Piano Technicians
Journal
January 1984

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Letters

Dear Fellow Members:

Our reasons for entering a trade or profession, and especially for remaining in it for most of a lifetime, are not easy to explain even to ourselves. There must be numerous satisfactions to keep our interest for so long and I have found many of these.

We need to enjoy the work itself, to recognize the challenges, to honestly feel that we have been more than a mediocre workman in the field we have chosen. We hope to have a good relationship with the people for whom we work and with our associates. There is considerable satisfaction in eventually acquiring sufficient skill and developing a clientele that will provide an adequate income.

There are small triumphs in being able to give some younger and talented person a boost along the way. But it is a very special feeling of reward to receive the recognition of friends and co-workers expressed by the award of the Golden Hammer. It is with much humility and gratitude that I thank you all for this remembrance of our years together. It will help me to feel that I was able to do something more than tune a piano pretty well.

Sincerely,

Robert A. Burton
Piano Technician

President's Message

Ernie Preuitt
President

In this column, just one year ago, the reference was made to New Year resolutions, those being kept for one day or a year, and that if they were kept for just one day, it was at least a beginning.

It is my special desire that each and every member of the Piano Technicians Guild make some kind of New Year resolution for improving one's self and one's fellow man.

My personal resolution this year is expressed in the following lines gleaned from the pages of one of my fraternal publications. Certainly, I would like to give credit to the author, but such is unknown.

★ ★ ★

It seems to me that to be a regular person is all that could or should be desired of us. Not great, not powerful, not worthy, not overly ambitious, not vain, and certainly not fearful. These lines by Mr. Unknown are an inspiration to me, and I hope to you.

May each of you have a happy and prosperous New Year.

Lord, Make a Regular Man Out of Me

This I would like to be—braver and bolder,
Just a bit wiser because I am older,
Just a bit kinder to those I may meet,
Just a bit manlier taking defeat;
This for the New Year, my wish and my plea—
Lord, make a regular man out of me.

This I would like to be—just a bit finer,
More of a smiler and less of a whiner,
Just a bit quicker to stretch out my hand
Helping another who's struggling to stand,
This is my prayer for the New Year to be,
Lord, make a regular man out of me.

This I would like to be—just a bit fairer,
Just a bit better, and just a bit squarer
Not quite so ready to censure and blame,
Quicker to help every man in the game,
Not quite so eager men's failings to see,
Lord, make a regular man out of me.

This I would like to be—just a bit truer,
Less of the wisher and more of the doer,
Broader and bigger, more willing to give,
Living and helping my neighbor to live!
This, for the New Year, my prayer and my plea—
Lord, make a regular man out of me.

Author Unknown

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Executive Director's Message

Barbara Parks
Executive Director

Professional Organizations: More Than Just The Sum of the Parts

What exactly is a professional organization like the Piano Technicians Guild, and what makes it tick?

Those are always tough questions to answer. The stock responses cover things like shared technical information, fellowship, education, professional advancement, recognition and movement toward a common goal. But there's much more . . .

We at Headquarters have been fortunate to get a deeper look—a chance to watch such a group unfold before our eyes.

We recently received the Guild's membership records from its former office in Seattle. Thanks to the Baldwin Co., which provided a truck to help us move, we received approximately 20 filing cabinets and countless boxes of files, literature, records, back issues of the *Journal* and a lot more. (As I write this, we're nearing the end of the inventory.)

When the last boxes had been taken off the truck, we stood for a moment catching our breaths and eyeing the small mountain of boxes and packing cases in our storeroom. Looking at it, we became aware of how much there is to know about the Piano Technicians Guild and its rich history of accomplishment.

You could say that it was all right there in front of us, all the numbers and statistics, the facts and figures. Boxes of old *Journals* would chronicle the history of the Guild. Filing cabinets of records would tell us names and facts about those names. Books, brochures and pamphlets would tell us about pianos and what it takes to keep them singing. It was a sobering sight. The complete records of an entire profession were stacked before us. More important than that, the professional lives of almost 4,000 people were contained in those records.

Ignoring our aching backs, we plunged into the task of putting it all in order.

As promised, filing cabinets are divulging names and information: members' names, where they live, where they work, where they have trained, when they passed the various examinations required for advancement in the profession. *Journals* tell of the merger of two smaller groups more than 25 years ago.

There are photographs of past conventions, faces that we look forward to meeting and some that unfortunately we will never have a chance to meet. There are records of past council sessions, the conclusions of dedicated men and women who sculpted a profession and are paving the way for those who follow.

But the deeper we dig, the more it becomes apparent that there is something missing, something that we can not get from any notebook or filing cabinet. What makes an association? Dreams. The dreams of its members for themselves and their profession. That, after all, is why members of any group come together—to build something that is larger and longer-lasting than the sum of its parts.

Unfortunately, dreams do not translate well to paper. They resist being categorized in neat files. They are best expressed by hard work, by sacrifice and by dialogue which brings everyone closer to common goals.

We're looking forward to sharing your dreams.

Presenting a piano 16 years in the making. The Viennese Edition.

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We invite you to compare the Kimball Viennese Edition Grand to any performing piano. Compare the touch. Compare the tone quality. Compare the meticulous preparation and regulation Kimball Viennese Edition Grands receive before they leave our factory.

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The International Scene

Fred Odenheimer, Chairman
International Relations Committee

PTA Convention Set

Arrangements for the trip to England, Scotland and Wales May 9 through May 29, 1984, are coming along splendidly and a sizeable number of our members will be taking the tour.

We will visit a number of factories, amongst them the Bentley and Welmar Piano Factories, Naish Felt Factory, Crown Foundry and Herrburger Brooks Action Factory. There will be an interesting visit to the Royal National College for the Blind, Piano Department, and we will have a chance to see their piano museum. Also on tap is a visit to the Boesendorfer showrooms in London.

The PTA Convention will be May 17 to 19 and projected classes are as follows:

Installation of hammers and dampers.
Upright servicing.
Soundboard and bridge repairs.
Rebushing.
Reshaping or recovering hammers.
Grand action regulation—basic.
Grand action regulation—advanced.
Voicing.
Concert preparation.
Harpsichord service.
Temperament.
Reconditioning action parts.
Touch-up.
Regulation of overdampers.

This looks like a very interesting program and I am sure this in itself will make the trip worthwhile.

Sightseeing and the more serious aspects of the trip are nicely woven together and the stay in Britain should be not only enjoyable, but also a great learning experience. If you want to come along, please contact Dan Evans immediately. His address is: 4100 Beck Ave., Studio City, CA 91604. Phone: (213) 762-7544.

Via Professor Ting-Chao Chou of the Memorial Sloan-Kettering Cancer Center, we had some indirect correspondence with the Taiwan Piano Technicians Association. They would like to have friendly ties with our organization and suggested attending each others' conventions. We wrote that we would welcome their attendance at our 1984 Indianapolis convention and we are now awaiting their reply.

With the October issue *Das Musikinstrument* acquired a new face as well as a different type of print. In times past, we had a fine relationship with the magazine and its late publisher, Erwin Bochinsky. A number of articles from *Das Musikinstrument* were published in the *Journal* with Mr. Bochinsky's permission and we want to express our gratitude even at such a late date. We wish the new owners the best of luck and hope that a working relationship can be reestablished some time in the future.

Mini-Classes for Indy Institute '84

Dick Bittinger
Institute Director

What are these mini-classes? Maybe we should call them "mini-miracles."

Haven't you often gone to a meeting of your chapter or a neighboring one and found a fellow Guild Member putting on a short technical that really impressed you? It can be anything from gadgets to rebuilding tips or business practices.

Now these PTG members are going to share their knowledge at the Indianapolis convention in July through a series of mini-technicals with 20 minutes per instructor and four instructors per class period, giving us 1½-hour classes. This will be the first time a national convention has offered this type of class, although the New England Regional Seminars have had great success with it for the past few years.

Watch your *Journal* for the schedule of these exciting classes that will offer more in '84.

Indianapolis—More In '84!

You may miss the Indy 500, but don't let that stop you from attending the annual Piano Technicians Guild Convention in Indianapolis, Ind., July 2-6. There is plenty to see and do in Indianapolis at any time of the year.

It's a city that has managed to grow into a 20th-century metropolitan area while retaining its pioneer heritage. Parks, museums, monuments and statues intertwine with gleaming new office buildings throughout the downtown area, with the tree-lined Monument circle serving as a focal point to it all.

You'll be staying in the Hyatt Regency Indianapolis, a luxurious modern hotel located close by the state capitol building. Downtown Indianapolis is called the "Mile Square" in honor of the original city limits projected by Washington, D.C., architect Alexander Ralston, who designed the city in 1821.

The downtown area also includes the original City Market, which has been remodeled and face-lifted into the 20th century so that vendors of exotic and ethnic foods, farm-fresh meats and vegetables, and imported gifts and crafts can display their goods for modern shoppers.

Although the Indy 500 is held on Memorial Day, the 2½-mile oval track is open year-around for bus tours and much of the history of modern racing is contained in the Speedway's museum.

Even though you'll miss the Indy 500, you'll find a wealth of professional information in the Piano Technicians Guild's "Indy 440." You'll also get to know one of America's friendliest and most picturesque cities.

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Business Books Added To PTG Offerings

It takes a lot of work and study to become a piano technician. Technical information is acquired only through years of study and practice.

But there's more to becoming a successful technician than acquiring technical skills. Whether you work for a company or operate your own business, you must be adept at dealing with customers, marketing your services, long-range planning, financial management and a host of other administrative chores.

The *Piano Technicians Journal* is proud to offer a selection of McGraw-Hill business and management books. These titles are available to *Journal* readers at a significant savings, and more titles will be announced in months to come. These books are offered in addition to regular Piano Technicians Guild books and pamphlets, which are still available.

"Success and Survival in the Family-Owned Business," P. Alcorn. A helpful, positive guide for operating a family firm, this is a highly dignified overview of the family-owned enterprise. Retail: $19.95. *Journal*: $17.95.

"How to Start and Manage Your Own Business," G. Greene. This informal, personal guide, replete with solid information and practical advice, covers the basic areas of concern for anyone contemplating starting his own business. Retail: $19.95. *Journal*: $17.95.

"How to Run A Small Business," J.K. Lasser. Shows aspiring entrepreneurs and small business owners how to plan for all the stages that affect vital operations from financing through business controls. This edition focuses on the new economic climate and the 1981 tax laws. Retail: $17.95. *Journal*: $16.15.

"How to Buy Money: Investing Wisely for Maximum Return," Wayne Nelson. A guide for the prudent investor—the author, a Merrill Lynch vice president, explores all the low risk, high yield alternatives in this one-of-a-kind book. Retail: $12.95. *Journal*: $11.65.

"Positioning," A. Ries and J. Trout. This eye-opening book fully explores the proven market positioning concept and illustrates via fascinating case histories the positioning campaigns used for a corporation, a country, a service company and a church. Retail: $14.95. *Journal*: $13.45.

"The Grid for Sales Excellence," R. Blake. For anyone who sells products or services, this realistic guide can enhance the moment-by-moment rapport that develops between salesperson and customer and leads to solution selling. Retail: $21.95. *Journal*: $19.75.

Orders should be addressed to: Piano Technicians Guild, 9140 Ward Parkway, Kansas City, MO 64114. Please include $1.50 per order for mailing and handling. Allow six to eight weeks for delivery.

The Technical Forum

Jack Krefting
Technical Editor

Another Precision Tuning Device

It was with considerable surprise and dismay that we learned of the recent grant of U.S. Patent No. 4,398,443, which identifies an invention called a "precision tuning pin for pianos," illustrated in **Fig. 1.** The fact that the patent was allowed at all suggests that the U.S. Patent Office shares with the inventor a considerable degree of ignorance of the way a piano is manufactured and serviced.

First of all, we have one more instance of an undoubtedly well-meaning person, likely a music teacher, making the usual assumption that an ordinary tuning pin cannot be set with precision simply because he himself cannot do it. This takes skill and practice, and musicians are usually unwilling to admit that they cannot tune an instrument, any instrument, because of the inherent reflection on their skill. This is nonsense, of course. One would no more expect a musician to suddenly become an expert tuner, or even to be cognizant of the requisite skills, than one would expect every airline pilot to be an expert aeronautical engineer. After all, if this patent were necessary, how is it that so many discriminating musicians have been satisfied with the work of their piano technicians?

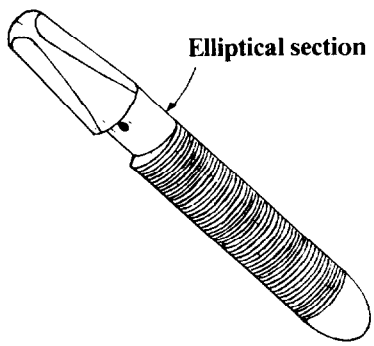


Figure 1

Obviously, some are able to do a good job of tuning pianos while others who have not invested the necessary time are prone to feel that the problem is inherent in the design of the instrument rather than in their own lack of skill. One wonders what would be the reaction of these same musicians to a group of tuners who suddenly insisted that something must be wrong with the theory of music because the average piano tuner is unable to play the piano with the same degree of skill possessed by a well-rehearsed pianist. There would be a lot of patronizing generalizations, no doubt, but the bottom line would be that you can't learn to play if you won't practice. Well, as those of us who are also musicians know, that blade cuts both ways.

This invention seems to be based on the premise that pianos go out of tune because the pins slip, a silly assumption to begin with, unless we are talking about a defective piano, in which case we would recommend a new pinblock, not a tuning. This represents the same kind of thinking that brought us the sales demonstration involving twisting a tuning pin in a handkerchief. The idea was to dramatize the idea that the tuning pins made for a certain piano were better because they would turn readily only in a clockwise direction; never mind that a tuner turns the pins in both directions when he tunes the piano, or that the real reason a good piano needs periodic tuning is because of things like back compression, crown variation with humidity changes, string stretching and string creep due to inexpert tuning or insufficient bearing friction, *not* because of slipping pins.

Finally, as a practical matter it would be difficult to string a piano so that all strings, when at pitch, would have the same departure angle. Those that varied more than a few degrees would pull considerably more wire in the same arc of hammer movement, and the result would be a balky, recalcitrant piano to tune. Not incidentally, there would also be a considerable increase in the incidence of broken tuning pins because the grinding operation removes material from the becket hole area where the pin tends to break anyway when torque is high, as it should be on any newly strung piano. The only way around that problem is to drill the block so the pins are loose, which brings us once again to the unpalatable and indefensible proposition of intentionally building a defective instrument. It is this writer's opinion that this invention is unworkable in its present form and should not have been honored by the granting of a United States Patent. I hope our readers will pardon the editorial.

Vertical Rebuilding

As we proceed to rebuild the action, we should consider the various types of flanges which will be encountered from one make to another. The traditional wooden flange, the brass rail, the Billings flange and the double flange are some of the more common types seen in modern pianos. Each has its advantages, as will be discussed presently, but some designs are easier to service than others.

Probably the most serious problem which could befall a vertical action, assuming of course that the action parts themselves are either rebuildable or replaceable, would be a failure of a major structural part like a rail, for example. The main action rail of a modern upright has 88 carefully spaced holes for butt flange screws, 88 more

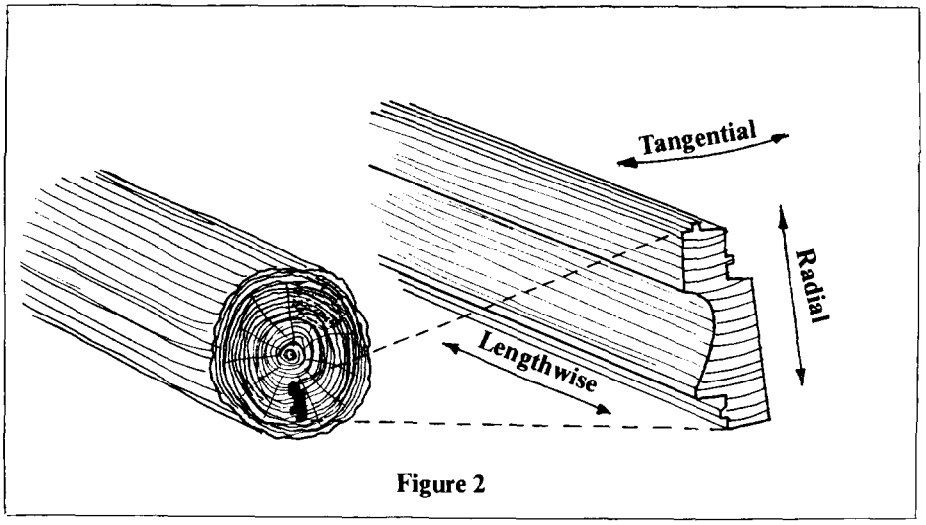


Figure 2

holes for whip flange screws, 67 to 72 more holes for damper flange screws, 12 to 16 more holes for bracket mounting screws, and miscellaneous holes for things like damper rod hanger screws and letoff rail mounting posts. In all, we are considering well over 250 holes which must be drilled with precision, even assuming we can find a suitable blank replacement rail. It doesn't happen very often, fortunately, but once in awhile a poorly made rail will develop a crack which runs from hole to hole, indicating that the grain orientation was wrong to begin with. Oversized action screws in such a rail would merely increase the width of the crack, so the best answer is to replace the rail.

Since wood will split radially (across the growth rings) far more readily than tangentially (around the growth rings), it is best to orient the grain so that the screws will be driven parallel to the rings as shown in **Fig. 2.** In the case of the lower portion of the rail, then, the grain should unquestionably run tangentially from front to back as shown; the top of the rail, usually having one set of screws driven at ninety degrees to another set so that neither can be correct unless the other is wrong, requires some sort of compromise. If a double flange is used, the grain should run tangentially from top to bottom because the only set of screws will be driven straight down from the top, and that's about the only possible advantage to that otherwise troublesome flange design.

Making a new rail is about as challenging a job as there is in the piano rebuilding business, especially if there is no suitable molding available that will give the correct action spread without machining, so it is fortunate that rails rarely cause trouble.

Ordinarily it is possible to replace a stripped flange screw with one slightly larger in diameter, or with one having wider threads, such as a sheet metal screw. If the screws are loose because the rail has split, however, oversize screws will only widen the split. In this event, assuming it is impractical to make or purchase a new rail for some reason, it may be possible to drill out and plug the split portion of the existing rail. Use maple plugs cut with a plug cutter, though, not dowels or hammershanks.

If a new rail will be made for the instrument, three critical dimensions must be kept in mind: (1) The action spread, or the distance between and elevations of the centerpins; (2) The distance between the hammer butt center and the face of the string; and (3) The spacing of the screw holes. The first is controlled by the shape and size of the rail, the second by the way in which the brackets are mounted, and the third by marking out the rail with a scale stick.

A scale stick is simply a piece of wood a little more than four feet long that looks like a ruler. It has 88 marks on it, each mark indicating the center of the unison of one note at the strike point. If a new rail will be made, or a new set of keys installed, for example, a scale stick would be necessary to accurately space the screw holes in the rail or the capstan holes in the keys. **Fig. 3** illustrates a procedure for

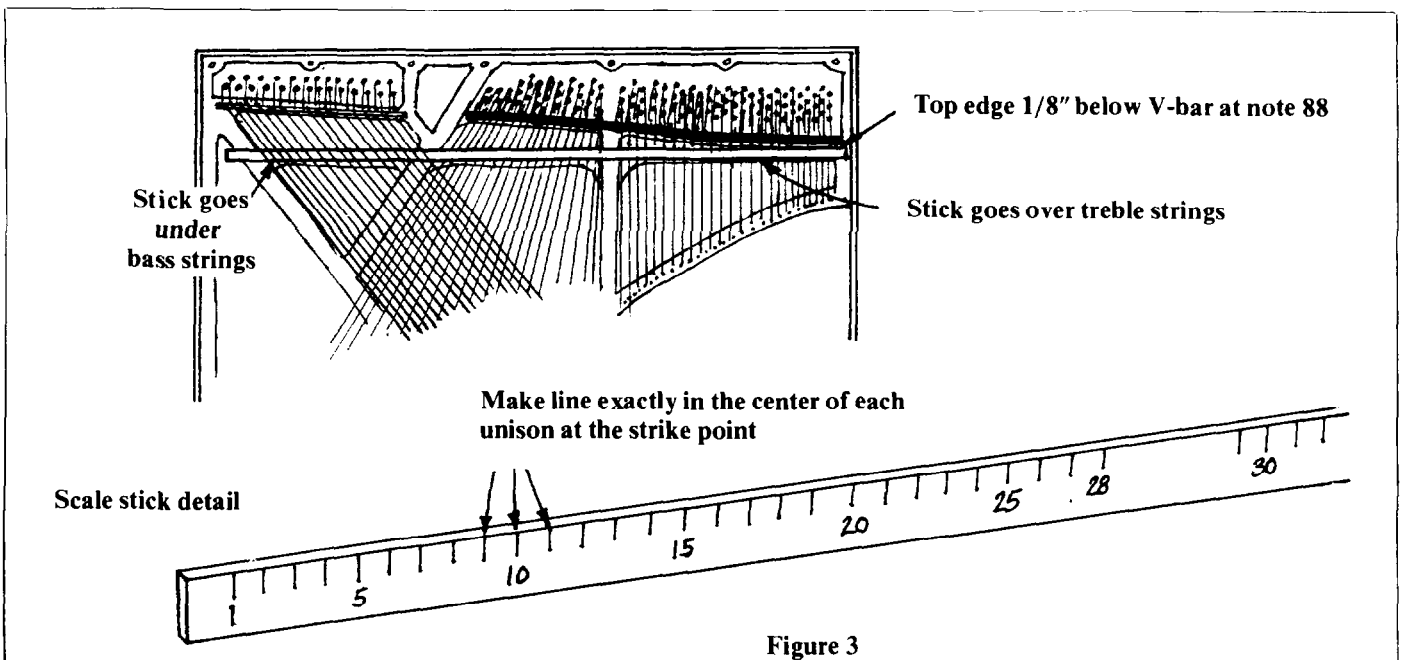


Figure 3

making a scale stick from a strung piano. Slip the stick under the bass strings and over the treble strings, supporting it so that its upper edge is exactly 1/8" below the centerline of the plate V-bar at note 88, and level it across the scale from there. If the treble end of the stick is, say, seven inches below the top of the pinblock, then the bass end should correspond.

Block the stick in this position and carefully mark the position of the center of each unison, using a scratch awl or similar fine marking tool. The three-string unisons in the treble will naturally be marked in the center of the center string, assuming of course that the center string is in fact correctly spaced. The two-string unisons are marked so that the scale marking falls equidistant between the two strings of the bichord at the strike point. In the case of single-string unisons, of course, we would expect to see the marks on the stick precisely centered on the string.

The scale stick is then used to mark the action rail for hammer butt flange screws and for whippen flange screws, and with an offset also for damper flange screws. If the instrument is equipped with a sticker rail, inverted or otherwise, that rail is also marked out with the scale stick; the keys are also marked out that way, indicating the side to side position of the capstan screws.

Some old uprights are equipped with a continuous brass rail which holds the butt centerpins as shown in **Fig. 4.** This rail is replaceable by supply houses, provided a suitable scale stick is submitted; spot repair of broken tabs and plates is customarily accomplished in the field by the use of brass repair clips, but if these are already in use the rebuilder should have reason to suspect the future reliability of the unbroken parts as well. This metal fatigue, almost inevitable in this design, was certainly one reason for its rapid decline in popularity; the difficulty of spacing and traveling butts, however, probably finished it off. We will explore this a bit further next month in this space.

Technical Tips

Our first tip this month is from Luther Minton of Clayton, North Carolina, who describes what may be the best method of removing grand knuckles. Here is his description, as illustrated in **Fig. 5:**

"Lay shank, barrel up, on edge of table or bench, so as not to let drop screw interfere with firm, level position on bench. Take a sharp *felt knife and cut through the leather until you strike wooden core or molding of barrel, One easy slice will do it. Ease (and cut) over to flat broad surface of core. Cut very closely down the core until you strike shank proper. Be sure to cut all felt loose from core. Next, lay knife flat on shank, blade toward core. Make cut firmly through leather-glue joint until you strike the core. This will give you example #1.*

Repeat same procedure to remove felt and leather from the other side of the core, which leaves only the core standing in its slot, the cleaner of felt the better.

Take small side-cutters or the small center pin clippers that work like pliers, cut three or four snips through the wood, with the grain. The grain is the same in all barrels. This will get you up to example enclosed no. #2. Remove the wood, easily and cleanly and there you have it. Try it on a few old shanks—you'll be surprised how clean the wood comes out, requires no soaking or anything, and it's ready to replace with new barrels, sold at all supply houses.

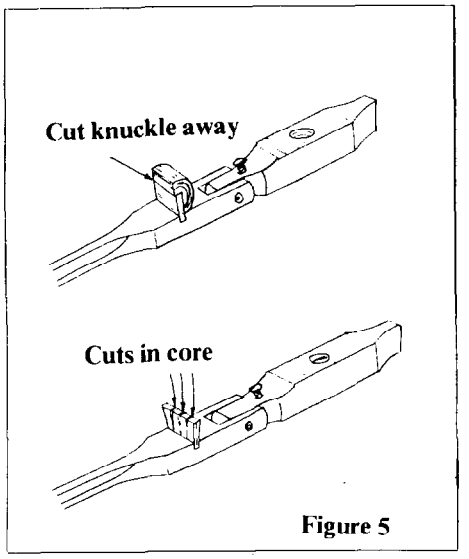


Figure 5

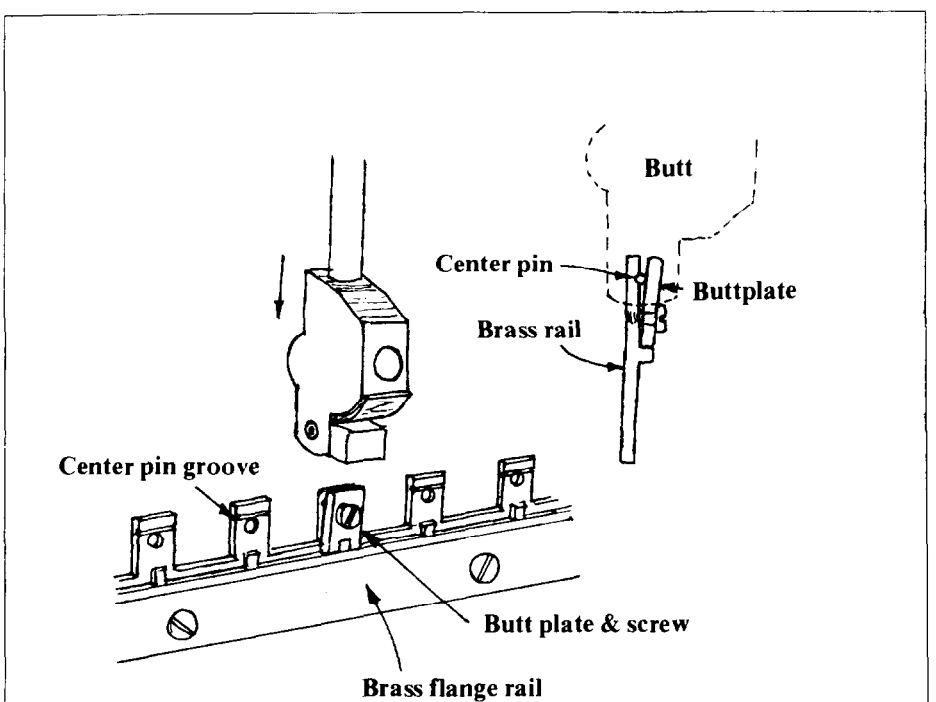


Figure 4

Our next tip was contributed by Ellen Sewell of the Cincinnati Chapter, and involves the installation of damper repair springs in vertical pianos. Ellen has found that the spring tends to twist out of line when the screw is tightened, and that it is difficult to keep it where it belongs. One solution to the problem, according to Ellen, is to insert a piece of thread through the coil of the spring after it has been placed in position, and pull the ends of the thread tightly around the damper lever, as shown in **Fig. 6,** to keep the spring in place while the screw is tightened. By releasing one end of the thread later, the tension is removed and the technician can pull the thread out by the other end.

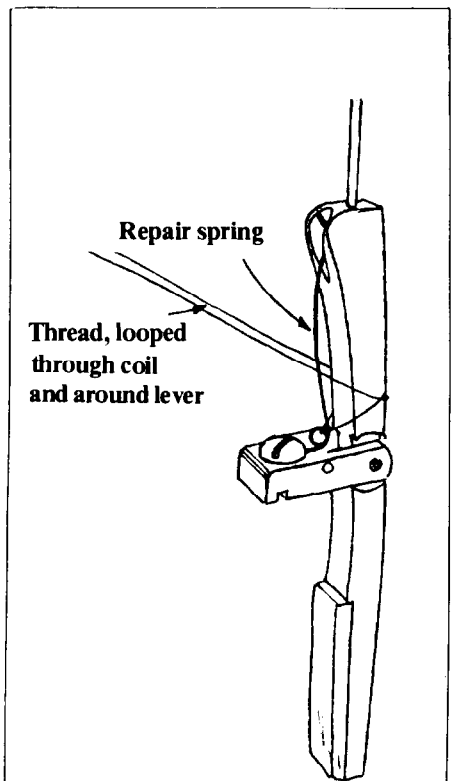


Figure 6

Barry Heismann of Cincinnati has suggested a method for removing the stub of a broken shank from a vertical butt. Rather than try to drill the old shank out in the customer's home, or bring the butt assembly to the shop to drill it out on the drill press where it can be drilled straight, Barry suggests we try cutting the end of a new shank to roughly the same angle as the break on the old shank. Glue it on to the old stub temporarily, clamping the glue with a standard shank clamp, and use that to pull the old stub out with the shank puller as shown in **Fig. 7.**

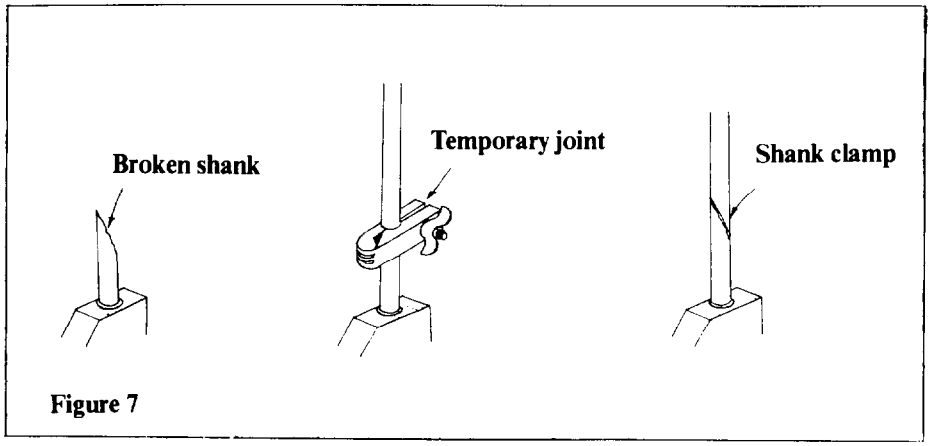


Figure 7

Upright Hammer Boring

QUESTION: "Many times, when striving for the correct angle of upright bass hammers I wind up having to cut the corners in order to achieve needed clearance. Is it preferable to ease up on the boring angle so it's not as great, or to bore at the correct angle and cut the corners, or is it possible to get narrower bass hammers?"

—Vincent E. Mrykalo

ANSWER: Because of the design of the piano, it is obvious that a compromise must be made. The designer, knowing full well that the hammers couldn't be hung parallel to the strings if he used such a radical overstring angle, did it anyway; obviously, since he didn't specify narrower bass hammers but rather sanctioned the compromise boring angle, his choice was to ease up on the boring angle.

The only pianos which regularly used cut hammers were squares, which generally sound bad for reasons other than the cut hammers, but in general it is still a poor practice. The tension around the perimeter of the hammer is destroyed when the corners are cut off, and for that reason I prefer the usual system. Narrower hammers are another possibility, but that would affect mass and tension in a negative way, also. One would almost have to make all 88 moldings narrower, and then use harder or longer-grained felt, with additional weight somewhere, to make it work, and this could pose problems in hammer alignment with the three-string unisons in the treble.

The problem illustrated in the question certainly deserves more consideration than it has been given, but in the meantime I would strongly urge readers to make angular compromises rather than cutting felt for clearance.

Separable Damper Action Rail

QUESTION: "I wonder if any manufacturers have ever tried a separable action rail for upright dampers, where the entire row of damper levers could be removed en masse? This would make many other action reconditioning jobs much easier, such as: filing hammers, voicing, working on brass rails, replacing butt springs, butt spring punchings, lubricating or shrinking butt flange centers, lubricating or replacing damper lever spring punchings,

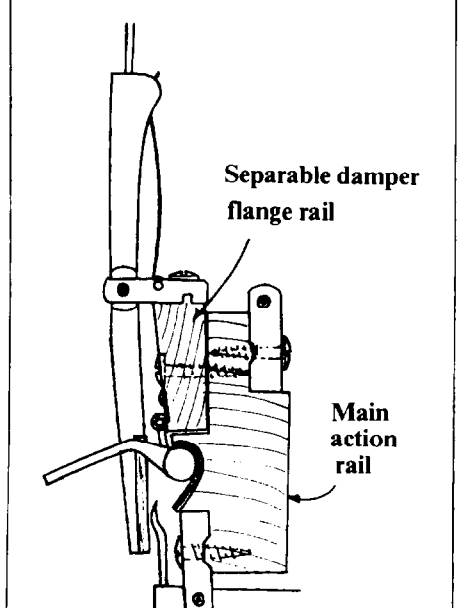


Figure 8

replacing or cleaning damper lever cloth, strengthening damper lever springs, and working on spoons and whippen flanges. I realize that action rails already have plenty of holes drilled into them and that the damper flange screws go into the wood almost in between the hammer flange screws, so that making the rail thicker would be necessary in order to have the dampers be separable from the main action. I would think that the aluminum action rails, though, wouldn't present much problem in re-design to incorporate this feature."

—David Nereson
Denver, Colorado

ANSWER: The only problem I can see with this design, aside from the additional cost of manufacture, would be that it would push the hammer butt flange center considerably farther away from the string. This would require a set of hammers with extra-long moldings, which means they would whip more than ordinary hammers on a hard blow, which means heavier shanks would be required, which of course means there would be a tendency toward woodiness in the sound. I think David is right in saying that the action would be more serviceable with this feature, and also in the assumption that it could be better incorporated into an aluminum action rail design than into a wooden one. The aluminum rail requires less material, which could easily mean that it would be possible to add this feature while retaining the butt-flange-center-to-string dimension.

Multi-Purpose Tool Contest

It has taken half a year to get underway, partly because of our long lead times for publication, but we are finally ready to proceed. Our very first entry has to be one of the most beautifully finished tools one would ever expect to see, and the fact that it was made as a prank gift to another technician does not lessen the value of the craftsmanship with which it was fashioned. Pictured in **Fig. 9**, this tool was made by Ron Nossaman of the Wichita Chapter, especially for Tony Novinski, same chapter, who has understandably dubbed it "Tony's Tuning Hammer." Tony lists the following possible uses for the tool:

"This tool can be used to (1) tune a piano; (2) lift certain coils; (3) open stuck lids; (4) remove ivories; (5) remove rubber-headed nails; (6) remove casters; (7) tap in loose tuning pins; (8) remove loose tuning pins; (9) remove bridge pins; and (10) discourage dogs."

Moving right along, as they say in the late-night talk shows, we have another entry which is, I think, a bit more serious. **Fig. 10** illustrates what appears to be an ordinary screwdriver with a notch in it; but Joe Meehan of the Maine Chapter assures us that it's more than that:

Dear Jack,

Enclosed is my entry for the great multi-purpose piano service tool contest. Obviously, I came up a little short this month and figured that if I won this contest I would have enough to live on for hours.

At first glance this looks like a regular screw driver that has been tapered a bit and notched 1/16" at one end. Don't let appearances fool you! What we have here is actually a regular screw driver that has been tapered a bit and notched 1/16" at one end. See how people rush to judgement!

Here's the perfect tool. I'm living proof that any idiot can make one in fifteen minutes with a screw driver and a file. What can it do? The list is practically endless.

I (possibly along with a hundred others—but I'm the one taking ALL of the credit) invented this as a sort of string hook that pushes instead of pulls. So it . . .

1. *Lets you do the opposite of a string hook:*
   a. *Helps guide string through, under, and around V-bars, agraffes, etc. in stringing.*
   b. *Helps straighten and even coils when stringing with the tuning pin in the block.*
   c. *Seats strings on bridges and hitch pins.*
   d. *Works to alleviate false beats (see PTJ June 83, page 14, for a better tool).*
   e. *Bends high strings downward to level for fine seating of dampers and hammer strike.*
2. *Bends bridge pins.*
3. *Squares keys (bends balance rail pins).*
4. *Can be easily used to position hammer and jack springs.*
5. *Makes it easier to tune Rhodes electronic pianos. (Just place the adjustable tuning spring in the notch and gently nudge into position.)*
6. *Slips under, and with a firm upward motion, quickly removes old punchings off of front and balance rail pins.*
7. *Works good for prying out old rubber headed nails, tacks, buttons and screws with stripped holes.*
8. *Still can be used as a regular*

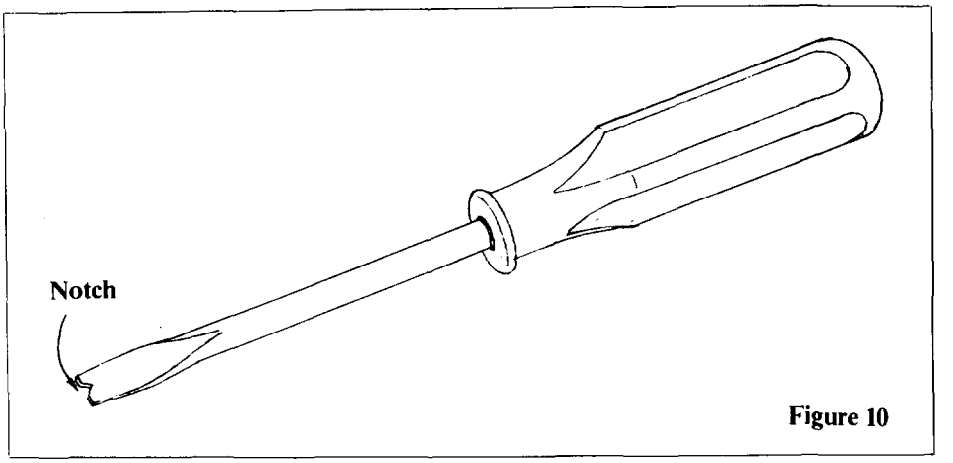


Figure 10

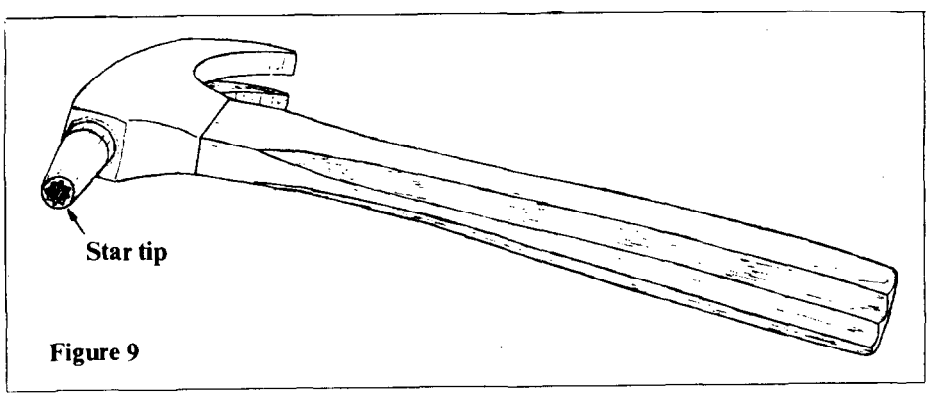


Figure 9

screw driver and will sometimes stay in the slot better than a non-notched one.

I use two of these; one of steel, the other of brass, to help prevent damage to strings and pins.

I call this tool "the Joseph Anthony Meehan regular screw driver, tapered a bit with a 1/16" notch." (so named after its founder-in-chief)

All the best,
Joe

P.S. I'm working on a curved model.

READER COMMENT

I read with interest Jerry O'Connell's article about his "false beat suppressor." I don't think pushing strings is anything new but I first learned about it from the "Wurlitzer team" at a Boulder, Colo., seminar in, I believe, April of '81. You were there also. I had not thought about what Jerry had to say about false beats becoming more numerous after a pitch raise due to moving the "set" which is formed in the wire around the bridge pins. When the string is pulled up, a tiny portion of this set appears in the speaking length.

I believe that, basically, false beats are caused by bad piano wire and/or twisting or otherwise mishandling the wire when stringing. I have found that imperfect or twisted wire can be pushed very effectively but it takes a lot of work. New pianos which have never needed pitch raising have more than a fair share of wild strings—especially cheaper pianos. I have eliminated beats in a lot of these wires just by a process of repeated pushing.

Jerry describes two methods of pushing—gradual pushes or short jabs. I favor the strong, gradual pushes but the strings must be pushed hard. The string should be pushed in different locations up and down the wire as length allows. Sometimes a repeated process of pushing—tuning—pushing—tuning, etc., can be more effective than doing it just once. The tool should not be allowed to slip on the string and it is probably best to use a tool made of brass or aluminum.

If one wants to push strings on a wholesale basis, it would be better to remove the action. You should remove all tools, etc. from the top of a vertical because such pushing will have everything falling. It's really best to remove the piano lid and locate the piano snugly against the wall. If you don't do this the piano will do a lot of rocking back and forth. This is bound to take some of the effectiveness out of the pushing, to say nothing of the customer's look of dismay to see you "tuning a piano like that."

I haven't tried this but I have thought that a better job could be done by laying the piano on its back and using the conventional string stretcher with the wheel. Maybe someone who has done it could tell us how it works. Just as Jerry says, wild strings are not limited to the upper treble. I very frequently hear beats in the mid-scale but they are usually less detectable. Nonetheless, if one is having trouble coming to a decent unison, you can bet there is a false beat involved.

In conclusion, I will say that if I were in the business of manufacturing pianos I would concentrate efforts on getting rid of this "bug-a-boo" once and for all. Nothing can make a piano sound so tinny and junky. If tuners in the field can eliminate false beats by such antiquated methods, think how much better factories could do it—if they just would. They could put into use much more sophisticated equipment than the tuner can carry around. If they would use the very best grade of wire for even the cheapest pianos, didn't twist it or mishandle it in any way and rolled it several times after stringing, I think we would hear far fewer false beats.

—Marvin Snell
Scottsbluff, Neb.

In Conclusion

It is with a great sense of loss that we observe the passing of any colleague, but Don Galt's contribution to the technical community was so great that it deserves special mention here. For eight and a half years, March 1969 through August 1977, Don served with distinction as Technical Editor of the PTJ. During his tenure, the level of competence within the PTG rose markedly, due in part to the excellent articles he wrote.

Don was a fine technician, excellent writer, diplomat, inspiration to others and, perhaps most important of all, a thoughtful person. He will be sorely missed.

Sound Background

Mathematical Theory of 1/4-Comma Meantone Temperament

by Jack Greenfield, RTT
Chicago Chapter

Comparison of Intonation

While there has been an awakened interest in the history and application of historic temperaments during recent decades, much less attention has been directed to the mathematical theory of such tuning. One of the few references available to those interested in the subject is: "Theory and Tuning: Aron's Meantone Temperament and Marpurg's Temperament 'I'" by John W. Link, Jr., published by Tuners Supply Company, Boston, Massachusetts in 1969. Link goes into great detail on mathematical relationships. Although his emphasis is primarily on 1/4-comma meantone, the material presented aids in understanding the later historic temperaments which replaced "Aron's Meantone." Much of the information in this article is based on Link's book.

SEQUENCE OF FIFTHS

Pitch in cents (to nearest whole number)

Intonation	A^b	E^b	B^b	F	C	G	D	A	E	B	$F^\#$	$C^\#$	$G^\#$
Pythagorian	792	294	996	498	0	702	204	906	408	1110	612	114	816
Equal Temperament	800	300	1000	500	0	700	200	900	400	1100	600	100	800
1/4-comma Meantone	814	310	1007	503	0	697	193	890	386	1083	580	76	773
Just	(+1) 814	(+1) 316	(+1) 1018	(0) 498	0	(0) 702	(0) 204	(-1) 884	(-1) 386	(-1) 1088	(-1) 590	(-2) 71	(-2) 773

The table shows Pythagorian tuning and temperaments developed later as successions of fifths. The just or pure Pythagorian fifth based on a string length ratio of 3/2 or 1.5 has a value of 702.0¢ in modern pitch units. The difference between initial A^b and $G^\#$ the thirteenth note is the interval known historically as the Pythagorian or ditonic comma, almost a quarter semitone or 23.5¢ in modern units. However, since the normal keyboard has only twelve notes, the cycle must be completed by the diminished sixth or "wolf" fifth $C^\# A^b$, 677.5¢.

"The earliest general use of equal temperament for music performance in Europe occurred in the tuning of the six-string lute."

The earliest general use of equal temperament for music performance in Europe occurred in the tuning of the six-string lute. Vincenzo Galilei, in the late 16th century observed that an 18:17 ratio for placement of frets gave approximate equal temperament. In terms of more accurate historical theory, the fifth was reduced 1/12 ditonic comma—approximately 2¢ in modern units, to give a closed circle of uniform fifths.

In the most widely used form of meantone temperament, fifths were reduced to produce just or pure major thirds, 386.3¢ in modern units. The interval between the Pythagorian major third, 407.8¢ and the just major third is historically known as the syntonic comma, 21.5¢ in modern units. The fifths therefore are reduced by 1/4 comma, or to 696.6¢. The deficit accumulated in the complete sequence of fifths results in a final wolf $C^\# A^b$ of 737.7¢, almost a half semitone larger than the others.

Just temperaments retained most pure fifths but interrupted the sequence by placement of fifths reduced by a syntonic comma to 680.5¢ to give separate clusters of just thirds. The table shows a typical example of a just temperament. Others vary in the number of pure thirds and fifths and their location in the sequence.

The numbers in parenthesis above the line of figures for just intonation indicate the pitch difference from Pythagorian intonation in syntonic commas, for example (+1) signifies 21.5¢ higher. In this temperament, the tempered fifths or fourths are those formed by B^b F, D A and $F^\# C^\#$. The final wolf fifth has a value of 743.0¢, almost a half semitone larger than a just fifth.

Just temperaments and others formed by a non-uniform sequence of fifths, excluding the final wolf, are classified as irregular. In these, other intervals also vary in size. In regular tunings and temperaments all intervals formed by ditonic notes are uniform in size for each particular intonation.

Our musical staff notation was invented for Pythagorian tuning and historic temperaments in which the pitch of enharmonic sharps and flats was not the same. Equal temperament eliminated the difference. This is shown by figures in the table. Pythagorian A^b is 23.5¢, a ditonic comma flatter than $G^\#$. The interval is the same for the other enharmonic pairs with the tuning sequence extended in either direction. In 1/4 comma meantone, A^b is 41.1¢, nearly two syntonic or almost a half semitone sharper than $G^\#$. In meantone temperament any difference between enharmonic sharps and flats is known as a *diesis*.

"Our musical staff notation was invented for Pythagorian tuning and historic temperaments in which the pitch of enharmonic sharps and flats was not the same."

Acoustical Qualities of Meantone Temperaments

Just temperaments were not adopted for practical music because with each of them the number and placement of unacceptable intervals allowed use of only the simplest harmonic structure. Meantone temperaments, however, because of their favorable musical and acoustical qualities, were successful as the replacement for Pythagorian tunings. While the pitch difference between enharmonic sharps and flats caused problems for keyboards, from another standpoint the difference can be considered a musical virtue in providing a greater variety of intervals and musical colors. Meantone intonation has more than twice the number of intervals found in equal temperament. E $G^\#$ does not sound like E A^b nor $G^\#$ C like A^b C. Enharmonic differences are even more pronounced in the formation of chords. For example, in equal temperament, the diminished chord C $D^\#$ $F^\#$ A sounds the same when written C E^b G^b A or in the other enharmonic equivalents. In meantone, however, there would be a different sound for each of the combinations of sharps and flats possible.

In 1/4-comma meantone temperament, the diatonic major thirds and their inversions, the minor sixths are beatless. Fifths are tempered 1/4 comma flatter; their inversions, the fourths, are tempered 1/4 comma sharper than just. Minor thirds are also 1/4 comma flat and their inversions, major sixths, 1/4 comma sharp. In equal temperament, major thirds and minor sixths are tempered by 2/3 comma and minor thirds and major sixths are tempered by 3/4 comma from just. Pythagorian major thirds and major sixths differ from just by one full syntonic comma. In historical theory, unless more precision was required, it was often customary to consider the syntonic and ditonic commas as equivalent.

Under some conditions, a psychoacoustical effect known as the *difference tone* is produced which enhances the sound of just intervals. When the ear hears two fairly loud tones together, for example, sounds of A_3-220Hz. and E_4-330Hz. a pure fifth higher, a third tone A_2-110Hz., the difference tone will also be heard. Research has shown that the difference cannot be detected by a frequency meter but is a *subjective* tone created in the ear. The same effect occurs with 5/4 pure thirds and other pure intervals with simple ratios in Pythagorian tuning, meantone, just and other historic temperaments.

"Under some conditions, a psychoacoustical effect known as the difference tone is produced which enhances the sound of just intervals."

Another desirable sonic effect is the production of "ornamental beats" by intervals composed of tones tempered from just to the same extent, even though in opposite directions. In 1/4-comma meantone temperament, when

the first coincidental partials of the identically tempered fourths, fifths, minor thirds and major sixths are the same, their beat rates will also be identical, otherwise the beats are proportional in simple ratios. For example, in the chord C_4 E^b_4 G_4 C_5, C E^b_4 E^b_4 C_5 and G_4 C_5 will each give 4.90, and C_4 G_4 will give 2.45 beats per second. The pure major third E^b_4 G_4 will be beatless but will produce the difference tone E^b_2 two octaves lower. The low bass tone combined with the strong reinforced beating of the intervals produces a rich resonant sound.

In Pythagorian tuning, major thirds are sharper and minor thirds are flatter than just by the same degree, a syntonic comma. When such thirds are combined in a triad containing a pure fifth the enhanced acoustical effect of difference tones and ornamental beats also occurs. In equal temperament the closest approach to the sound of ornamental beats is heard in the third inversion of the dominant seventh chord. For example, in B^b_3 C_4 E_4G_4, B^b_3 G_4 gives 10.57 beats and C_4 E_4 gives 10.38 beats per second, close enough to produce emphasized beat sound.

Difference tones and ornamental beats are most noticeable with the pure tones of an organ. In keyboard stringed instruments, inharmonicity diminishes the effect.

Meantone Microtonal Temperament

The physical design of the keyboard made it impractical to develop the musical potential of 1/4-comma meantone temperament to its fullest extent. Instruments with seventeen-note octaves including separate keys for sharps and flats were constructed but performers found these and even thirteen-note octave keyboards less desirable than the later temperaments for twelve-note octaves. This did not halt the theoretical study of 1/4-comma meantone tuning extended to microtonal thirty-one-note octave. The sequence can be visualized as consisting of two complete cycles of twelve notes each plus a partial cycle including only the seven white notes. Another concept is a sequence running from G^{bb} to A^x (double sharp). The thirty-one-division octave was first described by Vicentino in 1555 and discussed again later by other theorists including Salinas and Mersenne. In 1724, the physicist Christian Huygens showed by logarithms that 1/4-comma meantone temperament was equivalent of a portion of thirty-one-division equal temperament. The physical limitations of the twelve-note keyboard instruments have held back further study.

"The physical limitations of the twelve-note keyboard instruments have held back further study."

Tuning Procedures

The method used during the first half of the 19th century by professional tuners in England before abandonment of meantone temperaments according to Ellis, was by tempered fifths and octaves. In Ellis's view, accuracy was difficult to obtain and occurred only haphazardly. Recent printings of White's "Piano Tuning and Allied Arts" contain such a procedure. Further uncertainty is added by some obvious discrepancies in White's figures for beat rates which do not check with figures published elsewhere, although White's data for pitch frequency and cents deviation from equal temperament is the same as others.

Another method advocated by more recent authorities is to tune the first four notes in tempered fifths and fourths and then complete the series by tuning in pure major thirds.

For example, Link's first notes and beat rates when A_4 = 440Hz. are: A_3 D_4-2.74, A_3 E_4-2.05, B_3 E_4-3.06, and octaves A_3 A_4 and B_3 B_4. The remaining white keys are tuned by major thirds and checked by the equal beating of the fourths and major sixths and their inversions. For example, after tuning F_3 to A_3, the equal beating of F_3D_4 and A_3D_4 as separate intervals or in the triad $F_3A_3D_4$ is a check verifying F_3A_3 as a pure beatless major third. The black keys are then tuned and checked in the same way.

Jorgensen's equal beating procedure for the Aron Meantone (1/4-comma)

Temperament in "Tuning the Historical Temperaments by Ear" uses major thirds, augmented seconds and octaves in tuning. An important check is the equal beating of the fourth descending and the augmented second and fifth ascending from a common note. For example, after tuning C_4, C_3, E_3 and $G^{\#}_3$ in successive beatless intervals, F_3 is tuned so that the augmented second $F_3G^{\#}_3$ beats at the same rate as C_3F_3 and F_3C_4 The beat rate calculated on the basis of middle C = 261.63Hz. is 1.6. The equal beating of the fourths and major sixths also serves as a check on pure major thirds. The procedure in "Meantone Tuning" by Marvin B. Tittle (*The Piano Technicians Journal*, June 1977, p. 14) is similar to the preceding. Jorgensen has also presented several alternate methods for the Aron Meantone Temperament.

Just as in tuning equal temperament, comparing beat rates of different intervals makes it possible to tune more precisely even in the presence of inharmonicity. Equal or proportionate beat rates are even more pronounced in the minor triads that can be formed. The relation between beat rates remains the same regardless of starting pitch. In electronic tuning meantone temperaments, steps must be taken to compensate for inharmonicity also, as in equal temperament.

The traditional tuning of meantone temperament with three sharps and two flats gives the major scales of $B^{\flat}$, F, C, G, D, and A and the minor scales of A, D, and G. Black keys are tuned otherwise if required by the composition. Generally notes should never be used enharmonically except when played briefly as passing notes. For compositions containing passages with extensive use of chromatics, other temperaments may be preferable.

Continuing Education

CONCERT PIANO PREPARATION, Part I

Stephen H. Brady, RTT
Seattle Chapter

Most piano technicians have the opportunity to experience many different facets of piano work. While comparatively few of us actually specialize in tuning and preparation of fine concert instruments, I think most of us, at one time or another, are called on to perform this service. My first concert tuning experience came when I was barely three months out of tuning school. The pianist was famous and I was nervous. Nothing really terrible happened on that occasion, and for the next few years, one of my regular duties was to care for that same piano whenever it was used in a concert. When I took this university job a few years ago, I assumed responsibility for a stable of concert grands now numbering five (representing three different makes) which are used for both performing and recording. In addition, I frequently take calls from promoters in our area to tune for performances at different halls in the city. Since most technicians may expect to do this sort of work at some time, I would like to share some of what has "rubbed off" on me so far, during my own continuing education.

Like nearly all areas of piano work, concert piano preparation consists of two basic types of work: working with pianos, and working with people. These two aspects are equally important and necessary; no matter how brilliant the technician, if he can't communicate and assume certain responsibilities toward the people who are necessarily involved with the piano, he will ultimately fail. I've found that customers are usually quite willing to exchange a small amount of technical brilliance for a large amount of conscientious and responsible behavior. On the other hand, a technician may have "personality plus," always be on time, and charge the lowest rates in town, but without technical expertise, will not be able to "cut it" where piano performance is a critical factor. So, both are necessary. Let's talk first about working with pianos.

Tuning

Even if you have the job of caring for a given concert piano on a long-term basis, tuning is the job you will be asked to do most often. Tuning is still an indispensible job before each performance. When we speak of *concert* tuning, we imply that it is somehow different than ordinary, everyday tuning. Actually, I think of only one real difference, and that is the one touched upon by Yat Lam Hong a few years ago.[1] That difference deals with the concept of "point of diminishing returns," a point which is reached much sooner with the average home piano than with the average concert grand. What it means is this: on a good concert grand, it is worth our time to be especially nit-picky about our tuning, because the extra time spent translates to a discernable difference in the finished product. This would apply to the areas of regulation and voicing as well.

Within the realm of "concert" tuning, every part of the tuning is important, but we must give special emphasis to unisons and tuning stability. At this point, I still hold with the belief that beatless unisons are important to a tuning because of the crisp, clean effect they give it. I have yet to be convinced that a unison with a two-cent spread is in any way desirable. Unisons drift rapidly enough without our setting them "on the edge" to begin with, and the average layman will complain about bad unisons long before hearing misaligned octaves or uneven temperaments. For these reasons, we should pay close attention to unisons, going over them two or even three times in the course of a concert tuning.

"Like nearly all areas of piano work, concert piano preparation consists of two basic types of work: working with pianos, and working with people."

The other area of special emphasis is tuning stability. Conditions are often aggravated by circumstances surrounding the piano, such as temperature and humidity fluctuations in the hall, the fact that concert instruments are often brought in from somewhere else, and must readjust to the hall, and the fact that, in performance, a piano often undergoes extremely heavy playing. In light of these factors, we must make sure that, when we tune the piano, we are hitting the keys at least as hard as the pianist will, and that, before tuning, the piano has acclimated as well as possible.

I will never forget the time I had to hurry through a concert tuning and managed not to hit some of the keys as hard as I should have. Sitting in the fourth row at the concert that evening, I was mortified to hear B♭50 suddenly become a very wild unison during a stressful part of the Schumann *Fantasy*. Thereafter, the note was played often in some very exposed melodic passages, and I cringed each time I heard it. At intermission I hurried onto the stage to touch up the unison, and was greeted by a smattering of applause. As I bent over the piano, someone shouted, "It's the

B♭!" Needless to say, I was thoroughly embarrassed.

By thoughtful practice, a technician can overcome problems with unison tuning and tuning stability. Tuning tutors at PTG conventions can be helpful even to experienced tuners, sometimes spotting small deficiencies which have become ingrained in our technique over the years. I find it instructive to watch others tune and see their methods of pin-setting. By experimenting with different hammer techniques and measuring slippage with a good electronic tuning aid, a tuner can learn a lot about which method works best for him or her. A machine with one-tenth cent accuracy is a great help in honing unison tuning as well.

One other aspect of tuning that is sometimes critical is the pitch of the A itself. While a small error is usually not disastrous in a home tuning, it may well be in a concert tuning, particularly where other instruments (especially oboes and flutes) are involved. Many musicians are acutely aware of pitch and how a change in pitch can affect their sound and performance. Even if you feel this sensitivity is more psychological than real, you would be well advised to adhere scrupulously to setting A as close to 440 hz. as you can. Many musicians now own small electronic tuners, and some of them like to check the pitch of the piano, so the closer you can get the pitch to 440, the better off you'll be in that respect as well.

Where conditions permit, I like to tune the piano thoroughly several hours before the performance, even before any rehearsal, and then return to go over problem areas again shortly before the performance. I find if anything is going to slip, it will do it during rehearsal, and I can concentrate on such problems when I touch up the tuning before the performance.

Regulating

Although when talking about regulation we usually think about the action, one regulation item of extreme importance to many performers is pedal regulation. So many aspects of shading and nuance in fine playing are controlled by the pedals, we need to be sure that the damper pedal lift is even throughout, that the shift pedal moves the action noiselessly and provides a different tone color (but not *too* different!) and that the sostenuto mechanism works properly.

"Tuning tutors at PTG conventions can be helpful even to experienced tuners, sometimes spotting small deficiencies which have become ingrained in our technique over the years."

Uneven damper lift at the pedal can cause a performer real grief. The sound of a damper coming down later than the others around it as the pianist releases the pedal slowly in a pianissimo passage can utterly destroy the mood and effect of the piece. A late-lifting damper, on the other hand, makes it hard for the pianist to be sure each note will be sustained if the pedal is only partially depressed (the damper pedal is more than an on-off mechanism to a good pianist). If there is any unevenness in damper lift, such techniques as half-pedalling become ineffective at best.

Some artists depend on the shift pedal more than others, and what they want it to do tends to be a personal matter. If it doesn't provide enough change in tone for a performer, this change can be increased by light needling on the left side of the hammer crown. If there is too much change when the shift is applied, try brushing the hammer crowns with a suede brush to soften the felt in the string grooves.

With regard to the action itself, the word is evenness, especially in aftertouch, touch weight, and let-off. Another important item is the repetition spring.

The aftertouch determines, to a large extent, how comfortable the pianist will be in playing a particular piano. If the aftertouch is too great, the action will feel slow and cumbersome. If too little, the pianist will complain of a "too-shallow" touch and will feel a lack of solid power.

For touch weight, most artists prefer an action requiring between 50 and 55 grams of downweight on a concert piano, although they sometimes like a little heavier action on a practice instrument. Again, the really important factor here, and with let-off, is evenness from note to note.

Repetition springs are often set too strong, probably by technicians who feel that if a little is good, then a lot is better. With overly-strong repetition springs, particularly in the tenor and bass, a pianist will have difficulty controlling the action in soft playing. Set properly, the springs should not cause the hammers to jump up jerkily from checked position, but to rise smoothly and without hesitation.

To be continued.

Notes

[1]See "How In-Tune is Really In-Tune?" *Piano Technicians Journal,* starting with Aug. 1977, p. 18. Article continues in Sept. 1977 and Oct. 1977.

The Eclectic's Notebook

Christopher S. Robinson
Connecticut Chapter

It is almost time now to move into the question of the piano hammer, which following only the soundboard, assumes the major role in determining the quality, the quantity, and the consistency of the tone which the instrument we are servicing will produce. Before entering that discussion in earnest, however, I find that I must digress into a somewhat philosophical presentation to my reader. The reason for this is that we all must work from a point of view, just as we all lead our daily lives from a point of view, whether or not the time has been taken to articulate it.

Ask any first-rate piano tuner his or her philosophy about the way that instrument should sound when properly tuned, and you will get a very strong (and probably opinionated) answer. Ask the same question of someone who is recognized for excellent regulation or voicing work and the responses will be similar in character.

The point is that we cannot work toward a goal without having identified it; as we cannot participate on the playing field without having some idea of what the rules are or how to handle the ball. It is not sufficient merely to follow steps one through ten in specified sequence when attempting to move down the field, because there is always the opposition, meaning specifically the unpredictable.

The modern piano is constructed of numerous opposing forces, all of which must be kept in balance with each other, and none of which can be allowed to predominate over the others. In article two the concept of *compliance* and *impedance* was introduced. In piano language, *compliance* is the willingness of the instrument's component parts to be bent, deflected, moved or shaken. *Impedance* is the resistance of those same parts to movement. *Compliance* uses up the energy that goes into setting its parts into motion. *Impedance does not use up the energy that attempts to move it, because that energy is not absorbed by the part which refuses to be moved.*

Think again of the Hawaiian guitar that was mentioned in the first of these articles. It has a heavy steel body and no soundboard. If it were not for the fact that the player could plug in the instrument's magnetic pick-ups to an outside source of energy (electrical), one would barely be able to hear it played at all. And yet, because of its weight and heavy construction and the attending fact that it resists being moved by the vibration of its strings, the Hawaiian guitar has an extremely long *decay* time. The strings continue to vibrate because their energy is not absorbed.

Let's also look back at the banjo in the same article. Here, in the drumhead, we can see a highly compliant soundboard. There is almost nothing to inhibit its free movement except the pressure of the strings themselves. The (unmuted) banjo, as we all know is very loud, characterized by an explosive *attack* and a very quick *decay*. The banjo decays quickly because the energy of its strings is rapidly assimilated by the drumhead soundboard in its construction. The different degrees of compliance and impedance which are built into the construction of our piano are going to, in large part, decide what the nature of the sound it produces is going to be. It's odd, isn't it, that two such opposite forces should be brought together to make the whole function in the intended manner!

"The modern piano is constructed of numerous opposing forces, all of which must be kept in balance with each other, and none of which can be allowed to predominate over the others."

Let's look into this a little further. The piano also possesses considerable *tension* and *compression* within its construction. There is the tension produced by the stretched music wire within the string band (scale). There is the attendant compression of the iron plate and the wooden superstructure. These forces also must be kept in balance, for if the tension of the strings were not offset by the compression of the superstructure, the instrument would be torn apart (as most of the very early pianos and harpsichords attest). The tendency of the soundboard to push up is balanced by the desire of the string band to push down (downbearing). The felt squeezed together on the inside of the piano hammer is contained by outer layers of the same felt which are stretched by the constant desire of the inside to expand.

Always, the balance of these opposing forces determines the potential of the instrument for doing our work; in this case the emission of organized sound.

When we strike a key with our finger, we set into motion a series of mechanical reactions which temporarily upsets the balance of opposing forces in the piano. It is the natural tendency of the object to reassert its equilibrium. The tone we hear coming from the piano is the result of our disturbing its equilibrium,

"Always the balance of these opposing forces determines the potential of the instrument for doing our work; in this case the emission of organized sound."

and its violent desire to return to its original balance of opposing forces.

The greater the difference between each of the two equally opposing energies, then, produces a greater potential for disturbing the static balance of those opposites. The greater this potential, then the more "raw material" we have to work with as tone regulators.

If our iron plate gives way, and there is no compression in the scale, the potential for sound will be greatly reduced (forget that you will not be able to tune it). If the soundboard collapses, the difference between the downward pressure of the strings and the upward pressure of the bridges will largely be lost, and with the loss of the difference comes loss of potential. When the piano hammer has no tension or compression, the difference of those forces is lost when the hammer strikes the piano string; it will not have a violent desire to return to its original state, and therefore it will not bounce or rebound off of the deflected string using its own energy. It will come away from the string because the string throws it off.

All of the component parts, particularly the ones which oppose each other in stresses and energy, should be properly matched to do the job. When they are not, the characteristic of the instrument will primarily be determined by the dominant feature of its strongest component. Next month we'll begin to look at the piano hammer.

It's the Little Things That Count!

Gerald F. Foye
San Diego Chapter

Running the keyboard isn't a new idea; yet, how many of us fail to do so? It's the first thing we should do to locate trouble spots before tuning and the last thing to be done to catch problems that might otherwise require a free return visit.

Some problems that could develop might be interference caused by key leveling, dampers sustaining after regulating the damper sustain pedal, malfunctioning notes due to a jack or hammer spring out of position, or a multitude of other gremlins that plague us piano technicians.

On spinets and consoles with a keystrip that is supported near the middle with a threaded stud, be certain that those nuts are tight. Failure to do so might result in a return call when the bottom nut winds itself down against a key.

Piano case components can even cause problems such as sympathetic vibrations with loose parts; especially hinges, music racks, and sometimes inset panels on older instruments.

If nothing else, at least we can catch that one unison that slipped.

Unfortunately the system isn't foolproof since there is no protection against those sounds that develop after you've gone when Mrs. Jones puts all those decorative ornaments back on top of the piano; or, the customer who calls to complain about those ringing notes in the last octave and a half and you go all the way back only to realize that she didn't understand there never were any dampers in that section—"Oh! Is that the reason? I was always going to ask you about that!"

THE WORLD'S MOST INSIGNIFICANT AND USELESS CALCULATOR PROGRAM

Fred W. Tremper, RTT
Chicago Chapter

Like anyone else, I bought a Texas Instruments 58C calculator and wondered what I was going to do with it. I now had the capability to figure polar coordinates, to calculate *sin, cos,* and *tan,* and to figure anti-logs to unheard-of decimal places. I was now able to figure new stringing scales on pianos, except that I had no stringing scales to figure. After staring at those wonderful buttons for a month or so, I decided to read the instructions. (After all, when all else fails, read the manual, right?) I had already figured out how to add, subtract, multiply and divide, which until now had served me quite well in life.

I worked out a few simple programs that rar through some mathematical formulas I had figured out (I really don't know if they are original; I am sure they can't be), and I was now able to find the frequency of any note on the piano (where 1 is the lowest A and 88 the highest C). Never mind that all I had to do was look in a book to find these frequencies.

Here is the formula I came up with:

$$\sqrt[12]{2}\,(M-49) \times 440 = F$$

To explain this formula, let's look at its components. We know that in music the pure octave is a fundamentally important interval. We divide the octave into twelve equal parts. To do this we must find a number that answers the question,"What number multiplied by itself twelve times equals two?" The answer to this question is the twelfth root of two, which is expressed

$$\sqrt[12]{2}$$

If you have a slide rule or know how to extract square roots and have a day or two to spare, you can figure it out; or you can go to the calculator and punch in:

$$2 \text{ INV } y^x \text{ } 12 = 1.059463094$$

(I am sure there are more decimal places, but this is as far as my calculator will go.)

This means if you have a given frequency, say A-49 (440 c/s), and want to know the frequency (F) of A#-50, multiply (don't add) 440 by 1.059463094:

$$440 \times 1.059463094 = 466.16$$

(which is 466.1637615 rounded off to two decimal places. We will round off to two decimal places from now on.)

You can find the frequency of B-51 by multiplying 466.16 by $\sqrt[12]{2}$:

$$466.16 \times \sqrt[12]{2} = 493.88$$

Now, suppose you want to find the frequency of C-52 and you know only the frequency of A-49. You would multiply 440 by $\sqrt[12]{2}$ raised to the third power (C-52 is three notes higher than A-49):

$$440 \times \sqrt[12]{2}^{3} = 440 \times 1.19 = 523.25$$

If you want to find the frequency of a note one step lower than A-49, divide 440 by $\sqrt[12]{2}$:

$$\frac{440}{\sqrt[12]{2}} = 415.30$$

The formula works by plugging in the note in the piano whose frequency you want; for example, C-40, middle C, in place of n:

$$\sqrt[12]{2}\,(40-49) \times 440 = 261.63$$

To program this on the calculator, press the following:

Key Sequence	Location	Key Codes
2nd CP		
2nd CMs		
CLR		
LRN		
2nd lbl	000	76
A	001	11
STO	002	42
0	003	00
R/S	004	91
2	005	02
INV	006	22
y^x	007	45
1	008	01
2	009	02
y^x	010	45
(	011	53
RCL	012	43
0	013	00
-(minus)	014	75
4	015	04
9	016	09
)	017	54
X	018	65
4	019	04
4	020	04
0	021	00
=	022	95
2nd fix	023	58
2	024	02
R/S	025	91
LRN		

After you have done this, you operate the program by:

1. Entering the note of the keyboard, say 40
2. Pressing A
3. Pressing R/S

The calculator will do its thing and display 261.63, the frequency of C-40.

Go back to the program and note the key sequence 24. The number 2 fixes the number of decimal places in your displayed answer. On the 58C calculator you can plug any number from zero to nine.

Note also key location 20-22 (440). If you want to find the frequency of a note when A-49 is at, say 442 c/s, change key location 22 from zero to 2.

A second formula will find the note of any given frequency. The formula is a bit more complicated, at least it looks

that way; but to the calculator it's a breeze:

$$\left(\frac{\log(F)}{\log \sqrt[12]{2}}\right) + 49 = N$$

Here we plug in 261.63 in place of F:

$$\frac{\log\left(\frac{261.63}{440}\right)}{\log \sqrt[12]{2}} \times 49 = 40$$

You program this formula by pressing:

Key Sequence	Location	Key Codes
2nd CP		
2nd CMs		
CLR		
LRN		
2nd lbl	000	76
A	001	11
STO	002	42
0	003	00
R/S	004	91
(	005	53
RCL	006	43
0	007	00
÷	008	55
4	009	04
4	010	04
0	011	00
)	012	54
2nd log	013	28
÷	014	55
(	015	53
2	016	02
INV	017	22
y^x	018	45
1	019	01
2	020	02
)	021	54
2nd log	022	28
+	023	85
4	024	04
9	025	09
=	026	95
2nd fix	027	58
2	028	02
R/S	029	91
LRN		

The program works by:

1. Entering the frequency, say 174.61 c/s
2. Pressing A
3. Pressing R/S

The calculator will calculate and display 33, the note of the keyboard with the frequency 174.61 c/s.

Since the 58C has enough room to contain both formulas, you can get fancy and use "A" if you want the frequency of a given note and "B" if you want the note of a given frequency:

Key Sequence	Location	Key Codes
2nd CP		
2nd CMs		
CLR		
LRN		
2nd lbl	000	76
A	001	11
STO	002	42
0	003	00
R/S	004	91
2	005	02
INV	006	22
y^x	007	45
1	008	01
2	009	02
y^x	010	45
STO	011	42
1	012	01
(	013	53
RCL	014	43
0	015	00
-	016	75
4	017	04
9	018	09
)	019	54
X	020	65
4	021	04
4	022	04
0	023	00
=	024	95
2nd fix	025	58
2	026	02
R/S	027	91
2nd lbl	028	76
B	029	12
STO	030	42
2	031	02
R/S	032	91
(	033	53
(	034	53
RCL	035	43
2	036	02
÷	037	55
4	038	04
4	039	04
0	040	00
)	041	54
2nd log	042	28
÷	043	55
RCL	044	43
1	045	01
2nd log	046	28
)	047	54
+	048	85
4	049	04
9	050	09
=	051	95
2nd fix	052	58
2	053	02
R/S	054	91
LRN		

The program works by:

1. Entering a note number, say 8
2. Pressing A
3. Pressing R/S

The display will read 41.20, the frequency of E-8.

You can do the reverse by:

1. Entering a frequency, say 41.20
2. Pressing B.
3. Pressing R/S

The calculator will display 8, the note on the keyboard with a frequency of 41.20 c/s.

I am now working on a formula and a program that will give the frequency of a note when an octave is expanded by a given number of cents. When I get it, I'll let you know.

ON PITCH

Fifth in a Series of Articles Dealing with the Integration and Equation of Aural and Electronic Tuning Techniques

RICK L. BALDASSIN, RTT
Utah Valley Chapter

Last time our discussion presented aural checks and electronic setting instructions for four types of octaves used in tuning the bass of the piano. They were the 6:3, 8:4, 10:5, and 12:6 octaves.

This month our discussion will include aural tests and electronic setting instructions for two types of double octaves, 4:1 and 8:2, and a review of the different types of octaves, with their respective aural checks and classifications, electronic setting instructions, and areas of general use in the piano.

Since double octaves are tuned both up and down in the piano, and the aural tests employ both expanded and contracted intervals, there are four classifications of aural tests. These classifications are the same as those listed previously for the octaves. They are repeated here for convenience.

CLASS A: Lower note is the reference note. If the beat rate between the test note and the upper note is *too slow* as compared to the beat rate of the test note and the reference note, *raise the upper note.* If the beat rate with the upper note is *too fast, lower the upper note.*

CLASS B: Upper note is the reference note. If the beat rate between the test note and the lower note is *too slow* as compared to the beat rate of the test note and the reference note, *raise the lower note.* If the beat rate with the lower note is *too fast, lower the lower note.*

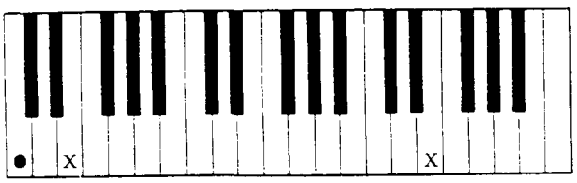
CLASS C: Lower note is the reference note. If the beat rate between the test note and the upper note is *too slow* as compared to the beat rate of the test note and the reference note, *lower the upper note.* If the beat rate with the upper note is *too fast, raise the upper note.*

CLASS D: Upper note is the reference note. If the beat rate between the test note and the lower note is *too slow* as compared to the beat rate of the test note and the reference note, *lower the lower note.* If the beat rate with the lower note is *too fast, raise the lower note.*

The object in each case is to obtain an equal beat rate between the upper and lower notes of the double octave and the test note. The "x" indicates a double octave note, and the "•" indicates the test note. Each test is given a name corresponding to the intervals employed in the test. In naming these intervals, "P" denotes a so-called "Perfect" interval, "M" denotes a "Major" interval, and "m" denotes a "minor" interval.

4:1 DOUBLE OCTAVE (Midrange, Treble)

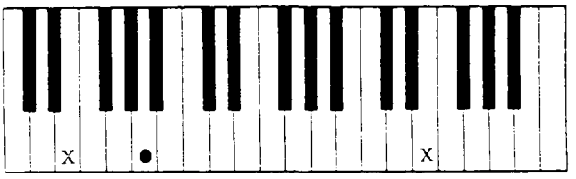
M3 - M17



(Class A)

Test the double octave by playing a M3 below the lower note and a M17 below the upper note.

P4 - P12



(Class C)

Test the double octave by playing a P4 above the lower note and a P12 below the upper note.

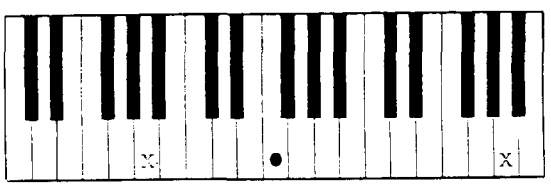
4:1 DOUBLE OCTAVE Electronic Setting Instructions:

On the Upper note

To tune the above example electronically, set the tuner on E7, play E5, stop the pattern, and tune E7.

8:2 DOUBLE OCTAVE (Bass)

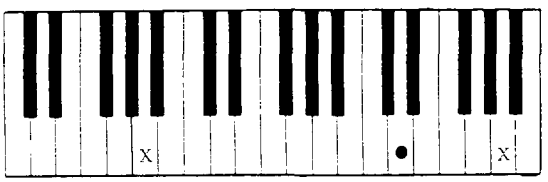
m6 — M10



(Class B)

Test the double octave by playing a m6 above the lower note and a M10 below the upper note.

P11 — P5



(Class D)

Test the double octave by playing a P11 above the lower note and a P5 below the upper note.

8:2 DOUBLE OCTAVE Electronic Setting Instructions:

Octave above the Upper note

To tune the above example electronically, set the tuner on A4, play A3, stop the pattern, and tune A1. You may have to pluck A1 to get a reading.

Prove these aural tests and electronic setting instructions by cross-checking. In the case of the 4:1 double octave, tune the double octave such that the M3-M17 are equal beating. Testing with the other aural test for the 4:1 double octave, the P4-P12 should also be equal beating. Finally, check electronically by setting the tuner on the upper note. Play the lower double octave note and stop the pattern. When the upper note is played, the pattern should be stopped as well. The order of these three tests is unimportant. The double octave could have just as well been tuned electronically and tested aurally. Be sure, however, to use the aural tests and electronic setting instructions for the same type of double octave.

At this point, let us review the different types of octaves and double octave, with their respective aural checks and classifications, electronic setting instructions and areas of general use in the piano.

Octave Type	Aural Tests	Classifi-cations	Electronic Setting Instructions	Area Generally Used
2:1	M10 - M17 P5 - P12	A C	on the upper note	treble
4:2	M3 - M10 P4 - P5	A, B C, D	octave above the upper note	midrange
6:3	m3 - M6 P12 - P5	B B	twelfth above the upper note*	midrange, bass
8:4	m6 - M3 P11 - P4	B D	two octaves above the upper note*	low bass med. pianos
10:5	M6 - m3 A4 - d5	D B	seventeenth above the upper note*	lower bass large pianos
12:6	m10 - m3 P19 - P12	B B	nineteenth above the upper note*	lowest bass large pianos
4:1	M3 - M17 P4 - P12	A C	on the upper note	midrange, treble
8:2	m6 — M10 P11 - P5	B D	octave above the upper note*	bass

* This note may also be used as the strike note to excite beat rates in the bass of the piano where intervals are difficult to hear.

Next month our discussion will include why we need to compromise between the various types of octaves and double octaves, and how to execute these compromises both aurally and electronically.

Coming Events

DATE	EVENT	SITE	CONTACT
Feb. 17-19	California State PTG Convention South Bay Chapter	Queen Mary Long Beach, CA	Herb Sorg 18316 Falda Torrance, CA 90504 (213) 323-6675
March 21-24	Music Educators National Conference	Conrad Hilton Hotel Chicago, IL	PTG Headquarters 9140 Ward Parkway Kansas City, MO 64114 (816) 444-3500
March 25-30	Music Teachers National Association Convention	Galt House & Hyatt Regency, Louisville, KY	PTG Headquarters 9140 Ward Parkway Kansas City, MO 64114 (816) 444-3500
March 29-April 1	Pennsylvania State Convention Erie Chapter	Ramada Inn Erie, PA	David D. First RD 1 Meadville, PA 16335 (814) 724-5221
March 30-April 2	N. Illinois Regional Seminar Chicago & Waukegan Chapters	N. Illinois U. of Music DeKalb, IL	Jack Greenfield 259 Riverside Drive Northfield, IL 60093
April 6-8	Central West Regional Seminar Nebraska Chapter	Westbrook Music Bldg. Lincoln, Nebraska	Richard E. West Westbrook Music Bldg. University of Nebraska Lincoln, NE 68588 (403) 483-6770 (H) 472-2568 (B)
April 12-14	Pacific Northwest Conference Vancouver, BC Chapter	Coquitlam Motor Inn Coquitlam, BC	Karl Verhnjak 20939 - 117 Avenue Maple Ridge, BC Canada V2X 2G4 (604) 467-2225

Industry News

Defebaugh Joins "New Aeolian" Team

Peter M. Perez, chairman and chief executive officer of Aeolian Pianos, Inc., has announced the appointment of industry veteran George Defebaugh as that company's Technical Representative.

In making the announcement, Perez stated that Defebaugh will represent the full line of Aeolian pianos at Piano Technicians Guild-sponsored seminars throughout the country.

Defebaugh is a long-time member of the Piano Technicians Guild and has served PTG as Los Angeles Chapter president, chairman of the California State Conference, a six-year member of the National Executive Board and as an instructor at many PTG conventions and seminars.

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Editor, Auxiliary Exchange

JULIE BERRY
6520 Parker Lane
Indianapolis, IN 46220

Happy New Year!

As we welcome in a new year we also extend a welcome to a new management company for the Piano Technicians Guild. The company's name is Martin Fromm and Associates, Inc. Barbara Parks is the new executive director. Several other employees of Martin Fromm and Associates will be working with the Piano Technicians Guild and its Auxiliary as they are needed to help us carry on our various activities and events. When you come to the Indianapolis convention in July you will have a chance to meet some of these people. In the meantime, we hope you will join us in wishing them a lasting and rewarding relationship with the Piano Technicians Guild, the Piano Technicians Guild Auxiliary, and all the members of both organizations. Welcome aboard, Martin Fromm and Associates!

From the Recording Secretary

As a new officer on the National Auxiliary Board, one basically unknown to most of you, I thought it might be helpful to share my background in the PTGA with you. When you know this kind of information about someone you can understand them better when they start to get opinionated.

Basically, I fell into PTGA membership the way my husband got into piano work. (He said—at the beginning of the great teachers' strikes—"I'll just learn tuning and do pianos until the education field opens up again." That was ten years ago. Now he doesn't care about public education; he's thoroughly hooked on piano technology.)

Several years ago my husband's Guild chapter decided it would be nice to have an auxiliary in case they had to host a convention or something. (These guys look ahead.) So, we consented to become the new Youngstown Auxiliary Chapter. Our first order of business was to establish a policy discouraging any projects that involved work (although we decided that picnics and Christmas parties were OK), and that any monies we needed would be obtained by begging. Our greatest happiness was when the Ohio State Convention was scheduled for anywhere but Youngstown. We were a rather reluctant group, to say the least. If that sounds negative, it's because it is, and the only reason I'm relating it at all is because it takes a special group of people to change an attitude like that.

As I began to go to conventions, I began to meet people in the Guild and Auxiliary in spite of my best efforts to remain uninvolved. If you are as I was, your first convention or two will be spent alone in your room or silently enduring some structured activity. What I didn't know was that tours and programs are part of a plot by hosting chapters to get people together at these conventions. (There, the secret is out.) They *knew* they were all wonderful and that a little exposure to their charm and warmth would draw me in. They were right. I started to have the best times ever at conventions, and not because of the resorts where we stayed or any fabulous tours we took, but because of the people I met and came to know as friends from all over the country.

I also have come to appreciate conventions because piano technology can be a lonely business, and I know it's exciting for technicians to get together and talk about flanges, dampers and key bushing techniques with someone who understands the language. That excitement is very contagious. Even if you don't know your hammer butt from a hole in a pinblock, you still get caught up in the enthusiasm of people who are vitally interested in their profession—and face it, that's a rare commodity in our society today.

A survey I read stated that 80% of the American work force dislike their jobs. Piano technicians, as a rule, *love* what they're doing, and that makes them interesting people to be around. I've come to look at convention time as one of the most stimulating and fun times of the year because it gives me the opportunity to spend time with friends I've made there. And, my husband comes back so inspired, I almost consider going into piano technology myself. (I said "almost.")

You see how they've won me over? It can happen to you, too, if you'll let yourself get involved. Even if you're shy, there are enough irrepressible people-lovers around who will take up conversational slack for you if you just give them a chance.

I've had so many good times at conventions, I am considering compiling a book of memoirs. Some of the chapter headings might be:

- Losing weight by the Party Plan (or, how to party until you are too tired to eat)
- Midnight swimming in shark infested waters
- Strange encounters of the Yamaha party kind

- Napping with Norm (or how to make your mark in Institute classes)
- Creative harassment of exhibitors.

I know many of you could write a similar book of your experience, and new people, it won't take you long to gather your own set of experiences and great memories. I've only been to three national and two state conventions.

Now comes the opinionated part: It is my opinion that anyone who doesn't attend the Piano Technicians Guild conventions and accompanying Auxiliary functions is missing an opportunity to meet and know some of the most wonderful and fun-filled people in the country. Of course, there's always the chance you might get elected to a national office, but that's a risk you'll just have to take. Planning for the Indianapolis convention is under way. Even if you've never been to a convention before, please consider attending with your technician. The aim of the planning committees this year is to provide enough variety in the program so that everyone finds something enticing. At any rate, we are going to make it hard for you to ignore us. I am looking forward to meeting more of you this coming July in Indianapolis where I intend to have an even better time than before (if that's possible). After all, where else but at a PTG convention can a lyric soprano find happiness by singing tenor in a men's barbershop chorus?

Helena Thomas
Recording Secretary

With Fond Memories of Edith Davis

It was with sadness that we received the news of the death of Edith Davis. Norma Lamb went to visit her and learned that she had died. Edith, a member of the Los Angeles chapter and an honorary life member of the Piano Technicians Guild Auxiliary, served both the Guild and the Auxiliary for many years. Her contributions were marked with professionalism and dignity. She was one of the foundations upon which the rest of the organization has been built. We salute her accomplishments and remember her with fondness.

Dues Due

As treasurer I must remind you it's time to pay Auxiliary dues for 1984. Every member should have received a notice for dues by now. Send your check for $5.00 (new members $8.00). Make sure your name, address, and zip code are correct. Mail to Kathryn Snyder, 79 Furnace Street, Robesonia, PA 19551.

Do You Want to Change the Bylaws?

If your chapter would like to introduce changes in the Auxiliary's bylaws, the time to introduce them is now. Copies of all proposed amendments need to be in the hands of the president, the parliamentarian and the recording secretary by February first so they can be published in the April issue of the *Journal.*

Why don't you curl up with a copy of the bylaws and see if you notice anything that needs to be changed?

An Invitation to Indy

Dear Friends and Members of the Auxiliary,

For two or three years now we have known that the Guild and the Auxiliary will be coming to Indianapolis for the 1984 national convention. For two or three years we have been thinking about things we would like to plan for you while you are here. Now we can begin to talk about our plans. Now we can begin to tell you how excited we are at the prospect of your visiting our town. In fact, we are so pleased to have the convention in our city that we would like to meet you at the airport. If you plan to fly to Indianapolis just let us know your flight number and arrival time, and we will have a welcoming party there to meet you and take you to the Hyatt Regency, our convention hotel.

We love Indianapolis. We think the city has lots to offer that many people do not realize. When they come here they are surprised to see such a beautiful city with so many attractions and such friendly people. When you see the beautiful Hyatt Regency Hotel you won't believe the moderate prices are for real . . . but they are. You can come to Indianapolis and spend less money than you did in San Francisco, in Washington, D.C., or in New Orleans. But will there will be lots to do, many fine eateries, and enjoyable tourist attractions . . . definitely yes. Mark it on your calendar today . . . the first week of July in Indianapolis. We'll be looking for you.

Julie Berry

Everybody Goes Home from Work

It may seem like a simple statement: everybody goes home from work.

Nevertheless, it is sometimes difficult for a piano technician to know when she or he is actually home from work. When the technician walks in the door she or he is often met with a list of telephone calls that need to be made and business decisions that need to be settled. Tools often need to be brought in from the car. A bill or two usually arrived in the mail. Perhaps there was also a package from one of the supply houses. The technician has arrived home but the work is still there waiting to be done. Unfortunately, some of these matters need to be handled before the technician quits working for the day. Some of the phone calls might pertain to appointments which had been arranged for the following day, and it is usually a bit of a pleasure to open packages that arrive in the mail. The telephone calls really need to be returned. However, we all know that one thing can lead to another and then to another. If we are not careful, it can soon be eight o'clock in the evening and the technician is still on the phone.

As spouses of technicians we can help them decide when it is time to stop working and call it a day. Recreation and relaxation will help them prepare for the next day's work. It can be a tremendous service to our technicians if we help them decide which things need to be done before the office door can be shut and the business closed for the day. Working together for a few minutes, we can decide which calls need to be made, which tasks need to be done in order for the following day to go smoothly. Then we can help the technician come home from work and enjoy the evening.

JB

Classified Advertising

CLASSIFIED ADVERTISING RATES are 25 cents per word with a $7.50 minimum. Full payment must accompany insertion request. Closing date for ads is six weeks prior to the month of publication.

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Replacement stacks for old players. Will fit Angelus, Gubransen, etc. $450.00 Guaranteed tight and easy to pump. Best suited for two tier stacks. May be slightly harder to pump with some 3 tier. **Ragtime 1320C Angie, Modesto, CA 95351 (209) 538-2330.**

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A GUIDE TO RESTRINGING will guide you safely through a restringing job with confidence. Increases your income with fully reconditioned, fully rebuilt, fine old pianos. Now almost forgotten, they're out there somewhere in our good old USA, ten million of them! Why not make up for lost income due to the present recession—NOW's the time, not LATER. The price? Less than the cost of a single tuning. A GUIDE TO RESTRINGING, enlarged second edition. Perfect binding—$30.00, hard binding—$35.00. Order from: **John W. Travis, P.O. Box 5359-0359, Takoma Park, MD 20912.**

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PIANOS FOR SALE—Always on hand, 150 to 300 uprights! Plain case, art case and players. Also 50 to 150 grands at all times, as is or rebuilt. Excellent brand names—no junk! All set up for inspection. Lowest possible prices. Call for quotes: **Owen Piano Wholesalers, 2152 W. Washington Blvd., Los Angeles, CA 90018. Telephone (213) 883-9643.**

KEY RECOVERING MACHINES for sale. Prices on request. Send self-addressed envelope. Or build your own—send $15.00 for plans, photos, instructions (refund w/purchase of machine). **Solenberger Piano Service, 1551 Lynn Court, Santa Rosa, CA 95405.**

KORG AT-12 AUTOCHROMATIC TUNER. New, improved tuner replaces WT-12 model. Play any note on your instrument and the AT-12 instantly indicates the note and octave (by LED) and how many cents sharp or flat (by V-U meter) in 7 octaves: C1 to B7. Generates 4 octaves: C2 to B5 at 2 volumes. Calibrate tuner A-430 Hz to 450 Hz. Quartz Crystal. Case, stand, AC adaptor, batteries, earphone. One lb. One year warranty. Introductory Offer: $125 ppd. ($180 list). **Song of the Sea, 47 West Street, Bar Harbor, Maine 04609. (207) 288-5653.**

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WANTED

WILL PAY $2.00lb. for Ivories. Heads, Tails, chipped OK. Send 25lb Boxes to **Ragtime, 1320C Angie, Modesto, CA 95351 (209) 538-2330.**

UPRIGHT PIANOS WANTED, any quantity. Especially Oak and Walnut. Must be double fallboard and have fluted or carved legs. Pinblocks must be tight and hammers and soundboards fair. Will pay close to the retail price. Rebuilt or as is but not refinished. **Ragtime 1320C Angie, Modesto, CA 95351 (209) 538-2330.**

WANTED: MASON & HAMLIN OR STEINWAY. Want one that was a player. Have mechanism to install. **BRADY, 4609 Cranbrook, Indianapolis, IN 46250. (317) 259-4305, after 5:00 pm (317) 849-1469.**

PIANO TECHNICIAN Experienced piano tuner for sunny So. Fl. company. Benefits, paid vacation. Call 305-456-7800 or write **Bobb's Pianos & Organs, 2512 So. 30 Ave., Hallandale, FL. 33009.**

WANTED: 9'Steinway Grand any condition 88 note call collect— **Douglas Wurz 804-358-1929.**

MISCELLANEOUS

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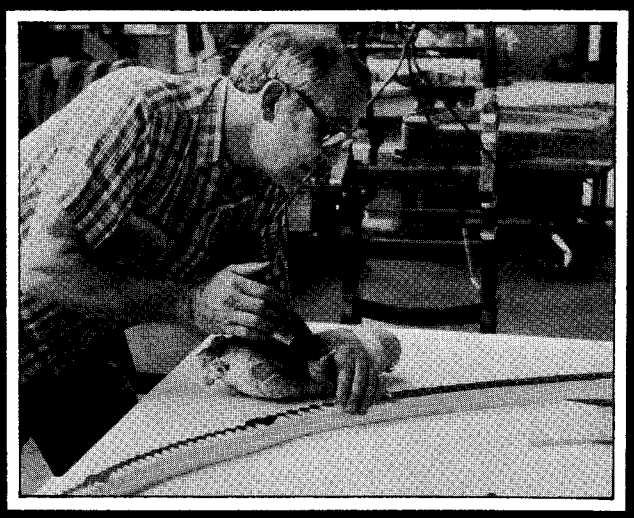

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Our continuing commitment to you, the technician, goes beyond product design. It's apparent in our ongoing willingness to teach and train. Our key technical people attend PTG meetings and conventions and conduct training sessions. Our service department continues its seminars. Our technical staff is at your service to provide any assistance you might need, just call 800/435-2930 toll-free between 8:00 a.m. and 4:30 p.m. For parts call Code-A-Phone 800/435-6954. In Illinois call 815/756-2771.

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January 1984

UPDATE

1984 Guild Due Statements Mailed

If you have not received your annual dues billing, please call Headquarters at (816) 444-3500. Otherwise, your name will be placed on the delinquency list.

Annual dues must be paid in one sum. There is no longer a partial payment method.

If chapter dues are included in your billing, please include that amount in your payment. Please note that this arrangement is not used by every chapter. Do not include chapter dues in your check total unless an amount for chapter dues is indicated on your billing. Headquarters collects chapter dues only for those chapters which made the arrangements for their dues collection last year.

Membership cards for 1984 are now being printed and will be mailed when all dues have been paid. A small gold seal bearing the year 1984 will be sent to each Registered Technician whose dues are fully paid. The seal may be placed over the year on the Registered Technician certificates of those with earlier certificate dates. This 1983 seal then shows that the member is in good standing with the guild this year.

PTG Calendar

Jan. 1	PTG Dues are due.
Feb. 1	Nominations are due for 1984-1985 elective positions on the Guild executive board. Nominations should be sent to: Bob Russell, 1414 Lander Road, Mayfield Heights, Ohio, 44124, or call (216) 449-5212.
July 1-2	Guild Council meeting, Hyatt Regency Indianapolis
July 2-6	Guild Annual Convention, Indianapolis, Ind.

PTG Pamphlets To Be Reprinted

Piano Technicians Guild pamphlets such as "A-440 and Your Piano," "Care of Your Piano," "Piano Pointers," "Should I Have My Piano Tuned In The Summer," "The Tuner To Turn To" and "The Unseen Artist" are valuable business aids for Registered Technicians.

The pamphlets, like most other printed pieces produced by the Guild, are now being reprinted to show the new Headquarters address in Kansas City. Orders for the business aids will be filled as soon as they become available.

Return of Films, Books Requested

A number of films, books and other reference materials from the Piano Technicians Guild lending library are overdue or missing. If your bookshelf contains some of the missing works, please return them; others are clamoring for knowledge.

NOTE: Please return them to the new Guild Headquarters in Kansas City. The address there is 9140 Ward Parkway, Kansas City, MO 64114.

New Members To Be Listed

The Piano Technicians Guild has gained a number of new members in recent months. A complete listing will be published in an upcoming issue.

Remember Our New Address

The new address and telephone number for Guild Headquarters are:

Piano Technicians Guild
9140 Ward Parkway
Kansas City, MO 64114
(816) 444-3500

Chapter Notes

Since it's been a few months since we published any chapter news, we have some catching up to do. Here are some gleanings from several chapter newsletters received in Headquarters recently.

Please make sure we're on your chapter's mailing list. We'd love to hear from you. Please send news releases and newsletters to: Piano Technicians Journal, 9140 Ward Parkway, Kansas City, MO 64114.

The Pocono Northeast Chapter held its first formal meeting conducted by President Howard Yepson. The chapter covers a large portion of northeastern Pennsylvania, from Williamsport on the west to the New Jersey line on the east, and from Hazleton in the south to the New York state line in the north.

At present the chapter is composed of six Craftsmen, two Apprentices and two students. Many thanks to Dick Bittinger, Sharla Kistler, Charlie Huether and Bob Smit who were in-

Continued

Non-members: Part of the Overall Picture!

Dale Heikkinen
Chapter Management
and Achievement

On Dec. 21, I attended a Christmas party for a piano teacher, and I met, for the first time, an old-time piano tuner, now semi-retired. Over the years, his name had occasionally surfaced.

In our conversation, he said, "Who do you recommend for piano tunings? You know, three out of four piano tuners around here just aren't any good at all. I used to pride myself on doing a perfect piano tuning every time." He was a non-member.

Chapter Management is currently looking for the names of non-members throughout the country to update the master list. It is reasonable to expect that there is at least one non-member for each chapter in the country. Not only are we interested in updating the master list, we also want to improve attendance at our next national convention in Indianapolis.

Non-members form an integral part of these national conventions. Their registrations count for 10 to 20 percent of the overall attendance.

Each Institute instructor would like to have his or her class at least partially filled. It gives instructors a good feeling to know that enough people are interested in their topics to attend.

Non-member registrations give the Institute director a chance to incorporate a few new programs and a few new faces into the lineup to attract more people.

It gives the exhibitors more incentive to rent a booth because there is a much greater chance for making more sales and therefore more money. They have costs, too.

It gives the Guild a chance to host a national convention without losing a lot of money. A lower rate per room sometimes reflects anticipated registration.

There is a vested interest for everyone who attends.

Special commendations go to Leon Speir, president of the Dallas Chapter, and to Fred Tremper of Chicago for the exhaustive lists of names they submitted.

If there is a non-member in your area, please take a moment to clip, complete and send in the form on this page. Everyone concerned will benefit.

NON-MEMBER(S)

NAME _____

ADDRESS _____

_____

Send to: Chapter Management and Achievement
c/o Dale E. Heikkinen
1914 Wayne
Ann Arbor, MI 48104

DEADLINE: Feb. 15, 1984

Creativity in Chapters? A Smorgasbord of Ideas

Creativity, according to Webster's Dictionary, is "to cause something to come into existence, bring into being, to make, or to originate."

The Quarterly Activity Report, which is sent to this Committee by your chapter president, includes a category for creativity. It was deliberately inserted knowing very well it would be difficult to answer. It was included, also, because it doesn't make any difference on the size or prominence of a chapter. It was included because most of us would want to be creative sometimes.

As you might imagine, many chapter presidents have made no attempt to give it a try. But for those who have . . . oh my, what a smorgasbord of ideas! The following will give you an inkling of what is happening:

Community service projects:

- Atlanta, Ga. High school tuning program

Promoting music related programs:

- Baltimore, Md. — Answering phones and giving ten tunings as premiums for local public radio station.
- Baltimore, Md. — Free tuning and repairs for a local college on an anniversary event.

Film:

- Reading-Lancaster, Pa. — Willis Snyder has prepared a film on action regulating

At regular PTG programs:

- Blue Grass, Ky. — Every meeting opens with a musical performance by one of the members.

Developing new programs:

- Cleveland, Oh. — Piano leg repair class.

Inventing new tools:

- Dallas, Texas — Making a new tuning hammer.
- Detroit, Mich. — Electronic keyboard for teaching class instruction in tuning.
- Reading-Lancaster, Pa. — Ruth Brown and Suzanne Rosato introduce a new type of capstan regulating tool for grand pianos.
- Richmond, Va. — A new rib gluing tool.
- Tucson, Az. — A unique voicing tool demonstrated in a technical session by Mark Peele.

Tape:

- San Francisco East Bay, Calif. — "Name that noise" produced individually.

Western Region Dumps Central East Foes At The Buzzer

"Hello, everybody. This is Ray Scott bringing you the results of computer football activity in the third quarter of Chapter Activity Reports. But first, time out for this radio message."

"This message is brought to you today by Ajax, makers of jack lubricant since 1917. A name that your tuner can trust. Used by 10 percent of the tuners in your area. Recommended for speeding up those sluggish jacks. Make them feel like jumping jacks. Don't confuse with Hijacks. Make sure you housewives encourage your tuner to jack 'em up, with Ajax!

"Since we last reported to you, the powerful Western Conference demolished Central East foes in some area thrillers. Under Head Coach Keith Allison, the Vancouver Canucksblasted the Milwaukee Packers under first year Coach Bill Gobitas. Coach Robert Gable of the Seattle Sea Hawks put it to veteran Coach Jim Byassee of Little Egypt; says Byassee, 'We played like sphinxes out there.' And under first year Coach Allen Cate, the Los Angeles Rams stuffed it to the Chicago Bears; says Coach James Houston, 'We got the wind knocked out of us!' "

"In the Central West, a frisky outfit from Wichita, Kansas under Head Coach Ron Nossamen put it to the Northeast Region Buffalo Bills under veteran Coach Chuck Erbsmehl; says Chuck, 'No bills, but we need some change.' And the sparks from Ozark (Coach Michael Rooks) dumped favorite Rhode Island under Coach Tom Stanton."

"In the South, we have the Razorbacks from Arkansas under Coach Bill Yick beating their South Central foe, the Oklahoma Sooners, under Head Coach James Marks; says Marks, 'It should have ended sooner.' And in a major upset, Tulsa under Head Coach Jack Frost spilled Herbert Dady and company from Nashville; the Grand Ole Opry is still screeching."

PREDICTIONS

"In the 4th quarter of regional play, the Computer predicts that the Central East Region will make a major bid to take over the top spot from its Western rivals, but will need help from Chapters in West Virginia, Cincinnati, Madison and Lansing. Under strong leadership, the Southeast Region will continue to maintain its hold on third place. The Northeast Region will probably sink to lower heights. The crusty Northeasterners are still riding on the glories of the Revolutionary War. Considering the narrow point spread, the Computer predicts that the mercurial South Central Conference, with some help from North Central Louisiana, Fort Worth, San Antonio, and the Central West Conference, with some help from Calgary, Saskatchewan, North Dakota and Colorado West, will put on a powerful passing display to humiliate their Northeast cousins."

"That's it for this month's computer analysis. Stay tuned for the final quarter of Regional play. This is Ray Scott for Computer Kickoff."

Dale Heikkinen
Chapter Management and Achievement

Quarterly Activity Reports

	1st Quarter	3rd Quarter
Western Region	75%	50%
Central East Region	74%	41%
Southeast Region	62%	25%
Northeast Region	46%	21%
Central West Region	66%	17%
South Central Region	52%	15%

In Respectful Memory

Arthur L. Gray

Arthur L. Gray, a Guild life member, died in Kew Gardens, N.Y., Sept. 4, 1983. He was born in Glasgow, Scotland, Oct. 22, 1902. He had a musical background, playing cello, drums and piano. Learning his trade in Scotland, he came to New York in 1930, where he worked for the Winter Piano Co. before striking out on his own. He became a member of the American Society of Piano Technicians, involving himself in all of its activities and eventually becoming President of the N.Y. Chapter.

My long friendship with Arthur began in 1949 when he helped me with many of the problems common to fledgling tuners. My experience was not unique. Arthur was always ready to give of his great knowledge to anyone. He was always available.

I will always remember Arthur Gray as a kindly, unassuming man who loved his profession and the people who practiced it. He will be long remembered.

Joseph Duze

Rudolph Griffin

Rudolph Griffin, a charter member of the Hampton Chapter, passed away on Saturday, Aug. 20, 1983, following many months of declining health. His interest in the Chapter, its activities, and his fellow technicians never declined—Rudy was always among us, be it a factory tour, a testing session for new members, a technical discussion during a meeting, or offering advice and inspiration while showing a keen appreciation of the fellowship and the refreshments after the meeting.

Rudy graduated from the School of Piano Technology at the New York Trade School in 1947, and had been an Associate Piano Technician at Hampton Institute since 1969.

Rudy's cheerful countenance and lively enthusiasm will be sorely missed.

strumental in the formation of the chapter.

The first major project will be a program for local piano teachers in conjunction with the Pennsylvania State Conference Teacher Relations Committee. Plans are being made to offer the program in October at a college in northeast Pennsylvania.

According to committee chairman **Pauline Fox**, the **Pennsylvania state teacher relations committee** serves two obvious functions: helping teachers realize the benefits available to them from the Guild and its members, and helping technicians relate to teachers and their needs, as different from needs of non-teaching customers. The first function is partly fulfilled by chapter sponsorship of one-day seminars for local teachers; this article may begin to accomplish the second function, that of helping you understand them.

Every customer expects fine tuning and skillful work from a Guild technician. What extra ability, then, would be meaningful to piano teachers? I believe piano teachers appreciate discovering technicians who not only provide excellent technical service but also empathize with the goal of helping students enjoy and play music. As a former teacher, I offer four suggestions for demonstrating such empathy.

First, be sure your name is listed in printed programs of community concert series and other individual music events as a business patron or advertiser. Second, begin an occasional informative newsletter (described in the August 1982 Journal, page 35) with enough copies for your teacher-customers to distribute to their students. Third, supply a quantity of informative pamphlets, such as humidity control literature or PTG "A-440" and "Care of Piano," to the teacher for distribution to students. Lastly, attend musical events, especially the ones where your name is printed on the program, and be sure to personally greet your customers.

These steps will establish the teacher's confidence in you not only as a technician dedicated to quality workmanship but also a colleague interested in quality music education.

Besides Fox, other committee members are Fred Fornwalt and Darrel Cadle.

Frank Reed of the **Northern Virginia Chapter** has done some research on the question of how many technicians are working as technicians on a full time basis. In our geographical area, judging by the number of people advertising piano service, it would seem that quite a few must be "after work and on weekend" technicians. Here are some statistics extracted from the U.S. Department of Labor which bear this out, although the category here is "musical instrument repairers."

For the year 1979, there were 5,784 full time repairers, of a total full and part time employment of 13,611. In 1982, the figure was 5,740, of a group of 13,617. Projections for 1995 are 8,880 repairers per 16,758 total employment.

Dave Frease

At the last general meeting of the **New York City Chapter**, the matter of small business tax was discussed. At least two of our members must now pay penalties in addition to the tax on unincorporated businesses because they were not aware of the laws.

To avoid this nasty surprise, Nancy Hazzard recommends you call either the Service Corps of Retired Executives or the Small Business Administration. They will explain what you need to know as the owner of a small business and will send you tax forms, all free of charge.

On November 1, 32 members of the **Atlanta Chapter**, guests and hosts met at the Cecil White Piano Company to hear the newest developments in the Aeolian Piano group. David Campbell, president of the Aeolian American Corporation, East Rochester, N.Y. (Chickering, Knabe and Mason & Hamlin), explained how Peter Perez, Inc., has purchased the entire Aeolian group, including a plate foundry, Mason & Risch in Toronto and the Aeolian Corp. in Memphis, Tenn., where the balance of the piano production work is done.

In addition to the various models of pianos being manufactured in East Rochester, they are planning to bring back the Mason & Hamlin AA grand (6'3"), and to re-instill the original quality across all lines. The slide presentation which Dave narrated showed the handicraft skills that go into the building of their pianos.

Tim Reed

During the past year, the **Twin Cities Chapter** added eight names to the list of those in the RTT classification. The chapter's exam committee administered 12 tuning tests, eight bench tests and 11 written tests. From this, we changed our membership by seven RTTs (two new and five upgraded) and three Apprentices. Among those passing the exam were Richard Alton, Phil DeHaan, Noel Gagnon, Mark Grim, Dennis Johnson, Ralph Kratzer and Paul Rom. Mary Manthey passed the exam at last summer's national convention in New Orleans.

The December issue of Soundboard Buttons, edited by **JoAnn Bruner** and **Christi Mickel**, also included contributions from writers from all over the country and the results of a mail survey of U.S. Piano companies. The survey produced names and phone numbers of technical service representatives and parts order departments, company history and locations of production facilities.

In November, the **Wichita Chapter** elected a new slate of officers to take over in January. President is Hugo Reimer, Vice President is Bob Unruh, Secretary and Newsletter Editor is Kent Swafford and Treasurer is Ron Nossaman.

Marty Hess

The **San Diego Chapter** also elected officers recently. Set to serve in 1984 are Librarian Joe Gaspar, Treasurer Mark Adams, Secretary Bob Shallenberg, Vice President Don Menino and President Scott Thile.

During the meeting, Isaac Sadigursky gave a fantastic program on the Clemson action, shaping grand hammer tails and being a piano technician in the Soviet Union.

Scott E. Thile