Piano Technicians

Journal

November 1987

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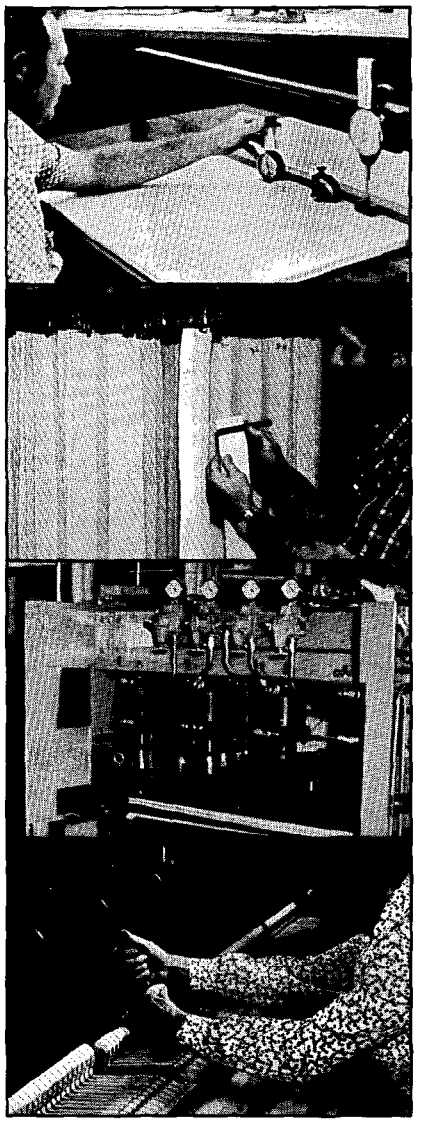

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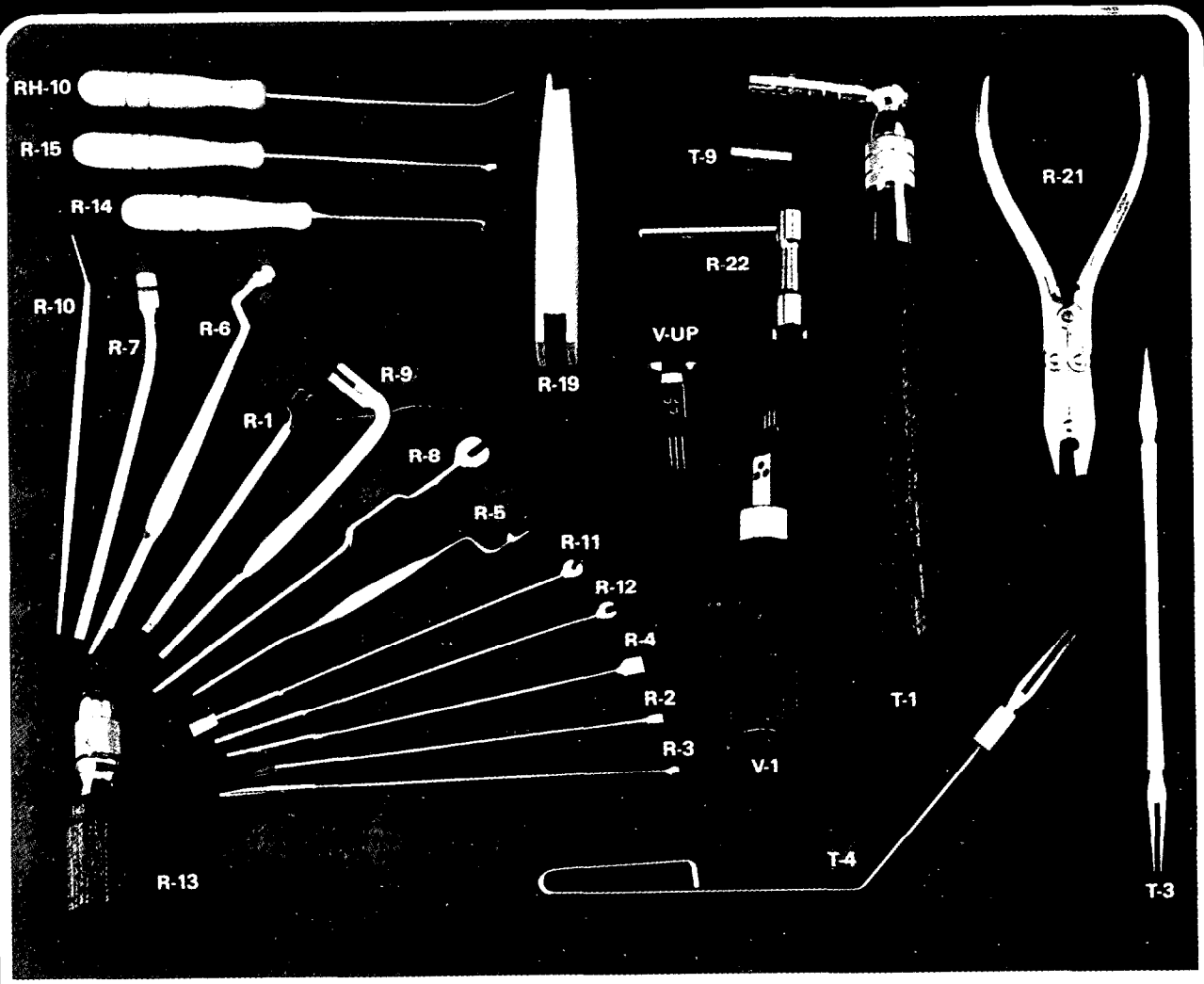

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The Piano Technicians Journal — **November 1987**

Official Publication Of The Piano Technicians Guild, Inc.

Volume 30
Number 11

IN THIS ISSUE...

THE COVER...

Restored to its past glory, the piano featured in Charlie Huether's "Paramount Theater Piano" article glows with gold leaf. For a "before" look, see page 22.

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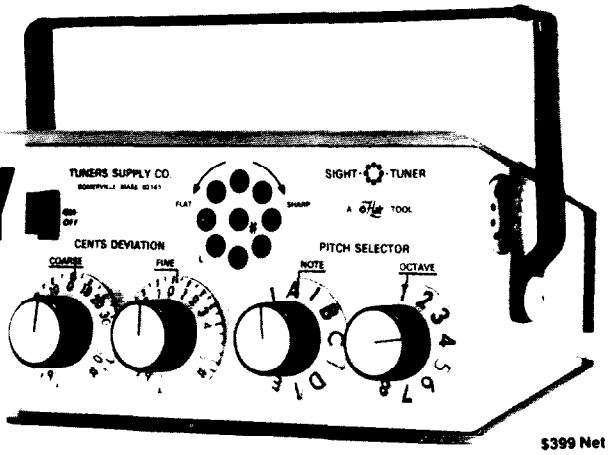

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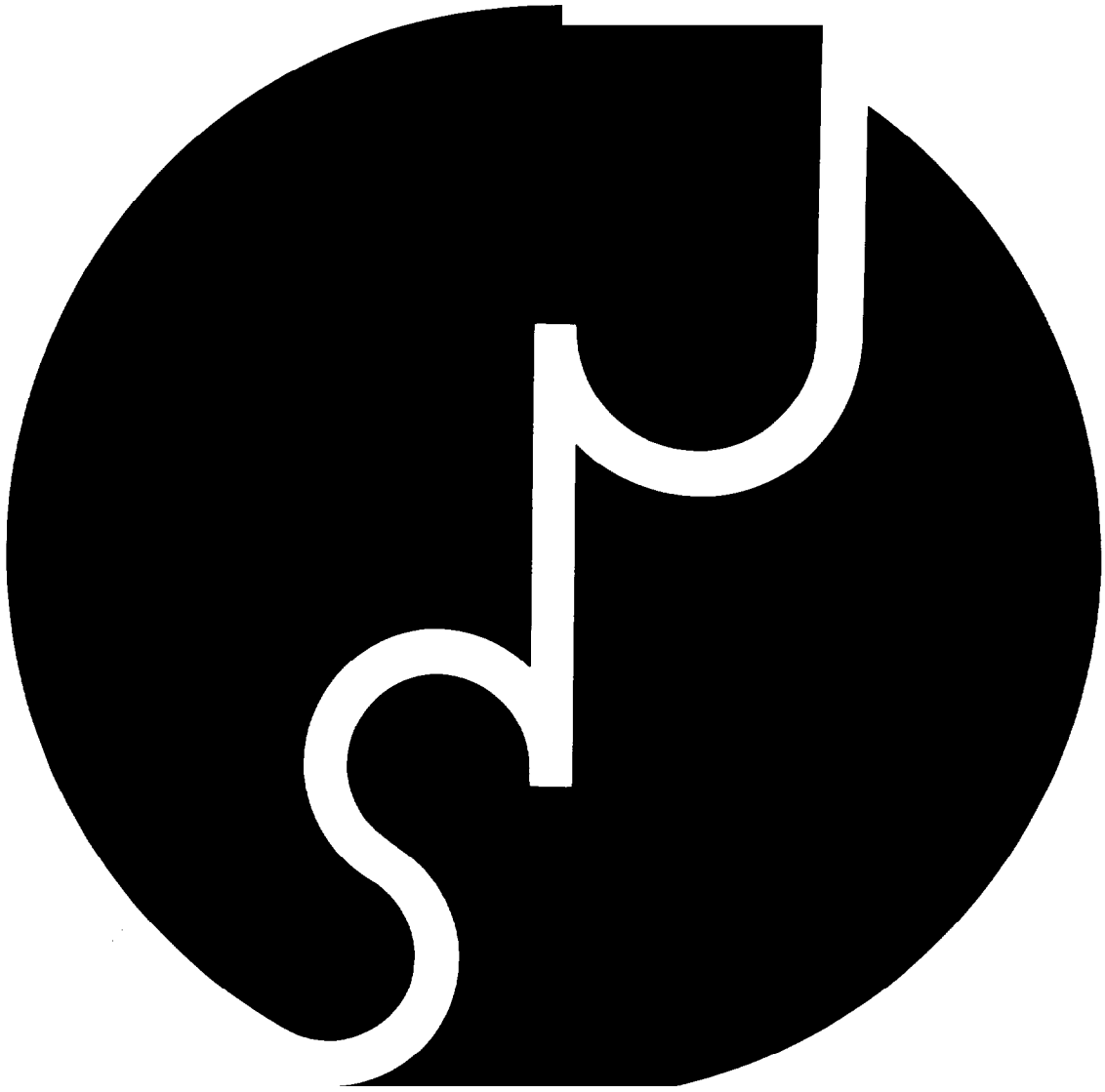

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YOUNG CHANG

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President's Message

M.B. Hawkins
President

Planning Keeps Momentum High

Already it is November and before you know it, December will be upon us. During December the holiday season reaches its peak as well as a lot of tough scheduling to get the holiday servicing under control so as to be able to personally enjoy the season. Since December is bound to be a bit hectic for most of us, let me touch on some things that perhaps can be better handled now.

During the past few months the feedback I've gotten regarding Toronto has been terrific. Members are riding high on all of the benefits they came away with, not to mention the encouragement and enthusiasm generated. My reason for mentioning this now is that *now* is the time to stop and make your plans for St. Louis not January, or February, or March, etc. December is going to fly by and when the new year arrives you need to have in place what you will be doing January through June to make sure you are one of the 1188 who will be in St. Louis for our next annual meeting.

Some could say that's too far away to think about now. Well, think of this: when you board a ship, if someone has not taken the time to plan the course to where it is you are going, you may rest assured you will end up some place you did not plan on being. The point is there must be a plan, a road map, a blueprint or something that points the way. November is a perfect time to do that type of planning if, and I hope it is, one of your goals for 1988 is to be among those present in St. Louis next July.

I have already heard from some chapters who say September started with a real bang and they attribute much of the excitement to the number of people who were excited because they were in Toronto. I hear from the Toronto Chapter that they are thrilled about their chapter enthusiasm. There have been times a chapter appears tired after playing host and allows itself to slip into a slump for a couple of years. Toronto's reaction is just the opposite and that is the way it should be for everyone. This tremendous high propels you to heights not previously viewed as achievable. In the case of Toronto, the numbers alone added an extra dimension to a well-planned and well-executed convention.

Set your goal now to be one of the 1188 in '88. By planning now and effectively executing that plan together, we can make that extra dimension a regular feature.

In conclusion, remember how fortunate and indeed blessed we are to be part of a free society. Thomas Jefferson once said only constant vigilance can keep it that way. My wife and I wish each of you a most pleasant holiday over Thanksgiving. Have a good one! ■

Tech Gazette

Yamaha Piano Service November, 1987

New Products

TOUCH WEIGHT ADJUSTERS

Now for the pianist who insists on a "heavier" action: we introduce our new TOUCH WEIGHT ADJUSTERS. They give you a simple, fast and—most importantly—easily reversible method for adding touch weight. They're a significant departure from traditional methods requiring unsightly key modifications that can accelerate wear. TOUCH WEIGHT ADJUSTERS, instead, simply clip onto either the hammershanks of a grand piano, or the catcher dowels of a vertical piano, and can add as much as eight grams of extra weight at the keys. TOUCH WEIGHT ADJUSTERS are available in those two styles, at a price of $49.50 per set.

PT-100 TUNING SCOPE

Another item that should perk up the ears of the technician is the introduction of the all new Yamaha piano tuning scope, the PT-100.

The old PT-4 tuner was a popular machine, but it was somewhat cumbersome and required an external microphone, as well as 110-volt A.C. power, to operate. It also carried a price tag of about $700. Our new PT-100 is much more compact, lightweight, and is powered by an internal rechargeable battery pack.

It also features a built-in microphone; a remote note switch you can mount on your tuning hammer; very easy-to-read LCD and LED displays; and numerous scale, pitch and temperament settings. It all comes neatly packaged in a handsome, protective carrying case.

One of the most attractive features of the new PT-100, though, is the price: only $625.00. For additional information on these items, please call the Yamaha piano parts lines at (800) 521-9477, or (714) 522-9161 "Collect" in California, Alaska, or Hawaii. We are also pleased to announce that we now accept Visa, MasterCard and American Express for all piano parts orders.

Personnel Profiles

LAROY EDWARDS

LaRoy joined Yamaha in 1963 as National Piano Service Department Manager in a part-time position. As Yamaha grew, he became the full-time Piano Service Manager, and was later promoted to Service Division Manager. In 1984, he relocated near San Francisco and became Piano Consultant for Yamaha. In this capacity, he directs his vast energies to the Piano Division, especially in the area of technical and sales education. Some of those activities include teaching at various PTG and dealer-related events, as well as integral involvement in the production of our Master Series in Piano Technology. He also serves as the principal instructor in the Yamaha "Little Red Schoolhouse" program.

As you may already know, LaRoy was awarded the Golden Hammer, the most prestigious award in the piano technical community, at the National PTG Convention in Toronto this July.

LaRoy and his wife Barbara have six children, four of whom are piano tuner/technicians.

MIDI Corner

What is MIDI? MIDI is an acronym for "Musical Instrument Digital Interface." MIDI is a world-standard interface system that allows musical instruments, drum machines, sequencers, computers, and other music-related equipment to "talk" to each other. The most basic MIDI function enables the user to connect two MIDI keyboards together allowing them both to sound when one is played. It only starts here, however. Additional MIDI capabilities allow the musician to create an extremely powerful composition/recording/performance setup. As we mentioned in last month's article, we recently introduced two MIDI-equipped acoustic pianos; the Yamaha MIDI Grand and the Yamaha Disklavier.

The MIDI Grand, incorporated into both our C3E and C7E Conservatory models, will soon be available. The MIDI capabilities in these grand pianos make them some of the most powerful MIDI keyboard controllers available.

The Disklavier, integrated into our 48" U1 upright piano, is a 21st century version of a player piano. In addition to song playback, record capabilities allow for complete expression playback. The capabilities of this instrument will require a number of Tech Gazettes to properly describe what the Disklavier is and does . . .

What is MIDI? In the following issues of Tech Gazette we will continue to expand on what the current technology in the music industry today is able to provide the musician. To conclude this article, we would like to say what we know MIDI has done. MIDI has essentially revolutionized the art of music-making, significantly changing the way most musicians approach the process of music creation. More to come . . .

Calendar of Coming Events

November 6-8:	North Carolina State Black Mountain, NC
1988:	
January 15-17:	Winter NAMM Anaheim, CA
February 12-14:	California State Torrance, CA
March 11-13:	S. Central Regional Fayetteville, AR
April 8-10:	New England Regional Newport, RI
April 15-17:	Pennsylvania State Altoona, PA
April 29 & 30, May 1:	Michigan State Livonia, MI
July 18-22:	31st National Convention St. Louis, MO

YAMAHA

From The Home Office

Larry Goldsmith
Executive Director

St. Louis: A Great Place For A Convention

St. Louis used to be a city with a bad reputation. Like many American cities, St. Louis came down with a case of urban blight. The causes were many – economic stagnation, flight to the suburbs, a deteriorating downtown – and solutions came hard. I remember visiting in 1970 or '71, taking the proverbial wrong turn and seeing some parts of town that weren't exactly a credit.

I went back 10 years later, helping to put on a week-long convention in the city's new convention center. A great deal had happened in that decade. The city had recognized the value of conventions, evaluated its considerable natural advantages and decided to actively pursue that type of business. New downtown hotels had gone up. The convention center was a beautiful place for a tradeshow. The riverfront area where the arch is located had been developed. An area of old brick warehouses and factories where the city began as a river landing in 1764 had been renovated and turned into a section with shops and quaint restaurants lining cobblestone streets lit with old-fashioned gaslights. It was a bustling, lively, charming city.

The transformation has continued. A recent walk on a late summer evening showed the city off to full advantage. The streets were full of people, many of them near Busch Stadium where the baseball Cardinals were in pursuit of a pennant, their third in six years. Uniformed bellmen waited at the entrance of elegant new hotels and refurbished old ones. There were fountains and new office buildings. Overhead, the arch gleamed in the moonlight, not one or two but half a dozen riverboats moored nearby. There's even a riverboat with a McDonald's aboard.

The city's old train station, a gorgeous structure, now contains new shops, restaurants and a luxury hotel. It has become an example for other cities around the country.

A little farther away from downtown is Forest Park, site of one of the city's largest meetings, the 1904 World's Fair. The city claims credit for the invention of the hot dog, the ice cream cone and iced tea there. In what must have been an amazing double-header, the city hosted the first olympiad to be held in the U.S. later that year.

Today, it's a city of 2.4 million, the second largest inland port, the third largest rail center and the sixth busiest airport. It's the home of the nations second-oldest symphony and the first university west of the Mississippi – truly a world-class city and a unique cultural center.

As you can see, there's a lot to see and do in St. Louis. I've only scratched the surface here, and I'm sure you'll enjoy exploring it for yourself when you visit next July 18-22 for the Guild's 31st annual Convention and Technical Institute. ■

Economic Affairs

Henry L. Jones, RTT
Economic Affairs Committee

Credit Card Total Cost

I receive four or five "applications" each month asking me to apply for one credit card or another. Most are from banks. Competition between credit card issuers is getting fierce. They love us. They have every reason to. I heard on the radio recently that 1986 was a "bankers" year, with customers charging over $320 billion on credit cards, and nearly half of those charges were on bank "plastic." Credit card issuers are using every gimmick in the book to entice us to use their card. We're being offered such things as pre-approved lines of credit with appropriate checks that we can cash most anywhere. Several offer "first year free," assorted prizes and even coupons.

Few are at no cost to you. Many are free the first year. Most have a monthly or annual cost. One card I use charges 90 cents each month that I incur a charge. No charge, no cost. Most banks charge about $20.00 annually for their regular card. Gold or platinum or whatever they call their "premium" or first class cards are usually issued with extra privileges such as a higher line of credit, travel insurance on tickets or what-have-you purchased with their card, etc., and no cost from $30 to more than $200 annually.

There are six plastic cards in my wallet that were issued by "major" banks, plus cards to use at Sears and several local merchants. There are also cards for five nationwide oil companies that I use regularly. I love 'em. I use their money for 15 to 30 days or more for little or no cost. Or do I?

Besides the initial cost, another factor to consider is what is generally known as a grace period. How long do you have to pay the bill before they begin to charge interest? Usually 25 to 30 days. However, some banks offer no grace period, and some even start finance charges the day of purchase. A good number of banks are gradually shortening the grace period, some are eliminating it. What about the ones you use?

As Janet Leary pointed out in an earlier article, interest rates will become more important as tax deductions for interest paid on credit cards and other consumer debts are phased out because of the Tax Reform Law of 1986. This year (1987) only 65 percent of interest paid will be deductible. The interest deduction is to be entirely eliminated by 1991.

Annual percentage rate is a key factor to consider. The average bank credit finance charge about mid-1986 was between 17 percent and 18 percent. They generally charge near the maximum allowed in the state in which they are chartered to operate. Take a look at the rates allowed by the various states, (it's usually in the fine print). I reside in the state of Delaware. Several years ago, the Delaware State Legislature raised the maximum allowable interest rate to 21 percent. Since then, a bunch of banks have moved their "credit departments" to Delaware. The reason is obvious, where you buy isn't as important as where you're billed from.

But, from your individual perspective, probably the most important ingredient in all this is how you personally handle credit. Do you pay off all charges every month or do you have a running balance? If you use a card from a bank that has a grace period, you never pay a finance charge if you pay off all charges each billing, and before the grace period ends. However, if you pay only a portion of the bill, interest charges begin at the end of the grace period and continue as long as you have a balance due, including new purchases. My tax lawyer informs me that this is true except in Massachusetts, Vermont and Maine.

Now that you probably have a few credit cards, have you read the fine print? Do you know what the fine print really means? What is the total cost of the card to you?

These are just a few things to think about as another holiday season is upon us. I have to agree that credit is great as long as we know how to use it and how much it costs. And, it does cost! Use your plastic with discretion.■

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Ernie Juhn
Institute Director '88

See You In St. Louis

I guess it is never too early to write about future events when it comes to planning. Even though there is still plenty of time and we only returned from the convention in Toronto, I would like to tell you about what you can look forward to in St. Louis at our 31st PTG convention.

As you probably have noticed, each technical institute has its own personality. In the past I have always tried to come up with something new and different. We had the "all hands-on classes" in Philadelphia, the "International" theme in Kansas City and one of my previous institutes was unique because of the fact that we had mostly new instructors. Well, this time again I am working on something new and different. I thought it would be interesting to see some of our "famous instructors" teach subjects that they are not famous for. I hope to have quite a few of those. Of course, there still will be a lot of standard basic classes which are traditionally part of our Technical Institute.

In addition to all this there will be some new topics and instructors as well. I promise it will be quite a program. In fact, it might be a good idea to plan even as early as now to attend the convention in July at St. Louis. ■

THE
TECHNICAL
FORUM

A Fond Farewell, Some Stories, A Few Pet Peeves And More On Grand Rebuilding

Jack Krefting
Technical Editor

Since this will be my final issue as Tech Ed, I hope our readers will be tolerant of miscellaneous non-technical observations.

First of all, I want to thank everyone who has helped me over the years. I have enjoyed my tenure immensely because of the willingness of other Guild members to write articles, letters of encouragment, tech tips and the like. I especially appreciate the efforts of our regular contributors who, together with the Executive Board and the Home Office, simply could not have been more helpful or cooperative.

Secondly, I wish there were a way to clear the record by editing out all the dumb things I've said in print, sort of like our lawmakers do when they want a speech entered into the Congressional Record, although in both instances the main problem is knowing when to stop.

The biggest challenge of this job is that there is no universal authority in our craft, no textbook, expert or technical committee that absolutely defines what is right and isn't, probably because ours is an evolving profession rather than an established one.

We are belatedly assembling a body of knowledge that will eventually serve as the basis for an authoritative textbook or series of manuals, but until some great expert writes that great book, the Tech Ed is on his own. The state of the art is nebulous at best, especially when many of the experts have an axe to grind or a product to sell, so one tries to tread the narrow path between tradition and innovation, hoping to preserve the best of the former without excluding the latter.

"The biggest challenge in this job is that there is no universal authority in our craft, no textbook, expert or technical committee that absolutely defines what is right and isn't, probably because ours is an evolving profession rather than an established one."

In connection with having held the post so long, it occurs to me that possibly some of our readers might have been wondering about the kinds of questions I didn't use, whether because they were inappropiate or just silly, and so I thought I would present a few of them here – anonymously, of course. Obviously, many of our correspondents not only aren't members, but neither are they technicians, even though they have pretend to have extensive knowledge in every area except that covered by the question. One reader, for example, stated that he had been rebuilding for a number of years and had an amazing discovery that he wanted to share. Loose tuning pins, he slyly divulged, could be cured by the use of Durham's Rock Hard Water Putty!

Another reader stated his preference for the A fork over the C fork on the basis that the first note on a piano is A, so it only makes sense to tune the first note with the fork. It avoids backtracking, apparently.

Another reader, who was being sued because his client's newly rebuilt piano failed to live up to tonal expectations, tried to cure poor bass tone by replacing the custom-wound bass strings with universals after the piano was delivered. In his defense against the lawsuit, he cited the number of hours he had spent doing "custom unwinding of copper" in the customer's home.

One reader described the difficulty of training people to work in the shop during one's absence, especially when the trainee's level of awareness is assumed to be greater than it actually is. In this case, the technician had just sold a hammer-filing job to a client. He painstakingly filed the top hammer to its optimum shape and instructed his aide to "make them all look just like that one." Not understanding that he meant them to be tapered to the full, round shape of the bass hammers as one went down the scale, the trainee literally followed his directions when he returned, all 88 hammers looked exactly like number 88.

And then there was the technician who had restrung a grand without removing the action. He had used longer pins than the originals, and was unable to remove the action afterward because the tuning pins protruded through the bottom of the block. He was just wondering whether another experienced rebuilder might agree that removing the keybed for regulation would be the best answer.

And then there are the professional journalists, who want to do an article on how to buy a piano, but aren't even remotely qualified to write such a piece and don't want to spend the time to research the topic even superficially. They call and want simplistic answers to complex questions, and then they quote only the meatiest or most controversial part of the answer.

The flattery of having been considered an expert is quickly diluted by the realization that the writer doesn't really care to hear a detailed explantion, or to take the trouble to understand it. They would rather just come up with a couple of quotable quotes, all too often, which does a real disservice to the person being quoted.

Incidentally, I have three pet peeves to share with whoever may still be reading at this point:

1. Square pianos are squares, not grands. The term, "square grand" is as silly as the term, "cabinet grand," and almost as annoying as "baby grand."

2. The keyslip is not the "front rail." The front rail is either the bar behind and above the fallboard, otherwise known as the stretcher or cornice, or it is the forward part of the keyframe. The keyslip should be referred to as the "keyslip."

3. There is no such thing as a "concert tuning" or a "concert tuner." If you can tune, you can tune for a concert, if you can't, you shouldn't be tuning except in practice.

Grand Rebuilding

This month we consider the task of making new bridges. Before we removed the old soundboard, you may recall from our discussion a few years ago, we had removed all the bridge pins and made a pin pattern as well as a "tree" to relocate the bridge if we were planning to re-use the existing one. The patterns will also be used to locate the new bridge, as we will see presently.

The preferred material is close-grained hard maple – preferably sugar maple – although there are several common methods of construction. Whatever method is selected, it is important for the transmission of sound that the lengthwise grain of at least part of the bridge run from end to end. Since it would be impractical to try to find material that is bent to the shape of a bridge, solid bridges necessarily have short grain, that is, end grain running out of the side of the bridge in places. The continuous grain being better for tone, many rebuilders prefer the vertically laminated bridge with or without a cap. This is the type of construction we will discuss here.

The maple strips should be flatsawn so that, when turned up on edge, they will be quartersawn. They should be about an eighth of an inch in thickness, and the width of the strips will be determined by the height of the old bridge and whether or not the new one will be capped. The main argument for the uncapped bridge, incidentally, is that there are no horizontal glue joints within the bridge and that therefore the sound transmission is better. The other side of that coin is that a capped bridge is less likely to delaminate and a lot easier to plane and notch. Considering the fact that most of that work will be done by hand in most shops, we recommend a quartersawn maple cap, installed so the grain runs out from the length of the bridge by 25 degrees or so. This naturally dictates that there will have to be at least one butt joint in the cap, usually at the top scale break. If the grain runs parallel to the length, it isn't nearly so resistant to splitting and is very difficult to notch cleanly, especially in the top treble; conversely, if the grain is too perpendicular to the length of the bridge, there is even more chance of splitting and very little tonal transmission from the cap.

Don't remove the old bridge from the board until ready to make the caul, because it can easily bow and twist out of shape, and then you have no pattern.

To make the caul, use the stiffest, most dimensionally stable material practical, such as hardwood plywood, in a thickness at least equal to the width of the strips to be glued. If the old soundboard will be re-used, remove the old bridge carefully; if not, simply saw through the board next to the bridges with a saber saw, and then knock off the small pieces of soundboard and rib that are still stuck to the bridge. Scrape the bottom of the bridge clean, lay it onto the caul material, and trace its outline with a pencil directly onto the caul. Don't follow the undercuts, make it full width for now.

Saw the caul along the pencil lines, and cut it so it can be used as a clamping fixture. Always do a dry run – no glue – to be sure the thing will work when it has to. If any of the plies are not tightly clamped together anywhere along their length or width, add clamping pressure or shim the caul as required. The caul will have to be held down loosely, incidentally, otherwise the clamping pressure

will make the thing fold up like a book.

Lay waxed paper on the table so the bridge won't be glued to it, and also on the outside of each side so it won't stick to the caul. Apply glue and clamp the assembly together with enough force to produce very thin glue lines. The glue used should be one with little or no tendency to creep (cold flow), which rules out aliphatic resin and polyvinyl acetate glues. Two preferred glues for this application are urea formaldehyde and resorcinol, but there are others that will work also.

When the glue has cured, it is a good idea to leave it clamped until the excess moisture has dissipated. Then plane the top surface flat to accept the capping, which incidentally should be thicker than the old cap to allow for planing. When the cap has been glued and trimmed, machine the bottom of the bridge to fit the soundboard and do any undercutting or stepping of the underside to make it match the old bridge design. Now we can locate and install the bridge.

If the new bridge is going onto the old board, lay it in position and locate it with the tree. Scribe its outline lightly onto the board, clamp it in place and drill at least two screw holes into the bridge from underneath. Then devise a clamping method such as a go-bar system or a beam clamped across the rim with jacks under the beam, and glue it in place.

If the bridge is going onto a new board, locate it with the tree as above, but then drill two locating holes to positively align the soundboard to the inner rim as we discussed in a recent issue, and then attach the bridge to the board out of the piano. It is much easier that way, and you can get a soundboard button and screw right under note 88, which isn't always possible if it is done in the piano.

I regret that I did not complete the above series, but I'm sure that Susan or someone else will do so. If not, possibly I might find time to finish it later.

Once again, I thank you all for your help and encouragement. This has been a long, arduous but rewarding effort – maybe we'll do it again sometime. ■

T U N I N G
UP

Rick Baldassin
Tuning Editor

It has come to my attention that in the September issue of the *Journal,* during my review of Albert Sanderson's class, one line was omitted from the text, which drastically altered the content. Page 29, paragraph three should read:

It was noted that for a while, it is fairly easy to achieve a good compromise between the single octave, double octave, and twelfth. After a while, the three paths diverge, and a choice must be made. In general, the single octave will give the most conservative stretch, and the twelfth will give the most radical stretch. The double octave lies between the two.

With the omission, it read that the single octave gave the most radical stretch. My apologies for any grief this may have caused you in the past two months.

Piano Curve Identity Revealed

Last month, I presented a graph showing the tuning curves for two pianos, a large upright and a console, which had the same Stretch Number. It was demonstrated that while the Stretch Calculator could accurately predict the tuning curve for the midrange, the bass and treble curves must be determined on an individual basis from piano to piano. It was also noted that, while both the large upright and console had the same Stretch Number, it was entirely possible that the beat rates of the two pianos could be different, even when both are tuned to the same curve. If you look back to the graph from last month (Fig. 1), you will notice that the curve for one piano starts out at -22 cents for the sixth partial of note A0, while the other starts out at -16 cents. In the treble, one piano ends up at 44 cents at note C8, while the other ends up at 36 cents. The piano which has the steeper curve in the bass also has the steeper curve in the treble. I did not indicate which curve was for the large upright, and which was for the console. In this particular case, the piano with the steeper curves was the large upright. This may surprise some of you. I must add that this would not always be the case, and that in general, the size of the piano is rather unreliable in determining which tuning curve to use. Even with two pianos of the same size, but of different manufacture, the curves can be quite different. The tuning curve is determined by the piano scale (and the tuner's preference), and not by the piano's size. The best results can be obtained by treating each piano, or at least make and model, individually.

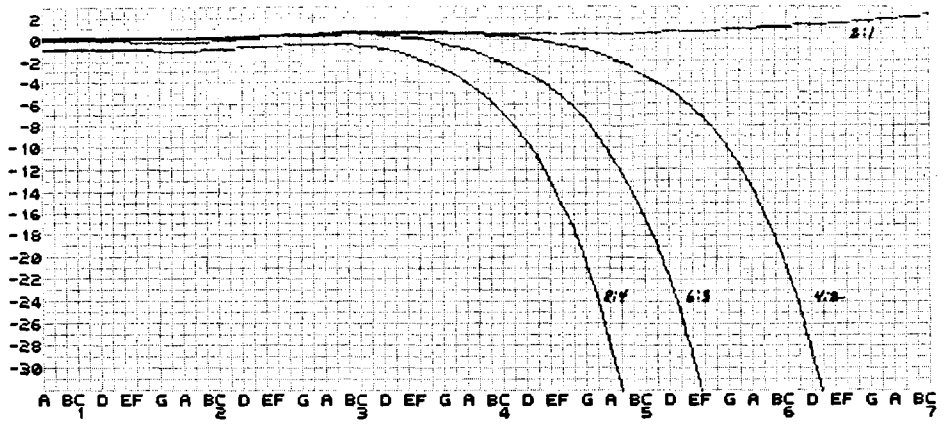

Figure 1 shows the beat rates for the 2:1, 4:2, 6:3, and 8:4 coincidences of the octave. Theoretically, the beat rate would be zero for all coincidences.

Beat Rates From Sanderson Data

Last month I also presented data supplied by Dr. Albert Sanderson which included the cent deviation for several of the partials, tuning curve, and the width of several of the intervals for all 88 notes. The cent widths of four octave types, Major 3rds, 10ths, and 17ths, plus 4ths and 5ths, were graphed. This month, the beat rates from the same data will be presented.

The theoretical beat rate for all of the coincidences of all of the octaves would be zero. Because of inharmonicity in the piano, this is not possible. Notice that for this piano, the octaves were matched (or nearly matched) at the 6:3 level from notes A0 to C3, where the octaves matched (or nearly matched) at the 4:2 level (+1/2 BPS) to note C4, where the octaves were matched (or nearly matched) at the 2:1 level (+1 cent), to the top of the piano. This one cent stretching results in octaves with slightly over 2 BPS at the top of the piano. Notice how the beat rates of the 8:4, 6:3, and 4:2 octaves increase (negatively) as we proceed from the bass to the treble. Fortunately for us, by the time the beat rates become alarmingly fast, we cannot hear them any more.

This brings up an interesting point for discussion. When testing for octaves, should the m3 always beat slower than the M6, and should the M3 always beat slower than the M10? It is obvious from Fig. 1, that both of the above cases are impossible. Since the m3-M6 tests for the 6:3 octave, by looking at the beat rates for the 6:3 octave, we can determine if the m3 is slower, faster, or the same speed as the M6. Looking at Fig. 1, we see that the beat rate for the 6:3 octave from A0-A1 is 0 BPS. This means that for the A0-A1 octave in this piano, the m3 is the same speed as the M6. If we look at the C3-C4 octave, we see that the beat rate for the 6:3 octave is .5 BPS. This means that for the C3-C4 octave in this piano, the m3 is *slower*

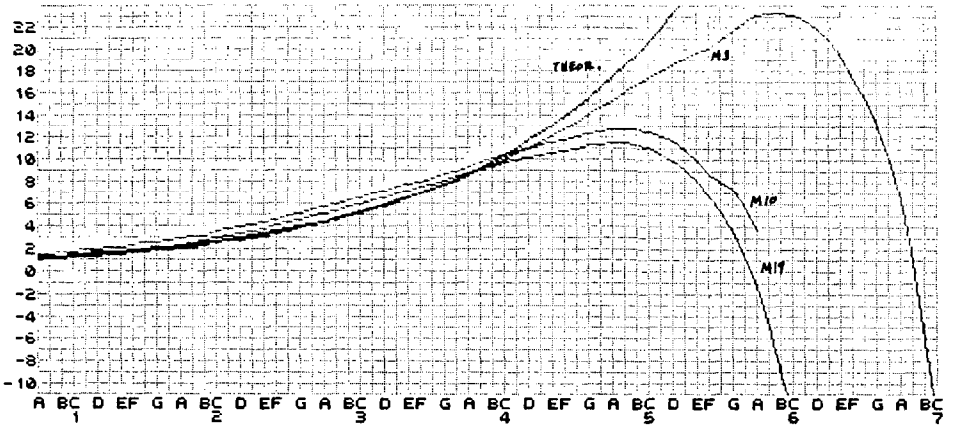

Fig. 2 shows the beat rates for the M3, M10, and M17. The theoretical beat rates for the M3, M10 and M17 are the same, and are shown by the darker curve for comparison.

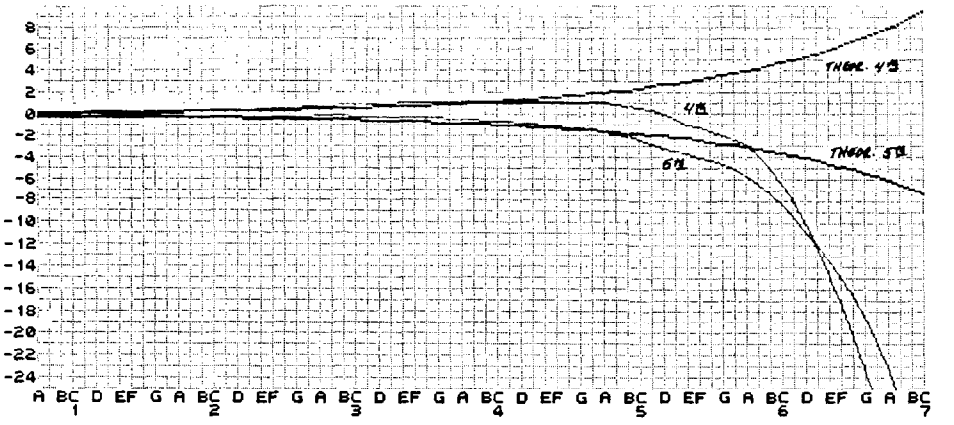

Fig 3. shows the beat rates for the 4ths and 5ths. The theoretical beat rates are shown by the darker curves for comparison.

than the M6 by .5 BPS. If we look at the F3-F4 octave, we see that the beat rate for the 6:3 octave is again 0 BPS. This means that for the F3-F4 octave in this piano, the m3 is the same speed as the M6. If we look at the C4-C5 octave, we see that the beat rate for the 6:3 octave is -2 BPS. This means that for the C4-C5 octave in this piano, the m3 is *faster* than the M6 by 2 BPS. As we proceed into the treble, the m3 becomes increasingly faster than the M6. It is obvious from the above that the m3 is *not* always slower than the M6, but that the relationship varies depending upon which area of the piano is being referred to.

Let us now look at the relationship of the M3-M10. Should the M3 always be slower than the M10? The M3-M10 tests for the 4:2 octave. If we look at the C3-C4 octave, we see that there are .5 BPS at the 4:2 level. This means that for the C3-C4 octave in this piano, the M3 beats *slower* than the M10 by .5 BPS. This condition continues for over an octave. By the time we reach the D♯4 - D♯5 octave, we see that there are 0 BPS at the 4:2 level. This means that the M3 beats at the same speed as the M10 for the D♯4 - D♯5 octave in this piano. If we look at the C5-C6 octave, we see that there are -3.5 BPS at the 4:2 level. This means that for the C5-C6 octave in this piano, the M3 beats *faster* than the M10 by 3.5 BPS. It is obvious that again the relationship between the M3 and M10 varies depending upon which area of the piano is being refered to.

What about the relationship of the M10-M17? Should the M10 always beat slower than the M17? The M10-M17 tests for the 2:1 octave. Looking at the beat rates for the 2:1 octave, we see that the beat rates are all positive, and therefore the M10 *would* beat slower than the M17 in all cases in this piano. Or at least the M10 should be the same speed or slower than the M17, since we never want the 2:1 octave to be narrow.

Notice from Fig. 2 how the M3rds rather closely match the theoretical curve from A3 to the bottom of the piano, being slightly slower than theoretical. From C4 to C6, the beat rates still increase, but at a much slower rate than theoretical. Above C6, the beat rates begin to decrease and are severely negative (inverted) by C7.

If we look at the M10 and M17, we see that from A3 to the bottom of the piano, the beat rates decrease in speed at a rate slower than theoretical. From C4 to C5, they increase at a rate slower than theoretical. Above C5, they decrease in speed, the 10th becoming severely negative (inverted) by C6. Notice that the M10 is indeed slower than the M17 throughout the piano. In fact, to note A3, the M3<M10<M17. At note B3, M3 = M10<M17. By note F4, M10<M17<M3.

The 5ths are slightly slower than theoretical from A4 to the bottom of the piano, actually becoming just at the bottom of the piano. Though they are slightly slower from A4 to the bottom of the piano, they decrease in speed (negatively) at about the same rate as theoretical. Above A4, they increase in speed (negatively) at a much faster rate than theoretical. It is obvious that while it is possible to tune the 5ths pure in the bass, it is not possible to do so in the treble.

In looking at the relative speeds of the 4ths and 5ths, we see that at note F4, the speeds are about equal (one positive, and one negative). Below F4, the 5th is slower than the 4th. This is a very helpful tool in tuning the transition from tenor to bass – the 5th above the note being tuned should beat slower than the 4th above the note being tuned. When the 4th can no longer be heard, descending into the bass, the 5ths should be increasingly more pure.

From the above data, it is obvious that on the piano, we cannot tune Equal Temperament. What we do is try to emulate the characteristics of Equal Temperament as much as possible. In general, where theory and practice depart radically, we are spared by the fact that the tonal spectra does not produce the beats any longer. The bottom line is that even though we cannot tune the piano in Equal Temperament, what we tune the piano in we call "Equal Temperament."

Tuning Two Different Pianos Together

This month we have a question from Ross Anderson, of Monroe, Connecticut. Ross writes:

This refers to your article in the September 1987 issue of the Journal. My question is this: If two pianos have different stretch numbers, hence different inharmonicity, how can the two pianos be in tune with each other, except for one note, say A-440?

Strictly speaking, the two pianos cannot be in tune with each other, even at note A4 tuned to 440. If the notes have different inharmonicity, even if they are in tune at the 1st partials, they will not be at the 2nd, 3rd, 4th, etc. In fact, according to this strict definition, the piano cannot be in tune with itself.

Tuning two pianos together can be a real problem. If the two pianos are identical, the problems are minimal. But if the two are different, as described above, some important decisions must be made. Do we call one the primary piano, tune it, and tune the second piano to the first? Do we tune each piano individually at the same pitch level? Or do we average the tuning curves of the two and tune each to the average? Good questions.

I suppose each method has its advantages and disadvantages. Let us examine each method. Method 1 call one piano the primary piano and tune it, then tune the second piano to the first. This method can be done either aurally or with an electronic aid. Tuning the first piano is easy in either case. Tuning the second is easier with the electronic aid, unless you have an an assistant to play the notes one by one while matching the second piano. In my opinion, matching the second piano by ear to the first would yield better results than tuning the second piano to the tuning curve of the first with an electronic aid. The reason is that the electronic aid sets the pitch at a prescribed partial without respect to the other partials. In mismatched pianos we have a situation similar to mismatched bichords. Sometimes the best placement is when none of the partials are exactly in tune. The ear hears all of the partials simultaneously, and better allows for the best compromise. The major disadvantage of this method, is that it is quite likely that the second piano will not sound in tune with itself.

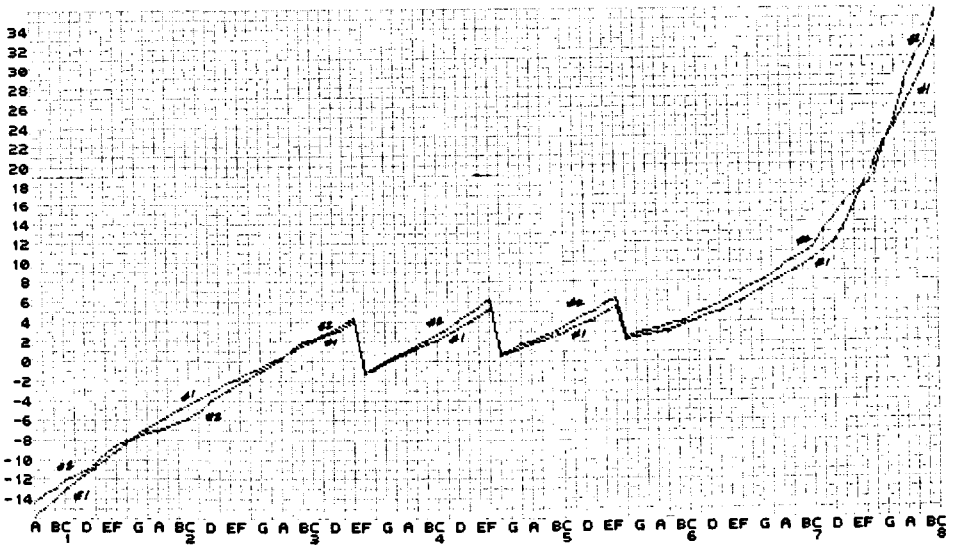

Fig. 4 shows the tuning curves of two studio pianos, 1 with a Stretch Number of 5.0, and 2 with a Stretch Number of 6.0. The curve represents 6th partials for notes A0 to E3, 4th partials for notes F3 to F4, 2nd partials for notes F4 to F5, and 1st partials for notes F5 to C8.

Method two: Tune each piano individually, at the same pitch level. This also can be done either aurally, or with an electronic aid. The advantage to this system is that each piano will sound in tune with itself. The disadvantage is that the two pianos may have notes which are not in tune with each other.

Method three: Average the two piano curves, and tune each piano to the average. This would only be practical with the use of an electronic aid. The advantage of this method is that the discrepancies between the two pianos are minimized. The disadvantage is that it is possible that neither piano will be in tune with itself.

As we can see, each method has its advantages and disadvantages. I suppose how mismatched the two pianos were might influence our decision. Let us look at two studio pianos, one with a Stretch Number of 5.0, and one 6.0.

Examination of Fig. 4 shows that the major deviations occur in octave 7. Although there appears to be problems from A0 to C♯1, and from A1 to D2, these cent deviations are minimal when converted into

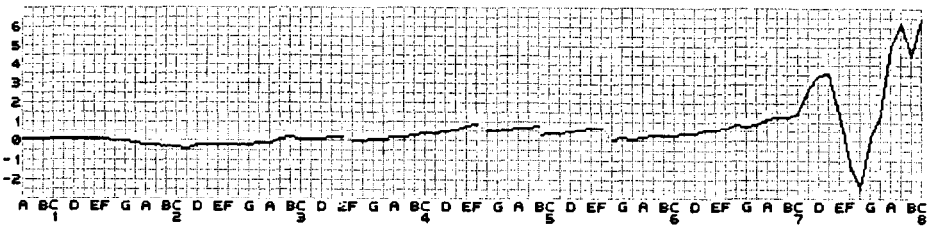

Fig. 5 shows the difference in the two tunings in BPS at the partial level tuned. Where a one cent difference is about 1.5 BPS at the 1st partial of E7, it is only about .2 BPS at the 6th partial of E2.

beats. To help evaluate what we would hear, I have calculated the difference in BPS at the partial level tuned.

From Fig. 5 we see that although the two pianos have Stretch Numbers which vary by one cent, we have no more than +/− .5 BPS between the two pianos from A0 to D4. From A0 to F6, the worst case is .8 BPS. The scaling differences show up most in the high treble, where the two vary at times by over 6 BPS.

On paper, this looks terrible. In practice, it is maybe not so bad. In spite of the apparent problems, my experience has shown that for me, the best results come from tuning each piano to itself at the same pitch level. Since it has been demonstrated that the two cannot be in tune (strictly speaking) with each other, I settle for each being in tune with itself. When music is played on the two pianos, they will sound in tune together. If you are concerned about the notes in the high treble which are six beats apart, consider how many times the two notes will be played at the same time. Probably not many. In addition, the decay time is so short, the beats probably would not be heard anyway. The note-for-note test which George Defebaugh and Jim Coleman gave their two pianos in Toronto (See September 1987 for review) would certainly be more revealing than any piece of music written for two pianos. The idea of compromise sounds good, but what really happens is that instead of making one piano out of tune with itself to match the other, we make each out of tune with itself. In the case above, I might be tempted in the 7th octave to play note for note to see if there were any which sounded too bad, and see if they could be improved.

I admit that there is no perfect way, and it is entirely possible that none of the above methods is any better than any other. The biggest problem would probably be getting the two pianos at the same pitch level so that they would stay in tune, no matter how they were tuned.

Our thanks again to Albert Sanderson for the piano data he supplied, to Ross Anderson for his question, and to Franz Mohr for the tip on string replacement. Please send your questions and comments to me:

Rick Baldassin
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AT
LARGE

The New York Paramount Theatre Piano: An Historic Instrument Restored

Charles P. Huether
New Jersey Chapter

During the course of operating a piano rebuilding and restoration business, the occasional "special" instrument adds spice to the usual run of conventional pianos. If that instrument also has a verifiable history and significance, the excitement and satisfaction grows both in the restoration and the search for historical authentication.

Such an instrument found its way into the shop of Robert Leech, RTT, of Linden, New Jersey. Its historic past and how it came into Bob's hands is a fascinating story and worth recounting.

A musician friend in Princeton, N.J., told Bob of a "big piano" in the barn of a nearby home and he went to investigate. What he found was a nine-foot Knabe concert grand, with an elaborately carved case, mounted on a six-legged pedestal, covered with blue and green paint, dust and chicken feathers. His eyes lit up with excitement as his instinct told him there must be something special beneath the disfiguring paint. A deal was arranged and Knabe concert grand #100,000 was soon standing in all its ugly greenness in Bob's shop.

This was not the first unusual instrument to pass through the shop so Bob was prepared to research its background. There had to be a history to this piano and a search was begun immediately. Working through records found at the old Aeolian piano factory in East Rochester and the resources of the Theater Historical Society, the story unfolded; leads were followed up by correspondence, telephone contact and interview until the record was compiled and authenticated.

Knabe concert grand #100,000 had been made expressly for the New York Paramount Theater in 1926. The opening of the theater was a highly publicized event for the New York Paramount was the ultimate in motion picture palaces. It was the keystone of New York City's Times Square first-run movie houses; the "Jewel in the Crown." The builders' intention was to overshadow all the other theaters in elaborateness of design and decor and they succeeded. The piano was in keeping with these intentions. Standing on an elegantly carved pedestal, decorated in gold leaf, the instruments exuded opulence.

Knabe Co. publicity material from 1926 detailed the making of the piano expressly for the new theater. Photographs located in the files of the Theater Historical Society showed the instrument in various locations in the theater's grandiose rooms as well as on stage with the big-name bands. Performances by Goodman, Basie, Ellington, Duchin, Miller, the Dorsey brothers and others made the New York Paramount Theater synonymous with the great music and musicians of the Swing Era and this instrument was used by all of them; it accompanied all the great bands and all their great soloists; it was played by all the pianistic greats.

How did it wind up in a barn in Belle Meade, N.J.? With the closing of the theater in 1964 the instrument found its way into the

Before And After

hands of Paul Boepple, musician, conductor and teacher, director of the well-known Dessoff Choir, on faculty at Bennington College and Westminister Choir College. When coming to Westminister Choir College and setting up residence in Princeton, the piano came along. Upon his death, his widow moved into a smaller house in Belle Meade and, because of lack of space, relegated it to the barn. Bob was fortunate to be on site when another move was being contemplated and bought the instrument. Who applied the paint is still a mystery.

Years of hard use and neglect had diminished its richness of tone and touch. These were brought back to original luster through meticulous care, repair, replacement and adjustment.

The elegant case was concealed beneath coats of blue and green paint. Painstaking work removed the paint and revealed clues to what had been the original finish. The old photographs provided additional detail. Final restoration of the case required eighteen books of gold leaf for the ornamentation.

The reborn instrument has been seen and played by numerous artists, admired by all. Its restored voice is as great as its distinguished appearance. The photographs, letters and other records accumulated during the research have been assembled in a 75-page album. It will soon be moving into a private setting worthy of its elegance and distinction.■

Elements of Quality Soundboard Construction

Nick Gravagne
New Mexico Chapter

A soundboard is ready to be installed in a piano when it is in an acceptably completed form. The elements of quality soundboard construction, both as to the process and the product, will be immediately recognizable to those involved in such work. The high points of these elements are outlined below, followed by preliminary details of soundboard installation.

The four- to six-inch spruce strips which make up the surface of the soundboard should have been carefully selected as to closeness and clarity of grain, color continuity, and grain orientation as to direction and rise. Those strips with closest grain (slow growth timber) and are placed in the center of the soundboard with the wider grain pieces at the edges and corners. A close grain of 15 to 20 hard grains per inch is considered quite good. Also, the selected boards should be vertically grained as a result of quarter sawing. As viewed from the end, a 45-degree grain angle is generally considered a maximum deviation. A well-built soundboard should reveal no visible evidence of the edge-to-edge glue joints which exist every five inches or so. Since the color of spruce varies from white to honey, care should have been taken to build a grand piano soundboard of one color (for cosmetic reasons if nothing else). Of course, the grain direction should match that of the old board. The fall and rise of the grain relative to the face of the individual strips should be arranged in the same direction to facilitate clean planing of the spruce sheet later on.

Other structural features such as tapering, rib dimensions and paring, location of ribs and nose-bolt holes, crowning and finishing of the soundboard should have been carefully attended to. The thickness/taper of the spruce sheet is usually cut into the top surface of the soundboard before the ribs are pressed on. The underside, or rib side, should be a flat, true surface suitable for good glue joints with the ribs. The primary tool used in rebuilding shops for the surfacing and grading of the spruce sheet is the hand plane. Four sizes complete the job, beginning with an electric hand planer for fast stock removal. This is followed by a 15-inch jack plane, a 22- to 24-inch jointer plane, and finished with a smaller smooth plane or scraper plane to even out the surface. The experienced worker will use cutting blades in the bench planes which have rounded rather than sharp corners to prevent gouging the wood surface. Super-sharp, polished blades, properly set in a non-chattering plane, are essential to a good job. Electric sanders of all types obviously find their use in this work. When this phase of the work is done, the surfaces should be smooth and clean with no apparent gouging, splintering or torn-out grain. Minor defects, such as occur in planing against a reversing grain rise, can be puttied or plugged. The top surface grading should be gradual, showing no signs of hills or hollows or immediate and disparate slopes. This is not only for an attractive appearance and better vibration, but to ensure a good glue joint with the bridges.

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The four- to six-inch spruce strips which make up the surface of the soundboard should have been carefully selected as to closeness and clarity of grain, color continuity, and grain orientation as to direction and rise. Those strips with closest grain (slow growth timber) and are placed in the center of the soundboard with the wider grain pieces at the edges and corners.

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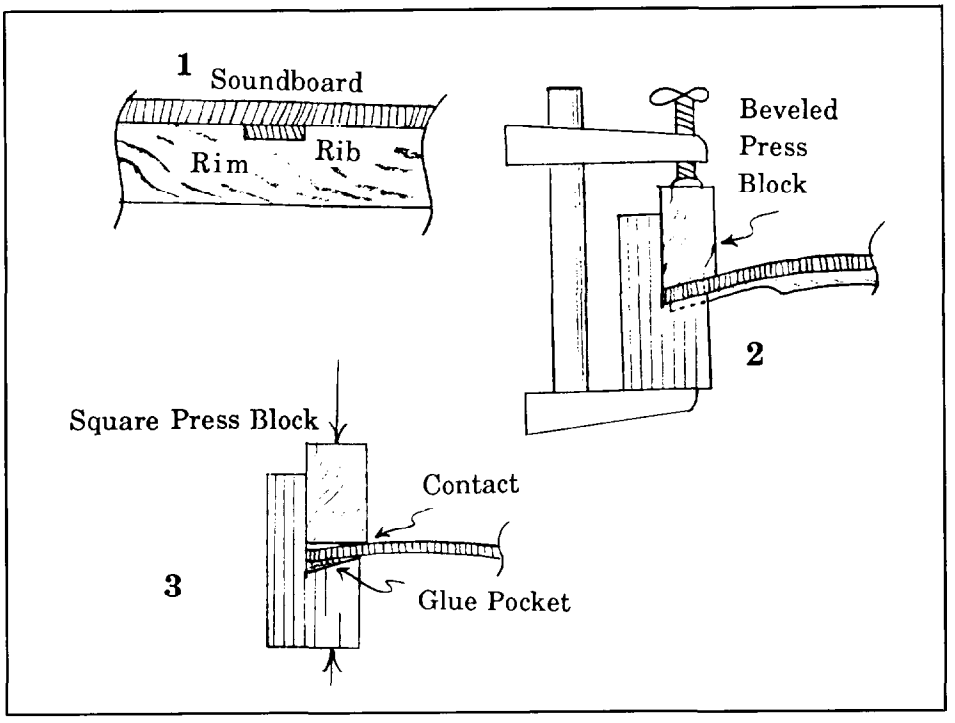
The rib dimensions, configurations and locations are picked up by direct measurement and/or patterns. The July "Technical Forum" explained the technique of locating the ribs on the spruce sheet by direct marking. Other techniques involve making a paper or posterboard pattern to pick up key dimensions and locations of ribs and notches. Since not all rib paring is the same, either from one make to another or even in the same piano, a small poster board pattern showing the configuration is useful. Generally, all the parings are the same in a given piano but any departures should be picked up and duplicated in the new rib. No matter what the shape, parings should be smooth and not choppy. The rib material is usually spruce but clear sugar pine is preferred by some. The cross-sectional corners of the ribs are removed, leaving a neat and graceful radiused appearance. Whether the nose-bolt holes are drilled out before or after crowning, they should be clean, leaving no splinters or split-out grain. Regardless of whether the soundboard is crowned in a flat or dished press, it should not be severely bellied, oddly shaped or twisted. Rather, it should have a rounded and graceful appearance. Ideally, there should be measurable crown at all ribs, including the short ones, as there is going to be pressure from down-bearing at every rib when the piano is strung. The rib-to-soundboard glue joint should show no signs of glue pockets.

A debate has ensued for many years now as to whether varnish or lacquer is more conducive to better tone. Whether one or the other is less detrimental to good tone is probably more to the point as an unfinished soundboard should theoretically move more freely as a whole and segmentally than one which has the added drag of any finishing substances. However, a finished soundboard looks better, is protected, and is less susceptible to atmospheric changes. What is more important than which finish is chosen is the amount of material put on the soundboard. Applying the same techniques in finishing a soundboard as are used in quality furniture finishing could impede the soundboard movements to such a degree as to render it lifeless. Some rebuilders take pride in finishing a soundboard so it is "like glass" both in texture and appearance. An awful lot of finishing material is necessary for such an outcome. It is a personal conviction that no wood fillers should be used and that only enough varnish or lacquer be used to achieve a pleasant appearance. An inspection of new first-rate pianos shows a somewhat "grainy" look to the soundboard indicating a non-excessive loading of finishing material. Futhermore, the scraping of old soundboards also reveals that a minimum of varnish was originally applied in the best instruments. Anything added to the soundboard/rib unit further impedes its ability to move freely. A scraped and sanded old soundboard has a noticably lower resonant frequency than it does after it's finished. Of course, no finishing material should be applied to a new soundboard at the glue joint perimeter.

The final thought on the completed, ready-for-installation soundboard is an aesthetic one. Like other isolated componets of the piano, such as the gilded plate, an action part or hammer, a soundboard should possess an inherent beauty of its own. When it is a pleasure to behold and to handle, it is a work of art in its own right. That it serves an acoustical and mechanical function in the piano seems almost secondary at this point. Since perfection in anything is an elusive concept, no soundboard will rate perfect scores in all categories. It should be evident, however, that the objective of the builder was clearly to produce a first-rate soundboard based on objective and aesthetic criteria.

Before going on to some of the soundboard installation techniques, one last word on soundboard *making* versus *installation*. They are not to be confused. Soundboard making requires far more comprehensive woodworking skills than does installation. A skilled cabinet-maker who knows zero about pianos can learn to make soundboards in no time. A crackerjack piano technician, but with minimal woodworking skills, tools and jigs will have to become a much better woodworker in order to produce quality soundboards. Particularly, the care, setting and use of hand planes, chisels and scrapers is of the utmost importance, to say nothing of wood knowledge and gluing techniques. Soundboard installation, on the other hand, is relatively straightforward and can be successfully completed, even on the first outing, by an intelligent and motivated technician.

When the soundboard is in the condition outlined above, and the rim is in the condition explained last month, the installation can begin. It starts by placing the new soundboard into the case in order to determine how well the ribs and notches are lining up. The actual perimetrical shape of the board will have been cut, cleaned and fitted to the case prior to the crowning of the board. Even with the most careful attention given to rib locations and their thicknesses at the notch area, the soundboard/rib unit will need some fitting before it is ready for gluing. Typically, the ribs are a bit too deep, wide, or off center at their notches, preventing the soundboard from "dropping in." Ideally, the rib ends should bottom out in their notches at the same time that the soundboard gluing surface makes contact with the rim. See Figure 1. They never do on the first try. The worst of the offending ribs should be quickly isolated and marked with chalk in some coded fashion. This is, of course, accomplished under the piano with a flashlight and mirrors if necessary. It helps to have a helper pressing on the board at each rib as the inspection is made. The soundboard is then removed (the nose-bolt holes make excellent "handles") and the chalked ribs are trimmed according to the coded markings with chisels. If all the ribs are off-center by the same amount, the soundboard can usually be "drifted" into place by rasping and sanding the appropriate soundboard edges until the ribs are over their notches. It is for this reason that the new soundboard should overhang the belly rail a little bit. It allows for all eventualities and is trimmed last.



When the rib ends are more or less over their notches it is time for a dry fit with clamping pressure. The equipment used for this is the very same that will be used to glue in the soundboard. This equipment consists of bar or pipe clamps ranging in length from approximately 20 inches to 24 inches. The jaws should be deep enough for a three-inch reach. The number of these clamps necessary depends on the size of the piano and the favorite technique of the rebuilder as to positioning and clamping. There should be at least one bar clamp per rib notch. C-clamps work fine at the belly rail.

Wooden cauls and press blocks are also necessary as the bar clamps are not able to make direct contact with the soundboard. See Figure 2. The drawing shows the clamping screw pressing on the press block which has a bevel cut into the end which in turn contacts the soundboard. The press block bevel corresponds to the rim bevel (see last month's *Journal*). The other jaw of the clamp is pressing on the underside of the case rim. Simple two-by-fours make suitable press blocks. The drawing shows the block pushing directly on the soundboard. If this arrangement is used all around the rim, more blocks and clamps are necessary than if scrap pieces of wood (cauls) are placed lengthwise along the contour of the rim. In that case the press blocks contact the cauls which in turn press on the soundboard. Fewer clamp assemblies are then necessary as the pressure is distributed over the larger areas. In no case should there be fewer than one clamp per notch. Since some of the glue-squeeze is prone to ooze up between the edge of the soundboard and the inside of the outer rim, the blocks should be sealed and waxed to prevent adhesion to the soundboard and case. Smaller-dimensioned press blocks can be used going around turns, such as at the tail. Simple one-by-twos with the bottom cut bevel work fine.

The reason a beveled press block is necessary is illustrated in Figure 3. As shown, a square block will press on the high point of the rim bevel leaving a glue sandwich at the low part of the rim bevel. This points up what these last few *Journal* articles have been about. The best possible movement of the soundboard will be realized if the board is *rigidly* affixed to the rim. It is far better to have the dense, hard inner rim, rather than a continous pocket of glue, reflecting the many soundboard vibrations. Next month, the final fitting and gluing. ■

The Square Piano Wins Acceptance Quickly In London

Jack Greenfield
Chicago Chapter

Square Piano Replaces English Spinet

When Johann Zumpe started to produce square pianos in England in 1762, harpsichords held the same place in music performance as the concert grand pianos of today. Harpsichords were used in opera, public concerts and in the large homes of the nobility and wealthy. Spinets were the smaller, moderate-cost, plucked string instruments that the square pianos had to compete with. Virginals, still smaller plucked string instruments, but rectangular in form, had dropped out of favor late during the preceeding century.

The 18th-century English spinet had an almost triangular shape with long side or spine extending from just behind the left of the keyboard diagonally backward toward the right to meet the bentside on the right. The keyboard was offset a little toward the left. The strings stretched diagonally backward toward the right from the tuning pins in front just behind the keyboard to the hitch pins along the bentside. English spinets usually had the compass G1-G6 with a single set of strings that produced a light crisp sound. The tone of Zumpe's square piano was dull, but the hammer-struck bichords produced a fuller sound, especially from the wound strings of the bass. Furthermore, the piano could be played with more dynamic shading overall. Zumpe's pianos received an enthusiastic welcome, and before long they started to replace spinets, now looked upon as old-fashioned.

Johann Christian Bach Promotes Use of the Piano

The status of square pianos rose rapidly soon after their appearance, aided by the interest of Johann Christian Bach, one of London's most influential musicians after his arrival in 1762. Born in 1735 in Leipzig, the youngest son of Johann Sebastian Bach, Johann Christian began studies with his father at an early age. After his father's death in 1750, he inherited a generous share of the estate including three harpsichords. He left Leipzig then to live with his brother Carl Phillip Emanuel who was in the service of Frederick the Great in Berlin. Johann Christian probably became quite familiar with pianos here since Frederick had purchased at least six or more from Silbermann. Carl Phillip Emanuel had favorable comments for the piano in his 1753 book *Essay on the True Art of Playing Keyboard Instruments* (*Journal*, December 1986, page 19).

Johann Christian left Berlin in 1754 and went to Italy to work and to study. He held the post of organist at the Milan Cathedral for several years. Later, he wrote several operas that were all well received, gaining him an invitation to compose two operas for the King's Theater in London. Handel, Bach's predecessor as a composer for the opera houses of London, had died about three years before Bach's arrival in 1762. Besides opera, Bach became involved in other musical

"The 18th-century English spinet had an almost triangular shape with long side or spine extending from just behind the left of the keyboard diagonally backward toward the right to meet the bentside on the right."

activities. He acquired considerable prestige as music advisor to German-born Queen Charlotte, and he served as musical director for many social musical events. In 1764, he and another German-born musician, Karl Friedrich Abel, formed a concert production partnership to arrange an annual series of concerts. From 10 to 15 concerts were given each year through the rest of the 1760s and the 1770s.

It is likely that Bach acquired a piano during his first years in London. In 1776 he published his Op. 5 set of six sonatas for solo keyboard instrument he designated "pour le clavecin or le piano forte." These sonatas were no more than moderate in difficulty, suitable for students or amateurs. Other keyboard compositions he designated for harpsichords or piano include another set of solo sonatas, Op. 17, published in 1778, and several four hand duets published in 1778 and 1780.

Bach was not the first pianist to perform publicly in England. The first appearance of the piano at a concert was on May 16, 1767, when Miss Brickler, a singer, was accompanied on the piano by Charles Dibden. The first piano solo performance in Great Britain occured in Dublin on May 19, 1768. An announcement of the program in *The Dublin Journal* gave ticket prices as 5s.5d. Bach performed his first solo piano program on June 2, 13 days later. Bach's playing style was not brilliant but was described as "expressive and masterly." His continuing activity as a pianist paved the way for the instrument to move ahead of the harpsichord in importance in England. In 1781 Bach's health started to decline and the Bach-Abel concerts were discontinued. He died early in the following year. Johann Christian Bach now ranks as one of the most important composers of keyboard sonatas preceding Mozart and Haydn. Mozart acknowledged Bach's influence upon his work and praised him highly.

The Price of a Zumpe Piano

A record of transactions between Bach and Zumpe and several other London piano makers is shown in the biography *Johann Christian Bach* by C. S. Terry (London, 1929). Entries on a 1768 bank statement list a payment of 50 pounds to Zumpe in July. Also shown are several other payments to Zumpe's partner (1768-78) Gabriel Buntebart and to Americus Backers, who had his own business. The statement does not indicate the reasons for the payments. Warwick Henry Cole in his recent study *The Early Piano in Britain (Early Music,* November, 1986) points out that Bach's payment to Zumpe was not likely to have been for the square piano played at Bach's June concert a month earlier, as concluded by Terry. In view of Bach's designation of piano for his Op. 5 sonatas published in 1776, it can be assumed he must have owned one before then. Cole also believes 50 pounds is an unreasonably high figure for the cost of a newly manufactured square piano. Cole quotes Burney who reported prices less than 20 pounds for square pianofortes in a 1774 letter of advice to a friend. Shudi's price for his simplest harpsichord was around 40 pounds. The smaller Zumpe square piano with its crude action required considerably less work to build than any Shudi harpsichord with its delicate jacks. The lower prices reported by Burney provide another reason why so many buyers were eager to get square pianos instead of harpsichords and spinets.

Start in London

Observing Zumpe's successful piano business, some of the other instrument makers from Germany soon began to build similar instruments. The first recorded advertisement in Great Britain is an announcement in 1763 in *Mortimer's Directory* for the sale of "harpsichords, piano fortes, lyrichords and claffichords" by Frederic Neubar. Americus Backers, who may have worked in the Hitchcock spinet shop previously, started his own business in about 1763. Johannes Pohlman, later Zumpe's leading competitor, opened his shop around 1768. Zumpe's growing competition did not cut into his sales since he sold all the instruments he could make. He was unable to accept all the orders he received. The competitor who benefitted most in taking business Zumpe had to turn away was Pohlman. Burney's 1774 letter rated Zumpe's pianos as best and Pohlman's as next best. However, the demand for square pianos became great enough to keep the other instrument makers quite busy also. Zumpe's action, not patented, was copied by the others. The Zumpe action was so widely used that it became known as the English single action.

It is believed that Backers and several other builders may have been working on grand pianos, but their is no evidence of any acceptable grand piano built in England before the early 1770s. The oldest known is a 1772 Backers instrument now in an Edinburgh museum collection. Burney advised his friend not to buy a grand piano in 1774 because they were too expensive – over three times the cost of a square piano.

Demand for Fine Harpsichords Continues

The businesses of Shudi and Kirkman were not hurt by the rising competition of square pianos during the 1760's. However, even if they did not feel threatened, they took steps to improve their harpischords by providing better control of dynamics. In the harpsichord, loudness is determined by the number of strings in unison or in octaves. Large English harpischords were built with two sets of strings in unison and one set an octave higher. Each set has a corresponding set of jacks. Harpsichords with a lute stop also contained a fourth set of jacks to pluck the strings close to the front bridge. The "lute" tone is more nasal than tone from jacks closer to the center of the strings. In the traditional design, the jacks are drawn in and out of position by registers or slotted upper jack guide rails shifted by hand stops.

In 1765, Shudi and Kirkman began building most of their harpsichords with "machine stops." This was an earlier invention, little used previously, for a shifting mechanism operated by a single pedal on the left, making it possible to increase or decrease volume without taking a hand away from the keyboard. Another device, added later, was the Venetian swell, patented by Shudi in 1769. This provided a set of longitudinal louvers like Venetian blinds above the soundboard, controlled by a

pedal on the right. The louvers were opened or closed for crescendo or diminuendo. Kirkman installed a similar device but with a single panel instead of Shudi's patented louvers.

Shudi's Harpischords Acclaimed

Shudi introduced his harpischords with machine stops under circumstances that brought him great pride –Frederick the Great had selected Shudi harpischords for use in the New Palace at Postdam. Adding additional honor, before shipment from London, one of the harpsichords was set up in a concert room for a performance in July 1765 by the nine-year-old prodigy Wolfgang Amadeus Mozart who was traveling with his sister and father on the first extended Mozart concert tour. Critics from the press in England and Prussia gave highly complimentary reviews.

While in London, young Wolfgang took lessons in composition from Johann Christian Bach. Mozart arranged three of Bach's Op. 5 sonatas as keyboard "Concerti" and wrote his first three symponies there. The Mozarts may have visited the shops of Zumpe and Nubauer, but there are no records of any public performances on the piano at the time by Mozart.

Broadwood Becomes a Partner

Fully occupied building harpsichords to meet orders, Shudi's shop did not follow the early rush of London instrument makers into building pianos. It is evident that Broadwood kept himself well informed on the developments that were occurring. As his technological skill continued to grow, he became Shudi's best craftsman. Shudi was very pleased when Broadwood became a member of his family by marrying to Barbara, Shudi's 21-year-old daughter, in January 1769. Broadwood was then 36 years old. Shudi had four other living children – three daughters and a 27-year-old son, also named Burkat. None were married.

Broadwood was now given the status of junior partner, instruments he worked on were inscribed "Burkat Shudi et Johannes Broadwood." Shudi believed his family would be much better off with Broadwood succeding him as head of the business rather than his son Burkat who had shown little aptitude for instrument making.

The earliest piano on record from the Shudi shop was a square sent out in August 1770. This was a five-octave instrument similar to the Zumpe piano. The records do not indicate whether it was an instrument from another shop or was one built by Broadwood himself.■

Calendar Of Coming Events

Date	Event
Nov. 6-8, 1987	**North Carolina Conference** Black Mountain, NC Jeff Owens; P.O. Box 903; Shelby, NC 28150; (704) 482-7119
Nov. 21, 1987	**Baltimore Annual One-Day Seminar** Baltimore, MD Christie Cornetta; 10 Drawbridge Court; Baltimore, MD 21228 (301) 788-3694
Jan. 8-9, 1988	**Arizona State Conference** Aztec Inn, Tucson Arizona Mark Peele; 2204 E. 6th St.; Tucson, AZ 85719 (602) 362-4528
Feb. 12-14, 1988	**California State Conference** Torrance Marriott, Torrance, CA Anthony Pascone; 895 N. Calle Circulo; Camarillo, CA 93010; (805) 482-3513
Mar. 11-13, 1988	**South Central Regional Spring Seminar** Fayetteville, AR Denele Campbell; 541 W. Meadow; Fayetteville, AR 72701; (501) 443-2457
Mar. 18-20, 1988	**Central West Regional Seminar** Wichita, KS Marty Hess; 4031 N. Harding; Wichita, KS 67220; (316) 744-0564
April 8-10, 1988	**New England Regional Conference** Holiday Crowne Plaza, Newport, RI Kirk Russell; 13 Liberty Street; Wakefield, RI 02879, (401) 783-1966
April 15-17, 1988	**Pennsylvania State Conference** Sheraton, Altoona, PA Fred Fornwalt; 1333 Logan Blvd.; Altoona, PA 16602; (814) 942-1489
April 22-24, 1988	**Northern Illinois Seminar** Northern Illinois University, DeKalb, IL Jack Greenfield; 259 Riverside Drive; Northfield, IL 60093; (312) 446-9193
April 29 - May 1, 1988	**Michigan State Conference** Detroit, MI Hugh Gulledge; 175 Degross; Walled Lake, MI 48088; (313) 669-4325
July 18-22, 1988	**31st Annual Piano Technician Guild Convention & Institute** Adams Mark Hotel, St. Louis, MO Home Office: 9140 Ward Parkway, Kansas City, MO 64114, (816) 444-3500.

Letters

We would like to thank PTG and especially members of the Awards Committee for the honor of receiving Member of Note Awards this year in Toronto. It is a nice feeling to know that your work is appreciated, although we have always felt that we are *getting* just as much, if not more out of our association with the many fine members of the Piano Technicians Guild with whom we have come in contact over the years.

Priscilla Rappaport
Joel Rappaport

Membership!

An Organization of the Like-Minded

Ronald L. Berry
Vice President

Support groups, trade associations, guilds, etc. are the many organizations created to serve the interests of people with similar problems, goals or both. What is it in associating with an organization of similar people that fills a need in people?

Particularly when we face a problem, we often feel alone and find the need for support from others who have faced the same problem. There are support groups for surviving spouses to organizations of businessmen to fight zoning boards. We often find ourselves in the middle of a problem and are surprised and pleased to find out that there is an organization to help us through.

Problem-solving is one aspect of PTG. When we have a technical problem with a piano that we don't know how to handle, we have a backlog of people we can call on to give us help or a second opinion. Other technicians can give us ideas on how they handle the everyday stress of running a business which may help us run our own.

Common goals are another reason for organizations. Lobbying the Congress or other large-scale activities certainly would not be possible by an individual. Public relations campaigns and education programs or other expensive programs are better handled by an organization. The PTG teacher relations committee has been working on educational programs for music teachers and have represented you at the MTNA conventions. A program for music teachers was also given at the convention in Toronto and all these efforts help to increase awareness of PTG everywhere. The Cincinnati chapter is in the process of making a film to be used by technicians when talking to teachers or the public. Certainly this kind of expense must be done by an organization rather than an individual.

There are organizations to meet almost every need. There is an organization which is tailored to the needs and goals of piano technicians and that organization is PTG. Pass on the word. ■

NEW MEMBERS DURING SEPTEMBER 1987

REGION 1

Boston, 021

John L. Cavanaugh
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Newfoundland,040

Kevin L. Blackmore
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CANADA A0G 2L0

Long Island - Nassau, 111

Roy J. Ratigan
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Lehigh Valley,180

Carl K. Leibert
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Emmaus, PA 18049

REGION 2

Washington,DC,201

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Centreville, VA 22020

Charlotte,282

Kenneth R. Walker
1217 W. Zion Church Road
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Sarasota-Ft. Myers,335

Steven W. Cox
2857 Webber Place South
Sarasota, FL 33582

REGION 3

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San Antonio, 782

Thomas A. Masinter
110 Cotillion
San Antonio, TX 78123

Austin, 787

Bates J. Hunt (Jim)
6207 Wagon Bend
Austin, TX 78744

REGION 4

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Phillip W. Gibson
404 Park Avenue
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Lansing, 489

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Hutchinson, 675

Allan Harlock
115 N. Ohio
Salina, KS 67401

REGION 6

Phoenix, 851

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Reno, 895

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Los Angeles, 901

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Orange County, 926

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Costa Mesa, CA 92627

Santa Barbara, 931

Paul E. Schneider
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Oxnard, CA 93030

Sacramento Valley, 956

Arend E. Wheeler
4130 Mountain View Lane
Vacaville, CA 95688

NEW AFFILIATE DURING MEMBERS SEPTEMBER, 1987

Anthony Card
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Stony Stratford
Milton Keynes MK111JS
ENGLAND

Fabrizio Santori
Via Torre 9
60045 Monterosso, AN
ITALY

Lim Hock Seng
Blk. 155 Mei Ling Street
Apt. 07-285
0314
SINGAPORE

RECLASSIFICATIONS DURING SEPTEMBER, 1987

REGION 6

San Francisco, 941

Mark E. Anderson
1621 Shasta Street
Richmond, CA 94894

The Auxiliary Exchange

Stress

The work-stress connection of daily life is most comparable to our spouse's vocation of piano technician. Characteristic of the well-tuned piano are the strings which are held taut so that harmonies and melodies may be vibrated and amplified through a sounding board creating a pleasure for the human ear. Improper tuning creates dischord and sometimes the inevitable broken string. So too is our life.

In the publication "The Work/Stress Connection" by Robert L. Veninga and James P. Spradley, the malady of burnout caused by unrelieved stress is an aspect of life that one should and can fight against.

Each one of us engages in activities to meet our needs, wants, and the normal demands of life. However, life is seldom normal. The unanticipated happens every day and stress is created whenever an extra demand is made on you which requires adjustment on your part. Obviously, the tensile strength of piano strings comes to mind – just how much pressure can be applied?

Unrelieved work stress creates the dischord in human life manifested by such symptoms as headache, backache, insomnia, ulcers and/or hypertension. The stress response of the human being involves four processes: 1) a preparation for muscular activity, 2) increase in energy consumption, 3) muscular action involved in fight or flight, and 4) return of the body to equilibrium.

No one is immune to stress as is apparent from a listing of the primary stress risk factors which include: 1) the individual's perception of stress, 2) family pressures, 3) environmental demands, 4) work problems, and 5) faulty stress safety valves. An interesting aspect of stress is that most

President's Message

"To ask or not to ask," that is the question. I have just completed compiling statistics on the questionnaires that were in your registration packets in Toronto. We received a 25 percent return and for those of you who took the time and the effort to complete them, I thank you. I shall list the first four responses as to the determinent factor in attending conventions:

1	Convention city	27
2.	Cost	13
3.	To accompany husband	10
4.	Visit friends	7

Preferences for future programs:

1	More planned activities	10
2.	Just right as is	7
3.	More free time	6
4.	Piano related classes	5

Several checked both more free time and more planned activities Not having a PhD in statistics/ logistics, I have not figured a way to accomplish this!

The fascinating reading, however, was the 'comments' on the back of some of the questionnaires. I shall try to relate some of them to you and perhaps this will stimulate you to write and send your thoughts and/or suggestions to me.

Choice of city in July – cool climate is a definite factor... Sorry, this is a PTG decision and the convention city is selected three or more years in advance, with many components taken into consideration.

Pre-convention activities planned, tours, etc. "to allow husband and wife to attend together." Again, this is a decision for PTG and the Host Chapter.

"A hotel located in the center of town, with restaurants within walking distance."

"A congenial hotel staff."

"No deep technical classes, as my job is taxing and my mind needs a rest, this is my vacation."

"When there is a tour or outside activities, knowing how much walking and how to dress would be appreciated."

One lady signed her name and I shall answer her full page of comments personally, however, I would like to mention some of her suggestions...valid though they are, but most difficult to accomplish with the mechanics involved. I shall select her paragraph on "tours." She gave several reasons for the tours becoming less attractive to her:

1. Length – an all-day tour, leaving at 9:00 a.m. is long and can be exhausting if the day is hot.

2. Delays – if there is a stated gathering and departure time given, why must we stand...waiting for those who just can't seem to be on time for anything? This results in a later returning time and makes evening plans most difficult. How can Auxiliary members be alerted to being courteous by returning to the bus promptly and not lingering in gift shops etc., thus contributing to the above...delays?

3. Alternatives – could several different tours be offered and limited to numbers? For instance, one bus for half day... a morning tour and an afternoon tour. Allow sign-up for one or the other or both, depending on interest and stamina. An all day tour for the hearty. Or could there be several buses going to the same place but going independently?

Needless to say, it would be impossible to answer these and other comments she made in this article, but she did give me something to think about and you all gave me things to consider.

Please be aware that these questionnaires are read by the President with a full analysis sent to each Board member. They are not "just another piece of paper" to fill your registration packet. Next year, take a few minutes to fill in you answers and enable us to give you the Auxiliary you want.

Ginger Bryant

people tend to think in terms of negative causes when it must be recognized that positive experiences create stress also, e.g. holidays, conventions, etc. When your piano is out of tune you call in the tuner. When your body is out of tune because of stress the response goes off automatically but you can effectively tune it by developing personal and organizational strategies.

Work simultaneously on the risk factors stated previously. Raise your consciousness to the stresses you face. Because the stress response is largely an involuntary process, tune in to your body. Take control and change your perceptions of the stress. Be realistic and if necessary, lower your achievement expectations. Develop satisfactory safety valves that enable you to escape the direct pressure of work stress and counteract the biochemical and psychological changes which occur.

Not all safety valves are workable for all people. However, the following list of personal strategies may fit your needs.

-Change gears, shift from work to something else.

-Cut back excessive hours.

-Exercise.

-Pamper yourself, you should be your own best friend.

-Get involved, this is especially for those who find their job boring.

-Warm up slowly, change the way your busy day begins, the little things you do in the morning can help prepare you for the tensions of the day.

-Practice relaxation techniques.

-Release pressures on the job, utilize break time positively.

At the root of most problems is work stress itself. By developing a detached view of your job, analyzing its hidden structure, and knowing the specific kinds of work stress facing you, you can make suggestions, ask for help or even change the structure of your own job.

With all of the above in mind, I have conquered the stress of preparing my first Journal article.

Judy White
Corresponding Secretary

Among the several pleasant and rewarding events to emerge from the annual convention in Toronto there are two special occurences we feel our readers would like to know about. One happened during the convention, the other took place shortly after the close of the 1987 international.

Estela McKee of Mexico City attended her first annual convention in Toronto '87. She especially enjoyed the gracious comraderie she received from other attendees, both technicians and their spouses. She looked forward to and very much enjoyed the cruise tour on Lake Ontario but when debarking and walking up the ramp, the catch on her gold bracelet opened as her arm brushed against the rail. It was only a moment when her bracelet slipped off and fell in to 30 feet of water dockside, and two feet of silt. This data on depths was given her by the authorities of Gray Line when she reported her loss. The prospect of recovery was doubtful. With heavy heart Estela returned to the hotel. Her husband, who had been attending classes, sensed that something was amiss since Estela was particularly preoccupied and quiet. Jack told her he felt something was wrong and pressed her to tell him. After a few stalls she told him about her bracelet. Upon learning that the beautiful 18-karat gold bracelet which she had had for over 25 years was not costume jewelry but had been in her family many years, Jack went into action and contacted Gray Line, "at Gray Line they were very helpful and sympathetic. They gave us the name of the Director of the Scuba Diving School nearby, also the telephone number. The school was closed. The next morning at seven o'clock Jack called and made a deal on the cost of diving for the bracelet, also a time was set for that afternoon to meet on the pier at 3:00 p.m. The director explained that safety laws required three divers on any dive. Subsequently the cost was $300 Canadian with no guarantee. We arrived at 3:25 p.m. and the divers were not there. The Gray Line informed us that they recovered the bracelet within 15 minutes of entering the water. I was so happy to have it back. Agnes, that is the tale of the Mexican tourist's bracelet that spent 24 hours at the bottom of Lake Ontario."

Fred Odenheimer wrapped up another successful convention of the International Association of Piano Builders and Technicians following the annual PTG convention in Toronto and elected to spend a week's holiday in Vermont at the invitation of Emily *nee* Goya and Ed Hilbert, RTTs. Dorothea and Fred are long time friends of the Hilberts, as well as Klaus Fenner, who also took a break from the piano business. On Saturday, August 1, while Emily showed Doro the little shops in town, Fred, Klaus, Ed and his two children, Christopher and Jennifer took a hike up Crystal Bluff. The day was clear and beautiful. The quintet of hikers are rather experienced, especially Fred, who was in the Alpine Corps in WW II and Ed, who is a member of the Vermont Rescue Squad.

Emily and Dorothea returned an hour and a half after shopping and were hailed by Klaus and the children who reported that Fred was not well. "Minutes later, Emily and Christopher were back at the base of the mountain. Already one of the rescue squads was waiting...some 15 men hiked up to where Ed and Fred waited. Eleven-year old Christopher lead the way even though he had never taken this special trail. He found where Ed cradled Fred's head and tried to comfort him. They all took turns carrying Fred down on a stretcher...(thus there was no delay)...the rugged terrain would not allow for a vehicle. Once at the base, Ed drove the ambulance to Middlebury Hospital where a Dr. Shapiro took over. Following initial emergence procedure, Fred was taken to Burlington, Vermont where a Dr. Dietrich Gundel performed a balloon operation and later assured Doro that her husband was OK.

After several hours in the intensive care unit Fred gave everyone another scare when his heart stopped and he required cardiac resuscitation. Since then he steadily improved and returned home to Van Nuys, California. The skilled and appropriate management given by Ed on the mountain, the well coordinated efforts of the rescue squad and Christopher, together with the expertise of the medical team, merit the thanks and praise of Dorothea and all who know and love Fred Odenheimer. We thank Doro for providing her first-hand account.

Agnes Huether, Editor

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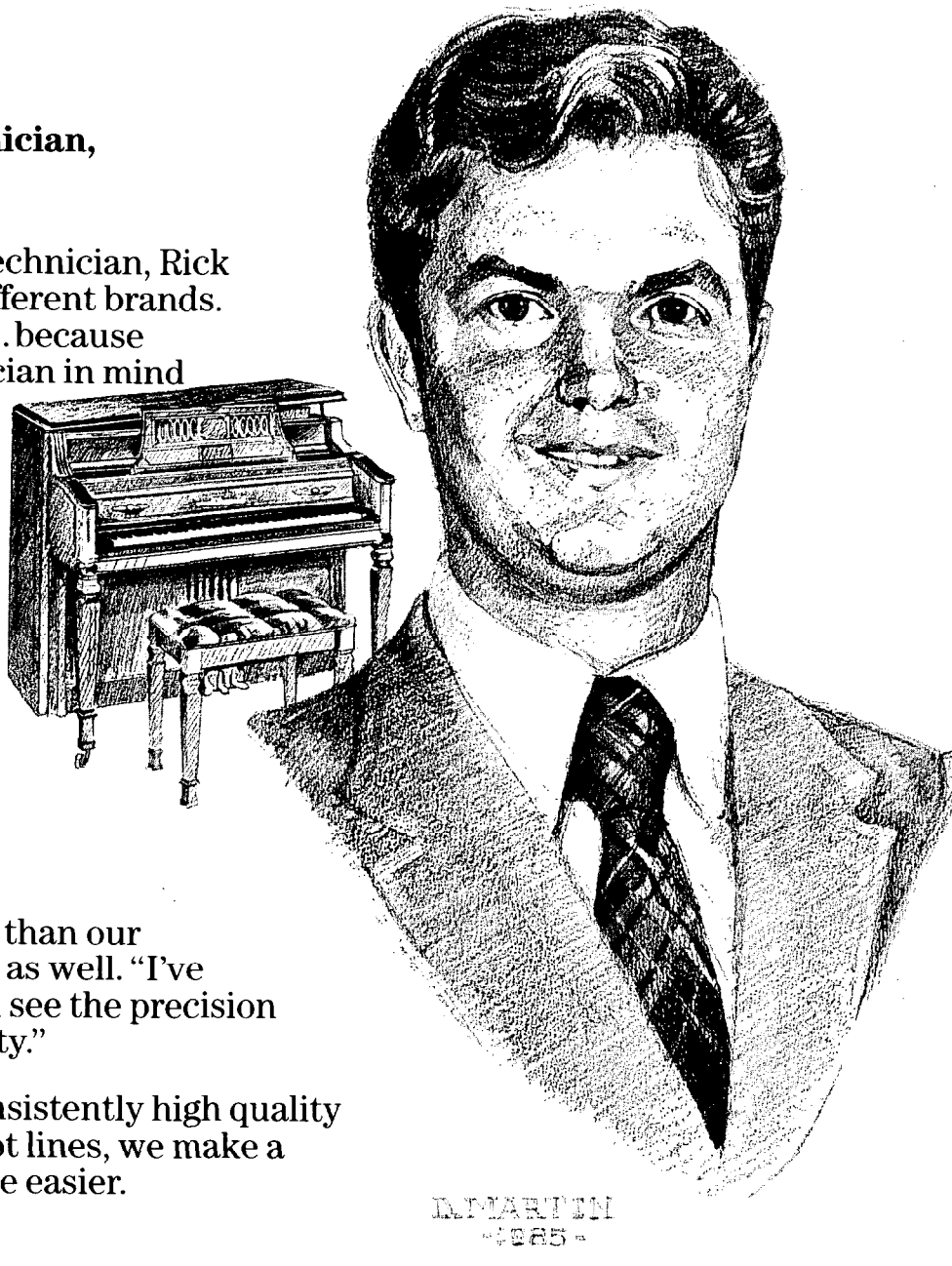

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