller dimensions for V and vice versa but *the pressure on the soundboard is the same because the angle is the same* My drawing is made on white poster board and kept in a safe place for reference.

The beauty of this is that the drawing, which is simple for anyone to make, is easily constructed to suit any average tension scale. For example, if the tension is 180 pounds per string, the required pressure on the soundboard would be figured: 180 divided by 40 equals 4.5 pounds of force. The 180 pounds tension relates to an 18-inch drawn line and four and one-half pounds to counting down four and one-half units on the one-inch line and then following through as explained above.

Figure 3



Incidentally, the angle in this case works out to be 1.44 degrees, which points up another very useful piece of information. Whether the average scale tension is 160 or 180 or 200 pounds the angle of deflection is very nearly the same in each case if one-fortieth of the tension is desired as a downbearing force. Although the tension and the pressure will change, the angle of downbearing does not. The large seven- and nine-foot grands might seem at first glance to have a steeper angle of deflection in that the dimension V is obviously larger. But this is due only to the longer rear string lengths in these instruments. The downbearing *force* is larger in these pianos because the tension is higher, not because the downbearing angle is greater. This is another reason why I consider the 1.5 degree angle a standard on all pianos with full crown.

In order to keep the record straight, however, the one-fortieth rule is not hard and fast, nor is it universally accepted. But unless there is some reason to abandon it, or a manufacturer clearly dictates some other numbers, the one-fortieth tension and 1.5 degree angle make for a fine hand-in-glove team. This arrangement could spell disaster on a flatter (but crowned) soundboard, so caution is advised. The modified approach to downbearing will be handled in a future article.

Various rules-of-thumb have been proposed over the years which suggest a sort of standard, ball-park dimension for V at different places in the scale. In addition, the use of coins such as dimes, nickles and quarters has been advocated for use as convenient gauge blocks. We will see how these practices fare when more closely examined.

In any event, here is a quick mathematical way for figuring dimension V. V equals the rear string length times .026. For example, if the rear length is five inches just multiply 5 times .026 and the dimension at V is about one-eigth inch.

**Although the front notch is the correct point from which to measure the rear string length, the string doesn't leave there heading straight for the rear string rest. Since this rear piece of string must first pass the back bridge notch we do have a small fly in the ointment insofar as our theoretical angle of deflection is concerned. Assuming a bridge top which is horizontal in cross sectional view and a five-eigths inch distance between front and rear bridge pins, the downbearing angle will be increased by 0.14 degrees making for a total angle of 1.64 degrees. But even if it were possible to precisely set these angles in practice the total force on the soundboard would only increase by about 87 pounds. This will come up again when we explore the mysteries of what is called front and rear bearings.*

Calendar Of Coming Events

Date	Event
May 13-14, 1988	**Intermountain PTG Conference** Rodeway Inn; 1292 S. University Ave.; Provo, UT 84061; (801) 374-2500 Jack Reeves; 486 N. 300 W., Orem, UT 84057 (801) 225-1757
July 18-22, 1988	**31st Annual Piano Technician Guild Convention & Institute** Adams Mark Hotel, St. Louis, MO Home Office: 9140 Ward Parkway, Kansas City, MO 64114, (816) 444-3500.
Sept. 30-Oct. 2, 1988	**Florida State Seminar** The Jacksonville Hotel, Jacksonville, FL John Pelick Jr.; 1567 Townsend Blvd; Jacksonville, FL 32211-4944; (904) 724-4795
October 14-16, 1988	**Texas State Seminar** Tropicana, San Antonio *Leonard Childs; 7867 Lark Ridge; San Antonio, TX 78250; (512) 647-3648*
October 20-23, 1988	**New York State Seminar** Holiday Inn Arthur Nick Smith; 730 Park Avenue; New York, NY 13204; (315) 478-1669
October 28-30, 1988	**Central East Regional** Sheraton Inn Robert Morris; 1729 D Valley Road; Champaign, IL 61820; (217) 356-9781
November 4-6, 1988	**North Carolina State** Comfort Inn Sam Corbett; Rt. 3, Box 115; Grifton, NC 28530; (919) 254-5016

PTG — What Direction Are We Going?

Ron Berry
Vice President

Looking over the bylaws changes coming before Council, I noticed that the issue of logo was coming up for this session. Do we want an Association logo that all members can use? What will it look like if we do? The thought came to me that before we can address this issue we might want to spend some time discussing a basic underlying issue: *what is PTG and where is it going?* This might look like a dumb question, but let me explain. When PTG was first formed as a merger of NAPT and ASPT we took on two basic philosophies with which we have been wrestling ever since.

One philosophy says that we are a professional association of professionals. This would indicate that we have RTT members and when others get to our level and pass our tests then they can join us. This would lead to having very strict tests to prove that our members are well above average so that we can advertise ourselves to the public as true professionals.

The other philosophy is that we are an educational organization which has a duty and responsibility to teach new people and upgrade new members. This philosophy says that we will take in everyone interested in piano technology and help them. With this philosophy alone we could simply have members with no classification and no tests. Anyone could then advertise membership which would show an intent to improve one's skills.

I think you can see that we have always walked the tightrope between these two concepts and tried to be both at once. Our proposals and discussions on many key issues reflect this dichotomy of views:

Dues level — do we give a break to beginners who are not making money from their business or do we charge students extra for teaching them a trade?

Testing — what are the tests for? Could we just have membership and no tests? Do we test to assure the public that this person is safe to come in the house and won't damage the piano? Do we test to be certain that anyone who has passed the exams can please Vladimir Horowitz and can rebuild a piano as well?

Membership — our whole membership structure is tied up in these issues. Do we need only one category for the whole organization? Do we need categories for different levels of competence as well as specialties such as rebuilding, action work, refinishing, etc.?

Advertising — this is directly tied to membership categories. The one thing that is perfectly clear is that *if you are a member of an organization, you have the right to say that you are.* We can prescribe how you may say it. So advertising becomes the issue of what are we

Membership . . .

advertising? Are we advertising technicians who can please Horowitz, technicians who are safe to come in the door, or technicians who are members so they can improve themselves? Or do we want to advertise all of these?

The recent membership changes moved us more toward the educational philosophy by consolidating the various categories other than RTT into one group. By legal necessity we allow these people to advertise as *"Associate Member, Piano Technicians Guild."* Now there is some flack from RTTs who see a problem in taking people off the street and allowing them to become a member and therefore advertise. Are we going to keep swinging back and forth between these two philosophies because we react to the problems inherent in each philosophy?! The conflict between these philosophies has become more and more of a problem.

We need to discuss these issues in our chapters and in Council. Rather than always reacting to situations we need a well defined outlook and well defined goals. What are we and what are we trying to accomplish? Rather than just plow into the logo issue which is more a symptom than a cause, we will spend some Council discussion time wrestling with these issues. There are many shades of gray between these two philosophies and we may well find that we are comfortable walking the tightrope between them. If we decide this, it will be a better informed decision if we have settled on some goals first.

Membership in our organization is not critical to someone's ability to make an income. We are not a licensing agency providing a license that is required to do business. These are the facts as of today. Taking the hard line professional approach might lead us to an elite group with very little membership and no money to operate. There are places right now with two chapters in the same area which represent these opposing philosophies. One chapter is very elite and complained that the new tests were too easy compared to their high standards. The other chapter has day-long training sessions for new technicians where all are invited to come for free and bring their sleeping bags and sleep on the floor.

Somewhere between these extremes is where the Guild is. We have RTTs with exams somewhat beyond the minimum level for daily work. We have also accepted Associate members without technical qualification. We have made the choice to have these people be members so we can help them with our educational opportunities. Since we have made them members we must allow them to identify themselves as such and have chosen to let them say "Associate member, Piano Technicians Guild." This seems to be a good compromise position but it is not without its problems. The committee that developed the membership restructure plan considered all the possible combinations of who is a member and who is not and felt that this was the most workable.

So why all this discussion? The last thing I want to do is make some change in the membership structure again. However, we will be discussing advertising and use of logos by the two membership classifications and by the Association itself. We need to have a good-concept of what we want an RTT to be and what advertising as an RTT is supposed to mean to the public. Please, encourage your chapter members to read this and then discuss it at a chapter meeting before the convention. I might suggest that formulating goals for the future of PTG might even be worth a special meeting devoted to this subject alone. With real chapter input your delegate can come prepared to make an informed decision in Council.

New Members In March 1988

REGION 1

Western Massachusetts, MA — 010

Carl Ippolito
46 Lynne Drive
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Toronto, ON — 062

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Paul C. Dorn
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Gotthard E. Kallberg
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Hawthorne, NJ 07506

Long Island-Suffolk, NY — 117

Christopher L. Young
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L.I. Cristofori, NY — 118

Stephen C. Fairchild, Jr.
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Lindenhurst, NY 11757

Pocono Northeast, PA — 186

Robert W. Dincher
2845 Four Mile Drive
Montoursville, PA 17754

Philadelphia, PA — 191

Al C. Rinaldi
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REGION 2

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William M. Resnick
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Charlotte, NC — 282

Robert Gudenzi
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Charlotte, NC 28206

Atlanta, GA — 301

Thomas L. Longenecker
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Powder Springs, GA 30073

Nashville, TN — 372

Bartley K. Boyd
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Garland, TX 75041

El Paso, TX — 799

Ruth E. Quarles
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Midland, TX 79703

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Las Cruces, NM 88001

REGION 4

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West Union, OH 45693

Detroit-Windsor, MI — 481

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Royal Oak, MI 48067

Craig S. Cole
246 Nakota
Clawson, MI 48017

Albert B. Stanley
24014 Woodham Street
Northville, MI 48167

Waukegan, IL — 600

Jan M. Durham
705 Reba Place, #1
Evanston, IL 60202

Chicago, IL — 601

Thomas P. Delegge
1215 Cactus Trail
Carol Stream, IL 60188

Mel Septon
9045 Karlov Street
Skokie IL 60076

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#119
Iowa City, IA 52240

Nebraska, NE — 683

Lynn M. Wilton
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Superior, NE 68978

Denver, CO — 801

Thomas C. Fleming
15567 East Brown Place
Aurora, CO 80013

Boulder, CO — 803

Thane Yennie
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Riverton, WY 82501

REGION 6

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Great Falls, MT 59401

Phoenix, AZ — 851

Larry D. Porter
3240 E. Linda Vista
Flagstaff, AZ 86004

Reno, NV — 895

William W. Sawyer
120 Taurus Circle
Reno, NV 89511

South Bay, CA — 905

David C. Deichman
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Van Nuys, CA 91405

San Francisco, CA — 941

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Portland, OR — 971

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Beaverton, OR 97005

Eugene, OR — 974

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1410 Edison
Cottage Grove, OR 97424

Rogue Valley, OR — 975

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Azalea, OR 97410

Seattle, WA — 981

Curtis A. Spiel
411 E. Thomas, #8
Seattle, WA 98102

Karl C. Thompson
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REINSTATEMENTS

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Richard G. Loomis, RTT
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Haydenville, MA 01039

Reclassifications During March 1988

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Robert Morss
P0 Box 2024
Norwalk, CT 06852

Long Island Suffolk, NY — 117

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The Auxiliary Exchange

President's Message— Marketing PTGA

Most things require marketing and PTGA is no exception since we do provide a marketable product and it is one that serves the piano industry. Our "product" is PTGA itself. Our "consumers" the non-member spouses of PTG members. There are many possible ways to market our product. Given the resources we might spend thousands of dollars advertising in various forms of media, most likely with doubtful results. So the question is, how do we reach our consumer with little or no cost and still be effective? An old, well worn adage comes to mind: "Telephone, telegraph, tell a woman person (updated). If each PTGA member would, whenever talking with a non-member, simply mention the many values PTGA offers — the educational value — our purpose and goals — the support we offer our spouses — and do so with knowledge and enthusiasm we would have a highly effective marketing program. You must believe in the work your spouse is doing and the support that is available to him or her or you wouldn't be a member. All that is required is that you communicate this to others who are not yet members.

Most of you, at one time or another, attend annual PTG Conventions, State or Regional Conferences. Usually there are a large number of non-members present. If our members would take the time to enthusiastically explain the benefits of Auxiliary membership it is quite possible that many of these people would join. Many already support our goals and have indicated that they enjoy convention programs. Perhaps they would enjoy being part of all this when they learn that the cost is most nominal *and* they are wanted.

If we, the membership, don't market our own organization, not only will it fail to grow — it will continue to dwindle. It must grow so our many worthy projects can grow with it.

Ginger Bryant

1988 Auxiliary Schedule — July 18-22 — Rose Garden Room

Sunday, July 17

Auxiliary Room open.

Monday, July 18

9:00 a.m. Board Meeting — Auxiliary Suite.

9:00 a.m. Walking Tour conducted by St. Louis Auxiliary of four-block radius of hotel. Meet in Auxiliary Room.

3:00 p.m. Class — Auxiliary Room
Gary Green, Sohmer Piano Co. — "All You Should And Would Ever Want To Know About Ivories."

Tuesday, July 19

8:30 a.m. Auxiliary Opening Assembly
Welcome to St. Louis
Memorial: Pauline Miller, Los Angeles, CA.

9:00 a.m. Guest speaker — Ron Elz, radio personality and newspaper columnist.

10:00 a.m. Get-acquainted coffee.

10:45 a.m. Council Meeting.

3:00 p.m. Tea — Program: Auxiliary Scholarship Recipients.

Wednesday, July 20

9:00 a.m. Tour.

3:00 p.m. Return to hotel.
Auxiliary Suite open all day for those not going on tour ("Auxiliary Room In Use" sign posted outside indicating suite number).

Thursday, July 21

8:30 a.m. Master Graphoanalyst, Sue Mathias.

10:00 a.m. Class — Auxiliary Room
Sharla Kistler, RTT, Lehigh Valley, PA, Chapter — "What It Is, Where It Goes, And How Not To Do It."

12:30 p.m. Installation Luncheon — Program: graduate student, the St. Louis Conservatory and Schools of the Arts.
Installing officer: Christine Monroe, California, At-Large.

4:00 p.m. Post Board Meeting

Friday, July 22

8:30 a.m. Organizational Forum — Moderator: Julie Berry.

10:00 a.m. Business Class.
Chris Monroe, Paul Monroe, RTT — "How To Build, Increase And Maintain Your Business."

A Professional Look Into The Lives Of Our Instructors

Gary Green, Sales & Service Manager, Sohmer & Co., is presenting a class for PTG as well as for PTGA. An expert on all aspects of the piano, his subject this year will be "Ivory, The Good, Bad and Ugly." He has promised to bring everything except the Elephant!

Sharla Kistler, RTT has been a member of PTG since 1978 and an active member of the Lehigh Valley Chapter, PA. The title of her class is "What It Is, Where It Goes and How Not To Do It." She will instruct you to be prepared to assist your technician-spouse intelligently in the shop by developing a familiarity with individual parts as well as their functions in the piano. Gather valuable hints about safeguards in the shop and also learn tricks to provide yourself with a convenient workbench location. Learn why the easiest way of doing a job might be the correct way.

Paul Monroe, RTT and Christine Monroe, of Orange County, CA, will present an innovative class titled: "How to Build, Increase and Maintain a Successful Business." Paul was formerly a construction manager, with piano technology an avocation. After retiring, the roles reversed and he became a full-time technician, joining PTG 13 years ago. Christine, a retired teacher, with her masters degree in education, accepted the position of office manager for their business. Knowing both Paul and Christine personally, I can attest to their ability to accurately teach this particular class.

Time — Use It Or Lose It!

The complete Schedule of Events can be found elsewhere on this page. This gives you ample opportunity to pick and choose those things you wish to attend. We would like to see each and every one of you enjoy all of them. Through your requests, via last years questionnaire, we have selected classes, fun times and kept open some free time. We have assembled some excellent instructors who are giving their time to prepare their class for you and then are giving up PTG Class time to present them to you.

If you have never had your handwriting analyzed, this is your chance. You will learn many things about yourself. You will also learn the rudiments of analyzing the handwriting of others. "Do they really mean what they say in that letter you receive?" "Or are they just being polite?" You can often tell by the way they cross a "t," dot an "i" or slant their letters.

At the Opening Assembly, the history and background of St. Louis will unfold for you. Each time you leave the hotel, across the street you will observe the Court House where Dred Scott was tried and remember the city's history.

The PTGA Council Meeting, where the membership has its opportunity to change the rules and by-laws and elect officers for the coming year, is of importance to all, not just the delegates, because you can speak through the delegate from your chapter or region.

The Tea and the Annual Installation Luncheon are always high points. At the Tea you will hear both of our PTGA Scholarship winners perform. See and hear, firsthand, the first results from this worthy program. A fine pianist is also scheduled for the luncheon.

The newly built hotel, located in the reconstructed area of St. Louis, immediately across from their famed "Arch," is ideal for easy access to shops, restaurants, fast food outlets and points of interest. A great time should be had by all!

Ginger Bryant

Nominating Committee Report

The P.T.G.A. Nominating Committee has submitted the names of the following individuals as nominees for offices on the Board for the term 1988-89:

President — Agnes Huether

Vice President — Arlene Paetow

Recording Secretary — Bert Sierota

Corresponding Secretary — Judy White

Treasurer — Barbara Fandrich

The two secretaries are currently incumbents and are eligible to continue service on the Board. Nominations from the floor will be entertained if anyone is interested in running for a particular office.

Cele Bittinger, Chairperson
Deanna Zeringue
Beva Jean Wisenbaker

St. Louis' Memoir

Ice cream cones came on the scene at the St. Louis 1904 World's Fair, when an ice cream vendor ran out of serving bowls! He selected a waffle from a nearby counter, rolled it up, in what we know today as a cone shaped holder and put ice cream on top. It became an immediate hit, and is still going strong. There's no one who does not love 'em.

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

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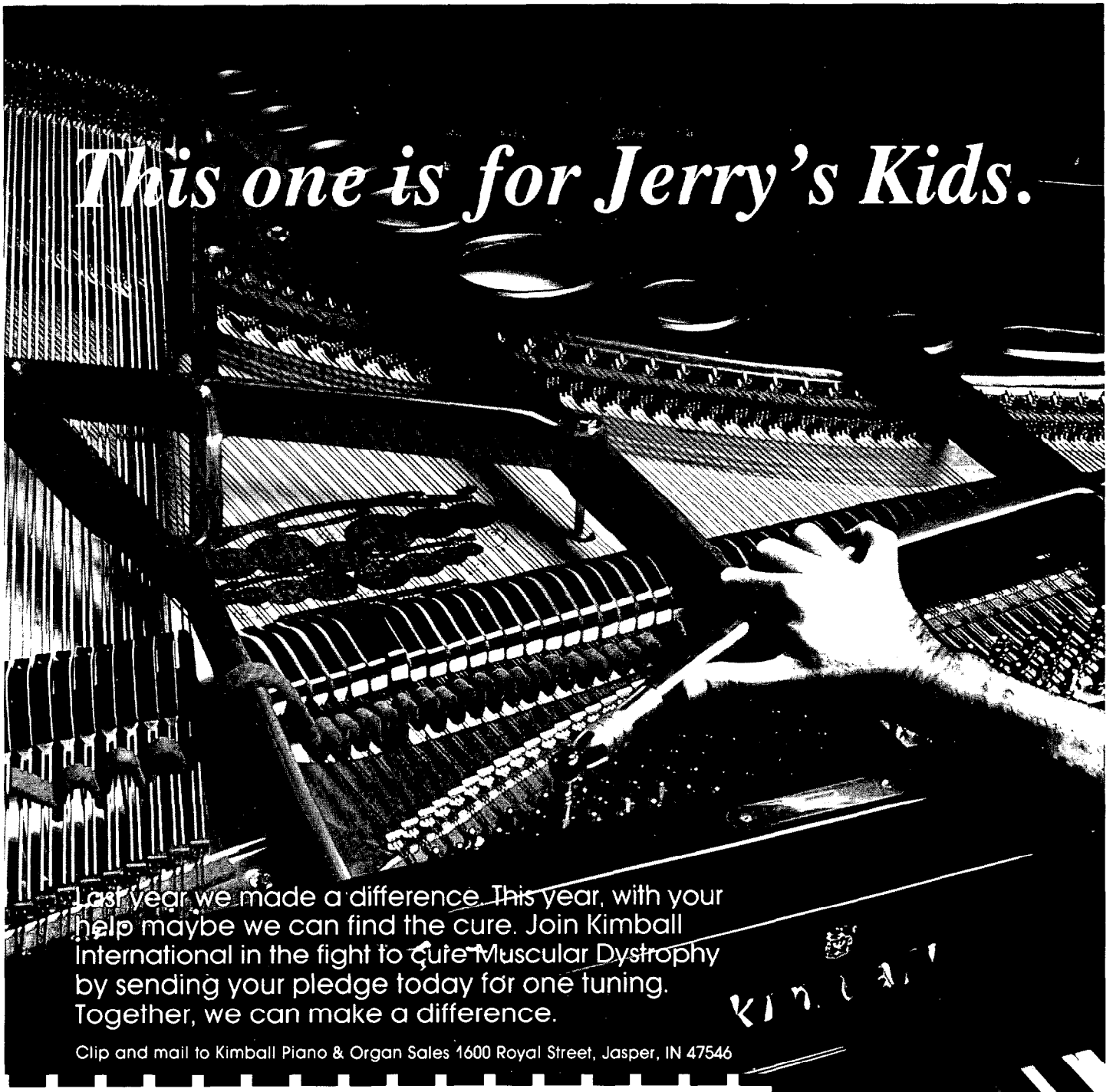

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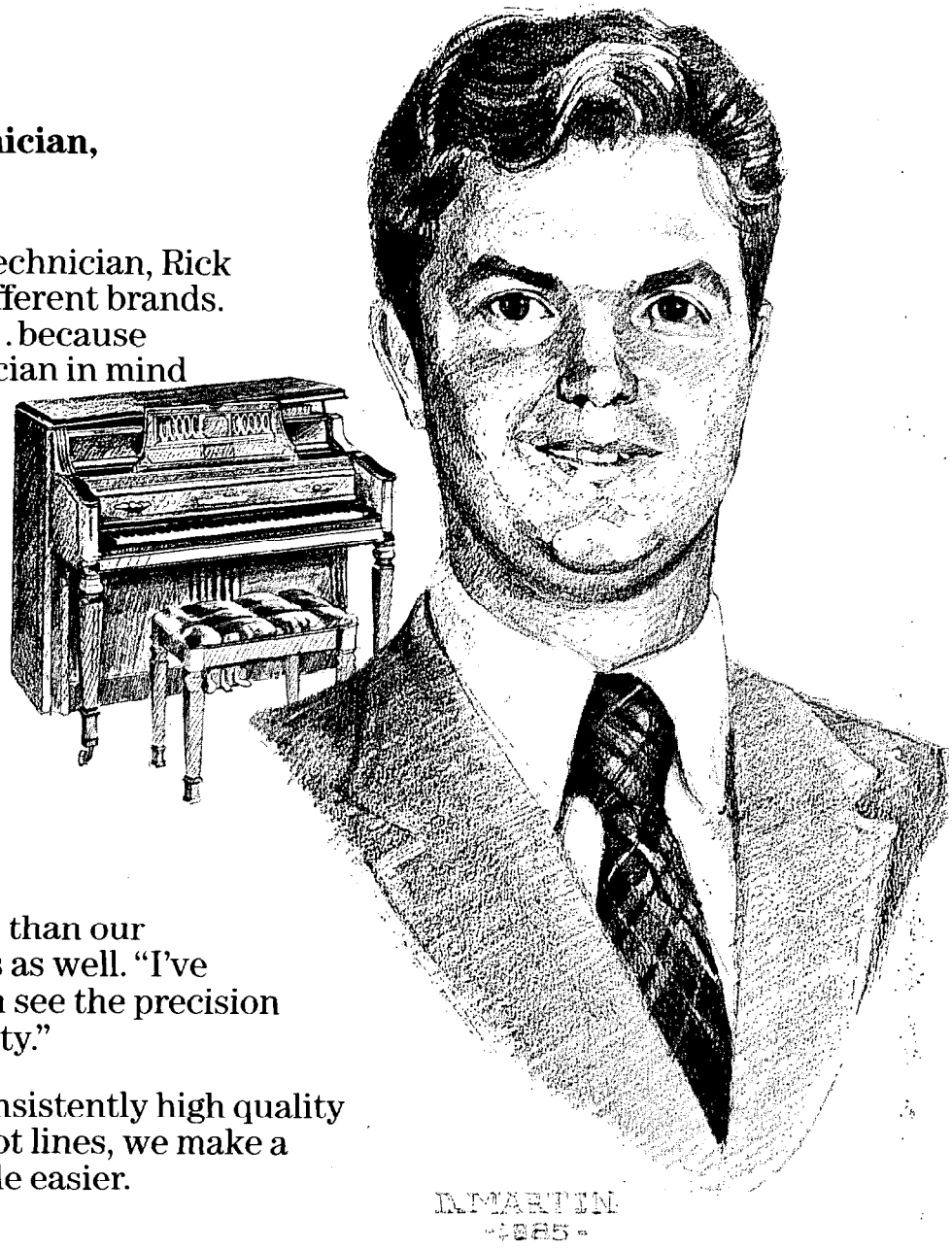

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