



PIANO TECHNICIANS

# Journal

*Official Publication of the Piano Technicians Guild*

May 1998

Vol. 41 • #5

## ***Inside:***

- *Longitudinal Modes in Piano Strings – Results of New Research*
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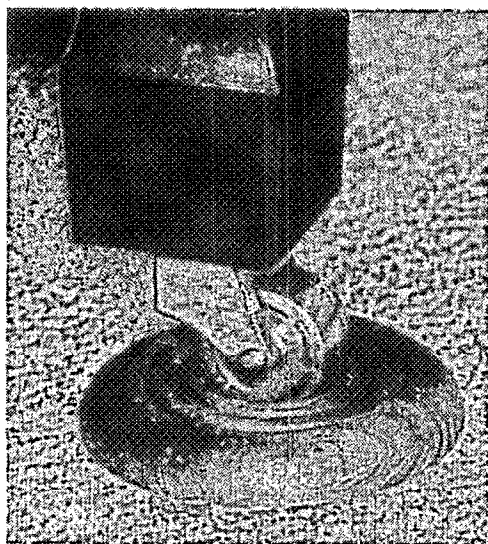
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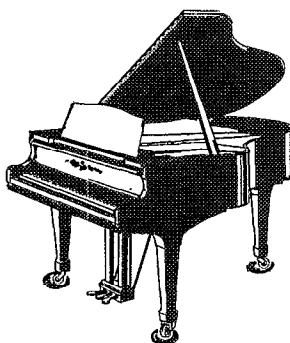
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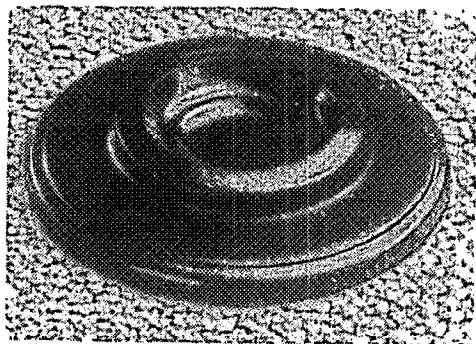
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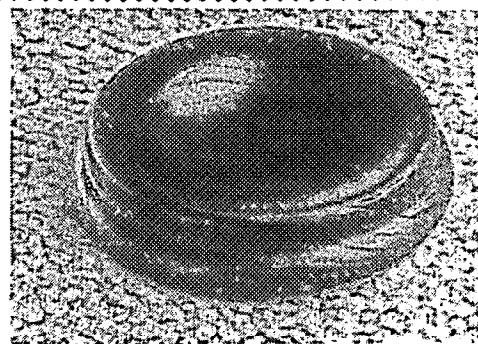
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# EDITORIAL PERSPECTIVE

## The Sayings of Russell Sherman

Although I had been impressed with his playing, I approached Russell Sherman's book with a vague sense of distrust. Books like this, consisting of short aphorisms loosely arranged in broad chapters, have never done much



Steve Brady, RPT  
*Journal* Editor

for me. I prefer a collection of well-argued essays, say, or a taut psychological novel — something you can really get your teeth into. Sherman, a gifted pianist noted for his recordings of Beethoven and Liszt, teaches piano at the New England Conservatory of Music, so I was interested in what he might have to say. But when I first opened his book and saw the format — something resembling a latter-day *Teachings of Lao-Tzu* — I was initially disappointed.


The operative word here is "initially." My first impression was confirmed (I thought) by some of Sherman's opening forays: "To play the piano is to consort with nature. Every mollusk, galaxy, vapor, or viper, as well as the sweet incense of love's distraction, is well within the hands and grasp of the pianist.... To know the piano is to know the universe. To master the piano is to master the universe." And so forth.

But a little further in, Sherman's sayings began to capture my interest. Towards the end of the first chapter, I found a number of references to the instrument itself and, furthermore, to the technicians who take care of it. "In fact," says Sherman, after quoting a famous pianist as having said that there are exactly 13 kinds of bad pianos in circulation, "there are good pianos, there are bad pianos, and mostly indifferent ones. Apart from the ingredients of mechanical action, there are four vital elements which concern the pianist: (1) the sustaining — or decay — factor of the individual notes, in particular those in the treble register; (2) the timbre or quality of the notes, both individually and in 'concert'; (3) the range of dynamics available; (4) the equivalence of voicing from note to note, register to register. Many people feel that the first two factors are the vital components. I believe, however, that the characteristics of range and voicing are more significant."

Sherman asserts that "the attributes of beautiful or radiant sound depend on a troika of conditions — the instrument, the technician, the venue." Going further, he states: "Assuming the piano is reasonably presentable, perhaps the most significant of these conditions is the quality of the technician. A wise and subtle technician can prepare an indifferent instrument for effective use, unless the range of sound is severely restricted or the action is inordinately clumsy." But his appreciation for the good technician is balanced by his factual recognition that "a good piano serviced by an inexperienced technician may quickly lose its bloom."

In short, I found the book intriguing and engaging. Sherman draws on an astonishing range of material for analogy: philosophy, theater, poetry, painting, classical literature, politics, psychology and ... sports! Obviously a big-time sports fan, he gleefully compares Lenny Dykstra's batting style and Jack Nicklaus' golf swing to some aspect or other of piano technique, sees a pianistic grace in the fielding of Duke Snider and Jackie Robinson, and throws in a sidelong reference to boxing when he says, "...it would be nice if all the teachers would get together and say *no más*" to piano competitions.

*Piano Pieces* is wonderful reading for anyone interested in classical music in general and piano playing or teaching in particular. It might make a good gift for some of those special clients with good pianos who really should be getting them

serviced just a little more often. Sherman has strong opinions about nearly everything, and, whether you agree with them or not (I mostly do), you'll be enriched for having read them. 

Please submit tuning and technical articles, queries, tips, etc., to me:

Steve Brady, *Journal* Editor  
205 McGraw Street • Seattle, WA 98109  
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A review of *Piano Pieces*, by Russell Sherman. Farrar, Strauss & Giroux, New York, 1996. 244 pages.



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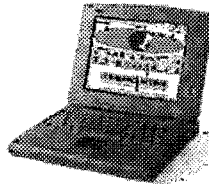
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## COVER ART

*RPT Michael Werkhoven created this month's cover – a hand-colored black-and-white photo of a 58-inch Jacob Doll "Budoir" Grand, New York (1902).*

# PIANO TECHNICIANS Journal

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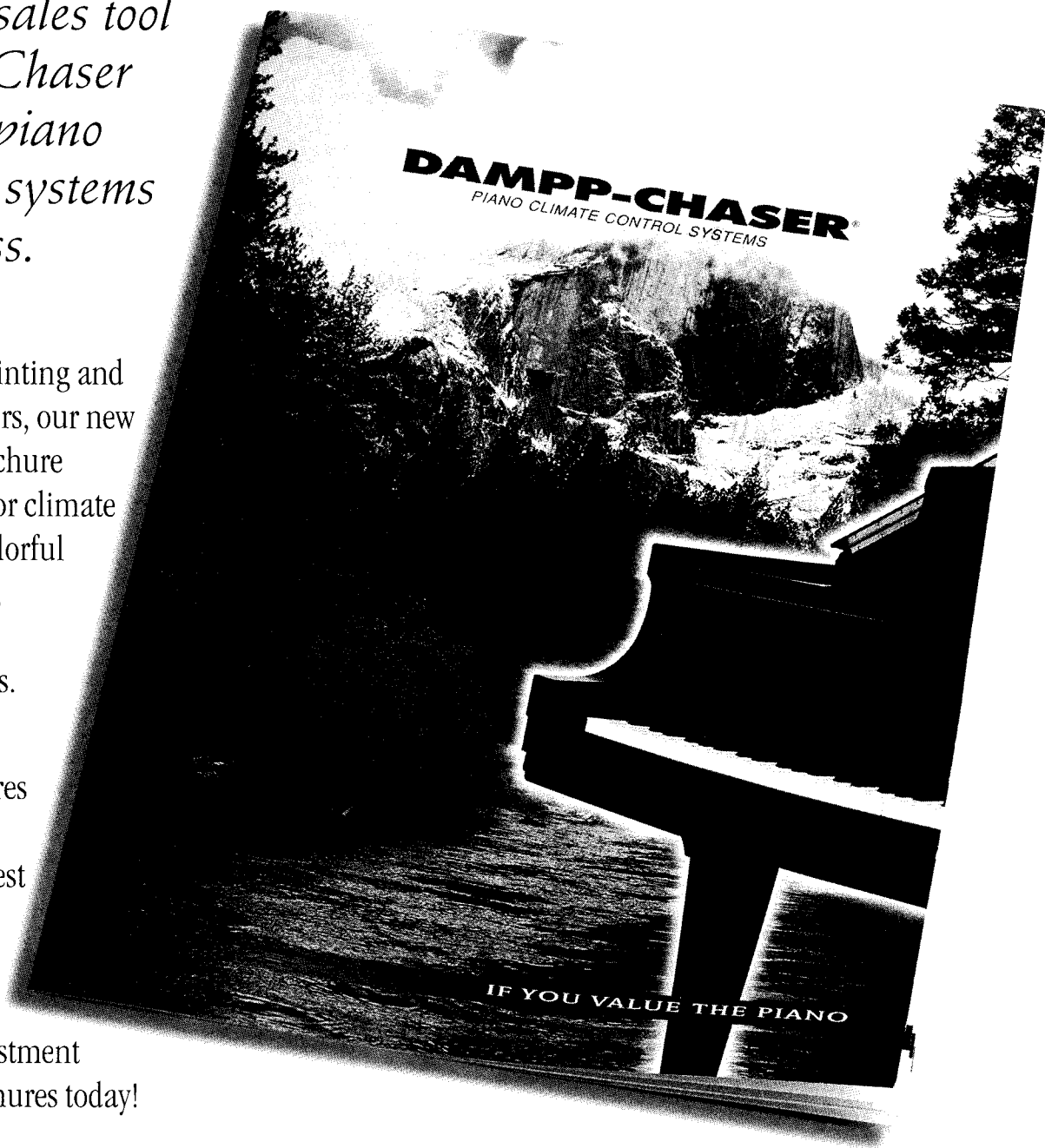


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# A Battle for Peace of Mind

**Y**ou need not be a history buff or a person interested in the military to recognize that our country has been in many military conflicts and wars over the years in defense of our great country. Through all of those times music was present in many different forms for the benefit of the morale of our troops. At the center of much of that music was the piano. Theaters, service clubs, churches, barracks and lounges of all types are places where pianos can be found. When a piano is around someone will always be willing to play to help lighten the atmosphere with a song. This is the same instrument we find ourselves involved with on a daily basis – still there to assist in bringing beauty to the world.

During the month of May we have a national holiday in the United States of America called Armed Forces Day. On that day the various ships and military bases around the country are opened for the public to visit. Many people travel long distances to enjoy the music and view the festivities associated with the armed forces and the many exhibits of military hardware used in the defense of the free world.

Although military hardware is designed to make war, the world is basically at peace. Each of us knows, however, that there are places around the world where peace does not exist. While we are aware of these situations, life goes on from day to day, and we make the best of it. When you stop to think about it, there is a similarity here. As we move about on a daily basis weaving in and out of life's myriad situations, we most often focus on that which is necessary to get us through what is current and we make the best of life as we see it. Few of us walk around with the thought of battlefields on our minds.

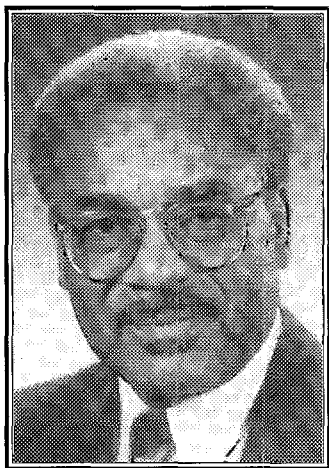
Now consider this. Many of us walk around continually dealing with our own personal battlefields because there are many deeply ingrained negative attitudes which seem to permeate much of our culture. Yes, our mind is indeed a battlefield. Make no doubt about it. The war against negative feelings and attitudes is one each of us at one time or another will do battle with, and if we win that struggle, we will experience a peace of mind unequalled by anything less than a healthy self-image.

It is our self-image which sustains us when we learn to wage war on negative feelings and attitudes. This is the way we win the war in the battlefield of our mind. Our infantry (positive input) must approach the enemy (negative feelings) by crawling slowly through the underbrush seeking contact and creeping through the darkness behind their lines in order to discover their positions. Then we become aware of the supreme importance of our thinking and the ability of our mental imaging power which will assist us in moving forward.

Our Navy, on the other hand, will find it impossible to transport our troops (positive attitudes) to victory before locating that enemy (negative attitudes). We must root out of our minds anything suggesting self-defeat before we can go forward in this war.

Even though our Air Force is equipped with the absolute latest model aircraft and tactical support forces (constructive activities), it is our adoption of a vigorous philosophy which includes our ability to set goals that will assist this mighty Air Force in strengthening our self-image, the mental image we have of ourselves. Over the long haul we will win in shaping the concept of our self worth.

So, during this month of May when we celebrate our Armed Forces' ability to wage war in self-defense when that is required, let us declare war on our own negative feelings and attitudes. When we have ourselves successfully in tow, as they say in the Navy, we will have taken a large, large step along the way of contributing to society, the positive attributes of good citizenship – hence good membership. 🎹



Marshall B. Hawkins, RPT  
PTG President



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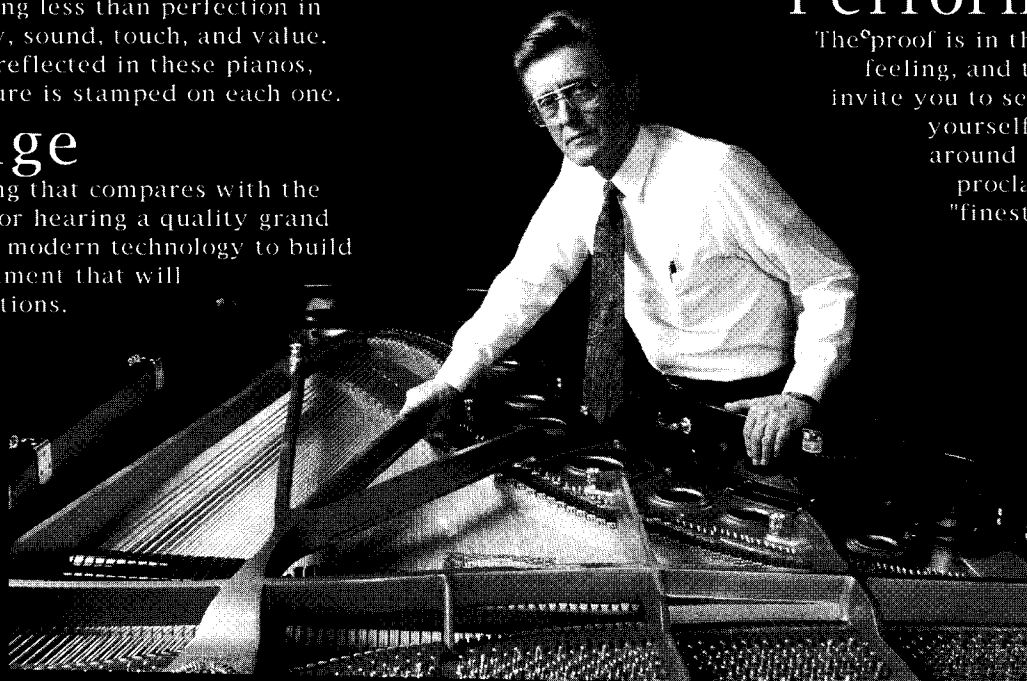
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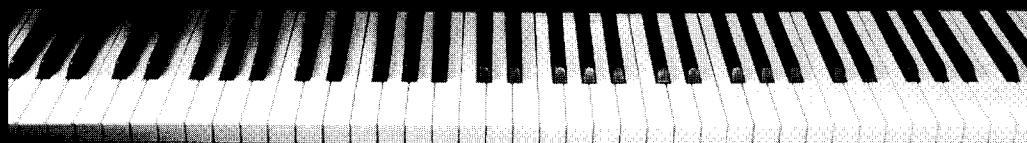
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## How Much Does a New String Stretch?

Our chapter has a Hamilton studio piano located in its monthly meeting room. It is used to demonstrate piano technology during the chapter's technical sessions and by our Education Committee to train our associates in tuning and regulation techniques.

As the piano had two wound bass strings with splice knots in their speaking lengths, it was decided to replace them with new strings, not only to enhance their tonal quality, but to demonstrate making string patterns (using paper adding machine tape) and the installation procedures of bass strings.

The purpose of this letter is to share the results of our measurements of new string pitch drop after installation. As the piano was not being played or tuned for a few months, we were able to carefully measure the pitch drop over this period of time.

In November 1997, three new bass strings were installed, F#1 (a single unison note) and E2 (both left and right unisons). After installation, the strings were pulled to initial pitch, then seated at both hitch and bridge pins. Using a generic Hamilton tuning page in a Sanderson Accu-Tuner™, the new strings were then pitched at +50 cents over standard A-440.

In January 1998, the following pitch deviation, in cents, was noted, using the same SAT page; F#1, -12¢/E2(L), -12¢/E2(R), -18¢. These strings were *not* tuned and were left at these pitches.

In February 1998, they were again measured and the readings were: F#1, -15¢/E2(L), -17¢/E2(R), -21¢.

The average pitch drop in two months was -64¢, in three months, -68¢! Could we draw initial conclusions that it would be necessary to over-pull new strings between +65¢ and +70¢ in order for them to settle to near pitch?

I'm sure these readings are valid only to the extent of a few strings being replaced and not an entire piano restringing. It would be interesting to see if this over-pull factor would also apply to very short treble wires. Maybe, as time goes on, these initial findings will be refined!

— Dave Knudtson, RPT  
Twin Cities Chapter

## More on Tuning to Pipe Organs

Steve's method of holding an organ key down with a rubber mute while setting the pitch of a piano to that of the organ is a technique I sometimes used before I bought my (Sanderson) Accu-Tuner™. However, I would like to point out the fact that a pipe organ does *not* go *flat* as it warms up. It goes *sharp*. This is because the pitch is determined by the velocity of sound in the air columns inside the pipes. Sound travels faster in warm air because it is less dense. It is true that the pipes expand and get longer as they warm up, but this effect is negligible compared to the effect of temperature on the air inside the pipes.

Some other things to consider are: 1) the reed pipes do not go as sharp as the flue pipes when the temperature rises; 2) the pipes in the swell chamber(s)

may not be at the same temperature as those that are exposed; 3) relative humidity affects the wooden pipes; and 4) letting "the organ warm up a few minutes" will have little effect on pitch unless the blower is drawing in air that is at a different temperature from that in the pipe chambers. The latter is a situation organ builders try to avoid.

If the organ does go flat when it is played, it suggests that the blower is drawing in cold air from somewhere, or that warm air was trapped in a closed swell chamber while the organ was not in use. Most organists open the swell shutters before turning the organ off; but if they forget, most pipe organs have spring-loaded swell shutters that automatically open when the wind is turned off anyway.

To make sure I was not overlooking something before writing this letter, I called my friend Randy Dyer, of Randall Dyer and Associates, pipe organ builders. Randy told me that the pitch of a flue pipe will typically go about two cents sharp for each degree temperature rise. The reed pipes are less sensitive to temperature because their pitch is controlled mostly by the reeds, although the temperature of the air in the pipes does have some effect.

Steve is right about organ pipes being harmonic as opposed to the inharmonicity of piano strings. However, when an organ and a piano are used together in a church service, the notes of the piano's treble octaves decay quickly while those of the organ are sustained. When the congregation is singing, the piano just adds to the attack of the notes and makes the rhythm more clearly defined.

When I tune a piano to a pipe organ, I check the pitch of each division, especially if it is a large organ with different divisions spread out all over the place, and then I try to guess what the average pitch is going to be when the organ is actually used. Most of the time, I end up leaving the piano very near to A-440 Hz, which is where I would like to keep it. I will sometimes leave a piano at its existing pitch to keep it closer to that of the organ, but I have never tuned a piano away from standard pitch just to put it with a pipe organ. The pitch of the organ is going to go up and down with every fluctuation of temperature. I don't worry about the harmonicity-vs-inharmonicity thing. I just tune the piano the way I normally would anyway.

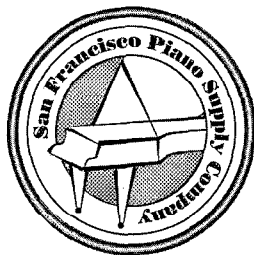
I love the sound of a big pipe organ, but let's face it, its pitch is going to fluctuate with the temperature of the air, and keeping a piano in perfect tune with it is virtually impossible.

— Jim Ellis, RPT  
Knoxville, TN Chapter

## Steve Brady Replies:

Jim's right — pipe organs, and other wind instruments, will go sharp as they warm up. I apparently had a brain seizure as I was writing the item for TT&T, because if I had given it a minute's thought, I would have recalled learning this in a college musical physics class. Thanks to Jim for catching this error. — SB





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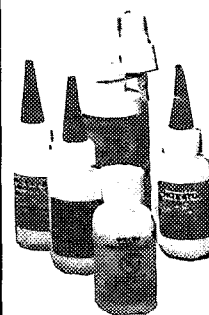
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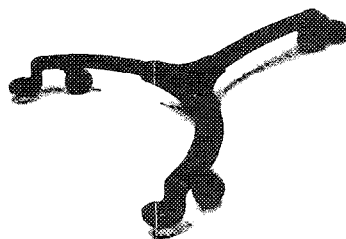


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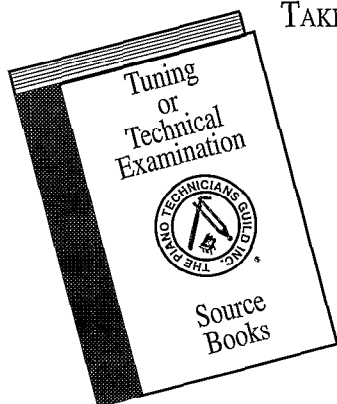
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# Tips, Tools & Techniques

## Filing Hammers with Sanding Mesh

Credit for this tip goes to my friend and colleague, Glenn Brown, RPT, of Tempe, Arizona. Glenn suggests using a strip of this sanding mesh to file hammers quickly and easily. The strip he gave me is about 10" x 1" and has the following printed on the back: "120M SIC WP MESH." This material is used for sanding drywall joints, and its main feature is that it doesn't load up like conventional sandpaper; the sanding dust just goes right on through the holes of the mesh.

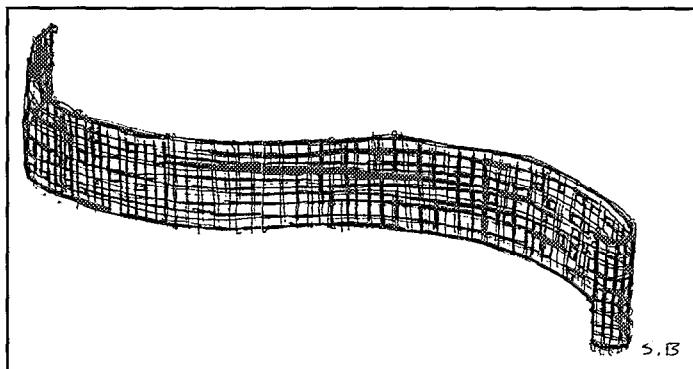


Figure 1 — One-inch strip of sanding mesh.

I find the sanding mesh is very effective for filing hammers with the "shoeshine" method, where you grab both ends of the strip and pull first from one end and then the other, back and forth over the top of the hammer, applying force downwards towards the tail of the hammer. With sanding mesh, making new sanding strips is a snap, because it doesn't require a tape backing as sandpaper does; you just cut the strip to any width you want, and start filing.

The downside is that I can't use this material in the same way I normally do when gang-filing grand hammers, that is, putting pressure on the strip with my left hand while pulling the other end with my right hand. The back of the sanding mesh is just as abrasive as the front, and it would soon leave my left-hand fingertips raw and bleeding! For me the solution is to keep strips of both types — sanding mesh and tape-backed sandpaper — handy in the shop and to use the kind that fits the situation.

— Steve Brady, RPT  
Journal Editor

## Suggestions for Tuning Stability

The subject of tuning stability can get rather complex. The following thoughts are just some simplistic ones that have occurred to me over the past several years. They are entered here in an attempt to come up with a last minute article.



1. If a note sounds correct, do not manipulate the tuning pin. Why so? That string's tuning has survived the test of time, so leave it alone. The odds of such a string going out of tune after some heavy playing is less than a string that has been freshly tuned.
2. When using firm hard blows on a key, use two or more

fingers at the same time. The thumb by itself is not very efficient in applying a downward force, so avoid using it when you get serious and start the heavy blows. In combination with some other finger or fingers, the thumb does okay.

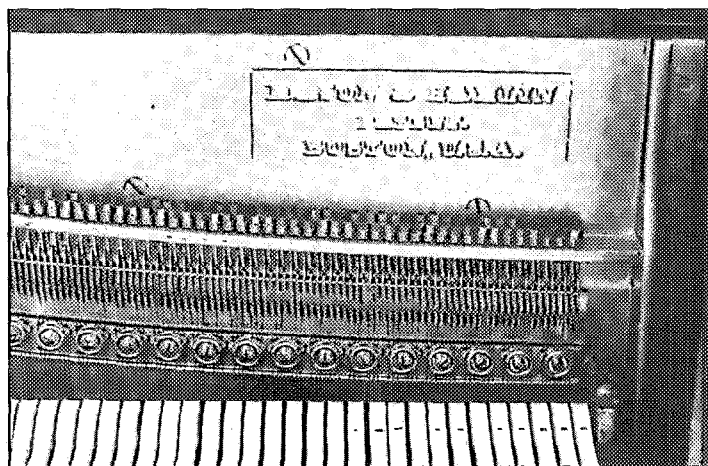
3. A standard tuning hammer can cause tenderness in the palm of the hand. This can lead to a lack of proper manipulation of the tuning hammer. Wear a biker's glove and your control should improve.
4. To save your ears and others from loud sounds, focus on tuning pin manipulation first, use firm hard blows next for the final stabilization and to see if the pitch changes. This is especially true if the tuning pins are tight and the pins tend to twist in the pin block.
5. A good electronic aid can be beneficial in achieving tuning stability. You can plug your ears and watch the lights of the tuning device for drift either flat or sharp. Without having to do as much thinking in getting the intervals and octaves established, one has some leftover gusto for that incessant buffeting of the keys.

— Fred Yonley, RPT  
Dallas, Texas Chapter

(Reprinted from the "Piano Wire," newsletter of the Dallas Chapter)

## More on the Mason & Hamlin Screw-stringer

I would like to add my two cents worth concerning the Mason & Hamlin screw stringer, which I consider an excellent design. I have serviced one for almost 20 years and restrung another one. They are more work to string, but worth it. I wouldn't go so far as to call it a nightmare. With new strings, the plate rebronzed and the screws and nuts all cleaned up, they are quite something. To answer John Fortiner's question about string length, I find the best length is one that extends 1/8" to 3/16" beyond the slotted metal piece that guides the screw-



Mason & Hamlin upright screw-stringer restrung by Les Conover.

hooks. Cut each piece a little too long, make the hitch pin bend, lay it in place around the hitch pin, pull it over the V-

Continued on Page 14

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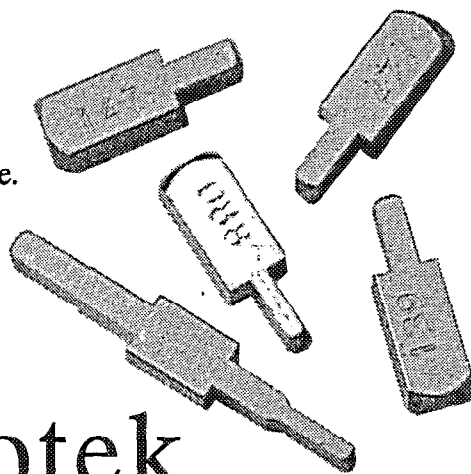


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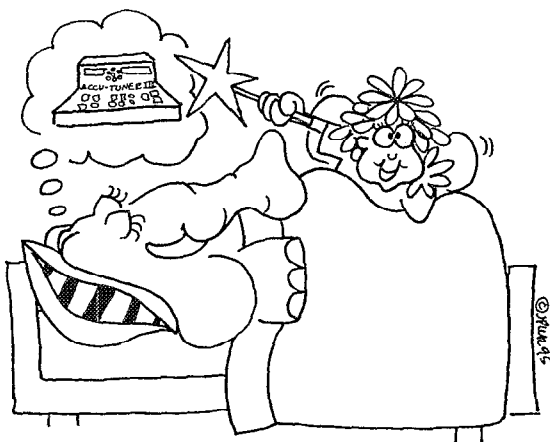
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# Q&A/EDITOR'S ROUNDTABLE

## Noisy Keys

**Q** A customer complained of "noisy keys" on a three-year-old Baldwin Hamilton. I traced the noise (woody sound when the key returns to rest position) to the balance rail. I haven't yet removed the keys and checked the adjustment and hold down screws, but just feeling the balance rail, it seemed to be seated firmly. As a test, I placed a cardboard front rail punching (it was the only thing I had with me at the time) between one of the keys and the balance rail - it stopped the noise (for that key).

I appreciate any tips for things to look for.

— *Jerry Hunt*  
*Dallas, Texas Chapter*

**A** *Jim Krentzel, RPT:* I've had Baldwins make the noise you've described. Check the area of the balance rail on the capstan side of the balance rail pin. I've seen key bottoms knock against the balance rail in this area as the keys return to rest. Sometimes, in order to get the correct key height, a manufacturer will use a very thin balance rail felt, and very few, if any, punchings. If this is the problem, you can remove a little wood from the key bottom in front of the balance rail felt.

**A** *Ralph Martin:* Sounds to me as if there is not enough back rail thickness to keep the keys from hitting the back of the balance rail. Heavier back rail felt or thicker balance rail felts may cure the problem.

**A** *Dave Porritt, RPT:* Check for hard back rail felt. I've seen some of these where glue oozed out and the bottom of the key was hitting hard glue rather than felt.

**A** *Keith A. McGavern, RPT:* Check for "pulley" keys (balance hole in key too large or elongated). If so, glue sizing the balance hole will remedy the problem.

## Warped Keys

**Q** I have a piano in my care that has developed two severely warped keys adjacent to each other and warping in opposite directions (go figure, kind of reminds me of David Letterman's smile). My first response is to "un" warp them with dry heat like we do hammer shanks. I seem to remember, though, someone teaching the use of steam in this case. Your input would be appreciated. Some of the students here are more annoyed than usual.

— *Christopher D. Purdy, RPT*  
*School of Music, Ohio University, Athens OH*

**A** *Lance Lafargue, RPT:* I'm not sure that steaming/rewarping would be permanent. I usually use a small hand plane sander to remove wood. I don't know how bad yours are. Ignore those angry students, they'll be gone soon enough....

**A** *Richard Moody:* In case the keytops are tilted because of warping, dry heat and bending is the option. The heat from an electric stove works pretty good. Clamp to a strong board. It might take two operations, so

charge accordingly, and it cannot be guaranteed. If it warped once who can say, and is an uncommon job. I don't think you need steam. Steam is for radical bends, this is a slight bend. Kind of like burning-in hammers. I have done one key with dry heat, and seemed to get the job done. I told them to call as soon as it rubbed again. Almost two years later they haven't.

But if the keytops are not tilted, by all means sand, grind, file, or plane.

**A** *Dave Peake, RPT:* It has been years since I have run across warped keys, but if my memory serves me correct I would soak a rag and wrap it around the warped part of the key, secure with a rubber band, then clamp it flat on the work bench, forcing the key to bend in the right direction. Leave it overnight and by the next day, the key should unwarped. Food for thought.

**A** *Jerry Hunt:* I've unwarped one key, using a steam iron. Put the end of the key in a vise or clamp (not too tightly), heat the key on both sides with the steam iron while gently twisting the key, twist a little past normal. Then hold the key while it cools. Let it dry, and/or use a hair dryer.

## Response:

The keys are tilted, big time. If I just sanded to cure the rubbing I would still have the capstans pointing at 11:00 and the keytops at 1:00. The good news is that this piano is here in the school of music so I don't have to worry about charging and guarantees. I am going to try unwarping first and if it doesn't take I will go nuclear.

Thanks to everyone who wrote. I really enjoy being able to draw on so much experience.

## Cleaning Grand Soundboards

**Q** Greetings group from the gray skies of Michigan. I'm wondering about tips for cleaning soundboards on grands. Do you remove the lid? What cleaning solutions, if any, do you use? What tools? (rags, spring steel, dusters). I would like to suggest cleaning to some of my clients with nice grands, but don't think I could do a job I would be proud of.

— *Dick Day*

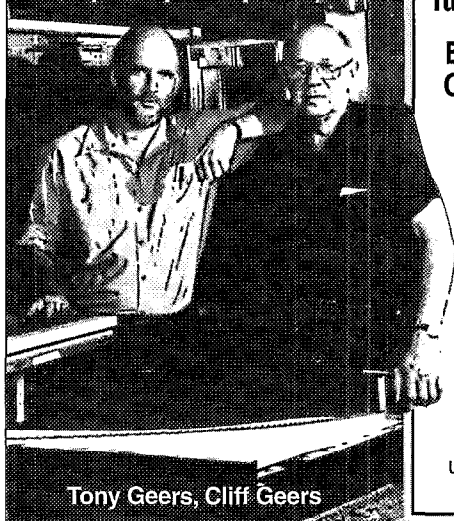
**A** *Danny Moore:* I remove the lid only if I'm planning to remove the strings also. I use no cleaning solutions - liquids have no business that close to the strings. What tools? I use the spring steel with diaper or terry cloth threaded through the slot. (Unless it's in my shop, then a blow gun attached to my compressor - customers tend not to appreciate that method in their living room!)

This is not presented as the "correct" way of cleaning, only how I do it. I'm not sure if it is an historical method of cleaning or not, but it works for me.

**A** *David Vanderhoofven, RPT:* I would highly recommend the set of three soundboard cleaning tools sold by Bill Spurlock, for about \$20.00 plus shipping (see fig. 1). A soundboard steel fits into my tool case more easily,

*Continued on Page 14*

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# Q&A/EDITOR'S ROUNDTABLE

Continued from Page 12

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Sorry about the commercial plug, but he sells good stuff.

**A** *Robert Goodale, RPT:* I also use those nifty little tools that Bill Spurlock makes. They work wonderfully, and take less than half the time than any other method or tool I have tried. This is not to say they are effortless, as you still need a good strong vacuum and a small brush. I prefer one of those cheap 1-1/2" boar's-hair paint brushes, which seem to last forever as a cleaning tool. I also like to have a couple of soft rags handy, and a pair of forceps for grabbing paper clips and other hard-to-reach articles that the vacuum won't pick up.

The Spurlock cleaning tools, (which are actually just bent pieces of welding rod soldered onto a strip of felt-covered brass), are economical and last a long time if you are careful with them. I am on my first set and haven't worn or broken them yet after cleaning more soundboards than I can recall over the last couple years. My hat is off to Bill S. for inventing this simple long-overdue little gizmo.

**A** *John Elving, RPT:* I also recommend Spurlock's tools. I do use cotton cloths (they're easier to clean than the tools. Use the tools to push the cloth. Occasionally, I have treated the cloth, in advance with Endust®. That seems to keep the dust from flying (and the cloth is not large enough to "bunch" up and corrupt the strings).

Instead of using a spring steel, I use a 24-30 inch long, 3/4 inch wide, 1/16th inch thick piece of flexible plastic (such as 1/2 piece of plastic corner molding) to get in places where the Spurlock tools can't quite get. The plastic is much less likely to inadvertently scratch the finish on the board.

Of course I use a natural bristle 3" paint brush. The natural bristles hold on to the dust instead of throwing it all over the place. Spend the money for a good quality brush instead of the "cheapies."

I also use an old bed sheet under the piano to protect the

carpet. Bring an extra to hang on the stretcher board and drape down over the keybed when you are cleaning. This keeps the dust confined to the keybed better. Along with this I use a vacuum cleaner that both inhales and exhales (blows and sucks). I bought an extra hose and connect them both to the vacuum. Then while I'm blowing it out with one, I'm vacuuming up the dust with the other. Slick little trick someone taught me. ☐

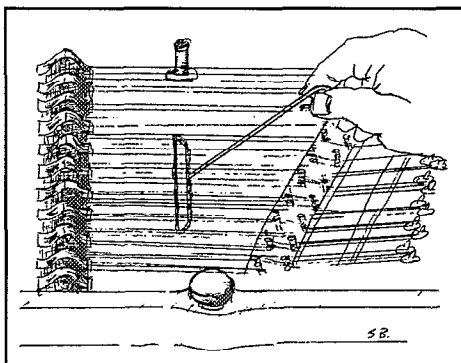


Figure 1 — Spurlock soundboard cleaning tool in use.

## Tips, Tools & Techniques

Continued from Page 10

bar, and cut it 1/8" to 3/16" past the guide piece. As was mentioned, if the wire is cut too long, you will run out of screw travel. If it's too short, you won't be able to engage the nut onto the screw. A little practice is all it takes. Just don't practice with the new bass strings.

A tip on tuning a screw stringer, especially one that hasn't been touched in years, is to put a drop of oil or Liquid Wrench™ in the top of each nut so it can soak down into the threads. Then make your first turn of each nut a loosening one. That should prevent breaking a screw, or a string. If a screw ever does break, it can be mended as long as some thread is left on the screw-hook. It's a common 8-32 thread. A piece of a machine screw can be spliced on with a threaded connector. The original nut is then put back on the new screw length.

If anyone knows any history of the screw stringer, I for one would be interested. All I know is they were made in the mid- and late-1880s. Were they made into the 1890s? Did M&H also make conventional pianos at the same time? Were screw stringer grands made? Does anyone have pictures?

— Les Conover, RPT  
New Mexico Chapter ☐

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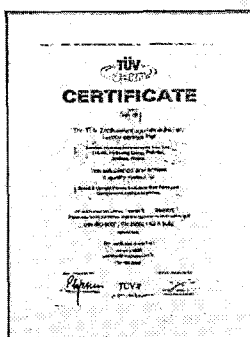
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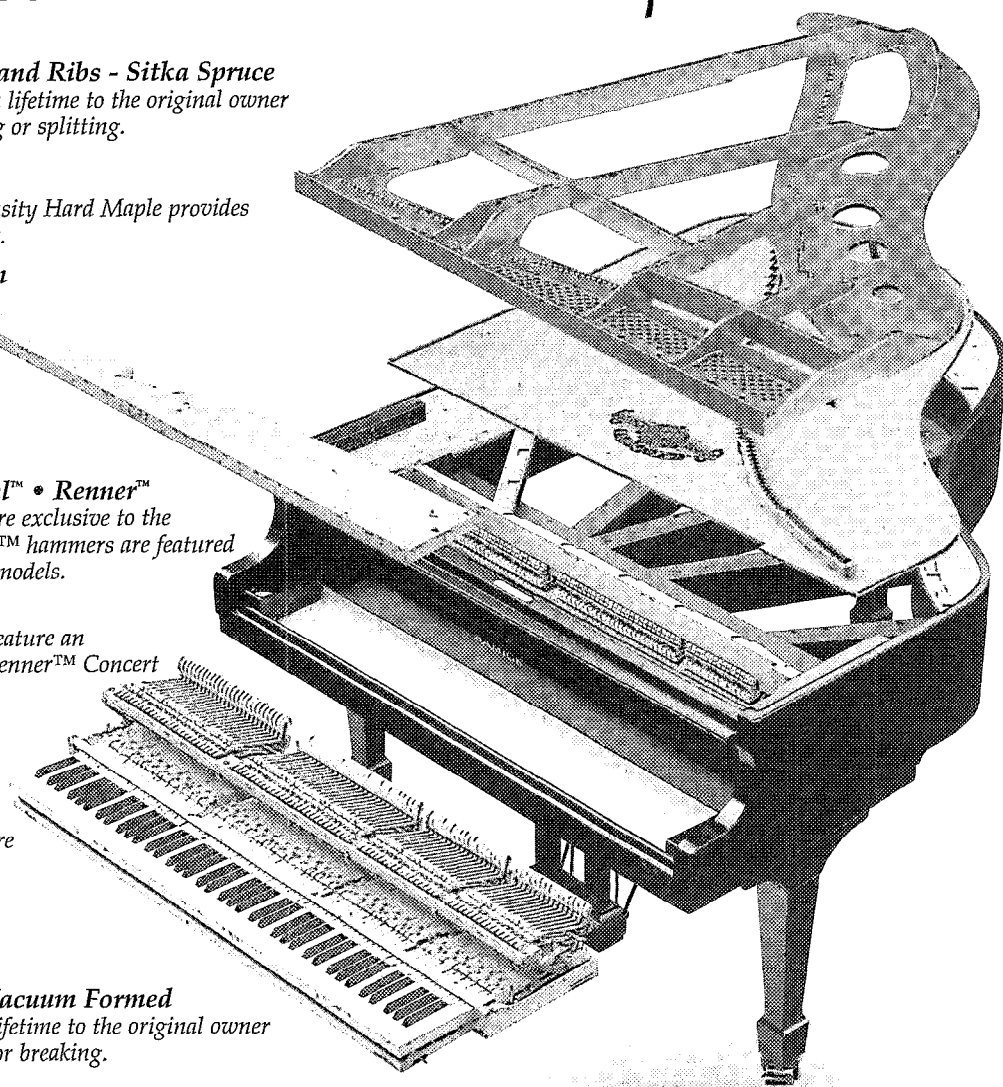
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# Longitudinal Modes in Piano Strings

## Results of New Research

By Jim Ellis, RPT  
Knoxville, TN Chapter

### Abstract

*The effects of longitudinal vibrations in piano strings have been little understood and virtually ignored by the majority of piano manufacturers, and not at all understood by most technicians.*

*Although the primary modes of piano strings are transverse, longitudinal modes also exist, and they contribute to the attack and timbre of the notes. This article describes the author's most recent investigation and discovery of the intrinsic mechanisms that excite longitudinal modes in piano strings. It presents five theorems that identify the resonances that are the primary sources of those inharmonic ringing sounds that are sometimes present in the first, second, and third octaves of pianos — those that do not respond to conventional voicing techniques.*

### Introduction

Many of those strange, inharmonic, high-pitched ringing sounds we sometimes hear in certain strings in the first, second, third, and occasionally even the fourth octaves are the result of longitudinal modes. They should not be confused with the ringing sounds produced by noisy aliquots, because their source is something entirely different. In contrast to the normal transverse modes of piano strings that are tunable by adjustment of tension, longitudinal modes refer to vibrations along the axes of the strings. The string moves from end to end rather than up and down or side to side. The frequency of a longitudinal mode is virtually independent of tension. Instead, it is determined by the density and the Young's modulus (the elasticity) of the string (and the loading, if it is a wound string). In a piano, the fundamental frequency of a longitudinal mode will typically range from 14 to 18 times that of the normal transverse-mode fundamental for the same string, depending upon the scaling of the instrument.

Longitudinal modes in piano strings have been observed for at least 70 years. In 1928, A.F. Knoblauch believed they were responsible for certain "wolf tones."<sup>1</sup> In 1944, he published a paper on the subject.<sup>2</sup> During August of 1970, Harold A. Conklin, Jr. was granted a patent for longitudinal mode tuning.<sup>3</sup> Mr. Conklin published an article about longitudinal modes in pianos in 1983.<sup>4</sup> More articles about longitudinal modes by M. Podelsak and A.R. Lee appeared in 1987,<sup>5</sup> and again in 1988.<sup>6</sup> Harold Conklin published another article in 1996 that contained a section on longitudinal modes,<sup>7</sup> and he also published a short article about "Phantom Partials" in July of 1997.<sup>8</sup> RPT James Arledge has prepared a demonstration that illustrates the sounds of longitudinal modes in the bass strings of some pianos.<sup>9</sup> Although longitudinal modes in piano strings have been observed and written about for decades, it is my opinion that the reso-

nances that cause some of them to stand out disproportionately above all the other overtones have neither been adequately identified nor received due attention.

### Early Observations

My interest in the longitudinal modes of piano strings began about 50 years ago when I noticed that certain strings in certain pianos produced strange-sounding, high-pitched ringing tones that did not correspond to any of the normal overtones. These ringing sounds would not change pitch as I tuned the string; instead, their intensity would often either increase or decrease. I believed they were caused by longitudinal vibrations in the string that resulted from some resonance.

### Beginning The Quest

My search for the source of these longitudinal modes began about 15 years ago after I had tuned a customer's new seven-foot grand. The customer, a young doctor with sensitive ears, complained of ringing sounds in a couple of unisons right in the middle of the third octave that he said were not there before I tuned his piano. He demonstrated; I listened; and I heard the ringing sounds too. Why were they not there before? Prior to my tuning, the piano was about 30 cents flat. Now it was at standard pitch. Did that have anything to do with it? I lowered the pitch of one of the ringing strings by 30 cents, and the ringing was gone! I brought the string back up to pitch, and the ringing returned. Indeed, there was some connection between the ringing longitudinal mode and the pitch of the normal (transverse) modes of these strings. I resolved to find out what it was. I set up some experiments with my own 6'4" grand, and I was able to duplicate the situation that I had experienced with the customer's piano. I could make the ringing appear and disappear by changing the tuning of the test strings by about 30 cents. I conducted every kind of experiment I could devise with the limited test equipment that I had at that time, but I was unable to resolve anything. I kept getting ambiguous results, shifting resonances, double resonance peaks, and things like that. The task I had undertaken required some equipment that I did not have at the time, so the project got laid aside — for a while.

### Developing A Theory

Although I had discontinued my experiments, I had not stopped thinking about what could be causing the resonances that I had been finding. I began to formulate a theory or two.

We visualize a piano string vibrating simultaneously at its fundamental frequency and higher partials, with loops and nodes making standing waves on the string. This concept is correct, but it is not the way the vibration first begins. At the instant the hammer strikes the string, it forms a ripple. This ripple begins to move along the string in both directions away from its origin. The ripple that moves forward is reflected at the agraffe (or V-bar), is inverted, and begins to move back toward the bridge. By this time, the hammer has left the string, and the reflected ripple becomes the trailing end of the ripple that is already moving toward the bridge. These combined ripples (this complex transverse pulse) now contain all of the frequency components that will become the standing waves (the partials) that will define the timbre of the note.

The complex pulse I have just described moves from end to end along the string, reflecting over and over again at each termination, both front and rear, and is inverted each time it is reflected. Because of inharmonicity, the higher frequency components in the pulse move out ahead of the lower ones until what was once a discrete complex pulse moving from end to end along the string has dispersed and become the standing waves that we think of as representing the various partials. This all happens in a fraction of a second, its speed depending upon the location in the scale.

According to my original theory, whenever a transverse pulse is reflected from a termination, force vectors are produced that cause a slight tensile anomaly in the string as the pulse inverts and reverses direction. This momentary tensile anomaly generates a weak longitudinal wave that also moves from end to end along the string, reflecting at each termination. If there is no resonance between the transverse and the longitudinal modes, these weak longitudinal waves just decay away as the transverse pulse disperses into standing waves, and nothing of significance comes of it.

However, if the frequency of the longitudinal fundamental corresponds to an odd-numbered multiple of the cycling frequency of the transverse pulse, the two will coincide each time the transverse pulse is reflected even though the longitudinal wave will have made several passes during one pass of the transverse pulse. Each time the transverse pulse is reflected, it will give the longitudinal wave another kick, causing it to build up as the transverse pulse is beginning to disperse and decay. This continues until the transverse pulse has dispersed into standing waves. Although my theory made sense to me, I had not been able to prove it experimentally.

## Resuming The Quest

I was in Elkhart, Indiana, in 1992, working with Chuck Walter on the Walter Piano Company's new grand when I ran into the longitudinal ringing problem again, right in the middle of the third octave plain strings. That did it! I would have to find the answer to this riddle so we could deal with it appropriately. We got out of storage, the old monochord that Mr. Walter and Dr. Kent had built some years earlier. It was a beauty too — very well designed and constructed! I made a trip to the local Radio Shack store and purchased some materials to make a sensor that would detect the longitudinal modes of a test string without confusing them with the normal transverse modes. I would

use it along with some other sensors and test equipment that I had brought with me to Elkhart. The longitudinal-mode sensor I made was crude, but it worked. The sensors I had brought with me responded only to the normal (transverse) modes. With the addition of the sensor I had just made, I could separate the sounds produced by the longitudinal modes from those produced by transverse modes.

The results obtained from the monochord experiments supported my theory. The troubling resonance was occurring when the frequencies of the longitudinal and transverse modes were at a ratio very near 15/1. In fact, the ratio was closer to what would be the theoretical 15th transverse harmonic (*exactly* 15 times the fundamental) than it was to the actual 15th transverse partial. It is theoretically possible for true harmonics of inharmonic partials to exist. If they do, then the third harmonic of the fifth partial and the fifth harmonic of the third partial would both fall near the 15/1 ratio, along with whatever else might be occurring near that ratio. I found this idea intriguing, but it was still speculation on my part. I had not been able to prove anything so far. What I was seeking was a clear understanding of the inherent basic principles that caused energy to transfer from transverse modes to longitudinal modes. I wanted to separate these from extraneous causes such as complex hammer motions, bends in the strings near terminations, bridge motion, plate resonances, and things like that.<sup>10</sup> I wanted to separate the intrinsic from the extrinsic. To do that, I would need to devise some experiments that would be as free of extraneous influences as I could make them.

## Experimental Set-Up

When I returned home to my own workshop, I had the facilities to build the apparatus and the instrumentation I needed to do the job. Figure 1 is a diagram of the experimental set-up. The monochord (details in Appendix A) had a maximum speaking length of just under 12 feet (3646 millimeters, to be exact). Oscillators I and II (top left in the figure) were Hewlett Packard sine-wave generators. The frequency counter was a B&K Dynascan Model 1851. Scope (oscilloscope) I was a Tektronix Model 205AG (dual trace), and Scope II was a Philips Model PM 3213 (dual trace) with camera attached. The data recorder was a 4-channel reel-to-reel audio tape recorder with microphone-level inputs and line-level outputs. All of the transducers (drivers and sensors) along the test string were of my own design and construction, as were the preamplifier for scope I and the single-shot trigger circuit for Scope II.

Transducer LD1 was a magnetostrictive driver for exciting the longitudinal modes of the string, and LS1 (at the opposite end) was a magnetostrictive sensor for detecting longitudinal waves (see Appendix B). Transducer TD1 was an electromagnetic driver for exciting the transverse modes of the string, and TS1, TS2, TS3, and TS4 were electromagnetic sensors for detecting the transverse vibrations (Appendix C). This arrangement enabled me to selectively excite and monitor both transverse and longitudinal modes independently without any driver or sensor touching the string. The small piano hammer H1 (5.2 grams) was spring-loaded and trigger-released from a cocked position to provide light blows of uniform intensity. Sensor TS1, which provided the trigger signal for Scope II, was always located directly over hammer H1.

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# Longitudinal Modes in Piano Strings

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## Experimental Procedure

I chose a #16 plain piano wire at the full 3646 mm speaking length for the first set of experiments. It would be large enough to provide plenty of signal for the sensors, small enough to have relatively low inharmonicity, and long enough to provide good measurement resolution.

The first step was to put the string at a tension similar to that which it would be under in a piano (Appendix D). According to my calculations, that would correspond to a transverse fundamental frequency of about 47 Hz for a string of this length. I set Oscillator I to 47 Hz (according to the counter), and patched its output to channel A of Scope I (Appendix E). I tapped the string lightly with a small piano hammer covered with soft butt felt to produce a transverse mode with no high-order partials, and then tuned the string until its frequency matched that of the oscillator as displayed on the scope.

The second step was to measure the fundamental frequency of the longitudinal mode. I patched the output of oscillator II to longitudinal driver LD1, to the counter, and to channel A of scope II, and set the scope to synchronize with the output from the oscillator. With the amplified signal from longitudinal sensor LS1 patched to channel B of scope II, I manually swept the frequency of the oscillator until I had found the fundamental frequency of the longitudinal mode, fine-tuned the oscillator to it, and recorded the frequency displayed on the counter.

The third step was to find those frequency ratios between the transverse and longitudinal modes that would cause energy to transfer from one mode to the other. There was not point in investigating longitudinal-to-transverse frequency ratios greater than 19/1 or less than 13/1 because those were beyond the range of any I expected to find in a piano. I calculated the fundamental transverse

frequencies that would have odd *harmonics* (not partials) at the longitudinal fundamental, and proceeded to slowly tune the test string through the entire range of ratios from 19/1 to 13/1 while striking it with hammer H1 as I watched and listened for the longitudinal resonances. As I expected, the prominent ones did occur near the odd-numbered ratios.

The question was: were these resonances occurring when the frequency of the longitudinal mode was the same as that of the odd harmonics of the fundamental transverse mode, or were they at the actual partials, or were they somewhere else? To find out, I tuned the string so that its measured 15th partial was precisely at the natural fundamental frequency of the longitudinal mode of the string. I then drove the string with a pure sine wave at its 15th partial (and nothing else) using oscillator I to drive TD1. The results? There was *no* longitudinal resonance! None! It was clear that the resonance near the 15/1 longitudinal-to-transverse ratio was not coming from the 15th partial. This further supported my theory that it was occurring when the longitudinal frequency was equal to an odd *harmonic* of the transverse fundamental *while the string vibration was still in the traveling pulse phase*. To check this theory out, I would need to excite the string with a continuous train of discrete pulses (not sine waves) occurring at the frequency of its transverse fundamental. The trouble was, the equipment I had would not do that. I would have to do it by some other method.

That "other method" became the fourth step in the process. I would drive the string at its fundamental *longitudinal* frequency and see if some of that energy would invert back to some transverse mode. According to the theory of mutual coupling, if energy will couple from "A" to "B," then it will also couple from "B" back to "A." Out of necessity, this would be doing the experiment "in reverse," but that would offer an added benefit. If it worked, it would reveal the transverse-mode components that excited the longitudinal mode in the first place.

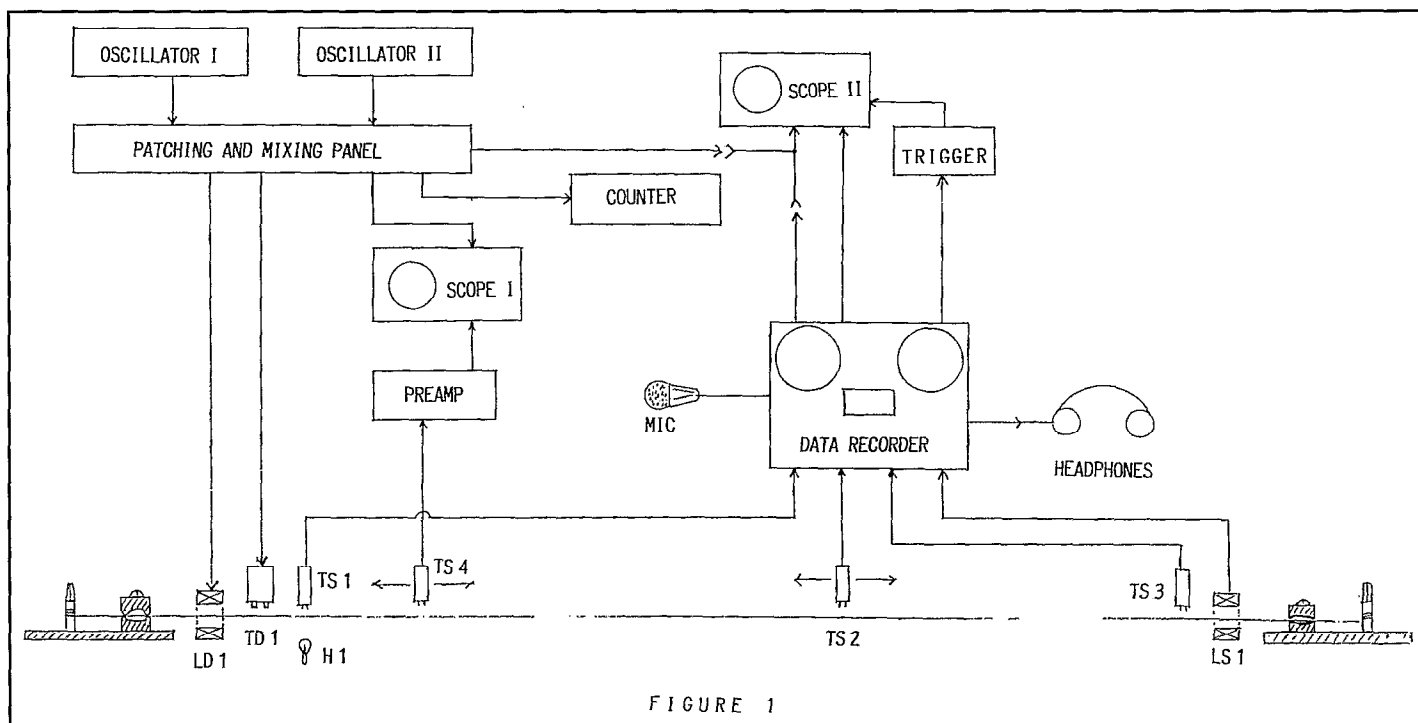


FIGURE 1

Once again, I carefully measured the frequency of the longitudinal fundamental, divided that number by 15, and carefully tuned the string's transverse fundamental to that frequency using the technique already described (Appendix E). This put the 15th transverse *harmonic* precisely at the same frequency as that of the longitudinal fundamental. With the output of oscillator II patched to LD1, I drove the string hard at its longitudinal fundamental to see if any energy would invert back to some transverse mode, or modes. Not very much happened, but I could tell that I had things tuned very close to some resonance, but not precisely at it. I tinkered around with the tuning (the tension) of the string, changing it every so slightly trying to find the resonance. When I did find it, the amplitude of some compound transverse mode slowly built up to a peak as that of the longitudinal mode decreased because it was giving up energy to excite the transverse mode. The trace of the transverse mode on the scope looked like a low-frequency carrier wave modulated by a sine wave, but before I could analyze it, something drifted ever so slightly, and the resonance was lost.

For reasons that are beyond the subject of this article, the resonance that causes energy to invert from longitudinal modes back to transverse modes is extremely narrow, making the tuning critical. The slightest drift of the oscillator, the tuning, or the temperature can throw it completely off. When I did get things stabilized at the resonance long enough to do an analysis, I was able to locate the nodes of each transverse component by moving TS2 and TS4 along the string. I matched the frequency components sensed by TS4 to the output of oscillator I using scope I and the counter while oscillator II continued to drive the string at its fundamental longitudinal frequency (Appendix H).

## Results

The transverse mode excited by the longitudinal resonance was made up entirely of the seventh and eighth transverse partials, and the sum of their frequencies was exactly equal to that of the fundamental longitudinal mode that excited them. Because energy will transfer in either direction at resonance, it stood to reason that the longitudinal-mode fundamental at roughly 15 times the frequency of the transverse fundamental was being excited by the paired seventh and eighth transverse partials when the sum of their two frequencies was equal to the natural frequency of the longitudinal mode.

## The Proof

I believed the proof should be straightforward. I would simply drive the string at the seventh and eighth transverse partials, and see what would happen. Using the counter to make sure I was at the correct partial, I tuned the frequency of oscillator I to the seventh partial, and that of oscillator II to the eighth, patched their mixed outputs to TD1, and switched on the drive. The seventh and eighth transverse partials quickly appeared on the string, and a pronounced longitudinal-mode fundamental followed soon afterwards. There was no mistake about it this time. Now I knew the "combination," or at least one of them, that was exciting the longitudinal mode. It was the combination of two transverse partials occurring consecutively in the harmonic series, one odd-numbered and one even-numbered, that excited the longitudinal fundamental if its natural frequency happened

to be very close to that of the sum of the two partials. This was a resonance that I had not predicted.

## Expanding The Theory

I had proven to myself that the paired seventh and eighth transverse partials would excite a longitudinal fundamental if it happened to be resonant with the sum of the frequencies of the pair. Therefore, it stood to reason that another pair of odd + even transverse partials would excite other longitudinal fundamentals. For example, would the eighth and ninth transverse partials excite a longitudinal mode if its natural frequency were equal to the sum of the two partial frequencies? If so, this would put it somewhere between the 17th transverse harmonic and the actual 17th transverse partial. Would a pair of odd + even transverse partials that were not consecutive in the series also do it at the sum of their two frequencies? For example, would the paired seventh and tenth partials do it, but at a lower level?

Carrying this line of reasoning further: The fundamental of a tone is its first partial, which is an odd-numbered partial in the harmonic series. I had found that a pair of odd + even transverse partials would excite an odd-numbered longitudinal partial, in this case, the first partial. Would a pair of odd + even transverse partials at higher frequencies excite other odd-numbered longitudinal partials if there were a resonance? For example, would the 19th and 20th pair excite a third-partial longitudinal mode? Granted, this would be getting into some high-order partials, but could it happen?

Carrying this logic still further: the sum of two odd numbers is an even number, and the sum of two even numbers is an even number. Would a pair of odd-numbered, or a pair of even-numbered, transverse partials excite an even-numbered longitudinal partial if a resonance existed?

## More Proof

I set up the appropriate experiments to check out each of the postulations listed above, and each one checked out in the affirmative! The strongest resonances occurred when the two transverse partials of the pair in question were nearest to each other in the harmonic series, and it became weaker as they got farther apart.

## Set-Up No. 2

The next set of experiments was designed to see what would happen in cases of high inharmonicity. For that, I used a #23 size piano wire at a speaking length of 1000 mm (39.37 inches). The results of the few experiments that I did with this configuration can best be described as "full of garbage." Everything all ran together, and it was difficult to tell which was what. The amplified sounds from this piece of wire (heard in the headphones) had a horrible tone! I decided to bring that experiment to a hasty end because it was resolving none of the questions that I had.

## Set-Up No. 3

For the next set of experiments, I used a #13 wire at a speaking length of 2388 mm (94 inches). The purpose of

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## Longitudinal Modes in Piano Strings

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these experiments was to verify — to double check — under a different set of low-inharmonicity parameters — that which I had determined under the original set of parameters. Once again, everything checked out in the affirmative.

### Set-Up No. 4

For the final tests of my theories and verification of previous experimental results, I decided to go for extremely low inharmonicity, very high resolution, and a reduction of extraneous effects to the bare minimum. For this, I used a #6 steel music wire at the full 3646 mm speaking length, and exchanged hammer H1 for a super-light hammer H2 (Appendix F). I just hoped that this small-sized wire would provide enough signal for the sensors to keep my measurements well above the electronic noise level. It did! The measurements I obtained were clean and precise. The very low mass of the wire, and the heavy construction of the monochord with its mass-loaded terminations reduced the extraneous effects (structural resonances, and things like that) to the vanishing point. Again, everything checked out right down the line. Each of my revised theories was proven to my satisfaction. This led me to write the five theorems that follow.

### Longitudinal Vibrations in Taut Strings – Theorems

1. The angular deflection of a taut string resulting from a blow or a pluck will alter the tension of the string in the region of the deflection and initiate longitudinal vibrations (in addition to transverse vibrations) that will decay in a characteristic manner following the initial event if no other energy is imparted to the longitudinal mode of vibration.
2. A transverse-mode pulse traveling from end to end along a taut string will impart energy to longitudinal-mode vibrations of that string when an odd-numbered multiple of the frequency of the pulse (the number of round-trip passes per unit time) is resonant with the natural frequency of the longitudinal mode, and will cause the longitudinal vibrations to increase following the initial event that caused the transverse pulse.
3. Transverse vibrations of a taut string will excite longitudinal vibrations of that string when the sum of the frequencies of an odd-numbered and even-numbered transverse partial is resonance with the natural frequency of the fundamental longitudinal mode, or an odd-numbered multiple thereof. The greatest amount of energy will be transferred from transverse modes to longitudinal modes when the transverse modes occur sequentially (nearest to each other) in the harmonic series.
4. Transverse vibrations of a taut string will excite longitudinal vibrations of that string when the sum of the frequencies of two odd-numbered transverse partials or two even-numbered transverse partials is resonant with the natural frequency of an even multiple of the fundamental longitudinal frequency. The greatest energy transfer will occur when the two transverse partials are nearest to each other in the harmonic series.
5. When conditions are set up according to #3 or #4 above,

energy can be transferred from the longitudinal mode to the two specified transverse partials (odd + even, odd + odd, or even + even) that lie nearest each other in the harmonic series.

### Explanations And Illustrations

Theorem 1 describes principles that might be considered axiomatic — principles that can be deduced from text-book equations and much of the literature already published. Theorems 2 through 5, to the best of my knowledge, are new and original, having been developed as a direct result of my theories and experimental research.

Theorem 1 simply says that the impact of the hammer against the string causes a momentary localized deflection that results in a momentary tensile anomaly (a localized increase in tension) that propagates along the string and reflects from end to end at the velocity of sound in the wire until the vibration decays away.

The following three figures (2,3 and 4) are pictures of oscilloscope traces selected from a set of some 200 shots. All three were shot at the same amplifier gain and scope settings. The string was the #16 wire at the full 3646-mm speaking length. The sweep rate of the scope was at a slow setting to show the relative peak-to-peak amplitude of the vibrations (the wave “envelope”) as a function of time (as opposed to showing the actual wave form).

Figure 2 (frame 4-13) illustrates that which I described in Theorem 1. The string was excited by a single blow of hammer H1, which also triggered the scope. The fundamental transverse frequency (lower trace) was 45.08 Hz,

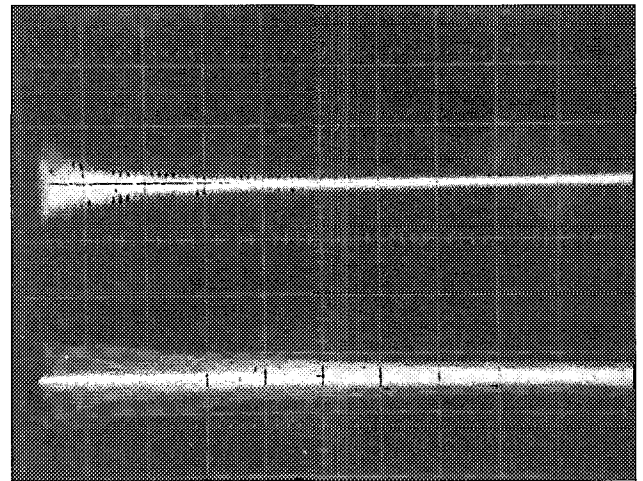


Figure 2 — Frame 4 - 13

and the fundamental longitudinal (upper trace) was 692.9 Hz. There was no resonance between the two modes, and the longitudinal mode began to decrease rapidly following hammer impact, decaying by about half its amplitude for each half second following impact. The sweep rate was 0.5 second per division.

Figure 3 (frame 4-18) illustrates the conditions I describe in Theorem 3. A single blow of H1 excited the string. The transverse fundamental was 46.11 Hz; the longitudinal fundamental was 692.7 Hz; and the sum of the frequencies of the 7th and 8th transverse partials was resonant with the fundamental longitudinal mode, causing it to increase to four times its original amplitude within the

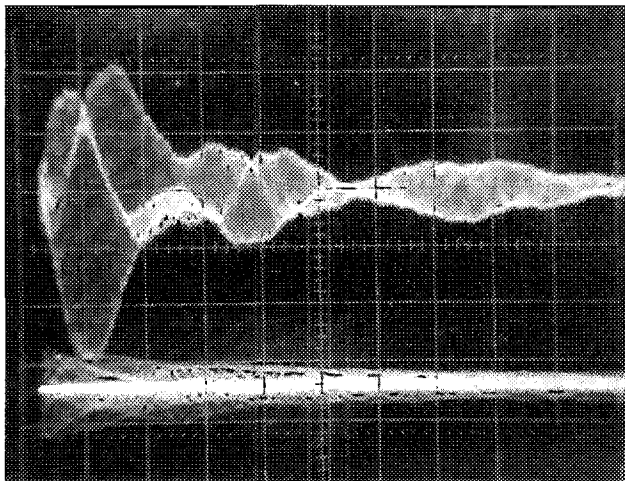


Figure 3—Frame 4 - 18

first half second after hammer impact. In this case, the energy that was transferred from the pair of odd + even transverse partials to the longitudinal fundamental was the result of augmentation and interference, of addition and subtraction, of *beats* (but beats in a different dimension).

When a single string is vibrating simultaneously at two consecutive transverse partials (one odd, and one even), the two will beat against each other in the string itself at a rate very close to the frequency of the fundamental, but the beats will not occur uniformly over the entire string. The higher partial will have one more loop than the lower one. When the loops of the two partials are in phase at one end of the string, they will be out of phase at the opposite end. The in-phase partials will add, but the out-of-phase partials will cancel. At that instant in time, the string will have more transverse wave deflection at one end than at the other, and the increased deflection will increase the tension at that end, pulling the string in that direction. At 180 degrees in the beating cycle, everything will be reversed, and the string will be pulled in the opposite direction. If the sum of the odd and even transverse partials is equal to the natural frequency of an odd-numbered longitudinal partial (the fundamental, for example), the beating of the transverse partials will always coincide with some odd number of the longitudinal cycles, thus creating the resonance, which will cause the longitudinal mode to build up until much of the energy in the two transverse partials has been given up to it.

Figure 4 (frame 5-11) illustrates Theorem 4. As before,

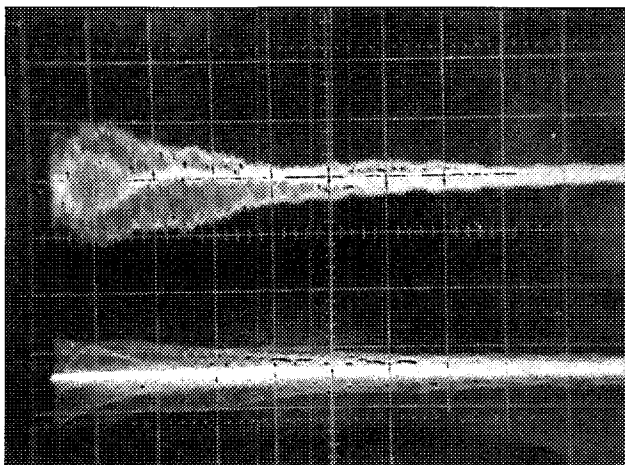


Figure 4—Frame 5 - 11

the string was excited by a blow of H1. The transverse fundamental (lower trace) was 49.35 Hz, and the longitudinal *second partial* (upper trace) was 1384.7 Hz. In this case, the even-numbered longitudinal second partial was being excited by its resonance with a pair of odd-numbered transverse partials (the 13th and 15th), the sum of whose frequencies was equal to that of the longitudinal mode. The basic principles that caused the energy to be transferred from one mode to the other were the same as before, but that time the longitudinal mode had a node in the middle of the string, and that changed the combination that was required to excite it.

Figure 5 (frame 6-2), also made using the #16 wire at the 3646-mm speaking length, offers proof of Theorem 5. In this shot, the string was *not* excited by any hammer blow. Instead, the upper trace shows the fundamental longitudinal mode at 691.12 Hz being driven by oscillator II via LD1, and the lower trace shows the beating of the sixth and seventh transverse partials, the sum of whose frequencies

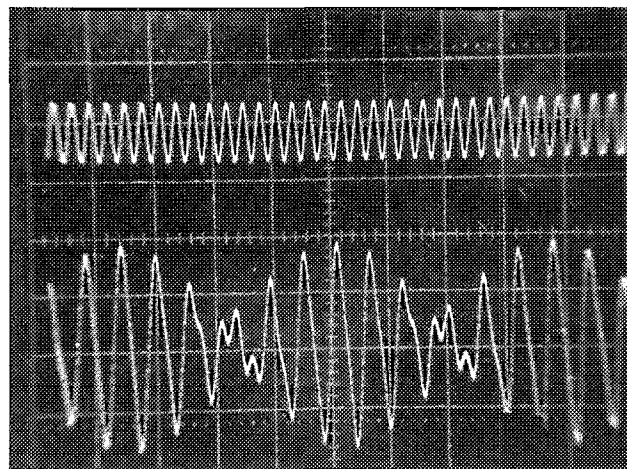


Figure 5—Frame 6 - 2

was resonant with the longitudinal mode, and excited by it. The transverse fundamental was measured as 53.13 Hz, and the sweep rate was 5 milliseconds (ms) per division.

Figure 6 (frame 6-7) offers additional proof of Theorem 3 by showing the same transverse and longitudinal modes as those shown in frame 6-2. However, in frame 6-7, the two transverse partials (lower trace) were being driven

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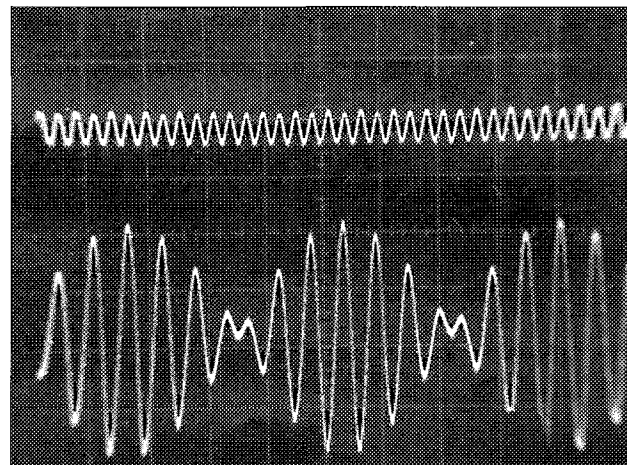


Figure 6—Frame 6 - 7

## Longitudinal Modes in Piano Strings

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by the mixed outputs of oscillators I and II driving TD1, and the longitudinal mode (upper trace) was being excited by its resonance with the pair or partials. The sweep rate was 5 ms per division. The fact that the energy will transfer in either direction (from transverse to longitudinal, or longitudinal to transverse) is proof of the resonance.

Figure 7 (frame 7-4) was made using a #13 music wire at 2388 mm (94 inches) speaking length. The scope was triggered by a single blow of hammer H1 (signal from TS1 not shown), and the sweep rate was 1 ms per div. The lower trace shows the arrival and reflection of the transverse hammer pulse at the far-end termination (TS3) about 8 ms following the hammer blow. The little wiggles just to the left of the main

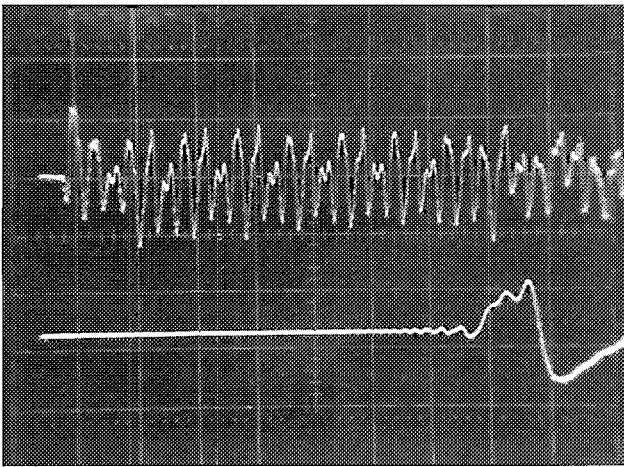


Figure 7 — Frame 7 - 4

pulse are the very high partials of the normal transverse mode that, because of inharmonicity, are shown beginning to move out ahead of the fundamental. The upper trace is the longitudinal mode detected by sensor LS1 at the far end of the string. Its arrival at LS1 was about 0.5 ms following the hammer blow, or about 7.5 ms before the arrival of the normal mode (Appendix G). The first, second, and third partials of the longitudinal mode are clearly seen in the trace. This might be related to some of the “attack” sounds in pianos that have been reported by other authors.<sup>2,6</sup>

Figure 8 (frame 8-9) is proof of Theorem 2. It was made using the #6 steel music wire at the full 3646-mm (12 ft.)

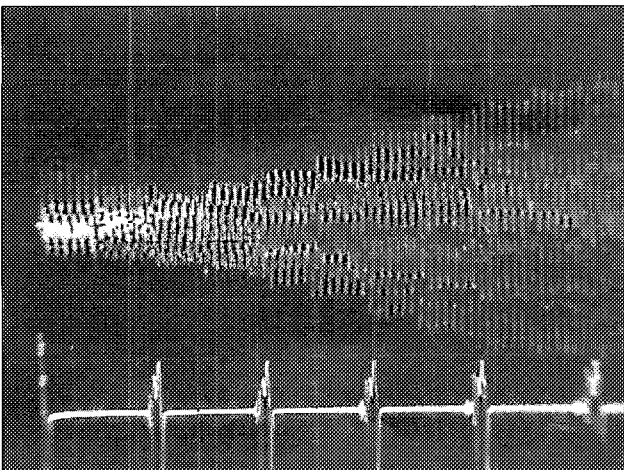


Figure 8 — Frame 8 - 9

speaking length, and super-light hammer H2 (1.2 gram). In this shot, the inharmonicity was extremely low, which allowed the initial transverse pulse caused by the hammer blow to remain well defined for many cycles. The scope was triggered from TS1 at the hammer blow, and the sweep rate was 10 ms per division. The lower trace shows the transverse pulse resulting from the hammer blow for five complete cycles. The upper trace is the longitudinal mode with all of its partials. The incremental increase in the longitudinal mode at each reflection of the transverse pulse is clearly shown. There are two incremental increases in the longitudinal mode for each complete cycle of the transverse pulse because it is reflected twice in each complete cycle (front termination, rear termination).

## Applications For Technicians

The question now in the minds of piano technicians will surely be: “What do I do about it?” The answer: Learn to recognize it when you encounter it so you won’t become frustrated by trying to voice out something that just won’t go away. The next question will be: “How can I recognize it?” That can sometimes get tricky, but it’s not all that hard when you learn how. If the problem is occurring in the third-octave plain strings, pick out one of the strings of the offending unison, and mute the others. Slowly lower the pitch of the offending string to a maximum of about 40 cents as you sound the note and listen for the ringing. Then slowly raise it back up to pitch while you listen. If the ringing sound is a longitudinal mode, it will come and go as you change the tuning of the string. If it’s a normal partial, it will just change pitch right along with all the other partials. Also in the third octave, if you hear a peculiar, wavering, sour-sounding tone resembling that of a slightly diminished 15th partial, it’s probably the longitudinal fundamental excited by the paired 7th and 8th partials, and it’s beating against the 15th partial.

Longitudinal modes occurring in the second octave wound strings will usually have a more simple ringing sound with a pitch corresponding to some note in the sixth octave. Just a slight change in the tuning of the string will usually give it away, if that is what it is. If it is a normal partial, it will change pitch with the tuning of the string. If it is a longitudinal, it will come and go as you tune to the resonance, and away from it. Sometimes in large grands, second- and third-order longitudinal modes can be excited by pairs of transverse partials, especially if the piano is voiced brightly. I have occasionally found it even in small verticals. Changing the pitch of the string by just a few cents will make it come and go if it’s a longitudinal partial in the low bass.

Sometimes you can use one of the high-tech electronic tuning instruments now on the market to help you distinguish a longitudinal mode from a normal partial, *but there is a problem with this method*. Your electronic instrument is likely to lock on to a normal partial that is very near to, and perhaps stronger than, the longitudinal mode frequency, and this will lead you to the wrong conclusion. Also, there is enough mutual coupling in a piano due to bridge compliance and other things to permit a longitudinal mode and a normal partial that are very close to “pull” each other a little bit off frequency. This can really confuse things. This is one of the reasons it was impossible for me to determine exactly what was going on when I was using an actual piano

for my earlier experiments. Because of its very nature, there are enough extrinsic effects built into a piano to confuse things when you are looking for those that are intrinsic.

So, back to the question: "What should I do about it?" Unfortunately, as a technician, there is not much you can do. It's too late to do what should have been done at the factory.

Tuning the piano off pitch is not an option. If you try to voice it out by needling, you will end up with no brilliance by the time you get rid of the ringing. A little bit of cautious needling will help a little bit, but it won't fix it. I'm sorry to say, there is just no "quick fix" for this. However, it does help to know what you are dealing with. That can save you lots of time, energy, and frustration trying to fix something that can't be fixed by any simple means. The real solution to the problem is the subject of a patent application that I have filed in the United States Patent and Trademark Office.<sup>11</sup>

## Conclusion

Longitudinal modes are always produced to some degree when a piano string is struck by its hammer. This is a natural phenomenon that results from the impulse excitation of the string. The sounds produced by longitudinal modes are usually subdued and decay rapidly, provided those modes are not intensified by certain resonances with the normal transverse modes. Longitudinal-mode resonances with transverse-mode partials have been found to occur when the natural frequency of an odd-numbered longitudinal partial (including the fundamental) is equal to an odd multiple of the frequency of the cycling rate of the initial hammer-induced transverse wave. Other resonances have been found to occur when the natural frequency of an odd-numbered longitudinal partial is equal to the sum of the frequencies of a pair of transverse-mode partials when one is an odd-numbered partial and other is an even-numbered partial. Still other resonances have been found to occur when the natural frequency of an even-numbered longitudinal partial is equal to the sum of the frequencies of a pair of odd-numbered or a pair of even-numbered transverse partials. When any one of these resonances does occur, the sound of the longitudinal mode can be raised to an objectionable level resulting in inharmonious ringing sounds.

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## Appendix

- A. The 13.5-ft. monochord comprised two heavy wooden beams laid parallel and spaced and bolted at intervals. Identical string plates, one for each end, could be clamped anywhere along the length of the beams. Each string plate was mass-loaded to reduce vibration, and fitted with a small pinblock, tuning pin, and a specially-designed pinch-type terminator to provide well-defined terminations for the longitudinal modes. Conventional terminations like agraffes, or V-bar pressure bar assemblies were found to have ambiguous terminations for longitudinal modes. Maximum speaking length was 12 ft.
- B. Magnetostriction is that property of a ferromagnetic material that causes it to shrink slightly in the presence of a magnetic field. A steel wire passing through the center of a coil surrounded by a magnet will vibrate longitudinally if an alternating current is applied to the coil; or, if the wire is vibrating in a longitudinal mode, it will induce an alternating voltage in the coil.
- C. The electromagnetic sensors were bipolar units with small pole pieces spaced 1/4 inch apart and designed for single-string pick-up. The transverse driver (TD1) was similar, but of heavier construction and lower impedance.
- D. Although tension is said to have virtually no effect on longitudinal frequency, my experiments indicated that there is a minute negative effect. Therefore, I measured the longitudinal frequency each time I changed the tension of the string.
- E. When measuring low frequencies with a counter, greatly improved statistics are obtained by measuring average period and calculating its reciprocal to get frequency. Very precise measurements can be made by this method. When tuning the string to the output frequency of one of the oscillators, the string was excited by the oscillator output using one of the drivers while the phase angle and amplitude of its vibration was compared to that of the oscillator output as seen on the scope screen.
- F. The super-light hammer was a thinned grand shank with a small leather tab glued to its tip. Effective striking weight was 1.2 gram.
- G. Because of the timing ambiguity of the scope trigger, I did not use single-shot transit time to measure the velocity of sound in the wire. For that measurement (not included in this article) I used a different technique.
- H. The resonance when energy is transferred from transverse modes to longitudinal modes is relatively broad compared to that when the energy is transferred from longitudinal to transverse modes. The reason for this is a bit involved and beyond the scope of this article. ☐



# Modes of Thought in Unison Tuning

By Ed Sutton, RPT  
Wichita, Kansas Chapter

Many wonderful articles on unison tuning and tuning stability have been published in the *Journal* over the years. Ken Burton has published a book on tuning pin management called *Diff'rent Strokes*<sup>1</sup>—it is excellent. Having studied these, I still found it hard to tune clean, stable unisons, and felt there must be still more to understand about it.

No doubt some will feel I'm collecting awfully short loose ends, and perhaps for them I am. More power to those with talent! For me, however, unison tuning hasn't come easily, and I've been forced to learn things other people didn't need. But perhaps there are a few others out there who, like me, have trouble tuning unisons, and who might gain a little from my efforts to do better.

It is a commonplace that we learn from our mistakes. While there is truth to this, it is unfortunate that we don't also notice how much better it is to learn by doing things right. As we learn to recognize our "right" work, we make fewer and fewer mistakes and our work becomes joyful. I believe fine technicians know very little about making mistakes; and we have all met the sad fellows ("I'll never learn to regulate...") who have become masters of making mistakes.

To become fine technicians we may need to work at least as hard at tuning, regulating, voicing and playing

ourselves as we do pianos. Our kit of thought tools may be a very important part of our tool kit.

A thought tool is a way of thinking, imagining or observing a situation which enables us to attain and sustain higher levels of performance. It may be literally non-rational, but in practice, it works.<sup>2</sup> Some examples:

- A violinist imagines the bow is weightless, floating in the air, and so attains better tone and faster repetition.

- A dancer imagines a sky hook lifting a string from the top of her head to stand straighter and feel lighter.

- Piano teachers have all sorts of ideas about how to produce "good tone."

They may not make sense in terms of action physics, but many of the ideas do help people play more musically: the piano does sound better!

It's rough for a beginner trying to learn. The pianos you are most likely to get to work on are the hardest to tune. You may be trying to produce a level of work that the piano cannot sustain, and you don't know whether to blame yourself or the piano. Often you will learn more from tuning two or three good instruments than from 30 hopeless or deeply troubled instruments. You may need to tune for free if that's what it takes to get your hands on a good instrument.

Once in a while we have it all: a lovely seven-foot instrument, regulated, voiced, at pitch; the pins are even, predictable, nicely torqued; the strings flow responsively; the temperature and room acoustics are perfect; enough time to work comfortably.

It can seem like the piano is tuning itself. Just put your hand on the hammer and the beats evaporate. It's not any harder than dotting an "i" or crossing a "t." On the other hand, we can all remember learning to dot i's and cross t's, and we know that on a rough train ride, it's not so easy to do.

So as we thought-travel from this perfect piano to the pianos we really have to tune, we face more and more things that interfere with our simple hearing and doing. (It might be best to fix some of these things, but for now assume we're tuning it as it is.) Let's imagine we are watching a very competent tuner tuning our less than perfect piano. We may be surprised to see that she tunes this piano just as easily as she tunes the perfect piano. The problems of the instrument don't interrupt her flow of work. This is what

we need to learn to do!

At Western Iowa Tech, Doug Neal tells his students: "You must learn to hear the part of the tone that you are responsible for tuning." That is what our imaginary guest tuner is doing. Having judged the piano hopelessly full of wheezes, beats, buzzes, clangs and wows, she is not hearing them anymore: she is hearing the same part of the sound that she would hear if the piano were in perfect condition.

How does a person learn to hear this way? I don't have a simple, single answer. A good start would be to read every article on unisons and tuning stability you can find. If that's not enough, you may want to try some of the ideas proposed here. It is important, I think, to recognize that in learning to tune unisons you are trying to develop a mode of perception that must honestly be described as not normal. It may take time for this mode of perception to develop. You must allow yourself that time. Different people may need to use different techniques to develop high level unison skills. You must allow yourself to learn the way you need to learn. And different people may have very different resources at hand. At some point we must start earning a living tuning the pianos we can get paid for tuning. At the same time we must use our work experiences to improve our skills so that we can have better, higher level work experiences.

It's my impression that people who do efficient jobs of setting temperaments and single string tunings often bog down during unison tuning. It seems the complexity of temperament tuning can make it easier to stay alert to our work. In temperament work, we are concerned with beat rates, which are, after all, "something," while a unison is "nothing." From the pinblock's point of view, there's no difference; all we're doing is setting pins. But perceptually, the two operations seem very different. Perhaps it would help if we gave some body to those beatless unisons....

Much of the trouble with tuning studio pianos comes from the fact that mutes and strips aren't very effective on small vertical pianos. The sounds that bleed through can be very confusing. One or two quick tunings, pulling in the unisons each time, can make the instrument sound much cleaner. Your work may go much happier and faster. An important lesson here is to

learn not to overload your ability to “hear through” the garbage sound. Being frustrated and angry is not a good way to learn. Make the effort to be easy on yourself and to have a good experience. Soon you will need fewer preparatory passes.

Notice how often during a pitch raise it is easy to hear “the part of the tone you are responsible for tuning.” Do you notice all the false beats, rattles and sirens when you are pulling in pitch adjustment unisons? I don’t. When I’m adjusting pitch I know whether the string must go up or down. I’m moving the pin as I strike the note, and what I hear from the start is a moving beat. I don’t get caught up in the other stuff. Since I’m not worried about overshooting the unison, I move easily, and often land dead-on without trying.

When I’m doing a final unison tuning, however, I’m more prone to think of my “almost” unison as something precious to be saved. My movements become finicky and ineffective, and my ear is distracted by noises that are not tuning related. There are times when it seems that the closer I get to the “zero” place, the harder it gets to tell where it is.

This “zero” place needs to be the place where two different systems meet. Acoustically it is the place where the strings “couple” into unison. This coupling is in fact a place and not a point. There is space in it; if that were not so, unison tuning would be impossible. Mechanically it is the place where the pin/string system can be settled into a place where it will stay. I imagine it as a valley within which there is a very tiny bit of room that allows a very little bit of favoring to one side or the other.

If our piano is very close to perfect, it may allow us to just “settle in” the barely out of tune unisons. When this works well, it works wonderfully, and tempts us to think: “Ah, this is the way it should be,” but in fact it is an exception, and can mislead us. In almost all cases we must work more positively to find that zero place where the two systems meet. Once we understand this, it is not hard to do.

It’s worth the trouble to look more closely at what happens when we “just settle in” the unisons. I’m referring to the situation wherein the strings to be tuned are just slightly above pitch and we nudge, tap and pound the string until it “settles in.” Perhaps you

arranged when adjusting pitch to have most strings just a tad sharp, or maybe you found the string flat, pulled it a little sharp, and are now settling it down. Sometimes this works “just right,” and when it does, it’s wonderful; but I propose that it doesn’t really work as well or as often, as we tend to think, and that when it doesn’t work well, it may seriously interfere with our work.

***“It is a commonplace that we learn from our mistakes. While there is truth to this, it is unfortunate that we don’t also notice how much better it is to learn by doing things right.”***

When we know that our string is ever-so-slightly above unison we tend to think of it as “something precious.” We become inhibited about moving the pin because we don’t want to “go through” the unison. We decide that “halfway to unison” is better than “too far.” As our movements become more and more inhibited the changing beat moves less and less, if at all, and it becomes harder to focus on “that part of the sound we are responsible for.” As we hit harder, trying to drive the string down the last little bit, the amount of noise we generate increases and our ears are becoming exhausted. We know we are hearing noise; we aren’t sure if we’re hearing the unison, or if we’d recognize it if we did.

Our thoughts are saying “No, not yet ... no, that’s not quite it ... no, not really ... no, I’m not sure....” Our frontal lobes are in crisis. They are frightened and will say “No” to anything and everything. Our tuning techniques have driven us into an obsessive-compulsive crisis.

Am I the only piano technician in the country with obsessive-compulsive tendencies?

Is there anyone else out there who

keeps the money in his billfold “in order?” If you know what I mean by “in order,” well...you know what I mean. This isn’t necessarily a bad thing. If you like to put your tools in order at the end of the day, that’s good. But if you can’t sleep until you’ve checked five times to make sure you’ve put your tools in order, that’s not so good.<sup>3</sup>

Returning to our discussion of unison tuning, I suggest that we need to be conscious of the occurrence of the word “no” in our thoughts. It is better to be able to think the word “yes.” If we find ourselves thinking “no” three times in a row, it probably indicates that our tuning technique isn’t working. Our instinct is often to try “harder.” In fact it would probably be better to try “different.”

“No” can be a very dangerous word for a piano technician. I believe that saying “no” several times actually reduces our level of well-being, perception and performance.

I believe that to attain our best well-being, perception and performance we need to arrange for lots of “yes” experiences in our work. Of course when we begin to regulate, tune or voice a piano there may be many things we can’t say “yes” to. If we can’t find something to say “yes” to, we can’t begin! As we work on the piano, we find ourselves saying “yes” more and more. If we are working our profession well, we can leave most of our pianos with a very happy smile on our faces. This freedom to do “yesward” work is, for me, one of the greatest rewards of our profession.

I find that the tuning method that has been called “bracketing the unison” has a high “yes” content. I feel that it is the best “default” technique. That is, first try tuning unisons with any method you think will work, but as soon as you get three consecutive “no’s” go to the bracketing technique. For that matter, I think it is a good way to start.

But first some disclaimers. Not all pianos can be tuned this way. It won’t work for pianos with poor “follow” or with loose, jumpy pins. But even in cases where “bracketing” won’t work, trying it will tell you a lot about the piano and help you find a way that will work.

In describing tuning unisons by “bracketing,” I realize I’m not the first person to describe this technique ... or even the second or third. I do feel that

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# Modes of Thought in Unison Tuning

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I'm describing it in greater detail, giving reasons why it works and how to use it to improve your skills. I offer my apologies to those who find my approach an unnecessarily belabored plagiarism.

I propose that the best way to tune unisons is:

1. Lower pitch very slightly until you are sure you are below unison
  - a. note the beat rate
  - b. note what you did to the pin – did you move it or just twist it?
2. Raise pitch very slightly above unison
  - a. try to equal your “below” beat rate – be lighthearted about this – try for it and take what you get.
  - b. note what the pin has done – does it feel close enough to settle down to unison, or do you feel you need to move it?
3. Lower the pitch down to unison.
4. If you can't get the string to unison in two nudges, repeat steps 1, 2 and 3, trying to make smaller movements.

Comments on this method:

1. By bracketing the unison place, you are helping your mind and body locate “zero” point both by sound and by muscular sensation.
2. By creating a “moving target,” you help your ear and brain to focus on the “part of the sound you are responsible for tuning.”
3. This technique can be used to bracket higher partials of bass and tenor strings.
4. If you are using very small twists of the pin, you have almost certainly settled the pin on center. This last movement downward can be very gentle, not at all jerky. It is also worthwhile to practice a very relaxed, gentle release of pressure to the pin.
5. As you become comfortable with this technique, if you stay conscious of what you're doing, you will find yourself using much smaller changes of pitch with much smaller pin movements than you ever thought possible. This approach seems to open the door to continuous, natural improvement.
6. Although tuning unisons this way seems complex, it is actually very efficient. Most of your efforts

produce real improvement in the piano. In practice it is a very fast way to tune. Because you have many things to focus on, it is easy to stay focused.

7. And finally, I believe that if you study and practice this way, it will eventually lead you to a better way. It will teach you to be more sensitive to pianos, and help you find your own unique way to tune.

Maybe you'll write the next article!

I don't believe anyone will question the statement that efficient high-level piano work requires focused, unwandering concentration. I will offer further that highest levels of sustained concentration are not “fixed” concentration, nor are they the result of iron-willed effort to “pay attention.” Rather they are the result of a flexible and intelligent technique, knowing how to use our minds and bodies consciously (and joyfully!) to maximum effectiveness. Focused concentration is not hypnotism.

To sustain attention it is important to accept that the structure of our nervous system is such that it is not possible to sustain focused awareness of a simple stimulus for a long time. The first time you hear a sound is the clearest. If you just keep repeating the sound without changing the sound, or at least your place of thought, you will hear it less and less clearly. Telling yourself “pay attention!” only makes it worse. If your brain could pay attention, it would! Not only is the command virtually impossible to follow, but now you've divided yourself mentally for a battle you're certain to lose: part of you is the boss who gives useless orders and part of you is the worker who can't do what he's told.

I'm not saying it's wrong to monitor ourselves, but when we do, we need to internalize the boss who gives useful, helpful orders and the worker who is competent, seldom needs to be interrupted, and knows when to ask for help.

Thus, an important part of this approach to unison tuning is the concept of variable priority training and monitoring. By subdividing a seemingly simple task into many smaller tasks, we can focus on different aspects of it, one part at a time. By asking many little questions about what we are doing, we keep our minds conscious of what we are doing. It keeps us from becoming hypnotized by a repetitive task. I find that tuning unisons this way goes faster

than “automatic,” uses less key and hammer work, and is actually fun to do! Focusing on a single stimulus for a long time is impossible. Cycling our focus through a sequence of stimuli is easy.

I have also found that it helps to add a monitor for the tuner himself. I like to make sure that I am breathing when I tune unisons. I would like to know how many tuners have fallen into the habit of holding their breath when making tiny adjustments. This would be a fine approach if only the piano didn't have so many strings. Taking a conscious breath is a fine way to become conscious of your body state, and to remember to relax. It helps us hear better and learn better.<sup>4</sup>

I would like to repeat the idea that it is better to learn from what we do right than from our mistakes. Sometimes what we get right is subtle, compared to what we get wrong, such as the sound of a clear unison compared to the beating of a mis-tuned one. If we are tense and angry, we may fail to hear what we get right, and miss the chance to learn and have our spirits lifted by our good efforts. To attain our best results, we need to be working in a manner that moves as much of our being as possible in a yes-ward direction.

Tuning unisons in the manner I have described enables us to have a large “yes” component to our work and to avoid the excessive criticism that so many people experience in this phase of our profession. Yes-ward working lifts our spirits, clears our ears, and leads us to approach our next piano with a smile.

## Notes

1. Too many to list! Read as many as you can, and pick the ones you like best for serious study. If you really want to know what a unison is, look up *Unisons - the Effect of Tuning on Persistence and Timbre* by Jim Ellis in the *Journal*, September, October and November of 1982. Ken Burton's book is often advertised in the *Journal* classifieds.
2. Thanks to Prof. Saul Sternberg of the University of Pennsylvania for this idea.
3. Seriously, folks, obsessive-compulsive behavior is an occupational hazard for piano technicians. See Schwartz, Jeffrey. *Brain Lock - Free Yourself from Obsessive-Compulsive Behavior*. Harper/Collins N.Y. 1996.
4. Hanh, Thich Nhat. *Peace is Every Step*. Bantam. N.Y. 1991. ☐

# World-Class JUNK

## Trying to Stay Sort of Safe, Part I

By Susan Kline, RPT  
Eugene, OR Chapter

**WARNING (THE FIRST OF MANY):** *If you are the sort of person who feels a deep pain in the nether regions when people fuss over taking precautions, I fully sympathize, and you are probably better off turning the page. I hope you come back in the future, for a more technical article.*

One of the big foundation stones of staying safe is working to prevent misunderstanding (more about that next month.) I can start the process by saying that no one is ever really safe, nor need we be. If we were able to live forever, barring accidents, avoiding the accidents with all our strength might make more sense. All safety measures involve trade-offs, and some aren't worth the trouble. Other safety measures are so incredibly cheap and effective that not using them is a form of lunacy. These questions should be decided according to our individual tastes and values, enhanced by knowledge and awareness.

The *Journal* has had a number of safety-related articles, by people who know a lot more about individual hazards than I do. This is just a wide overview, and my personal approach to the various risks one meets every day.

### These Give Good Value

- **Tetanus Shots**

Tetanus is a potentially fatal and very painful bacterial infectious disease (lockjaw) that can be acquired from cuts and small puncture wounds, especially dirty ones from rusty metal. (Stepping on a rusty nail is the classic way to get it.) The shot for it is effective for seven years, and is available from the county health department. My last one was in 1992, and cost \$8, so next year, back I go for another. Even just for peace of mind these shots are a real bargain.

- **Hand Washing**

About five years ago I started methodically washing my hands after a piano tuning, even before I left my customer's house most of the time, and I washed them again whenever I got home. My incidence of colds and flu dropped almost to zero. I've talked to several people who should know what they're talking about, including the head nurse in a large hospital, and they all agree: washing your hands frequently with soap and water is the best way

to prevent illness, especially colds. (See other cold and flu measures, below.)

- **Ear Protection**

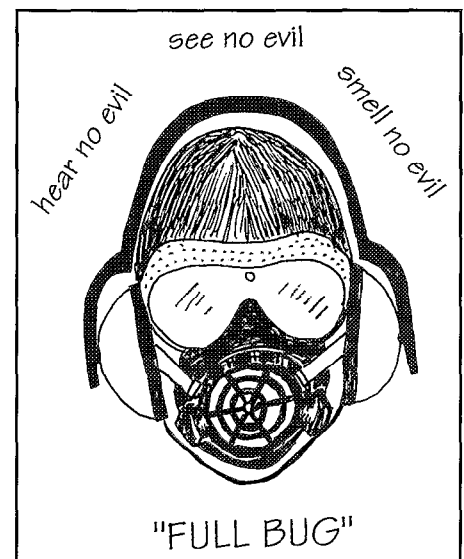
I've used the headphone-style muffs for years, especially near power tools, and finally got the musicians' ear plugs (which are individually molded to your ears by an audiologist). They cost a bit, but are well worth it. Even without considering all the other loud noises you can get exposed to, tuning bright pianos with heavy blows can damage your hearing over time. A piano tuner wearing a double hearing aid is not a pretty sight. I keep the muffs in the car, and the plugs with me at all times.

- **Dust Masks**

Piano dirt can be fairly infectious, and when vacuuming, breathing it is not advisable. I use the black rubber type of mask, which seals better than the little disposable shells, and has a thicker filter. It can even stop hay fever in its tracks, which indicates to me that it is removing quite small particles. I doubt it could filter out hanta virus, but it still does a lot of good, reducing exposure to bacteria, toxic mothproofing, allergens, particulates, etc.

- **Eye Protection**

I once took a woodworking class in night school. In a display case in the hall was a pair of completely starred safety glasses. The wearer had not been injured. "When



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# World-Class Junk

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using your power tools, don't forget the most important safety tip — safety glasses." Don't forget to use them when hammering, or during any activity where small fragments might fly quickly through the air.

Using these last three very inexpensive safety measures, one can look a little funny. First the black rubber mask, then the glasses or goggles, then the muffs — I call it "full bug." I don't feel that providing a little innocent amusement for bystanders is a burden to me. I like hearing, breathing, and seeing, and I want to go on doing them.

## Toxics

Moving merrily along the list of ways to hurt oneself, we can talk for just a minute about solvents. These are not created equal. Some such as naphtha are very bad indeed. Naphtha is nearly as toxic as benzene. Others pose much less risk. Besides toxicity, flashpoint (at what temperature the material bursts into flame) is important in enclosed spaces.

I feel that many of the jobs done by various solvents can be done in other ways. Naphtha is usually used to free sluggish center pins, for instance. This can be done with Protek™, or alcohol and water, or by repinning. We all must decide these things for ourselves, but do consider whether you are using toxic solvents merely out of habit.

Material Safety Data Sheets for hazardous materials are available. You can ask for them where you buy the materials, or you can search the web. Rob Kiddell, RPT, recently sent this to the pianotech e-mail list:

"Here are some Web addresses for Material Safety Data Sheets on chemicals:

- ◇ <http://www.generalpaint.com/97.html>

This is a listing of solvents and such sold by General Paint, with Material Safety Data Sheets on each product.

- ◇ [http://www.osha-slc.gov/OCIS/toc\\_chemsamp.html](http://www.osha-slc.gov/OCIS/toc_chemsamp.html)

A listing of chemical properties from the American Occupational Safety and Health Administration. Extremely comprehensive.

- ◇ <http://www.enviro-net.com/technical/msds/>

Enviro-net has this search engine linked to the University of Utah Material Safety Data Sheet database. Better than the OSHA site. For fun, check out Caffeine."

(Seems like good, clean fun.)

I cannot finish talking about solvents without a mention of my pet peeve: Methanol (also known as methyl alcohol, wood alcohol, or methyl hydrate) is quite toxic, and is absorbed through the skin and by breathing it. In piano work it is used indoors, and evaporates and gets inhaled. It does nothing that cannot be done equally well by "denatured alcohol solvent," which now replaces it in hardware stores, and contains no more than 4 percent methanol. This is a lot better, but still somewhat toxic. Much safer than either is good, old-fashioned potable grain alcohol ("Everclear" is one brand) from any liquor store. In a pinch, vodka makes a dandy shrinking solution for tight center pins, as well as being a good disinfectant; or grain alcohol at 190 proof (95 percent alcohol, 5 percent water) can be diluted to whatever strength you desire for a shrinking solution. Its only drawback is expense, but the quantities we use for shrinking center pin bushings are not all that great. The only valid reason I can see to use even the "denatured alcohol solvent" is to avoid keeping alcohol in

the house if one has a drinking problem, yet people still keep looking for alternate sources of pure methanol that may damage their livers or eyesight and could be fatal if a kid got into it. Go figure.

## Poisoned Keybeds

We do not buy and use all the toxic materials that we come in contact with. Some we encounter.

If you are cleaning under the keys of a piano and find a white (or yellow or green) powder, be aware that in days past both arsenic, DDT, and possibly other very toxic materials were used for mothproofing and/or rodent control. In particular, it is a time to be very careful that interested children don't get into it. They are fascinated by all the diverse articles hidden by old pianos, and automatically pick them up and play with them. I warn both them and their parents that they should wash their hands after touching anything from inside an old piano, especially before eating.

## Allergens

Those of us with allergies may have some hard times when going into many different homes and working on pianos. I thank heavens that I got over my allergy to cats in young adulthood, and that house dust doesn't cause much of a problem for me. Pet and mouse dander, house dust, dust mites, chemicals, molds and mildews.... I'm sure there are other components to piano dirt as well. I've known tuners who developed chemical sensitivities and simply had to find other work. Owners can have a hard time, too. I've sometimes opened pianos and started wiping up the dust, only to hear my customer start to cough and wheeze. I try to get them to leave the room, and preferably go outside, until I'm done cleaning. This can be hard if she or he feels it's a duty to help.

One could argue that vacuuming up the mat under the keys just sends the dust and allergens all through the house. This is true, but I think that if someone is allergic to a lot of animal hair or mold or dust lying just under the keys when they play the piano, in the long run they are better off with the stuff out of there, and out of the house.

## Hopeful Thought

May you be able to tune for as many years as you feel like doing it. Dealing with some of these areas of concern may help this wish come true. We're none of us getting any younger. It all adds up.

### • Orthopedic problems

The *Journal* has had several excellent articles on this subject. I try to keep a relaxed stance, and alter my grip on the tuning lever a lot. Taking an occasional break and stretching can help prevent strained muscles. Some people have remarked that tuning with both hands, left handed for uprights and right handed for grands, has greatly lessened wear and tear. Others have mentioned changing the style of tuning lever for an easier grip. They mention the Wonder Wand with the ball on the end. Others talk about impact hammers. I wish I had tried all three of these approaches years ago, but it's still not too late.

(I am not a doctor, and this is not medical advice, but it

has worked for me.) Finding a good massage therapist has been well worth the time and effort. I go to one whenever my back, shoulders, neck, or right elbow give me trouble, and she can paste me back together very ably, in a session or two. For years I had a pain in my middle back which I had become resigned to, thinking I'd never get over it. I had visited several other people trying to fix it without the slightest improvement. She had it down to an occasional whisper in a couple of months, with sessions every two weeks. Massage therapists are not all equally talented. It's worth the effort to ask for referrals and try a few different ones to see who can do you the most good.

- **Carpal tunnel syndrome**

This condition has been covered better than I can, in earlier *Journals*. I do break up repetitive jobs (like removing 88 action screws) into segments, and I put other sorts of work in between.

- **Heavy lifting**

There are a lot of sources for good advice about how to lift things safely. As I get older, I avoid lifting grand actions alone unless I have to. I leave the piano lifting to piano movers. When I was young I pulled a few stunts which I now regret. I advise against them, especially for those of the female persuasion.

## **(Confession Time)**

It was a church with an old 6-foot grand. The lyre needed work, and was held in with tapered wooden pins, one of which was missing, replaced by a ball-point pen. (One always wonders who did that....) The tenons on the ends of lyre legs slid up into a box under the keybed, and the pins were inserted into tapered holes in the box. I arrived after a church service to take the lyre home, and discovered that the tenons wouldn't clear the box unless the whole piano was raised an inch or so. Several hefty helpful men lifted it for me, while I slid the lyre out. So far, so good.

I brought it back late on a Wednesday afternoon, with a lovely duplicate of the tapered pin which I had made. I tuned the piano; then it was even later. The offices were far away from the sanctuary, and I wasn't even sure if any strong people were still there. I decided to do it alone. (This is the Stupid Part.) I took two old hymn books. I got under the keybed and hunched my back like a cat to raise the piano, putting a book under each front caster. The lyre went right back in. I hunched my back again, and took the books out from under the casters. I stood up very slowly. My back didn't exactly hurt, but it felt very strange. That was the place which gradually went bad seven years later.

Not content with this idiocy, I did the same stunt a few months later, to help a small and lightly built customer get caster cups under her small Asian grand's legs.

O, young people, pay heed to my sad tale! (Ha, young people never do....)

- **Bashing Oneself (Auto-Destructive Tendencies)**

Do we all do it, or am I alone in this? It even predated piano tuning for me. I went to the airport to fly to an orchestra audition, and getting out of the shuttle van allowed my left hand to rest on the jamb, and someone tried to close the door on it. (Yes, I soldiered on, and got the job, not that it worked out very well for me.)

Pianos give one so many chances: the flap of the grand lid to pinch one's fingers in; heavy case parts to almost

drop, straining joints to try to save the day; or to really drop, bruising one's feet; grand actions to lift, with sharp edges and splinters to hurt one's hands; sharp corners to run into while thinking of something else; broken strings with sharp little ends to poke into one; screws with metal splinters on them; those console actions wedged in with the bolts bent down, so one's hand gets bashed on the case when they finally let loose. The back of my hand still has the scar from one of those! I always carry Band-Aids with me. It prevents the embarrassment of asking for one ("Oh dear! She hurt herself!") I just go to the bathroom, wash the place, and wrap it up so no dirt can get ground into it.

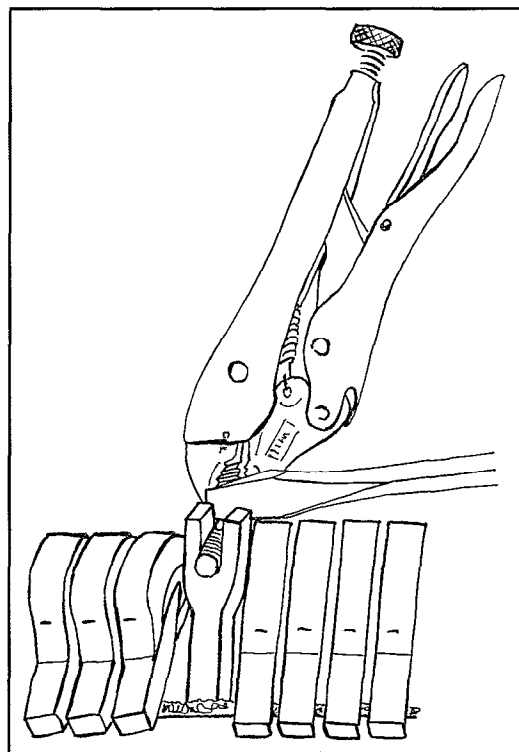
## **Excursion – Removing Tight Console or Small Upright Actions**

The action must come out: broken wippen flange, noisy damper rod hanger bushings, or some such. I undo the action bracket bolt nuts, usually getting them to turn with Vise-Grips™. (How do the factory gorillas get them on so tight?) Knowing what will happen, I pull on the action brackets; struggle ensues. The hammers are in the way so I can't grab the brackets well without hurting the center pinning. I need some way to pry, but the plate is too far

away ... I invented a helpful gadget using a knotted nylon cord and a heavy dowel. One end would go through a hole in the dowel, the other could go around the action bracket and into a slot in the dowel. Then I could heave away, and not bash my hands on the case parts.

Human nature took over: I never got around to making it, but I posted the idea to the pianotech list. Back came two or three other approaches!

Several people talked about using a stringing hook or other stringing tool (a slide-hammer with prongs on the end — mine has a narrow lip instead) to reach behind the action bracket and pull. Handy, easy — but my favorite was so straight-forward! Take a pair of Vise-Grips™ and clamp them on the action bolt, close to the front. Pry the action bracket loose with a large screwdriver, wedging it against the Vise-Grips™.



*Continued on Next Page*

# World-Class Junk

*Continued from Previous Page*

So simple! One of those flat-forehead answers, where you whack your brow and say, "Why didn't I think of that?" (I may still try my dowel idea. It would leave no little scrunch marks on the action bolt, not that they would matter.)

Okay — you have the action out at last, without any bodily harm. Now, how do you get it back in? I use what I call The Enforcer, a two-foot length of 1/2" steel pipe. Placed over the action bolts, it will (gently! slowly!) lever them in any direction. (Sometimes they are displaced to the left or right as well as being too low.) Being able to bend them is only the first step: where should they end up? That compression of the action during manufacture was actually intended, believe it or not! It prevents a particular pedal groan which occurs when the action bracket nearest the right pedal rod grinds on its support. (It was really fun when I first located that one! What a sense of power over a previously frustrating noise.) If I hear that noise, I counter it by putting a dab of VJ lube on the ball of the support. That noise aside, there is a good reason not to allow the action to move up and down much. Even small changes in height will really mess up bass damper regulation and hammer alignment, since the bass strings are at such a steep angle. I use the steel pipe to lever the action bolts till the action just easily snugs into place, without more than a tiny bit of free play. This approach has worked for me, and it certainly smoothes the path for future technicians.

## • Edged Tools

On the left wrists of some very competent people, including some shop teachers, are some fairly gruesome scars. The story is always the same: Chisel in the right hand, piece of work in the left. A simple chisel can be one of the most dangerous tools around, if a vise is left out of the equation. I was caught by a variation: flange in the left hand, razor blade to trim new flange bushing in the right, spot of hardened glue. The corner of the razor blade entered the end of my long finger, and I didn't play the cello for 3 months. I put the flanges down on a table top covered with something to cut against, now.

## • The Day the Dog Bit Me

This is almost a postscript. I usually am very good with dogs, and they don't mind me. They jump up a bit, sniff the toolbox a bit ... no trouble. When they come running up I allow them to sniff my limp hand, which is usually all they need. This exception was a little hostile yappy thing which the owners exiled to a neighboring room behind a closed door. It hadn't been "introduced" to me first, and it was having a double-dyed fit, constantly snarling and barking and scratching. The owners had left, talking to it did no good, and after about an hour I got tired of the noise. (Another Stupid Part) I opened the door to let it see that I was really all right, and got bit ... of course!

## • Cold and Flu Measures

It seems a little strange to be putting home remedies for colds in an article about piano technology, but since going from house to house tuning pianos makes exposure to colds inevitable, I consider them an occupational hazard. Keyboards spread viruses quite readily, and I sometimes suggest to owners that they wipe the keys a lot in flu season when children bring colds home.

If I feel a cold coming on in spite of the hand washing, I follow up with my favorite home remedies. I believe that if caught early enough, some colds can be aborted. Some people suck on zinc lozenges and take vitamin C, and I use

echinacea (as an herbal tincture), but my favorite weapon is ginger tea. I like this so well that I always give the instructions for it at the drop of a hat. This column will be no exception. I make no claims (once again, I'm not a doctor), but the people who have tried it tend to like it.

## • Ginger Tea

Take some fresh ginger root, and thinly slice a piece about as big as your thumb, peel and all. Put some water (a couple of cups, roughly) in a saucepan, dump in the ginger root, and start it simmering. Take an actual lemon or lime, organic if possible. (Reconstituted lemon juice in the little plastic lemon won't work!) Scrub your lemon or lime well in running water, slice it in half, and put one half back in the fridge for later. Squeeze the other half into the saucepan, then roughly chop it (in pretty big hunks) peel and all, and dump those in, too. (The peel has bioflavonoids.) When your ginger tea has simmered a few minutes, take a slotted spoon and strain some off into a mug. If your throat is very sore you can add honey, but otherwise it doesn't need sweetening. You can add some water and leave it sitting cold on the stove, then heat it and strain off more later, adding the other half lemon or lime if it gets a little weak. I keep it cycling like this for about 24 hours, and usually I don't need any more after that. If I do still feel bad, I toss the remnants and start a new batch. I find it to be comforting and warming, and good for general malaise (a little headache or an uncertain stomach). It also seems to keep colds at bay, or to shorten them if it's too late to prevent them. (This is what scientists call anecdotal evidence, and is not to be considered medical advice.)

While everyone has their own way of looking at this, I try to stay home when I am in the worst stages of a cold. I feel a responsibility not to spread my illness to others, especially since some of my customers are old and/or infirm. For aging people in poor general health, a bad cold or the flu can be life-threatening. They may pick up a cold or pneumonia at some point anyway, but I don't want them to pick it up from me. I don't think soldiering on while miserable and ill does anyone a favor. (As the old Noel Coward song said, "Why must the show go on?") No one is truly indispensable. Better to lighten the schedule, and stay home sipping ginger tea.

## Common Sense — (A Final Deluge of Hopefully Unnecessary Warnings)

(Why is common sense so uncommon?) Orthopedic problems, hearing problems, and general health can often be improved by good diet and exercise. Be careful when using power tools. (Keep all 10 intact.) Be sure electrical cords aren't frayed or pinched, and be aware of whether or not you are grounded if you are working with hot wires. Unplug anything electrical before attempting to repair it. (Really! When I was in college a music major killed himself while trying to fix an air conditioner. He drilled into it when it was still plugged in. He left a wife and two children.) Keep your car well maintained, with good tires and brakes.

• Drive carefully.

• Tune long and prosper.

## Coming Up

"Trying to Stay Sort of Safe, Part II," other normal but less physical risks. 📖

# An Essay on the History of Tuning - Part IX

## Apologies From the Author

This essay has come to the brink of the 19th century a couple of times. Even so, the importance of Classical Times cannot be overstated. The existence of the piano today is due in no small part to the worldwide devotion of contemporary musicians to Classical music (adding 19th-century piano literature only bolsters the point). This music will never die. We may even live to see a time when the common tuning for pianos is devoted to such music – Well Temperament the norm, and Equal Temperament reserved for the latter 20th-century works for which it was written (and which demand its atonality). So pick up your jaws, gentle readers. It's quite fair to say that for musicians living between 1750 and, say, 1850, the one constant in their ever-more-rapidly changing world was the tuning on their pianos. We take a closer look at the mid-1700s, with this supplement to "Classical Times."

## Jean-Jacques Rousseau

Jean-Jacques Rousseau (1712-1778) was the professional tuner who has had the greatest impact on modern Western civilization. He is best remembered for his opera *Le Devin du village* and his important historical work *Dictionnaire de Musique* (1768; see Chapter 7 of this work for his tuning instructions). Rousseau was the least academic of modern philosophers, and the only one who was a working musician. Yet, in many ways, he was the most influential. The idea of man's natural goodness (the "noble savage," as Rousseau developed it) set him apart from both the conservatives and the radicals of his time. He literally "propelled political and ethical thinking into new channels." (*Britannica*) Unfortunately for Rousseau, times were such that, as a result of his writing, he spent much of his adult life as a fugitive, traveling incognito (he became quite adept at it). He often made his "ready-money" as a tuner(!).<sup>1</sup> His writings on liberty and equality were inspirational to the "Founding Fathers" of the United States, and later in France. He has made the "pursuit of liberty" a universal aspiration. His views on the cor-

By Skip Becker, RPT  
Northeast Florida Chapter

rupting influence of private property heavily influenced both Marx and Lenin. It is intriguing that much of what has happened in the 20th century has been the interplay of governments devoted to different ideas from the same man. In his times, he revolutionized taste, first in music, then in the other arts. He taught parents to raise their children differently—with nurturing and education.<sup>2</sup> He furthered the expression of emotion rather than polite restraint in friendship and love. He expressed religious sentiment among intellectuals who had discarded religious dogma. He also opened 18th-century eyes to the beauties of nature. The extent to which these ideas no longer seem peculiar is a measure of his success. Not surprisingly, historians find in this tuner the birth of Romanticism.

## The Early Years

Rousseau was born in Geneva, the city of Calvin. His mother died in childbirth, and he was brought up by his father to believe that his city was a republic as splendid as Sparta or ancient Rome. Rousseau senior had an equally glorious image of his own importance; after marrying above his modest station as a watchmaker, he got into trouble with the civil authorities by brandishing the sword that his upper-class pretensions prompted him to wear.<sup>3</sup> He had to leave Geneva to avoid imprisonment. The son then lived for six years as a poor relation in his mother's family, patronized and humiliated, until he, too, at the age of 16, left Geneva to seek his fortune (*Britannica*).

The young Jean-Jacques traveled to Savoy, where he was most fortunate in finding a benefactress, the Baronne de Warens. Short-term, she provided refuge in her home and employed him as her steward. Long-term, Rousseau may well have received the inspiration for much of his philosophy from Mme. de Warens. She transmitted to him the optimism about human purity that she had learned as a child from the mystical Protestant Pietists. In any case, she transformed the stammering unschooled young adventurer, who

had arrived on her doorstep, into a philosopher, a man of letters, and a musician. This most unusual and physically beautiful woman was herself an adventuress – a Swiss Protestant converted to Catholicism, who deserted her husband, and absconded with both his money and the gardener's son. In Savoy, she set herself up as a Catholic missionary, and specialized in the conversion of young Protestant males. She was said to be an energetic zealot. Evangelical ardor aside, her morals distressed Rousseau – even when he, too, became old enough, and was "converted." But she was a woman of taste and intelligence, who brought out in Rousseau just the talents that were needed to conquer Paris (at a time when Voltaire had made radical ideas fashionable).

## Gay Paris

Rousseau was 30 when he reached Paris. He was attempting to write serious opera, but made a living copying music and tinkering with instruments. He submitted an innovative scheme for simplifying musical notation to the French Academy of Science, but the system was inadequate for anything more than simple melodies. It was summarily rejected. Thus piqued, he presented his brainchild to Rameau (the ultimate authority on music in France), who found the same defects. Nevertheless, Rousseau was desperate to be considered a composer. He continued to submit musical scores to Rameau, who soon refused to hear them. In the face of Rousseau's persistence, he avoided contact – but he underestimated Rousseau's resolve. Rameau was ambushed with a musical presentation by Rousseau, in the home of a patron; and was compelled by etiquette to listen. Rameau reluctantly pronounced his judgment: Rousseau's music was the product of a mixture of inspired melodist and musical ignoramus, and the good parts were all plagiarized from Italian opera (charges of plagiarism followed Rousseau all his life). Eventually, Rameau did find some use for Rousseau. When a joint Voltaire/Rameau operatic effort was going poorly, Rousseau was called upon for a hasty rewrite. The successful result

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# An Essay on the History of Tuning - Part IX

Continued from Previous Page

finally put Rousseau on the level with the French opera elite (*New Grove*).

During his early years in Paris, Rousseau frequented the coffeehouses (everybody did), where he met Denis Diderot, who was making a reputation by translating the philosophical work of the Earl of Shaftesbury. Their friendship was steadfast for 15 years (until Rousseau attacked some of Diderot's work). In 1745, Diderot accepted a commission which was to become his life's work: the French translation of Ephraim Chambers' *Cyclopaedia*. Diderot assembled a team for the task, with Jean Le Rond D'Alembert as his co-editor. Diderot's intent was to expand Chambers' work, and turn it into an instrument for the radical change of society.

Of course, midway through the 18th century, this was very dangerous work. Many of the *philosophes* (as they came to be called) faced prison for their radical ideas. Diderot himself was imprisoned in 1749 for his essay on materialistic atheism (considered irreligious). It turned out to be a pivotal moment for Rousseau, who had an "illumination" while walking to visit Diderot in prison. In his *Confessions* (which he wrote late in life), Rousseau says that it came to him then in a "terrible flash" that modern progress had corrupted instead of improved mankind. He went on to write his first important work, a prize-winning essay for the Academy of Dijon entitled "A Discourse on the Sciences and the Arts" ("Discours sur les sciences et les arts"; 1750), in which he argues that the history of civilization has been a history of decay. Humans are good by nature, but have been corrupted by complex society. He championed the "noble savages," whom he thought were manifested in the Huron Indians, and the native Polynesians. Rousseau even extended the noble image to include simple peasants, but for all the aristocrats who might have looked on their serfs and servants with a new eye — as Loesser points out — few were sufficiently moved to join in manure-pitching.

## War of the Buffoons

"Rousseau's specialty at the *Encyclopédie* was music, and it was in

this sphere that he first established his influence as reformer." (Britannica). In 1752 an Italian Opera troupe touring Paris delivered a series of stunning performances. This split French musicians into two camps: those who thought French Opera should be improved along Italian lines, and those who thought French Opera should be abandoned altogether — in favor of the Italian. This set the stage for the "War of the Buffoons" (a pun on the Buffo Opera style), the first bona-fide "Temperament War." All the *Encyclopedists* were eager to jump into the fray, on the side of the Italians. Rousseau was the most original in his thinking, and the most forceful and eloquent in his style of writing. He was soon the most conspicuous. He was the only *Encyclopedist* to attack the eminent Rameau directly.

Rameau was, of course, the champion of French music. To the general public, Rousseau and Rameau must have seemed unevenly matched in a controversy about music. Rameau, already 70, was Europe's leading musicologist. He was not only a prolific and successful composer, but was also the author of the celebrated *Traité de l'harmonie* (1722; *Treatise on Harmony*) and other technical works (see Part 4 of this essay). Rousseau, by contrast, was 30 years younger, a newcomer to the musical elite, with no professional training, and only one opera in production to his credit. As noted above, the two had disputed musical values before. But this dispute was not merely musical, it was also philosophical; and Rameau was confronted with a more formidable adversary than he had realized. Rousseau eloquently built his case for the superiority of Italian music on the principle that melody must have priority over harmony. Rameau asserted that harmony must have priority over melody. By championing melody, Rousseau introduced the characteristic idea of Romanticism: "the free expression of the creative spirit in Art, is more important than strict adhesion to formal rules and traditional procedures."<sup>4</sup> Arguing for harmony, Rameau reaffirmed the first principle of French Classicism, namely, that "conformity to rationally intelligible rules is a necessary condition of art, the aim of which is to impose order on the chaos of human experience."<sup>5</sup>

Of prime consideration for us, the

"War of the Buffoons" included writings on the nature of temperament. Rameau's *Traité de l'harmonie* (see Chapter 4 of this work) had been the definitive description (and endorsement) of the Well Temperament in common practice. In his *Harmonic Generation of 1736*, he changed his position, reproached himself for expediently bowing to custom, and advocated Equal Temperament. Rousseau's contrary arguments reflected the taste of the times. He believed, like the vast majority of musicians, "le Temperament Establi" was the very font of emotion in music. From the perspective of Rousseau the historian, it was both the end product of temperament evolution, and a necessity for faithfully reproducing the music of the past (from the ancients to his times). He used Rameau's own arguments from 1722 to further his case. Rousseau's criticism of Rameau's latter endorsement of ET also reflected the taste of the times; and literally set the tone of temperament debate for the next century. He writes:

"In regards to musicians and instrument-makers, they find, that a harpsichord tuned in this manner (ET) is not really so concordant as Mons. Rameau pretends. The major 3rds appear to them rough and disgusting; and when we tell them that they have only to act in the alteration of 3rds, as they did before in that of the 5ths, they answer, that they can't conceive how the instrument can be managed to suppress the beatings which are heard therein by this method of tuning, or how the ear can fail to be disgusted."

The controversy raged on the streets, in newspapers, and periodicals. Rousseau's position enabled him to fire with a "bigger gun." His articles were published in the *encyclopédie*. Quite naturally, Rameau was outraged to find that this new *Encyclopédie* contained articles which attacked him personally. When Rousseau finally presented his own opera, Rameau took the opportunity to counter-attack. He wrote a public letter addressed "To Mons. Rousseau" which was published in all the Paris newspapers. In it, he excoriated Rousseau for stealing Italian melodies, supplying tripe dialogue, and calling it "French Opera." Rousseau's response to Rameau was that he had done the best he could: Opera is impossible in the



French language! He suggested that the French language is suitable only for ideas, not sentiments (for which Italian was required). Rameau also wrote a public letter to D'Alembert, in which he attacked the coeditor of the *Encyclopédie* for inconsistency: in his *Encyclopédie* article on temperament D'Alembert had included both the "established temperament" and a treatment of Rameau's theories on E.T. D'Alembert's only contribution to the "War of the Buffoons" was his response addressed "To Mons. Rameau," in which he pointed out that the tuning recommended by Rameau (ET) was "far remote from that which was in common practice."

Despite Rameau's criticism, Rousseau's *Le Devin du village* (1752) attracted so much admiration from Louis and the court that he might have enjoyed an easy life as a fashionable composer. The King offered Rousseau a generous pension. Rousseau declined because he knew he would have to give up his latest project, an essay on equality, which challenged the very legitimacy of kingship. In characteristic fashion, Rousseau was writing about the corrupting influence of the theater while enjoying success as a composer. Also, although he was writing about liberty and equality, Rousseau seemed to have a special hatred of French musicians (of whom he always speaks with unmeasured contempt). While superintending the rehearsals of his *Devin du Village*, he treated his orchestral players so cavalierly that they, in revenge, hanged him in effigy. "Well," said Rousseau, "I don't wonder that they should hang me now, after having so long put me to the torture." (Lebrecht's *Musical Anecdotes*).

## Ah, Nature

In 1754, Rousseau took his own advice about living the simple life. He left Paris to reside in the French countryside at the estate of a rich patron with the minimal amount of servants. Historians say he did his best work there, including his *Social Contract*, and his utopian *Geneva*. It should be noted that Rousseau was no democrat. Like Calvin, he believed in government by the *intelligentsia*. Still involved with the *encyclopédie*, he begged his friend D'Alembert to travel to Geneva and review the new Opera Theatre there. D'Alembert accepted; when he returned, he wrote a glowing

article on the new theater, and a rebuke of the ultra-conservative Calvinist bureaucrats who formed the city government. Unfortunately for D'Alembert, in his absence, Rousseau had reconverted to Protestantism. All D'Alembert ever got in the way of thanks for his effort was a public letter from Rousseau addressed "To Mons. D'Alembert." It was a passionate refutation of D'Alembert, praising the Calvinist government, and attacking the theater as corruption in noble Geneva. The very surprised D'Alembert feared public reprisal. He resigned as co-editor, and went into hiding. Rousseau claimed he never meant the attack personally, nor the one that followed on Diderot's rationalism, and ditto for the one on Voltaire's atheism.<sup>6</sup> He apparently did mean his personal attacks on Gluck, the German composer who carried the French Opera banner after Rameau. "It is characteristic of Rousseau that he never retracted, never forgave, and admitted no mistakes." (*New Grove*).

## On the Road

By 1762, Rousseau was crossing all sorts of boundaries. First, he crossed the boundary of family values, with his novel *Émile*, (a thinly veiled attack on contemporary church-endorsed child-rearing techniques). It caused a furor. The authorities would take no more. The books were collected and burned and warrants for Rousseau's arrest were issued. He intended to flee to his native Geneva, but discovered en route that even in Switzerland his citizenship had been revoked. It was at this point that he developed his skills for traveling incognito and of all the *Encyclopedists*, he proved to be the most nimble-footed. He was never imprisoned. But he was soon crossing every boundary on the Continent. Then as now, such notoriety could be a ticket to fame. Political exiles, especially the *philosophes*, were much desired ornaments in the courts of Prussia, Austria, England, and Russia. Rousseau did run the "court circuit" visiting, among others, Frederick the Great. This eventful stay was followed by a lengthy trip to St. Petersburg. However, seeing little prospect for the advancement of liberty in Catherine's Russia (no matter how charming her personal company might be), he chose, once again, to "hit the road" and live as a fugitive. He traveled to England,

where he was granted sanctuary by his friend and fellow philosopher, David Hume. His arrival in England was celebrated. Charles Burney took advantage of the opportunity to meet him, and they collaborated on an English production of *Le Devin du village*, called "The Cunning-Man" (1766). His supporters were numerous, as the writings of the "Great Rousseau" were having marked effect all over the world. The generous King George offered yet another pension – but Rousseau again refused. When publicly criticized for accepting money from private sources while turning up his nose at royal pensions, Rousseau put on his mustache, changed clothes, and surreptitiously returned to the Continent (some suggest paranoia was setting in).

Upon his return to France Rousseau found a different world than he had left. Historians say these pre-revolutionary French were a "Rousseauesque" generation. This was a world which he had made, but ironically, he could tell no one who he was (warrants were still technically in effect)! Fortunately, because of his essay praising the Calvinist government, his citizenship in Geneva had been restored. He lived there, finishing his important historical work, the *Dictionnaire de Musique* (expanded version of *Encyclopédie* articles), and producing auto-biographical writings (some suggest auto-hagiography) such as the *Confessions*. The intense passion of his earlier writings is replaced with "gentle lyricism and serenity." Rousseau does seem to have discovered peace of mind in his last years when he was once again granted refuge on the estates of great French noblemen. Yet, he continued to use his itinerant musician skills for his income. When asked why he did not take his talents to a better market, he replied: "Ah, there are two Rousseaus in the world: one rich, or who might have been if he had chosen; a man capricious, singular, fantastic; this is the Rousseau of the public; the other is obliged to work for his living, the Rousseau whom you see." (Lebrecht's *Musical Anecdotes*). He died in France on July 2, 1778, at Ermenonville, the park of the Marquis de Girardin. Some say it was by his own hand, but this author disagrees, as the tone of his *Confessions* reflects a tuner both amused by and content with his

*Continued on Next Page*

## An Essay on the History of Tuning - Part IX

Continued from Previous Page

incredible life; and one who had made peace with his Maker.

### Post Script: The French *Encyclopédie*

In 1745, the publisher André Le Breton approached Denis Diderot about a French translation of Ephraim Chambers' *Cyclopaedia*. Diderot was not the publisher's first choice, or even second. Two other translators had withdrawn from the project because of the immensity of the task. Diderot, however, saw opportunity. He could broaden its scope, and turn it into an important organ of radical and revolutionary opinion. He undertook the task with mathematician and music theorist Jean-Le Rond D'Alembert as coeditor. They became immensely successful as the center of a group of intellectuals, or "Philosophes." They gathered a team of dedicated writers, philosophers, scientists, and even priests, "many of whom, as yet unknown, were to make their mark in later life. They were fired with a common purpose: to further knowledge and, by so doing, strike a resounding blow against reactionary forces in church and state." (*Britannica*). Their intent was to supply the information necessary for "The Age of Enlightenment."

"The *Encyclopédie* was an important organ of radical and anticlerical opinion. The contributors were as much iconoclastic pamphleteers as they were philosophers." (*Britannica*). Their history, as can be discerned from the above Rousseau biography, was checkered. Several of the contributors were imprisoned, the work eventually suppressed and copies were collected and burned. Diderot refused Voltaire's offer to arrange publishing in England. Publication continued covertly in Paris. Extant copies of their work, the *Encyclopédie* (17 volumes of text and 11 volumes of plates - over 4,000 of exceptional quality), are today guarded like the bullion they are worth.

The *Encyclopédie* was completed in 1772. When Diderot was left without a source of income, Catherine of Russia stepped in "to relieve him of financial worry. First she bought his library through an agent in Paris, requesting him to

retain the books until she required them, and then appointed him librarian on an annual salary for the duration of his life. Diderot went to St. Petersburg in 1773 to thank her for her financial support and was received with great honor and warmth. He wrote for her the 'Plan of a University for the Government of Russia.' He stayed five months, long enough to become disillusioned with enlightened despotism as a solution to social ills." (*Britannica*).

### Notes

1. Although he could have been rich if he had chosen, Rousseau refused the many pensions offered by royalty (Louis XV, Frederick the Great, Catherine the Great, George III among them). He preferred earning his spending money "honestly" with his itinerant musician's skills, such as tuning, or, when fate permitted him a residence for a period of time, by copying music manuscripts. But it should be noted that the mercurial Rousseau was far from refusing "food and lodging." In fact, some of his hosts suggest that he was rather hard to get rid of. But the problem was never there for very long - the authorities were never far behind. When they pounded on the door all his friends could do was furnish a fast horse (and carriage, of course).
2. It should also be noted that he was far from following his own advice. He gave away his two children.
3. Only citizens were allowed to bear arms (see Machiavelli's *Discourses*). Only landed gentry were allowed to be citizens.
4. *Britannica*
5. Ibid
6. Rousseau believed in God, and claimed God's love was manifest in the hegemony of Christian nations. Voltaire conceded that God does seem to be on the side of the big battalions. ☐

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- *Journal*/advertising can be done 1-time affordably, or 12-times at a great rate. Lead-time is 6 weeks prior to publication.
- *Guide To Resources* advertising is accepted in the fall, with the publication being available in April of the following year.
- The *Convention Program Guide* is set-up in early April and distributed to every convention attendee the following July.

### Journal/Rates

Cost for a 12-time run in the *Journal*, and the rate for *The Guide to Resources* as well as the *Convention Guide* are as follows:

FULL PAGE .....	\$554
2/3 PAGE .....	\$433
1/2 PAGE .....	\$318
1/3 PAGE .....	\$222
1/4 PAGE .....	\$189
1/6 PAGE .....	\$126
1/8 PAGE .....	\$105
2-INCH .....	\$52
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For more information on advertising in the *Journal*, *Guide To Resources*, or the *Convention Program Guide*, please contact the Home Office and request a Media Packet.

**(816) 753-7747**

# Jack Van Mourik: Tuning in Two Worlds

"This business has been very good to me," says San Diego master piano rebuilder Jack Van Mourik. He is talking about Acme Piano Co., the store and piano rebuilding shop he has operated for 38 years, but he is also talking about piano work in general. "I am a victim of my own success," he says, and it is almost a complaint. At 72, Van Mourik would like to stop rebuilding pianos. He would like to stop doing the work he has loved and excelled at since he was a young man. He would like to climb into his 22-foot motor home with his wife and drive off into the wild blue yonder. But, like the Sorcerer's Apprentice, once he started chopping the brooms in half, they just kept multiplying — the broken pianos keep showing up at Van Mourik's door and he simply cannot turn them away.

"I have rebuilt so many Steinways...!" he muses. He prefers the old European and American grands, the ones from the late 19th century through the 1920s, when the wood was well selected and seasoned. The oldest piano he has rebuilt was an 1820 Collard & Collard (London) grand. "Oh, I had quite a time with the action of that one!" he remembers. The stack was screwed on underneath the key frame. He even tells the tale of a five-foot Kimball grand he was talked into rebuilding, with the usual misgivings about

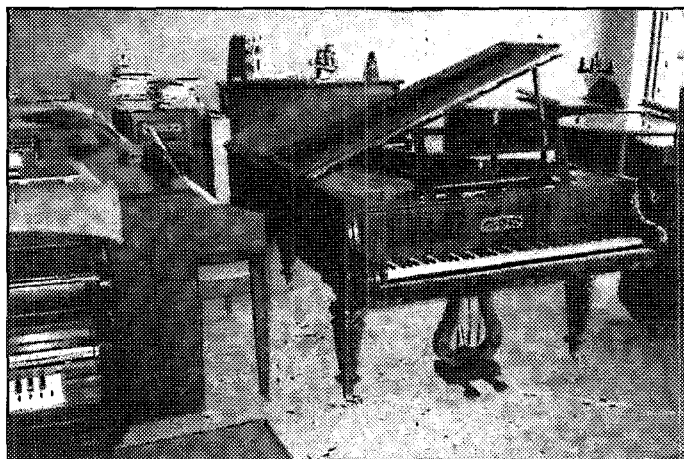


Photo 1 — 1820 Collard & Collard grand rebuilt by Van Mourik.

small pianos — he couldn't resist trying to overcome the terrible stringing scale which started with #15 as the smallest diameter string at the top, and went all the way up to #22 at the bottom of the tenor section. When he was done, the range had shifted to #12-1/2 to #20, and the piano sounded much better.

When he and business partner James McEvoy purchased "Acme Piano Shop" from Joseph Kopriva in 1961, the shop had been in business since 1947. Along with rebuilding grands both for customers and for sale, they started a rental program, and became dealers for Mason & Hamlin, J & C Fischer, Cable Nelson and Everett. The two new owners wished to continue the store's tradition of providing the musicians in the community with "Old World" quality piano service.

**By Anita Sullivan  
PTJ Feature Writer**

Van Mourik did learn his craft in the Old World — in Holland where he was born. As a child, he says he remembers the piano tuner coming to the house *three times a year* (forgive me, I must put that in italics!) to tune his family's piano. "If the tuner came in the morning, he would have a cup of coffee with a cookie, or if he came in the afternoon, he would have a cup of tea with a cookie." Sometimes the boy was home from school when the tuner came, and he was not one of those kids who just walk past the piano without a glance — he was fascinated. He began to dream of being a piano tuner when he grew up.

However, World War II delayed his plans in an unexpected way. In the fall of 1943, when he was 18, the Germans came into his neighborhood and rounded up all the young men and hauled them off to prison camp on suspicion of being involved in the death of a German officer. Van Mourik spent the remainder of the war in prison, returning home in 1945 "as skinny as could be." Here he spent a year recuperating physically and emotionally until

in 1946 he was finally able to start the career he had decided upon several years earlier. He was accepted into one of the traditional five-year apprenticeship programs then offered by many European and Canadian piano companies — two guilders a week for five years to learn every aspect of piano work, including: tuning, pinblock installation and winding bass



Photo 2 — Jack Van Mourik at C.C. Bender in Rotterdam, 1950.

strings. It was an austere and aristocratic discipline, the school of "Old World craftsmanship," and it still hovers over the profession of piano tuning like a *Platonic Ideal* to which not all can aspire. After his graduation the young journeyman was sent out into the world on his bicycle with the tools strapped on the back. "Rain, wind, snow, I went!"

Nowadays Van Mourik works in his shirtsleeves in the San Diego sunshine. It was those bicycle trips in the freezing snows which brought him to California, not the chance for more money, nor the glamour of U.S. culture. In 1953, at the movies with some friends, he saw a news clip of the Rose Bowl Parade in Pasadena. The sight of people lining the streets in January wearing

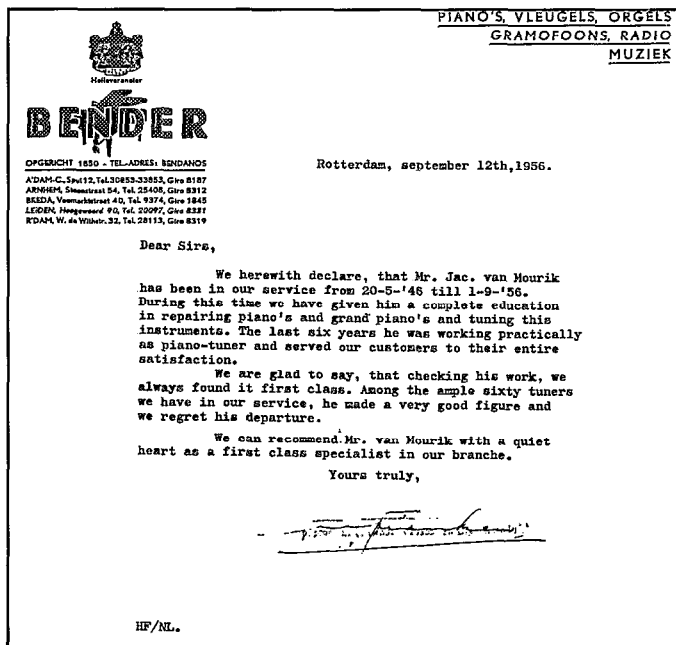
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**The  
Tuner's  
Life**

# Jack Van Mourik: Tuning in Two Worlds

Continued from Previous Page

shorts and sleeveless shirts made a deep impression on the young man. Wasting no time, he went to the American consulate the following Monday to fill in his papers for emigration to the United States.



Van Mourik brought this letter of recommendation from his former employer when he emigrated to the U.S.

To hear him tell the tale, Van Mourik is an embodiment of the traditional American dream: hard work will eventually bring success. He arrived in the U.S. with \$10 in his pocket, and two English words, "yes" and "no." Many kind people were willing to help him, and as soon as they learned of his formidable skills as a piano technician, Steinway & Sons wanted to keep him on Long Island. But the picture inside this young Dutchman's head of people in shirtsleeves standing in the sun, allowed him no compromises, no delays. His English had expanded to allow him to say, "No thank you, it's too cold here!" And soon he had gotten an offer from the Steinway dealer in Santa Barbara, Calif., and was on his way.

"I have seen the Golden Years of the piano," says Van Mourik, with some sadness. He thinks the piano may go obsolete, the way of the harpsichord, "in 40 or 50 more years." Why? The usual reasons: lack of skilled craftspeople to take care of them; loss of materials to build them (mainly the fine wood from old-growth trees); and the distractions offered to people in our culture from computers, electronic keyboards, and other devices.

For the present, though, there continues to be a steady demand for fine piano work, even though, as Van Mourik laughs, "I have probably rebuilt almost all the pianos which need rebuilding in the San Diego area!" Just recently he has finally completed work on a personal favorite, an 1896 Hardman grand he bought from the University of California at San Diego 24 years ago. It was a piano he use to tune, and he loved the sound, so when the piano came up for sale he was on the spot with the highest bid. He knew the piano had never been rebuilt and the soundboard was good.

Since the pinblock had #2 pins in it, he replaced them with #3's for restringing, and then refinished it. The case is beautifully decorated with spiral and leaf patterns, and the instrument has a particularly ornate version of the large 19th-century grand piano legs. An antique dealer who happened into the store a few years ago and saw the piano told him the case was one-of-a-kind, and that when the piano was finally restored he should not even think of asking less than \$45,000 for it.



Photo 3 — Van Mourik's San Diego workshop with two Steinway grands in progress.

The modest building where Van Mourik does his work has been remodeled, but not expanded during the 37 years he has owned it (he bought out McEvoy about 23 years ago). Although he has had a number of apprentices, including his own son, Van Mourik has always directly supervised every grand rebuilt in his shop, and has preferred to work with independent contractor technicians and tuners rather than hiring them as employees. This, too, reflects his Old World way of doing business, a personal style and close attention to detail. If you call the store you don't get a secretary, but Van Mourik himself. "Back home we did everything perfect," he says quietly. Over the years, through various economic recessions he has continued to resist the philosophy — as he says — of "make it work, keys up and down, and forget the rest of it." He even goes so far as to charge less for a new

piano if there isn't a trade-in, because "I don't want the things." When it comes to rebuilding, he is quite selective (no Asian pianos, uprights only if they're exceptionally good and have sentimental value for the customer). His adherence to the standards he learned in his early training has been much more than its own reward: he has earned a good living, has paid off his house and his 22-foot motor home and sent his children to



Photo 4 — Van Mourik at work in his shop.

college. Unfortunately, the motor home languishes in the driveway. "I love nature!" says Van Mourik wistfully, "I don't like the city." But he can't get away.

Although he doesn't go out for tuning much any more, when he announced his retirement several years ago, the Music Teachers' Association of California, San Diego made a plaque in his honor which says "In gratitude and friendship for years of excellent service and carefull (sic) attention to the needs of our music community." On top of that, however, they kept sending him work. So, Van Mourik now has all the disadvantages of retirement without the advantages.

"Today I work as a volunteer in my store," he says.

(Theoretically he only works weekday afternoons any more, yet when I phoned him on Sunday he was out appraising a piano.) He can't take a salary because of Social Security. He can't quit either, because though he has had the business up for sale, nobody has yet come along who satisfies his standards, and has the cash at the same time. "I found a very good English-trained tuner, and I found a technician who with training is going to be a good man," says Van Mourik.

He would very much like to pass along his life's work in the Old World way — his piano rebuilding skills and the store which goes with it — but can find no one to take it on all at once. His two children, a son and a daughter, each have chosen other paths. Over the years he has trained a number of technicians and rebuilders (including his own son) through the traditional five-year program, but as a piano craftsman he has outlasted them all. "My wife says I'm going to be like Mr. Horning!" he laughs, speaking of a piano technician in the area who just wouldn't ever take a vacation, and died of a stroke in his 80s, still working full time. "And there's a seven-foot Steinway grand in the store seven or eight years which I haven't gotten around to rebuilding yet...." ■

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The State University of New York at Potsdam invites applications for a full-time, twelve month position as Piano Technician. Responsibilities include care of a \$2 million inventory of keyboard instruments, including 155 pianos, 3 harpsichords and 1 fortepiano. His/her services in tuning, voicing, regulating and rebuilding are critical to the daily operation of the music program. Implement and manage all aspects of stringed keyboard technology at the Crane School of Music, a school of 600 students and 60 Faculty. Responsibilities also include piano and harpsichord maintenance, concert preparation of artist calibre. Working directly with a diverse community of faculty, staff, students and guest artists, the technician is responsible for tuning, voicing, repairing, regulating and rebuilding all Crane keyboards, including 30 Steinway uprights, 5 Steinway "D" grands, 3 harpsichords and 1 fortepiano; plan and manage budget and resource requests and allocations. Opportunity to evolve a piano technology program and develop an apprentice program. Qualifications are a Bachelor's degree and/or certification from accredited Piano Technology program and at least 5 years experience as a technician with concert experience required. Appropriate length of experience in lieu of degree/certificate will be considered. Send letter of application, resume and the names and phone numbers of three current references to: Dr. James Stoltie, SUNY Potsdam, Potsdam, NY 13676. Deadline for receipt of applications is April 15, 1998. State University of New York at Potsdam is an equal opportunity affirmative action employer committed to excellence through diversity.

# Calendar of Events

*May 9, 1998*

#### BALTIMORE CHAPTER 1-DAY SEMINAR

David Hughes Piano Rebuilding Shop, Reisterstown, MD  
Contact: Rob Bangert (410)255-2550  
186 Lowes Way, Pasadena, MD 21122

*May 16, 1998*

#### NEW MEXICO SPRING SEMINAR

Piano Store (Vintage Piano Workshop) Albuquerque, NM  
Contact: Les Conover (505)255-0658  
4805 Central, NE, Albuquerque, NM 87108

*July 8-12, 1998*

#### PTG ANNUAL CONVENTION & INSTITUTE

Westin Hotel, Providence, RI  
Contact: PTG Home Office (816)753-7747  
3930 Washington, Kansas City, MO 64111

*October 9-11, 1998*

#### OHIO STATE CONFERENCE

Location: To be announced  
Contact: Bob Russell (440)449-5212  
1414 Lander Rd, Mayfield Hts, OH 44124

*October 17, 1998*

#### NYSICON

Holiday Inn, Plainview, NY  
Contact: Michael Slavin (516)781-8888  
2409 Wood Ave., Bellmore, NY 11710

*October 22-25, 1998*

#### NORTH CAROLINA REGIONAL CONFERENCE

Holiday Inn Select, Richmond, VA  
Contact: Alan Hallmark, (804)346-8068  
email: pianomanadventures@erols.com  
Or Contact: Lewis Spivey (919)937-4777  
15 Rachel Dr., Nashville, NC 27856

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

Once approval is given and your request form reaches the Home Office, your event will be listed six-months prior and each issue until the month in which it is to take place.

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



# Grand Illusions ...

## THE PAGE FOR SERIOUS CASES



# A Modest Proposal

By Joe Mehaffey

No one wants to talk about it, but a quiet war threatens our very industry.

It all has to do with a certain radio talk show host. Some consider him an infallible beacon of truth; others rank him lower than worms. The mere mention of his name has started fist fights at chapter meetings.

In Madison, Wisc., a technician

heard this man's talk show on his customer's radio and deliberately broke five strings. In another case, a customer casually made a disparaging remark about the great man, whereupon the technician assaulted him with a voicing tool.

Is there no solution to this madness? I think there is. I propose that we divide the current RPT category into two new groups, the Dittoheads and the

Liberals.

When technicians advertise, they could place in small letters underneath the RPT logo either "Long Live Rush" or "Rush Sucks." That way, customers could always be sure of getting a technician of their own persuasion.

Red and blue jerseys might be a good idea, too.♦

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

## A Great Idea Revisited

Remember the great old cut-down uprights? What a piece of Americana. But there was one thing wrong with the idea: they didn't really save any space. That's why we at the Pulley Key Company have decided to offer our Cut-Down Grand Service. Maybe your customer has a new addition to the family and just doesn't have room for that seven-foot grand anymore. We'll shorten it to five, four, even three feet – at a price that we think will surprise you!

And we can also recover the piano in these custom surfaces: naugahyde, ceramic tile, Congoleum, fur, alligator skin (in season), or 100 percent rag museum-quality cardboard.

**The Pulley Key Company**  
Serving your rebuilding needs since last month.

## Our Man in Concord

Houndog says, "It's the little things which slow you down. Like having to deal with tangled temperament strips."

The new RetracToMute™ by MasterMark™ stores up to 20 feet of temperament strip on a cordless

reel and hangs from the upper corner of a raised grand lid. It has adjustable hub spring tension and a voice-activated circuit (you record your favorite command into its digital sampler) which tugs the next loop out of the strings. The strips are available in designer colors, and a range of materials from scratchy cloth, to oiled leather or hard rubber, whatever you're into. "All the big factories are using them

now," says Houndog.

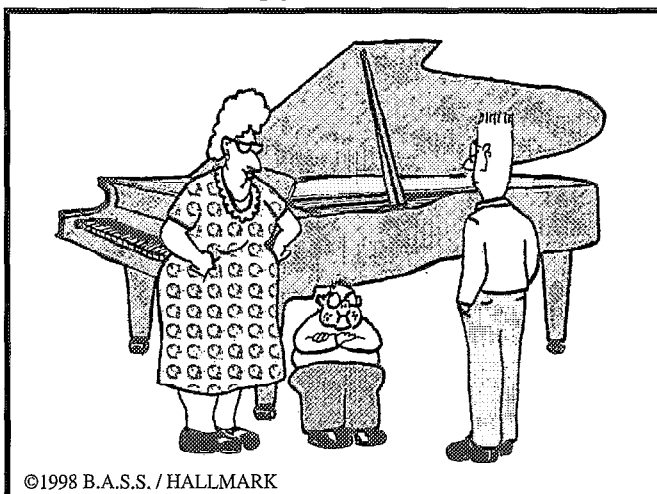
At roughly the cost of three tunings, this little number is well worth it.♦

Houndog Dempson may be reached c/o Bill Ballard, New Hampshire Chapter

## PIANOMAN Adventures

by Alan Hallmark

### The Prodigy



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"He says that the ceiling's too low for proper acoustic projection... You'll have to shorten the legs by six inches."

## It's All on the Web – Providence Classes on the Internet

By Evelyn Smith, Institute Director

Want to know the latest about what's happening in Providence in July?

For up-to-the minute information about the classes for the Providence Institute, check out the web site for the Piano Technicians Guild Annual Convention at <[www.ptg.org/1998/conv/](http://www.ptg.org/1998/conv/)> (or go to the Piano Page at <[www.ptg.org](http://www.ptg.org)> and follow the Convention link).

At the web site you'll find tons of information about the city (including maps and tourist information), the hotel and convention center (including pictures), and the conference (including the schedule of events). Read about the Mason & Hamlin factory tour and the Gallery of Rebuilders. While you're at it, you can look at the instructor bios, too.

Best of all are the classes – you'll find more than 115 of them, including the Rebuilding Skills Workshop, Applied Skills Class, Bruce Hoadley, the Festival of Temperaments, Cybercafe, and more. The 75 classes that have never before been taught at an Annual are marked with a special "new" symbol.

Many of your questions will be answered on the site's FAQ (frequently asked questions) page, but you can also send email directly from the Web page to the convention coordinators.

The Rhode Island Convention web site is constantly being updated and expanded. So if you want to stay up to date and in the know, check out on the Web. ■

## Cybercafe, Classes and an Evening on the Net: Computers at the Providence Institute

By Evelyn Smith, Institute Director

Many of us have run successful piano service businesses without a computer, and many technicians today still do. It's true that no computer can substitute for the technical, business and people skills needed to be a success in this work.

But as I write this article using my Macintosh, I'm struck by the ways that having a computer helps me. Writing is so much easier because I can shift around words and phrases; compiling financial information for my taxes takes about three hours instead of the three days it used to take; and email has revolutionized my ability to stay in closer contact with friends, family and other technicians, especially across the continental time gap.

Technicians are fond of tools, and in Providence you'll have lots of chances to see how the com-

puter can be a powerful tool in your business. There will be two classes brought back by popular demand from Orlando – Jeannie Grassi's "Computer Basics" and Andy Rudoff's "The Internet for Piano Technicians."

But if you're thinking you don't want to miss classes about pianos to attend a computer class, we've got just the thing. Andy Rudoff, a piano technician and a full-time computer/networking engineer, will host an informal "Internet Evening Session" after regular classes end, from 5:30 - 7 p.m. Thursday. It will be a time for your questions about the why's and how's of the resources for technicians on the Internet.

And Sunday will include an exciting first: the all-new Cybercafe will take hands-on learning and apply it to computers. Grab a cup of coffee and a pastry from the breakfast cart, and sit down at a table with a computer and an instructor. Choose your subject – there will be stations for word processing, financial software, customer record-keeping, and desktop publishing. Tuning software and scaling software will be demonstrated. Surf the Web for the first time, or learn the fine points of email etiquette. We'll even have a demonstration of the new computerized index of the *Piano Technicians Journal* from 1946 to the present.

All of this is available at no extra cost to technicians registered for the conference. Whether you're a computer novice or a seasoned user, take advantage of this fun, no-cost exploration of the world of computers, the latest tool to make a technician's life and work easier. ■



"You're using the CD tray as a cup holder, the mouse pad as a place mat, and the floppy drive as a food return. . . Something tells me you've never been to the Cybercafe."

# The Business of Being a Piano Technician

## — Business Classes & Roundtables —

By Beverly Kim, RPT  
Special to the Institute Committee

We might be piano technicians because we want to work on pianos, to enrich the lives of people interested in music, or because we like to know "how things work." Few of us would say we were drawn to the profession because we wanted to run a small business, yet this is how we spend much of our time. To help increase efficiency in this area, and to free up more time to spend on the really fun parts of piano service, we'll be offer-

ing business classes that address some of our essential business needs.

Here are some of our key instructors and the topics that you can anticipate in Providence: Tax Strategies by Murray Bradford, CPA; Warranty Work by Brian DeTar; Computer Basics by Jeannie Grassi, RPT; PTG Benefits by David Hanzlick, CAE; and Beverly Kim, RPT; Marketing Strategies by Gary Neie, RPT; Piano Rentals by Anthony Pascone; Pricing Your Services by Dale Probst, RPT; Internet Usage by Andy Rudoff; and Selling Damp-Chasers by Teresa

Severin. If you've ever attended classes by any of these instructors, you know that they will come to class well prepared with real life examples and helpful materials for your references.

In addition to these classes, there will be another avenue for obtaining assistance with your business management. Building on last year's positive response to the Business Roundtables, they will be offered again this year. Perhaps you've found yourself stumped when one of your clients asked you, "How much do you think my piano is worth?" or maybe you've considered expanding you income by providing piano moving services or piano supplies and accessories. You will have an opportunity to *ask your questions* or to discuss a business service topic with a technician who's knowledgeable about the topic.

The Business Roundtables will be offered from 8:30 to 10 Sunday morning. Just drop in to the classroom and sit down at any table and ask away. Feel free to float around to several tables if you wish. Our roundtable topics and facilitators include: *Dealer Relations*, Brian DeTar; *Selling and Disposing of Your Business*, Anthony Pascone; *PTG Member Benefits*, Beverly Kim, RPT, and David Hanzlick, CAE; *Marketing*, Gary Neie, RPT; *Estimating Jobs*, John Foy; *Winning and Keeping Good Customers*, Ruth Brown; *Appraisals*, Ward Guthrie; *The Cost of Being in Business*, Vivian Brooks; *Piano Moving*, Jim Geiger; and *Selling Humidity Control*, Teresa Severin.

As self-employed service technicians, we spend an awful lot of time alone. This is one way to take advantage of the experiences of other technicians and to discuss issues of importance to you. Besides, it will be a fun way to meet other people and to learn some valuable business ideas.■

# CONVENTION

## PROVIDENCE, R.I.

## Techniques & Tools for On-Site Service

By Dale Probst,  
Institute Committee

Many times it is more efficient to repair and service a piano on location. This portion of the Institute is dedicated to tools, tips and techniques that facilitate service in a customer's home, at a school or other institution. Classes will concentrate on the organization, methods and skills necessary for success.

In three humorous and fascinating hours, Isaac Sadigursky, RPT, reveals his secrets for organizing your vehicle and building an inventory of parts and tools. This will be a special presentation of practical tips by a master technician.

Jim Harvey, RPT, will teach you how to build a tool kit that will do 95 percent of the repairs encountered in the field.

Don't have a vehicle? Dan Levitan, RPT, will demonstrate how technicians from the Big Apple service customers with a kit they carry with them.

How much improvement in a piano can be accomplished in a day? In three hours, Nick Gravagne, RPT, and Richard Davenport, RPT, will

teach you what you can do and how to educate your customer on the benefits of complete piano service, whether they live in Hollywood or Albuquerque.

Allan Gilreath, RPT, shows you how to make an inexpensive grand piano perform to its potential for the discerning customer on a budget.

If you are unsure what is the problem, Ernie Juhn, RPT, will show you how to troubleshoot the customer and the piano.

David Patterson, RPT, has a tip a minute for getting the most out of vertical pianos.

Drop your tuning hammer on that new ebony polyester grand? Phil Glenn, RPT, will show you how to do minor repairs with a minimum of supplies.

Dan Reed, RPT, will show you how to get the best touch and tone out of every day vertical and grand pianos.

Want to customize pedals for discriminating players? Joyce Meekins, RPT, has the lowdown on pedals from the ground up.

Finally, keep the piano in top condition by understanding humidity and humidity control, courtesy of expert advice from Damp-Chaser Electronics.■



# Guidelines for Effective Teaching

## Tips for Annual, Regional & Chapter Technical Instructors

By Jeannie Grassi, RPT  
Special to the Institute Committee

Teaching each other is the heart of our organization; however, we are not professional teachers and even some of the best of our instructors have to battle with their nerves before teaching at an annual convention. The Institute Committee has worked hard to bring together a superb offering of classes this year. One of goals of the Committee is to offer support to all of the instructors to do their best and to improve their individual presentations, first-timers and well-seasoned instructors alike.

The following is intended to assist you with ideas for effective Design and Preparation and successful Delivery and Presentation of your class. Offered here are some ideas and suggestions that will either get you started or perhaps help you to improve what you've been doing already. As Evelyn Smith, Institute Director, has written to instructors in past years: "No two people present information the same way, and these suggestions aren't meant to create a one-style-fits-all teaching model. Take these ideas and develop your own style; that's part of the enjoyment of teaching."

### Design & Preparation

A sizable portion of the work involved in teaching takes place well before the class is presented. Even those who teach effectively are often overwhelmed by justifiable concern for their lesson plans and their implementation.

### Design Considerations

- **Content** – be sure that information is relevant to participants' training needs and interests. Is it specific? Is it focused on the goals? Does it fit within the class description?
- **Flexibility** – be open to the possibility of modifying the design during the event itself. Plan for possible design modifications in advance where possible. On your outline use highlighter pen for your main points, and draw a box around sections of the class that could be

omitted if time runs short.

- **Pacing/time usage** – keep things moving, use time appropriately. Does the topic flow make sense? Are you covering the entire material in the allotted time?
- **Processing** – don't generate more data during the activity than can be digested during the presentation portion of the class. Are a variety of methods used to accommodate various learning styles? Provide a hand-out with key information.
- **Goals** – keep the content of the class goal-directed at all times. Are your goals appropriate to content? Are they appropriate to time allotment? What one or two main ideas do you want them to learn? Think about the "big picture." For example, imagine yourself overhearing a group of technicians who have taken your class and are discussing why it was among the most valuable classes they have ever taken. What would they be saying about the class?
- **Set up** – build from the objective and work toward the anticipated outcome. Set the stage. What is to be the focus of the class? Devise a

logical arrangement of material. Distinguish between essential and optional material. It can be arranged chronologically, by topic or category, from concrete to abstract or vice versa, from theory to application or vice versa, by increasing level of skill or complexity, or by other schemes.

- **Closing** – allow enough time at the end for questions and discussion.

### Preparation Considerations

#### Know Your Subject – Inside and Out

This may seem obvious, but often instructors forget how hard it was to understand something back when they had never tried it before. Knowing something so well that you can anticipate any question that might come up during the session will make a much more engaging and dynamic presentation. Become comfortable enough with the material that you can relax during the presentation, and allow yourself to be creative in your explanations. This will allow you to devise examples and analogies that clarify key points and relate one topic to another.

*Continued on Next Page*

## Providence on the Horizon

It's time to make plans (if you haven't already) for a great time in and near Providence in early July!

As I write, our daily paper is reporting that the airport serving Providence, with its beautiful new terminal, ranked tops in New England in on-time arrivals last year. So if air travel is your mode, we're user-friendly in that department.

However you travel, we hope maybe you can plan some extra time to take advantage of Providence's pivotal location, surrounded by destinations that beckon: on foot; by car or public transit; even by water.

David Flanders' *PTJ* article in January gave you a generous sampling of the on-foot attractions including restaurants and sightseeing opportunities. And as I pointed out in December, distances are surprisingly short from Providence to many long-famous New England landmarks. Phyllis Glazerman, in the

February *PTJ*, spelled out many of the potential rewards available for going 50 miles to Boston. And Vivian Brooks, in the April issue, enumerated the attractions in nearby Connecticut, with phone numbers for more information.

The Rhode Island Chapter, as your host chapter, is working closely with the Guild's convention planners in the hope of helping to make this year's Annual Convention the most enjoyable and successful ever. For example, we've had a hand in bringing about a Thursday evening outdoor concert at Waterplace Park, with the blessings of the Providence Mayor's office, to be sponsored by Steinway & Sons with a reception following at the Convention Center.

See you in Providence? We cordially hope so.

— Wade Johnson, RPT  
Rhode Island Chapter ■

# Guidelines for Effective Teaching

*Continued from Previous Page*

This may have to be done in a few different ways before students begin to show comprehension and excitement at grasping the idea. That's when you remember why you agreed to teach the class in the first place, and that's when you begin to have some fun.

## Be Prepared

This goes beyond a comprehensive lesson plan; it also means practicing your presentation out loud, for timing. Even before testing out your class on your local chapter meeting, or regional conference, you might benefit from practicing at home with a tape recorder. Practice increases confidence and relaxes you better than anything else you can do.

One of the leading complaints noted on the instructor evaluation forms from the past two years was that the teacher did not complete the presentation or demonstration in the allotted time period.

## Delivery & Presentation

Most teachers, even seasoned instructors, feel a twinge of apprehension before class begins. Do your best to assume a confident attitude. Arriving to the classroom early to set up and to talk informally with students before the session begins may help you relax.

The heart of effective teaching is the instructor's understanding of the material. But knowledge of the subject matter, though essential, is not enough. Good teachers also understand what makes certain topics or concepts difficult for students, and they can explain those topics in plain comprehensible terms. In addition, they are able to gauge their students' background knowledge and experiences, select appropriate teaching methods and materials, devise examples and analogies that clarify key points, relate one topic to another, and assess whether students are learning what is being taught.

## General Strategies for the Classroom

### Introduce Yourself to Your Class

Say something about your background, how you first became inter-

ested in the subject, how it has been important to you and why you are teaching this class. It also may be helpful to assess the amount of experience among the class members and their interest in taking the class. If the setting is small, you might have them say their names.

### Be Positive

The instructor will be most effective if he or she is excited about the subject, enthusiastic, natural and human in his or her reactions – clearly having fun. Don't be apologetic about the material or discount the value of what is being offered, but on the other hand, don't preach or berate opposing views. Use humor that is appropriate, and not at someone else's expense. Don't belittle another technician, product or manufacturer.

### Be Aware of Yourself & Your Surroundings

Be yourself – humanness and genuineness are easily perceived by students. Know who you are; recognize your strengths and weaknesses. Dress comfortably and appropriately. Voice modulation helps to keep the attention and interest of the audience; so does eye contact. Relax and smile. Nervous or excessive gesturing may reduce the impact of what is being said. Whenever possible, use student's names.

The instructor should also be aware of the physical setting in which he/she is operating and the body language being used. Leftover posters tacked to the wall behind a speaker, for example, may present a continued, inappropriate distraction.

Since the presentation is oral, it is essential to have structure, order and clarity.

A simple organization, a clearly delineated progression from point to point, appropriate restatements and recapitulations – these devices are simple but very helpful. Solicit feedback from the group regarding your performance; i.e., "Did everyone understand that?" or "Do I need to repeat anything before we go on?"

### Stay on Topic and Be Specific

Write notes for yourself, and follow them. For an easy-to-read format, print your notes on the top two-thirds of 8

1/2" by 11" sheets of paper in 14-point type. Encourage comments, questions, and clarifications; however, maintain control. If questions begin to stray off topic, you are the one to control the flow of the discussion. Remain flexible in responding to students while being aware of pace and timing of the class. If a question can be answered further on in the presentation, ask the student to hold that question and remind you of it at the appropriate time. Don't let a talkative student dominate the discussion, even if the student is knowledgeable. Follow your outline and pace yourself so that you don't run out of time.

### Engage the Entire Class

Pacing the class to accord with the students is important. The instructor should look for signs of puzzlement, incomprehension, or boredom, and should slow down or speed up the presentation on the basis of these clues. Actively listen. Interrupting the discourse from time to time by initiating brief activities or by soliciting comments and examples from the class also varies the pace of the presentation. Active learning is more effective than passive. Be empathetic (put yourself in their shoes.) Rephrase questions to make sure everyone heard and understood what was asked.

### Vary Methods of Presentation

How the instructor presents the discourse is significant to its impact. The average person's attention span is between 10 and 20 minutes. After that, people have difficulty concentrating on the speaker. Change the pace every 15 minutes or so to relieve the monotony. For example: ask students to solve a problem at their seats or in groups of two or three, give a demonstration, use an audio/visual aid or tell a story or anecdote. However, there is a huge difference between relating a story to get your point across and wasting valuable time with unnecessary personal stories. Save those for the cocktail lounge after classes are over for the day.

The challenge, therefore, is to present the material in a way which engages the class members as participants instead of an audience. Effective use of visual aids, be they audio/visual equipment, demonstration models, flip charts, etc., can enhance the



presentation of a class. Be familiar and comfortable with the equipment you use. Overhead projectors are easy to use and allow students to see material on a large screen. You can have anything on paper or your computer copied to film for an overhead transparency at any neighborhood copy store. You might want to consider using some slides, but choose carefully. The key is to vary the methods. There is no faster way to lose your class than to force them to sit in a semi-lit room for an hour and a half looking at slides – no matter how good a photographer you think you are!

### **Prepare a Detailed & Logical Handout**

Enable students to concentrate on the material being presented, by following along with what is being said, rather than being concerned with taking their own notes. This will also assist you in getting out the information that needs your explanation and letting the students view other related material at their leisure. Use your handout as an aid for getting out more information, not a script for reading aloud to the

class. Reading both reduces the personal touch and increases the students' tendency to lose interest.

Note: The evaluation forms, in past years, have had many comments regarding appreciation for good handouts and requests for instructors to include them in future classes.

### **Allow for a Question/Answer Period**

The major concerns of the facilitator after presenting a class are to ensure that the input has been understood clearly and that it has practical usefulness for participants. Discussion is a time-honored teaching tool. So summarize your main ideas, and end on time. Respect students' time by not running over.

### **Enjoy Yourself**

If you're not having a good time, your students probably won't be either. If you've done all of the above suggestions, you should be able to reap the benefits and enjoy yourself. Most experienced teachers know that the best way to learn something is to teach it. And one of the most rewarding

experiences in life is sharing something that you know with someone else.

### **More Info**

For more info, you might find these resources helpful:

Angus, Helen. *Leading Workshops, Seminars, and Training Sessions*. Self-Counsel Business Series, Self-Counsel Press, 1704 N. State St., Bellingham, WA

Banner, James M. Jr. & Cannon, Harold C., *The Elements of Teaching*, Yale University, 1997

Brody, Marjorie; and Kent, Shawn. *Power Presentations; How to Connect With Your Audience and Sell Your Ideas*. John Wiley & Sons, Inc.

Frederick, P.J., *The Lively Lecture – 8 Variations*, College Teaching, 1986, 43-50

Geske, J., *Overcoming the Drawbacks of the Large Lecture Class*. College Teaching, 1992, 40, 151-154

McKeachie, WJ., *Teaching Tips*. (8th ed.) Lexington, Mass.: Heath, 1986

Sarnoff, Dorothy. *Never Be Nervous Again*. Crown Publishers, NY

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# **The Power of Goals**

By David J. Barr, RPT  
Member of the Economic Affairs  
Committee

There are three key areas in any business. A business success formula must work within these three areas in order to produce results. They are: 1) people skills, 2) business skills, and 3) technical skills. The stronger one's skills in each and all of these areas, the greater the likelihood of personal, professional and financial rewards. Without sufficient technical skills, the work we leave behind will not create repeat business. Without adequate business skills, even a fairly lucrative business can go under. Without decent people skills, we can leave our customers feeling very uncomfortable with us in their homes, the one place in the world they least want to feel uncomfortable. It takes a strong balance of all three to be very successful. I am sure that we all believe that first and foremost it takes strong technical skills to be successful. While I believe that having strong technical skills is essential for a business that wants to have high integrity, I have ob-

served that there are many "successful" businesses that operate with modest to mediocre technical knowledge and skill, but remain "successful" because of excellent people skills and business skills. Conversely, I have observed situations where individuals exhibiting outstanding technical knowledge and skill, coupled with poor people skills and mediocre business skills remain quite "unsuccessful" by most modern standards. While I hold that the latter example more often than not has higher standards and integrity, those people nonetheless remain largely unsuccessful.

The point of this is not to degrade technical skills, it is, rather, to raise the importance of developing strong people and business skills. According to the last survey of our membership, 22.3 percent have gross receipts over \$50,000 and 25.6 percent have estimated net incomes (before taxes) greater than \$30,000. These figures may also be skewed upwards since they include members who also do very significant retailing. In today's economy, this indicates that roughly 75 percent of our membership would struggle a great

deal to support a family of four with even a modest standard of living. Obviously, not everyone supports a family of four or is the sole provider, but the figures as a whole are not very encouraging. Perhaps this wouldn't be so troubling if 50.7 percent of our membership didn't net under \$20,000 per year. Consider that decent health care insurance for a family is close to \$5,000 a year, a modest mortgage would be about \$7,000 per year, taxes could be as much as \$3,000 to \$5,000 more, and a decent vehicle (if you only own one) would be around \$4,000 more without ever driving it. Add utilities, food, clothing, and all the other normal expenses of life and you get the idea. According to the survey, only 8.4 percent net over \$50,000 a year, and again, that includes some retailers. 8.6 percent of those surveyed tune more than 1,000 pianos per year. The survey indicates that .9 percent net \$100,000 or more, .6 percent of those surveyed tune more than 2,000 pianos per year. Perhaps the .5 percent who retail over 100 pianos per year are also closely correlated to the .9 per-

*Continued on Next Page*

# The Power of Goals

*Continued from Previous Page*

cent who net over \$100,000 per year. The survey does not make this clear, but it is a logical conclusion.

The point of reviewing these survey numbers is to emphasize the need to develop plans for raising the overall incomes of our membership without invoking the Sherman Antitrust Laws. If the answers were solely in increasing our technical skills, those of us who attend monthly meetings, annual regional conferences, and annual international conventions should all be wealthy by now and we are not. The main emphasis of these conventions is technical education. The secondary emphasis is business. People skills are seldom or never mentioned.

There are two key points I would like to explore concerning developing a more successful business. They are people related points which overlap into the other two areas, but originate in the area of people skills. They are: 1) setting goals, and 2) enjoying what you do. They are primarily people skills which deal with the boss; you. How well do you deal with yourself? Do you know how to remain self-motivated? I believe that these two elements can help drive you further up the success ladder because they motivate.

There is a whole process involved in making and setting goals. The first step is carefully and honestly assessing where you are now. Goal setting is a lot more difficult than it seems. It is a subject with a highly charged emotional content. The first thing to do is get all your year-end numbers together. Tax time is the perfect time of year since the government forces you to do this anyway. Try to remove your feelings from the numbers long enough to put all the numbers in two columns; one with income as a heading, and the other with expenses as the other heading. Total up the numbers to see where you ended after taxes. The next step involves some emotional content. Are you satisfied with your standard of living? Was there enough money to buy life and disability insurance, pay into a retirement plan, go on vacation, put children through college, live in a decent school district/town, go to some shows, eat out occasionally, entertain? Or are you looking at making cuts? That gets emotional, doesn't it? If the final conclusion is that there wasn't quite enough left over to do some of the things you really wanted to do, then it is time to make a decision. The positive decision is to set a

new goal for the upcoming year.

Let's say you want to earn another \$3,000 next year in net income. That would normally mean grossing between \$5,000 and \$6,000 more. Break that down to monthly numbers and then weekly and daily numbers. \$6,000 divided by 12 months equals \$500 more a month. That's an additional \$125 a week which is an additional \$25 a day. Now, if you tune five pianos a day, the goal can be achieved by simply raising your rate \$5 per tuning, which won't offend too many of your customers at all. If you don't feel comfortable with raising your rate, the other choice is to work more hours. It's that simple. If you are currently tuning three pianos a day, by adding one piano more a day, even after days off, you will add the income of close to 225 tunings. Can that be done in one year? Certainly. Even at \$50 per tuning, that's over a \$10,000 increase in gross receipts.

Is setting a goal all that important? You have no idea the power of setting a goal. I speak from personal experience here. I set a goal several years ago to return to college and finish a degree after a 20-year absence. I also set a very high work standard. The energy of setting that goal and focusing on it was remarkable. I was working about 45 to 50 hours a week in my service business at the time. I took on 30 credits per year. It took me two years and a semester to finish the 63 credits I needed to graduate. I graduated with honors. Following graduation, I did that analysis of my business I spoke of, and decided to set some high goals. Although I was only grossing in the 50's, I set a goal to gross \$100,000 within three years. I focused on it and knew that I really wanted to accomplish that goal for the sake of my family. I made several changes in my business operation. It didn't take three years. It only took one. In one year, I doubled my gross revenues and net income. I held those figures the following four years. Now, I am resetting my goals again. The motivating energy of setting a meaningful goal is amazing.

The other aspect of business building I wanted to talk about is the element of enjoying yourself. If you can look for ways to enjoy your customers, your work, and your business, as you become very successful, you will find yourself really enjoying your life on a broader scale. I am sure that you have met someone who is truly a pleasure to be around. They seem to enjoy your company while they are with you, have something encouraging to talk about, are looking forward to

something, themselves, and, generally, they have a lot of energy. If they are working for you, they seem to enjoy being good at what they do because it gives them a great deal of satisfaction to be able to satisfy your needs. This person comes into your home with a smile and a lot of energy, and they seem to leave a lot of that behind. You feel like they learned something they wanted to know from you, and you learned a little something from them. They leave you feeling like you helped make their day a little better because they listened to you. You also know that they cared about what you were saying while they were there, thereby imparting a greater value to that part of your day. You enjoyed their visit. You need to be that kind of person. An attitude of caring and uplifting is contagious and will open up new levels of energy in your business (and personal) life. It will allow you the luxury of enjoying what you do. You will actually look forward to getting up and getting on the job. There is a great deal of research now that shows that a positive attitude releases endorphins in our bodies. This release then heightens our sense of enjoyment and heals our bodies, giving us even more energy. The opposite is also true. Negative attitudes cause negative responses in the body.

Underlying my real enjoyment of my work is the firm belief that what I am doing for my life's work is meaningful and important. Perhaps it sounds like a subtle point, but I derive meaningfulness in knowing that what I do helps others become more developed and whole people. My customers have the opportunity to uplift their own lives as they strive to develop their skills at the piano. I truly believe that the piano is one of the greatest self development tools ever invented. New research is finally proving this to be true. Studying music by learning to play the piano challenges us in many disciplines with multiple levels within each discipline all at the same time. The physical, emotional, and intellectual development that takes place in the process of becoming an accomplished pianist is incredible. For those who are willing to take on such a challenge in life, we have the privilege of providing needed support and encouragement, both with our words and our work. Understanding this to be true, I cannot help but enjoy myself the vast majority of most days and I do.

I wish each of you, my colleagues, the highest levels of success! Set the goals and enjoy the process! ■

# Baldwin Support Key to PTGF Class

A generous donation from the Baldwin Piano Company has made it possible for the Piano Technician's Guild Foundation to present a class at the 1998 Annual Institute in Providence, Rhode Island. Sunday morning, July 12, 1998, Alan Fox will give a lecture and lead a discussion on early childhood music education and what we as individuals and PTG as a group can do to promote it. PTG members and Auxiliary members are invited. I hope you will adjust your travel plans so that you won't miss this informative and inspiring class.

Alan Fox is a leader in the field of childhood and community music education. Mr. Fox obtained his B.A. in Music from the University of Massachusetts in 1982 and has done graduate work in piano performance at Colby College. In 1987, he founded the Music School in Providence, the first community-based school of the performing arts in Rhode Island. In eight years he increased student enrollment from 35 to over 2,000. The Music School has been cited as the fastest growing community school for the arts in its field.

During his tenure at The Music School, Mr. Fox initiated a number of unique and creative outreach pro-

grams into the community, including a Cultural Alternatives program that was recently cited in the President's Report on Model Arts and Humanities Programs for Inner-city Youths. This programs served over 1,000 children in public housing community centers and other after-school programs.

Mr. Fox developed Arts as Basic Curriculum (ABC Program) an innovative multi-literacy public school curriculum which has been shown to significantly raise the scores of students in the Metropolitan Achievement Test (MAT). Mr. Fox then co-authored a research paper with scientist Martin Gardiner documenting the impact on learning of the ABC Program. The research shows how arts training has led to improved classroom attitudes and behavior as well as improvements in learning mathematics.

Mr. Fox initiated a community service program through the arts in partnership with Brown University and the Swearer Center for Community Service which currently involves 50 Brown students who mentor over 800 inner-city youth.

Mr. Fox serves as a consultant, a speaker and an author of articles

related to the field of arts education so I'm sure we will all learn ways that we can encourage music making in the communities we live and the places where we work.

This topic is of vital interest to our business and I hope many of you will be able to take advantage of this opportunity.

— Laura Kunsky, RPT  
PTGF President

## Piano Technicians Guild Foundation

### Mission Statement

*"The Piano Technicians Guild Foundation is formed to support the goals of PTG by preserving and displaying historical materials and providing scholarships and grants for piano performance, study and research!"*

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IS A  
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**PIANO TECHNICIANS GUILD FOUNDATION**

AND TO EXPRESS OUR APPRECIATION OF THIS GENEROUS LEVEL OF  
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SIGNED THIS ELEVENTH DAY OF NOVEMBER, 1997

*Laura Kunsky*  
Laura Kunsky, RPT  
President

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 622 E. 14th Street  
 Sioux Falls SD 57104

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 Walnut Creek CA 94596

## Region 7

*972 Portland, OR*

David K. Streit  
 3560 Sw 103rd Avenue  
 Beaverton OR 97005

*In Memory . . .*

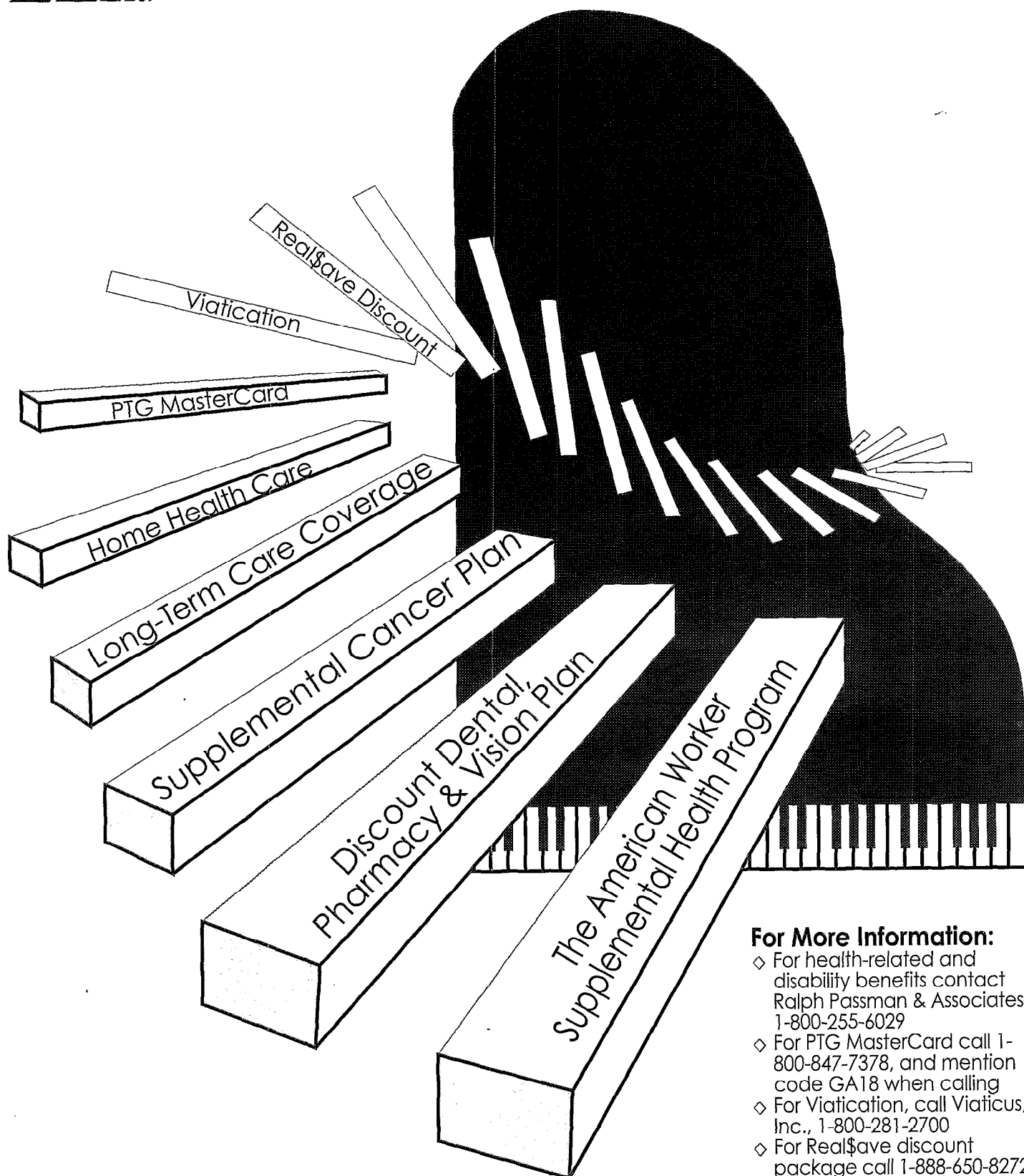
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## The Privileges of Membership

Because members' personal and professional circumstances change over time, the products and services offered by PTG must change as well. The number of membership benefits available through PTG recently expanded with one idea in mind: to meet members' needs by providing quality products and services at a competitive cost.



### For More Information:

- ◇ For health-related and disability benefits contact Ralph Passman & Associates, 1-800-255-6029
- ◇ For PTG MasterCard call 1-800-847-7378, and mention code GA18 when calling
- ◇ For Viatication, call Viaticus, Inc., 1-800-281-2700
- ◇ For Real\$ave discount package call 1-888-650-8272





Phyllis Tremper  
PTGA President

# AUXILIARY

## exchange

DEDICATED TO AUXILIARY NEWS AND INTERESTS

## Providence Through The Eyes Of A Native

By Donald D. Breed

From time to time I like to give over this space to people who have items of interest for us in the Auxiliary. The following article was written by a high school classmate of mine whom I looked up when I was in Providence at the Convention Planning Meeting last September. We renewed memories and friendships from 40 years ago about Freeport, Illinois.

— Phyllis

A Rhode Island landmark that visitors to Providence can see very easily – maybe even from their hotel windows – is the Independent Man, the statue at the top of the gleaming white dome of the State House. It is a symbol of Rhode Island's founding, and it remains appropriate today. We are not like the other New England States.

Oh, they also have seacoasts, at least most of them do, with surf and sandy beaches, rocky inlets, blue-water harbors crisscrossed by high-performance racing boats, 19th century mill buildings, fishing villages (picturesque and still working) and real colonial architecture. We just have more of them per square mile. What we don't have very much of are those big white, Congregational churches standing in front of a common. That's because when Roger Williams established Rhode Island in 1636, he did so mainly to get away from established religion, places where the public common and the only church were run by the same people. Williams was a very religious man, a preacher, but he had a notion – very strange in those days, and some people still don't get it – that he had no business forcing people to believe the way he did!

We do have historic white churches though. You should check out the First Baptist Meeting House and the First Unitarian Church, both walking distance from downtown Providence. But except for places like Little Compton, which used to be part of Massachusetts, you won't see the church and the common together.

From the start, Rhode Island was settled by people off the mainstream: Quakers, Jews, and Catholics, among others. Rhode Islanders were independent in ways other than religion. Some we are

proud of. The first battle of the Revolution, according to us, was not Lexington and Concord; it was the Gaspee Affair, in which a British patrol boat was burned. Before the Declaration of Independence, the Rhode Island legislature had already renounced the authority of King George III.

Rhode Island also showed its independent spirit by being the last of the original 13 states to ratify the Constitution. Given some of the reasons for it, we aren't ashamed of that. Other manifestations of our independent nature aren't so savory, but we own up to them. Bristol, Newport and, to a lesser extent, Providence sent out slaving ships, and some family fortunes were made that way. Smuggling was a way of life for many people in the colonial period – and when Prohibition came along, it picked right up again. Until relatively recently, the New England Mafia was run out of Providence.

There are still families in Rhode Island whose ancestors came down the river in the same canoe with Roger Williams, but old Yankee stock is just a fraction of today's population. The first factory in the country was Slater Mill in Pawtucket, now a museum, and the abundance of water power made the state one of the leaders in manufacturing. Over the years, those mills were staffed by waves and waves of new immigrants. French Canada is still a big cultural influence in the Blackstone Valley, and Rhode Island had the first U.S. Senator of Italian descent. More recently, the state has been a haven for Cambodians, Laotians, Hmong, Russian and Ukrainian Jews and Liberians.

### Why Does Ethnic Diversity Make Me Think of Food?

The restaurants in Rhode Island, particularly in Greater Providence and Newport, are one of those formerly best-kept secrets. Now you can read about them in the food magazines. They run the gamut from the very best fish and chips you have ever had, to fancy or down-home ethnic restaurants (Italian the most numerous), to trendy/continental. I'll leave it at that, because if I start mentioning names, I

won't be able to stop.

Time won't allow you to gather wild oysters in one of the little inlets in southern Rhode Island (and I'll never tell you the spot), but you'll have the opportunity to savor the fresh, briny flavor of oysters raised in the Ocean State. Those who stay after the convention can charter fishing boats. Perhaps the best feature of Rhode Island is the built environment: the historic architecture from the colonial period and the 19th Century, as well as the redevelopment of the waterfront.

Providence missed the worst excesses of the urban renewal that laid waste to so many cities in the period right after World War II. (What was it? Did we Americans wish to have been bombed, too?) There was some redevelopment, and, some like the demolition of City Hall, was planned but never done. The fact that Rhode Island's economy was not as robust as the other states in the period was, as it turned out, one of the preservationist's best friends. Consequently, you can walk around downtown Providence and see a fine collection of historic buildings.

Even here, Rhode Island's independence plays something of a role. Benefit Street in Providence, one of the classiest historic districts in the state, used to be a slum and a red-light area, slated for redevelopment, but thanks to some far-sighted citizens, the houses were carefully restored instead or torn down.

Newport's famous "cottages" – on a scale so lavish they are unique – once seemed doomed to re-use as apartments or offices, but they were preserved in their glory, so that thousands of tourists in shorts and sensible shoes can get a taste of the Gilded Age.

Far be it for me to tell a group of piano tuners to listen up! But, hey, have a good time in Rhode Island. It's waiting for you. ■

*Donald D. Breed grew up in northern Illinois, but has lived in Rhode Island since 1966. He is retired from the Providence Journal-Bulletin but still writes about wine and restaurants.*

## Mail Call

Members, please watch your mailboxes for an important letter to all members who have paid their dues as of March 31, 1998. We will be voting on many By-law changes at the Council meeting and I would like to have as much input as possible. You make this organization what it is and your vote is important. We need you at Council meeting to take care of business. On Friday, we play!

— Phyllis K. Tremper  
PTG Auxiliary President

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News From The World of PianoDisc

## How to remove and replace grand action on pianos with TFT Record

When you encounter a piano equipped with PianoDisc's TFT Record system in the field, note the following helpful tips before removing the action and servicing the piano:

- Power down from the wall.
- Remove the fallboard, keyblocks and keyslip.
- With a small wrench, turn the locking action bolt down. (It is located on the hammer rail.)
- Unplug connector cable from the Record adapter board (which is attached on the treble side of the hammer rail).
- Check to make sure the hammers clear the pinblock and that no keys are depressed before carefully sliding out the action.

When you're ready to slide the action back in, proceed as follows:

- Push action into the piano so that the

front rail of the key frame is even with the keyboard.

- Take keyslip and carefully place it on top of all the keys (both sharps and naturals).
- Depress all the keys at the same time. While holding down the keys, depress sustain pedal.
- While sustain pedal and keys are fully depressed, slide action back into the piano. Be careful that the backs of the keys do not bend any plungers.
- Reconnect power chord to the wall receptacle. **Very important: this must be done after cable has been reconnected to the adapter board.**

If you need additional assistance, please call PianoDisc Technical Support at any of the following numbers: 1-888-601-TECH (8324); 1-800-566-3472 or 916-567-9999.



## PIANODISC'S 1998 FACTORY TRAINING SCHEDULE

### INSTALLATION SEMINARS

- June 1 - 6      • Aug. 3 - 8
- Sept. 14 - 19

### CONTINUING EDUCATION

- June 8 - 10      • Aug. 10 - 12
- Sept. 21 - 23

Tuition for the Installation and Continuing Education Seminars is free, but a \$50 refundable deposit is required for confirmation. The PianoDisc Continuing Education seminars are restricted to PianoDisc certified technicians in good standing. For more information, call PianoDisc during our office hours, Mon - Fri., 8 a.m. - 5 p.m. PST.

### PianoDisc

4111 North Freeway Blvd.  
Sacramento, CA 95834

Ph: 800-566-3472 or 916-567-9999



PianoDisc's newest technical training instructor, Michael Zarate, greets PTG President Marshall B. Hawkins at the California PTG Convention.

## Mason & Hamlin offers factory tour during PTG Nat'l

Mason & Hamlin will throw open its doors for a special one-day factory tour during this summer's PTG National Convention. A chartered bus will take a group of 50 from convention headquarters in Providence, Rhode Island, to the Mason & Hamlin factory in Haverhill, Massachusetts. During the hour and a half bus trip, Mason & Hamlin's Paul Monachino will give a presentation on the history of the venerable company beginning with its founding in 1854.

Lunch will be provided upon arrival at the factory, followed by the tour. Since space is limited, anyone interested should make reservations immediately through the PTG. Local technicians may also participate by contacting the factory directly at 978-374-8888.

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# Tech Gazette

Yamaha Service

May 1998

**Last month**, we discussed the method used to install strings in pianos manufactured at Yamaha Music Manufacturing (YMM) in Thomaston, GA.

**In this issue**, advantages and benefits of using this unique method will be shown.

## *Piano Stringing*

The R&D department of Yamaha Corporation (Japan) carefully investigated all of the ways possible to string a new piano. These included the angle of drilling the tuning pin hole, the size of the hole, the size and quality of the tuning pin, the manner of inserting the pin into the pinblock, etc. The outcome of all these investigations can be summarized as follows:

First, the tuning pin hole is drilled robotically at a 5 degree angle. This results in the pin leaning away from the direction of the pull exerted by the string. The end result is enhanced tuning stability and longevity to the pinblock. The nickel-plated cut thread tuning pins are made by Yamaha so we control exactly the various dimensions of each tuning pin for uniformity without relying on the quality standards of an outside vendor. The precision is exceptionally high resulting in pins that are very accurate and uniform (machined to a tolerance of 2/100 MM.) In conclusion, all 230 plus pins found in each piano will be uniform in torque.

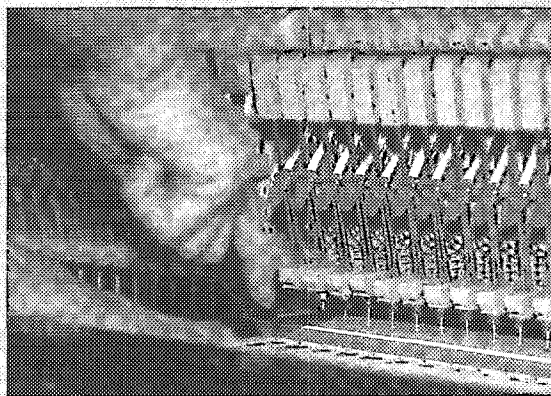
Secondly, Yamaha has improved the method of turning the coils on the tuning pins. Traditionally, the tuning pin was held horizontally while the wire was wrapped around the pin. Then the pin was rotated 90 degrees to be driven into the pinblock with a heavy hammer. That method put an unnecessary twist into the wire (which could result in false beats) and driving the pin by hand always results in some type of damage to the tuning pin hole.

At Yamaha, the pins are positioned above the hole at the exact angle the hole was drilled, then tapped into the pinblock to a predetermined depth. Later the string is inserted into the tuning pin that is already in the pinblock. The Yamaha made stringing tool is placed on the pin and the pin is rotated exactly two and one half revolutions as the wire coils itself around the pin. In this manner, the pin is inserted into the tuning pin hole without damage, and the string is attached without twisting the wire.

This kind of care and attention to detail, ensures that tuning stability and ease of tuning will always remain a tradition with Yamaha pianos.

## *The YMM "Tip of the Month"*

When regulating capstans to remove lost motion, it is easier and faster to use the capstan wrench if it is resting on a support that is almost level to the square shoulders of the capstan. Try placing wood strips of varying thickness in front of the capstans. Then you can quickly and consistently find the capstan with the tool resting on the wood strip.



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