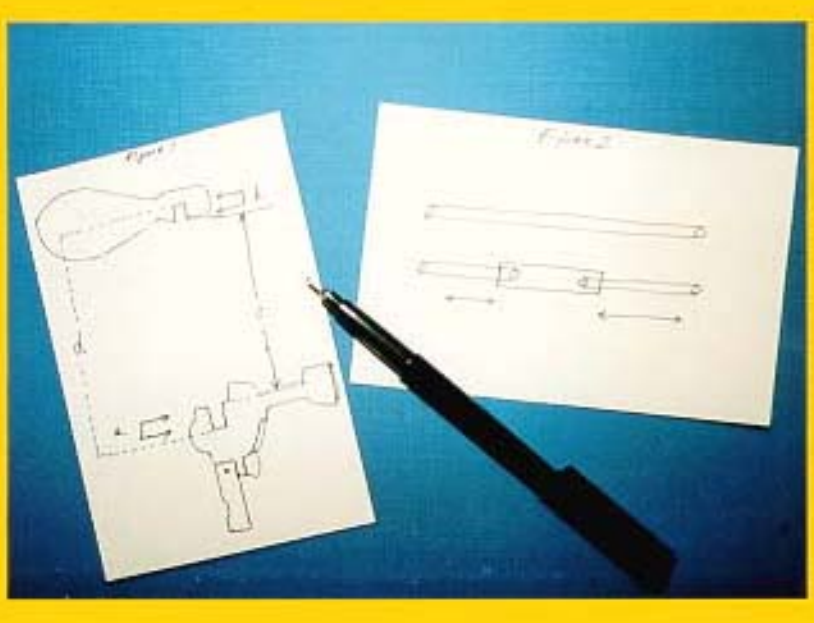
PIANO TECHNICIANS
Journal
August 1992



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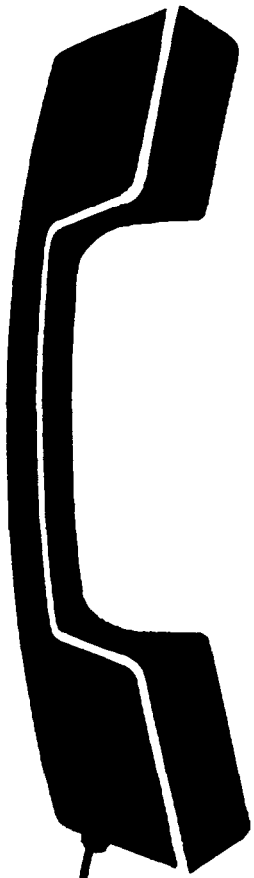
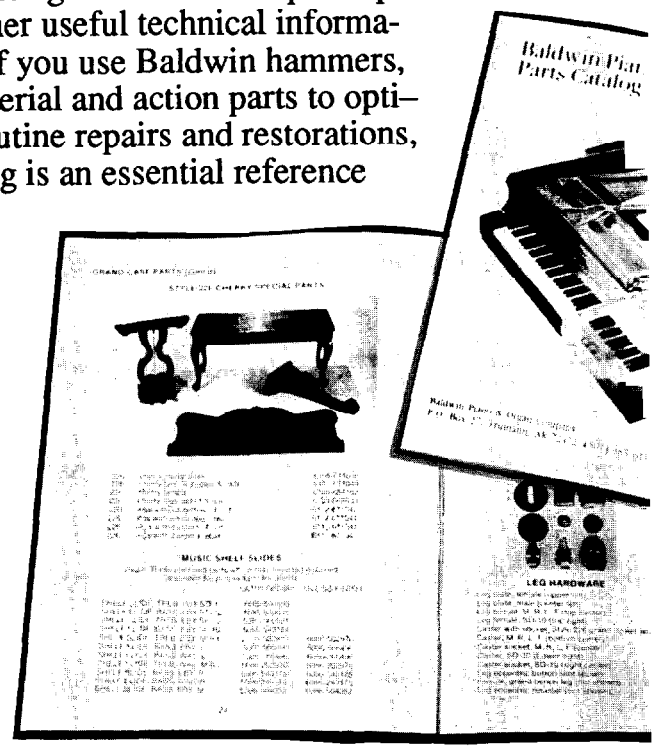


Like this free 36-page parts catalog with supplementary price list, for example. It provides a complete listing of all Baldwin piano parts as well as other useful technical information. Many of you use Baldwin hammers, pinblock material and action parts to optimize your routine repairs and restorations, so this catalog is an essential reference tool for you.



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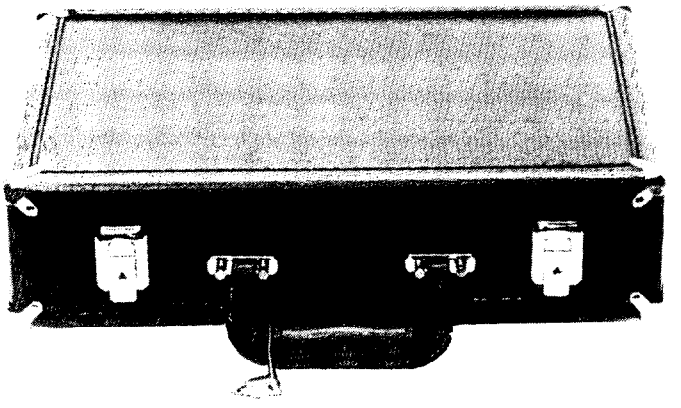

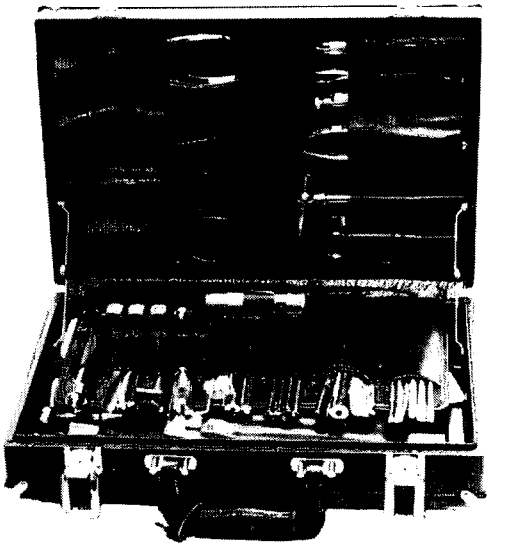

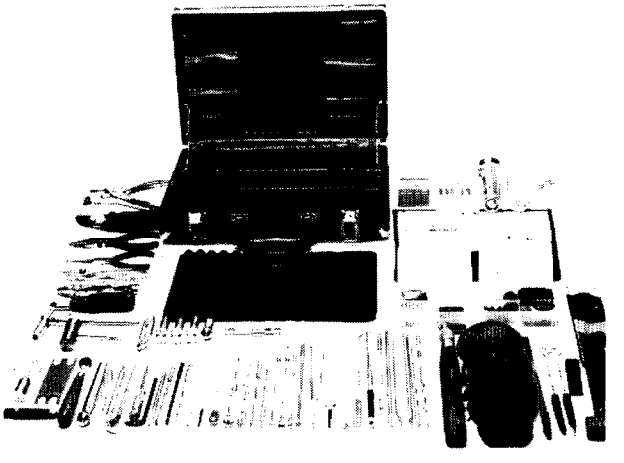

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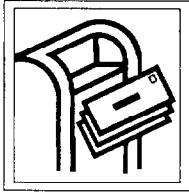

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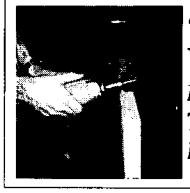

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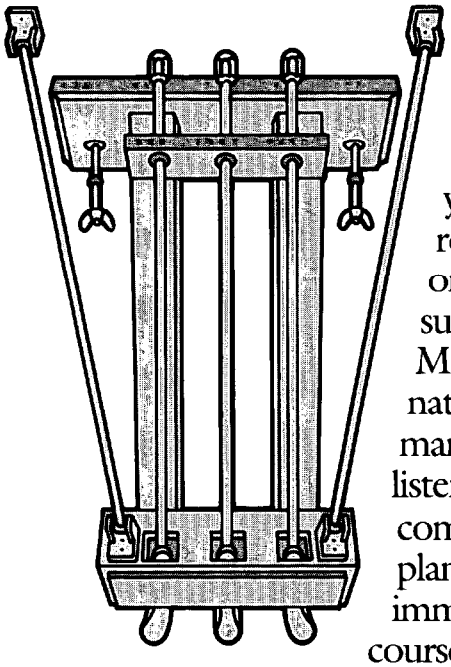
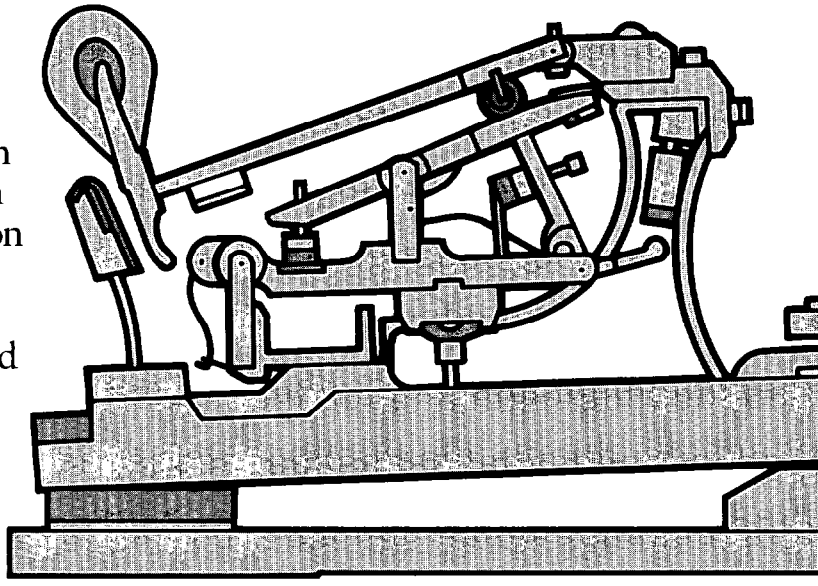
Replacing broken hammer shanks in verticals as explained on page 12 of The Technical Forum "From the Mailbag"

How we to silence

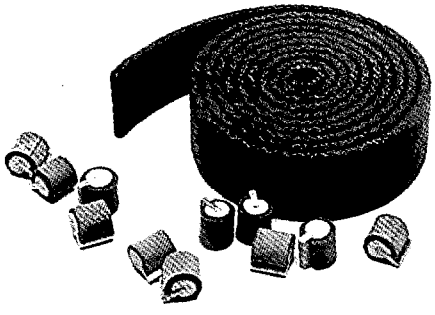




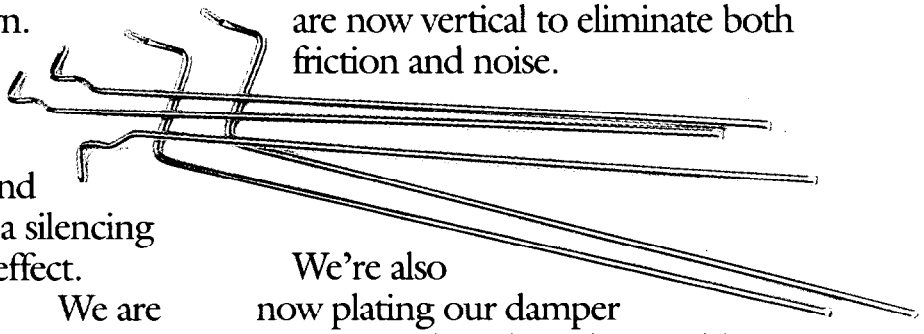
Several of you have recently written or phoned with suggestions. Don Mannino, our national service manager, read and listened to your comments and planned an immediate course of action.

Some of you have suggested that we lessen the amount of mechanical noise in our pianos. With the help of your suggestions, we've come up with a number of ways to quiet our pianos down.

For starters, we've changed the knuckle core felt, whippen heel cloth and keyboard rail cloth in our grand actions to softer materials for a silencing effect.



We are now fastening our grand pedals to the pedal box bottom instead of using nylon dowels in the box sides. And the grand pedal rods that previously had been angled in slightly are now vertical to eliminate both friction and noise.

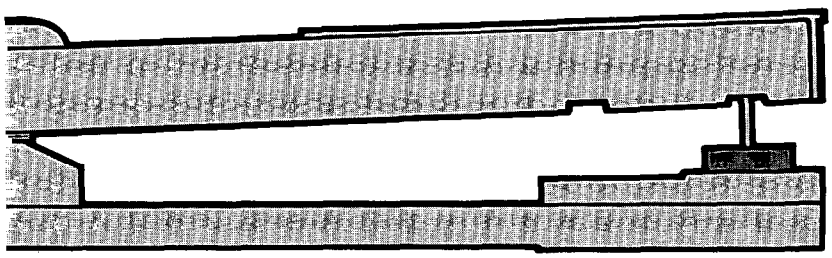


We're also now plating our damper wires more heavily and smoothly to decrease wear and corrosion as well as reduce noise where they pass through the guide rail.

In addition to diminishing noise, we've

are plotting our critics.

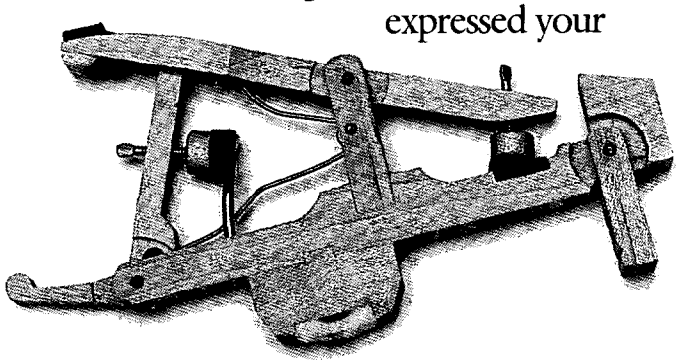
also lightened our touch through the repositioning of jack tenders and letoff buttons, and the use of auxiliary whippen springs in selected models. In response to your comments and suggestions about our action, we've now introduced a lighter



weigh off standard, as well.

We're also excited to have discovered a truly remarkable grade of English bushing cloth for our action centers and keys. Its superior properties will dramatically increase action longevity as well as create a noticeably smoother touch.

On his latest trip to the factory, Don expressed your



concerns to our manufacturing department heads and production engineers.

Within six days, they began implementing improvements and refinements. And within a week, many of these were already in use in our pianos.

Striving to build a perfect piano is not an easy task. It's a challenge we eagerly face each day. But we're getting there thanks to all of you — our not so silent partners.

To share your comments and suggestions on how we can continue to improve our pianos together, please write us at Young Chang America, Inc., 13336 Alondra Boulevard, Cerritos, CA 90701, or call us at (213) 926-3200.

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President's Message

The Public's *Right To Know*

In our information-oriented age, we are surrounded by messages. Politicians, educators, advertisers, crusaders, sales people...it seems that everyone is clamoring for the consumer's attention. We in the piano service industry compete in this crowded marketplace and must, in this challenging economy, work diligently to ensure that our clients hear our message and know the value of quality piano service.

We are making progress at presenting ourselves and PTG to the piano industry. Each year we are represented at NAMM as well as at the annual convention of the Music Teachers National Association. We are part of a network of industry organizations (including the National Piano Foundation and American Music Conference) that meets regularly to promote our common goals. The Piano Manufacturers Association International this year unveiled the results of a test market pilot project that shows how to stimulate interest in the piano as well as increase piano sales and interest in piano lessons in local communities. Already PTG Chapters in Dallas, Austin and Richmond have noted the PMAI study and begun to use it to network with piano dealers.

This past year we updated our selection of brochures and early response indicates a positive reception of these. We sent a press release to over 500 newspapers, inviting readers to send for a free brochure on piano care; over 1,000 requests have already been received and we have ordered a second printing of our basic piano care brochure. Chapters and individual members seem enthusiastic to see more products also, like our new client newsletter, The Soundboard, and our new Technical Bulletin series which explains various piano service procedures in client-friendly language.

Instead of waiting for the media to discover us, we are now going to them with intriguing story ideas. For instance, our publicist told an Associated Press feature writer about Yat-Lam Hong's secret twenty-year pursuit of his Ph.D. and his account of Tienanmen Square in 1989; the result was an AP feature on Dr. Hong that has been picked up by newspapers in at least three states so far. And when we learned that the Chicago chapter was donating a grand they had rebuilt to a local music school, immediate efforts were launched to get TV and press coverage.

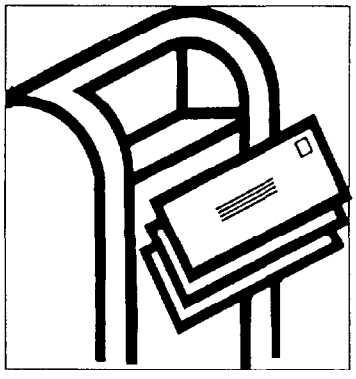
PTG should continue working to educate the public about RTTs, about piano maintenance, about our efforts to advance piano technology. PTG has long offered to piano technicians numerous opportunities to hone technical skills. We are now moving to offer more business and public relations support to promote the skilled technician. And, indeed, the public has a right to know the good work that we are dong.

Logically, then, as PTG members, we have a responsibility to this same public; we must deliver what we promise. The challenge to each of us is simple: to provide the best quality piano care possible. If we fail in delivering this service to our clients, we negate the message we are trying to send. If we offer words without the deeds to back them up, we will soon find no one listening.

Our clients have the right to expect quality piano service. We have the responsibility to deliver the same. It really is a simple message.

Technical Forum

FROM THE MAILBAG



Jim Harvey, RTT
Editor

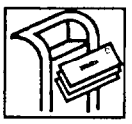
One of the commitments I made to this column was that of keeping responses to a particular subject close, in time, to the original topic. This worked, as material and space permitted, until the NAMM report and the two-part treatise from Klaus Fenner came along. Now, due to the backlog of mail, there is some catching up to do.

With the NAMM report, I seem to have opened a can of worms when I asked for a consensus whether that coverage continues. I wish *all* of my queries generated such a fast response: the early poll indicates that product updates from NAMM are not an option; rather they have become integral to the *Journal*. (And I thought no one read all the way to the end of the article to know there was a poll going on.)

A humorous aside: one reader wrote to say that he enjoyed the NAMM coverage. He was disappointed, however, not to see any mention of the Fandrich piano. I don't know what happened—it was in *my* copy of the *Journal*.

Last month I promised some new writers, and even new subjects. To eliminate any confusion, such as the Fandrich problem, feel free to take a moment and page through the magazine now. Welcome aboard, y'all.

BROKEN PLATE BLUES ADDENDUM



This is in response to the person with the "Broken Plate Blues" that appeared in your November 1991 column. In my former career as a heavy equipment mechanic, I learned that the first rule of troubleshooting is to suspect the simple things first; if your car "just dies," check the gas gauge. The second rule is to suspect everything; especially the things you know to be correct. Don't believe the gas gauge.

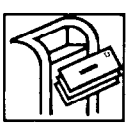
The first possibility that came to my mind in this case was that the piano may have been tuned too sharp. From the description of the work that was performed, it seems likely that the piano was well below pitch with no semblance of order to refer during the pitch raise.

It has been my experience in this situation that it is quite easy to get lost, either aurally or electronically, and be off by a fourth or a fifth. The fact that strings were breaking during the pitch raise would lend support to this theory. Ironically, I find the best way to avoid this is to quickly and confidently yank the piano up to pitch (aurally).

The sad part about this case of the "blues" is that the poor soul will never know for sure what caused the plate to break and will spend the rest of their career a little more on edge than those of us that have never had the experience.

Ken Kopp
Vancouver Island Chapter

SPEAKING OF CARS?



After reading the article in the February issue of the Journal that tries to explain the similarities, or differences, between a car and a piano, I thought you might be interested in this article, which I published in the St. Louis Gateway Tuner several months back.

Wim Blees
St. Louis Chapter

A Piano Is Like A Car...

When you are trying to explain maintenance or a repair to a customer, how many times have you had to compare the piano to a car? I know that most

customers can relate to that, but is it really fair? After all, a car is kept only 3-6 years, while a piano is a life-long investment. A piano doesn't have tires to change, it doesn't need gas and oil, and the insurance is a heck of a lot cheaper. Yet, somehow, when you do relate a repair to a car, the customer understands it. If this is the only way we can ensure that the customer keeps his or her piano in top condition, allow me to give you some comparisons.

The Body. This is the easy part. The car body is like the piano case. And like a car's body, if it isn't taken care of properly, it will become dull, scratched and dented. Then it will need to be refinished.

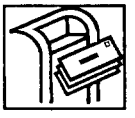
The transmission and drivetrain. These are the pinblock and soundboard of the piano. The way we take care of a transmission and drivetrain is like we should take care of the pinblock and soundboard. You don't pour coffee and soda into a transmission, but you shouldn't let it dry out either.

The tires, shocks and struts. These are the hammers, knuckles and flanges. Tires can be retreated, just like hammers can be filed. When tires get worn out, however, they need to be replaced, just like hammers. With worn-out tires, a driver will feel out of control, just like a piano player will not have control over dynamics with worn-out hammers. And just as worn-out shocks and struts of a car will keep it from driving stable and performing properly, worn-out knuckles or flanges will prevent an action from playing properly.

Engine tune-up. Tuning up an engine is like regulating the action. Even with new spark plugs (wippens), and a new distributor cap, (key bushings), if the engine is not "tuned" properly, it will not run smoothly. An action also needs to be "tuned" or regulated, on a regular basis, so that it plays smoothly.

And just because a car has been refinished in a body shop, and it has new tires and struts, new spark plugs and a new distributor cap, and it has been "tuned up," it doesn't go anywhere without gas and oil. And just because a piano has been refinished, has a new pinblock and strings, new hammers, new whippens, and the action has been completely regulated, it won't "play" unless it has been voiced and tuned. Gas is the tuning and oil is the voicing. They are both needed regularly. And just like a car, the more it is played, the more it is needed.

SPEAKING OF MECHANICS



While tapping down strings on a piano with particularly prominent false beats, I fell to wondering what actual magnitude of speaking length errors would be involved.

One cause of false beats in plain wire strings, after the strings are tapped down, is the differences in speaking lengths of the horizontal vibration of the string as terminated against the bridge pin

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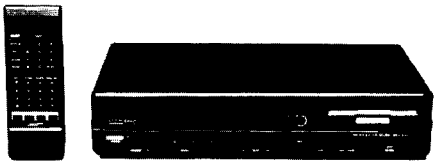

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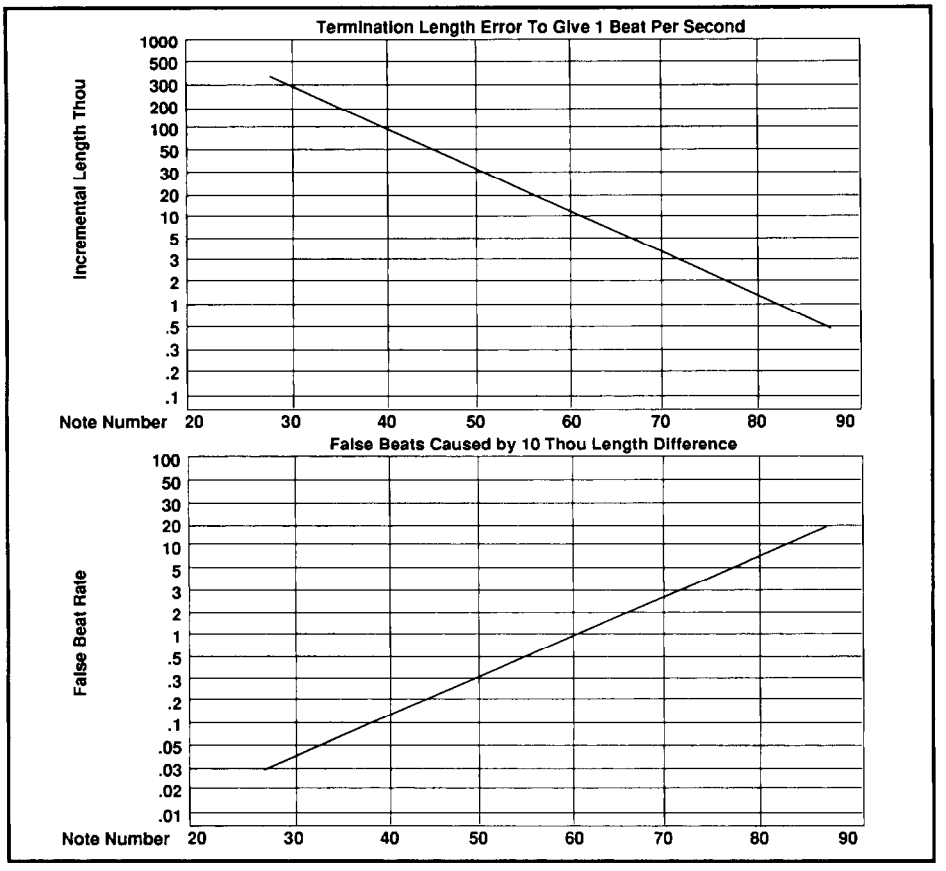
and the vertical vibration as terminated by the forward edge of the bridge notch. This is especially true where the bridge pin has shifted sideways over time.

Since this phenomenon can be described by straightforward calculation I went to my trusty equation back solver, TKSolver! by Universal Technical Systems, and provided it with the pertinent equations and data and said "go" and then "plot." The piano I selected was an imaginary but reasonable piano with a treble section starting at C8 with a speaking length of 2 inches; the string length increasing by 1.88 times per octave to C3.

After examining the results it occurred to me that some readers of the Journal might be interested in the results so I present the graphs below.

Figure 1 *shows the difference in horizontal and vertical speaking lengths that would lead to a false beat rate of one per second.* **Figure 2** *gives the false beat rate for a 10 thousandth of an inch difference between the two speaking lengths.*



The graphs show that above note number 60, increasing care has to be taken in the notch placement. At note number 82, a difference of one thousandth of an inch will give a one beat per second false beat. If you can only hold the notching to within about 1/2 bridge pin diameter, then you may have a three beat-per-second false beat at note number 70.

As the string length gets longer and the note lower, the relationship between the notch and the bridge pin becomes increasingly less important.

This is far from the whole story, of course. The false beats of the partials have not been plotted, although they should not be that different: while the frequency is higher raising the beat frequency, the end error is shared among several wave lengths in the string, thus dividing down the beat frequency. In addition nothing has been said about false beats due to string diameter or shape irregularities or false beat mechanisms in wound strings.

Finally I will mention a neat tool that I have developed for tapping down strings. The traditional technique requires two hands, access to swing the hammer, reasonably lightly. Since most of the time tapping the strings down is just something to try that may have no effect on any given string there is always a dilemma as to whether to take the time to do it.

The tool that I have developed is made by placing a chisel tip of aluminum, brass or other soft material in lieu of the replaceable tip of an automatic center punch. The punch is adjusted to give the required impact. Such punches are not expensive and can be purchased readily at any hardware store.

There are several virtues to this tool. It gives a controlled impact every time. It can be operated single-handedly. Sight is not required to ensure that the hammer hits the punch, not the thumb so that it can be operated underneath the keyboard of an upright while peering over the top. The tip can be slid down the string until it meets the bridge pin so that it can be operated by feel alone. It requires less headroom than a hammer and drift. It is much lighter than a hammer and can be clipped into the shirt pocket if required. It can also be used to nudge a string sideways to better position it under a capo or pressure bar. Yes, it is one more thing to carry around but if it is on hand while tuning it makes it very simple to try a tap on any string that has false beats.

Chris Day
Boston, MA Chapter

JH I can't afford to beat up on Chris too much, because there are some other offerings from him in the archives, and I don't want to discourage anyone's efforts. So; I won't take issue with the theory of origin that Chris is advocating, or to the math involved. I'll leave that for the number-crunchers in our ranks. In addition, we haven't had any graphs to peruse in quite a while.

I do have a couple of thoughts on the matter of false beats, and would take exception to the statement about "whether to take the time to do it." This is one of those must-do items during first-time piano service, whether it be an upright or grand. In addition, I feel it is important to check the string seating periodically—especially in areas with wide humidity swings. It is well worth the time. This is one of the few service items that really doesn't take that much time for the benefits received.

Next, I am confident that Chris *meant* to say that he "developed" the modified punch. However, I *made* the same tool sometime around 1974, having cloned it from a picture and description in John Roll's tool brochure; then abandoned it shortly thereafter. In all fairness to the tool, abandoning it was a matter of personal preference, not because it failed to perform as Chris indicates.

Although not directly related to the letter, but close enough for parallelism, I feel that far too many of us still look to the strings (proper) as the cause of false beats. Chris does mention the significance of proper bridge notching. On a more global basis, though, we should consider the matter of *termination points*.

More than once I witnessed the late George Defebaugh do "something" with a screwdriver somewhere in the bridge area, although I was not close enough to see the process. At first, I thought he was massaging the string, but his motions weren't exactly right for that. Finally, I made it a point to ask what he was doing. The short version was that he was attempting (usually with success) to eliminate a false beat. What made it unusual was that he was touching the tip of the screwdriver to the top of the bridge pin. The word "touching" is significant, as opposed to pushing, pressing, or as some might say, mashing. This action effectively simulated a *very* long bridge pin, thereby changing the *moment* of the offending partial. This was George's method of determining whether the pin was "flag-poling."

Now having this test in my cache of tricks, I later had a situation where this information was enough to get me into trouble. I was experiencing the worst global case of false beats that I can recall. The piano was a grand of long background—and questionable value. I tried George's screwdriver trick, the results being a significant improvement in the sound. I then continued by tapping the pins further into the bridge, and quite easily, I might add. After the first bank of three pins disappeared below the string line, I became suspicious, enough to cause me to crawl under the piano to see whether they were coming out through the soundboard! They were not, but only because the pins weren't long enough. There simply was no bottom to the holes in the bridge. After going fishing for those pins, followed by much bridge pin hole filling (most of the holes), there was a dramatic lack of false beats—although the piano was still of questionable value.

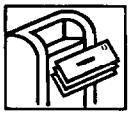
Perhaps one of you engineering or research-type readers would like to explore the following notion and write about it:

Drill bits leave a round-bottomed hole. If a rounded bridge pin is then inserted, no harm, no foul. At least in theory. However, these pins are somewhat lubricious (at least until something spills on them and the subsequent rust becomes a gap-filler), and therefore must depend upon:

1) relative tightness in the hole (initially)
2) climate control (long-term)
3) any "capture" effects of string side-bearing.

Conversely, what, if anything, happens when we insert a *pointed* bridge pin in that round-bottomed hole? Does the point of the pin act as a spear, thus negating the void? Is it worth worrying about? Is it, just possibly, a potential poor termination?

THE SHANK SLEEVES ARE GONNA RISE AGAIN! (PART 1)



When repairing broken hammer shanks in verticals, it has always been hard for me to establish the exact length to cut a new replacement.

After drilling out the hammer and butt, I would take three measurements:

1. The depth of the hold in the hammer butt. **(Figure 3a).**

2. The depth of the hold in the hammer **(Figure 3b).**

3. The distance between the top of the hammer butt and the bottom of the hammer based on an adjoining shank **(Figure 3c).**

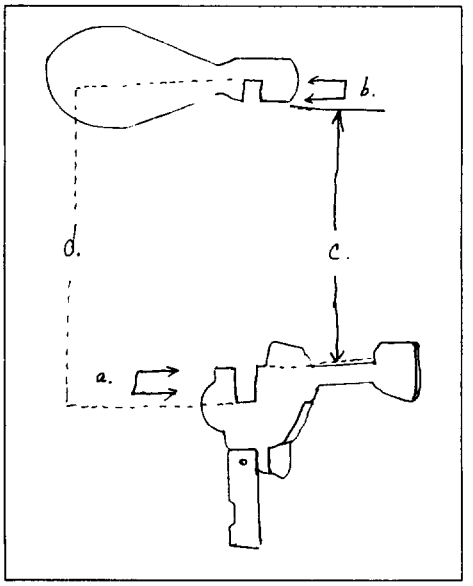


Figure 3 (a-d)

The total of all three would (or should) give the correct length of the new shank **(Figure 3d).** *More often than not, for some reason, my measurement would require some minor modification.*

I have recently discovered a precise way to establish the new shank length quickly and easily. The only two parts needed are found in every technician's toolbox:

1. Replacement hammershank
2. Hammershank repair sleeve

First, cut 1" off of the new shank, then cut it in half. Join the two halves with the sleeve snugly wrapped around the shank.

Next, pull the two halves apart in the sleeve almost to the end of the sleeve. You will end up with a shank that is gapped in the middle (inside the sleeve) and longer than needed **(Figure 4).**

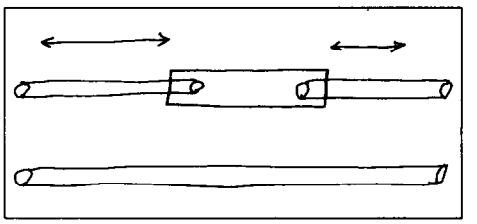


Figure 4

Insert one end of the modified shank into the hammer and lower the other end into the hammer butt. With slow, steady, downward pressure you will be pushing the gap together. Once the hammer is lined up with its neighbors, gently remove the hammer and modified shank as a unit.

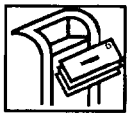
After removing the hammer, you have a shank of the proper length. Use this as your guide to cut your new shank, then glue in place as usual. The tool is, of course, reusable.

Note: I had another technician suggest the possible use of some small threaded stock and a turnbuckle to be used in place of the cut shank and sleeve. This would work, but I feel the beauty of the shank and sleeve is its simplicity. I made a few extras just to give away as door prizes at our next chapter meeting.

Larry T. Brannin
Louisville, KY Chapter

JH I agree on the part about the beauty being in the simplicity of the tool. For the same reason, I did not try to "dress up" Larry's artwork. On the back of his drawing is a caption that I didn't see until I was ready to mail the articles to the home office. It reads: "Artist was not paid well in this case"!

SHANK SLEEVES ON THE RISE (PART 2)



Thanks for printing my tip for repairing music racks. You asked for more; so I will pass this one along in case it might be useful. It is another use for the hammershank repair sleeve. File a narrow-bladed screwdriver down so the sleeve can be tapped on with a tight fit. It makes a great tool for getting at the damper lifter screws in a grand piano. Just don't tap it on all the way. A 1/8" or so collar will keep the screwdriver on the screw without slipping off. Finding those screws with an ordinary screwdriver while looking through the wrong half of your trifocals can be a real pain. (I expect that one could buy one of these—surely someone has thought of this a long time ago.) This is for those technicians that don't do much of this kind of work and hate to spend several bucks for a little-used tool.

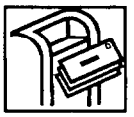
Don't throw all those sleeves away, Jim. They come in handy for other things too. I have one in a player piano transmission. The bearing was gone at the end of the shaft with the little drive gear. The sleeve is a hair bigger than needed, but it should last a long time.

Dick Beaton, RTT
Montana Chapter

JH I don't know whether Dick was being humorous or not regarding "half" of his trifocals—but it worked for me!

Don't Miss Sacramento Convention Coverage — September Journal

AND RELATING TO BEARINGS TRYING TO FIND OURS



Why do we keep on referring to the octave we start out tuning as a "temperament"? In the old days, one did not set a temperament, one set one's "bearings."

We temper the whole keyboard and the way the entire 88 notes are tuned is our temperament.

It seems to me, regardless of how we set our bearings, when we expand them up and down the keyboard, we are modifying the octaves according to our taste, experience, whim or whatever; we are modifying the relationship we so arduously applied in setting our bearings or what we now seem to call a temperament. It seems to me that this can only confuse everyone; it certainly has confused me.

What we do in that initial octave is to adjust certain relationships according to a set formula (whatever one we use) and modify that formula to suit the piano being tuned. If that is so, and if it is also true that different partials in different parts of the piano do not precisely react as they do in our bearing octave, we are modifying that tuning as we go along to suit the whims of the instrument being tuned.

I suppose it isn't important how you go about relating the notes on the piano as long as you finish up with something which is suitable and musical, showing off the piano and the pianist at their best. But it is the whole tuning which is the "temperament," not just an octave or some other limited section of the piano. We temper the whole keyboard, not just a few notes. Those initial few notes are our "Bearings."

Charles P. Huether, RTT
New Jersey Chapter

JH I suppose I qualify as one of those folks from the "old days" that Charlie speaks; for I, too, remember (and used) the word "bearings." Along about the same time, the expression "temperament octave" was coming into use. This phrase seemed, conversationally at least, to be interchangeable. Still later, there were certain tuning classes in which the virtues of "extending the temperament octave" were being extolled, the idea being to ultimately make the entire piano into an extended temperament—bearing? Is any of this ringing a bell?

At first, I thought this was simply a matter of word semantics. Then I did some investigation, and found that, if there is any blame for this, it lies with us.

I checked the index of every book I have left (some of those on loan never found their way back to me) for the words "temperament" and "bearing." It seems that the newer the book, the less likely we see the word *bearing*; at least regarding tuning. For example, Braid White mentions "laying the bearings" (including the quotation marks) in the chapter called "The Equal Temperament." Alfred Howe's book does not list the word "bearing" in the index, but it does have a chapter entitled: "How to Set the Temperament, or Bearing." John Travis mentions it, again parenthetically. And unless I overlooked it, I could find no mention of tuning related "bearing" in Art Reblitz' book.

For purposes of clarification, let's define the word "temperament":

Temperament: One of the several systems or methods for slightly modifying the intervals of a scale to permit modulations without the inconvenience of many distinctions of pitch; the compromises in frequencies of the 12-note scale in fixed tone instruments to permit more expedient use of all the chromatic keys. Some times called **bearing**. Best known is the contemporary equally tempered scale.

Bearing: The name sometimes given to the **Temperament**.

The preceding definitions were from our own house organ, "Piano Parts and Their Functions." So it appears we have done it to our-

selves through contemporary (ab)usage. To summarize, I would put this in the same category as rollers, barrels, and knuckles, or perhaps bridal straps, action tapes, and martingale ribbons. Besides, we refer to our "temperament strips," not our "bearing strips." Sorry, Charlie!

Good Vibrations

Fitting the Pinblock to the Flange

Nick Gravagne, RTT
New Mexico Chapter

If you have ever installed a pinblock and/or have been following this series, you understand the importance of fitting the new pinblock tightly to the plate flange (see March '92 of this series). There are basically two ways this is done. One method takes advantage of modern epoxy-type fillers that fill any gaps between the pinblock edge and the flange. This technique is called "glassing the pinblock." (See September '91 *Journal*, by Susan Graham and Wally Brooks—to avoid duplicating parts of that series here, I will be referring to it occasionally.) The second method, more conventional, entails the actual mating of the wood to the shape, contour and irregularities of the flange. This article will address the conventional method of "dry-fitting" a new block to the plate flange.

Have You Ever Noticed That...

I know this sounds like Andy Rooney, but have you ever noticed that:

1) You've checked the original block and flange fit with feeler gauges before tearing down the piano and found it to be tight; but after removing the block and trying it against the flange it is no longer tight? Have you ever noticed that? Have you ever tried that?

2) You've carefully traced the shape of the old block onto the new wood, cut out the new block copying (or so you thought) the flange angle, only to find that any resemblance of the new block to the original is purely coincidental?

3) You have "painted" the flange with some coloring agent, tapped the block into it, removed the wood that was showing marks (high spots), then seem to spend hours going in circles tapping and removing wood while the cagey block never seems to be getting closer to a tight fit. The block is laughing at you, but you re not laughing. Have you ever noticed that?

4) The real heartbreak: you have tapped the block and removed wood to where the block is uniformly marked along its edge, but after you've secured the block to the plate with screws you found a long, thin gap between the block and flange? Is that's what troubling you?

5) Dense, multi-laminate blocks are really out to put a crimp in your day? Worse, they're out to dull and destroy your once sharp tools? Have you ever noticed that?

If you have any experience with this work, you've noticed *all the above*, and more. Relax. Let's talk through some of this stuff.

First, if dry-fitting is so much trouble why not just glass it and be done with it? If you like glassing, and are comfortable with the materials and processes, fine. Done properly the fit will be air-tight and as long-lasting as any dry fit. For strength, epoxy or other glass-type filler (especially with fiber reinforcement) can easily withstand the compressive force of the string tonnage. In fact, many of us have seen hot hide glue used as a glassing agent in some old pianos with plate bushings. (I don't recommend it.) However, epoxies and the like cannot be relied on under heavy tensions. Still, one must be materially and psychologically geared up for glassing operations. Do you have the right epoxy for the job? What about shelf life? Proper mix with hardening agents? Potential mess with spills, leaks, proper consistency, squeeze out, etc.? Do you like the idea of glassing a Steinway block that was originally dry fit? And so on. Materially and psychologically, I am more at home with traditional methods, as I know some of you are.

As to the above five pitfalls...

Tracing the Old Block onto the New

What if the original flange fit checked out fine in the piano, but showed separations when the block was out of the case, let's say, along the bass edge? That is, the entire tenor to treble edge still looked good, but the bass edge showed a tapered gap starting at the bass end (1/16" or less) and closed too tight as the block approached the high bass. Obviously, copying the discrepancy makes no sense. So trace the tenor-treble edge as is, but don't trace the bass edge until you have adjusted the old block for tracing by the 1/16" at the bass end. If you are going to make such adjustments, make them along the bass edge of the block. Should you find the old block touching at the treble and bass edges, but open in the middle (unusual), then leave well enough alone. Trying to adjust for this in tracing the new block will be self-defeating. Anyway, it is easier to fit a new block to the flange when only the middle section is open, than when one entire edge, treble or bass, is open.

Refer to **Photo 1** that shows the old block sitting on the new block (the blank) material. Notice that the old block has beveled edges at the top *and* bottom. Both bevels are for

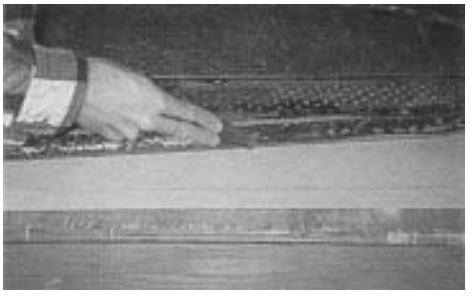


Photo 1

clearance purposes. The top one is to clear the fillet condition that exists where the plate flange meets the web area. The purpose of the bottom bevel is to insure that the flange fitting operations are not hindered by a lip that might develop on the new block. Since the block is usually a bit deeper than the flange this emerging lip becomes a nuisance during the fitting process. For the moment, let's consider that bottom bevel. As it usually exists in the old block, it makes tracing with a pencil or awl "iffy," since the tracing items have a tendency to wander in and out of the bevel. The tracing technique shown in the photo uses an ordinary chisel. To scribe this way, hold the back, flat surface of the chisel firmly against the old block edge, and use the corner point of the tool to scribe a reasonably deep line onto the new block. Considering the blackened flange edge as a plane, the scribed line more accurately describes the shape of the old block. Be sure to firmly clamp the old block to the new blank, and allow for extra wood to be showing behind the rear of the old block. After scribing, remove the old block, extend the lines to the ends of the blank, and run a very sharp pencil along the scribed line to make it easier to see. You will feel more sure-footed when sawing the block to the scribed line rather than to a pencil line.

Do not scribe and cut off the ends of the new block, nor the rear waste edge at this time.

These cuts are made only *after* the new block is completely fitted to the flange, and all screw holes drilled and dry fitted with screws.

THE BANDSAW BLADE

As to cutting out the new block on the band saw, as well as measuring and tracing for the tricky notch area of the block, refer to the August, 1991 *Journal* article by Graham and Brooks (page 11) for a pertinent discussion. Let me add a couple of thoughts. Compared to stiff rotary blades that run true, band saw blades seem to operate in a drunken stupor. Wide, stiffer blades (3/4") are a bit more sober and wander less, but have a wider turning radius. For me, a minimum blade width of 1/2" containing three or four teeth per inch is an excellent all-around blade for shop work.

THE FLANGE ANGLE

To duplicate the original block angle, place the old block on the band saw table and adjust for the angle using the block as a guide. Now turn on the saw and nibble the blackened block edge in a few places and look for the vertical saw marks; these indicate that your angle was *dynamically* set, and that it does indeed match that of the original block. If saw marks are evident only at the top or bottom of the blackened edge, the angle is wrong. Adjust until the saw marks are evenly apparent top to bottom. Always turn off the saw before adjusting the table.

FITTING THE BLOCK TO THE FLANGE

Assuming that the angle has been copied, and that the tricky area of the pinblock notch, or cut out, has been reasonably copied, fitting the block to the flange cannot really begin until the top bevel has been cut in (**Photo 2**). Notice in the photo that a rotary rasp chucked into a drill is being used for the operation of rounding off that corner. Don't overdo it. Try to match by eye the fillet radius

Photo 2

as found on the plate. On certain blocks, such as the Steinway Model "O" as shown in **Photo 3**, an additional bevel and recess is found in the notch area. This, too, must be rasped out before any serious fitting can begin. Place the old block on top of the new, and draw (on the blank) what appears to be a close approximation of the waste volume, which needs to be removed. The rotary rasp and a hand rasp make short work of this.

Photo 3

When bevels and recesses are roughed in, the actual flange fitting can begin. My choice of substance for coloring the flange is a mixture of ordinary carpenter's powdered chalk (usually blue, the stuff used to refill chalk-line devices), and water. "Paint" the mixture onto the flange, and don't forget to paint the fillet or any raised surface that would prevent the block from mating both with the flange and the web area. The mixture doesn't have to be dry before you begin fitting the block. Before you paint the flange, however, take advantage of the blacking agent that is already there. When this seems exhausted, then apply your new color.

WHOOPS!

A common mistake is to begin tapping the block into the flange and then indiscriminately removing high spots, as indicated by colored marks on the wood. If the block is hanging up in the notch area, or some other centrally located point, you will get nowhere fast. Since the block will be pivoting, marks will be showing up on both the bass and treble edges; but as the marks are removed, the block will not be getting any closer to a final fit, due to the rocking action between the bass and treble ends. Be aware of this.

To avoid pinblock rocking, take pains early on to fit (relieve) the notch area. You must find out if the block is rocking, and why. A common reason is that the notch area of the new block was improperly laid out, or cut, or both. The block may need further relief at the notch to stop the rocking, so you should begin by looking for this possibility. If the notch area isn't the culprit, the new block was probably not properly traced, even though it might have been beautifully cut. As mentioned earlier, you might find the long treble edge more or less touching the flange, but the bass edge touching near the notch only, and then tailing off into a widening gap. Yet, if you push the bass edge of the block up to the flange, the entire treble edge opens up. Minimize this frustrating condition by careful layout and cutting. To reiterate, after removing the old block, check its fit to the flange. If it looks good and checks out with feeler gauges (I use a 0.004" blade), feel confident in copying it. If not, try "fudging in" an adjustment to the layout and tracing. It has worked for me.

TAPPING THE BLOCK

Use a rubber mallet if you wish, but I use a stringing hammer. It dents the edge being hammered, but this is a waste edge anyway, to be cut off later. Keep in mind that you must be able to reposition the block for repeated hammering, so mark the plate with the corner of a metal file, and the block with an awl mark. If the cut-out area of the block worked out reasonably well during the layout and cutting processes, simply butting the block to the left (treble) is all that is necessary for consistent repositioning. The block will bounce and ricochet off both the hammer and the flange, requiring that it be set back in place repeatedly. As the fit gets tighter, clamps will be necessary to secure the block to the plate (more on this later).

TOOLS FOR WOOD REMOVAL

Almost everyone today uses some sort of power tool—belt sanders with rough grit paper, grinders, rotary rasps chucked in drills, or smaller diameter rotary rasps chucked into air die grinders. In fact, considering the nature of some of today's super dense, multi-laminate blocks, power tools are essential. I found the large diameter rasp shown in the photos in a local hardware store, and have also seen them advertised in catalogs. Bits (1/4" shanks) for air tools can be found locally or through mail order. **Photo 4** shows the rotary rasp in action. Note that to minimize chatter and bounce the "inside heel" of the rasp is being used to remove the high spots. Belt sanders are considerably heavier, but effective in smoothing out the roller-coaster surface left by an unsteady feed through the band saw, or a wandering blade. To remove small areas of wood though, belt sanders must be maneuvered and tipped in some creative ways.

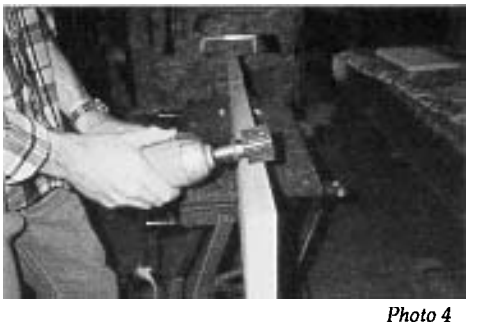


Photo 4

Whatever tools are used, care must be taken to remove only those marked places on the block edge. The process can become tricky and tedious, as more and more of the marked areas appear. Indeed, when continuous smudges in the form of lines and patterns begin to emerge, the process of taking them all down seems ridiculous. But stay with it by only removing the darkest and heaviest looking smudges, leaving the lighter and scantier looking marks. In addition, to avoid working in circles, use a feeler gauge to locate tight areas; mark these on the underside of the block (you're looking at it) with chalk. Concentrate only on removing wood from these tight areas and ignore those areas where the feeler gauge moved along freely, even if some marks appear on the block edge. As the flange loses color, repaint as necessary.

SECURE WITH CLAMPS

At some point before the entire block edge is showing color, clamps must be applied as in **Photo 5** to drive the block down against the web. Fast acting clamps with dowel handles are preferred, but sometimes do not have enough screw throw for tight clamping. Spacer blocks are required. C-clamps have enough throw, but are slower to use. Hand-screw type clamps are fast and effective but large and sometimes awkward. Whatever devices are used, the clamps must drive the block to the web, as if the pinblock screws were installed. Why? Because the screwed-on position is the final, end-

Photo 5

use orientation of block-to-flange. Failure to simulate this final orientation during the fitting process might be cause for serious chagrin later on when the screws are at last installed, revealing a long, thin gap. To avoid, begin using clamps when the smudge marks begin to show more or less everywhere. Apply the clamps. Gently tap the block towards the flange to seat it. Check with the feeler gauge for tight and open areas, and re-seat if necessary. Then mark the tight areas with chalk. Hammer the block, remove clamps and block, and remove the high spots. Repeat the process until the clamped-on pinblock tests out tight with the feeler gauge, and only insignificant open areas exist. A rule of thumb states that marks should appear no farther apart than two inches in a non-glassed job. This is probably true, but I (along with other rebuilders), prefer to see the marks more continuous and connected.

Creative Fudging

Perhaps you made an error in layout and cutting in the cut-out or notch area. Or maybe everything looks great except for a three-inch section along the treble where you sort of fell asleep at the band saw. The rest of the flange edge is well fit, but you still have these irksome gaps. Don't sweat it. There are two ways to handle this. One is to install all plate screws after the flange has been fit (necessary anyway), make some thin hardwood wedge shims, apply glue and drive the shims into place between the block and plate. Another idea, and particularly suited if the gap is feeler gauge thin, is to "cheap glass" the offending gap(s) with a thick, non-runny application of plastic resin glue such as Weldwood's commonly available (and easy to use) powder-water mix. Such a water mixed glue has a long setup time, and allows for control of consistency according to the amount of water used. So butter up the gap and clamp the block in two directions: to the web and towards the flange. Don't forget to wax the flange in the gap area to allow for release after the glue dries.

Installing the Series

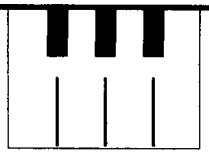
After all fitting and fudging is done, clamp the block (snugly) to the web and to the flange. If helping hands are available, turn the plate over with all clamps in place. Be careful that those clamps that are driving the pinblock towards the flange, and are sticking out in mischievous directions, do not fall off onto your big toe. This is a cumbersome operation. To free the plate and block from all those heavy and bulky clamps, install four or so plate screws

(one in each section), remove the clamps and turn the plate over. To install these four screws it will be necessary to accomplish all drilling and screw-turning operations from underneath—a little tricky, but do-able. A third option is, after fitting the block, remove it, turn the plate over, and re-clamp it in position. Then install the screws. Again, see the Graham-Brooks article (September, '91 *Journal*, page 28) for a discussion of screw installation.

MARK TUNING PIN HOLES

If you drill tuning pin holes at the drill press (rather than after the block has been installed in the case), now is the time to punch mark for tuning pin centers. If you don't have an actual punch, a drill bit that fits snugly in the hole without binding will work. Drive it straight down with a rubber or rawhide mallet. The punch mark left by a drill bit is not a point hole but rather a swedged dimple. Still, there is no doubt as to where the center is. Although not essential, I like to have the outline of the plate hole drawn in pencil onto the new block (**Photo 3**). The pencil dulls fast so have four sharp pencils on hand to do all holes. The penciled outline, along with the punch marks, leaves no doubt about where the tuning pin holes are supposed to be. In fact, the appearance is that of a small target that aids in drilling centered holes—that is, providing the drill press operator doesn't fall sleep.

Continued next time.



Temperament Sequence

Temperament Refinement Procedures

Kent Swafford
Kansas City Chapter
PTG ETSC Tuning Exam
Subcommittee Chair

The refinement of an existing temperament on a piano (regardless of what method was used to tune it) involves a somewhat different set of skills from that needed to tune the temperament in the first place. Here are some ways to improve a temperament after tuning through an aural temperament sequence or after making a "first-pass" with an electronic tuning device.

To refine a temperament, you must have the following basic knowledge ready for instant recall:

Major thirds, perfect fourths, and major sixths are expanded intervals.

Minor thirds and perfect fifths are contracted intervals.

You must know the relationships between raising/lowering notes, interval contraction/expansion, and beat rates. For example, if you raise the upper note of an expanded fourth, you will widen the interval and speed up its beat rate; if you lower the lower note of a contracted minor third, you will widen the interval but slow down its beat rate.

Speaking generally, the beat rates of properly expanded fourths and those of properly contracted fifths have a directly inverse relationship. That is, if you tune "wider" than "normal" (say, by using an electronic tuning device with a stretch tuning calculated with a stretch number that was too high, for example), the beat rates of the fifths will be slower than "normal" while those of the fourths will be faster than "normal." This inverse relationship between beat rates can be the basis for a powerful check for use in refining an existing temperament.

Specifically, in the temperament area of the piano, the beat rates of the fourth and fifth above a note, or the fourth and fifth below a note, have a directly inverse relationship. Example: If you have a properly expanded fourth and a properly contracted fifth with a common upper note, lowering the common note will narrow both intervals, slowing down the beat rate of the fourth but speeding up the beat rate of the fifth.

In the temperament area of the piano, the beat rates of the fourths should be faster than that of the fifths, but probably not faster than 1-1.5 beats per second (bps). In the temperament area, the beat rates of the fifths should be slower than the fourths, about .5 bps. By listening to the fourth and fifth above or below a common note, one can adjust the common note until the best possible relationship is achieved between the beat rates of the fourth and fifth.

If the beat rates of fourths and fifths do not exhibit an inverse relationship, either a fourth has been mistakenly contracted or a fifth has been mistakenly expanded. This is not particularly unusual, even among experienced tuners. For example, if you raise a note expecting to speed up the beat rate of the fourth below and slow down the beat rate of the fifth below the note, but instead the beat rates of both the fourth and the fifth speed up, you know that the fifth below the note is expanded instead of being properly contracted.

You can use the M3rd-M6th test of the 4:3 fourth to verify that fourths are properly expanded. Example: In checking the A3-D4 fourth, use F3 as a reference note. The F3-D4 major 6th should beat about 1-1.5 bps faster than the F3-A3 major 3rd.

You can use the M6th-M10th test of the 3:2 fifth to verify that fifths are properly contracted. Example: In

checking the A3-E4 fifth, use C3 as a reference note. The C3-E4 major 10th should beat about .5 bps slower than the C3-A3 major 6th.

In either the M3rd-M6th test or the M6th-M10th tests, the reference note need not have been fine-tuned, but it must form expanded, not contracted, M3rds, M6ths, and M10ths, but not so expanded that the beat rate is too fast to be heard clearly.

There are other directly inverse beat rate relationships that can be exploited:

"Contiguous intervals" are pairs of intervals where one of the intervals is above and the other interval is below a single note that is common to both intervals.

"Like contiguous intervals" are contiguous intervals that are made up of two of the same kind of interval.

When tuning the note in common between like contiguous intervals, the beat rates of like contiguous intervals have a directly inverse relationship. Example: F3-A3 and A3-C#4 are "like contiguous intervals." Assuming that both major thirds are properly expanded, raising the common note A3 would increase the beat rate of the F3-A3 third and decrease the beat rate of the A3-F#4 third.

Generally, the beat rates of like contiguous intervals should be more the same than different but the beat rate of the upper interval should be faster.

And, of course, neighboring intervals (also variously known as parallel, continuous, and chromatically ascending/descending intervals) should have smoothly progressing beat rates; this is the single, distinguishing characteristic of equal temperament.

Just as a temperament sequence is tuned one note at a time, a temperament can also be refined one note at a time, but instead of using a temperament sequence, check the tuning of each note of the temperament by moving through the temperament chromatically, either from the top or bottom.

In the box below is a list of check intervals using fourths and fifths which should let you evaluate all the notes of a temperament octave quite thoroughly before you have begun to tune outside the temperament octave. Listen for the beat rate relationships between fourths and fifths as described above. The information listed below assumes an F3-F4 temperament octave:

During any refinement procedure the emphasis should be on checking the tuning of one note at a time. Even so, it is very important that you change the tuning of an interval only when you know for sure which note of the interval is in error. If you find an interval that seems to be beating too fast or too slow, individually check the tuning of both notes that form the interval. Example: A wild fourth (that is, a fourth that is much too expanded and beating much too fast) should cause a too pure or even expanded fifth above the lower note or below the upper note. Find the pure or expanded fifth and retune the note that is common to the wild fourth and the pure or expanded fifth.

Example: A contracted fourth should cause a wild fifth either below the upper note or above the lower note. Find the wild fifth and retune the note that is common to the contracted fourth and the wild fifth.

To Evaluate the Tuning of:

F3:
Compare F3-A#3 P4th with F3-C4 P5th
F#3:
Compare F#3-B3 P4th with F3#-C#4 P5th
G3:
Compare G3-C4 P4th with G3-D4 P5th
G#3:
Compare G#3-C#4 P4th with G#3-D#4 P5th
A3:
Compare A3-D4 P4th with A3-E4 P5th
A#3:
Compare A#3-D#4 P4th with A#3-F4 P5th
B3:
Compare F#3-B3 P4th with B3-E4 P4th
C4:
Compare F3-C4 P5th with G3-C4 P4th
C#4
Compare F#3-C#4 P5th with G#3-C#4 P4th
D4:
Compare G3-D4 P5th with A3-D4 P4th
D#4:
Compare G#3-D#3 P5th with A#3-D#4 P4th
E4:
Compare A3-E4 P5th with B3-E4 P4th
F$:
Compare A#3-F4 P5th with C4-F4 P4th

Playing through a temperament octave using parallel intervals (M3rds, P4ths, P5ths, M6ths) can be a quick way of finding problems in your temperament. But remember to make no changes until you are sure which note is in error. For example, you play through the P4ths of your temperament octave and find one that seems to be beating faster than the others. To determine which note is in error, you could then individually check both notes that form the fast fourth, using the intervals from the above list.

Checks may not work out perfectly, but you can make the best compromise possible for each note. As you progress through a refinement of a temperament, try to find the fewest, smallest changes that can be made in your tuning that will smooth out the progression of beat rates. By making your best compromise on one note at a time, as you continue to work you should be able to make fewer and smaller changes, progressing to a high degree of "perfection."

When refining a temperament, achieving the correct relative beat rates is much more important than making the beat rates conform to preconceived ideas of what the beat rates should be. For example, in tuning through a temperament sequence you might try to tune the A#3-D4 M3rd to a "by-the-book" rate of about 9+ bps. However, in refining

a temperament sequence, you try to adjust the beat rate of the A#3-D4 M3rd so that it is greater than that of the A3-C#4 M3rd and less than that of the B3-D#4 M3rd, whatever the actual beat rates may be. That is, during refinement, you tune the relative beat rates, not the "by-the-book" or absolute beat rates.

As you tune outside the temperament octave you can make greater use of contiguous interval tests. The contiguous tuning intervals above and below a common note form a sort of family of intervals. The fifths above and below a note must both be smooth; the beat rates of the major thirds above and below a note should have close to a 5:4 ratio; the fourths above and below should beat much the same as each other but if there is a difference the upper one should generally be the faster; and the fourths above and below a note should beat faster than the fifths above and below that note.

And, for every family of intervals around a given note, there are two next-door families of intervals, a half step above and below, which should behave similarly. For example, not only must the major thirds above and below a common note beat in a 5:4 ratio, each of those major thirds must beat faster than the third a half step below and slower than the major third a half step above. And so on for the other tuning intervals—equal temperament is an intriguing challenge!

If there are obvious errors in the temperament but you have difficulty determining which notes to move to correct those errors, the temperament may yet be too "rough" for refinement, and you may need to first revert to an aural temperament sequence or another pass with your electronic tuning device before continuing a refinement procedure.

Tuning Corner

Daniel L. Bowman, RTT
Richmond Chapter

STABLE
Tuning Technique
Part 1
Setting A Stable Pin

This series of three articles, taken as a unit, is the sequel to "The Marshmallow Zone Revisited" (*Journal*, December 1991, page 18). When I first wrote that article, I had in mind two simple articles, the first dealing with "causes of the marshmallow effect", and the second dealing with "coping with the marshmallow effect." Analyzing and writing about coping techniques became a bit more involved than I expected. That second article thus became this series of three. These three articles presuppose complete familiarity with the December '91 article. Please re-read it if necessary. If I had gotten my ducks (or should I say tuning pins) lined up a little sooner, all of this would have been presented as a four-part series with the December '91 article as Part 1. Below is an outline showing the contents of the entire series.

A. Causes of the Marshmallow Effect—The Marshmallow Zone Revisited, (*Journal*, December 1991, page 18) included the following three points:
1. Tuning Pin Flexing (pin twisting and flag-poling);
2. Bearing Point Friction;
3. String Elasticity (tuning pin segment).

B. Coping with the Marshmallow Effect (one article each for the following three points)
1. Coping with Pin Flexing Setting a Stable Pin, (*Journal*, August 1992).
2. Coping with Bearing Point Friction and String Elasticity—Setting a Stable String, (*Journal*, Sept. 1992).
3. Integration of Coping Techniques into a Unified Process—Setting a Stable Pin/String Unit, (*Journal*, October, 1992).

B. Coping with the Marshmallow Effect

While trying to decide how best to write about these coping techniques, I became increasingly convinced that simply listing the various techniques for coping with pin twist, string bearing friction, and string elasticity will not do the trick. Setting a stable, tuned pin/string unit is a dynamic event in which the various techniques are integrated into a smooth, unified process. In that process it's just as important for the pin/string system to feel right in your hands while going into place as it is to sound right in your ears after it is set. Those tiny events that constitute "feeling right in your hands" are very difficult to analyze, let alone write out for clear communication to others. It's the dynamic character of the feedback in this process that, though readily enough perceived and used by the experienced tuner, is the bottleneck for rational thought and discussion. So, before getting directly to coping techniques and procedures, let's look at the peculiar nature of the feedback in the tuning process.

Some Preliminary Thoughts on Feedback in the Tuning Process

In the doing of any skill there is the business of recognizing and responding to feedback. With some skills the feedback is dynamic; it exists only when the event is in process. Athletic skills such as swimming and riding a bicycle are of this type. The feedback does not exist unless the process is in motion. With other skills the feedback is static, independent of time; it's more of an object that stands right there before you where you can take your time to observe and respond to it. Carving a stone statue and programming a computer are skills of this type. These are not athletic skills.

Setting a stable, tuned pin/string unit is a composite of mostly athletic skills where the feedback is recognized and responded to on the fly. The tactile portion of the tuning feedback (what you feel in your hands), and some of the aural feedback (pitch behavior during the tuning sequence) are dynamic. The rest of the aural portion of the feedback (the pitch after the note is tuned) is static, more like the stone statue, an object standing there before you to be examined and responded to independently of time. The dynamic part of the feedback vanishes as soon as the tuning hammer/pin/string system is no longer in motion. But the way that dynamic part feels and sounds *while in motion* has everything to do with tuning stability.

For what it's worth, I suspect that it is this dynamic character of so much of the tuning feedback that

explains why so many tuning instructors say that you will do better if you just keep moving even if you aren't doing very well.

As we move through the discussions of coping techniques in this series of articles, I will be weaving in further discussions of tuning feedback.

1. Coping with Pin Flexing

First, some general remarks. Strive for clean rotary movements as opposed to bending or leaning of the pin. To facilitate this, keep your forearm parallel to the pin block so that your pushing and pulling movements are parallel to the plane of the pin block. (On verticals, your elbow will be cocked out from your body.) That will make the handle of the tuning hammer act like the spoke of a wheel, which is what you want. You don't want the handle springing toward and from the pinblock as you move the pin. With clean rotary movements, you get more accurate feedback regarding pin twist, to say nothing of less unwanted disturbance to the pin and string.

The tuning hammer's position on the pin (parallel to strings, left, right, and so forth) does make differences that will be discussed in article 3, "Setting a Stable String and Pin Unit."

Correct mental imagery, or concept, of what's going on in the pin/string system is (for me at least) a valuable coping technique. Therefore, to facilitate the coping, imagine that the pin, in its hole with no string loading, has a line running along one side—from the becket hole to the tail parallel to the center axis. Now add the stress of the string pull; this line will become slightly curved or, more correctly, spiraled counter-clockwise as the pin twists a bit under the load. Call this the "at rest under load" spiral. Starting from this at-rest position, if you rotate the string end of the pin up-pitch, the imaginary line first returns to straight. It then spirals in the other direction, until the tail of the pin begins rotating. Starting from the at-rest position, if you turn the string end down-pitch, the spiral begins to increase until the tail begins rotating. Any string end rotation between tail rotation down-pitch to tail rotation up-pitch is just springing (twisting) the pin. The tighter the pin in the wood, the wider this springy range. Rotating the string end of the pin in this range without getting tail rotation (as sometimes happens when trying to work with tiny increments) will likely lead to an unstable set. If you want the string end rotated in either direction say, one degree, the string end must first be rotated *more* than one degree to get the tail to rotate one degree. Then the string end is settled back until the imaginary line resumes its *at rest under load spiral*. If that at rest spiral is not resumed, you won't have maximum holding power because all the wood fibers in the hole will not be enlisted in the task of holding the pin against the string pull. If the wood fibers at the tail of the pin are resisting the string pull as forcefully as those at the string end, the pin will necessarily be slightly twisted, hence the slight spiral of the imaginary line. Remember, after getting the tail of the pin to rotate that one degree, you, not the pin's tendency to spring back, must settle the pin back into the *at rest under load twist*. This is because the friction in the hole is enough to hold the pin for a while in a twist other than that imparted by the string pull.

From all this, we can see that to set a stable pin, we must know two things: 1. When the whole pin has rotated as opposed to merely springing/twisting, and; 2. When the pin has been resettled, that is, has resumed its normal *at rest under load twist* in its new location. The question now is, what is the feedback that supplies these two pieces of information?

Distinguishing between whole pin movement and mere pin twisting is through *direct perception*, the feel, as you turn the pin. When you begin rotating the pin up-pitch, the pressure or resistance in your hand escalates from zero, or null, as you transfer the weight of the string pull from the unspringing pin to your own hand and begin twisting the pin up-pitch. The resistance continues to escalate as the pin incurs the resistance of more and more of the wood fibers. The resistance stops escalating when the tail of the pin finally begins to move, and from this point on you are moving the *whole* pin against the string load and the resistance of *all* the wood fibers. This beginning of tail rotation is often felt as a "breaking loose," sometimes crisp, sometimes mushy, sometimes with an audible "tick." When you move the pin down-pitch from the starting point, the same breaking loose sensation is felt, but the springy range during which the resistance escalates before tail rotation is usually much smaller. With really small tuning adjustments in either direction the tail of the pin is barely nudged, meaning that the break-loose is scarcely felt if at all. With some of these small nudge movements, you know that you achieved tail rotation only because the feel and pitch came out right at the end of the sequence.

Thus, the specific feedback related to whole pin rotation versus pin twist is *direct perception* of escalating resistance capped by the breaking loose sensation that may be very perceptible, scarcely perceptible, or known only by the outcome.

The feed back related to resettling the pin is more complex. What we look for as we settle the pin back into its new resting place from either direction is the null point between increasing resistance up-pitch and increasing resistance down-pitch. This seemingly would signal that the pin has been returned to a condition of balance between the string pull and the gripping wood, that slight twist under load. The feedback for this is a combination of *direct perception* and *remembering*. We judge how far to settle back the pin by *feeling* (direct perception) for the null spot and by *remembering* how far the pin sprung

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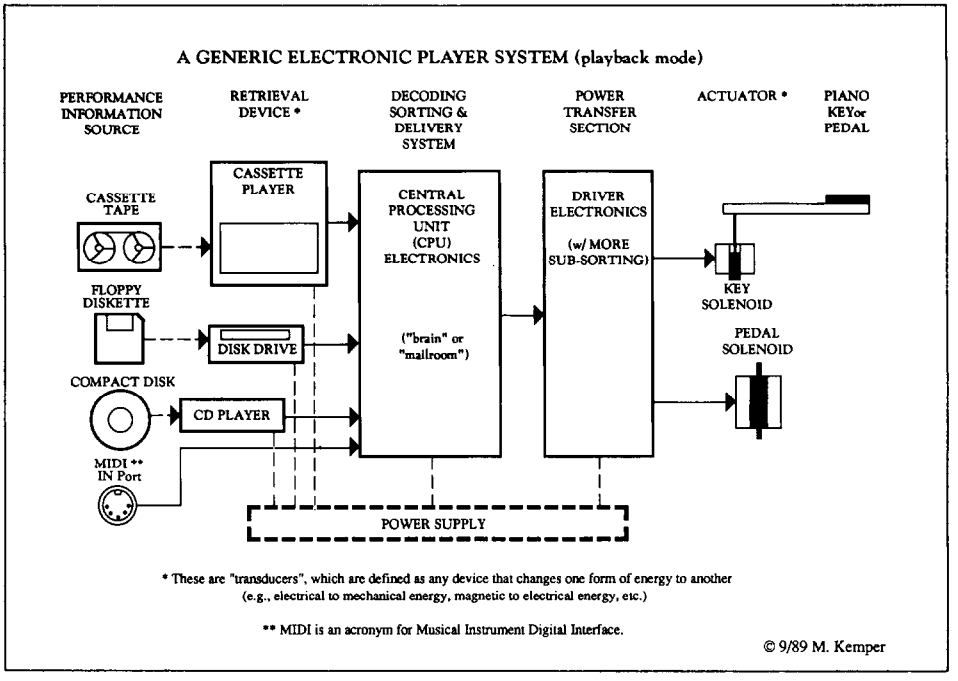
Forward Thinking

Mike Kemper, RTT
Los Angeles Chapter

De-mystifying

Electronic Player Systems



By now you have probably noticed the acoustic piano undergoing an intriguing phase in its evolution. Like several other useful and complex consumer products—with the passage of time and the integration of new technologies—greater dimensions of function are being made possible beyond the original, basic intentions of the inventors. Television has become interactive through the aid of cable TV and attachable electronic games. The old stereo is now an integrated entertainment center. And typewriters have evolved into word processors, and ultimately computers.

Similarly, during the pneumatic player/reproducing piano era of the earlier part of this century, the potential of the piano as an instrument with expanded capabilities was clearly demonstrated. For a brief period, the piano took its place alongside the radio and phonograph as an entertainment medium. Ultimately though, due to the natural course of competition between emerging entertainment media, the player piano was eclipsed.

Ironically, emerging technologies have recently brought the idea of the "player piano" back into vogue. Electronic player systems of today, whether factory installed or added (retrofitted) at the aftermarket stage, offer a unique spectrum of features with wide consumer appeal—to either the listener or musician.

Capabilities such as user-adjustable tempo and transposition are considered valuable tools for composers, educators and students, as well as performers in a variety of situations. A key and pedal motion-sensing system can capture and record the nuances of a live performance that can later be edited and enhanced. Furthermore, the ability to "import" and "export" performances through Musical Instrument Digital Interface (MIDI) connections opens up a broad palette of creative possibilities, particularly when you include orchestral sound synthesizers and computers. (More on MIDI in a future article.) So, how do the new player systems work?

Beneath the apparent mystique of high technology, there usually is a sensible and logical pattern. My first exposure to a grand action in a modern piano was, admittedly, a bit scary. However, upon further examination and with supportive instruction, I found this elegant energy-transfer system to make perfect sense.

When one includes human performers along with their sheet music, we have what can be termed a *music performance system*. Electronic player mechanisms can be more easily understood as simply another kind of music performance system. In a playback mode, the operation of such a system would need to start with a source of *performance information* or *data*. (It should not be called *music* since it is only a representation of a musical performance, like notes on a staff.) On pneumatic player pianos, the performance information source is the paper roll. The individual commands—note on/note off and pedal on/pedal off—are represented as perforations of varying lengths and

physical position. Modern systems use either cassette tape, floppy diskette or compact disc (CD) media as well as other means as a source of digitally encoded performance information.

Next, the recorded data needs to be retrieved from its medium and sent along its way. A tracker bar and roller mechanism in a conventional player piano retrieve information from an encoded paper roll. A cassette player moves the digitally encoded magnetic tape across a special head that reads the magnetic information from the tape and converts it to equivalent electrical pulses. These pulses are then sent on their way to be dealt with more specifically by other components. Similarly, the encoded data on a floppy diskette is retrieved by a moveable head as the diskette spins within a disk drive mechanism. Or, as in another type of electronic player system, microscopic crevices embedded in a compact disc are read by a moveable laser beam as the CD spins within a CD player. The crevice patterns are then translated into electrical pulses.

These retrieval mechanisms are passive devices. They do not have to do any thinking or so called processing. It is the job of a *central processing unit* (CPU) to receive the electrical on-off pulses—called *bits* and *bytes*—then decode, sort and deliver them. This CPU circuit board is also known by manufacturers as a processor board, host board, playback logic board or other generic name. It functions as the brain and "mailroom" for the whole system.

By itself, the processor board, like the human brain, is not empowered to move mountains, piano keys or other such relatively massive weights. Its purpose is simply to process information and subsequently pass along the appropriate commands (i.e., which key, how hard, et cetera) at the right moment to the "muscles" of the machine.

It is the job of the *driver board* and *solenoid* to actuate a piano key or pedal when told to do so by the processor board. Aside from doing some additional sub-sorting, the driver board converts the tiny electrical pulses from the processor into much greater ones for use by a solenoid. A solenoid (also sometimes called a solenoid actuator) converts electrical energy into mechanical force that in turn moves the key or pedal with which it is in contact. When these components are properly installed and set to work in tandem, as they have been so ingeniously devised to do, we end up hearing and seeing a "live" piano performance.

MORE TO IT THAN MEETS THE EAR...

This somewhat simplified description of a generic electronic player system intentionally omits certain specifics with which electronic design engineers are concerned. For example, there is a whole realm of complex details solely on the subject of solenoid design and function. While a solenoid is merely a coil of wire containing a moveable metal shaft at its core, it can be challenging to make it respond appropriately in a particular mechanical environment such as a piano action, and in a way that ultimately creates a musical performance.

It may be interesting to note that design engineers are concerned with many of the same basic laws of physics that piano technicians come across during everyday service. There are practical issues such as: What different types of (electrical) power curves should be applied to a key solenoid for notes of varying duration? How should the energy be released with regard to note repetition? What about the startup friction of the solenoid's shaft? What about the startup friction and weights of the action? All of these considerations need to be thoroughly dealt with to successfully develop and market the product.

Additionally, it should be pointed out that the performance of the player, be it electro-mechanical or human, is greatly dependent on the overall quality and condition of the instrument being played. Thus, an out-of-tune and ill-voiced piano with a poorly regulated action would result in an objectionable listening experience when played by either a machine or a person.

Through an understanding of the new player systems, it is perhaps possible to find a greater appreciation

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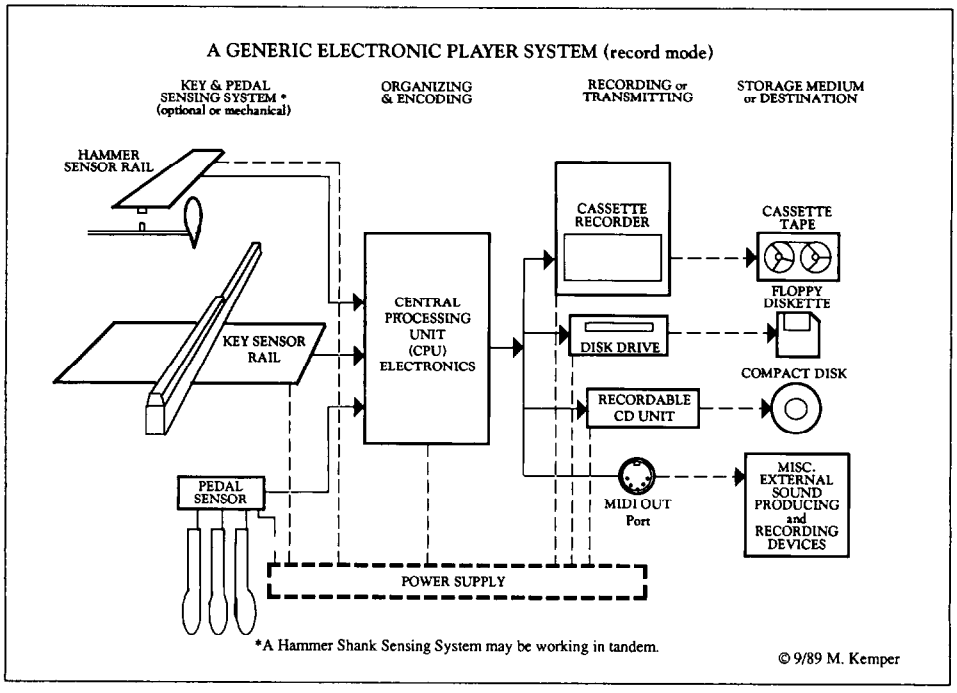

International Relations

Ron Berry, RTT
Chair
International Relations Committee

This month we have the last of the speeches given in Kyoto, Japan in 1989 at the IAPBT meeting. This was presented by Charlie Huether on behalf of the PTG. Along with this well written speech Charlie presented the film, "The Unknown Artist" which was translated simultaneously into Japanese, Korean, and Chinese. This was a particularly interesting feat since the film is designed to cram the most amount of information in the shortest amount of time. I have never heard people speak so fast trying to keep up with the English dialogue.

If any of you readers have interesting information about international activities, please write them up and send them to me: Ron Berry, 6520 Parker lane, Indianspolis, IN 46220-2259, phone/fax (317) 255-8213.

I bring greetings from Canada and the United States on behalf of the members of the Piano Technicians Guild, who, although unable to be with us today, want you to know that they support and encourage the work of this conference. I was Secretary Treasurer of the Piano Technicians Guild in 1979 when a delegation from the Japanese Piano Technicians Association visited our convention in Minneapolis, USA with the hope of reaching an agreement with The Piano Technicians Guild on forming an international association. The International Association of Piano Builders and Technicians was born at that meeting. I feel privileged to have been involved in the birth of this organization, am proud of what has been achieved and I look forward to continuing progress in international relations between our various member associations. IAPBT has prospered and grown over these ten years. The way things go in the world today, to survive ten years is a milestone. We intend to be around many more years. We will continue to grow and to add our weight and expertise to the world of music and the world of the piano.

I am grateful for this opportunity to address this conference. The topic selected for us to address: "The Present Situation and the Need for Future Promotional Activities for Tuning," is of great concern to all who work servicing pianos. The information material sent to participants requests some background statistics and information concerning conditions in our respective countries. I will do my best to provide some sort of estimate but wish to make it very clear that I do not speak for everyone. In our organization we observe a rule of non-intrusion into the operations of our members. What we know about them is only what they voluntarily submit.

The following data was requested:

- Number of technicians. Membership in the Piano Technicians Guild which includes mainly the USA and Canada number 3,800. It has been estimated that in the same area there are from two to three times as many people working at piano service who are not members of our organization.
- Number of Pianos. Estimates of the number of pianos in the United states and Canada range from 10 million to 12 million, most of which are over thirty years old.
- Diffusion Index. In about 20% of households, the concentration of instruments generally corresponds with the concentration of population,. The type of instrument is estimated to be two to three times as many verticals as grands.
- The average number of pianos serviced per month. This varies depending on the business focus of the technician. Those who concentrate on major rebuilding and repair will handle fewer pianos than those who do mainly tuning and repairs in the home or concert location.
- Average number of customers per year. About 500, depending on the number of tunings per piano per year.
- Operations. Most technicians tune and do minor repairs including voicing and regulating. To be successful as an independent technician one must master these skills.
- Average working time. 1.5 hours per piano, five to six days per week, less two to four weeks for

vacation which often includes study time at conventions and seminars, plus time spent maintaining records, answering the telephone and setting up appointments.

• The last three are: Promotional activities as an individual, promotional activities as the association, and the image of future piano technicians and proposals.

These will be the basis for the major part of this presentation.

It is essential in attempting to develop an understanding of the future of our industry to have some idea of where we are at present, the direction in which we are going and the direction we hope to go. Piano manufacturing and sales have been experiencing some extraordinary changes and stresses.

There has been a substantial increase in the overall capability of production. If all existing factories were producing at maximum we would be turning out, world wide, close to a million instruments. At the same time we are faced with the problem of reduced demand.

The problem of reduced demand has two different and distinct aspects: 1) Electronic keyboards are taking some of the prospective piano sales especially in the low end of the market. Some makers have discontinued making their low end pianos. On the other hand some see the proliferation of electronic keyboards as ultimately helping piano sales by getting more people interest and started, and 2) The large number of older pianos still on the market. This too has negative and positive effects. The notion many people have that a piano will live forever puts these older instruments in direct competition with new piano sales. On the other hand, repairing and refurbishing, even rebuilding these older instruments can be a substantial part of a technician's business and income.

Only time will tell which aspect, the positive or the negative one, will prevail. These problems, which are substantial, reflect most severely on the manufacturers and do not necessarily reflect negatively on the piano technician and his service business.

The piano technicians face two problems: 1) How to develop a customer list sufficient to maintain his income, and 2) How to maintain that list.

The potential number of customers depends on the number of pianos in use, not the number of pianos in existence. It is a known fact, in my area at least, that more pianos are not used than are used. It is also a known fact that if all the pianos in existence were tuned regularly, there would not be enough technicians to handle the work.

The problem, then, of maintaining a profitable business evolves around making sure that there is enough work coming into your shop or business each year.

How can one do this?

There are three inter-related structures in the piano business. Like a grand piano, it never rocks. When all three legs are in place and each carrying their proper load the piano stands firm and square. It is at it best.

What are the three legs of our business? Who are the three interdependent parts who support the entire music structure?

First we have manufacturing and sales. Here is where it all begins. Piano makers and sellers have the responsibility of making sure their customers understand the necessity of proper service. They should also be aware of who they can rely on to provide that service.

Second, we have the music teachers. No teacher can survive if the students, young or old, do not make progress or lose interest in learning. Essential to the learning process is an instrument which functions well and is responsive. Frequently, a student fails to achieve because the instrument at home is in poor condition and thereby inhibits their ability to advance. Teachers must realize that the pupil can only advance if they have an instrument of reasonable quality in good condition on which to practice.

Third, we have the piano technician. Here is the person who has the most direct and most frequent contact with the customer and the piano in the place where it is being used.

If any of these legs is deficient, the structure will collapse.

Aiding the technician are the technicians associations. This assistance is one of the many advantages of belonging to such an organization.

While a technicians' association cannot be directly responsible for manufacturers and teachers, they can certainly work towards developing and maintaining good relationships: relationships which make clear that mutual support and working together are beneficial to each of the interrelated parties.

Regarding manufacturers. The Piano Technicians Guild has always worked closely with piano makers. It has always maintained a rule never to criticize particular manufacturer. Through the years we have developed and maintained close bonds of mutual interest and respect so that manufacturers share their special knowledge of their product and we learn how to provide the service which shows off that product to best advantage. Our relations with manufacturers have never been better. They support our seminars and conventions. We listen to each other and benefit from our cooperation.

Unfortunately, the strong bonds of mutual respect between maker and technician do not always survive the journey from maker to seller and here we run into a major problem. Those dealers who understand the value of high quality service generally do better than those who do not. But that is a lesson which sometimes takes a long time to learn.

To work with teachers, The Piano Technicians Guild has an active Teachers Relations Committee. This group has assembled many scripts for presentation to teachers groups. Individual technicians or local groups can use them as the basis for lectures at teachers meetings and through these presentations emphasize the importance of regular service.

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MEMBERSHIP

JUNE • 1992

NEW MEMBERS

REGION 1

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GEORGE W. CURTIS
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Contact: PTG, 3930 Washington
Kansas City, MO 64111 (816) 753-7747

September 19, 1992 — **Washington DC Chapter One Day Seminar**
Ramada Inn-Washington, DC
Contact: Colette Collier, 12113 Somersworth Dr.
Silver Spring, MD 20902 (301) 649-7330

September 27, 1992 — **Annual Associates Day**
Music Warehouse Piano Outlet
4201 Pottsville Pike, Reading, PA
Contact: Mike Carraher
717-367-8256

October 2-4, 1992 — **Texas State Association 1992 Seminar**
Sheraton Mockingbird West-Dallas Texas
Contact: Jack Wyatt, 1801 Stratford
Garland, TX 75041 (214) 278-9312

October 3, 1992 — **San Diego All Day Seminar**
Piano Exchange-I-5 at Rosecrans
Guest Speaker: Bill Spurlock
Contact: Earl Kallberg
Shore Drive 32
2727 De Anza Road
San Diego, CA 92109 (619) 483-9468

October 8-11, 1992 — **Ohio State Seminar**
Cincinnati
Contact: Ellen C. Sewell, 6985 Wooster Pike
Cincinnati, Ohio 45227 (513) 272-0693

October 17, 1992 — **New York State One Day Seminar**
Holiday Inn-Westbury, NY
Contact: Marvin Witte, 26 Hollywood Dr.
Plainview, NY 11803 (516) 935-0556

October 24, 1992 — **LVPTG One Day Seminar**
Holiday Inn East-Bethlehem, PA
Contact: John Zeiner, Sr. 830 Hanover Avenue,
Allentown, PA 18103 (215) 437-1887

November 12-15, 1992 — **North Carolina State Conference**
Charleston, SC
Contact: Jim Harvey, 205 Parker Ave.,
Greenwood, SC 29649 (803) 223-2889

January 8-9, 1992 — **Arizona State Seminar**
Phoenix, AZ
Contact: Gary Mile, 3722 W. Port Royale Lane
Phoenix, AZ 85023 (602) 942-2588

AUXILIARY EXCHANGE

Dedicated To Auxiliary News and Interest

By the time you read this, you will have said good-bye to all your friends both old and new that you have met in Sacramento at the 35th annual Piano Technicians Guild Convention. I sincerely hope that you have come away with some rewarding experiences and lasting friendships and will be willing to spread the good news of our association to all of your acquaintances in your own little corner of the world.

I want to thank you for electing me president of your organization, but remember, neither I nor the board members can do it alone. We need your continued support and ideas to further the aims of our organization, which is to support the technicians, educate the public and support music in the schools.

Remember also that a tuner can sponsor not only a spouse but a sister, brother, mother, father or friend—anyone who is interested in supporting the aims of the PTG or PTGA. So, when you go to those local and state seminars, be sure to ask everyone there to become member of the Auxiliary. Any tuner can sponsor them.

I am looking forward to an exciting year working with the board that you have chosen to serve with me. I would like to try some innovative ideas and also to keep the old ones that work. If any of you have ideas for programs and subjects you would like to see at the next annual convention, please write to me and let me know. I love phone calls too. Also, let's hear from the male portion of the membership for ideas of interest to cover. This is your organization and I'd like it to express interests of all of you. As they say, "My door is always open."

Remember the sign hanging inside a shoe repair shop:

"I will heel you,
I will save your sole,
I will even dye for you."

Sincerely,

Phyllis Krahmer Tremper
President

From the Auxiliary Editor...

As I sit down to assemble this month's edition of the Auxiliary Exchange I realize that I am about to celebrate my first year anniversary as editor of these pages. What with meeting deadlines and planning articles to appear two months ahead of time, the year has really flown by. Unfortunately, the "mailbag" around here has been empty. I once again would like to encourage anyone who reads these pages to submit anything from a tidbit to a series of articles. I can't stress enough that the Auxiliary Exchange is here for your use. Please don't feel that you have to have a polished article. To the best of my ability I will put your thoughts together and submit them to the Home Office for publication. I would also appreciate any rough story ideas anyone may have.

Look at it this way—the more information from around the country that you the readers send me, the less you will have to read about the latest weather conditions and goings-on with our immediate family up in our little corner of the country!

Jennifer Reiter

It takes teamwork...

(Editor's note: This article has appeared in 3 or 4 newsletters that I have received lately. Maybe it can be applied to a situation you may find yourself in..)

This fall when you see geese heading back south for the winter flying in a V formation you might be interested in knowing what scientists have discovered about why they fly that way. It has been learned that as each bird flaps its wings, it creates an uplift for the bird following.

By flying in the V formation, the whole flock adds at least 71 percent greater flying range than if each bird flew on its own. Basic truth #1: People who share a common direction and sense of community can get where they are going quicker and easier because they are traveling on the thrust of one another.

Whenever a goose falls out of formation, it suddenly feels the drag and resistance of trying to go it alone and quickly gets back into formation to take advantage of the lifting power of the bird immediately in front. Basic truth #2: If we have as much sense as a goose, we will stay in formation with those who are headed the same way we are going.

When the lead goose gets tired, he rotates back in the wing and another goose flies point. Basic truth #3: It pays to take turns doing hard jobs, either with people or geese flying south.

These geese honk from behind to encourage those up front to keep up their speed. Basic truth #4: We need to be careful what we say when we honk from behind.

Finally, when a goose gets sick or is wounded by a gun shot and falls out, two geese fall out of formation and follow him down to help protect him. They stay with him until he is either able to fly or dies. Then they launch out on their own or with another formation to catch up with their group.

Final truth: If we have the sense of a goose we will stand by each other like that.

Did you ever wonder...

Have you ever wondered why horseshoes are considered to be lucky? The horseshoe nailed above a doorway, or worn as a charm is recognized as a good luck token everywhere.

According to legend, St. Dustan, an Anglo-Saxon ecclesiastic, who lived in the tenth century and was the patron saint of all blacksmiths, made the horseshoe lucky. When he was not occupied with his church work, he was employed as a blacksmith.

On day as St. Dustan was toiling at the forge a shadow fell across the door. On looking up, who did the good saint see but the devil himself.

The blacksmith asked the devil to what he owed the honor of having a visit. Satan indicated that he had walked so far and so long that his hoofs were sore and tender and he wished to have horseshoes put on them.

Dustan agreed to do the job and instead of making it as painless as possible he went out of his way to make it very painful. The devil bellowed and roared in rage but the saint was strong and would not let go until the devil had promised that he would never enter any house where a horseshoe was nailed above the door or molest any person carrying a horseshoe as a charm.

Also, legend has it that the horseshoe should be nailed or worn with the ends pointing up so that it resembles a "U" or else the luck will "drain out."

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CONTACT:
JENNIFER REITER
A/E EDITOR

...Tuning corner—
continued from page 25

before tail rotation. Memory of how much pin spring occurs before tail rotation begins helps locate the null spot; the settle-back move approximately equals the amount the pin sprung before tail rotation. Memory of how high the resistance escalated before tail rotation provides a clue of how firmly the pin can be sprung back on the other side of null without disturbing the tail. This is a maneuver used for settling the string, (to be further discussed later). These memories are comparisons of fleeting events in time and are quickly lost. Therefore, these bits of feedback have useful quality only as you are working smoothly, efficiently and quickly. Though fleeting, this *memory* information is a significant addition to *directly perceived* information.

There is a problem here. In reality this null point at which the pin is presumably stable is almost never an exact point but a vague area or range of positions. This vagueness is partly because the friction in the gripping wood does not allow the pin to freely un-spring to an exact, clearly felt null point. I have come to suspect that the main reason for this vagueness is that at this stage we are involved with settling the string, and this helps determine where the pin settles out. In other words, since we are also trying to settle the string at this stage, we are feeling for more than just where the pin wants to come to rest. This relationship between pin settling and string settling will hopefully become clearer in the third article of this series, "Setting a Stable String/Pin Unit."

So then, the feedback specifically related to pin resettling is *direct perception* of the null point and *memory* of pin spring; *memory* of the resistance peak is also used. This information translates to a sometimes clear and sometimes vague sense that the pin has been securely nestled into the gripping wood fibers.

Now let's look at some particular tuning hammer movements. There are at least two kinds of tuning hammer movements. One is aimed at whole pin movement, the other at springing the pin. Both are used. For the first move of the sequence, I generally prefer one or several quick bumps or jerks to get the tail rotated to the desired place. Then come (in the settle-back phase), carefully controlled movements of the tuning hammer and pin (accompanied by key pounding—to be discussed later). These pin-settling movements are usually little springing movements aimed at both settling the pin *and* maneuvering the string without disturbing the newly set tail. The initial quick jerk or bump is often preceded by little exploratory jabs into the springy marshmallow zone. This seems to get the tuning hammer and pin in proper alignment, or relationship, that insures a rotational rather than a bending movement in that quick thrust. It also gives me an idea how hard to make the thrust. When very tiny increments of pin rotation are desired, these quick bumps, jerks, or thrust are aimed right at the point where the tail breaks loose, no further. This seems to "disturb" the tail into rotating a bit in the desired direction. Sometimes the tuning hammer movements are little rocking movements, rocking the pin back and forth across the null point jabbing with increasing pressure into the up-pitch or down-pitch side, thus inducing tiny movements of the tail while simultaneously keeping close tab as to where the settle-back point is. A snug fit of tuning tip to pin helps with this maneuver.

Notice that there are only two places where the idea of "tiny increments" has real validity. One is the pitch at the *end* of the tuning sequence; the pitch may have fluctuated considerably *during* the sequence (though with experience, this fluctuation will decrease). The other is the tail of the pin; the string end may move considerably during the sequence.

This has been a lot of words about some very small events occurring in a few seconds. I hope you aren't in despair. Keep in mind that this article has been dealing with setting a stable pin, not a complete tuned stable pin/string unit. Next month we discuss setting a stable string.

...Forward Thinking

continued from page 27

of the beauty and elegance that has evolved from this merging of art and science. However, there is no doubt that when we sit back and listen to a digitally encoded recording performed by one of today's top artists—particularly on a respectable, well-maintained grand piano—we can truly bridge the connection between aesthetics and high technology.

...International Relations

continued from page 29

Teachers are also sought out by the Teachers Relations Committee during our annual convention and at various seminars held in different parts of the country throughout the year. At these meetings special programs are developed and the teachers in the area are invited to attend.

The Teachers Relations Committee attends the Music Teachers National Association Annual Convention and provides a training session to help teachers understand piano maintenance and its benefits and to answer questions.

Finally, through the Piano Technicians Guild Foundation we offer a yearly scholarship to a teacher who wishes to do further study of the piano or of teaching the piano.

In these ways we attempt to influence the two legs of the grand piano over which we have no direct control.

To support our own leg of that all important grand piano, the Piano Technicians Guild has a variety of aids designed to help the technician build up business. Available for members are a series of leaflets each of which deals with an aspect of piano service. They can be distributed to customers to help educate them of the necessity and advantages of regular service.

The Guild also has available a video tape which deals with the same subject. Professionally made, it is available for showing by members to individuals and to groups. One way it can be used is to let a customer look at it on their VCR while one is tuning the piano. When the job is completed the customer will be ready to ask more questions and the technician has an opportunity to develop a good relationship with the customer.

It must be understood that everything hinges on the initial contact. The cost and the difficulty of getting a customer for the first time must not be repeated the second time. Once a customer is on your books, you are responsible for all future work. Make sure that you have the refined ability to inspire confidence. You do that in two ways: 1) By doing the job well and 2) By using your skill and ability to inspire confidence. The customer must remember you favorably.

A favorable impression on a customer will bring additional work. Once you have established acceptance by the customer, you will be recommended to friends. It is hard work getting a customer. Never do anything which might jeopardize your being called again or recommended to others.

What have we to look forward to in the future?

The piano faces considerable competition from the new electric and electronic keyboards.

I would like to digress for a moment to express my feelings concerning the growing use of the term "electronic piano" and referring

to the instrument we service as an "acoustic piano." Our instrument is THE PIANO. The others are electronic keyboards. They have a value and identity of their own. They have no good reason to usurp the name "piano" and make it a generic term to designate something which has a keyboard.They have merit enough to stand on their own without putting our noble instrument down into a subcategory of "acoustic" piano.

Returning to the main subject, regardless of the battle of the names, it is reasonably sure that we will have pianos (our kind) for many years to come. And while we have them they will need service. What we will have will be an ever-increasing proportion of existing instruments in the better quality area. These instruments will require more high quality service. The better the instrument, the more obvious the flaw, the more refined the adjustments—tuning and regulation—required.

I look to the future with a great degree of optimism. There will continue to be a demand for qualified technicians and this demand will call for better and better trained people. Our associations will continue to be strong for they are an essential source for developing skills and for maintaining contact with other technicians and piano makers.

The future can look bleak if one looks at it superficially. But from the inside and from 40 years of experience I am inclined to be somewhat more optimistic. If one is willing to work hard in developing one's personal skills; if one enjoys working directly with a product where the results of careful and skillful labor are immediately here; if one is willing to accept as a return for labor the satisfaction of doing something you enjoy and doing it well; if one is will willing to accept a reasonable income for doing what one likes and enjoys; if one is willing to do the extra work necessary to keep our organizations alive; and as long as we have music, the universal language, there will be a place in the world of music for the piano technician.

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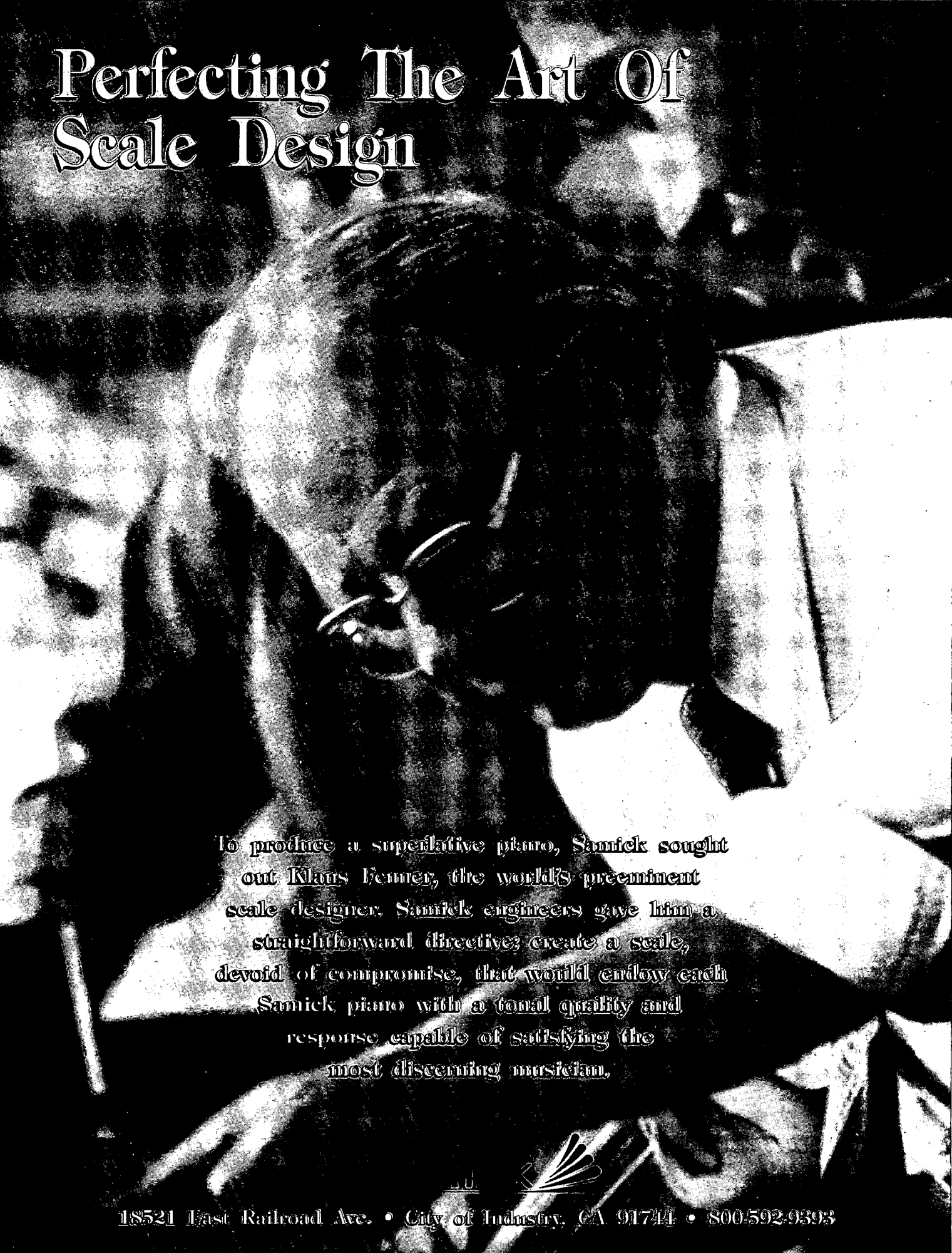
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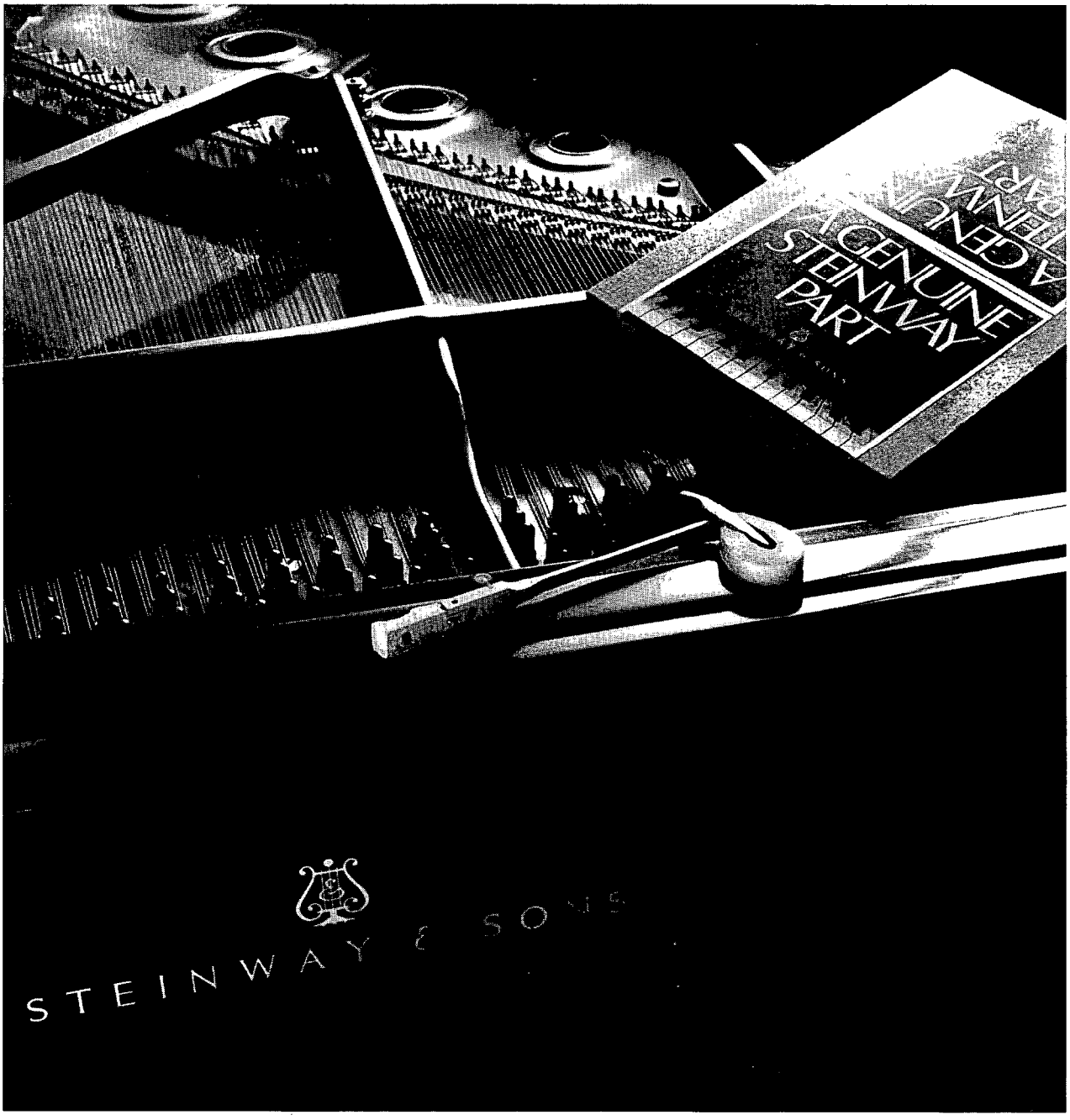

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Tech Gazette

Yamaha Piano Service August, 1992

The Yamaha Piano Servicebond℠ Assurance Program

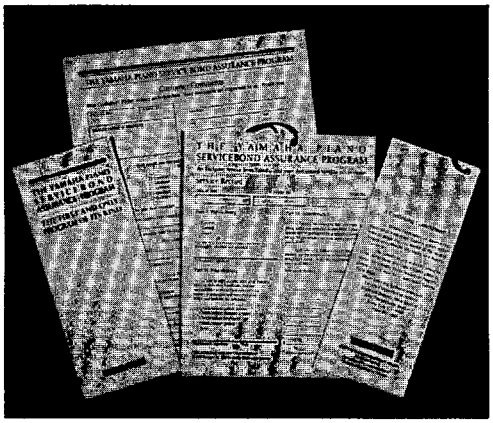
The Yamaha Servicebond℠ program has been in effect for many years now. But have you ever stopped and thought about what this program means to you?

Recently, we "re-introduced" the Servicebond℠ to our dealers, and have "reminded" them of the many benefits of this program. Let's take a few moments to look at this program, and how it can affect you and your business.

Yamaha believes that any new piano needs a thorough check-up before it is displayed. The piano needs to be tuned, the regulation and voicing carefully checked (and improved if needed), and the case should be polished. Ideally, the piano should be in its best condition possible on the sales floor. A "hang tag" is supplied and signed by the dealers' technician, for this purpose.

After the piano is delivered, it should undergo a thorough check-up to make sure the movers left it in good shape, both internally and externally. And, if necessary, it should be tuned to A440.

All new pianos go through a settling process during the first few months of life. Part of this is caused by use. But the largest portion is the effect of temperature and humidity changes that occur in the new environment during those first few months. The Yamaha Servicebond℠ program assists the dealer and his technician in performing this very important service after the piano has become acclimated to its new home. Screws should be tightened. The regulation should be checked and restored to the proper specifications, if necessary. Tuning to A440 will certainly be a part of this vital service call.



Now, how can this benefit you?

Well, to begin with, it provides additional income. As either an independent technician working with a dealer, or as an employee of the dealership, you are being paid to perform this service.

Of course, having quality pianos to work on is also a great benefit. And since this program is exclusive to Yamaha, you know that all of these pianos will be of high quality.

Yamaha clients are good clients to add to your own file box. They have purchased high quality instruments and are usually willing to care for them.

The Servicebond℠ is the ideal way to educate your clients on the need for proper and regular service. Once this is done, you have customers that want their pianos serviced, because you've shown them the value of it. This allows you the ability to further develop your long term business of servicing high quality pianos.

And, of course, the access to Yamaha Piano Services, and all it has to offer, is certainly one special value.

Our commitment to our customer, states that *"Yamaha Corporation of America and your local authorized Yamaha piano dealer want to assure that you receive all of the musical rewards and pleasures you expect as a Yamaha piano owner."*

So, that's what it's all about, really. A firm commitment to excellent service and customer satisfaction, unequaled in the piano industry. To accomplish that objective, Yamaha plays its part in terms of dealer and technical support. The dealer makes use of the programs we offer. But it takes *you,* the piano technician, to complete the picture.

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