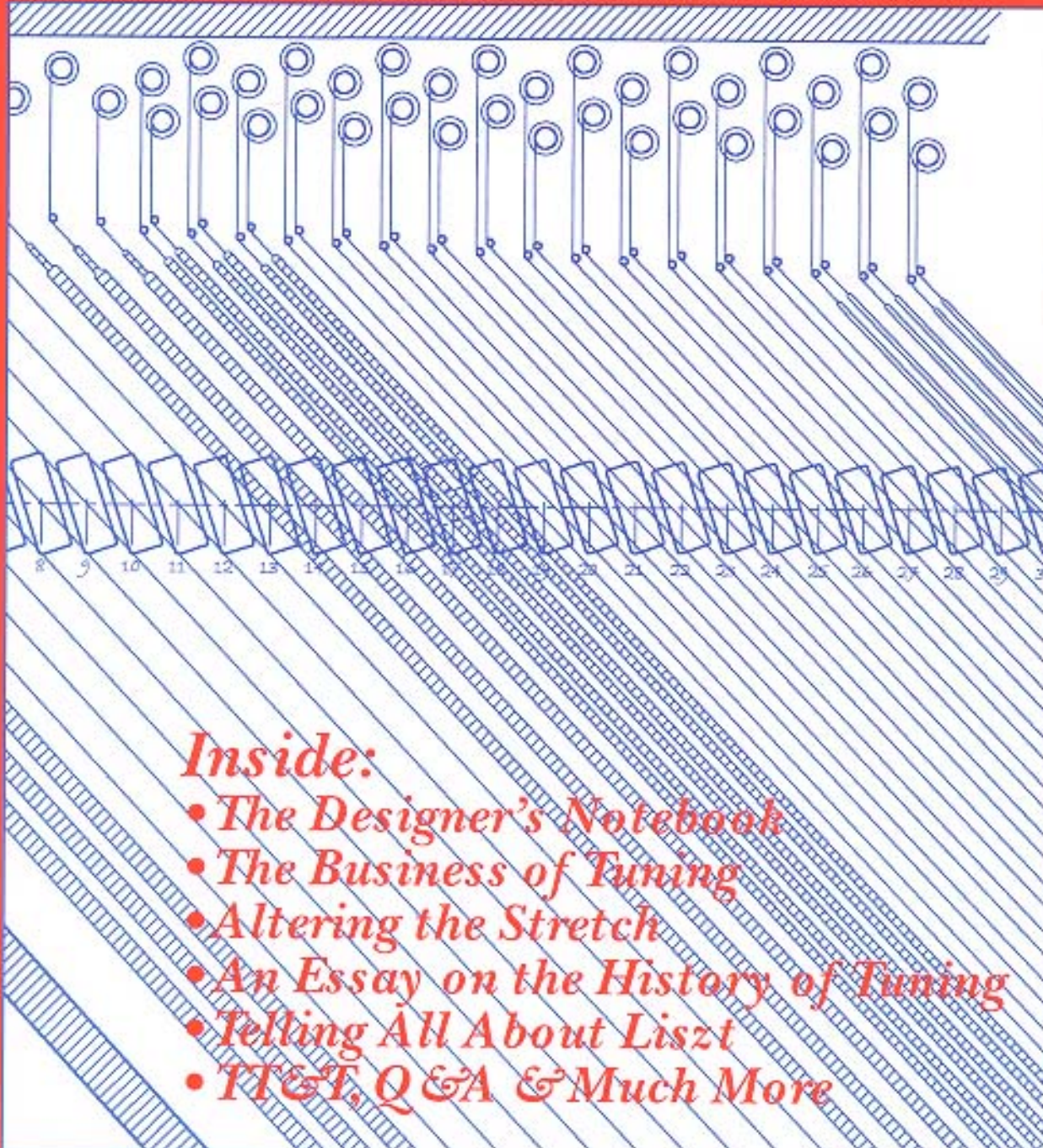


PIANO TECHNICIANS Journal

Official Publication of the Piano Technicians Guild

July 1997

Vol. 40 • #7



Inside:

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- *The Business of Tuning*
- *Altering the Stretch*
- *An Essay on the History of Tuning*
- *Telling All About Liszt*
- *TT&T, Q&A & Much More*

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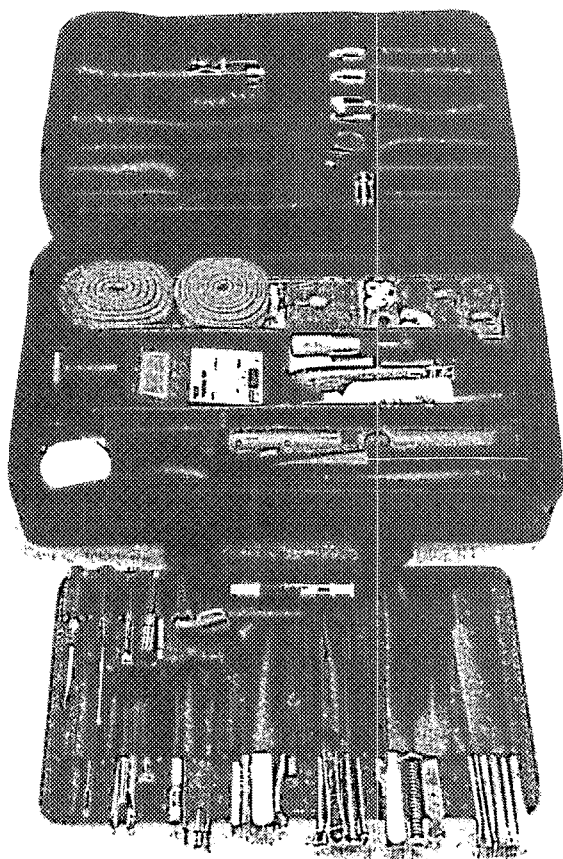
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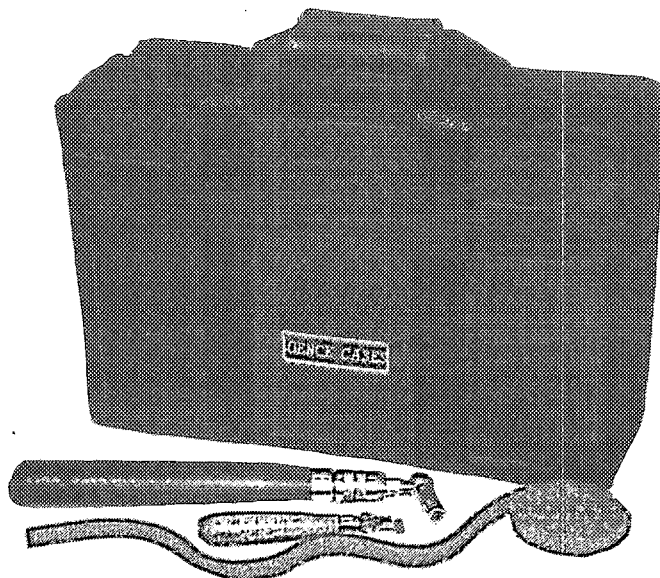
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Editorial Perspective

In Tune With Life

By Steve Brady, RPT
Journal Editor



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I'm sure most of us have thought, at one time or another, "I ought to write a book about all the fascinating people and pianos I've encountered in my career." I suppose this is a natural impulse; after all, our work brings us in contact with the rich and famous as well as the poor and obscure, and with pianos ranging from rotting bird-

cages to gleaming concert grands. Yes, we all think we *ought* to write that book, but Denele Campbell, an RPT from Arkansas, has actually done it. And done it very well.

Campbell's book begins with a brief autobiography:

the opening statement "I never intended to be a piano tuner," (she's certainly not the only one of us who could say that!) leads to a recounting of the events which led her into the field of which she now says, "I can't imagine a better career." She gives many reasons for this opinion, and infuses the stories and examples which follow with an obvious love for her craft.

Throughout *Notes of a Piano Tuner*, the salient impression is of Campbell's mind at work. Tuner-as-philosopher. In every situation, she's observing, analyzing, daydreaming, imagining, and just plain ruminating about her customers, their pianos, their lives, their motives. If at times judgemental, Campbell emerges on the whole as a keen and compassionate observer of human nature. "In [familiar] homes," she says, "my tuning time passes swiftly. I am lost in a reverie of poignant thoughts. But even in homes that don't feel familiar, I inadvertently find moving evidence of remarkable lives and intriguing curiosities that occupy my mind and dwell in my memory. I sometimes see my professional duty as an almost sacred task, a ministration to eternal muses which give music to speak what words cannot say in questions or answers that are never clearly formed."

An accomplished writer, Campbell seems to have a gift for finding the right words, as seen in passages such as these two examples. First, describing the experience of being bitten by a customer's "over-amped Chihuahua." "It was a shock at first to realize the psychotic, bony thing had ac-

tually bitten me.... I immediately and instinctively prepared to tear him loose and drop-kick him across the yard." Fortunately, the dog's owner appeared in the nick of time and "saved the savage rat-beast." Second,

another piano owner seemed overly concerned about her piano's condition: "... a

passing expression on her face revealed something to me that seemed more than relief for a piano. I wondered if the instrument involved some special family memory, or if it was a gift from someone. Maybe its original owner had died. I hear these things from people. The piano becomes the receptacle of emotions too heavy to carry around."

With stories arranged in chapters, Campbell neatly classifies the compartments of a tuner's working life: teachers, parents, children, driving, artists, old folk's homes, and churches. She devotes special chapters to "People Who Have Too Much Money," and "Folks Who Don't Have Enough Money," exercising her philosophical bent to its fullest. Lest one think that the whole book deals only with people at the expense of the pianos and actual piano work, have no fear. In several stories, Campbell describes in some detail work that she does on the pianos. In one case, she describes the work someone else got paid to do, but didn't!

Notes of a Piano Tuner is an engaging, thought-provoking book which should be interesting to lay-people and tuners alike. It gives an inside look at what it's like to be a piano tuner, and articulates many of the special treasures which we tuners are able to glimpse in our daily work. I anticipate buying extra copies for my family

and close friends, and perhaps as gifts for some of those special clients who have enriched my own life. ☐

A Review of *Notes of a Piano Tuner*, by Denele Pitts Campbell. Sarasota, Florida: Pineapple Press, 1997. 140 pages. Hardcover, \$16.95.

Please submit tuning and technical articles, queries, tips, etc., to me:
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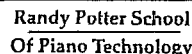
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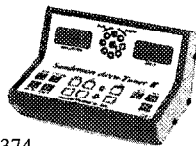
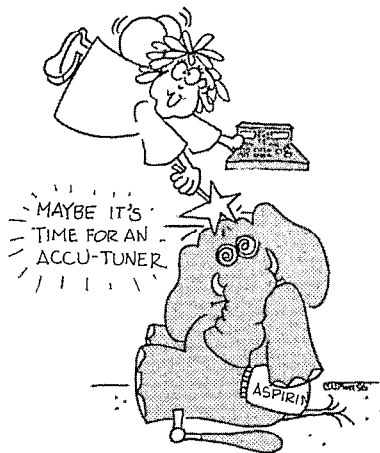
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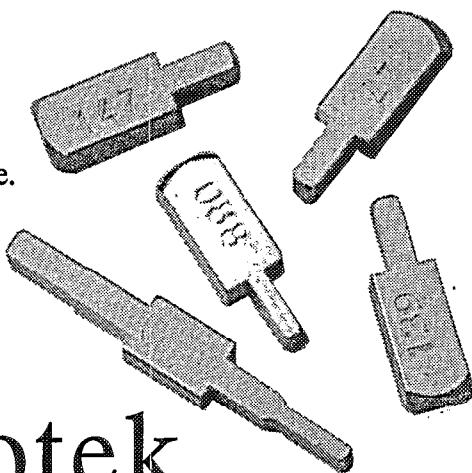
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President's Message

Emil Fries — A PTG Treasure

Without a doubt Emil Fries is one of our most valuable mentors.

Last February Emil celebrated his 95th birthday.

During this year in which we celebrate our 40th Anniversary, it seems to be an appropriate time to publish this article. It was written in 1993 for publication in our *Journal* and for whatever reason it was not accomplished at that time.

Recent efforts to focus on some of our history in anticipation of our 40th Anniversary celebration in Orlando, Fla., brought Emil and his unique contribution to mind once again.

The author, Dr. Dean O. Stenehjelm, superintendent of the Washington State School for the Blind and former president of the Vancouver Lions Club based this article upon written notes from conversation with Emil. It also includes excerpts from Emil's book, *But You Can Feel It*. Please enjoy. Once you discover how fascinating a gentleman he is, you may be inspired to get a copy of his book and "get the rest of the story."

— Marshall B. Hawkins, RPT
PTG President

Emil — A Lifetime of Service to His fellow Blind

At 92-years-young, Mr. Emil Fries, a member of the first graduation class of the Washington State School for the Blind, is still an active Lion and member of the Portland Chapter of the Piano Technicians Guild (PTG).

Mr. Fries began his work with piano tuning in 1924 upon completing a course of study under the direction of Mr. Walter R. Dry, an instructor at the Washington State School for the Blind and a member of the National Association of Piano Tuners (NAPT). This program helped lead Emil into a tremendous life of new adventures, independence, and as an inspiration for numerous blind individuals throughout the world. In 1930, Emil graduated from the University of Washington with a bachelor of arts degree. He financed his education entirely through his piano tuning skills. After the completion of his degree, he secured employment at the School for the Blind in Vancouver. In 1936 he became a member of the NAPT, and in 1951 he joined the Society of Piano Technicians. When these two organizations merged in 1958 Emil became one of the charter members. During this same time, Emil began a life-long commitment to Lionism. After 44 years as an active member of the Vancouver Lions Club, he still receives his yearly 100 percent attendance pin.

A decision was made at the Washington State School for the Blind in 1949 to no longer offer a curriculum in piano tuning. It was at this time that Emil and his late wife, Nettie, decided to start the Emil Fries Piano Hospital and Training Center. The center has been very successful to this day, and has provided training to more than 200 graduates, representing 42 states and five foreign countries. By 1969 the Piano Hospital had outgrown its facility, and Mr. Fries was wondering how an expansion of this important program promoting independence for the blind could be accomplished. The Lions of MD 19 Sight Conservation Foundation came to the rescue with a pledge of \$50,000 toward a new facility. This association with Lions has prospered over the years and in 1993

the Lions again supported the Piano Hospital by furnishing both materials and manpower to provide special repair and maintenance to the school. The renovation helped preserve an excellent school with a bright future.

Since 1924, Mr. Fries has been presented numerous awards which he cherishes. He has in his home a very special wall, which he calls "Emil's Ego Wall." Most of these awards have been received during his 44 years as an active member of the Vancouver Lions Club and his 57 years as a member of the professional piano tuners organizations. Other awards of appreciation presented to Emil include the "Service to Mankind" award from the Sertoma Club of Vancouver, and awards from the Oregon council of the Blind, the Cooperative Arts Council of Clark County, and the Clark County Y.M.C.A. Board of Management.

In 1974 Emil was presented with a life membership in the Portland Chapter of PTG, and in 1991 he received its "Distinguished Service Award." Emil has also been awarded three international awards from PTG: The "Member of Note" in 1970, the "Hall of Fame" in 1986, and the "Golden Hammer" in 1989.

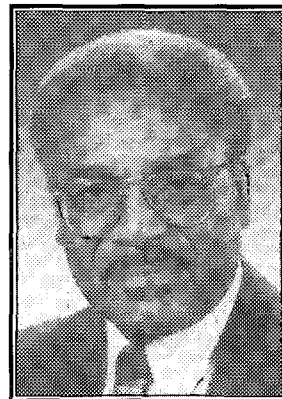
On this same wall are many Lions awards representing his presidency of the Vancouver Lions in 1957, presidents appreciation awards, and one of the Lions' highest awards, the "Malvin Jones Fellow," which was presented to Emil by the Lions of MD 19 G-2 in 1990.

Next to Emil's wall is a small table with a very special proclamation. On February 11, 1991, during a large celebration of Emil's 90th birthday, Gov. Booth Gardner of the State of Washington, proclaimed Feb. 11, 1991, "Emil Fries Appreciation Day" in Washington State.

In 1980, Emil's three grandsons and some of his former students persuaded him to write and publish the story of his life. Emil discovered early in his life a key to unlock college doors and entrances to wider opportunities. Emil's motto was and is: "Plan your work and work your plan." This motto provided Emil purpose and has worked well for him throughout his life. It guided him through the University of Washington, into marriage, to a successful teaching career, to the establishment of the Piano Hospital and Training Center, and helped him to write his book, *But You Can Feel It*. This book provides excellent historical information and is a story of Emil's positive feelings and thoughts which have given him direction throughout his life.

Emil's book and the numerous awards he has received represent tremendous memories of an active Lion, an involved piano technician, and a man who was determined to make a difference in the lives of not only blind citizens but of all mankind.

[**EDITOR'S NOTE:** After President Hawkins prepared this column, we received the sad news that our colleague, Emil Fries, passed away in his sleep on Saturday, June 7, 1997. We extend our heartfelt condolences to his wife, Wilda, and his family.]



Marshall B. Hawkins, RPT
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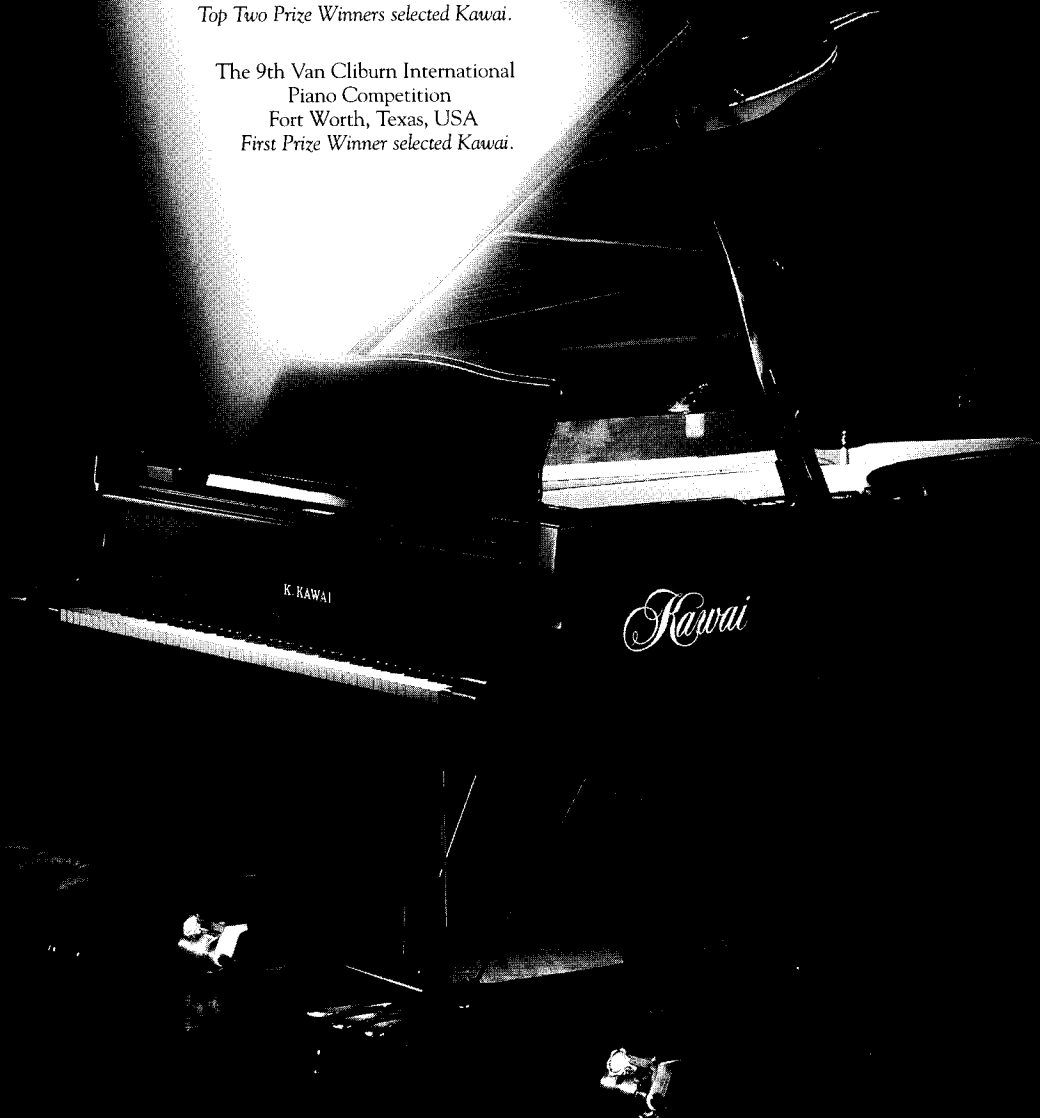
The 45th Ferruccio Busoni
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International Piano Competition
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First Prize Winner selected Kawai.

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International Piano Competition
Hamamatsu, Japan
First Prize Winner selected Kawai.

The 10th International
Tchaikovsky Competition
Moscow, Russia
Top Two Prize Winners selected Kawai.

The 9th Van Cliburn International
Piano Competition
Fort Worth, Texas, USA
First Prize Winner selected Kawai.



It's becoming a familiar refrain.

Doing the Right Thing

I had the very great pleasure of attending the Pennsylvania State Conference in April, just weeks after starting as the Executive Director of the Guild.

The PA State Conference gave me the opportunity to meet many of our members from Pennsylvania and the Northeastern United States.

While I was there, an event occurred that gave me pause for a great deal of thought. I was returning to my hotel room one afternoon and found a roll of cash on the floor of the deserted hallway. I picked up the money and went to my room. I called the front desk to report finding the cash. The front desk clerk told me he would call if someone reported the loss! Within about 20 minutes, the phone rang. The front desk clerk told me that a guest reported losing the money and correctly identified the amount. I went to the front desk to return the money. The grateful gentleman uttered the words that I'm thinking about even today. "You know," he said, "I almost didn't call because I couldn't believe anyone would return the money." I told him I hoped he would do the same thing for someone else.

I have to wonder why it is a matter of amazement that someone did the right thing. Shouldn't we be surprised instead when someone fails to do the right thing? The experience seemed to me a sad comment on the state of our human enterprise.

The following week I was in Dallas, Texas, for the Music Teachers National Association's annual meeting. The Guild has a booth each year in the exhibit hall to inform music teachers about the work of the Guild, the proper care and maintenance of the piano, and the RPT designation. Members and spouses of the Dallas and Fort Worth chapters worked as volunteers in the booth.

I was surprised and pleased that members of the local chapters and some of the members' spouses, took time out of their work day to support a common cause of piano music, inter-professional relations, and, of course, PTG.

In the evening I attended the Dallas Chapter's monthly meeting. Again, I was pleased to learn that the chapter has taken on a fine public service project — rebuilding a piano for a local civic organization. This volunteer work will pay dividends for years to come in goodwill for the chapter, the members and the profession.

During the Dallas Chapter meeting, I observed an academy-like atmosphere where all members, RPTs and Associates alike, share their knowledge, learn from each other, help each improve their skills, and take genuine pride in each other's successes.

I have heard a great deal over the past few months about the willingness of established technicians to assist new and aspiring technicians to hone their technical and business skills. This mentoring takes place on an individual level and through seminars taught by RPTs to assist Associates.

In most industries and professions, it is rare indeed for people to take an active role in training and encouraging people who are, or will soon become, direct competitors. Not in the Guild. This mutual support and caring surprised me.

Coming home on the plane from Dallas, I reflected on my surprise at the selflessness I had observed of Guild members. Quite frankly, I was amazed by what I had seen.

Then I came to a realization. The Guild members were simply doing the right thing: helping each other, helping the profession and helping the Guild.

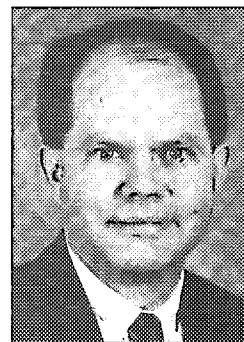
Like the hotel guest who couldn't believe someone would do the right thing, I was surprised that people would seek out ways to do right by each other.

That, I'm afraid, is also a sad comment on the state of our human enterprise. Doing right should be the norm. Failing to do right should be the surprise.

Management guru Peter Drucker notes that all members of non-profit organizations (such as PTG) are part of the organization's staff. Each member helps advance the mission. Guild members clearly understand that principle and act on it.

Each time a technician helps a peer with a question or problem, assists the chapter in community service, teaches a seminar, talks to an elementary school class about the piano, or provides a client with PTG literature about the proper care and maintenance of pianos, the member is part of the PTG staff — advancing the mission through individual action.

As I've learned, PTG members are intent on doing the right thing by each other, the public and the Guild. Knowing what I know now, I'm not surprised. ☐



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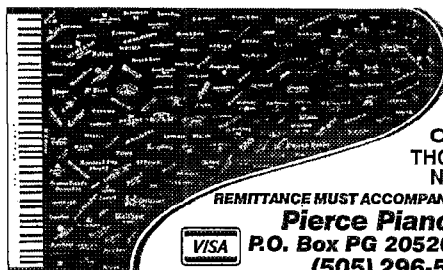
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Tips, Tools & Techniques

TT&T

Handle for Pulling Grand Actions

I'm regulating a grand action. Bringing it in and out of the piano is like giving birth (or what I imagine that's like).

Jim Harvey made a handle for removing grand actions. I thought of making it long enough to grab with both hands, so a discarded bass string looked like what I wanted. I cut a length about 15" long and bent hooks in the ends (See Figure 1).

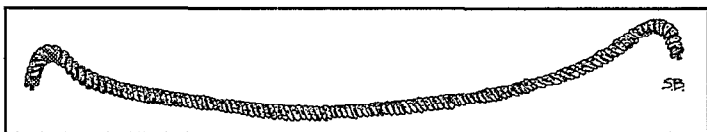


Figure 1 — Bass string tool for removing grand actions.

Take two front-rail punchings out and hook the string around the front rail pins. Grab with both hands and pull the action out. You can figure where best to use the tool to pull the action out evenly. Leave the punchings out until the regulation is done. You can regulate the final two notes at the end of the job.

— Ken Churchill, RPT
Orange County, CA Chapter

TT&T

Plastic Elbow Removal

Another way to remove those broken plastic elbows is to heat the broken part with the Ungar™ heat gun until the plastic is soft enough to come out easily from the center pin in the wippen, with the long-nosed pliers. One advantage of this method is that there are not bits and pieces of broken plastic flying hither and yon. This method is not useful for removing the threaded part of the elbow, but there is no problem with flying plastic here if we remove the droplifter wires from the piano before removing the broken plastic from the wires.

— Robert W. Soule, RPT
Vermont Chapter

TT&T

The Easy Way to Ease Keys

After giving myself a pretty good case of tendinitis by using key easing pliers to ease too many sets of keys in too short a time, I decided to try out the key easing iron sold by Pianotek (1-800-347-3854). Consisting of a 40-watt soldering iron fitted with a temperature control and a set of brass broaches (See Figure 2), this tool does a wonderful job of easing keys by ironing the bushings. Using the tool, it's easy to get perfectly consistent sets of bushings quickly and with a minimum of physical effort.

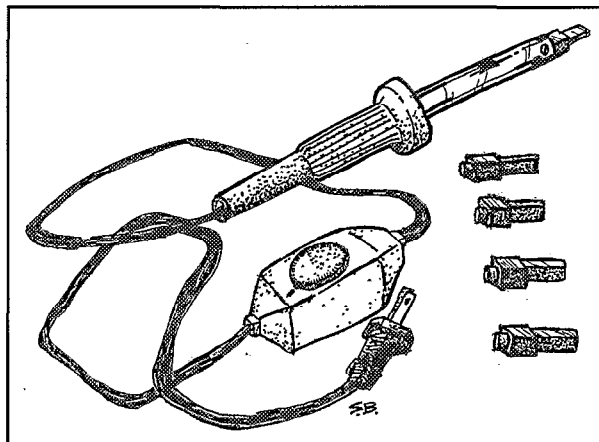


Figure 2 — Pianotek's Key Easing Iron, showing in-line temperature control and various broach tips.

The five slightly tapered broaches included should handle about any size of mortise. The iron, with broaches and temperature controller, sells for \$69. One caveat, though: the temperature controller must be disassembled, installed on the cord, and calibrated by the user (you), so if you're not comfortable with doing that kind of work, I'd suggest getting the substitute plug-in Dial-Temp which is available for an additional \$9.50.

— Steve Brady, RPT
Journal Editor

TT&T

Quick Fix for Non-Checking Grand Hammers

Sometimes grand hammers don't "catch" well due to glazed hammer tails. If there is no time to do the proper cleaning and re-grooving (like when the concert is about ready to start), there is a fast, easy, and fairly long-lasting way to fix it. Just wet the hammer tails with water. That will make the grain stand up and the hammers will check well.

— Ernie Juhn, RPT
Long Island Nassau Chapter
(Reprinted from NewsL.I.N.C., chapter newsletter)

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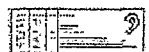
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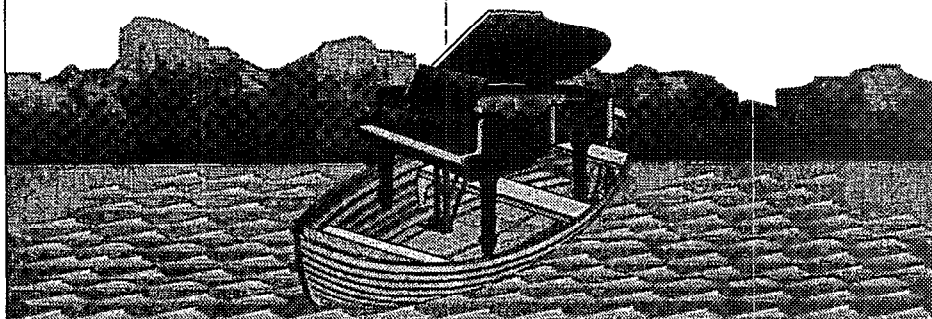
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Q & A/EDITOR'S ROUNDTABLE

Q:

Jumping Tuning Pins

The piano is a Kohler & Campbell spinet, 25 years old. In terms of strings, hammers, dampers and cosmetics, the piano is in excellent condition for what it is. It hasn't been used much. However, it is untunable because every tuning pin above the bass section is jumpy.

The size of the pins is 2/0. I tried chalk. I replaced one pin with a 3/0 after reaming out the hole with a #3 reamer. Helped only slightly. I replaced another pin with a 4/0 after reaming out with a #4. This seemed to be less jumpy, but turned really hard.

I think replacing the pinblock is not an option due to cost. But it seems a shame to junk the instrument when the rest is in such good shape.

I have heard of:

1. Putting varnish in the pinholes.
2. Swabbing out with naphtha.

What does the "pianotech" list suggest? I told my customer I was going to the Internet to do some research, so we are both anxiously awaiting the wisdom of the august body. Many thanks.

— Dick Day
Marshall MI

A:

Guy Nichols, RPT — Dick, condolences to your customer. You might go ahead and try a pinblock restorer (like Garfield's), thinned down, just to even things out, cheaply. Have Fun!

Al Jeschke, RPT — For what it's worth, this is an experience I had while rebuilding a Steinway grand for a music teacher in another city. A previous "tooner" had applied a tuning pin tightener, which I believe could very well have been glycol antifreeze. The pinblock otherwise appeared to be in very good condition, and I was not about ready to remove the glued-in pinblock. The first test pins installed were so jumpy, it would have been absolutely impossible to tune the piano if restrung in the manner as the first test pins. I went to work to try and rectify the problem by first swabbing a tuning pin hole with lacquer and immediately driving a tuning pin. Though very slightly less, I still had the jumpy pin. I then swabbed another pinhole with lacquer, let it dry overnight and drove in the tuning pin next day. To my rather delightful surprise, my problem was solved. I proceeded doing the same to all the tuning pin holes with the same result as with the last test pin. That happened in 1978. Curious as to how the job lasted, I inquired from the technician about a year or two ago, who services that piano regularly, and was told that the piano tunes as normally as any other piano. For all who might try this, I hope it works as well for you.

Dick Beaton, RPT — You can't afford to spend all that time on each pin! Try lowering the pitch and turn the pin back and forth 15 or 20 degrees a few times slowly to avoid overheating... and then raise it back to where you want it. If that

doesn't work, you may just have to fight it! Repinning would cost more than the piano's value. Good luck....

Keith A. McGavern, RPT — My first thoughts were to try thin CA glue on one or two pins. What a neat fix it would be, if it evened things out as well. Looking forward to my next jumping pin encounter.

I recall settling in on one old church upright in a basement that had this condition long ago. I just accepted its circumstances and did just as you said, not only fight it, but wrestle it and cajole it as well. That was some match. I'd like to meet that piano again armed with these new ideas.

Q:

Stripped Plate Bolts

I have always had this "fear" of stripping out some plate screw or pin block screw. I just tighten them with all my might, but what should I do if one of them does strip? How should I fix it?

— Arnold Schmidt
Raleigh, NC

A:

John Musselwhite, RPT — One suggestion might be to split a hammer shank in half and use a few drops of CA glue to stick half to one side of the stripped hole. Be careful to make sure it's stuck where the wood is thickest in line with the rim. The glue holds it in place so it won't drift over to the inside or outside of the rim or block, minimizing the chances of splitting apart the laminations. This fix was given to me by a factory service rep who seemed to be quite familiar with this problem.

Vince Mrykalo, RPT — This reminded me of the time about three plate bolts felt as if they stripped out in a certain piano. They were loose because the laminations of the inner rim indeed were separated. Taped the bottom and filled bolt holes with epoxy.

Q:

Replacing Bass String Sets

When replacing just the bass strings on a KG-2C, how many strings do you feel comfortable with letting down at one time? Let them all down at the same time, and replace them all in one shot? Or, replace an octave or so at a time to even out the tension?

Is it really necessary to be overly cautious in this regards? What's your experience with bass-string only replacements in a grand?

— John Piesik, RPT
Carlsbad, CA

Q & A/EDITOR'S ROUNDTABLE

I've just been lucky over the years.

A: *David Ilvedsen, RPT* — I've done it many times. Just go for it. Remove the strings (after you have the new ones), don't worry about any order or such and do your stringing. I have found that the rest of the piano really isn't changed that much.


Tom Cole, RPT — One time, I took the extra trouble of replacing a set of bass strings one string at a time. I had tuned the piano the month previous and wanted to preserve the tuning as much as possible. I ended up with a piano that was still pretty seriously out of tune — the bass, of course, but also the tenor section.

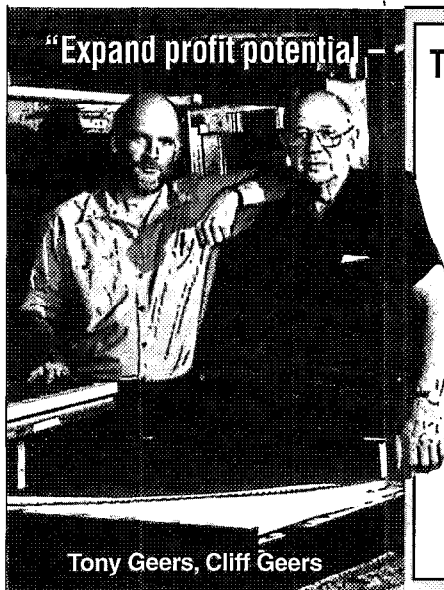
Since that time I remove the bass strings wholesale (and replace them retail, you bet). I think it has been adequately demonstrated, here on list as well as elsewhere, that the structure of a piano can easily withstand this kind of a strain.

If it would make you feel any better, you might check for plate cracks. As David says, go for it.

Avery Todd, RPT — John, you might also want to make sure the plate screws are tight. I've also replaced quite a few sets over the years without letting down the tension on the rest of it. Never a problem. Always on uprights, though. I've never done just bass strings on a grand.

Les Smith — Over the years I've routinely done this on fine-quality grands, too, with no problem other than that the tuning of the treble strings gets thrown out of whack quite a bit. Also, I don't remove the old strings until the new ones are in hand and ready to install. I guess if you really wanted to play it safe you could do just half at a time. One-at-a-time seems needlessly tedious and slow, but maybe

Newton Hunt, RPT — Pull them all out, clean the piano, re-string and tune, tune, tune, tune. There is no danger in letting the tension off the bass bridge. 



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The Designer's Notebook

The Problem of Small Pianos — Part I

By Delwin D Fandrich, RPT
Contributing Editor

Introduction

This started out to be an article about determining hammer boring angles. Perhaps later — I got sidetracked ...

I think that every piano tuner/technician I have ever known has at one time or another complained about the deficiencies of small or short pianos whether they be grands or verticals. More often than not this is due to either mechanical problems caused by tightly aligned parts — hammers, dampers, etc. — or to the tone problems they find in them that are difficult, if not impossible, to cope with. Their bass sections can be downright gnarly. Their bass/tenor crossovers are typically impossible to voice smoothly. Their actions are often difficult to work on — particularly in small verticals, action parts alignment can be a real pain. Damping through the bass and, especially, across the bass/tenor break is often problematic at best. The list goes on ... indeed, I've had technicians tell me, more than half seriously, that no grand piano shorter than 6 feet (approximately 183 cm) nor any vertical piano less than 48 inches (approximately 122 cm) tall should ever be built. On the flip side of this argument, of course, are the customers who need or want, for whatever reason, pianos that are somewhat smaller than this. The manufacturer, of course, is in the middle. Most of them do recognize the problems and limitations inherent in small pianos. For some odd and unreasonable reason, however, they seem to think it's in the best interests of their companies to build what they can sell. And they can still sell small pianos.

Designing and building small pianos involves a most careful blending of compromises. As I have pointed out several times in the past, it is pretty difficult to build a really bad nine-foot piano — yes, I know it's been done, but it does take some effort. It is, however, very easy to build a bad 42" console. The smaller the piano becomes, the more room there is — and the less tolerance there is — for error.

In this group of articles I'll try to address at least most of the various conflicting requirements that a piano designer (and the manufacturer he works for) must evaluate and choose between when developing a small piano. In doing so I'll actually be developing a scale design for a 42" to 43" console piano. Later, I may convert this into a small grand scale — we'll see.

Actually, there's more of a relationship between this topic and the problem of hammer bore angles than you might think. So, read on....

Just Who's Designing This Piano, Anyway?

It would be nice to think that all pianos were built by manufacturers for whom achieving the finest sound and the highest level of action performance was the first and only priority. Not once would any compromise be made that might have any adverse affect on those objectives.¹ Never once being forced to bow to all of the nasty economic realities of the marketplace. Obviously this is not the way things work in real life. Reality dictates that pianos — like most other consumer products — be built with the needs and desires of a wide range of potential buyers in mind. And those needs and desires often dictate small and inexpensive pianos whether we like them or

not. It might be useful to look at some of the thinking that goes into making some of these decisions.

(The following is based on conversations I've had with piano technicians, piano dealers and manufacturing people from a variety of companies and from various levels ranging from company presidents to janitors. However, any resemblance between this scenario and any specific company — past or present — is unintentional.)

The time has come for our friends at the **Matchless Piano Company** to take a critical and honest look at their small piano line. As they do, they are forced to acknowledge that their existing product line could use a bit of improvement. Their basic console piano scale was designed in 1932 and even though it has been "updated" from time to time with some minor scale changes and soundboard revisions, they are getting a bit long in the tooth. And, to be honest, most of the "improvements" that have been made were really more to accommodate changes in available materials and hardware and the modernization of their manufacturing process, not necessarily to improve performance. In fact, some have said that a few of the changes may actually have hurt performance — an allegation firmly rejected by manufacturing. In any case, marketing has been wondering lately if possibly some of the screwball ideas and theories that R&D has been spouting off about for the past six-and-a-half decades might have something to them. Could there actually be something there that might make their pianos sound a bit better?

Besides, sales are down and there is some concern in marketing about job security if they can't figure out how to sell more product. Manufacturing is also a little concerned since they now have quite a bit of excess plant capacity to fill and excess plant capacity costs money. And that's going to come out of year-end bonuses. Management has noticed that, while their market share has been looking good compared to other US manufacturers, they're losing ground to foreign competition. Some of their dealers have been pointing out that **Matchless** consoles are no longer up to the performance standards being set by some of their competitors' newer products and they're beginning to lose more and more sales to them. Who knows? Maybe there's even something to all those troublesome complaints from all those troublesome piano tuners after all. So, ultimately, a decision is made to consider upgrading the acoustic design of their console piano.

Before heading for the drawing board (actually, for some years now it has been a computer screen) they first must consider a wide variety of often-conflicting needs, desires and realities (here come those ugly compromises), all of which will have a bearing on the piano they ultimately decide to introduce to the marketplace. Among these might be the following:

■ **Their perception of the needs of the marketplace.** This perception will not necessarily be an accurate one but will be the best they can develop based on information from a number of sources:

- Feedback from their dealers.
- Dialogue with piano tuner/technicians.
- Communications with their existing customer base.
- Evaluating the results of any market studies and surveys they may have made.
- Evaluating similar competitive products.

If the company is a small one, most of these relationships will be close and personal. With a large company they will be somewhat more remote, being orchestrated primarily by the sales and marketing arm of the company. In either case, the opinions offered and even the data supplied to them will be influenced by the perspectives and special interests of the sources. Within the company, it will be influenced by the biases, experiences and prejudices of those whose job it is to evaluate all those various bits of information. This is not altogether good or bad; it's just the way it is.

For example, if *Matchless* has traditionally built low-end and mid-range pianos their dealer base may be heavily represented by those catering to "price-shoppers" looking for really inexpensive (well, okay, cheap) pianos. These dealers may well try to resist any up-market change that *Matchless* may want to make. They will want *Matchless* to continue providing those really inexpensive pianos to fill out that segment of their marketing strategy. When asked, they will probably advise *Matchless* that the best thing to do is to continue building those really inexpensive pianos; just please add a few new "features" and perhaps some new cabinet styles and finishes to help them sell more effectively against the new *Bauble Creek* pianos being sold down the street. How do *Matchless* pianos play and sound? "Well, nobody really cares about that anymore, do they? When can we get a European cabinet style with a high-gloss polyester finish?"

For the most part, piano dealers aren't going to understand a whole lot about the subtleties of piano design. Nor do many of them seem to understand all that much about piano sound and performance. Moreover, many don't really want to know overly much about them. In fact, it would seem that they don't really need to in order to do their jobs fairly well.

If they ask the tuner-technicians, they will learn that "*Matchless* pianos are all worthless junk and they should all be burned in the fire pits of hell. What the market really needs is a new 58" upright with a full sostenuto and 79" bass strings and hand-notched boxwood bridges and it should be made of solid select hardwood and it should be priced to sell for \$1,900 — even less on sale — and even then *Matchless* pianos will cost \$12.97 more than the *Bauble Creek* pianos sold by this other dealer I know and, besides, *Matchless* pianos don't come with 1/4" thick polyester finishes and even if they did they wouldn't be quite good enough for any of my customers so I probably won't ever recommend *Matchless* pianos no matter what you do."

(Permit me a small aside here: okay, perhaps I exaggerate slightly, but less than you might think. I've heard most of this stuff said about most manufacturers' products more often than I care to remember. And I'd wager that most everyone else connected to any piano manufacturer for any length of time in any public capacity has also heard it. No piano maker responds well to an emotional diatribe consigning them and their pianos to the fire pits of hell with no possibility of parole. Of

these there have been far too many. Even the most jaded manufacturer will, however, at least consider the suggestions — yes, even the criticisms — from technicians who approach them with solidly based and thoughtful comments. So, go ahead. Send in those cards and letters. I'd bet they do get read. Especially in light of today's increasingly competitive marketplace.)

If, on the other hand, *Matchless* had been building nothing but high-end grand pianos, the feedback would probably be quite different. This group of dealers would be used to working with a somewhat more sophisticated — at least more affluent — clientele. They might assure the *Matchless* marketing team that cost is no object; it's the features, the brand name of the action, the exotic veneers and the hand-rubbed finishes that count. They might even make a few comments about sound and performance. The tuner-technicians associated with these dealers, of course, will tell them "*Matchless* pianos are all worthless junk and..." well, just see the above.

You see the problem. Even if each of the special interest groups that *Matchless* approaches gives them the very best advice they know how to give, that advice will always carry the peculiar perspective of the person or group giving it. In the end, *Matchless* will accumulate quite a lot of very conflicting advice and information and ultimately they will have to make their own best guess as to how to proceed. Piano tuner-technicians are often puzzled by the seemingly random marketing and product development decisions made by the managers of some piano companies. From the manufacturers' perspective, however, these decisions are made only after a careful analysis of a substantial amount of very conflicting information.

■ **The Company's Traditional Position In The Marketplace.** If *Matchless* has traditionally built low-end verticals and grands, it will be very difficult for them to successfully introduce a piano aimed at a high-end market. Not impossible, just difficult. Aside from the obvious difficulties faced in designing and building the instrument, they will face a certain credibility problem in the marketplace. For similar reasons, it might be wise for the manufacturer of a high-end line of pianos to avoid introducing low-end pianos using their respected name. It might well lower the image of the entire line. Unfortunately, it takes a lot longer to raise a company image than it takes to lower it — a truth more than one piano company has learned to its woe.

■ **Their Understanding And Perceptions Of Future Market Trends.** Predicting market trends is nearly always guesswork. But at least it can be carefully considered and well-educated guesswork. Unfortunately, the signs that foretell market trends are always seen much more clearly in hindsight.

■ **The Sales History Of Their Current Line Of Pianos.** In this case they are concerned with the sales history of their 42" console piano.

If sales are declining for their current model in this category, it would be wise to try to find out why. If sales are down industry wide and they are actually improving their market share, that's one thing. But, if they are losing market share to other brands, either domestic or imported, they might want to take a look at their own products.

First, they might want to take a look at the cost-to-perceived value ratio of their pianos. Since *Match-*

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The Designer's Notebook

By Delwin D. Fandrich, RPT

The Designer's Notebook

The Problem of Small Pianos — Part I

Continued from Previous Page

less is a U.S. piano maker, no matter how much money they may be willing to pour into efficient manufacturing processes they are going to be faced with higher materials and assembly costs than, say, a Chinese manufacturer. So, they will have to face the reality that they will never be able to match the selling price of some of their imported competition. This still leaves them many areas in which to add real and perceived value to compete effectively with this competition, of course. Just to name a few, there is the overall appearance of the piano, including case styles and finish; the overall quality of construction; and last, but hopefully not least, the tone response and action performance. Let's try not to forget that this is, after all, a piano.

■ **Their Own Perceptions Of Their Existing Product Line.** This evaluation may not exactly coincide with that of their dealers, or of the piano technicians servicing their pianos, or even that of their customers. Just because *Matchless* may have historically produced what piano technicians have viewed as a low-end piano, that doesn't mean they view their own product that way. Certainly none of their marketing literature — their advertisements, brochures, newsletters, etc. — will acknowledge this. You're not likely to see many brochures trumpeting:

MATCHLESS PIANOS

CHEAP, MACHINE-MADE & MASS-PRODUCED PIANOS MADE OF SELECT MDF
PROVIDING THE MOST MEDIOCRE PERFORMANCE AND SOUND YOUR DOLLAR CAN BUY!

Manufacturers of even the lowest-cost pianos publicly boast about their *Old World Craftsmanship*, about all the *meticulous hand labor* that goes into their instruments and about how they use only *the world's finest materials*, etc. Indeed, their entire marketing department — as well as their corporate management — may well believe their own marketing story and honestly believe that their pianos are much better than they actually are.

■ **Their Companies Manufacturing Capabilities.** If the managers of *Matchless* hold to conventional wisdom, they will not allow their new piano to deviate too far from the basic manufacturing technology used in the pianos they are already building. At least, not without very good reason. Obviously, if they're having problems with their current design, they might think that this would be a good time to address those problems. If, however, they are currently building a relatively trouble-free five-post and block back assembly — or whatever — that seems to be working well for them with their other models, they will probably want to stick to that. Unless they have been considering setting up an entirely new assembly line, they will probably want their new piano to be assembled by the same people and run on the same assembly lines as the other pianos they produce.

Determining The Size Of The Piano

So. After considering all of the above — and after checking on the phase of the moon and the current price of hog futures — *Matchless* decides to proceed with the idea of developing a new piano. They have determined that the performance of their current 42" console, once the standard of the industry, has indeed fallen behind that of some of their competitors. And they don't like it. So they have made the unusual decision (at least it would be unusual for a U.S. company) to start fresh

with an entirely new scale design. In this case the size of the piano is a given. To make things somewhat simpler for the company and for the designer, let's assume that both marketing and manufacturing are happy with their current line of cabinet styles and they would like to continue using them on their new model. Also, let's assume that since manufacturing already has good production machinery to assemble their current 42" console back — we might as well also assume that it's a good one — they have requested that the overall design and dimensions of the back assembly be as close to the original as possible. So, the new piano will stand 42" tall, or at least it will be close, and its back design will be fairly similar to the one currently being manufactured.

Piano size is not the only aspect of the new design that will be influenced by *Matchless* marketing. Mr. H.P. Selalot, Marketing VP, has recently been looking through some of the heavy-stock, multi-fold, four-color, glossy-finish brochures extolling the various virtuous features of their competitor's pianos and has noticed that one of them uses a bass string in their console piano that is 45 3/4 inches long. Not wanting to be outdone in the marketing wars by any competitor, he specifies that the speaking length of A1 in the new *Matchless Concert Console* piano should be no less than 46 inches; yet one more design decision has been made for the designer. However, since the designer, for reasons of his own personal sanity, is working in the metric system, he requests permission to convert this to 1168.4 mm and round it up to 1170.0 mm. After all, longer is better. Right? [EDITOR'S NOTE: in this article, notes are numbered from 1 to 88 rather than by octave. Therefore, A1 means the lowest note on the piano. — SB]

It would be premature to specify the width of the piano at this point. That — at least the width of the back assembly — will be determined by the designer after he has laid out an acceptable pattern for the new stringing scale. It would also be best to hold off specifying the overall depth of the piano since this also will be dependent on a number of different factors that have yet to be decided. In all probability, however, since this new scale design will be built on the basic back design already used for an existing instrument, the depth of the new back assembly and the length of the keys will be the same, or at least very similar, to the original.

Notice that before the designer ever gets this project, a fair number of basic design decisions have already been made for him. Only the plate, the stringing scale and the soundboard/rib scale will actually be new. So, given these parameters, let's lay out a design cartoon — that is, a preliminary design sketch — to see what this new scale will look like in real life. Notice also that what we're now designing cannot technically be called a "new piano." It is simply a new plate and string scale along with a new soundboard and rib assembly that will fit onto an existing back assembly. It will probably use the existing action design, although the drilling centers of the action rails and the flare of the keyset will have to be changed. This new back assembly will still fit inside one of several existing cabinets with only minimal modifications to either.

Stringing Scale Limitations

Before going any further I would like to point out that, while these articles were prompted by a specific small console piano that was in our shop for a new soundboard — it was of a type having a large number of basic scale and design problems — what follows here is a completely new design.² The string scale and its configuration have been developed expressly for this set of articles. It does not resemble or represent any piano that has been or is now being produced by any manufacturer that

I am aware of. With the exception of the speaking length of A1 (1170.0 mm) and the height of the back assembly (1025.0 mm), both of which were deliberately chosen to illustrate a point, the rest of the stringing scale and the subsequent design layout is completely original. None of the design specifications that follow are taken from any existing piano.

In developing this design I will attempt to address some of the more troublesome aspects of small piano scales. As with any small piano scale, this would be a challenging design to get acoustically balanced; small scales always are. However, once the balance between the stringing scale and the soundboard and rib scale were worked out — one or two prototypes should be sufficient and no, I don't plan to build them as a part of these articles — it would be a fairly simple piano to build. The design is easily adaptable for use either as a mid- to high-end limited production piano or as a low-end high production piano.³ Its actual construction would be similar to most conventional 42" consoles and could be adapted to the production style used by nearly any existing company, so just picture your favorite. Those portions of the design that directly affect its acoustical performance could be readily adapted to most any manufacturer's process. As with other pianos of this size, it would probably be best to use a so-called "compact" vertical action since the compromises that would have to be made to the keyset to accommodate a full-size action with a drop mechanism would surely be unacceptable from both a cost and a performance standpoint.

So, if I have sufficiently covered my backsides, let's get back to the piano....

Although this piano is going to have an overall height of approximately 42 inches. 42 inches equals 1066.8 mm. Since we're going to need all the height we can get, let's round this up to a more convenient 1070.0 mm, or approximately 42 1/4 inches. I'm sure Mr. Selalot won't mind, since the vertical dimension of the piano's back will be somewhat less than this. Since the height of a vertical piano is specified from the floor to the very top of the lid, we're going to have to deduct about 25 mm for that lid panel and its hinges. Another 25 mm or so will be required between the bottom of the back assembly and the floor for casters, carpet clearance, etc. So, in the final analysis, our back assembly will be only 1025.0 mm tall.

Not all of this space will actually be available for our stringing scale, however. A vertical distance of about 60.0 mm will be required between the centerline (C/L) of the A1 agraffe pin on the upper bearing bar and the top edge of the back assembly to accommodate the tuning pin layout. In some designs, depending on the specific details of the stringing scale, this distance may be determined by the space required

for the tuning pins of the first tenor unison — in this case unison #33 — instead of that for the lowest bass string. We'll have to wait for Part II of this article to know which it's going to be in this case. In the meantime, we'll assume that 60.0 mm

will be sufficient. Also, since the hitch pin cannot be placed right at the bottom edge of the plate hitch-pin riser, we must deduct another 12 to 15 mm so that it can be placed well into the body of the riser. We now end up with a vertical height of approximately 950.0 mm in which to fit our stringing scale, including that lovely 1170.0 mm long A1 bass string.

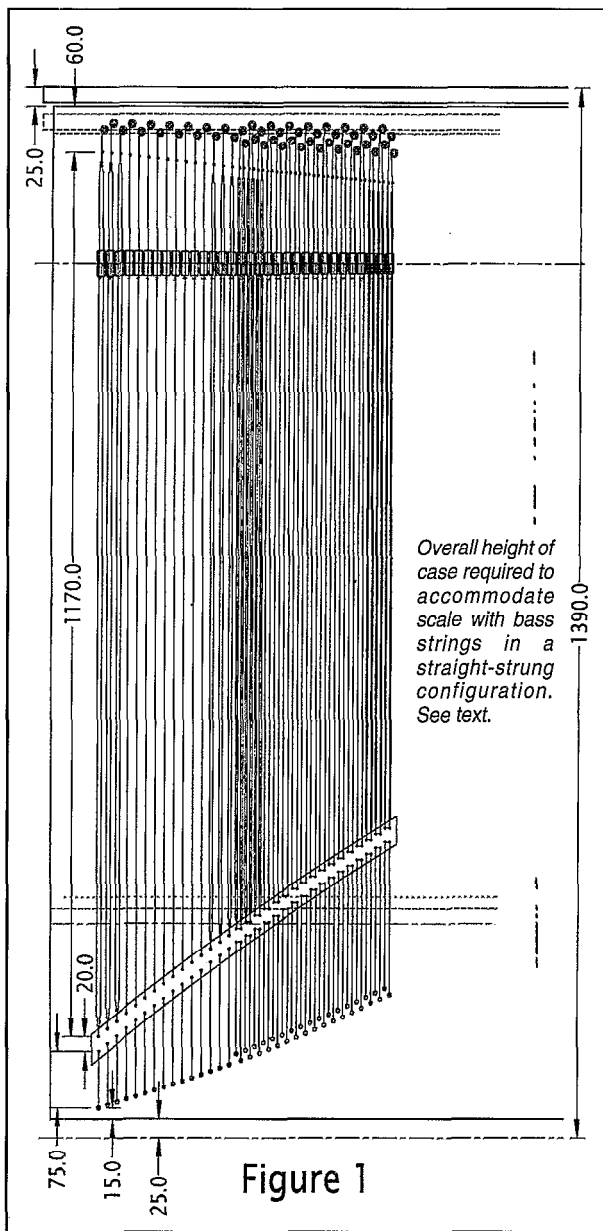
Actually, the problem is yet a bit more complicated. To the speaking length of 1170.0 mm, another 20 mm for the bridge-pin span and some minimum length for the back scale (the tail section of the string between the trailing bridge pins and the hitch pins) must be added. The shortest tail lengths I've seen used on production pianos have been about 50.0 mm. Unfortunately, bass sections with back scales this short are acoustical disasters, a fact easily verified by listening to the first half-octave of any piano using them. Several are still in production. Since we're stubborn enough actually to want this piano to have a reasonably good-sounding bass section despite its small size, let's assign a minimum tail length in the back scale of 75.0 mm to A1. Adding these three string segments together, we come up with an overall length of 1265.0 mm. This is the actual length of string we're going to have to find room for. We don't have to worry about the length of the string segment between the agraffe pin and the tuning pin at this point. No matter what we do to the angle of the

speaking length of A1, this segment will probably still be vertical and the 60 mm space between the agraffe pin and the top of the back assembly will accommodate it easily. It does not need to be in line with the speaking length.

Laying Out The Stringing Scale

So, let's see what it will take to fit this all together into a workable stringing scale. In **Figure 1** I have laid out a preliminary bass section stringing scale with the strings running vertically, that is, at 90 degrees to the strike-line, as they would be configured in a "straight-strung" scale. I have also sketched in agraffe pins, bridge pins, the tail sections and a tentative layout for the hitch pins and tuning pins. In this drawing, the "scale-stick centers" (that is, the unison C/L spacing along the hammer strike-line) are set at 13.5 mm.⁴ Most vertical piano

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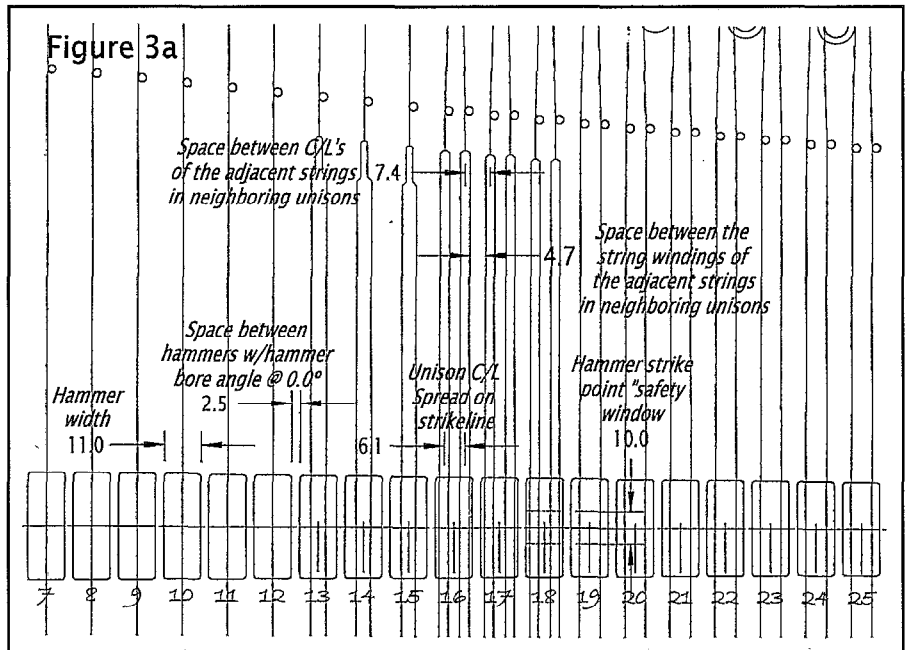
The Problem of Small Pianos — Part I

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hammers vary from about 10.0 to 11.0 mm in width; I would recommend 11.0 wide bass hammers for the *Matchless* piano. Depending on the manufacturer, most action flanges vary from around 10.5 to 11.5 mm in width. This spacing, then, would give us an acceptable minimum gap of 2.0 mm between even the widest action parts we're likely to run across. So this appears to be a fairly reasonable spacing — at least it would be for a straight-strung scale. Unfortunately, the overall height of the finished piano would have to be about 1390.0 mm (about 54 3/4") to accommodate the straight-strung string configuration. Of course, the completed piano would be only about 1300 mm (about 51 1/4") wide. But still, the piano would be just a bit taller than what Mr. Selalot had in mind.

Obviously, the only way we're going to get this stringing scale to fit onto a back assembly of this size is to tilt the bass strings over to some angle that will substantially reduce the vertical height required for the back. After fussing around with some geometry I determined that to fit our 1265.0 mm-long A1 bass string, complete with its attached parts, onto this back we're going to have to lean it over to an angle of about 42.5 degrees.⁵ Although this string angle is fairly severe, it is within the outside limits of acceptability. I've worked with pianos that were made to function reasonably well with bass strings angled as much as 45 degrees. A variety of problems that are fairly minor at string

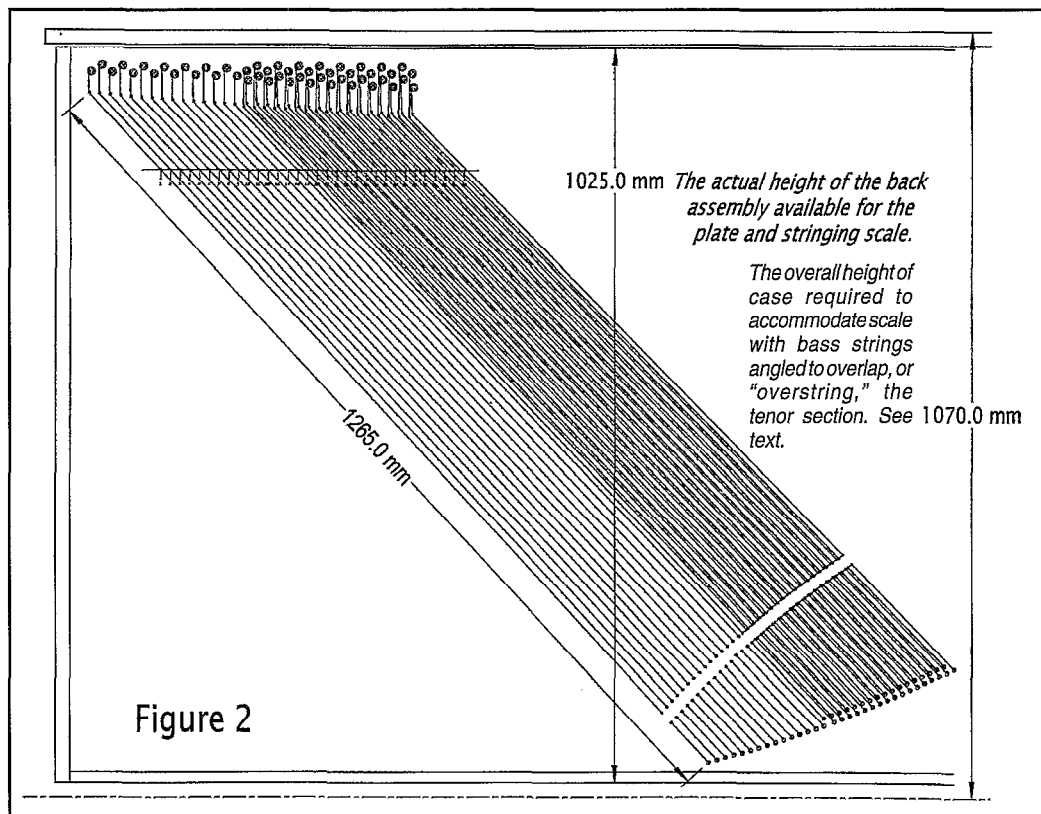
angles of 30 degrees or 35 degrees multiply at a fairly rapid rate, though, at angles much beyond 40 degrees. Somewhat more caution must be used in the rest of the layout. As may be ... if we're going to fit this bass string scale onto this back this is the string angle we'll have to use. **Figure 2** shows the same bass string scale used in **Figure 1**, but with the strings angled to 42.5 degrees.



Unfortunately, while this change did solve the piano's height problem it also introduced several new ones. Take a look at illustrations shown in **Figures 3-a** and **3-b** and notice what has happened to the spacing between the bi-chord strings of

unisons #16, #17 and #18 as the string angles are changed. In both illustrations the scale-stick centers remain at 13.5 mm and the 11.0 mm wide hammers are drawn in with a bore angle of 0.0 degrees to the hammer shank C/L. In the straight-strung scale there is a space of 4.7 mm between the string windings of unisons #16 and #17. With the bass strings angled to 42.5 degrees this space has been reduced to only 1 mm. In the straight-strung scale, unison #16 has a C/L spread of 6.1 mm. At a string angle of 42.5 degrees this has increased to 8.4 mm. In fact, the measurement to the outside edges of the two strings is now 12.2 mm. This is 1.2 mm more than the width of the hammer — I think we're going to have a problem here.

Hammers in any piano need a "safety window" of at least 5 to 6 mm both above and below the strike point, or 10 to 12 mm total, that does not overlap any



part of either adjacent string in the neighboring unisons. When a hammer traveling at high speed impacts the strings of any unison, but especially with the long bass strings, those strings deflect. The hammer does not stop moving immediately. It takes some finite distance for the hammer to slow

down, stop and reverse its direction. During this time, it is deflecting the string set from its rest position. It is this string deflection, of course, that initiates the wave motion traveling within and along the string. If the arrangement of strings and hammer angle is such that the hammer's strike-point safety window is too small, and if its velocity is great enough, the hammer can easily impact the strings of the neighboring unisons. Also,

though we'd like to think that the hammer travels in a straight line, or arc, from its rest position to the string, it doesn't. It wobbles around quite a bit during its travels, which just increases the likelihood of this happening. Even if these problems can be minimized by very careful hammer alignment and spacing when the piano is new, as the action centers wear and/or the various action parts—especially the hammer shanks—twist and warp, the problem will soon reappear. In **Figure 3-b**

the safety window has been reduced to 4.1 mm. Obviously, on anything more than the very softest blow, hammer #17 is going to hit the strings belonging to unisons #16 and #18 that are adjacent to it.

In addition, as they vibrate, the strings of unison #17 are almost certainly going to impact the strings of the adjacent unisons on all but the *very* softest of blows. With even moderately aggressive playing, this piano will be its own percussion section.

To resolve these problems we are going to have to make a couple of additional refinements to our design. First, let's see what we can accomplish by installing the hammer at an angle.

In **Figure 3-c** the hammers have been drawn with a bore angle of 18 degrees. This angle was not chosen by arbitrary guess. It represents what I consider to be the maximum practical hammer bore angle for either grand or vertical actions. As with string angles, there is a practical limit to hammer bore angles

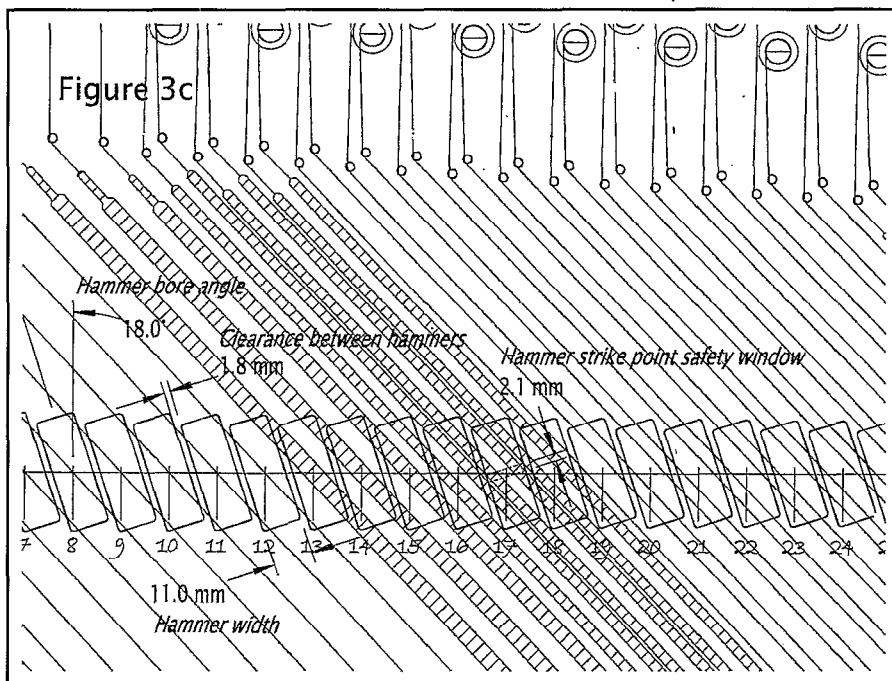
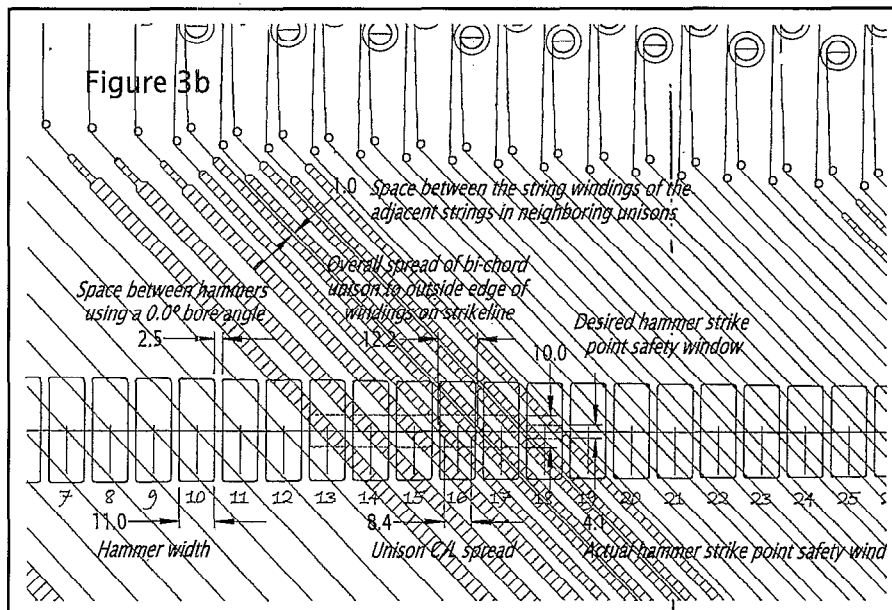
beyond which the problems created begin to outweigh any advantages gained. Actually, I would prefer to keep hammer bore angles down to no more than 15 degrees, but in extreme cases such as this it may be necessary go as high as 18 degrees.⁶ Beyond this, hammer spacing and traveling problems begin to increase at a dreadful rate.

As mentioned earlier, the hammer does not always travel to the string set in a straight line, or arc. As the hammer bore angle increases, the hammer's path toward the string plane under hard acceleration becomes increasingly erratic. As force from the key is transmitted to the hammer through the action—specifically through the relatively flexible hammer shank, and especially with the ridiculous “spinet” hammer shanks—the various parts twist and flex. The result is a hammer that wobbles and flops around to an increasing degree as the rate of acceleration increases. The hammer head then

impacts the strings at different points with each successive blow, a phenomenon presenting its own unique set of voicing problems. It also increases the likelihood of the hammer hitting the adjacent strings of the neighboring unisons which is the problem we were trying to avoid in the first place.

So, did we accomplish anything at all by tilting our hammers? If we look at the drawing carefully we find that with the hammers angled to 18 degrees, instead of enlarging the safety window we have actually made it smaller; it is now just 2.1 mm. The problem with the hammers overlapping the adjacent unisons has actually become worse. Also the space between the

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hammers has now decreased from 2.5 mm to only 1.8 mm. How can this be?

Perhaps we just don't have the hammers at a great enough

even an aggressive scale such as this.

Keeping in mind that "a price must be paid for every advantage," these changes did not come free of charge. So, what did they cost us? The piano is going to be somewhat wider with the overstrung scale than it would have been with the straight-strung scale. Assuming other factors to be equal, with the strings installed vertically the overall width of the piano

would have been approximately 1350.0 mm (approximately 53.1"). Angling the bass strings to 42.5 degrees added 98.8 mm of width between the scale-stick center for A1 and the left side of the agraffe pin for A1. Increasing the scale-stick spread from 13.5 mm to 15 mm added another 46.5 mm to the width of the bass section at the strike-line. So, to this point we have added 145.3 mm. And we aren't through yet; we still have to consider the bass/tenor break, which will also have to be somewhat wider. There will also be an acoustical price to be paid due to the overstrung bass section, but, at least mechanically, we now have a good workable bass section.

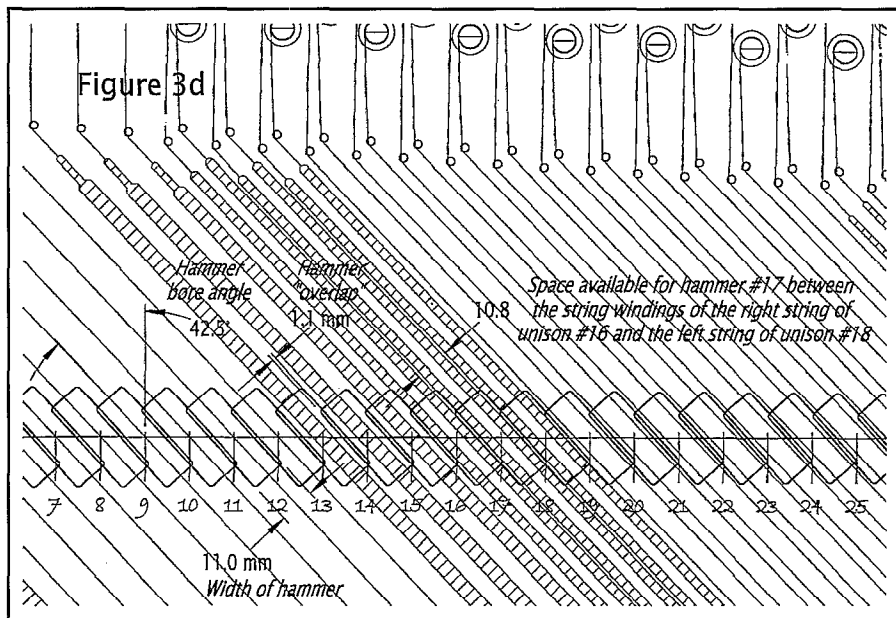
Figure 4 shows the upper third of the bass string scale in close to its final form. As I finish writing this I see several additional refinements that could be made to the string layout. And, of course, the tuning pin layout obviously needs much more work. This is as far as I'm going to take the bass section design for now, however. In Part II of this article we'll

tackle the tenor/treble section and the bass/tenor crossover. We'll also consider a few of the problems encountered with typical soundboard and bridge designs in small pianos.

As always, should you have questions or comments about this subject that are not addressed in these articles, please feel free to contact me either directly or through the *Journal*.

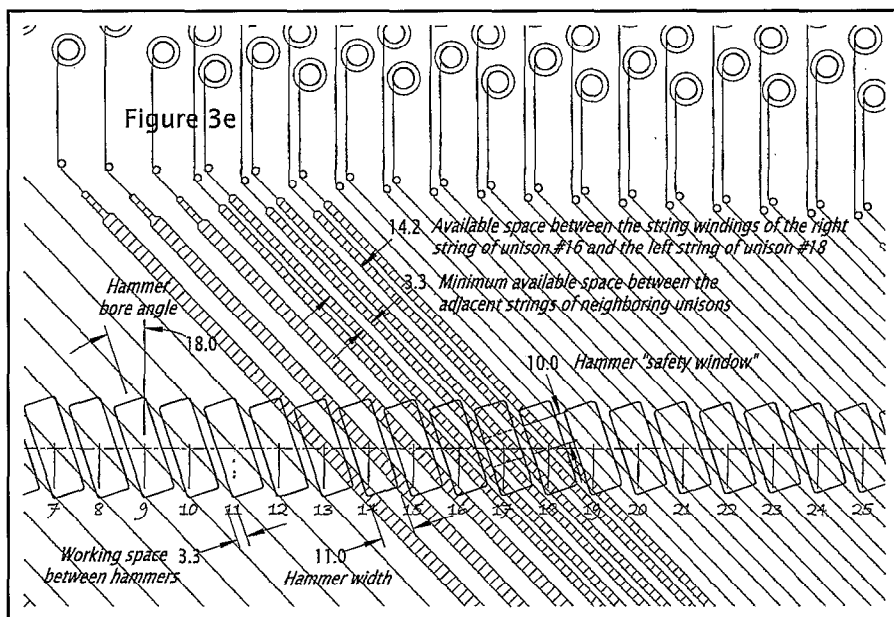
Notes

1. If the manufacturer of any product, whether they be pianos or space widgets, tries to tell you that their product was made "without compromise," they're lying to you. The design and manufacture of all products involves selecting from among many compromises, each of which will be reflected in the product's final cost, its level of performance, its



angle yet. Why not just keep increasing the hammer bore angle until the hammers are once again aligned with the strings as they were with our straight-strung design. Let's ignore our 18 degrees rule and increase the hammer bore angle to 42.5 degrees — a configuration loved only by the designers of square grand pianos. In Figure 3-d this has been done. As you can see, we can only do this in a drawing, not in real life, since the hammers would actually overlap each other by 1.1 mm. As the hammer bore angle increases, the clearance between adjacent hammers decreases. Obviously, we couldn't actually fit them on the action this way. Even if it were possible, it still wouldn't solve our problem. Since the space between the windings of the two outside unisons is only 10.8 mm and the hammer is 11 mm wide it is obvious that we're going to have to find another solution.

The actual problem, of course, is that the unison centers are simply too close together. The scale-stick-center spacing that worked just fine in the straight strung configuration does not work at all once the strings are placed at a 42.5 degrees angle. The next change we're going to have to make is to spread the scale-stick centers a bit. See Figure 3-e. I have now spread the scale-stick centers to 15.0 mm.⁷ Notice that the hammer strike safety zone of ± 5.0 mm no longer overlaps any portion of the strings in the adjacent unisons. Hammer side clearance with the hammers back at their 18 degrees bore angle is now 3.3 mm; a much safer figure.⁸ The space between the windings of the right string of unison #16 and the left string of unison #17 is now 3.3 mm; an adequate amount of clearance for



longevity, etc. The question is, how well did the designer and the manufacturer choose from among the many alternatives available to them and does the end product reflect a wise blending of those choices for their intended market and for your intended purpose.

2. I should also point out that since this is a new design — albeit not a complete one since I don't intend to publish the drawings for the complete soundboard and rib set, nor do I plan to publish the complete plate and back assembly drawings — and even though I personally have no plans to build this piano, I do retain all rights to its use. Please understand that it would be both unethical and illegal to build an instrument using this design for commercial use or production without my permission.

3. The differences in the selling prices of different pianos are not greatly design dependent. Up to a certain point, it costs no more to build a good acoustical design than it costs to build a bad one. Manufacturing costs are determined much more by such things as production volume, manufacturing efficiency and the cost of materials than by design issues. A poor design using costly materials and assembled in limited production will cost much more to build than a good design that is assembled in high volume using less expensive — but well matched — materials. And, though it may not look as elegant and while the former may have its moments of glory, the latter has every opportunity to consistently sound better.

4. Historically, once a piano scale was laid out on paper, a wooden stick would be marked with all of the critical points of a particular piano scale. In later years, the paper was replaced by mylar and the stick would be made of aluminum or steel, but in earlier times clear, straight-grain wood was used. This stick would be planed smooth and square (about 20 x 20 mm) so that all four sides would be available for data storage. The first side was marked off with the string length scale and the second would have the strike-line scale. The third would usually have the "back scale," or the string layout between the bridge pins and the hitch pins. The fourth side would be used for different information depending on its actual use. For example, it could have the layout for the key center rail pins. Or it could have bass string winding data laid out on it. This stick was called the "scale-stick" for that piano. It would be used to set up drilling templates for action rails, for key capstan lines, etc. It was the standard that workers in various departments or factories went by to ensure that all of the various components would fit when they came together for final assembly.

With the advent of computer-aided design and drafting (CAD) technology and computer-numerical control (CNC) machinery, the scale-stick has become pretty much redundant. Much more data than could ever be stored on a scale-stick is (nearly) instantly available in the form of electronic blips inside computers and it can be easily pulled directly from the piano's master CAD drawings and transferred directly to the CNC machines drilling the holes or cutting the cuts. More accurate to be sure, but not nearly as romantic.

Out of habit, I still usually refer to these points as scale-stick centers or, depending on the context they will sometimes be unison centers or action centers. Please bear with me.

5. Actually, 41.3 degrees would have done it. By increasing the string angle to 42.5 degrees we'll pick up a little extra space which we may need to find room for the three tuning pins in the low tenor, or we may discover that we need a little extra space between the hitch pin and the edge of the plate hitch pin riser. At this stage of the design, it is useful to have a bit of space in reserve. If we find everything working out as

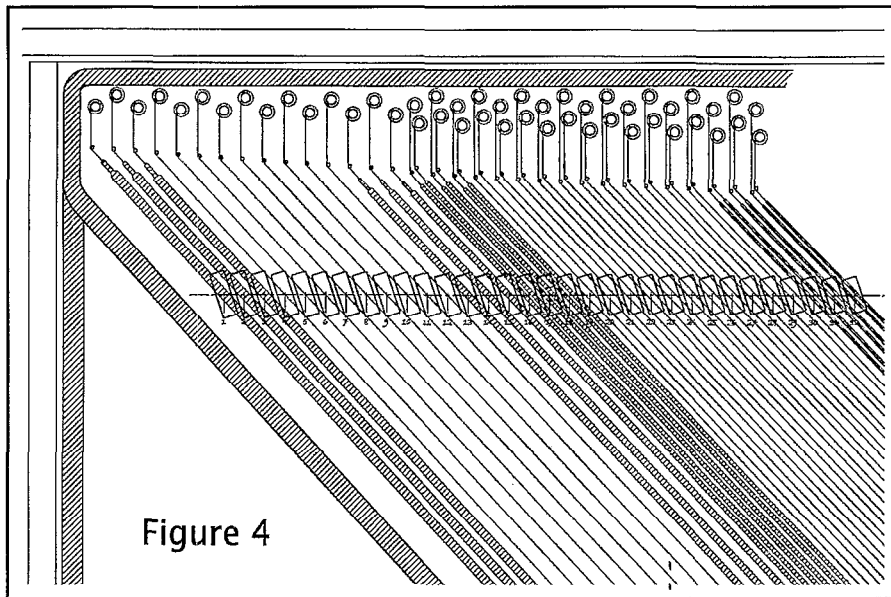


Figure 4

hoped, we can always go back and rotate the strings clockwise by 1.2 degrees, bringing them back to 41.3 degrees — or not ... we'll just have to wait and see.

6. If you'd like some general purpose "rule of thumb" principles to go by here, try these:

- If you are using replacement hammers are of similar size and shape to the originals and if the bore angle on the original hammers worked well, use it.

- If you are making changes for whatever reason, bore the new hammers to $1/2$ the string angle up to a string angle of 30 degrees, or a ham-

mer bore angle of 15 degrees.

- If the string angle is greater than 30 degrees, test bore the hammers belonging to the first three bi-chord unisons up to a maximum of 18 degrees and temporarily install them. Check for hammer side clearance through the entire hammer stroke. Verify that the striking point of the hammer does not approach the adjacent strings of the neighboring unisons too closely.

- If unison spacing is very close, you may have to use narrower hammers. Just be sure they adequately cover both strings of the bi-chord unisons.

- If the width of the hammer has already been reduced to the practical minimum and there are still side clearance problems, you can taper the back of the hammer on the treble side slightly. This was occasionally done on older uprights just to allow the builder to use wider hammers than would otherwise fit on his scale. (Yes, there was a good reason for this. More later....)

7. During the development of this scale I also tried a layout using a unison center spacing of 14.5 mm. While it worked on paper, spreading the centers to 15 mm cost only 15.5 mm (0.61") in overall piano width and would make action fitting and hammer alignment considerably easier. Besides, this would be a fairly aggressive scale and a little extra spacing for insurance against adjacent string impact through the bi-chord string section would not be a bad thing.

8. Before leaving the subject of hammer bore angles, I would like to add one more thought. I have often heard it proposed that hammers are angled to ensure that the crown of the hammer impacts each string of the unison at the same spot — that is, maintaining the same strike point ratio of each string. In the real world, this is of no consequence.

Let's use unison #16 of this scale as example — and it is a fairly extreme one. If the hammers were installed in line with the hammer shank, that is, with a 0.0 degrees bore angle, and if the nominal strike point ratio of the unison was 0.125 (or $1/8^{\text{th}}$ of the speaking length), then the strike point ratio of the left string would be 0.1222 ($1/8.18$) and for the right string it would be 0.1279 ($1/7.82$). In terms of sound, this difference would be very difficult to measure and would surely be inaudible — at least in the bass and lower tenor sections. With the longer strings in larger pianos the difference would be even less.

A variation this large would be quite audible, however, in the upper tenor and treble sections where the strings are much shorter and the strike point ratio is much more critical. The strings are generally not angled very much, if at all, in these areas of the scale. However this was one of the difficulties of the staggered bridge pin arrangements — i.e., those with unequal speaking lengths for each of the three strings of the unison — found in the first treble section of some grands built in the late 1800s and early 1900s.

Hammers are bored at angles to allow the strings of a given unison to be placed slightly farther apart and to allow the unison centers to be placed somewhat closer together without the danger of having the hammer impact the adjacent strings of the neighboring unisons. ■



The Business of Tuning — Part II

By Steve Brady, RPT
Journal Editor

Home Alone

Leslie Bartlett: My wife and I just watched "Dateline," and a story about a female high school teacher accused of seducing a 15-year-old boy. She was found guilty and spent some time in prison, though she still holds to her innocence.

I am aware that we, as technicians, frequently find ourselves in homes with only one individual besides ourselves, often of the opposite sex. "Sexual abuse" is flying around like wildfire today, reaching into homes, schools and churches. Some of the accusations are founded, and many are not — being fabrications.

What precautions should we, the self-employed, often the singular presence representing us, take to make sure that we don't find ourselves the focus of such problems? My wife, an elementary teacher, indicates that teachers throughout the age spectrum, have to go to extremes to protect themselves. I suspect we, as a group, have not been involved with this issue, but probably should be more aware of it and be very careful that we protect ourselves.

Case in point: I am scheduled to tune (first time) in the home of a band director in the school district for which I tune. The teacher indicated he wouldn't be there when I got there, but his daughter will be home since she doesn't have sectionals that day. I now think it prudent to call and reschedule when an adult will be there.

Warren Fisher, RPT: That's smart, Leslie. Such a charge directed at you would probably lose you your school job pronto. A friend was a youth director and choir director in his church. A teen-aged girl charged him with sexual misconduct a year and a half after the alleged incident and he was fired instantly! Nothing he said meant anything to the church! He was married with two kids. It literally destroyed him. I saw him two years later selling for a piano dealer.

It's irritating to have to rearrange your schedule, but do it!

Del Gittinger, RPT: A concern I've had many times. Ever notice that in the case of an accusation the man's name is all over the paper but the victim/accuser's name is never stated. Just the accusation in the paper will end your career as a piano technician. My wife is also an elementary music teacher. Same story. Many kids never get a hug at home and want one from their teacher(s). The teachers are now forced to be stand-offish thereby exacerbating the child's problems.

It's also wise to get out of a home before dark if you are there alone with a client of the opposite sex. Neighbors talk. By the way, be sure your jacket has "Piano Tuner" on it, especially if your service vehicle does not.

Gina Carter, RPT: Les, alas, what a sad situation we find ourselves in today. But better to face and deal with the reality than to put yourself in a potentially harmful situation. I think you've already answered your own question.

When I set up a first-time appointment, I try to set it for a time when the customer is at home. That way I can tell her my evaluation of the piano and what it needs. This also ensures that we establish some rapport and trust for future service. I will admit, though, that I have customers I have never met — only their pianos! But I make it a practice not to go to a home the first time with only a child there — a babysitter, maid, neighbor, or some adult must be there.

In your assessment of this situation one question you might ask yourself: from where or whom did the referral come? Was it another customer? Was it from the yellow pages. If from another customer, some semblance of trust is already established, but it is our responsibility to safeguard ourselves. If you have doubts, act on them!

Susan Kline, RPT: Gina, I concur with everything you've written here. I just keep offering new appointment times until I can find one when the owner will be home, the first time. After that, if they want to show me where their house key is hidden ... well, I'm still not comfortable with it, but if they seemed okay, I'll do it. I can picture the day when someone breaks into a house where I have carefully locked up and left a few hours before, or where the door lock won't work, and someone comes in after I go, but so far it hasn't happened. (Knock on wood!)

The only other thing I make sure I never do is answer a customer's phone, even if I suspect the owner might be trying to reach me. Can you imagine a wife calling her husband, only to have me answer? There was one time I worked on a piano for a man who worked at home, and I was just leaving as his wife pulled in. I got a *look!* Good thing I had left a card and a receipt.

The men are in a much more dangerous position than we are, especially as regards young girls left alone. All I can do is sympathize. I've sometimes wondered what I might be in for when some male clients call, but so far nothing has been a problem. One man kind of plaintively offered the opinion that extramarital affairs really did no one any harm, but I don't think that level of approach is anything to worry about. I knew his wife, too!

There was one really rough-sounding customer in Stockton, who called because he'd gotten his piano out of storage after he'd been in jail. I went (to a very "mean street") with some trepidation, but relaxed when I saw an old lady, a rather beady-eyed old lady, sitting on the porch. As I was tuning, he told me it was his granny. "She looks after me. If anybody gives me any trouble, she gets out her shotgun!"

Barb Barasa: I've been tuning for 15 years and have never felt this was an issue for me. In some ways (and this is reverse sexism, to be sure!), I think women are more comfortable having me come in as a tuner than a man. But I have no evidence to support this.

I think it may depend on the communities we serve. I came from a rural area, where people don't lock their doors and have no problem with me going in when kids or no one are home. But I also tuned in the Chicago suburbs, and there people wanted to meet me the first time, and after that they might leave a key. I now live in another small town, and I don't feel this is an issue here, either. But I must admit, it's a crazy world. People claim things that are not true for their own twisted reasons. We each have to do what we are comfortable with.

I have never felt uncomfortable when there is only a male customer home. I am friendly, talk to them about their piano, find out something about them, but keep it "professional." And, of course, since I know I may be crawling around under a piano, I wear pants, not mini-skirts. I've been in the homes of people who are pretty far off the deep end in one way or another, but not in any way that would harm me!

Service Vehicles

Gittinger: My Nissan pickup truck lease will soon be done. I use it with a cap on it to do my piano and organ service. I have used pickups for the last 13 years. It serves the purpose pretty well, but as of late I've had an urge for a better riding vehicle and one that I didn't have to crawl on hands and knees to get parts.

What do you use as a service vehicle? What do you like and/or dislike about it?

As a mini-van costs about \$10,000 more than a small pickup, is it worth the added expense?

Do any of you use a SUV (sports utility vehicle)? Like? Dislike?

As a side note: In the summer I quite often do routine tunings on my motorcycle. Last summer I got a Honda Gold Wing and a trailer for it. I'll be doing much more service work from it — you can count on it! (Got the trailer for a trip out west we'll be taking in June, not for servicing. But I'll still use it.)

Maybe I'll stick to the pickup for the rainy days. :)

Bartlett: I got a Ford Ranger, extended cab, put a shell on it and *love it!* It's a dog, though, slow like molasses in January. However, it's roomy, quiet, very comfortable. Cold in summer and warm in winter. It'll pull a 5'x8' trailer with ease. I used to have a Gold Wing. Now, I'm jealous!

Wim Blees, RPT: Del, I have been using a mini-van ever since Plymouth came out with the Voyager. (I think it was December of 1983). I now drive a Mercury Villager. The ride is much smoother than a pickup truck, and I have lots of room.

I took out the back seat, and have a board across the back wheel wells. This serves two purposes. A grand action will fit on top of the plank, which I clamp down with a C-clamp. And I store my parts and tool cases under the plank. That still leaves room in the back for additional cargo, like boxes, benches, or groceries. The middle seat stays in the van, so I can carry additional passengers.

Whether the additional expense is worth it to you, is your

call. Personally, I wouldn't have it any other way.

Allan Gilreath, RPT: Del, I went the SUV route (a Ford Bronco II) then moved up to an Aerostar for several years. Now I'm using a Ford Ranger with a commercial cap on the back. The Bronco was too short to fit actions easily. The Aerostar was nice but took a good while to heat or cool. The truck and cap I have now organize things well (swing up doors with shelves on the sides) and the big stuff is accessed by two swing-open doors on the back. This seems to work a lot better for me than the van did as the organization is much easier to work with and the cab heats and cools *very* quickly (important feature in the hot summertimes here).

So far this is my pick after experiencing the others. Oh yes, I forgot to mention the '63 Ford Fairlane two-door hardtop that I had before that, but I didn't have to transport many actions back then.

Lee Haynes: Lease vs. purchase. That is the question. In town I could see leasing, but for rural areas the extra miles could be costly. My 1990 Toyota pickup has 166,000 miles. Deluxe cab with camper top on back. It is okay, but wish I had a completely enclosed vehicle, van, SUV, etc.

Dan Hallett, RPT: Thanks for the discussion. I currently drive a Toyota station wagon which holds actions with both seats folded down. This also holds all my supplies, but not at the same time. I've been wondering what I will do when this vehicle is worn out. I've considered both an SUV and a van. The truck seems like a worthwhile investigation.

Kline: Your vehicles are very spacious and elegant, and can give you very good service. However, if low cost is an overriding factor, I can recommend a Tercel 5-door hatchback (mine is an '87). I'm amazed at what will fit into it. I can put in an action with one seat folded down, and block it with various stuff on the sides so it won't slither around. I usually use a big board over the folded seat, but if I'm taking an action home unexpectedly, the little back shelf laid lengthwise will work fine. The tools I use every day, plus my stringing gear (and a lot more) fit in the trunk area, easily accessible without crawling around, and out of sight. By having a modest sized vehicle with 5 doors, everything can be reached without strain.

Extra parts (in Zip-loc bags in boxes), vacuum and tool box, fit behind or on the back seat. Pedal dowels, a Damp-Chaser, a straightedge, and a prop for those dratted console lids hinged on the end slide in next to the rear door. At home I use a hand truck to get actions in and out, that is laid against the rear threshold (with the board on top). When putting an action in, I can open the rear passenger door and hatch, and reach from both sides at once.

This venerable vehicle, paid for many years ago, has 144,000 miles, and is about due for a new engine and carburetor. I want to drive it till it has 300,000! It gets 33 miles per gallon, turns on a dime, etc. The only drawback I mind at all is that it's totally gutless on hills. I arrange to let everyone pass me.

I've never had to carry so much in it that I needed two trips. I've never removed parts and tools to make room for actions, etc. I once carried a lyre, lyre props, grand action, a bench, and a suitcase in it at the same time, with no damage to anything. It's like stacking a fridge. You just have to pack it

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The Business of Tuning — Part II

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right.

Assorted clutter that is in my car: bottle jack, many parts (Weaver rocker arms, for instance), humidistats, pinblock support jacks and boards, tuning pin punch, maps for everywhere, gimlets, hand drills (power and manual), hammer replacement kit, cleaning supplies, ear protection, lamp, extension cords, dust mask, safety glasses. Stringing gear, including an attache case with a double set of universal bass strings (for clunkers only), soft-faced hammer, rubber mallet, caster cups, a whole case for ivory work ... well, you get the idea.

Fisher: Allan, I have been using a mini cargo van since 1990 and would not go back to a pickup for the following reasons:

1. Your legs hang almost straight down instead of straight out which has almost eliminated the low back strain sitting in a small pickup all day. Also the seat in my van has lumbar support you can crank out if you need it.
 2. Road vision. You are up high enough to see over all the cars and at least see through the windows of full sized pickups and vans in front of you. I had three accidents where I bumped the car in front in my pickup and no accidents, period, since I had my van.
 3. Ease of tool access. I slide open my side door and have all my tool boxes in order left to right to choose from without getting in the van. The stuff I don't use much is behind.
 4. Grand action platform (Also camp bed). A built-in platform sitting on top of the wheel wells which is a little below waist high for carrying grand actions safely. There is a removable 2x4 slide stop with dowels that insert into front support of the platform. I lay a doubled moving blanket on the platform so the action won't slide. I have another stop that goes on one side to completely box in the action. Now another neat thing that happened accidentally was that there is enough room between the rear of the platform and the tailgate to stand up even the largest upright piano action wrapped in a moving blanket which allows you to carry it in perfect safety! So I can pick up one of each and take them to the shop without a worry! Under the platform I have two large plastic storage containers for all those odds and ends you don't want cluttering up the back of your van. They slide in from the back.
- When I go camping, I put in another platform in the front of the cargo area and put a bed on it!
5. The tail gate doubles for a roof when it is raining. Allows you to get an action wrapped in plastic to take into a customer's house.
 6. The inside of my van is much drier than the inside of a pickup topper, which means good things for felts and wire.

Dale Probst, RPT & Elizabeth Ward, RPT: I have a 1989 Dodge Caravan CV with a paltry 129,000 on it. Has worked well for me. Elizabeth has used a 1988 Mazda 323 two-door, a 1993 Ford Escort wagon, and currently drives a 1996 Mitsubishi Mirage two-door. She has no trouble carrying piano gear in any of them. I carry organ repair gear, enough piano stuff to do anything short of a rebuild, and various junk in the van. Still have enough room to load a spinet organ through the side door or a grand action, whatever. I agree with Allan, a

van takes longer to heat or cool and you get to sniff a heady aroma of chemical cocktails occasionally. Gas mileage runs 20 in town or out, uphill or down. The 2.5 four is like Susan's: a little slow on the get-go. All in all, I have enjoyed the view, as Warren says.

John Mussekwhite, RPT: My favorite daily vehicle has always been the Volvo station wagon. Mine is a 1980 245 DL with a roll-type fabric cover over the back to hide tools from sight. I've retired it now in favor of a Dodge Caravan, which I may retire for a Ram van (a mini-van with steel sides). New Volvos have gotten too expensive, but I may just have mine rebuilt since it's like a fine piano, Volvos are quite rebuildable.

I really like the Caravans, actually. Although the Volvo has more prestige, the mini-van has a great view when you're driving around and is a little cheaper to run. The steel-sided mini-vans give you a little more security and are cheaper than the passenger versions. You have to remember that a mini-van is *not* a truck.... The Dodge/Plymouth are just K-cars with different bodies and are very light-duty.

Tuning Records

Ron Nossaman, RPT: I don't like mysteries. For many years, I've cursed the people who refuse to leave a permanent record of service in the pianos they tune. A piano shouldn't have to be a "black box" with no information other than that which is immediately observable. I don't give an eighteen-legged damn about who owned it, slept in it, or played it, but I would like a *service* history of the instrument. A loose piece of paper *will* be removed from the piano by the first non-tech who lifts the lid, losing the service record for all time. I request that the old business cards I find in pianos be left there for this reason. I'm not threatened by the last tech(s) who tuned it. If I can't do the job to the clients' satisfaction, they should call someone else next time! Isn't that how I got here this time? I log all tuning dates, temperature, and relative humidity info on the keys, in *ink*. Talk about ego problems, I don't feel that the only valid history info is that which I generated myself. If the last guy there left an indelible, informative record, I'm grateful. That's verticals. In grands, the underside of the music desk is an ideal spot for a sticker with the same information. I also leave a business card under the music desk (with all the other old cards, if any) with the same information.

PS: Tuning records ain't defacement. Performers signing grand plates with Magic Marker... now that's ego, graffiti and vandalism! That's my call.

Garret Traylor: I think of my customers as "above average" people who understand the importance of record keeping. I ask (tell) them to maintain a file for the piano. They probably have one for the car — and actually most of the pianos I service cost as much if not more than most cars. Record-keeping is also much like going to the doctor. I have to bring my records with me. I am especially glad that the doctor does not write messages and notes all over me.

In the future you will have all your medical records on some kind of microprocessor implanted on an ID card. Who knows, perhaps we will be able to secure a chip (microprocessor) on the piano. From that we will be able to upload and download extensive records.

Tim Geinert, RPT: I really have no objection to the discussion

on initials and other marks inside pianos. It has made me realize that I have always dated verticals, and never dated grands. I do like to know what a piano has been through, especially if a first-time customer has been having some difficulty. The more information I have, the more professional and intelligent my answer might be. I cannot answer why it doesn't seem to be so important on a grand.

David Ilvedson, RPT: I think tuning marks are totally useless. What does it matter whether it was tuned last month, six months ago, four years ago. Is it up to pitch? No, then pitch raise and fine tune. Yes, then tune and be on your way. Rebuilding is a different story.... I usually leave my mark on the side of key #1 when rebuilding. My customers know that their service record is on file in my computer via Dean Reyburn's "Piano Service Manager." I will print them up a copy if they move. I really believe if you must leave a mark, you should leave it in pencil for easy removal.

Dave Doremus, RPT: I think this concept is a joke. If everybody who tuned a piano recorded his name, number, weather, humidity, mood, how many cups of coffee he had had that morning, inside an instrument, in stickers or ink, all we would see in a couple of years is a graffitied-over mess. Come on guys, wise up.

Joel Rappaport, RPT: Now wait a minute. It is very important to know exactly what has been done to a piano. Take a grand, for example. We should use the top surface of the keys to record tunings, pitch variances, humidity, temperature, cloud ceiling and wind direction and velocity of each day the piano was serviced. If we adjust pedal rods, make a notation on each pedal rod's statistics even if this takes three keys to do. Then, when we run out of top surfaces, we will have to remove the stack and start writing on the sides and bottoms of the keys. Hammer shanks are next (use a fine tip pen). Don't forget to record each time we remove a writing utensil or paper clip from the action; we might detect a pattern here, and be completely justified in chastising the customer. And wow, for an action overhaul, look at the information we could leave for posterity. This is all important stuff to know, right?

Really, folks, I agree completely with Dave, above. Can't we have some respect for the materials? The keys are not our personal log books. A discreet signature or mark is fine for major items such as stringing or rebuilding, but not chicken scratchings all over where we (and the customer) can see when we start to disassemble the piano for servicing.

My opinion — not anyone else's — all mine, mine, mine!

Jeff Franson: Tuning records and service history should be kept and maintained with the piano. Information including temperature, humidity, piano zero, pitch raises, replacement parts, before service can quickly note problems. Complete documentation like check lists, (*The Piano Action Handbook*, pages 3.3 to 3.7) adds to the value of the piano, aids in collection of warranty work from manufactures, insurance companies, shows a higher standard of care to the customer and the patient, the piano!

Bill Ballard, RPT: One thing which hasn't been mentioned in all this discussion of what such a log can tell us about the piano, is what it tells us about the piano's owner. If you

come across a log which lists steady service going back over a number of years, and if (by asking the owner) you find that this service which you see thus recorded was during his/her ownership, you can immediately compliment them on how well they've looked after the piano, what an exemplary owner they've been. If they've been sold on regular service once, they can be sold on it again. What's more, they're probably expecting to be sold it again, this time by you.

David Porritt, RPT: Does the owner of the piano get a vote on whether you write in their property or not?

Nossaman: No. I tell them *all* I've done this and I've not yet had anyone take offense at it. That's in somewhat more than 20 years. They seem quite happy to be absolved of the responsibility of keeping records themselves. They see the economy of the method and like the fact that the information is "lose-proof." Besides, most people think pianos are immortal anyway and leaving no evidence of service just reinforces that misconception with a false aura of perpetual virginity. I'll take information over mythology any day.

At the risk of staggering into the metaphysical, I'd like to pose another question. How do we service someone else's property without permanently changing it? I've hauled off a lot of someone else's hammer felt, dust, key trimmings, bent center pins, etc. I've evicted a lot of squeaks and clicks and changed the sound and response of a lot of instruments. It's part of the job. Pianos are not shrines, and we are not of the priesthood. Pianos are instruments and mechanisms and we are mechanics. The engine compartment of my pickup has plenty of stickers, notes, and cryptic markings inside. Personally, I'm thrilled about it because it means that someone else did the work and I didn't have to mess with it!

I'm not looking for a fight, just perspective.

I find these recorded dates to be valuable. Especially the temperature and humidity information. With just the dates, the customer can see for herself that the need for the pitch raise is a result of the number of years since the last tuning. That's quick, logical credibility. You don't have to spend an extraordinary amount of time gaining their trust. The decision and justification is already made by the visible history in the piano. You don't have to sell it, it's obvious. The temperature and humidity information is there for the folks who don't hear or understand any of the fifteen minutes of education you gave them as to what will happen to their tuning when the heat comes on in a couple of weeks when the weather changes. They couldn't be convinced to wait for the seasonal change, but they'll call to complain about the tuning when the heat comes on. Again, you have documented credibility for the call back. Often, looking back in your own records and producing the figures will jog the memory of the caller in your favor and eliminate the call back altogether.

Standing around at a piano with no history, speculating and justifying service on this speculation seems to me to look a tad less professional than logical extrapolation of cause and effect from a continuous service record that wasn't removed from the piano.

Just date, temperature and humidity. The jokes are delivered verbally. ☐

Altering the *Stretch* — Part III

By Jim Coleman Sr., RPT
Contributing Editor

Since the normal stretch provided by the FAC true readings gives a tuning curve which attempts to keep the double octaves almost pure, the single octave tends to be just slightly wider than the 6:3 octave in the upper bass, so that the 3rd partial of the upper note will be the standard to which the 6th partial of the lower note of the octave is tuned. If this amount of stretch is not sufficient for one's taste, the F3 stretch number can be altered or increased to make the octaves more like an 8:4 match, that is, where the 8th partial of the bottom note of the octave is matched with the 4th partial of the upper note. There may be certain pianos (usually 7' or 9') in concert situations where one would prefer a 10:5 match from the mid bass on down, and even a few situations where 12:6 matching of the bottom few notes would be advantageous.

The effect of increasing the F3 stretch number is exponential, but in the digressing direction. By that I mean that there are larger changes in the bottom of the scale than in the upper bass.

When tuning downward in the bass using the unaltered stretch numbers, it may be noticed that when the upper note of an octave is played, the dot rotation is usually slow and toward the sharp side of where the 6th partial of the lower note is to be tuned. If one alters or increases the F3 stretch number, more difference or rotation will be seen in this comparison. As one continues to increase the F3 stretch number, there will come a time when the lowest octaves will remind one of the great pipe organs which can rattle the stained glass windows of a large cathedral with that peculiarly slow roll of the octave. When one is young and learning to tune, there is a tendency to want to eliminate all beating in all intervals. Eventually it is discovered that there is something nice about hearing controlled beating especially in the low bass. This is an effect which happily accompanies the near matching of very high partials such as the 16th or the 32nd. It often is the matching of higher partials like these rather than the matching of lower coincident partials which gives one the sense that the low bass sounds in tune.

For an example, let us take our hypothetical case where page 1 had 8, 8, and 8 for stretch numbers F3, A4 and C6 respectively. If on page 7 we alter the F3 stretch number to 10, you can see below how it affects the widening of the lower octaves more than the upper bass octaves.

| | FAC #s | A0 | A1 | A2 | A3 | A4 |
|--------|--------------|-------|------|-----|-----|------|
| Page 1 | 8.0 8.0 8.0 | -14.8 | -5.4 | 0.4 | 1.4 | 10.0 |
| Page 7 | 10.0 8.0 8.0 | -16.0 | -5.6 | 0.4 | 1.4 | 10.0 |

However, it must be remembered that whenever we alter a stretch number from the true measured number, we must adjust the pitch at the border where the machine changes the partial to which it listens. So, in the above case, since the partial change occurs between B2 and C3 on the SAT, we have the following analysis:

| | B2 Partial 6 | C3 partial 4 | Diff. |
|--------|--------------|--------------|------------|
| Page 1 | 1.4 | -2.4 | 3.8 |
| Page 7 | 1.4 | -2.6 | <u>4.0</u> |
| | | | -0.2 |

Since the C3 is .2 cents lower, the B2 needs to be made .2

cents lower in order to preserve the smooth progression across the break which the true numbers projected on page 1. Another way of saying this is that the relationship of the 6th partial of B2 needs to remain the same toward the 4th partial of C3 in the wider stretch.

This requires resetting the pitch at the location of B2 by the amount -0.2 cents as you tune downward from C3 to B2. This will cause the values in the comparison of page 1 and page 7 to be as follows:

| | FAC #s | A0 | A1 | A2 | A3 | A4 |
|--------|--------------|-------|------|-----|-----|------|
| Page 1 | 8.0 8.0 8.0 | -14.8 | -5.4 | 0.4 | 1.4 | 10.0 |
| Page 7 | 10.0 8.0 8.0 | -16.2 | -5.8 | 0.2 | 1.4 | 10.0 |

From this example, one can see that there is greater change in the lower octaves than in the upper octaves of the bass when the F3 stretch number is increased. I tend to think of this as being a reverse exponential curve. There is probably a better name for it.

Additional stretch of the bass such as F3=12 and F3=14 would provide (including .2 cent and .6 cent break corrections) values respectively as follows:

| | FAC #s | A0 | A1 | A2 | A3 | A4 |
|--------|--------------|-------|------|------|-----|------|
| Page 1 | 8.0 8.0 8.0 | -14.8 | -5.4 | 0.4 | 1.4 | 10.0 |
| Page 7 | 10.0 8.0 8.0 | -16.2 | -5.8 | 0.2 | 1.4 | 10.0 |
| Page 8 | 12.0 8.0 8.0 | -17.2 | -6.0 | 0.2 | 1.4 | 10.0 |
| Page 9 | 14.0 8.0 8.0 | -18.8 | -6.8 | -0.4 | 1.4 | 10.0 |

There may be occasions where one would wish to have less stretch in the bass than is normally provided by the regular FAC numbers. This can be easily accomplished by merely reducing the F3 number and even possibly reducing the A4 number. First let's consider just decreasing the F3 number and compare it with the normal results in Page 1. We will put this new arrangement on Page 10.

| | FAC #s | A0 | A1 | A2 | A3 | A4 |
|---------|-------------|-------|------|-----|-----|------|
| Page 1 | 8.0 8.0 8.0 | -14.8 | -5.4 | 0.4 | 1.4 | 10.0 |
| Page 10 | 6.0 8.0 8.0 | -13.6 | -5.0 | 0.2 | 1.4 | 10.0 |

Next let's apply the correction at the border change from partial 4 to partial 6 between B2 and C3 on pages 1 and 10.

| | B2 Partial 6 | C3 partial 4 | Diff. |
|---------|--------------|--------------|------------|
| Page 1 | 1.4 | -2.4 | 3.8 |
| Page 10 | 1.2 | -2.2 | <u>3.4</u> |
| | | | 0.4 |

Since the 4th partial of C3 is higher than the true values would provide, the 6th partial of B2 is lower than the true values, B2 needs to be raised by .4 cents. You can see that when this correction is applied, the bass curve flattens out just a little bit.

| | FAC #s | A0 | A1 | A2 | A3 | A4 |
|---------|-------------|-------|------|-----|-----|------|
| Page 1 | 8.0 8.0 8.0 | -14.8 | -5.4 | 0.4 | 1.4 | 10.0 |
| Page 10 | 6.0 8.0 8.0 | -13.2 | -4.6 | 0.6 | 1.4 | 10.0 |
| Page 11 | 4.0 8.0 8.0 | -11.4 | -3.6 | 1.2 | 1.4 | 10.0 |

On page 11 you can see the effect of even greater altering of the F3 stretch number. It now begins to affect the upper bass a little more.

Increasing & Decreasing Stretch on the Same Piano

Up to this point, we have shown controls by either increasing or decreasing the normal FAC stretch numbers of a piano. Now we will investigate combinations of the two types.

A Lester spinet might be an example where one would wish

to compress the temperament and upper bass section and yet have a wider, deep bass. The decreasing of the A4 number would have the effect of tightening up the octaves of the upper bass and tenor, while the expanding of the F3 number would have a greater effect on the lower bass where more stretch is needed on this piano.

The Lester spinet which has triple unisons in the top bass section cannot tolerate a 6:3 type octave. A decreased number for A4 would help accomplish this. If it were accompanied by an increased F3 number which would not affect the upper bass much at all as shown in previous articles, but would increase the stretch downward in the low bass, we could have the best of both solutions.

Here are the actual numbers for a Lester spinet:

| F3 | A4 | C6 |
|------|-----|-----|
| 12.8 | 5.8 | 8.2 |

Let's make this Page 12. On Page 13 we will decrease the A4 and then make the pitch correction and the break correction.

| | F4 | A4 | C6 | Pitch A4 | Break B2 | C3 | Diff. |
|---------|------|-----|-----|-------------|-------------|------|------------|
| Page 12 | 12.8 | 5.8 | 8.2 | 7.2 | 1.6 | -2.1 | 3.7 |
| Page 13 | 12.8 | 5.3 | 8.2 | <u>6.6</u> | 1.6 | -1.9 | <u>3.5</u> |
| | | | | +6 | | | +2 |

Actual SAT readings for Page 13:

| | F4 | A4 | C6 | A0 | A1 | A2 | A3 | A4 |
|---------|------|-----|-----|-------|------|-----|-----|-----|
| Page 13 | 12.8 | 5.3 | 8.2 | -12.4 | -3.6 | 0.9 | 0.9 | 6.6 |

Pitch Correction for Page 13 = +.6 Break Correction = +.2 below C3

| | F4 | A4 | C6 | A0 | A1 | A2 | A3 | A4 |
|---------|------|-----|-----|-------|------|-----|-----|-----|
| Page 12 | 12.8 | 5.8 | 8.2 | -13.2 | -4.0 | 0.8 | 1.0 | 7.2 |
| Page 13 | 12.8 | 5.3 | 8.2 | -11.6 | -2.8 | 1.7 | 1.5 | 7.2 |

Now, let's widen the low bass by increasing the F3 number.

| | F4 | A4 | C6 | Pitch A4 | Break B2 | C3 | Diff. |
|---------|------|-----|-----|-------------|-------------|------|------------|
| Page 12 | 12.8 | 5.8 | 8.2 | 7.2 | 1.6 | -2.1 | 3.7 |
| Page 14 | 15.0 | 5.3 | 8.2 | <u>6.6</u> | 1.6 | -2.2 | <u>3.8</u> |
| | | | | .6 | | | -.1 |

Actual SAT reading for Page 14:

| | F4 | A4 | C6 | A0 | A1 | A2 | A3 | A4 |
|---------|------|-----|-----|-------|------|-----|-----|-----|
| Page 14 | 12.8 | 5.3 | 8.2 | -13.4 | -3.8 | 0.9 | 0.9 | 6.6 |

Pitch Correction for Page 14 = +.6 Break Correction = -.1 for below C3

| | F4 | A4 | C6 | A0 | A1 | A2 | A3 | A4 |
|---------|------|-----|-----|-------|------|-----|-----|-----|
| Page 12 | 12.8 | 5.8 | 8.2 | -13.2 | -4.0 | 0.8 | 1.0 | 7.2 |
| Page 13 | 12.8 | 5.3 | 8.2 | -11.6 | -2.8 | 1.7 | 1.5 | 7.2 |
| Page 14 | 15.0 | 5.3 | 8.2 | -12.9 | -3.3 | 1.4 | 1.5 | 7.2 |

An analysis of the above 3 lines will show that the A3-A4 octave is tightened up in pages 13 and 14. The A2-A3 octave is tightened in page 13, but less in page 14. Octave A1-A2 is only tightened by .3 cents in page 13 and only by .1 cent in page 14. Octave A0-A1 is narrowed by 2.8 cents on page 13 and by only 1.0 cent on page 14. So, in general we can say that this is a way to tighten the center of the piano and keep the low bass about the same.

Widening The Center

A similar thing can be done for the treble where one may wish to widen the center of the piano, but curtail the widening in the bass octave. A suggestion would be to widen the A4 stretch number by perhaps .5 cents and decrease the F3 stretch number by 2 cents. By following the above principles, you can experimentally find out what works best for your particular situation.

Loose Ends

Just a few words about what Dean Reyburn has called parainharmonicity. In bass strings, as well as treble strings, there can be some irregularity in the way inharmonicity works. Some of the factors we know about are: downbearing effect, fit of the strings around the bearing points, uneven string loading or windings, the proximity to soundboard edges, the effect of bridge aprons, bridge undercutting, bridge notches, end-of-bridge effects, etc. Drs. Dave Roberts and Al Sanderson have contributed greatly to our understanding of the effects of the unwrapped lengths of bass strings.


Summary of Series

To summarize this series there are three main points to remember.

- 1) After calculating the FAC stretch for a piano, one can reset the SAT to a pitch which will make the fundamental of A4 be at 0.0 cents.
- 2) One can change the A4 stretch number in order to increase the stretch of the entire piano, but whatever amount of change is introduced, the same amount must be added to the SAT reset when one reaches C5. Increasing the A4 stretch number by .5 cents will result in flattening C1 about .6 cents and sharpening C5 by .2 plus .5 reset value at C5. It will affect C7 by 1.0 plus .5 reset value of C5. It will affect C8 by .4 plus .5 reset value of C5. Increasing the A4 stretch number by 1 cent will result in a flattening of C1 by 1.5 cents, sharpening C5 by 1.5 cents, sharpening C6 by 1.6 cents, sharpening C7 by 2.7 cents and sharpening C8 by 1.8 cents.
- 3) If additional stretch is used, it may be well to reverse the stretch a little at the extremes of the keyboard by reducing the stretch numbers of F3 and C6. Increasing the C6 stretch number by one cent will affect the C8 value by about five cents, but will only affect C7 around one cent. Increasing the F3 number by two cents will result in a flattening of C1 by about one cent.

Conclusion

All of the above estimates are based upon a moderate set of stretch numbers like, 7, 7, and 7. More radical changes from these numbers will produce more radical results in sharpening and flattening the various sections of the piano. Of course, if the measured starting points are different, the results will be slightly different.

The main reason for wanting to change the A4 stretch number is to provide a little wider temperament octave. A secondary reason would be to provide a greater stretch in the entire piano range. These simple guidelines are easy to apply in the everyday normal tunings to let the SAT help you to tune the way you like to tune. It is easy to see that there is an almost unlimited number of ways you can tune a piano and still keep it relatively consistent. 

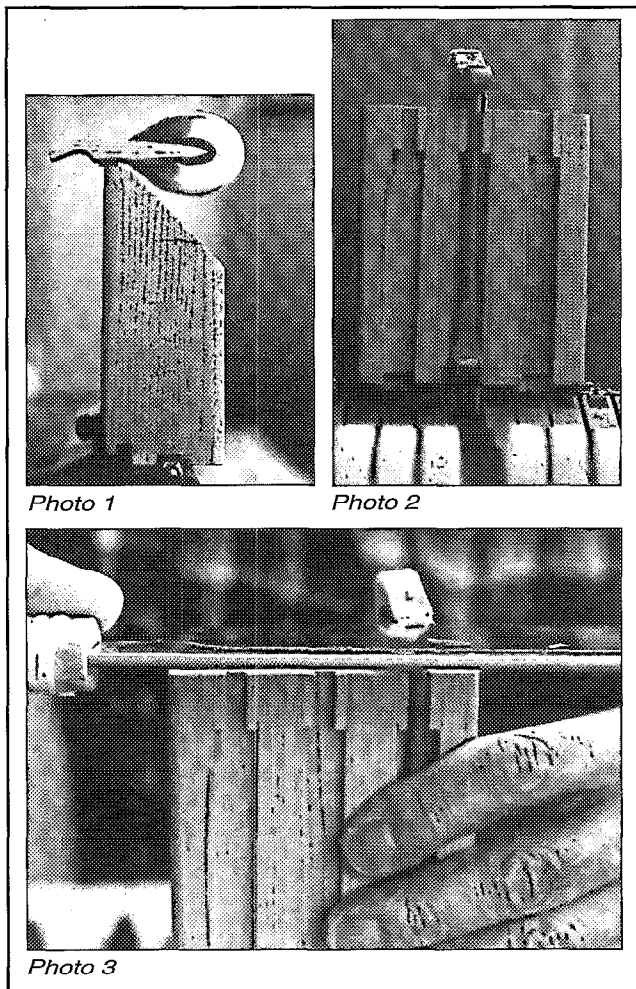
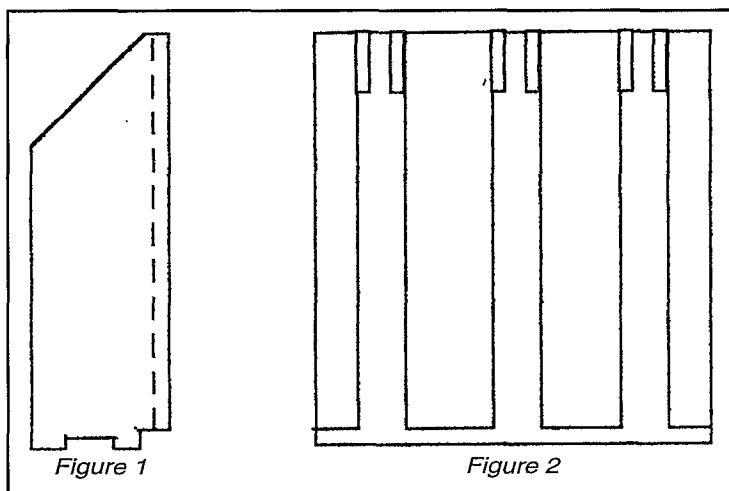
Grand Hammershank Trimming Block

By Ted Sambell, RPT
Calgary, Alberta Chapter

When a set of grand hammers has been installed on new shanks, one is confronted with the operation of trimming off the protruding shanks flush to the hammer moldings. Having tried just about every method going, and never being too satisfied with any of them, I was lucky enough to fall heir to a solution which I believe to be the simplest and most efficient to date.

This happened during the IAPBT


tour in June 1989, when the Japan Piano Technicians Conference took place in Kyoto. While I attended a meeting, Yat-Lam Hong attended a class, taught by an instructor from the Kawai factory. Yat-Lam saw an unfamiliar item in this man's equipment, and upon expressing curiosity, was given a demonstration. It was a wooden block, designed to stand vertically on the hammer flanges, with grooves to accept and hold each shank steady while sawing the end away. Yat-Lam said the Kawai man cut an entire set in five minutes, so neatly that there was no sanding necessary. The accompanying illustration shows the block. The end view (Figure 1) shows the cross section with a 45 degree bevel to provide room for the hammer head, on the bottom edge a half-inch groove for the flange screws, and a rabbet for the dropscrews one-quarter inch high by seven-sixteenths wide. On the face (Figure 2) which in use is towards the hammer tail, are three grooves, each identical at one-half inch wide by a quarter inch deep. At the top of the grooves are two one-eighth by three quarter inch pieces added to reduce the width to a quarter inch. The need for three grooves becomes obvious when cutting the end shanks at the bass and treble; otherwise most of the block would be dangling over the end of the hammer flange rail. Usually the middle groove is used. (Photos 1 and 2 show the block in place on the hammer flanges, with a hammer shank in the middle groove.)



will be the only equipment needed. A piece of hardwood, one and one-half inches thick, is cut to four and three-eighths inches high by three and three quarter inches wide. (Pinblock material is ideal) Using the regular saw blade tilted to 45 degrees, the bevel is cut to three-eighths inches from the face. The blade is then exchanged for the dado blades, half an inch wide, and now all the grooves and the rabbet can be cut. The two outer grooves can be cut with one setting of the fence by making the first cut, then turning the workpiece end for end to make the second cut. If an adjustable dado blade is used, one should make doubly sure it is well tightened. The project is completed by gluing in the small pieces which narrow the grooves to a quarter inch. The outer grooves are one-half inch in from the ends.

Using The Block

A Japanese saw is absolutely obligatory, not merely because these saws cut so quickly, but if the teeth snag, the block will not lift because these saws cut on the pull stroke, as I am sure most are aware. I recommend the saws used for dovetails, with 25 teeth per inch. The blades are about 10 inches long. The flush cutting type can also be used, but the blades are shorter, which slows the job. One hand holds the shank in the groove while cutting (see Photo 3). I admit that it takes me more than five minutes to cut a set, in fact all of ten, and I usually like to give two or three strokes with a sandpaper file, in order to give a finished appearance. Of course, this takes a little more time.

In conclusion, I owe thanks to the Kawai technician for sharing his techniques, and especially to Yat-Lam Hong for the neat sketch he made and his clear description of the tool. It has saved me a good deal of time and trouble. 

Making The Block

A table saw with a regular blade and dado blades

An Essay on the History of Tuning • Part V

**By Skip Becker, RPT
Northeast Florida Chapter**

Defining the Baroque

The Baroque era saw the biggest change in philosophy Western civilization had yet experienced. Renaissance scientists had posed the awful question: was the world a harmonious creation, or an incredibly complex machine?

Baroque science was finding a machine; and if the clock workings of this vast machine could be understood, the knowledge could be used to improve the condition of mankind. This was exciting information, and for the most part it proved true. Conditions for everyone were getting better (although in some places it happened sooner than in others). This change in thinking from “medieval to modern” was, for historians, the signal of modern times. Many scholars want to start the Baroque era, the period which saw the birth of modern science, around 1580, so that they can include the empirical experiments of both Galileis. They all love to end the Baroque in 1750, the year Bach died, and also the year James Watt invented the steam engine — neatly beginning the Industrial Revolution.

Baroque Science Meets the Ancient Greeks

The first “modern” scientists went through that pile of books left by the ancient Greeks very thoroughly. Using the new scientific method to separate fact from legend, they soon discovered that those ancient Greeks had gotten an awful lot right. Philosophy, mathematics (in particular geometry), natural science (including atomic theory), and medicine (not to mention music) all had roots in ancient Greece. There were also curious ideas such as democracy, and republican government (those Greeks had made a science of politics!). And just how did Pythagoras know, 2,000 years earlier, that the Earth was a globe, hanging in a void? That the globe was spinning, and the motion of the Sun and stars was merely “apparent” motion? The scientists of the 17th century were very impressed. They could not prove that all the sciences were interrelated (such notions remained speculative), but it certainly looked like Pythagoras was right about numbers being the basis for everything.¹ Appropriate ideas from ancient Greece were burnished, and placed in the foundations, or even on the top shelves of the emerging sciences. In a sense, this was Pythagoras’ finest hour. Betting would probably have been 3:2 that the Master was right about the “Music of the Spheres” as well.

Old School Still In Session

It was the fervent belief of Renaissance and early Baroque *musici* such as Zarlino, the Galileis, Mersenne, and others, that music could be studied scientifically. But by the end of the 17th-century, it was apparent that “musical science” wasn’t panning out. Compared to, say, the regular effects of gravity manifested by dropping a ball from a tower, the effects of music were quite unpredictable. We know that there was great tuning conformity,² due to the doctrine of affections. But it became unscientific to attribute specific

emotions to particular keys (despite the German propensity for doing so).³ To be sure, sound could be studied; pitch, tone, harmonics, even tuning and temperament were quantifiable. All these went into the new science of acoustics. In that sense, Music donated her children to science. But the “experience of music,” the Muse herself, resisted all attempts to be quantified (She still does). And the *musici* weren’t all that impressed with the new “science of acoustics,” as it was comprised wholly of their table scraps. Baroque *musici* found that the ideas of the old school, the doctrine of affections, were best able to shed light into the realm of the Muse. Their only tool was the ancient monochord of Pythagoras, and perhaps because of this, they all shared his mathematical/musical view of the universe. It is not possible to do more than a few calculations without becoming convinced that Pythagoras was right: music is indeed based in numbers.

The Monochord

From the time of its inventor, Pythagoras, the monochord remained a viable musical device until the late 19th century. This is a run of 25 centuries; pretty good for a one-string instrument. Musicians made their own, usually 80 to 120 centimeters in length. There was no standard pitch, so it was usually tuned to the lowest note the musician could comfortably sing. In fact, the monochord was originally a practical tool for singers, used to determine proper intervals. This tuning function passed to the keyboards (no doubt as soon as they were available), but the monochord continued to be useful to the *musici*. As we have seen, the earliest temperaments were scale divisions based on monochord string lengths, tempering determined by either mean (average) distances, or Euclidean geometry — the risqué method favored by Grammateus in 1518. In fact, the biggest scandal of Grammateus’ career involved his personal monochord, which, in 1526, was discovered to have demarcations for both D# and Eb! Enforcement of tuning rules was much more strict back then, but fortunately for Grammateus, he was safely dead. This inclusion of harmonic pairs is thought to be the inspiration for split keys. He was also the first to suggest a standard string length of 100 units.

The monochord is a very simple instrument: the combination of a string and a number line. We think of it as a way to study musical intervals, but using the musical number line was an invaluable aid to the study of mathematics.

After arithmetic tables were memorized, the veracity of any calculation could be determined immediately by a musical tone. Monochords were a musical slide-rule. Complex calculations (Grammateus worked with quadratic equations), such as determining the proper ratio of a Pythagorean semi-tone (256:243), could be accomplished quite easily on this instrument. The generality of tuners (the best of which continued to be instrument makers) didn’t use them. Most monochords were simply too inaccurate. Finger or bow pressure on the string could distort pitch as much as 1/6th comma. Much better results could be obtained by singing intervals, or using the new technique of listening to beats. Still, the *musici* stubbornly clung to monochord usage, but they made their own, often very

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An Essay on the History of Tuning

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elaborate instruments.⁴

This devotion was because of the didactic nature of the monochord. The most common and fundamental usage has today been forgotten. The monochord was a window into the musical nature of the universe. It was used to show the "existing unity between man and the cosmos. Monochord-based diagrams and sets of instructions for determining consonances abound in both speculative and practical Treatises of this era. The divided string could be used to represent the solar system, zodiac, the muses, or even bodily functions; often this being tuned by the hand of God" (*New Grove Dictionary of Music*). The influential Jesuit Athanasius Kircher, one of the last practitioners of speculative music, wrote odes to the Great Harmost (that is, God in the incarnation as the great "Tuner of human souls"). He petitions: "tune the enneachord (nine-stringed 'monochord') of my soul to thy divine will; play upon all the strings of my soul to the praise and glory of thy name, that I will love thee with a Seraphic ardor, and seek thee constantly with a Cherubic mind."

Robert Fludd

The old speculative school had many champions. Robert Fludd (1574-1637) was far and away the foremost. He is one of the last examples of the "Renaissance man."

Most of his work is not original, but is an erudite compilation of the theories and philosophies of medieval times. His encyclopedic works (he wrote his own version of "universal harmony") are among the most beautifully illustrated in the 17th century. Many of his drawings are mnemonic devices whereby large amounts of information are encoded in diagrams. Like Mersenne, he tried to close the gap between speculative and practical science. Unlike Mersenne, his speculative works embraced hermetic, or magical aspects of philosophy (during a time when most people believed in the efficacy of magic). It is believed that his works reflect the ideals of the "fraternity of the Rosy Cross," and Fludd is one of the historical figures suggested as the father of modern freemasonry.

His mundane monochord (see diagram insert) is a visual representation of the *Music of the Spheres*, a summation of the "mathematical/musical" nature of the universe. The Earth is an octave below the Sun, which is, in turn, an octave below the highest heaven. Each planet is assigned a diatonic musical position on the monochord, and

the arrangement provides us with the key to the arcane science of astrology (which turns out to be another musical science, based on harmony!). The laws of harmony and dissonance were well known: The Moon is always a harmonic 4th in conjunction with the Earth.

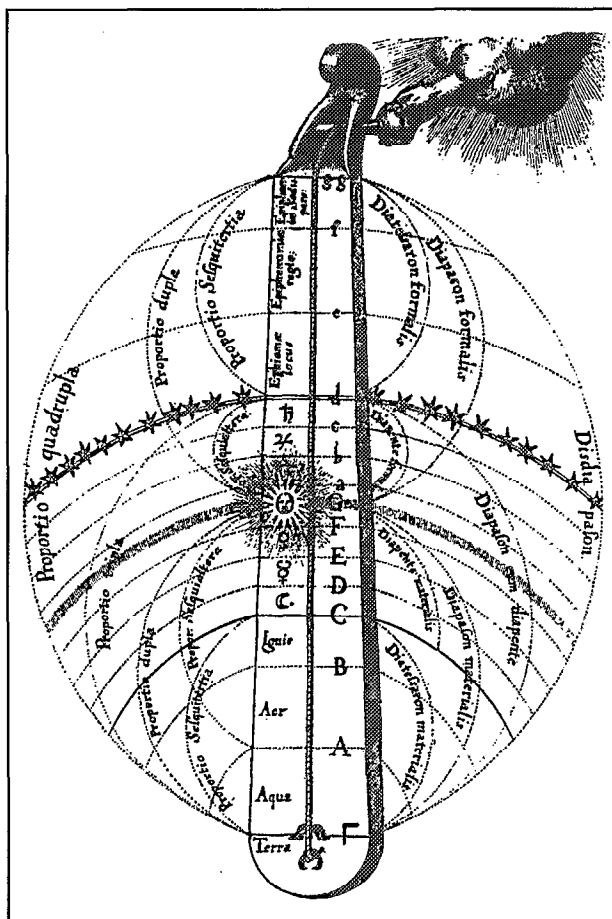
Mercury and Earth always create the interval of the perfect 5th. But should the Moon and Mercury enter the same zodiacal house (this happens frequently), the dissonant interval of a major 2nd is produced, potentially producing "discord" here on earth. Likewise, the conjunction of Saturn and Jupiter always produce the dissonant 2nd (this was considered to be the main source of illness). The benevolent or malevolent effects of the planets were thus determined by harmonic laws.

For us in the 20th century, the over-simplification above makes the "science" of astrology seem ridiculous. Mersenne, Kepler and other "new scientists" of the 17th century felt the same way. They attacked Fludd, and his unquantifiable notions. The modern science of astronomy was being born, and the new astronomers condemned Fludd's use of "mathematics-tinged magic" to explain the nature of the universe. Fludd saw his ideas driven from the realm of the new "natural science" into the realm of the "occult," to be branded by later historians as "superstition." It is interesting to note that these particular ideas just don't die. They continued to be influential in the Baroque, especially to musicians (and other "meta-physicians"). They also survived

by "going underground." They were incorporated as the core beliefs of the Rosicrucians and Freemasons (the secret societies of which Fludd was alleged to be one of the fathers). Fludd is best remembered as the "Rosicrucian Doctor of Oxford." Some of his music is extant in Oxford's library.

Johann Kepler

Generally credited as the father of modern astronomy, Kepler (1571-1630) was also a mathematician, musician (no surprise there), and tuner. He wrote that he would like to have learned tuning from Lasslo. His planetary observations, and his interpretation of data are a model of empirical science. His own data, combined with the observations of his mentor Tycho Brahe, proved conclusively that the planets orbited the Sun in great ellipses. Because of this, modern historians want to fit him in a rather ill-fitting white laboratory coat, or consider him a rational genius trapped in superstitious times. As Jamie James points out, this can only be accomplished by not reading any of his writings.⁵ He made a living (albeit a poor one) casting



Fludd's Mundane Monochord, from Manly Hall's *The Secret Teachings of All Ages*. © The Philosophical Research Society, Los Angeles, CA. Reproduced with permission.

horoscopes, and it was his intention to use the telescope to develop a new astrology, based on his scientific research (Kepler had decided that no event should occur in the heavens of which he should be unaware). He had been "thoroughly warmed by taking a liberal draught from the bowl of Pythagoras," whom he acknowledges as his Master. Contrary to the impressions of most historians, his motivation in astronomy was to prove the Pythagorean mathematical/musical nature of the universe. At a time when most astronomers were suspecting that the division of the heavens into the zodiac was arbitrary, Kepler offered "proof" that nature was often improved by a 12-fold division. Just look at the calendar, or your watch, or the keyboard. He felt sure that God thought likewise.

Kepler was the most widely read and influential astronomer of his day. His great work, *Harmony of the Universe*, was another attempt to reconcile the ever widening gap between speculative and practical science. His planetary laws are still valid. Although his third planetary law is known as the "harmonic law," he discovered, to his great dismay, that the orbits of the planets were not laid out in the ratios of the musical scale. There was no confluence of the octave, 5th, and 4th present in the heavens. Kepler thought there could have been no harmony in this arrangement of the planets since the "Day of Creation;" and the planets would not be in a harmonious alignment again until the "Day of Judgment." However, through his amazing genius, he did invent music in the solar system. He worked out a complex scheme whereby each planet had a particular voice (pitch) and range of notes. He thus added the concept of polyphony to the *Music of the Spheres* (but any harmony was perceptible only to Reason).

He did discover one musical ratio: 5:4, the major 3rd. This is, of course, the only ratio disallowed by orthodox Pythagoreans!⁶ This caused him to break with conventional Pythagoreans, in particular Fludd (whom he singled out in a preemptive attack): "Where are the numbers, without which I am like a blind man stumbling in the dark?" Fludd, never one to avoid an argument, responded that Kepler had missed the point. The mundane monochord was a metaphor. Indeed, the very notion of measuring the universe was wrong. "For it is for the vulgar mathematicians to concern themselves with quantitative shadows; the alchymists and Hermetic philosophers, however, comprehend the true core of natural bodies" (*Demonstratio analytica*).

The new scientists (and later historians) all weighed in on Kepler's side. They succeeded only too well. After Kepler, the *Music of the Spheres* was divorced from the science of astronomy. Another great irony in the history of music is that such a devoted Pythagorean (perhaps the first person since the Master himself to actually hear the *Music of the Spheres*), should have been the cause of tossing it into the dust-bin of science. Kepler's life was full of such irony. While he was writing his "great scientific work," his mother was arrested and charged with witchcraft. He was eventually excommunicated, and died a pauper during a bitter winter quest to obtain imaginary "back wages." His most astounding contribution to modern science has been largely ignored. His astronomical observations led him to conclude

There was no
standard
pitch, so it
was usually
tuned to the
lowest note the
musician could
comfortably
sing.

that when the planets drew within close proximity, they were actually attracted to each other. And he suspected that the force of that attraction was in proportion to the inverse square of their masses. Using Vincenzo Galilei's musical ratio, within the Pythagorean concept of the mathematical/musical universe, allowed Kepler to anticipate Newton's discovery of the law of gravity by some 40 years. He unfortunately lacked the mathematics to prove it (Newton's inspiration was not an apple dropping on his head; he read Kepler). Newton's contribution (Newton was also a devout Pythagorean) was "merely" to invent the necessary differential calculus. Hindemith's 1957 opera *The Harmony of the World* (*Die Harmonie der Welt*) is the story of Kepler's life.

Andreas Werckmeister

Werckmeister (1645-1706) is probably best known as the inventor of ET, although the best of historians will concede that his contribution to tuning was really the penultimate (inexorable) step towards the true equality of the keys. Werckmeister would be very unhappy with this attribution. Although he was not educated at a university, he was an extremely well read self-educated *musici*. His writings have never been completely translated (scholars complain of difficult German), but they show he was very familiar with the classic music theorists of the past. He was definitely of the old school, believing literally that "Music is a great gift and miracle from God, an art above all arts because it is prescribed by God himself for his service." (*Hypomnemata musica*)

Historians consider him a quaint fossil. He is the classic example of a 17th-century provincial German organist. In his time, he was also well known as an organ "examiner" ("tuner-technician" to us). His thought was pure medieval speculation, which is perhaps why his writings have never been fully translated. He wrote on the use and misuse of music (he must have hated the opera). For him, music was a speculative science, related most closely to theology and mathematics. It simply did not belong outside of the church. No other writer in the Baroque so totally regarded music as God's work. "In his treatises he subjected every aspect of music to two criteria: how it contributed to an expression of the spirit of God, and, as a corollary, how that expression was the result of an order of mathematical principles emanating from God" (*New Grove Dictionary of Music*).

He was also a disciple of Kepler, and to that extent he was thoroughly modern for his times. Like Kepler, he believed in astrology. He thought that musical harmony reflected the harmony of creation, and that the *Music of the Spheres* was created to influence humans on Earth. His theological extraction is found in his temperaments. His C-major triad was not just symbolic; when one listened to a triad of perfect intervals, one was in the actual presence of the trinity. He even broke it down: 1 = the Lord, 2 = Christ, and 3 = the Holy Ghost. He wrote three "correct temperaments," which were correct in the theological, astrological and mathematical sense. It should not be a surprise to learn he gave his tuning instructions in monochord string lengths.

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His elegant temperaments are the very definition of harmonic balance. They contain the greatest amount of harmony available to a circulating temperament, blended with eight perfect (Pythagorean) 5ths. His 3rds vary in size from pure to Pythagorean, which must have seemed the most natural limit in the world to Werckmeister, "as ancient ears had heard nothing else."⁷ He raised the Augustinian concept of "Well-Tuned" to the next level. "Well-Temperament" (Wohltemperierte) was a kind of a prize. If you were a good enough musician to tune a correct well-temperament, you could have a foretaste of the heavenly harmony to come.

For him, music was a speculative science, related most closely to theology and mathematics. It simply did not belong outside of the church.

His temperaments had an added practical bonus. He could convert an organ tuned to Pythagorean intonation (still common in Baroque Germany) by adjusting only four or five notes, in about 45 minutes per rank. This was a very neat trick for a tuning meister. Towards the end of his life, his philosophy of tuning became a little more liberal. This is not to suggest that he ever approved of music outside the church; but if you didn't like any of his correct temperaments (and also found no solace in Pythagorean intonation), Werckmeister suggests that you might find the harmony you're looking for with split keys (he would have been happy to install them for you). If this was impractical, you might try another of the German circulating temperaments, perhaps even the "equal" one.

Werckmeister's writings were an important part of musical science in Baroque Germany. He was much more mainstream than historians would want you to believe. His works are quoted by all the other theorists of his time. "Good tunings" had become a technical term, designating any temperament with circulating 5ths. In Germany, "Well-temperament" became a specific type of "good tuning;" one with great harmonic contrast, and a Pythagorean limit on major 3rds. It should be noted that the term "Well-temperament" was not used in Baroque England, but they did use "good tuning."

There can be no doubt that Bach read, and was heavily influenced by, Werckmeister (it is not difficult to find corresponding numerical symbolism in Bach's music). Bach was undoubtedly familiar with many temperaments. His monochord was well used, as were those of his students. In view of all this, it seems clear to this writer that Bach composed the *Well-Tempered Clavier* specifically for use with Werckmeister's temperaments. To the great fortune of us all, Bach brought the well-tempered clavier out of the church. The title page of the *Well-Tempered Clavier* included: "for the profit and use of

musical young people who are eager to learn, and also for the special enjoyment of those who are already accomplished musicians." Another large irony in the history of music is that the *Well-Tempered Clavier* is now generally thought to be Bach's proof of the validity of equal temperament.

Notes

1. Galileo wrote: "the book of Nature is written in mathematical symbols." Descartes' aim was "to reduce all of Nature to mathematical law."
2. Written descriptions of the character of the keys are surprisingly uniform. See Rita Steblin's *A History of Key Characteristics in the Eighteenth and Early Nineteenth Centuries*.
3. Melodies weren't necessarily restricted to any particular key, but it was generally agreed that they did better in some key signatures than in others. There was no melody that could not find a key.
4. Louis Saveur made a very accurate device. In the early 1700s, he examined the actual temperaments that were in use. He was able to determine that the best tuners (instrument makers) used intervals similar in size to those found in the 1/5 comma meantone.
5. Jamie James, author of *Music of the Spheres*.
6. The orbit of Jupiter varies in speed, with 5:4 being the ratio of the fastest rate to the slowest.
7. Contemporary musical tuner Paul N. Bailey, RPT, suggests that the Pythagorean limit compels well-temperaments to have 12 major 3rds (as opposed to the traditional Baroque eight 3rds with four diminished 4ths). It was by no means universally accepted. Many musicians still utilized the effective diminished 4ths. According to Owen Jorgensen, for every "gain" in temperament mechanics (toward the equality of intervals), there is a corresponding loss in expressiveness.



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Thanks for 10 great years!

Randy Potter, R.P.T.



Telling All About Liszt

By Richard M. Brown, MD, RPT
Portland, OR Chapter

Professor Alan Walker, faculty member of the McMaster University, Hamilton, Ontario has completed his *magnum opus* with the 1996 publication of the third volume of the life of Franz Liszt. The 1700 pages represent 24 years of scholarship largely devoted to this project. These volumes will likely remain the principal reference text for decades to come. The author has personally visited the sites where Liszt lived and worked, and has acquired an international reputation as an expert on *Lisztiana*. For most of us, having imbibed distortions passed along by word-of-mouth over generations, these books will prove astonishing for the myths quashed as well as the scandals exposed.

Before you rush out to acquire a set of books costing more than \$100, it may be prudent to ask yourself what you wish to know about Liszt and his world. For all its merit as a generally authoritative reference, it frequently digresses into critical reviews of prior biographical attempts, and the extensive microprint footnotes probably comprise as many words as the formal text. Even with such meticulous annotation, errors creep in which have yet to be expunged even from the "revised" first volume. As a biography, it leaves one puzzled regarding the motivation for many of Liszt's actions. If the purpose of biography is to enable the reader to understand the motivation behind the subject's actions, and to morally profit from a knowledge of his life, then this biography may not be particularly successful.

Principal sources for Professor Walker include the first "authorized" biography by Liszt's devoted student, Lina Ramann (1833-1912) and the collection of 4,000 letters by La Mara published between 1893 and 1918 (a project completed when she was 81 years old). Subsequent discoveries include correspondence with Agnes Street-Klindworth confirming an intimate liaison with Liszt spanning years, and a compelling case is made that Liszt knew of her role as an espionage agent for Metternich. The account of Marie d'Agoult's elopement with Liszt occupies a number of chapters that are very well written.

Liszt's story has all the contents of epic tragedy, and Walker associates Liszt's life with elements of Shakespeare's *King Lear*. Despite a Catholic upbringing and a personal identification with the Franciscan order since childhood, Liszt's three "significant" love affairs were with married women, two of whom deserted their husbands in order to live with Liszt. Countess Marie d'Agoult, the best known to posterity (Chopin's *Opus 25 Etudes* are dedicated to her) was 28 when she met the 21-year-old Liszt in 1833. Her husband, Count Charles d'Agoult, 15 years her senior, wisely kept his dignity and quietly took care of their daughter, Claire, when Marie eloped with Liszt to Geneva in 1835. Marie's pregnancy with Liszt's baby was the precipitating

cause of her desertion. Of the three children forthcoming by Liszt and Marie, Daniel died at age 20 of progressive tuberculosis, and Blandine died at age 27 following complications of childbirth. Cosima married Liszt's brilliant student and devoted protégé, Hans von Bulow, bearing him two children before deserting him in favor of Richard Wagner, whom she eventually married.

Liszt and Chopin met in Paris in 1832, and actually performed together with Ferdinand Hiller in Bach's *Concerto for 3 Pianos*. Chopin dedicated his *Opus 10 Etudes* to "his friend, M. Liszt." Their friendship ended in 1835, when Chopin severed contact following Liszt's assignation with Marie Pleyel at Chopin's rue Chaussée apartment. Chopin preferred the piano manufactured by Camille Pleyel, and was provided the finest of Pleyel's instruments wherever he lived or performed. One can imagine his indignation and sense of betrayal once he discovered that Liszt had surreptitiously slept with Camille's wife, Marie, at Chopin's Paris lodging! This is the first convincing explanation for the Chopin-Liszt rupture and represents no small feat of scholarship on Walker's part.

The literature of the Romantic period is filled with nonsense regarding the Thalberg-Liszt "duel," Sigismond Thalberg, the Swiss virtuoso, was only one year younger than Liszt, and would eventually complete a very successful American concert tour. In 1837, Princess

Cristina Belgiojoso invited both Liszt and Thalberg to her Paris salon, then "leaked" word to the city's music critics who smelled blood and a good story. The final verdict: two victors, no vanquished. All were enthralled beyond description, as both artists outclassed even themselves. One is tempted to

compare the Rubinstein-Horowitz rivalry of the 1930s where each must have smiled all the way to the bank.

The fabled performance of Nicolo Paganini in 1831 at the Paris Opera House motivated Liszt to a phenomenal period of technical development, from which he emerged so incredibly proficient that he subsequently hardly ever practiced. Clara Schumann (née Weick) was once mesmerized by Liszt's playing, but grew to detest his music, and therein lies one source of Liszt's lifelong battle with depression. He aspired to recognition as a composer, and actually split the Romantic movement into a Liszt-Berlioz-Wagner division that the "mainstream" would never accept. A prescient commentary by the Paris music critic Francois Fetis (*La Revue Musicale*, 1828): "What a pity that natural gifts such as those possessed by M. Liszt are employed solely to convert music into the subject for a thimble-rigger and conjurer. This is not for what this enchanting art is destined ... profit from time where your still-virgin faculties permit your talent to change direction; take a step back and be the

Continued on Next Page

A Review of *Franz Liszt, Biography in 3 Volumes*, By Alan Walker.
Vol. #1 — "The Virtuoso Years," 1811-1847, 481 pp, \$22.50, paperback, Cornell Univ Press, 1983, revised edition, 1988.
Vol. #2 — "The Weimar years," 1848-1861, 626 pp, \$39.95, hardback, Alfred A. Knopf, 1989.
Vol. #3 — "The Final Years," 1861-1886, 594 pp, \$50, hardback, Alfred A. Knopf, 1996.

Telling All About Liszt

Continued from Previous Page

first among the young pianists, and have the courage to renounce brilliant frivolities for advances that are more substantial. You will reap the rewards."

Chopin is supposed to have dipped a quill pen into an inkwell and flicked the top over blank music paper, splattering it with random black spots, then saying: "That's Berlioz!" Whether true or not, such was the opinion of the conservative Romantics, who eventually hailed Brahms as their logical successor. George Eliot, in a visit to Weimar with her live-in publisher, George Henry Lewes, rather conspicuously walked out of Wagner's *Lohengrin*. Subsequently Lewes wrote that "we came to the conclusion this was not for us." The painter Eugene Delacroix kept a journal, in which Chopin's comments are as follows: "As for Berlioz, the creator of noisy fanfares in brass, he strikes chords and fills in the intervals between as he can. Remember what Mozart said: 'Violent passions must never be expressed to the point of causing disgust. Even in horrible situations, they must never wound the ears and cease to be music.'"¹

Those of you who have read George Eliot's masterpiece, *Daniel Deronda*, will probably recognize elements of Liszt in the character of Klesmer, the piano virtuoso and vocal instructor to Gwendolyn. In a remarkable century filled with literary masterpieces, this is one that still speaks to us compellingly today. One senses, unfortunately, that Professor Walker fails to sustain narrative interest, and might have profited by a closer scrutiny of George Eliot's style. It is not that he attempted too much, although he claims that "it takes a life to write a life." One can portray a life in a way that keeps the reader riveted to the page, as proven by Ernst Pawel in his biography of Franz Kafka.² In less than 500 pages, one closes the book with reverence, thankful for the opportunity to know the soul of Kafka as revealed in an unforgettable study of his life. By the time one has come to the last of 1700 pages of *Lisztiana*, one really does not identify with either the man or the focus of his goals. He remains an enigma, and the understanding sought by the reader remains elusive.

For those such as myself with a particular interest in the medical aspects of genius, Walker's scholarship is disappointing. He makes statements that cannot be supported by the medical literature. In Volume #1, he gives Chopin the diagnosis of tuberculosis (Dr. John O'Shea compellingly makes a case for "cystic fibrosis"), and Schumann is labeled with "tertiary syphilis" (yet his wife, Clara, lives another four decades).³ Anyone who has studied schizophrenia will recognize the symptoms in Robert Schumann. A recent French film portrays the sculptress Camille Claudel, Rodin's mistress, hauntingly depicting the inexorable personality corrosion associated with this illness. Professor Walker may harbor a hidden aversion to medical expertise, suggested by a footnote in Volume #3, which he would do well to omit from future editions. He is discussing the ophthalmologist Dr. Alfred Graefe: "One endearing characteristic of Graefe deserves to be better known: evidently he believed in the healing power of prayer, and made a practice of saying the Lord's Prayer with his patients in the operating room before commencing his work. That indicates humility, a refreshing contrast to the god-like omnipotence sometimes encountered in the medical profession."

Pianos are accorded occasional mention by Professor Walker, particularly the instrument built by the firm of

Sebastien & Pierre Erard, notable for its innovation of double escapement. Rather inexplicably, Chopin preferred the Pleyel which had a stiffer, less responsive action. Erard showed his entrepreneurial skill by attaching Liszt's name to his firm, providing Liszt with performing instruments wherever requested, which could be easily sold at profit following a Liszt recital, thus sparing the firm the expense of further shipping. In Paris, each firm had an auditorium for concerts (Salle Pleyel and Salle Erard), lining up artists much as Steinway & Sons does today. Following Liszt's relocation to Weimar, he received instruments from the firms of Carl Bechstein, Ignaz Bösendorfer, and Frank Chickering. All were accorded his enthusiastic endorsement. In his Weimar studio he kept Mozart's spinet and Beethoven's Broadwood grand, but his preferred performing instrument seems to have been the American Chickering.

Liszt's music continues to have its enthusiastic proponents and its no less vocal detractors. Near the end of his life, Liszt performed his *Au Bord d'une source* (Beside a Brook) for Claude Debussy, and anyone familiar with Debussy's impressionistic atonality will recognize its antecedent in this utterly charming short piece by Liszt. Apparently he composed it in Geneva around 1835, following his elopement with Marie d'Agoult. Horowitz renders a thrilling performance of this piece in a 1950s RCA album. The great *B minor Sonata*, surely his piano masterpiece, and some of his piano transcriptions, particularly the first movement (*Allegro ma non troppo*) of Beethoven's 6th Symphony represent immortal works of genius. The Beethoven transcription seems to surpass the original scoring in thematic clarity. Undoubtedly the greatest of the *Hungarian Rhapsodies*, the number #19, was composed near the end of his life, when Liszt was more than 70 years of age, suggesting that he had lost nothing by way of creative ability and technical execution.

Congestive heart failure manifested itself the last three years of Liszt's life, which Professor Walker describes by the obsolete term of "dropsy." Alcoholism and chain smoking appear to have been the twin culprits, which certainly shortened his life and contributed significantly to the morbidity of his last years. Walker has Liszt imbibing two bottles of wine a day plus a fifth of Cognac, yet claims that Liszt was not "addicted," a nonsensical statement if ever one was made. It is entirely possible that Liszt did not appear inebriated, but as for chemical dependency, Liszt was most certainly alcoholic his last years. Alcoholic cardiomyopathy probably killed Liszt, just as alcoholic cirrhosis killed Beethoven. The only difference was that Beethoven began his heavy drinking much earlier in life than Liszt. At his deathbed, two physicians were observed with an intracardiac needle, and there was an odor of camphor in the room. Walker suggests that these reputable physicians may have hastened Liszt's death by an unintentional intracardiac injection of camphor. Dr. John O. Shea correctly points out that intracardiac camphor was the 19th century equivalent of intracardiac epinephrine, a desperate and usually futile attempt to resuscitate the heart following cardiac arrest. For Walker's egregious misrepresentation of the facts, he merits appropriate chastisement.

The reader who lacks a working knowledge of German is in for a rough time. Walker seldom translates the names of German institutions, buildings, societies or expressions. Despite a most distracting super-abundance of microprint footnotes, there is a paucity of explanation regarding German


terminology. I dusted off my Collins French dictionary a number of times (Liszt's French titles of compositions are untranslated) but having never studied German, I was obliged to skim over considerable material involving German terms. Walker would do better to use an English translation in the text and preserve the original German for a footnote. For those of you lacking familiarity with French, you will be exercised beyond patience. Here again, the author could have provided translations for all French terms.

The only color reproductions will be found on the jackets of the hardcover editions and the paperback book cover. Although Liszt himself is adequately represented in reproductions of paintings, sketches and photographs, there is a notable deficiency in portraiture of Liszt's contemporaries. An argument for spacial limitations cannot be convincing; Walker devotes dozens of pages to reprints of concert handbills, which can be of minimal interest to any but an academic scholar. Scores of famous people march through the pages of text; a few portraits would go far to prevent monotony.

Finally, there is an element of irony in the author's preface to Volume #1: "... the biographer has a responsibility to the reader: namely, to address him. He should heed

Voltaire's aphorism: "If you would be dull, tell all." Professor Walker could consolidate this biography into a well written and well illustrated single volume of perhaps 800 pages. Excellent recent biographies of Charles Dickens (by Peter Ackroyd) and Leo Tolstoy (by Henri Troyat) succeed as single volume works. My best advice to the potential reader would be to wait a bit, now that Professor Walker has completed his research, and give him time to thoroughly edit his material, condense it, and to issue a single volume that emphasizes analysis over chronology. Volume #2 is currently "out of stock" (the publisher is careful to deny that it is "out of print") and can be located only through an independent book search agency, if obtainable at all.

Notes

1. *Chopin*, by Bernard Gavoty, Charles Scribner's Sons, NY, 1977.
2. *The Nightmare of Reason — A Life of Franz Kafka*, by Ernst Pawel, Noonday Press, NY, 1992.
3. *Was Mozart Poisoned? Medical Investigations into the Lives of the Great Composers*, by John O'Shea, St Martin's Press, NY, 1990. 

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John Travis Speaks at ASPT Convention

(The following are excerpts from the remarks of President of NAPT, John W. Travis, made at the Philadelphia Convention of the American Society of Piano Technicians Annual Banquet.)

President Lockhart, Mr. Chairman, members and guests of the American Society of Piano Technicians:

This is my first, and last, convention of the American Society of Piano Technicians. ASPT no longer exists, NAPT no longer exists!

The past is past—the present is here—and the future is what we've got to work for. Do you fellows know what the merger **really means**? I'll tell you.

We are now the strongest tuner organization in **American History**! Perhaps the strongest tuner organization in the world.

We now have a strong and authoritative **voice** with which to command the **respect** and **attention** of everyone in the field of music, including piano technicians, piano manufacturers, music merchants, music teachers and all other related fields.

That this is so has **already** been shown by the **enthusiastic approval** of the piano manufacturers who have been the **first** to **recognize** and **support** this action. This will mean:

1. More promotional effort for sales for both parties.
2. A greater extension of piano playing.
3. More and better piano service.

We can now approach the music merchants as an authoritative organization, representing the **most qualified**, the **most honest** and the **most forward-looking** of American tuners. This will be to the merchants benefit in their piano **sales** and to our benefit in achieving proper **compensation** for our **services**.

There are many other things on the near horizon, one of which will be our consideration for an insurance program for our members against the hazards of **illness**, or physical incapacity and measures to broaden our protection for old age.

These things have **never** been possible before.

This convention has generated the highest enthusiasm for the coming Piano Technicians Guild, Incorporated not only in **your** organization but amongst the members of **ours**.

We are looking forward to Washington in 1958 when this long, hoped-for vision will become a working reality.

I thank you.

Convention Resolutions

PREAMBLE

Today, August the first Nineteen Hundred and Fifty Seven; the Seventeenth Annual Convention of the American Society of Piano Technicians comes to a glorious close; having through joint understanding and mutual cooperation between two honored bodies of professional piano craftsmen, established merger relationships, and agreement to drop their respective names in favor of one name mutually satisfactory to both bodies for the merger.

RESOLUTIONS

Therefore be it resolved, that we express appreciation for the cooperation rendered by Mr. A. D. Overdorff, board member of the National Association of Piano Tuners and editor of The Tuners Journal, U. V. Jeffers, vice-president of the National Association of Piano Tuners, John A. Kohl, advisor to the National Board of the National Association of Piano Tuners, and Arthur A. Berson, who by their action on July 30th, 1957 expressed the will of the members of their organization by discarding jointly with us the former names of our respective bodies, and agreed to be incorporated with the American Society of Piano Technicians into one organization to be known as The Piano Technicians Guild Incorporated.

And be it further **RESOLVED** that this occasion be memorialized with honor to The National Association of Piano Tuners and The American Society of Piano Technicians as co-partners in dropping their cherished names for the merger, thereby furthering united action with all allied interests to promote the general welfare of Teacher, Technician, Dealer, and Manufacturer, for the advancement of music, education, and better service.

And be it also **RESOLVED** that we acknowledge the welcome given us by His Honor Mr. Richardson Dilworth, Mayor of Philadelphia and cordial invitation to come again to this historic city of national fame and culture.

Also that we express our best wishes to the entire Hotel Bellevue-Stratford staff that did so much to make our stay most comfortable and delightful; and to Leas Campbell, general manager, for the hospitality of this great hotel.

Gratitude is also expressed to Mr. Frank Reed, vice-president of The National Piano Manufacturers Association, for the coordinated interest of the piano manufacturers in our behalf, also the manufacturers of parts and supplies for their exhibits and gift donations; and to all interests that participated in the work shop projects; and to Michael Mastrangelo, President of the Philadelphia Chapter, American Society of Piano Technicians, and Robert C. Mann, Convention Chairman and co-chairman John A. Demsey and Willis W. Sellers.

We include also in these resolutions our high esteem for the toastmaster Kelso Davis as reflecting the good-will of Pratt Read and Co. of Ivoryton, Connecticut. We extend best wishes also to Wood and Brooks Company of Buffalo, New York who, although their entire exhibit was lost in transportation, lived up to their high ideal and gave unstinted cooperation.

To Charlie Stein we express our love and respect for sincerity of purpose in promoting the welfare of our handicapped brothers as well as all technicians through education and shop practice.

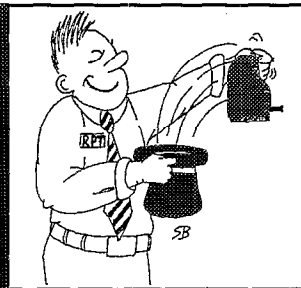
And especially to Mr. John Travis, President of The National Association of Piano Tuners, and to Mr. George Lockhart, now Past President of the American Society of Piano Technicians, our sincere congratulations on the success of this memorable Convention.

To all who have contributed to the success of this occasion, including the entertainers, we tender our sincere thanks and refer you to the Piano Technician and to the Tuners Journal for an amplified report on all activities.

(Continued on page 20)

Grand Illusions ...

The Page for Serious Cases



THE PUZZLE

By Daniel Levitan, RPT
Puzzler Editor

Unfortunately, the *Journal's* long lead time precludes publishing reader mail at the same time as a puzzle's solution. However, interesting mail regarding puzzles will be printed when possible, even at the expense of the puzzle editor's dignity. Ideas and suggestions for future puzzles are always welcome, subject, of course, to whatever modification the whim of the editor may deem necessary. Puzzle mail (snail mail only) may be sent to Daniel Levitan, Puzzle Editor, 530 First Street #6, Brooklyn, NY 11215.

Solution to Puzzler #1— Body Parts

1. Head
2. Eye
3. Ear
4. Nose
5. Cheek
6. Lip
7. Tongue
8. Throat
9. Shoulders
10. Arm
11. Elbow
12. Finger
13. Knuckle
14. Back
15. Spine
16. Rib
17. Belly
18. Butt
19. Tail
20. Leg
21. Heel
22. Toe

Honorable mention—Face,
Skin, Skeleton, Nipple

Joe Mehaffey may be contacted c/o
Mark Stivers, RPT, Sacramento Valley,
CA Chapter.

A Curiously Recurring Click — Puzzler #2

It was small. It was black. It was very shiny. It had made the long ocean crossing many years ago, from the shores of Asia to this living room, and in six short hours now it would feel the touch of a hundred and fifty tiny fingers. Yes, there was going to be a recital; the teacher of the eight-year-old in residence was coming with 14 other pupils, and "Please make it nice," he had said; "make it nice."

Piece of cake, she had thought. It's not in bad shape, and I've got a good couple of hours. Running up the keys, though, her ears stumbled on a click, right at C5. She checked the hammer flange screw. It was tight. Loose hammer head, she thought. Typical. But the head wasn't cooperating — wouldn't wiggle. Backcheck ditto. And the bridle strap hole? Nice and tight.

She unhitched the bridle and flicked the hammer at the string. Click! It's in the hammer, all right, she thought. She pulled the flange screw and eased the part out. Butt plate. Typical. But the plate screw was tight, the pin wouldn't budge, the bushing cloth was perfect, and it torqued at a comfortable 5 grams. What's more, everything else on the hammer was beyond reproach.

She eased the part back in and tightened the screw. And now, thankfully, the click was gone. Great, I'm off the hook, she thought, let's get tuning. She made it nice, and even did a bit of regulation — strike blow, lost motion, some hammers spacing, and a bit of needling. With a couple of minutes left before she had to run to her next appointment, she checked it out one more time ... and now the click was back. Time was getting tight now; tighter than the pins on a new Baldwin 656. Gotta be the hammer head, she thought, so she popped it off, drilled it, glued it up, and the click was ... still there! Time was gone now, and she could hear those hundred and fifty fingers marching closer. Aha! she cried, and grabbed a screwdriver, dived into the action, and surfaced moments later, the click gone. "I'll fix that next time I come back," she muttered as she packed up her bag.

What did she do?

Our Old Friend Humidity

By Joe Mehaffey

I was tuning a Steinway D for a concert. A couple of the damper levers needed attention. I pulled the action. To get a close look at the problem, I stuck my head in between the pinblock and keybed.

A few minutes later, they turned on the stage lights. I don't know if the piano contracted, or my head expanded, but I was stuck.

One hour later, after applying ice packs, a blow dryer, a bucket of water, and a set of fine Danish chisels, I was free.

The moral: never, never stick your head in there unless the piano is equipped with a full humidity control system. Condemn it!

Never be afraid to tell a customer that her piano is untunable. And never be afraid to charge her for your time.

"But, but ..." she gasps, "I just bought this piano last week!"

Be firm. "This piano is under 20 tons of tension, and it's hanging by a thread. If I disturb even *one* string, this piano could explode, sending out a *deadly* hail of splinters. I don't want that on my conscience." Then collect your check and drive away *fast*.

PIANOMAN Adventures

by Alan Hallmark

Problems with cloning—trouble in the shop



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PTG Review

Dedicated To PTG News • Interests & Organizational Activities



PIANO
TECHNICIANS
GUILD

Orlando Mini-Techs Cover All the Bases

The 40th Annual PTG Institute is going to offer you a wider array of learning experiences than ever before. On Friday, July 25th, the stage will be turned over to the Mini-tech Program during the 3rd class period. Will you be able to find something interesting? I think so. Do you want tuning, repair, regulation, voicing, business, computers, history, marketing, theory, practice? We've got it!

Have you ever attended a regulation class because you had problems with the una corda? And when the instructor got to that part there were only five minutes left in the class? You can cut to the chase with Allan Gilreath's *Una Corda Adjustment*. If you're still hung up on strings, see Claire Davies' *String Leveling—New Techniques*. Once your strings are leveled, you'll want to tune unisons. Michael Vecchione is waiting for you with *Making Unisons Sound "Spot On."* Of course, once your unisons are clean, you'll be ready for James Arledge's *Ear Aerobics*, an enlightening aural journey through aspects of piano tone. As you can see, there are strings attached to the Mini-tech Program. Don't be afraid to entangle yourself. You'll come out straight in the end.

If that una corda pedal just won't work, you may have to crawl under the piano, where Christopher Pilon awaits you with *Trapwork Rebuilding and Regulation*. You may need to cut some trapwork leather. Dull blade? Never fear, Alan Hoeckleman is here with *The Razor Edge*. Back up topside, your new sharp edge may come in handy to implement the techniques you'll learn in Walter Connell's *In-home*

Bridge Repair. While you're inspecting that bridge, you may notice a plate crack. Stop! Don't worry! See Bob Bartnick first. *It's Not All It's Cracked Up To Be* will give you a handle on dealing with this unpleasant problem.

The electronic age has given piano technicians new mountains to climb. Begin your ascents with Ron Torrella's *Internet Basics and Paul Adams' MIDI for Dummies 101*. And if you've been lulled to sleep by the electronic convenience of your EDT, you'll want to attend Randy Potter's *Getting The Most From Your Electronic Tuning Device Using Aural Checks*.

You really don't have to know anything about Hegelian dialectics to benefit from Dennis Johnson's *Distorted Commas*, but you will learn how to use a piano's inharmonicity to guide you in temperament selection.

Do you need to polish your business acumen? Larry Crabb has some useful ideas to help you *Control Your Paperwork—Control your Business*. And your customers will positively pat you on the back for attending Colette Collier's power-packed *Practical Piano Purchase Parameters Prevents Panic*.

There are sixteen more Mini-techs I could tell you about, but I'll leave you in suspense. You don't want to spoil all your surprises, do you? What? You can't go to all the Mini-techs you want? Well, you have an enviable problem—an embarrassment of riches. That's much better than just being embarrassed. Don't be embarrassed! Be in Orlando for the 40th Annual PTG Institute!

—Bob Anderson,
Institute Assistant Director



PTG Member Survey Report

This month let's take a look at the recent "Piano Technicians Guild Member Survey" to see if we can draw some conclusions, or make some changes in our lives that will help our economic conditions.

First off, it will help if we are between the ages of 36 and 55, that's where the majority of our members reside, and majority "male," but I don't want to touch that one. Education: By and large, the majority

Economic News & Views

have at least some college work. Surprisingly, almost 23 percent have post-graduate degrees. We evidently believe that education is an important ingredient in working toward success. However, the survey also shows that the highest percentage of members responding said they received their piano training through self-study (55.3%).

Most of us are self-employed (59.3%) and work alone. Is that why we enjoy chapter meetings, seminars and conventions so much? We get to talk to others of our profession only a few times a year.

In the meantime, we are tuning somewhere between 200 and 1,000 pianos a year, so most of us are pretty busy. We spend the majority of our time in customer's homes. Are we earning a living from this? Well 26.2 percent have gross receipts under \$10,000 a year. That's disturbing because it is not a living wage. I wonder, are those that earn this income part-time tuners, beginners in the business, or some reason that I cannot fathom? The survey didn't tell us. Are these technicians taking advantage of learning opportunities through chapter meetings, seminars or conventions to improve their income possibilities?

On the other end of the scale 22.6 percent gross between \$30,000 and \$50,000, and 23 percent gross between \$50,000 and \$100,000. The remainder

Continued on Next Page

Dallas MTNA Convention Report

The Music Teachers National Association Convention was held at the Wyndham Anatole Hotel in Dallas, Texas. The PTG has had a display at this convention for several years now (how many I am not sure). The Home

Teachers Relations Committee

Office sent the "booth" and several boxes of promotional literature to our local liaison, Leon

Speir, in Dallas. The booth is a collapsible backdrop roughly 10' x 8' with lights, onto which our name and other graphics and print media can be attached with velcro. The booth is starting to show signs of wear and the graphic/print display needs updating. Monica Hern attempted to have the Home Office create a new look with the theme "At Your Service" but this did not materialize in a fashion that could be used. I believe her idea is a good one, but it will require further study and prototype before we can use it. Also the booth needs to have the PTG logo displayed on it.

I arrived on Saturday, April 5, and lucky for me my daughter lives in Dallas so she picked me up at the airport and delivered me to the hotel. Leon brought the packages containing the booth, etc., and we spent a good part of the afternoon setting everything up for the opening of the exhibit hall Sunday morning at 9 a.m. The exhibit hall was large and had three rows of exhibitors. We were located in the first row next to Kawai and across from Young Chang and the Music Box.

MTNA has what is called the "Treasure Hunt," which is an activity designed to encourage the teachers to visit each booth each day the exhibits are open. The teachers come by to sign up for a drawing for a prize given away each day by the booth proprietor. MTNA provided a box and paid for the drawing and they came by each day at around 1 p.m. to draw the name of the winner. They would then announce the name and post it on a bulletin board. Originally we had intended to give away a vase of fresh-cut flowers each day. However, there was obviously a miscommunication somewhere and three plants were delivered to us on Saturday. They were in gray plastic pots with no foil or anything. I felt that they were not suitable for the Treasure Hunt and so I made an "executive

decision" to substitute a book, *Piano*, by David Crombie, of which I had a copy with me because I had just bought it and brought it along to read. It is a very lavish book with gorgeous pictures and as it turned out, was an excellent prize to give away.

We had a good number of teachers visit our booth, approximately 100 per day. Many of them had questions about their piano problems they were having and many of them commented that they only use and recommend PTG

members (RPT) for service on theirs and their student's pianos. They also commented on how much they appreciate the PTG grant.

Our literature was popular, especially the brochure "How Should I Take Care of My Piano." You might also be interested to know that many teachers commented on the beneficial effects of having a Damp-Chaser on their instruments. (Bob Mair of Damp-Chaser was also exhibiting).

Continued on Next Page

PTG Member Survey Report

Continued from Previous Page

fall somewhere between \$10,000 to more than \$100,000. How much of this is due to education in our professional field? The survey tells us that the majority of members that earned more than \$50,000 a year are RPTs and a member for at least 10 years, so it does help to upgrade, in fact, almost two-thirds of the Associates that responded said they plan to upgrade to RPT status.

Well, we are more and more into the electronic age. The majority use an electronic tuning aid, have a computer that they use primarily for word processing, and 42.3 percent have cellular phones. The overwhelming majority of our members have been members for at least 10 years, have chapter meetings every month, and are regular in attendance at these meetings. Oh yes, 53.7 percent of you have served as an officer in your chapter. You evidently see some importance in helping your chapter grow, also more than 50 percent of you have also taught a technical class for your chapter.

In a limited survey that Regional Vice President Jack Wyatt and I have made, we find that the busiest members are the ones that do more than just tune pianos. Most also do at least some repairs on pianos. In this recent survey we concluded that more and more piano repair work will become available in the years that follow, electronic keyboards *will not* hurt the amount of available piano work, and the income we earn does not depend on what our competitors are charging for their work.

In the South Central Regional Associates Seminar that was just concluded in Waco, Texas, we saw the excitement to learn and an excitement to upgrade.

There is a real hunger in most Associates to improve themselves. This is the second year that this seminar has been held in this region, and there is real desire to have another next year. There were nine Associates who passed the PTG written test and two who passed the technical test at this seminar.

It rained for three days and we wondered how many Associates who signed up for this seminar would come, and we were surprised when 100 percent showed up.

Well, what else have we discovered? Most of us like the *Piano Technicians Journal*, with just some minor changes. Most can improve their financial position through education (chapter technicals, regional meetings, and PTG's annual convention) there are so many opportunities for improving our skills that we can each reach a higher plane in our skills. When we do that our income will also increase.

I would like to see a survey of income for technicians that go to seminars and conventions and compare that with income for technicians that don't go to any. I am convinced that the more we learn the more we earn. Watch it, Gary, you might be a poet and don't know it.

Anyway, why don't you give a regional seminar or International Piano Convention a try and see if my theory is true? Technicians tell me all the time that they learn at least one thing each time they go to one of these and that it helps them build their business. I know that is also true for me. My desire is to see you succeed.

— Gary A. Neie,

Chairman Economic Affairs Committee

Nashville Chapter Rebuilds Garth's Piano

The Nashville Chapter of PTG has completed their project of rebuilding an infamous grand piano. The piano, which was used as a prop on the "Red Strokes" video by country music star Garth Brooks, was drenched in paint during one of the dramatic sequences.

Garth donated the piano's remains to the T.J. Martell Foundation, the music industry's largest charity organization. The piano was shipped from the video set in New York to Nashville and arrived in broken pieces. The T.J. Martell Foundation then turned to James

Dallas MTNA Convention Report

Continued from Previous Page

The experience was a very positive one, and I am indebted to Leon Speir and the members of the Dallas chapter who generously gave their time to staff the booth. I believe that it is a wise decision and money well spent to show our support for MTNA at their convention. David Hanzlick, our new Executive Director, also expressed his support for this activity. (He came for the last day of the convention).

As for critical commentary, there are a few things that I would like to see improved for future MTNA exhibits. As I mentioned above, the booth and its overall look and presentation needs improvement. I would like to have a video player on our table with a copy of "The Anatomy of the Piano" playing. One teacher mentioned how much she liked the nail files we gave away one year. This might be something worth considering. PTG was allowed to give a program one year and we are looking into doing that again at a future convention. Also we *must* enforce a strict dress code for the technicians who staff the booth, that is, coat and tie. If one cannot dress appropriately then one cannot participate. I believe this is very important!

I believe that should give you an idea of how things went at the MTNA convention. I particularly enjoyed this event because I have quite a few teacher friends across the country and enjoyed seeing them and representing PTG at this event.

— Matt Grossman, RPT
Teachers Relations Committee Chairman

Arledge, RPT, with a call for help in making the piano sellable. After being presented with the situation, the Nashville Chapter promptly voted to rebuild the piano, even after realizing the magnitude of the job.

John D. Fox, RPT, a 25-year member and current chapter president donated his experienced pin block fitting and regulating skills. Dan Rembold, RPT, Jimmie Freeman, RPT, and Steve Lehner contributed their expert woodworking skills in fabricating many of the lost and or broken case parts. Scott Thile, RPT, teamed up with Ralph Black, Devlon Bignault, Steve Kelly and his wife, Leslie, for a beautiful job of replacing the keytops and bushings while Dale Whitehead, RPT, and Candace Wilken, RPT, provided some very tidy restringing and damper replacement. Ralph Scott had the unusual task of removing the paint that had been poured into the keys and keybed. This was a job you will not find in the help manual. Herb Dady, RPT, finessed the plate rebronzing.

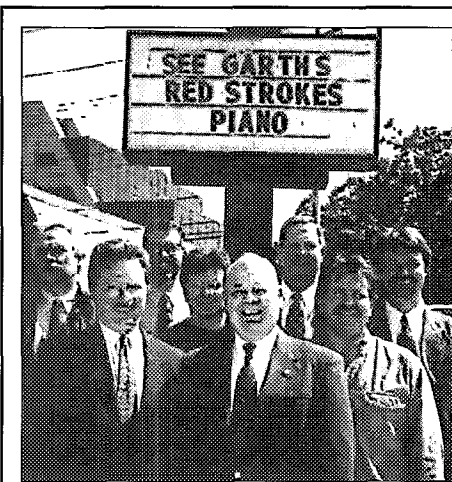
New bass strings were designed and wound by James Arledge, RPT, using Tremaine Parson's PSCALE scaling software. Wound strings replaced two unisons of original plain wire in the lower tenor area for improved tone. This was accomplished without altering any hitch pins by a custom winding process which effectively winds copper around the strings of an existing plain wire configuration: the wound wire runs from the tuning pin around the hitch pin and back to the tuning pin with no loop!

Everyone shared in the formidable task of refinishing, and the piano now features a high gloss lacquer finish.

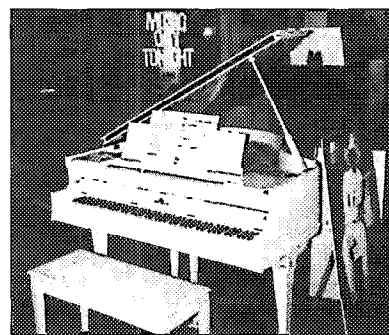
The 13 members and wife who contributed to this project can now enjoy the pride of a job well done and the satisfaction of contributing to a worthy cause. The piano rebuilding project has been featured on the Nashville Network's "TNN Magazine," "This Week in Country Music" and two different stories (before and after) on "Crook and Chase." The piano is now on display

Showcase Museum in Nashville. Each program portrayed the Piano Technicians Guild favorably to a worldwide television audience of millions. The programs sited how the Guild "lovingly rebuilt" the piano while showing clips of the actual rebuilding process at James Arledge's shop. One day the T.J. Martell Foundation phoned to ask if TNN Magazine could come over for an interview. To our surprise it was not a magazine article as we expected but a video crew. Within a few days our dirty clothes and shop was broadcast to millions. So, keep a clean shop. You never know.

Bids are now being taken starting at \$8,000. More information can be found on-line at www.tjmartellfoundation.org. All proceeds will be donated to medical research for cancer, aids and leukemia. So, bust out the check-book!



Members of the Nashville, TN Chapter, above, rebuilt a piano, below, used by Garth Brooks in a music video.



Lilly Receives PTG Foundation Scholarship



Karen Lilly, NCTM

I am writing to send my sincere appreciation for being awarded the \$1,000 grant for continuing education. It will gratefully be used toward my studies in pursuit of the M.M. degree in piano accompanying.

Your award, combined with the partnership established with MTNA certified teachers, shows a serious commitment as well as a wise venture.

As an older returning music student whose time and resources are limited due to family commitments, this grant

and its application qualifications are ideal. In my two year search for grants and scholarships, doors were closed due to age, sex, race, marital status and degree plan. Your award is hand-tailored to the private teacher who already strives for high quality in their work by being MTNA certified. It further encourages growth by the requirement of seeking continuing education, i.e., pursuing an advanced degree.

By giving this award, you make it known that you believe in the value of quality music instruction and are concerned about the future of the musical arts in our country. I am convinced that what *each of us* does today will affect tomorrow, positively or negatively. The

choice is ours to make.

I must admit that before this year I did not know about your organization. I am now impressed by the philosophy this award represents. I look forward to hearing more about you and your members and the future joint efforts with MTNA.

With sincere appreciation for your support and generosity.

— Karen Lilly, NCTM

[EDITOR'S NOTE: The Piano Technicians Guild Foundation provides an annual scholarship of \$1,000 to a music teacher for his/her further music study. Karen Lilly, NCTM, of Phoenix, Ariz., is the 1997 Scholarship recipient. The award was announced at the Dallas MTNA Convention in April. Guild members and Foundation supporters will find food for thought in Ms. Lilly's letter of thanks to the Foundation.]

INDUSTRY NEWS

MTNA Elects New Officers

Cincinnati, OH — The Music Teachers National Association (MTNA) recently announced the new officers elected to the Board of Directors for 1997-99. Elected during the April 1997 MTNA national convention in Dallas were: L. Rexford Whiddon, president; Joan Reist, president-elect; LeAnn House, vice president for membership; Barbara G. Woods, vice president for professional activities; and R. Wayne Gibson, treasurer.

Whiddon, NCTM, has served as the chairman of the Schwob Department of Music at Columbus state University in Columbus, Ga., since 1981. He is a concert pianist and educator, and holds bachelor's and master's degrees from the Eastman School of Music. Whiddon had been active in the MTNA Foundation and MTNA for more than 25 years.



L. Rexford Whiddon, NCTM
MTNA President

Joan Reist, NCTM, is the coordinator of piano proficiency and piano pedagogy at the University of Nebraska-Lincoln,

where she earned bachelor's and master's degrees. She also serves as assistant professor of keyboard skills and coordinator of The Academy, UNL's integrated program for first-year music students.

LeAnn House, NCTM, is the former chairwoman of the music department and currently associate professor of music at the College of St. Scholastica in Duluth, Minn., where she teaches piano, harpsichord and music theory. She has a master's degree in applied piano, master of arts and a Ph.D. in musicology, all from the University of North Carolina in Chapel Hill.

Barbara G. Woods, NCTM, serves as a clinician, consultant and writer in the music education technology field. She holds bachelor's and master's degrees with formal studies taken at San Jose State University, the University of Iowa and Eastman School of Music.

R. Wayne Gibson, NCTM, is special assistant to the president for arts affairs at Kennesaw State University in Atlanta, where for several years he headed the Department of Music and Performing Arts. He has his master's and Ph.D. degrees in music history and literature from Northwestern University.

MTNA is a professional organization serving 24,000 independent and collegiate music teachers across the country, and is committed to further-

ing the art of music through programs that encourage and support teaching, performance, composition and scholarly research.

Free Small Business Catalog from U.S. Chamber on the Internet

The U.S. Chamber of Commerce's Small Business Institute recently introduced its free Small Business Resource Catalog to the Internet at www.usccsbi.com, providing free, up-to-date access to more than 200 books, software, audio tapes and video programs designed to help small business owners and entrepreneurs find proven products to help take their businesses to more competitive levels.

Visitors to the On-line Resource Catalog site can review and directly order numerous small business resources addressing topics such as: business planning and startup, sales and marketing, management and supervision, customer satisfaction, legal and financial, communications and more.

The On-line Resource Catalog was developed in cooperation with the FedEx®

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Industry News

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VirtualOrder™ system, enabling buyers to purchase catalog products through a secure on-line ordering service and allowing them to select their preferred shipping service.

The U.S. Chamber of Commerce is the world's largest business federation representing an underlying membership of more than three million businesses and organizations of every size, sector and region.

To preview other small business resources, visit the U.S. Chamber website at www.uschamber.org.

Forshey Piano is

Top Boston Dealer

Houston Company Makes Top Ten Dealer for Fourth Year

Forshey Piano Company of Houston was recently recognized by the

Boston Piano Company as one of the top ten dealers in North America for sales and customer service. It is the fourth consecutive year Forshey has earned this honor.

Boston Piano Company, a division of the legendary firm of Steinway & Sons, presents this award to those ten dealers who meet rigid sales and service standards. Upon the acceptance of the award, owner Fred Forshey said, "This is only the beginning. The Boston piano is the hottest thing going in the acoustic piano business. I am very glad that we are the exclusive area representative."

The Forshey showroom, celebrating its tenth year, is located at 2920 Kirby Drive in the Upper Kirby District. For more information, call 713-524-3900.

TOOLS OF THE MASTER

*An opportunity to own tools used by
FRED DRASCHE in his 70-plus
years as a Steinway technician.*

Fred Drasche has donated his personal tools to the PTG Foundation, and they will be available by silent auction and sale in the Foundation booth in the PTG exhibit hall at the July 1997 PTG Convention in Orlando. All of the proceeds from the sale of Fred's tools will go to the PTG Foundation which sponsors scholarships and preservation of piano related materials.



Promoting the Piano

"The Keys to Higher Learning — The Piano, Music & Improving Test Scores," on the facing page, has been well received since it was developed for distribution at a mall mega-recital earlier this spring.

Research findings released earlier this year have pointed out the positive link between early music education — piano training in particular — and higher student test scores.

The following page was designed using the original article, which was originally published in the *Piano Technicians Journal*, outlining the research findings and several quotes from the researchers.

Members of the Piano Technicians Guild may reproduce the following page in its entirety* for wider redistribution to the general public.

Once reproduced, distribute "The Keys to Higher Learning — The Piano, Music & Improving Test Scores" anywhere the public is gathered for a musical or music-related event.

*While the Piano Technicians Journal is a copyrighted publication, through this column of Member Benefits, permission is granted for Piano Technicians Guild members to copy or reproduce page 43 of the July 1997 PTJ for the specific purpose of furthering public awareness of the benefits of piano training and education. "The Keys to Higher Learning — The Piano, Music & Improving Test Scores" was originally produced on a light gray, card-weight stock, but members may reproduce it on a lighter weight or different colored stock. Copies are available for purchase through the Home Office. This "Keys" publication is one example of how PTG works to promote the use of the piano to the public on behalf of our members.

The Keys to Higher Learning — The Piano, Music & Improving Test Scores

Music Beats Computers at Enhancing Early Childhood Development

Irvine, CA (February 28, 1997) — A research team exploring the link between music and intelligence reports that music training—specifically piano instruction—is far superior to computer instruction in dramatically enhancing children's abstract reasoning skills necessary for learning math and science.

The new findings, published in the February 1997 issue of *Neurological Research*, are the result of a two-year experiment with preschoolers, led by psychologist Dr. Frances Rauscher of the University of Wisconsin at Oshkosh and physicist Dr. Gordon Shaw of the University of California at Irvine. As a follow-up to their groundbreaking studies indicating how music can enhance spatial-reasoning ability, the researchers set out to compare the effects of musical and non-musical training on intellectual development.

The experiment included three groups of

preschoolers: one group received private piano/keyboard lessons and singing lessons; a second group received private computer lessons; and a third group received no training. *Those children who received piano/keyboard training performed 34 percent higher on tests measuring spatial-temporal ability than the others.*

"Music lessons have been shown to improve a child's performance in school. After eight months of keyboard lessons, preschoolers tested showed a 46 percent boost in their spatial IQ, which is crucial for higher brain functions such as complex mathematics."

— Frances Rauscher, Ph.D.,
Gordon Shaw, Ph.D.,
University of California, Irvine

preschoolers: one group received private piano/keyboard lessons and singing lessons; a second group received private computer lessons; and a third group received no training. *Those children who received piano/keyboard training performed 34 percent higher on tests measuring spatial-temporal ability than the others.*

"Mozart's Piano Sonata K448 was found to significantly increase spatial scores of college students on IQ tests when the Sonata was listened to for 10 minutes, dubbed the 'Mozart Effect.'"

— From *Nature*, copyright 1993, Drs. Rauscher and Shaw, University of California, Irvine

portion (heavily used in math and science) and that no successful program has been developed to teach these concepts in the school system," stated Dr. Rauscher. "The high proportion of children who evidenced dramatic improvement in spatial-temporal reasoning as a result of music training should be of great interest to scientists and educators," added Dr. Shaw.

Results Reinforce Causal Link Between Music and Intelligence

The research is based on some remarkable studies that have recently begun pouring out of neuroscience laboratories throughout the country. These studies show that early experiences determine which brain cells (neurons) will connect with other brain cells, and which ones will die away. Because neural connections are responsible

for all types of intelligence, a child's brain develops to its full potential only with exposure to the necessary enriching experiences in early childhood. What Drs. Rauscher and Shaw have emphasized has been the causal relationship between early music training and the development of the neural circuitry that governs spatial intelligence. Their studies indicate that music training

generates the neural connections used for abstract reasoning, including those necessary for understanding mathematical concepts.

Specifically, earlier studies led by Drs. Rauscher and Shaw reported a causal relationship between music training and spatial-temporal ability enhancement in preschoolers (1994), and among college students who simply listened to a Mozart sonata (1993, 1995). References to these and other findings related to music research conducted worldwide are available at the Music and Science Information Computer Archive (MuSICA) at the University of California, Irvine. For more information access MuSICA on the World Wide Web (<http://www.musica.uci.edu>).

"Students with coursework/experience in music performance scored 51 points higher on the verbal portion of the SAT and 39 points higher on the math portion of the SAT than students with no coursework or experience in the arts."

— Profiles of SAT and Achievement Test Takers, The College Board, compiled by the Music Educators National Conference (MENC), 1995



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MAY • 1997

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Calgary AB T1Y 4X7 Canada

846 Utah Valley

Russell B. Norton
1065 E. 420 S.
Provo UT 84606

EVENTS CALENDAR

October 11-12, 1997

TEXAS STATE

Ramada Hotel Downtown, Ft. Worth, TX

Contact: David Reed (817)735-4420

4004 Lovell, Ft. Worth, TX 76107

October 18-19, 1997

NYS CON—Ontario Province

Radisson Hotel, Corning, NY

Contact: Donald McKechnie (607)277-7112

1660 Slaterville Rd, Ithaca, NY 14850

October 23-26, 1997

NORTH CAROLINA REGIONAL

Embassy Suites Conv. Center, Greenville, SC

Contact: Don Valley (864)574-6165 or (864)574-1201

P.O. Box 844, Fairforest, SC 29336

All seminars, conferences, conventions and events listed here are approved PTG activities. Chapters and regions wishing to have their function listed must complete a seminar request form. To obtain one of these forms, contact the PTG Home Office or your Regional Vice President.

Once approval is given and your request form reaches the Home Office, your event will be listed through the month in which it is to take place.

Deadline to be included in the Events Calendar is at least 45 days before the publication date; however, once the request is approved, it will automatically be included in the next available issue.

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AUXILIARY

E X C H A N G E

Dedicated To Auxiliary News and Interests

There's Still Time for Orlando

Well, it's O-day, that's Orlando and the big convention. The early registration is past, but it's not too late for you to still sign up for the best instruction of your piano tuning days. Don't forget to bring the kids. If ever you wanted to bring the children, it's this year in Orlando. There is so much to do if you have been following my columns. You must call and register at the Radisson Twin Towers for the rooms will go fast. It is a smaller hotel but has a large outdoor pool and is right across the street from the Universal Studios. You know that all the Auxiliary members congregate in the lobby and meet each other. If you're not registered there, you'll miss all of the fun!



*Phyllis Tremper
PTGA President*

dinner at the
come.

I wanted to write a little bit about the Wisconsin Seminar which we attended in April, but will have to tell you about that next month as space is rather short this month. Just to tell you that we had a *great* time there in Madison, and we were treated royally. Thank you again, Renee Farley and Connie Jones.

Reminder, do not forget your straw hat, water bottle, preferably the one you received from PTGA a few conventions ago, and good walking shoes. Dress in layers and nothing formal down there except the Saturday night

— *Phyllis K. Tremper*
PTGA Auxiliary President

PTGA at PA State

Recently, the PA State Convention was held at State College, Penn. State College is the home of the Penn State University. While the technicians were in classes, the PTGA took two days of tours.

The area has such a regal past, the history is filled with important people, beautiful architecture and so many stories. European colonists settled the area prior to the Revolutionary War. Prosperity came into the area when nearby iron works began tapping abundant supplies of coal, timber and iron ore.

Our day started at the Centre Furnace, visiting the Mansion and the grounds. As a charcoal iron making industry, it became very prosperous. We toured the mansion and viewed all the antique furnishings. We learned so much history.

The downtown district of Bellefonte is listed on the Na-

tional Register of Historic Places and was founded in 1800. Our tour guide pointed out the many types of ornate architecture. Next we visited the Reynolds Mansion Bed and Breakfast, that was built in 1885. The interior had a marble vestibule, classic mirror, hand-crafted woodwork, stained glass windows, detailed moldings, and inlaid parquet floors of which no two were the same. I could just imagine enjoying myself in one of the rooms with a cherub mural painted on the ceiling, and relaxing in the Jacuzzi, before going to sleep in the king-sized bed.

Our lunch was at the Gamble Mill, which was built in 1786. In 1794, John Dunlop, an ironmaster brought the properties, including 800 acres and the Big Spring, then called the Beautiful Fountain, from which Bellefonte gained its name. The Dunlops estab-

lished their iron industry and bought many more thousands of acres. Water still flows through the raceway and under the building where at one time a water wheel supplied power to all sections of the building. Today turbines have replaced the wheel and it is used to pump water to some sections of the town. Our meal was so elegant, and all of our PTGA enjoyed the fellowship over lunch.

Since 1789 the Boal Mansion in Boalsburg has been home to nine generations of the Boal family. The home was originally a frontier stone cabin that was expanded into a farmhouse, then a mansion. The mansion included a European style ballroom for the elaborate parties. The grounds hold the original buildings, furnishings and family archives, but the most fascinating feature

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PTGA at PA State

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was the Columbus Chapel. The chapel was part of the Christopher Columbus family castle in Spain, and was brought here by the family for worship. It contains heirlooms that date back to the 1400s including the admiral's desk, and explorer's cross that was planted on the shores of newly discovered territories and masterpieces of European art. We saw the original vestments worn by the priests during Christopher Columbus' time and later years. Everyone was in absolute awe to visit this place.

Our next stop was the Boalsburg Village, a quaint little shopping area. Our PTGA members are always ready to go shopping, but it was time to go back to the hotel for the evening concert at Penn State University.

The next morning our group was ready to start our second day of touring. We toured the Penn State University campus, where 40,000 full time students are on campus. It is a small city in itself. It was founded in 1855 as Farmer's High School, and eventually became Penn State Uni-

versity. We stopped to taste the "grilled stickys," this is a grilled cinnamon bun. After, exploring more of the University, we went back to the "Corner Room" for lunch. The "Corner Room" has been serving meals since 1926, and is one of the favorite places of the local people.

For only 35 cents you can ride the bus around campus. Many of us have not ridden on public transportation for years! We took the bus to the campus "Creamery." They only serve ice cream cones, and always have a line waiting. It was the best ice cream you have ever tasted. Being on campus, we began to act just like the students, and climbed onto the "Nattany Lion" to take our photos!

Every year the SEPA Chapter honors someone with an award at the Banquet. Dick Krietz received the award this year as well as our own PTGA member, Celia Bittinger. It is given to someone who works hard for many years to promote PTG, and works unnoticed behind the scenes. In 1996 Kathryn Snyder, another PTGA member, received this award. Congratulations to Celia and Kathryn.

The PA PTG State Convention is al-

ways an enjoyable time — we make new friends and renew other friendships. Now it is time to start thinking about the Orlando convention and being part of the PTGA program there.

I can remember, years ago, when my husband first joined PTG. I did not join the PTGA activities because I did not know anyone. Then, one year, I decided to try it. I found that everyone was in the same situation as myself, and needed something to do while their spouse attended classes. So many of the people did not know each other, but friendships were made. It certainly was better than sitting in my room reading a book, or trying to find the local mall to go shopping.

I would like to encourage you to join us at this convention, it is past the early registration deadline, but there is still time to attend. Please come to me and the other officers and introduce yourself, we really would like to meet you. See you in Orlando!

— Marilyn Raudenbush,
PTGA Treasurer

The Influential Spud — Part III

By Beva Jean Wisenbaker,
PTGA Corresponding Secretary

Continued from April 1997

The exorbitant rents required practically all the cash that the cottier saw during the year. The crops which he grew were his entire subsistence. The land was in almost a perpetual state of warfare. The usual grain crops were easy access to destruction by bands of raiders, therefore, the potato was welcomed as a crop that might not be destroyed. The manner of cultivation and storage of the potato might outwit the enemy in a period of war and their subsistence thereby saved.

The Irish diet soon became milk and potatoes. Potatoes are deficient in vitamins A and D but these are supplied when milk is drunk. A potato diet is "only adequate in quality when consumed in enormous quantities, and only fully nutritious when accompanied by a supply of fresh milk". The diet was therefore nutritious even if very monotonous. As time went on, however, milk became scarcer and potatoes more voluminous in their diet. An example is given of Gloster, King's County where the consumption of potatoes for a five-member family for one week was 280 pounds — an average of eight pounds of potatoes a day for each individual. If one takes into consideration that three of these individuals were children then the consumption of an adult man would be 12 pounds

of potatoes each day. Another example is Shaens Castle, Antrim where a man, his wife, and four children consumed three bushels of potatoes and 20 pounds of oatmeal per week.

One can see that the Irish cottier had become totally dependent on the potato for his subsistence. Disaster struck with the pandemic blight (*Phytophthora infestans*) and the resulting potato crop failures of 1845 - 1846. It was the economic importance of the potato which sparked the interest of the scientists in the cultivation and creation of new varieties which would not be susceptible. The potato famine precipitated a major political crisis as well as a financial crisis. There were dead bodies by the roadside and in the towns — too many to bury. Deserted cabins often contained unburied corpses. There were starving almost naked beggars. Estimates of the loss of life range from 1 million to 1.25 million. Diseases associated with the famine were scurvy, dysentery, cholera, and typhus fever which was the most devastating and was conveyed by body lice. There was physical suffering as a result of the development of ophthalmia due to a lack of vitamin A. There was mental suffering in the form of insanity due to misery, exposure, possible nervous debility and even dementia due to a lack of vitamin B7.

Famine relief came through two departments — the Board of Works for development schemes and the Commissioners' Re-

lief Office to provide food to be sold at regulated prices. Relief works included road, canal, and harbour construction. A repercussion of the famine was mass emigration to the United States. The Irish developed a deep anger and bitter hatred of England. The good work of England was discounted and

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Scholarship Fund

This past year we have not had many contributions to the PTGA Scholarship Fund. We do wish to thank Jane Enock, Margaret Strong, Eileen Bell and Phyllis Tremper for their contributions this past year.

You may contribute at any time to the Scholarship Fund. Some suggestions would be:

- in memory of a loved one
- to honor someone
- to commemorate a birthday or anniversary
- as a wedding or graduation gift
- just because you're a nice person.

You may mail your check to the PTG Home Office at 3930 Washington, Kansas City, MO 64111, or to any member of the PTGA Board or the treasurer of PTGA. Your donation would be appreciated.

The Influential Spud — Part III

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her blunders and stupidities magnified. The hostility was passed on from generation to generation and now affects American public opinion since those descendants are now influential people. The development, therefore, of the relations between Americans, Irish, and English was determined by the potato.

A substantial change in the economic and social welfare came between 1870-1903 when the small growers and cottiers began to be freed from the burden of heavy rents and taxes after three centuries of the potato controlling the standard of living of the people. Potatoes now began to be eaten because they were liked instead of from necessity. They were still served twice a day with an average of three pounds per person. In the 1920s Ireland started a new economic path with a high quality potato-seed trade in the North and South with a remarkably high standard of excellence. In Eire in the West it has been built up strictly along scientific lines. "The old gibe that Ireland only emerged from the stone age after the great potato famine, was not without its basis of truth". For three hundred years the potato had stabilized and perpetuated the misery of the Irish masses.

Highlands of Scotland: In the Highlands of Scotland the potato was not accepted on its intrinsic merits but rather "as the inevitable solution to the economic crisis resulting from the politico-social upheaval" after the Act of 1747. The Act of 1747 destroyed the age long relationship between chief and clansman. The chief turned to raising sheep and as a result the crofters and cottars were turned away from the land they had so long rented and occupied causing a wholesale displacement of the population. Each class of people when they relocated assumed the position of the next lower class. Most of the lowest class (the cottars) left the Highlands for good. A social revolution took place gradually over 60 years. A quarter of a million people advanced economically from the 13th to the 18th century. The potato became the cornerstone of the social structure. It took one generation for the potato to gain control of the domestic economy of most Highlanders. The potato blight and famine of 1845-47 caused a social economic crisis similar to that in Ireland. Their main food supply was threatened, but there was a smaller number involved so their rescue was easier and therefore prevented tragedy comparable to that in Ireland. Relief works were drainage, bridge-building, roads and railways. Emigration assumed great proportions. There was chronic hunger until the end of the century. The potato was no longer their mainstay, but it was still of great importance.

Lowlands of Scotland, England, and Wales:

In the Lowlands of Scotland and in England the potato was first accepted in the great houses and rejected by the servants, whereas in the Highlands and Ireland it was accepted by the workers first. The potato blight of 1846-47 affected them less because they were accustomed to a varied diet. They merely adjusted their home economy to meet the emergency. The area under potatoes reached its maximum in 1881. There has been a remarkable falling off of consumption since that time. At the end of the 18th century, housing in Wales was nearly as bad as Ireland and far behind England, but they were better fed. Wales did not have the political troubles that Ireland and the Highlands had had which brought on their dependence on the potato, but Wales was ill prepared for the industrial revolution and the extra arable farming necessary to support the growing towns. The potato has not completely dominated the economy of the Welsh home, but it is second only to bread. Over a period of 75 years the acreage under potatoes has declined except during war years. The great industrial centers now depend on imports for their supplies.

There was a shortage of fresh vegetables in England during the Middle Ages and well into the 17th century. The working classes were in a more or less chronic scorbutic condition. Two hundred years later the potato was to remedy this condition. In the latter quarter of the 18th century the potato began a slow progress into the working class homes. The labourer associated the potato with the Irish immigrant labourer for whom he had great contempt. He was afraid he would be lowered to their status. The potato was accepted only because of actual want. The people highly prized wheaten bread. They thought that since they lived almost entirely on bread that they must have the best bread (which they considered to be wheaten bread) in order to obtain enough strength to do their work. The year 1795 was a critical year. Failure of the wheat crop in 1794 more than doubled the price in 1795 of wheaten bread. People did not want to give it up so unbalanced budgets resulted. More was being spent on potatoes but less on meat. Milk had already been sacrificed when the labourer had lost his cow when there was not longer anywhere for it to graze after the open fields were enclosed. Meat was given up and then they gave up their wheaten bread also for potatoes to maintain their bare existence. Their poor wages were subsidized from the poor rate. The potato acquired the nick-name "the root of misery."

There are two chief disadvantages of the potato as a major source of food — its bulk because of the water content and its short storage life. Wherever it came into use efforts were made to find suitable methods for drying it to persevere it for a greater length of

time. The Peruvian method as mentioned earlier was chuno. In Great Britain dried potatoes were used for stock feeding as well as human consumption. There were various forms of dried potato including potato-flour, dried strips of potato, "riced" potato, and mashed-potato powder. In times of war the dried potato was an advantage not only because of its longer storage life but also because of its superior packing density. Under good storage conditions the storage life can be several years, but tropical temperatures will cause the dried potato products to develop a brown color and a "burnt" taste.

Given a backward economic situation such as prevailed in Ireland, the Highlands and Western Isles, the potato acts as a depressant of the moral, economic and social status of the people. Given a free and dynamic movement in economic and social spheres such as occurred in the Lowlands, the potato acts as a valuable dietetic asset of all classes of people.

Conclusion: I found the book to be very enlightening and very readable as a whole; although it is quite lengthy and tends to lose the interest of the reader. It is written in such a manner that, in general, no special scientific knowledge is needed to understand it. Some sections such as the one on Ireland seem to be repetitious in the information that was being given. The sections which I found most interesting were the ones concerning the Peruvian fertility rites, the fact that the lowly potato was once considered an aphrodisiac, and the fantastic volume of potatoes which were consumed by individuals in Ireland. I would recommend the book to anyone wishing to broaden their knowledge about a particular food such as the potato or to someone interested in how food items can render an influence on social history.

My husband, Martin, commented that I had not mentioned French fries. Someone in one of the classes mentioned the same thing. I pointed out that it is a book report and the book didn't say anything about it. Phyllis Tremper mentioned that there is a musical instrument called the sweet potato, but it wasn't mentioned in the book either. Wouldn't 12 pounds of potatoes per day be fattening? No, because potatoes are *not* fattening. It is the things we add to them for more flavor that is fattening such as butter, sour cream, cheese, etc. So, enjoy your potatoes!

— Beva Jean Wisenbaker

CORRECTION

Auxiliary member Carol Bussell is incorrectly listed as a PTGA Honorary Life Member in the 1997 Piano Technicians Guild Membership Directory.

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www.Heartlandpiano.com We're on the NET. it's plain to see/ there's lots to find. and always free// look us up. to see what's new @HPR// we're there for you! Heartland Piano Restorations.

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

OLD - WORLD QUALITY RESTORATIONS/REBUILDING by PTG technicians. Reasonable prices. To the trade, individuals or Institutions. 20 years experience with Steinway, Knabe, M&H, Baldwin, Chickering, Bechstein and many others. Nationwide Service. Heartland Piano Restorations. Toll-Free 1-888-874-4266. Visit our Homepage: www.Heartlandpiano.com

REPLACEMENT SOUNDBOARD PANELS — North Hudson Woodcraft has been producing **QUALITY** soundboard blanks for over 100 years. We will custom build a spruce soundboard to your specs. Rib stock, shim stock, and quartersawn Hard Maple also available. For information and prices call: **NORTH HUDSON WOODCRAFT CORP.** (315)429-3105 - FAX (315)429-3479.

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Many other services available. Call or write for price list. **FREE** return freight on pre-paid orders of \$75.00.
WALKER PIANO SERVICE,
554 State Route 1907, Fulton, KY 42041,
1-800-745-6819.

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

HELP WANTED



TUNER NEEDED IMMEDIATELY—Salaried technician position available in rapidly expanding family held corporation. Good and efficient tuning skills as well as good people skills required. Well rounded knowledge of repairs and regulating a plus. Starting salary is \$22,500 with one-week paid sick leave and one-week vacation. Profit-sharing after first year can substantially increase income. If you want to become part of a growing team in a relaxed environment and desirable location, send resume to: Ruggero Piano Service, Inc., 3504 Fairhill Drive, Raleigh, NC 27612.

GENEVA INTERNATIONAL CORPORATION, exclusive U.S. distributor of Petrof and Weinbach pianos, is wishing to hire a manager/technician for our piano service center in the northwest Chicago suburbs. RPT preferred but not required. Strong rebuilding experience a must. Finish experience a plus. Salary based on skills and experience. Must be able to perform high level grand piano rebuilding and supervise others. Full health and retirement benefits offered. Please contact Alan Vincent at 1-800-533-2388 for more information or FAX resume to 847-520-9593.

TRAINING

NORTH CAROLINA REGIONAL CONFERENCE October 23-26, 1997 • Embassy Suites Resort Hotel Golf and Conference Center • Greenville, South Carolina. National and Regional Instructors along with Major Piano Manufacturers and Preferred Suppliers will be on hand for 2-1/2 days of comprehensive classes offering a full range of piano service topics. In a supplemental all-day class Thursday, October 23 learn to design and build your own pneumatic soundboard and bridge presses. Bring your spouse and enjoy a get-a-way in the spacious surroundings of a luxury resort hotel. For more information contact Don Valley, RPT (864)574-6165.

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

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

THE RANDY POTTER SCHOOL OF PIANO TECHNOLOGY— Home Study programs for beginning students, associate members studying to upgrade to Registered Piano Technician, and RPT's wanting to continue their education. Tuning, repairing, regulating, voicing, apprentice training, business practices. Top instructors and materials. Call or write for information: **RANDY POTTER, RPT**; 61592 ORION DRIVE; BEND, OR 97702; 541-382-5411.

See our ad on page 3.

VIDEOS

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

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

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

WANTED

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

WANTED: Very old Chickering Grands to restore. PTG member, technician would appreciate your referrals. Contact Michael W. Hart, P.O. Box 268, Corbin, KY 40702 (606) 528-8760.

LOOKING FOR KEYFRAME with key-board or if necessary, the whole action for an 88 key 6'1" Steinway A #121116. Call Leopold at N.Y. Piano Center at 1-800-642-5648.

LOOKING TO BUY OSUND-KEY MACHINES-ANY CONDITION. VINCENT IZZO'S PIANO GALLERY, 516-437-4386

PIANOS! PIANOS! PIANOS! !!!Free phone appraisal!!! Buying all types of usable pianos. Cash or bank check on pick up. Won't hesitate on price. Call us first for fast professional service. "Steinway, Mason-Hamlin command specialty prices." Jay-Mart Wholesale, P.O. Box 21148, Cleveland, OH 44121. Call Irv Jacoby 1-800-411-2363, or collect 216-382-7600/FAX 216-382-3249.

WANTED by PTG member/technician. A copy of the book "Historical Pianos." Please call 606-528-8760

WANTED: TINY PIANOS such as the Wurlitzer Student Butterfly or other small types. No more than 50 keys. Call toll-free: Doug Taylor, 1-888-895-6211. I'll pay shipping!

WANTED: By PTG Member Technician—OLD ROSEWOOD VENEER. Any size or amount acceptable. Contact Michael W. Hart, P.O. Box 268, Corbin, KY 40702 (606) 528-8760.

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PianoDisc™

July 1997

News From The World of MSR/PianoDisc, Knabe, Mason & Hamlin

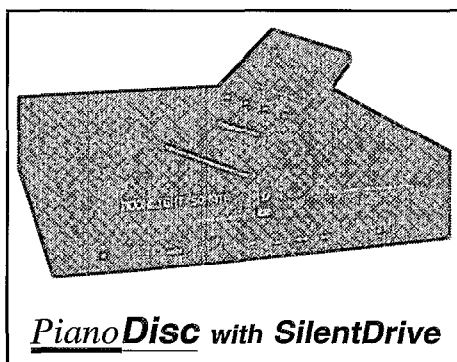
SilentDrive is here — see it in Orlando!

The most exciting innovation in player piano technology, PianoDisc's new **SilentDrive**, will have it's first national PTG review at the '97 Convention this month.

Hailed as **the most significant improvement in player piano technology in years**, SilentDrive consists of four circuit boards which allow for precise control of the key and pedal solenoids by the PDS-128 Plus control box. **The result is a player performance capable of tremendous dynamic range, with better volume control and faster key and pedal response than has ever before been possible. It also allows for whisper quiet movement of the key and pedal solenoids.**

PianoDisc Certified Technician, Franco Skilan (Precision Pianos of North Hollywood) summed up the common response of PTG California convention goers who saw SilentDrive in February, **"Absolutely incredible! A quiet system with awesome dynamic expression."**

Be sure to stop by the PianoDisc booth for a demonstration of SilentDrive.



PianoDisc with SilentDrive

New labor warranty on PDS-128 Plus with SilentDrive

Beginning May 1, 1997, all **new PDS-128 Plus systems manufactured with the SilentDrive System** will carry a 90-day warranty for labor required to repair or replace defective parts. The PDS-128 Plus With Silent Drive also comes with a 5-year warranty on defective parts.

For information call MSR.

MSR/PianoDisc Factory

Installation Training Seminars

Aug. 19-24 Sep. 23-28 Oct. 21-26

Continuing Education

Aug. 26-28 Sep./Oct. 30-2 Oct. 28-30

Tuition is free, but a \$50 refundable deposit is required for confirmation. The Continuing Education Seminars are restricted to

PianoDisc certified technicians in good standing. For more information about either the Installation Seminars or Continuing Education,

**CALL MSR AT
1-800-566-3472**

4111 North Freeway Blvd.
Sacramento, CA 95834

916/567-9999 • FAX: 916/567-1941

***Congratulations,
Piano Technicians Guild,
on 40 years of significant
contributions to music
and the piano industry.***

***— Gary & Kirk Burgett,
PianoDisc/MSR, Knabe
and Mason & Hamlin***

PianoDisc reads Standard MIDI

PianoDisc's PDS-128 and PDS-128 Plus systems can now read Standard MIDI files. New technology makes the PianoDisc system compatible with nearly all marketed software for player piano systems.

The new enhancements allow "off the shelf" playback of DSDD 3.5 consumer Standard MIDI file disks which are General MIDI. If a piano part exists on any channel, it will be played by the PDS-128 Plus system. If the system is also equipped with PianoDisc's Symphony option, all other parts will be played by its sound card through external speakers. That will allow it to play *Yamaha PianoSoft*, *Yamaha Piano Soft Plus* and other software lines made by Yamaha. Educational software, specifically *Alfred's* instructional software materials, which were originally made for use exclusively with Disklavier, are now compatible with the PianoDisc system. Educational software made by other manufacturers may also work well on the PianoDisc system.

"We think this enhancement, since it makes educational software available to PianoDisc owners, is one of our most valuable to date," commented MSR's Executive Vice President, Tom Lagormarsino.

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PianoSoft Yamaha
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Invisible Touch
Turbo Music
Tune 1000
Virtuoso

MIDI Keyboard Library
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Reads Standard MIDI file disks that meet commercial software protocol and standard

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A new point-of-purchase display features some of the software brands that new PDS-128 Plus System (and PDS-128 Systems with upgrades) can now play.

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PianoDisc disclaimer: PianoDisc reserves the right to change product design and specifications at any time without prior notice

Tech Gazette

Yamaha Service

July 1997

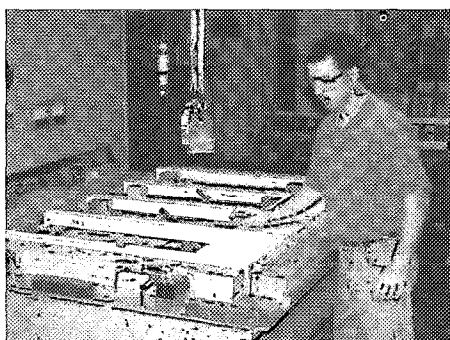
Last month, we discussed the procedures for hammer installation utilized by Yamaha Music Manufacturing (YMM).

In this issue, we will discuss how the backframe is constructed for all M450, M500, M1, P2 and P22 pianos.

Backframe Construction

The Yamaha back assembly is comprised of two major components: the full perimeter V-Pro plate and the wooden backframe.

The wooden backframe for Yamaha pianos, manufactured at YMM, consists of components of spruce, hard maple and poplar. The woods used are cured to an Equalized Moisture Content (E.M.C.) of 6%. This is necessary so the piano will survive in the extreme conditions of heating and air conditioning found in the homes of North America.



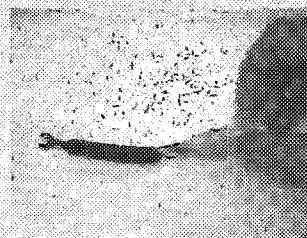
A typical YMM backframe is comprised of precisely machined components which include: an eleven ply hard maple pinblock, five spruce backposts, eight spruce filler blocks, four spruce soundboard liners, two poplar binders, two spruce acoustibars and two spruce handles.

At YMM the twenty-five components that make up one solid backframe are assembled and glued in the tray of the high frequency gluing machine. The machine utilizes the elements of both heat and pressure to bond the components into a solid backframe. The actual gluing time for each backframe is six (6) minutes. After cooling, the backframe is stained and sealed.

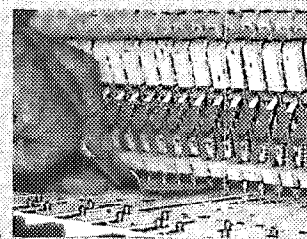
The YMM "Tip of the Month"

Many times we will purchase a tool to perform a particular task and the tool will "work", but not work well.

In a production facility tools are made and modified to make the most efficient use of time. Notice how the capstan wrench in this picture has been bent.



This bend makes the tool much more usable for the task intended. The capstan wrench can be ordered from Schaff Piano Supply (#R10), or Yamaha (#TX622801).



Stay tuned for next month's information from Yamaha Music Manufacturing.