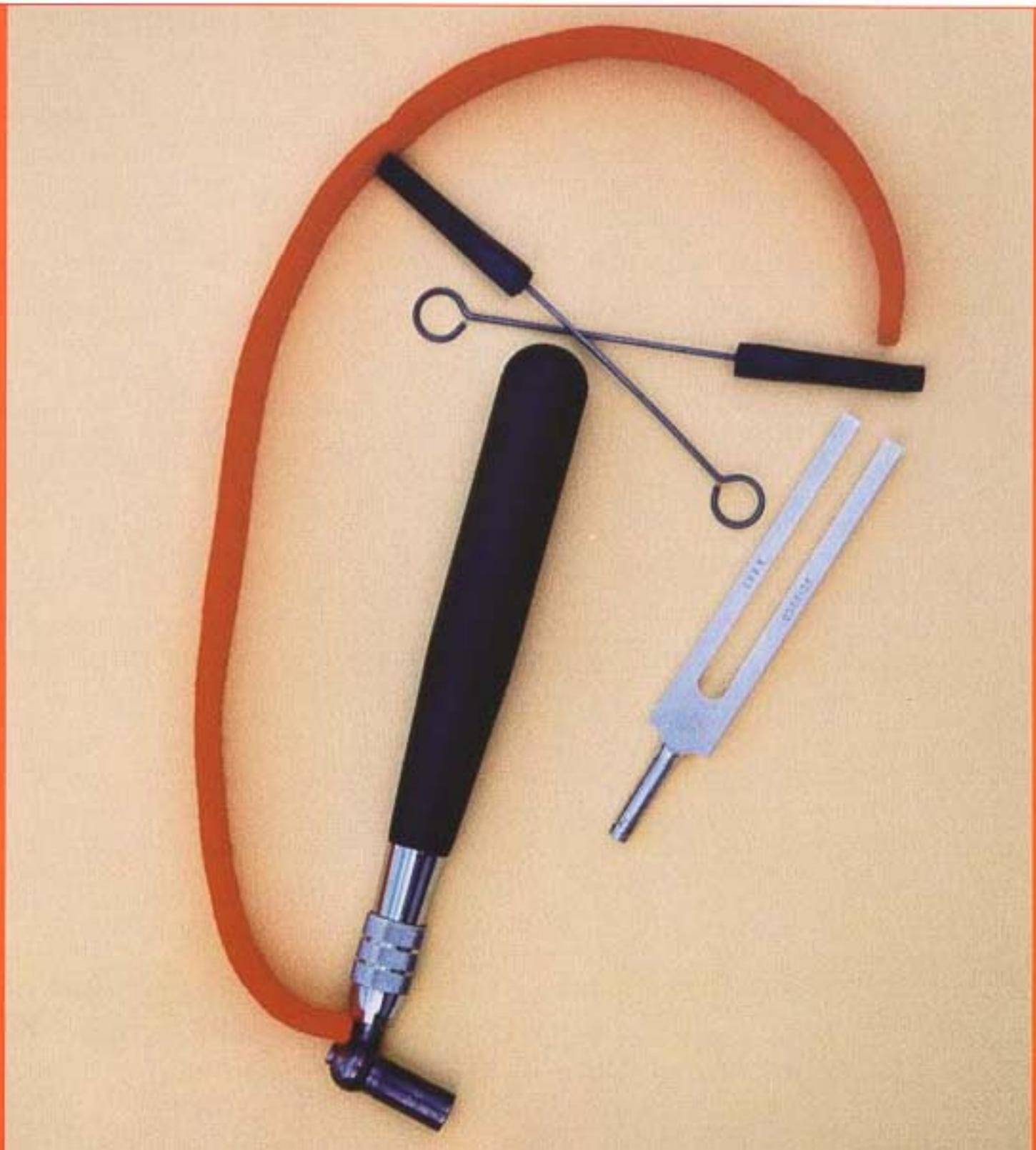
PIANO TECHNICIANS
Journal
Official Publication of Piano Technicians Guild

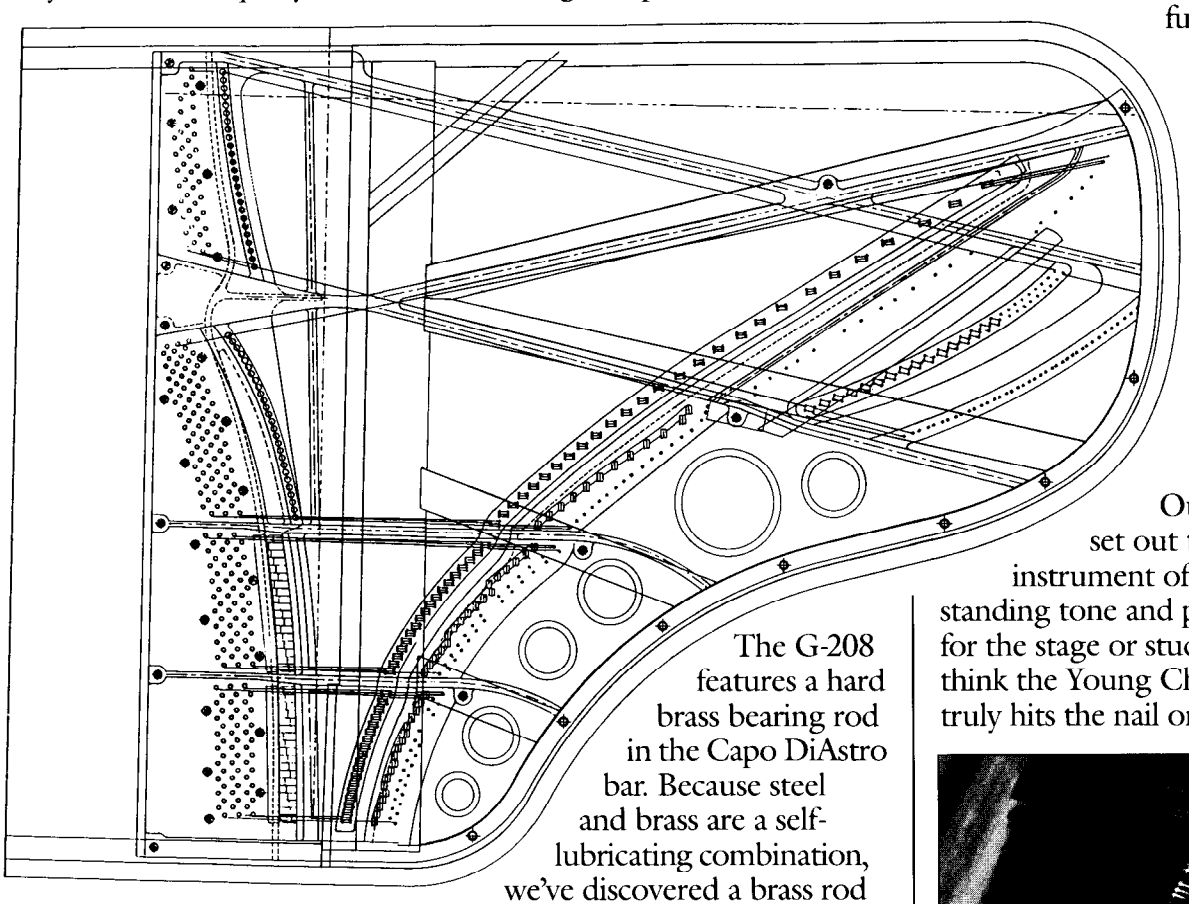
October 1994 Vol. 37 • #10



A nuts and bolts guide to the new Young Chang G-208.

Our engineers are obsessed with the little things because they recognize the importance of attention to detail. But lately, they've become equally obsessed with big things, and the result is 6′10″ long. Our new G-208 grand is a departure for us and represents the smallest and largest of our latest innovations.

The G-208 is a 6′10″ grand piano of an entirely new scale design. It features our new "Asymmetrically Crowned" soundboard which places the highest part of the crown in each rib directly under the bridge providing maximum support under the downbearing pressure of the strings. This new soundboard design exhibits improved power, projection and tuning stability, and offers a longer soundboard lifetime. We're so pleased with this new design, we're now incorporating it into all our grand pianos.

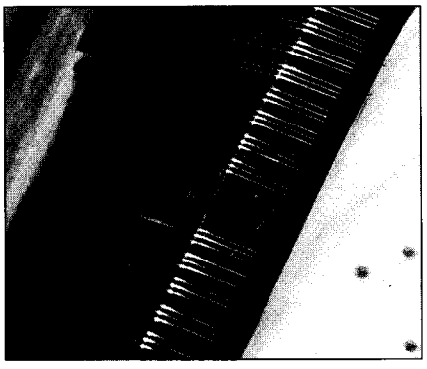


The G-208 features a hard brass bearing rod in the Capo DiAstro bar. Because steel and brass are a self-lubricating combination, we've discovered a brass rod offers better control of strings during tuning. In addition, the brass rod is easily replaced later in the life of the instrument eliminating the need for reshaping of the capo bar.

We also took a close look at our action and developed an all-new action design which improves response without loss of projection or clarity.

Our new double duplex system terminates the strings at the rear of the bridge and near the tuning pins with duplex bars. Both duplex lengths of the strings for each note are then terminated in equal length offering improved sustain, projection and clarity.

Together these innovations create an instrument with a rich, full sound, greatly improved response and a remarkable evenness of tone throughout the entire range of the keyboard. Our engineers set out to design an instrument offering outstanding tone and performance for the stage or studio. And we think the Young Chang G-208 truly hits the nail on the head.



Because strings bear against a replaceable brass rod, tuning control is improved.

For technical information on our new G-208 grand piano, write to us at Young Chang America, Inc., 13336 Alondra Blvd, Cerritos, CA 90701. Or call 310/926-3200, ext. 237.

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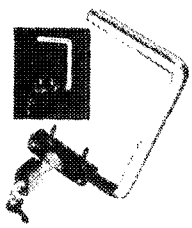
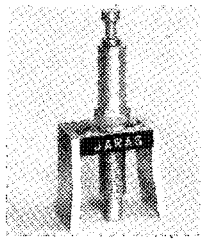
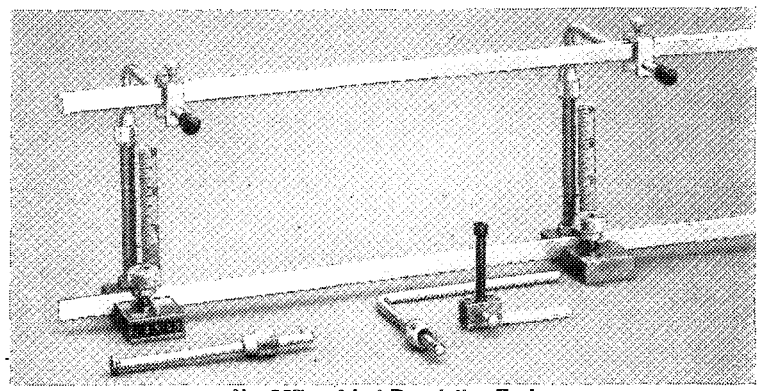


No. 893 — Fallboard Clamp

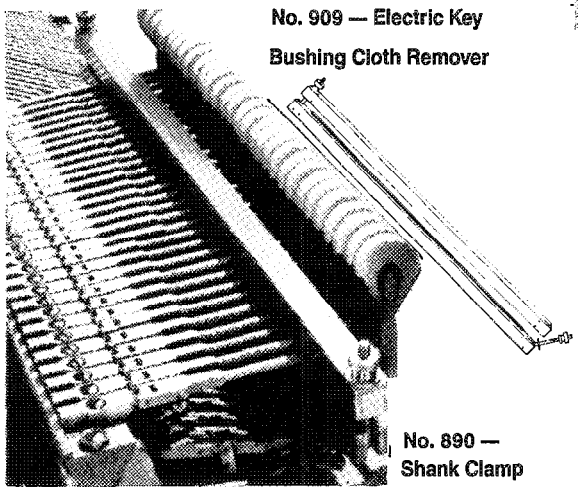


No. 40 — Sharp leveler

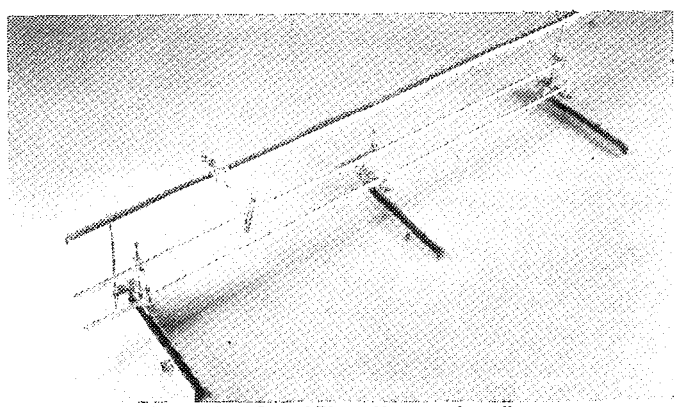
No. 909 — Electric Key Bushing Cloth Remover



No. 907 — 4-in-1 Regulating Tool



No. 890 — Shank Clamp



No. 892 — Grand Piano Hammer Installer

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Larry Goldsmith
Publisher/Executive Director

Jami Henry
Managing Editor

Kent Swafford, RPT
Nick Gravagne, RPT
Contributing Editors

Sandy Essary
Subscriptions

Mary Kinman
Director of Member Services

Catherine Wilane
Director of Finance

Midge Sheldon
Administrative Assistant

Home Office
Phone: 816-753-7747
FAX: 816-531-0070

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Editorial Perspective

Communications Mania—Where Is It All Going?

Faxes, computers, cellular phones, E-mail — where will it all end?

The simple answer is, it won't.

I recently talked to a sales representative for a telephone equipment company about upgrading our phone system in the office. He told me, "There are some amazing products on the market now. You can get a new system that will do twice as many things for about half what you paid for your present system. But — and don't tell my boss I said this — my best advice to you is to wait if you can. There are so many new things coming out now and so many things are changing, you'll be better off to wait until things settle down a bit."

I appreciate his honesty, because he's right. The pace of change has double-timed, and if you can keep up with all the new toys that are becoming available now, you're doing better than I am. Not so long ago, the basic tools of a home-based business were a rotary-dial phone and a customer file, probably in the form of 3x5 cards. Now, the computer you bought a year ago is totally obsolete. The disk drive you thought you'd never fill up is now woefully inadequate to do even basic functions. If you were really sophisticated, you might once have used an answering service. Now, you'd better be thinking about a cellular phone, so anyone can reach you, any time.

Keeping in touch is the name of the game. You have to be able to be accessible to your customers. And you have to be able to keep track of them. That means compiling information in a form you can use efficiently.

At the recent American Society of Association Executives Convention, the buzzwords were "broadcast fax" — which allows you to fax a zillion people at once — and "fax-on-demand" — which lets customers dial up from their fax machines, tell your fax machine what information they want, and receive it automatically.

All over the United States, telephone and cable companies are nervously eyeing each others' turf. What we wind up with is any body's guess at this point, but two things are certain: we'll all be involved in making some difficult choices, and those choices will dramatically change our personal and professional lives.

Even PTG? It's true that the basic mechanical systems that produce music from a piano are generally speaking not exactly at the leading edge of technology, but the people who make and service them have to live in a world where high technology is becoming more and more commonplace. Who knows, you may even receive the *Journal* electronically someday.

We're making a few toddling steps in that direction. President Leon Speir has appointed John Baird, RPT, to head a committee to study new methods of electronic communication. John has already hosted two conferences on the CompuServe on-line network, and more are planned. The committee is studying ways to make PTG's technical information available to both PTG members and to the public. John can be reached at 71023.221@compuserve.com.

Thanks to John, Danny Boone and others, we've accumulated over 80 E-mail addresses. We plan to publish a separate listing of those electronic addresses in next spring's membership directory, so if you're on-line, send your address to the Home Office for inclusion. PTG's College and University Technicians Committee, through Jack Reeves, RPT, at Brigham Young University, also is maintaining a database of E-mail addresses.

Messages to the Home Office can be sent to me at 75032.3711@compuserve.com.

Larry Goldsmith

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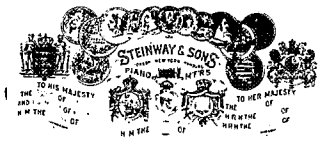

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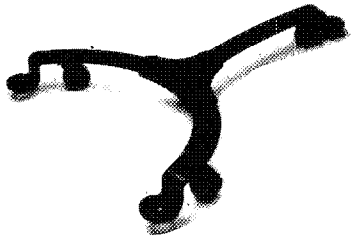

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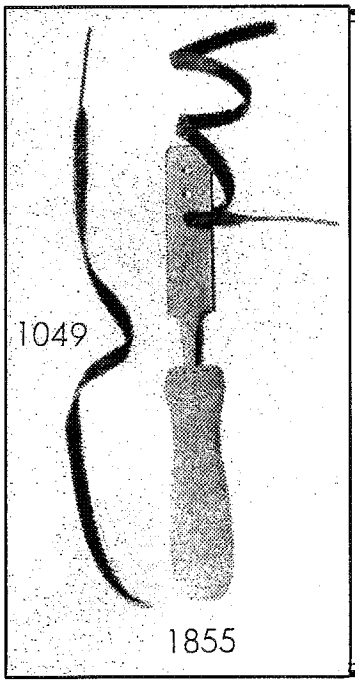

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PIANO TECHNICIANS
Journal
Volume 37 • Number 10 • October 1994

DEPARTMENTS

COVER ART

"Piano Tuner" is the name of this creative work from Yang Qui of the Pomona Valley, California Chapter. The fork is in the position of the human ear—since a piano technician should have good hearing.

Photo by Yang Qui

PACE
Professionals Advance through Continuing Education
LESSON PLAN

PTG*Review*

IN ADDITION

FEATURES

PTG President
Leon Speir, RPT

...Regional & State Seminar Season Has Arrived...

October marks the unofficial beginning of our Regional and State Seminar season. If you want to attend a class on basic skills or an advanced class on piano construction, you should be able to find one at an area seminar. Regional and state seminars are sponsored by chapters or other governing bodies to provide educational opportunities in areas closer to the sponsoring entity. Since these seminars are more localized, information is available to a broader base of our membership. Some classes are presented at area seminars which are unavailable at the Annual Institute. The increased popularity of the PACE classes have resulted in more hands on classes being taught at State and Regional seminars. If you were unable to attend the Institute classes in Kansas City but want to participate in the education PTG has to offer you should make plans to participate in at least one of the seminars in your area. You will find a complete seminar list below. A lot of hard work has gone into making area seminars available to you. Give the organizers and planners of these seminars your support. You will be glad you did!

This year for the first time PTG will team up with an area seminar (North Carolina Regional Conference) to present a class titled *BusinessCraft*. This one-day business seminar is designed to teach skills necessary to efficiently take care of the "business side" of managing a piano service business. *BusinessCraft* will be presented in a full-day seminar on November 3rd at High Point, North Carolina. Instructors will be Larry Goldsmith, PTG Executive Director; Fern Henry and Bill Spurlock, Spurlock Specialty Tools; and SCORE (the Small Business Administration's Service Corps of Retired Executives). You must be a PTG member and register for the North Carolina Regional Seminar in order to attend the *BusinessCraft* seminar. The fee for attending is $35.00 (prior to Oct 5th. $40.00 after Oct. 5th) plus the registration fee for the North Carolina Regional Conference. For more information contact Evelyn Smith at 910-230-1783. If you have all the technical skills necessary to run a business but feel you don't have all the business savvy you need, this seminar is for you.

When we view PTG objectively, we must realize that our product as an organization is our membership. We must provide the tools to prepare the best possible product for our customers. If we succeed we will solidify the validity of PTG as an organization. It is stated so well in a slogan at a sandwich shop where I often eat; "You must build your top line before you can build your bottom line." Through the many educational programs offered, which include classes at our Annual Institute, classes at Regional and State seminars, our *Journal*, the PACE program, and classes developed to teach specific skills, we are able to provide the tools for developing a quality product. Support of our educational offerings will make you a better technician and make PTG a stronger organization.

Leon Speir

PTG 1994-1995 Seminar List

1994

Sept. 24/Pomona Valley Annual Seminar
Claremont, California
Oct. 6-9/Ohio State Conference
Cleveland, Ohio
Oct. 13-15/New York State Conference
Syracuse, New York
Oct. 27-30/Texas State Association Seminar
Wichita Falls, Texas
Oct. 29/Lehigh Valley One-Day Seminar
Bethlehem, PA
Nov. 3-6/North Carolina State Conference
High Point, North Carolina

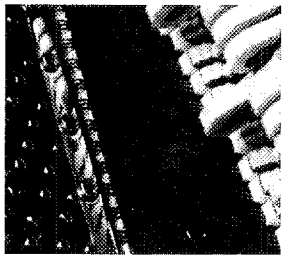
1995

Feb. 17-19/California State Conference
Los Angeles, California
Mar. 23-25/Pacific Northwest Conference
Vancouver, B.C.
Mar. 30-April 2/Pennsylvania State Conference
Wilkes-Barre, PA
April 21-23/Florida State Seminar
Orlando, Florida
April 27-30/NEECSO
White River Junction, Vermont
May 5-7/Central West Regional Seminar
St. Louis, Missouri
July 19-24/PTG International
Albuquerque, New Mexico
Oct. 5-8/New York State NYSCON
Oakville, Ontario
Oct. 13-15/Texas State Association
Waco, Texas
Oct. 19-21/Central East Regional Seminar
Brookfield, Wisconsin
Nov. 3-5/North Carolina Regional Seminar
Durham, North Carolina

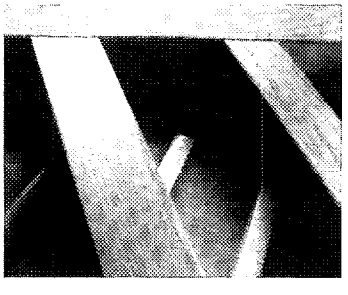
SOUND THINKING

IT'S THE FIRST THING THAT GOES INTO A WURLITZER PIANO.

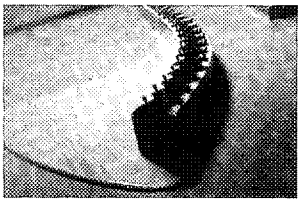
EVERY TIME WE SELECT A MATERIAL OR IMPROVE A MECHANISM FOR ANY ONE OF OUR INSTRUMENTS, WE THINK ABOUT THE SOUND.



THAT'S WHY OUR PIANOS HAVE A GRAND PIANO STYLE PIN BLOCK. SO OUR HIGH-FIDELITY SOUND BOARDS ARE LARGER, DELIVERING ACCURATE, FULL-RANGE TONE. AND OUR BASS STRINGS ARE LONGER, FOR RICHER, FULLER REASONANCE.



ALL SOUND DECISIONS. THE KIND CRAFTSMEN LIKE YOU UNDERSTAND AND APPRECIATE.



PUTTING THE SOUND FIRST IS A TRADITION WE'VE HONORED FOR OVER 135 YEARS. IN FACT, THE REASON THE "T" IN OUR NAME STANDS OUT IS TO REMIND US EVERY DAY JUST HOW IMPORTANT TONE IS.

BUT DON'T TAKE OUR WORD FOR IT. LISTEN. THE SOUND THINKING THAT GOES INTO EVERY WURLITZER SPEAKS FOR ITSELF.

WURLITZER

YOU SHOULD HEAR US NOW.

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A Wide Variety Will Serve Us All...

I want to take issue with the letter written by Francis Elmer, published in the July 1994 *Journal.* I am fairly new to the PTG, and a lot of the articles written in the *Piano Technicians Journal* are too difficult for me to understand now, but I would not like to see all the technical articles made much simpler for those of us who are not as experienced in this business. I know that if I study harder and learn more, I will eventually get much more out of those articles than if they had been written so that the "6th grader next door could read and understand" them. There are many technicians who can understand and utilize the concepts and theories, and you would be doing them a real disservice if you only printed beginning-level information. I would like to see a wide variety of articles written to meet the needs of all technicians, whether they are beginners, intermediate level, or advanced.

Sincerely,
David A. Vanderhoofven

P.S. I really enjoyed reading the Q&A and the TT&T

The Class Was A Huge Success...

Most of you are probably aware that every July, at our PTG Technical Institute, there are some classes for the visually impaired technicians. Although these are designed with people who have no sight, or limited vision, any technician would be welcome to attend. My purpose in mentioning this is so that everyone will fully understand the following.

The first two class periods of the above mentioned classes were instructed by Wally Brooks. The subject was tone regulating and voicing of piano hammers. This is a subject on which he is an acknowledged expert. I am sure that many of you have attended his classes.

Mr. Brooks had obviously done some preparation for this presentation. He realized that wall charts, projections on a screen, or printed hand-outs would be meaningless for us. Not only did he plan his props and discussion accordingly, he made a concerted effort to see that each and every one of us fully understood the entire procedure.

I believe that I can safely say that everyone who attended this class would agree that it was a resounding success. I heard comments such as "This is the best day I have ever had at a PTG convention."

I have no doubt that any technician, sightless or light-dependent, would have benefited from this class. For us, however, it was superb.

It is indeed unfortunate that Jack Sprinkle was unable to attend the convention or this class. It was he who approached Wally about doing this class for us, and he deserves full credit for the idea.

On behalf of the Visually Impaired Piano Technicians Concerns committee, and speaking for myself, thank you, Jack. Thank you, Wally. It was terrific.

Richard Hassig RPT

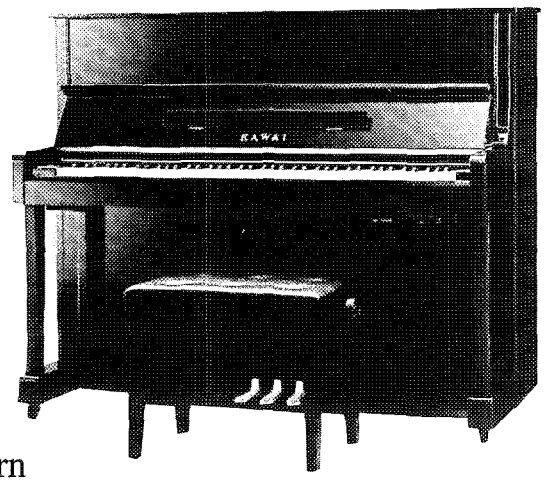
I Will Treasure This Gift...

At the recent national convention in Kansas City, I was surprised, humbled and even shocked to have received the PTG "Member of Note" award. So unexpected was this that I wasn't in attendance at the opening ceremonies when the award was announced. Actually, I was resting from a day of prepping pianos with friend and co-instructor Norman Neblett who, incidentally, was later to receive the well deserved "Golden Hammer Award" on Banquet Night. It is often said that no greater recognition can be given than that of one's peers. I am sincerely honored. I will treasure this gift always and hope that I may live up to the trust placed in me. Thank you all! Let us in PTG continue to "accentuate the positive and eliminate the negative."

Nick Gravagne

KAWAI PRODUCT NEWS

THE AnyTime PIANO



Responding to the ever-changing needs of the modern musician, the AT-170 AnyTime Piano is a unique combination of acoustic upright piano, personal practice tool, MIDI control device, and MIDI piano sound module . . . all in one. It's the Acoustic/Digital piano for '90s life-style.

For Standard Performance

The AnyTime Piano is built to meet the same exacting quality standards demanded of all Kawai acoustic pianos. In normal playing mode, it offers the exceptional tone and touch that you would expect from a Kawai upright piano.

For AnyTime Practice

In "AnyTime" mode, the AT-170 operates silently. Its unique action lets you easily mute the acoustic sound of the piano strings. Your touch on the keyboard controls the internal digital sound generator, allowing you to hear your playing through headphones. True to its name, the AnyTime Piano lets you practice, multi-piano class room teaching . . . or whenever you want to practice in private, the AT-170 is the perfect solution -- combining the touch and feel of an acoustic piano with the "AnyTime" Practice capability of a digital instrument.

For MIDI Uses

To offer more ways to enjoy the Anytime Piano, the AT-170 includes a digital sound genterator which allows you to play other internal sounds, Harpsichord and Vibraphone. Additionally, the AT-170's MIDI terminals let you connect to any external MIDI sounf device (such as Kawai's K11 Synthesizer or GMega Sound Module). In this situation, the AT-170 becomes a unique 88-note MIDI controller with real acoustic piano touch. The keyboard action incorporates a "photo sensor" system to detect and send velocity information. The MIDI control unit comes complete with Audio In/Out as well as MIDI In/Out/Thru jacks.

Specifications

AT-170 Vertical Piano (Ebony Polish)
Height: 45"
Pedal: Loud, Soft, Practice (Acoustic)
Loud, Soft
Tone Generator: 32-note polyphony, PCM
Tone: Piano, Harpsicord, Vibraphone
Others: Tone Spreader (Acoustic)
Reverb, Tune control, 2 headphone jacks,
MIDI/IN/OUT/THRU, LINE IN/OUT

Kawai America Corporation
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Each of the following questions were submitted by Jerry Raz from Berkeley, California.

Q — Is There A More Efficient Way?

I have had the opportunity to tune several square grand and birdcage upright pianos. Although I have had no major difficulty tuning them, I wonder if there might be a better way to mute the strings during the tuning process. For square grands, I remove the complete damper assembly, strip-mute everything I can, and then selectively use individual mutes where necessary. I also use masking tape to reduce ringing on those strings I am not tuning.

On birdcage pianos, I remove the action, strip-mute the entire piano, replace the action and remove the strip as necessary when tuning unisons.

Since I do a relatively small number of these pianos I would appreciate a more efficient way of doing these jobs.

A — *From Joe Garrett*

Joe Garrett is an RPT who has trained with Del and Darrell Fandrich and many current "giants" of the trade. He has been servicing antique pianos for approximately 20 years.

Regarding your inquiry of strip muting square grands and over-damper, ("Birdcage") pianos, your system on the "Birdcage" piano is partially correct. I always remove the action to strip the entire piano. The one exception is the German style, that often times has an over-strung scale and the bass can be stripped as in an ordinary upright. One key tool to tuning "Birdcages" is the papp stick mute. I believe this tool was specifically designed for the "Birdcage" piano. The tuning procedure is the same as regular uprights, as to tuning the entire piano, single strings. However, the easiest method I have found, is as follows: Start tuning the left/right unisons of the tenor (bi-chords). Do this immediately after tuning the bass/tenor singles, as the tension of these strings has the greatest effect on tuning stability. (I usually stop at A=220cps.) Next, tune the single strings up to the top. Then pull out every other one of the strips and tune down from the top, tuning the left/right unisons. When you reach A=220, pull the action again, and pull the strips completely out. (This will make a very ethereal sound, if done correctly.) Return to the top and tune down to A=220. If any unisons are a little off, use the papp stick mute to get at the offenders. Another tool that I consider essential to tuning those "Birdcage" pianos with oval tuning pins is a double headed, tipped tuning hammer. The slots of each tip should be at right angles to the other.

Regarding square grand pianos, your system does not lend to solid tuning as the ringing of all the other strings, with the damper system extracted, is an exercise leading towards insanity. (Maybe that's why all the tuners in my area think I'm crazy to work on this type of piano!) The method I use to strip-mute the square grand does not require the removal of the damper system. I use a strip of spring rail felt. It is inserted with strip directly over the first plain wire unison (at the break). Insert the strip all the way down and through the plain wire unison. Proceed all the way up the piano to the treble strut. As the majority of square grands only have two string unisons up to that point, it is simply a matter of muting two notes with one insertion. Once past the over-strung area, standard methods are employed. The upper treble area of most square grands is three-string unisons. I usually use wide, rubber grand mutes in that area. (The use of masking tape should be avoided since it leaves residue on the strings.)

It should be said that tuning antique type pianos, takes a totally different mind set, especially with square grands. The tuning technique is "mirror image" of standard tuning techniques on standard grands. Where most technicians encounter problems is when "antiques" are approached as they would a modern counterpart. Because of different bridge, aggraffe and top nut configurations on antiques, the even pull technique is verboten. There are many other "tricks" to tuning these pianos, but space does not allow me to pursue them at this time.

Q — How Can I See The Future?

I schedule my customers' next appointments six months in advance and have occasionally scheduled up to a year ahead (particularly with institutional clients). As a result I have a continuing need for calendars for the next year well before most office supply stores have them in stock. Do you know of any suppliers that print calendars that far in advance?

A

From Jami Henry/Managing Editor

I won't say it is impossible to find calendars which are pre-printed beyond the most current year, but I have not been able to uncover the suppliers, if they exist. In talking with LaRoy Edwards and Evelyn Smith, our recommendation would be to create your own. Fortunately, there are a variety of software packages in existence that are made for creating calendars and most of them have other features as well. One of the most popular packages is published by a company called Now Software, Inc. This package will maintain your schedule, remind you of upcoming events, manage your to-do list and will allow you to print your calendar in a wide variety of formats, including layouts which fit most popular appointment books. When used in conjunction with a second product, Now Contact, (published by the same company) you can keep your client list (address information, etc.) up-to-date and accessible. These programs go on to include features like form letters, faxes, mailing labels, envelopes and will also keep track of all of your correspondence and related documents for each client.

This is not the only program available. Check with your local software distributor for more details and they will no doubt be able to help you select the perfect program to fit your needs.

In addition, there are a variety of software management programs available from suppliers and members of PTG. Among them, Jim Coleman, Sr. sells *Piano Technician's Management System* and Reyburn Piano Services sells a management program called *Piano Service Manager.* Both of these programs include organizational type applications such as calendars, customer database information, appointments, reminders and a wide variety of other features.

Also, be aware that if you are a MAC user, there are some very good bundle prices for the two programs from Now Software. Good luck!!

Q

What Are The Specifics On Hide Glue?

Please discuss the best method for preparing hide glues. I have been told that one should soak the glue crystals in water (just enough to cover them) overnight prior to use. But what should one do if a job needs to be done quickly and time is not available to soak the glue overnight? Will the glue retain its strength? Please discuss additives to retard glue set-up time.

A

From Jane Aisenbrey

The following answer is based on manufacturer's recommendations according to Jane Aisenbrey, Vice President of Pianotek Supply Company.

The best method for preparing hide glue is cold soaking. The preparation of animal glue for industrial uses is exceedingly simple. The proper amounts of dry glue and cold water are mixed together and the glue allowed to soak until swollen. The swollen glue is then melted at 140° F (mild heat) and stirred until dissolved. The glue solution is then ready for immediate use.

While animal glue will stand considerable abuse in its preparation and use, there are a few basic considerations which will enable the users to always obtain maximum economy and uniformity of working properties in the handling of this material.

If the technician has forgotten to prepare the glue and needs it in a hurry, he/she can pour the crystals directly into 180° F hot water. Pour the crystals very slowly with vigorous agitation. However, it is difficult to do this successfully on a small scale, such as for piano work. The chance of lumps occurring is greater. If lumps do occur, all you can do is strain the glue, discarding the lumps.

The manufacturer suggests first trying to slow the set time by warming the pieces of work under a heat lamp. You might also try using regular table salt to give you a longer work time. No more than 5% based on weight of dry glue should be used. Finally, urea can be added up to 15% by dry weight.

The follow general considerations may be used for hide glue.

Use Clean Equipment
Clean equipment means a clean glue solution with best results.

Weigh Glue and Water
Correct glue-water ratios ensure uniform, consistent working properties of the glue solution.

Continued page 14

Soak in Clean, Cold Water
For general adhesive work the dry glue should always be soaked in clean, cold water to ensure speedy glue preparation. (For dilute sizing solution, a pulverized glue may be dissolved directly in hot water under many conditions.) Coarse ground glue will require from one to two hours to thoroughly swell.

Pour Dry Glue Into Water
To minimize possible lumping and to ensure speedy preparation, the dry glue is preferably added slowly to the cold water with stirring until the dry glue is wet-out.

Use Gentle Heat
When the glue has been thoroughly soaked until soft, it is then preferably heated in a jacketed kettle, tank or pot. Swollen glue dissolves readily at temperature of from 110 to 150° F. with gentle stirring. A glue temperature in excess of 140° to 150° is unnecessary, is wasteful of heat, increases evaporation losses, slows the speed of set and introduces needless process variables.

Q When Is A Pitch Raise Necessary?

In general, if a piano is 4 cents or more flat I do a pitch raise (by Sanderson Accu-Tuner) and then tune the piano. I read in the July, 1994 *Journal* in the Q&A section, a response in which it was stated that a pitch raise was done only if the piano is 10 cents or more flat. Am I doing unnecessary work? Could you present a thorough discussion about the basic theory of pitch raising to include any precautions to take with pianos that are very flat, the possibility of cracked plates, and the even distribution of pressure while doing the procedure. Please describe different methods of pitch raising including pros and cons of each.

A *From Dr. Al Sanderson*

Dr. Al Sanderson has been tuning and doing research on pianos for over twenty years. His aural training was through private lessons with Bill Garlick, and electronically he is well known as the inventor of the Sanderson Accu-Tuner, its FAC Tuning program and its Pitch Raise Calculator program. He lectures extensively at PTG Conventions, is a 1980 Member of Note, and was elected to the Hall of Fame in 1993.

Pitch raising is a very important subject because of the amount of time (money) consumed by the process, and the amount of frustration it can create for the average piano tuner. Understanding what is going on within the piano during a pitch raise is the best method I know of reducing the time and frustration involved.

The first thing to understand is that to a pitch raise, a piano is kind of squishy soft. As a result, no string can be tuned without affecting its neighbors for about an octave on either side. The second thing is that strings not being tuned change pitch in the opposite direction from the string being tuned. These two factors account for the famous "anticipated drop" of a pitch raise. To counter the drop we overshoot the correct pitch, but this can never be done with perfect accuracy because some sections of the piano are squishier than others.

Think of the process of pitch raising as successive approximations that will converge on the desired result with as few iterations as possible. Even with the best techniques, you can only improve a piano by about a factor of ten to twenty on a single pitch-raising pass. Using poor techniques, i.e., no overshoot at all, you can only improve it by a factor to two or three per pass. So it is very important to use the best techniques to save yourself time as well as an aching back!

The answer to Jerry's question is clear from the above. If the piano is 4 cents flat, and you are using good techniques, you can bring it into tune within 0.2 to 0.4 cents in one pass. Good enough for almost anyone! If a piano is 10 cents flat, you can bring it into tune with 0.5 to 1.0 cents in one pass. Sometimes this is good enough, sometimes not. So the question is answered by asking another one in return—how fussy do you want to be? Just divide the flatness by ten and ask yourself if the result will be good enough. If not, then two passes will be necessary.

When a piano is very flat, I run scared (don't you?). I recommend on the first pass just to bring it up to pitch to see whether or not the piano can take it. If you start to break strings it won't be on account of overpull, it's not your fault, so just back off and tune the piano below pitch. Assuming the raise "to pitch" works, use the normal pitch raise procedure on the next pass because the piano will still be about one quarter as flat as it was to start. As far as cracked plates are concerned, they are extremely rare if that's any comfort to you. I believe that it always indicates a defect such as a crack that grew in the plate over the years, because the plate actually underwent far greater stresses in the factory during manufacture. Factory stringers have never worried about cracking plates!

As far as different methods of pitch raising go, there are probably four main categories: 1) aural, unisons last; 2) aural, unisons-as-you-go; 3) electronic, unisons last; 4)

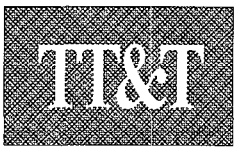
electronic, unisons as-you-go. In my opinion, these are in order of increasing precision and decreasing time required.

The problem with aural methods is twofold: loss of a good pitch reference as the center of the piano sinks under the weight of the pitch raise, and the difficulty of estimating overshoot based upon beat rates, which of course double per octave. Just as a carpenter needs a tape measure to cut a board accurately, a piano tuner needs a pitch-measuring device to cut a pitch raise accurately.

Finally, many tests and the experience of many tuners, both aural and electronic, has established that tuning unisons as you go is superior to tuning center strings only and then bringing in all the unisons. You need the tension of the two outside strings to fully "squish" each section of the piano as the pitch raise proceeds. Assuming the correct overshoot has been taken, each section of the piano reaches its correct pitch as soon as an octave above it has been tuned. This cannot happen with single strings first. Only one-third of the squishing takes place as you go, and the pitch will drop the additional two-thirds when you pull in the unisons. Bad news!

The ability to measure the flatness of the piano is especially important in pitch raising the treble end of the piano. Beat rates become too fast to hear up there, and you need to know the flatness to calculate the proper overpull. The flatness is always least in the bass, most in the treble, and therefore should be measured at several points along the scale. However flat the piano is, the overpull correction is always roughly one-quarter of the flatness in cents, so you need to be able to work in cents to do a precision pitch raise.

One last thing, taper off the overpull in the last octave down to zero on note C8. There is no need to pitch-raise C8 if you are pulling in unisons as you go. Notes are knocked flat when the notes above them are pitch raised. Since there are no notes above C8, no overpull is necessary!



More On Agraffes

Before you get out your left-handed bit, power drill, and Moto Tool to remove a broken agraffe, consider the fact that the stem of the busted agraffe is probably not frozen into the threads of the plate. To quote from Larry Scheer in the December 1970 *Journal*, "no stub has yet been found tight enough in the hole to need this procedure." Because of the way old agraffes (Steinways in particular) were designed, they were often overturned during installation. When the underside of the agraffe shoulder bottoms out against the plate, the stem stops moving but the top part can continue to be twisted causing a microscopic crack or weakness that eventually fails. Brass also seems to have some naturally lubricating properties, which probably helps the agraffe stem from being truly frozen in the threads of the plate.

There seem to be two major differences between agraffes on old Steinways vs. the modern replacements. Not only are the old agraffes sometimes not threaded all the way up the stem to the bottom of the shoulder, the entire undersurface of the agraffe shoulder bears against the plate, creating a good solid contact between the plate and the agraffe. Since it would have been difficult to remove such a wide swath of material from the bottom of such an agraffe, the temptation would have been to overtighten the agraffe to get the correct alignment, creating a weakened agraffe that lets go at the darndest times—midnight in a quiet house, or on a service call, just when you can't spare the time to repair it. Modern replacements are consistently threaded all the way up the stem, and only the outer rim of the under surface of the agraffe shoulder bears against the plate. This small area of contact between agraffe and plate makes it much easier to grind away material for proper angle of alignment using a counterbore, reducing the temptation and need to overtighten the agraffe to get that last little bit of correct alignment. (Consult Susan Graham's article from October 1989 for a complete discussion of agraffe replacement and tools.) I compared two sets of Steinway agraffes from old pianos. The set from the piano that had four broken agraffes was not consistently threaded all the way to the tops of the stems, and it was possible to observe where extra threads had been cut by overtightening. (Three more agraffes broke as we were removing strings, because of changing tension!) The other set of agraffes, from a piano where none had broken, was pretty consistent in having threads all the way up to the stem.

Try the following method for broken agraffe removal first:

1. Buy a regular flat blade 3/16" screwdriver, so that the tip is just narrower than the diameter of an old Steinway agraffe stem. Grind a V-shaped notch into the center of the top and a little material off the sides so that there are two sharp points. According to what I can find in my personal library of *Journals*, this "fish-tail" tool was first invented and popularized by Herman Koford of the South Bay, CA, chapter. (There are many articles on agraffe repair in the old *Journals*; although I didn't read them all, the nightmarish ones usually seemed to start with drilling a hole in the stub.)

2. Tap your modified screwdriver into the agraffe stem so that the points dig into the brass. (Use the uneven surface of the break to your advantage.) Now bear down and turn the screwdriver counterclockwise. The stub of the agraffe stem should start to turn out quite easily. Continue to tap, bear down and turn until the stem is out.

3. Sometimes an even simpler tool such as an awl can be tapped against one of the high spots of the ragged surface of the break, close to the perimeter of the stub, to start turning the stub out.

The only time the above method didn't work was when a well-meaning customer had already drilled a hole in the agraffe (way off-center, of course). That agraffe did not respond to the above technique, probably because the act of drilling into the brass had splayed it just a little bit into the threads. That one was very difficult to remove. If you can avoid even starting to drill a hole, you won't have to worry about splaying out the brass and jamming the agraffe into the plate threads.

Margie Williams

Clogged CA Glue Spouts

Clogged glue spouts seem to be one of the major frustrations in working with CA glue (a.k.a. super glue or stupid glue). Here's my solution:

1. Acquire several extra spouts and caps for the CA glue you use.

2. Drop the clogged spouts and caps into a jar of acetone (best left safely in the shop) and let them soak until the glue is dissolved. (This may take awhile, 24 to 48 hours sometimes.) Acetone is the main component in the CA glue solvent, and it does not harm the material of the spout and cap because they are a teflon product.

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Ingo Hoffman
Concert Technician

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3. Simply keep recycling the spouts and caps through the acetone, and make sure you have at least one or two fresh ones with you in your kit at all times.

4. Also, before capping the glue for the final time and periodically during a long gluing project, gently purge the spout of glue while the bottle is standing up, wiping the glue carefully, quickly and completely with a dry rag or tissue. Try to keep the rag away from the opening in the spout.

For additional excellent information, consult the August 1990 *Journal* for a reprint of a *Popular Science* article, "Secrets of the Superglues."

Margie Williams

T&T Consistent Aftertouch GO/NO GO Gauge

Where possible, it is better to make objective judgements when adjusting things rather than performing subjective adjustments since objective adjustments tend to be more repeatable and teachable. In gauging or setting aftertouch some technicians use touch alone. While it is relatively easy to feel the onset of jack movement it is less easy to judge whether the tip of the jack has really cleared the knuckle. Other factors, such as drop amount, tend to alter touch, making key-to-key comparisons more difficult unless all of these other adjustments have already been optimized.

The other classic method is the use of the penny with the hole drilled in the middle placed over the front rail pin. This requires the subjective judgement of the aftertouch just starting. It also requires the key hold down rail to be removed and is tedious to perform on the naturals. Getting the penny over the front rail pin of a sharp is a real fairground exercise. Fortunately there is a simpler answer. The GO/NO-GO aftertouch gauge.

Make this from an ordinary hardwood tongue depressor. The next time you say "Ahhhhhh" to your doctor ask to keep the wooden depressor he is just about to throw away. They are usually .060" thick. Square off both ends. In each end cut a deep 'V' notch about 3/8" deep. Sand one end to .060" thick, (measure with your center pin micrometer) and the other to .040". Label them 60 and 40. (You can change these thicknesses to your requirements once you understand the principle).

To use the gauge, pass the 40 end under a natural so that the notch fits snugly over the front rail pin. Depress the key and the onset of aftertouch should be felt. This is best done before drop has been set and is large. This exaggerates the aftertouch feel. Repeat the test but use the 60 end of the gauge. Aftertouch should not be felt. You now know that aftertouch is greater than .040" (about the minimum in many pianos for the jack to clear the knuckle), but less than .060". Quibble with the numbers if you wish but just remember that repeatability due to front rail punching stack compression and general perversity is five to .010" so that the minimum spread should be at least .010"

Here is the nice part. The gauge is just as easy and fast to use on the sharps. Just slip the gauge between two adjacent natural front pins and it will automatically locate on the sharp front rail pin. Voila! Consistent aftertouch between sharps and naturals! How many times have you found a piano with too little aftertouch on the sharps compared with the naturals?

Chris Day

T&T Burning The Fuzz From The Hammer

Recently I had the occasion to install a new set of hammers. As is my usual practice I filed them to remove dead felt. As usual, there was a lot of fuzz on the hammers, which I usually try to remove by repeated filing, each time with a finer grit of sandpaper. Suddenly it occurred to me that this fuzz could be burned away. Using my Unger heat gun I applied heat to the hammers, scorching the felt, which turned a golden brown. (Photo 1) Next, I used a suede wire brush to remove the burned felt (Photo 2). The result was the cleanest hammers I have ever had. Photo by C. Gallaher.

Sincerely,
Fred W. Tremper, RPT

Photo 1

Photo 2

TT&T Q & A Wanted!

The *Piano Technicians Journal* is now accepting articles for:

- Tips, Tools & Techniques
- Questions for the Questions & Answers Column
- Covers

If you have a particular trick of the trade, system for accomplishing a particular function or a special tool which seems to make your job easier...share it with the readers of the Journal.

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Lay out your own client newsletter in minutes with the new

PTG Business Resource Manual

Bill Spurlock, RPT
Chairman, Marketing Committee

Have you ever wanted to have a good looking, personalized newsletter you could hand or mail to clients, but were daunted by the task of writing the articles, designing a nice page layout, and printing it up? If so, you're not alone. Few members have ever done so. Yet, most seem to understand the benefits of providing informative, reader-friendly information to their clients. Whether it's a copy of Larry Fine's *Piano Book*, our technical bulletins or brochures, PTG members are providing educational materials to their clients like never before. Now you can easily produce your own client newsletters as well, using pre-written articles and page layouts provided in the new PTG *Business Resource Manual* (BRM.)

The idea for these "pre-written" newsletter pages came from member requests for more client education materials and more public relations tools. We decided that both these needs could be met with client newsletters addressing common customer questions on tuning, piano placement in the home, piano storage, buying & selling, moving, etc.—questions we're often asked that are not covered in our technical bulletin series. The result is a series of 13 pre-written pages containing articles on these topics as well as piano facts and general interest reading. The pages are laid out in camera-ready form and include front, inside, and rear pages. Making your newsletter is just a matter of choosing the pages you prefer, adding your personal information to the front page, and taking the job to your printer or a local copy shop.

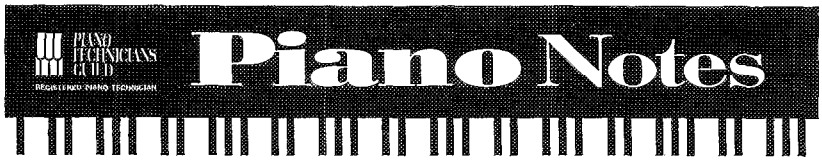
Assembling Your Newsletter

The BRM includes three each of pages one, two, three, and four, plus an extra page. To make a two-sided, single sheet 8-1/2 x 11 newsletter, choose one front page and one back page with the articles you like. For a four page newsletter on folded, 11 x 17 paper, add pages 2 and 3.

Sample masthead provided in the BRM

Add your member logo version

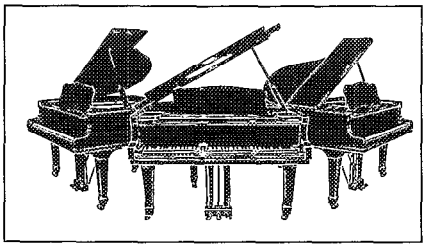
Add your name and address here
(Use Times Bold Typeface)



Bob Jones, RPT 123 Main Street, Oakland, CA 95667 (916)334-1234

Why Do Pianos Need Tuning?

"If I move my piano to another room, does it need to be re-tuned? My grandmother had a fine old upright that she never got tuned. Why does my piano need regular tuning? Back home we always kept a jar of water in the bottom of the piano. Does this help keep the piano in tune? How often does my piano need tuning?" Piano technicians hear these questions every day. Tuning is the most frequent and important type of piano maintenance, but it's often the least understood. Here we'll look at why pianos go out of tune and how you can help yours stay in better tune between visits from your technician.



First, new pianos are a special case; their pitch drops quickly for the first few years as new strings stretch and wood parts settle. It's very important that a new piano be maintained at proper pitch (A-440) during this period, so the string tension and piano structure can reach a stable equilibrium. Most manufacturers recommend three to four tunings the first year, and at least two annually after that.

Aside from this initial settling, seasonal change is the primary reason pianos go out of tune. To understand why, you must realize that the piano's main acoustical structure, the soundboard, is made of wood (typically 3/8-inch thick Sitka spruce). And while wooden soundboards produce a wonderful sound, they also react constantly to the weather. As humidity goes up, a soundboard swells, increasing its crowned shape and stretching the piano's strings to a higher pitch. During dry times, the soundboard flattens out, lowering tension on the strings and causing the pitch to drop.

Unfortunately, the strings don't change pitch equally. Those near the soundboard's edge move the least, and those near the center move the most. So, unless it's in a hermetically sealed chamber, every piano is constantly going out of tune!

The good news is there are some simple things you can do to keep your piano sounding sweet and harmonious between regular service appointments. Although it's impossible to prevent every minor variation in indoor climate, you can often improve conditions for your piano.

Start by locating the piano away from direct sunlight, drafts, and heat sources. Excess heating causes extreme dryness, so try to keep the temperature moderate (below 70 degrees) during the winter heating season.

Get a portable room humidifier, or install a central humidification system to combat winter dryness in climates with very cold, dry winters.

A portable dehumidifier or a dehumidifier added to your air-conditioning system can remove excess moisture during hot, muggy summers.

If controlling your home's environment is impractical, or if you want the best protection possible, have a humidity control system installed inside your piano. These are very effective in controlling the climate within the instrument itself. Besides improving tuning stability, they help minimize the constant swelling and shrinking of your piano's wooden parts. The critical part of such a system is the humidistat, a device that monitors the relative humidity within the piano and adds or removes moisture as needed. Jars of water, light bulbs, or other "home remedies" have no such control and can actually do more harm than good.

Page 1: The first pages have spaces at the top for a header, so you can personalize your newsletter with a title, name, address, etc. There are several ways to go here:

- Use an existing letterhead from your stationery, if suitable. Cut and paste it in place.
- Design a new header including a title for the newsletter, your correct member logo version, name and address. This requires desktop publishing software (or a modern word processing program) and a laser printer. Lacking these, you can rent computer time at a copy shop such as Kinko's, or have your printer execute the design for you. Choose typefaces compatible with those in the templates.
- Use the sample "Piano Notes" masthead provided, as shown here. Paste in your PTG member logo to the left of the title. (Because of the black background, it's best to use a color-reversed logo image as shown here. This can be obtained by taking the logo sheet from your Graphics Standards Manual to a copy shop such as Kinko's, which can reverse the image colors for you.) Then paste in your name, address, etc. along the bottom of the masthead as shown in this example. (The typeface used in the newsletter text is Times, so Times Bold is a good choice to use here.)

Pages 2 & 3: Most of the second and third pages are paired, with one of the articles flowing from one page to the other. Choose articles that complement your other pages.

Back page: The last pages are blank along the lower third; this allows space for addressing and folding as a self-mailer, as shown at right. If you will be handing out the newsletters instead of mailing, this extra space can be used for extra pictures or information about your business.

Customizing Your Newsletter

Most technicians will want to include a little information about their own businesses, such as specific services they offer, pianos for sale, rentals available, etc. This can be easily done by writing up the information, formatting it to match the column width and typeface of the existing text, (the body text is set in Times; headings are Fenice Bold), and pasting it over another article or in the blank "self-mailer" space.

When adding your own text, stick to typefaces that are similar to those on the template pages. While some variety can add interest to a page, using too many different typefaces will give your newsletter the "ransom note" appearance—a patched-together look that's distracting to the reader. Remember that you don't have to supply the final copy yourself—most printers can format your text to fit the existing page style, or you can rent time on a computer and laser printer at many copy shops. Once you have your custom header and personal information, save it to paste into future editions of your newsletter.

You can also dress up your newsletter with additional clip art. The BRM contains several pages of camera-ready piano images in a variety of sizes. These can be added here and there to fill empty space, to illustrate some text, or pasted in place of an existing article. To make your newsletter most inviting to the reader, don't cram it too full of text. White space and pictures sprinkled throughout will attract the reader's eye and interest much more than solid text.

Assembling your final camera-ready copy is simple. All you need is a glue stick, scissors, and a roll of 3M Post-it correction & cover-up tape. Better copy shops have self-service work tables equipped with these supplies. Just cut and glue down your personal information, additional pictures, etc. For an 11 x 17 folded newsletter, tape pages 1 & 4, and pages 2 & 3, together using the white cover-up tape.

On the Road: An Interview with Concert Pianist Jeffrey Kahane

The aura of Jeffrey Kahane's success in both the 1981 Van Cliburn and 1983 Aurthur Rubinstein Competition (first prize) has never been diminished and continues to be reflected in his busy schedule of performances with leading orchestras both here and abroad.

Mr. Kahane made his Carnegie Hall debut in 1983 in a special concert tribute to Aurthur Rubinstein. He was one of three pianists chosen in Lincoln Center to inaugurate a new piano series at Alice Tully Hall in the spring of 1986. Piano Technicians Journal contributor Rick Baldassin spoke with Jeffrey Kahane in April 1989:

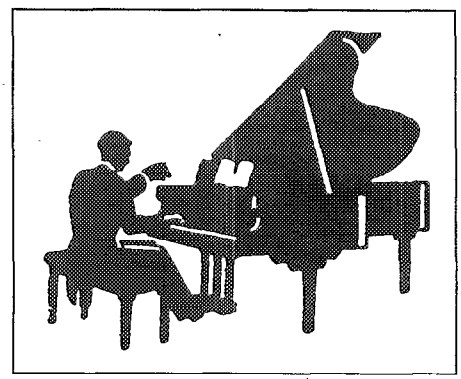
How many programs do you have to keep in your repertoire at a time, and how much time to do you have to spend practicing while you are on the road? Is this something that is hard for you?

Kahane:

Probably the single hardest thing about my life, and I think I speak for a lot of my colleagues, is practicing on the road. First of all, being on the road is tiring. When you get to a place, you may be hungry, you may be tired, you may be late. If it is difficult to find a place to practice, if the piano is lousy that you have to practice on, all of these things are a problem.

What people don't realize is that we are very often practicing not for the concerts that we are doing tonight or this week, but for next week and the week after. I play generally anywhere between eight and twelve different concertos in a season, usually two recital programs, and a fair amount of chamber music. That is a lot of music, maybe 15 to 20 hours of music that one is responsible for in the course of a season.

If you multiply each hour of music by the number of hours necessary to practice it to keep it in shape, and/or prepare it, you can see the problem of finding hundreds of hours of practice time over a period of several months, during which many hours are spent on the road, doing sort of fundamental things one has to do to survive. It is a real problem.



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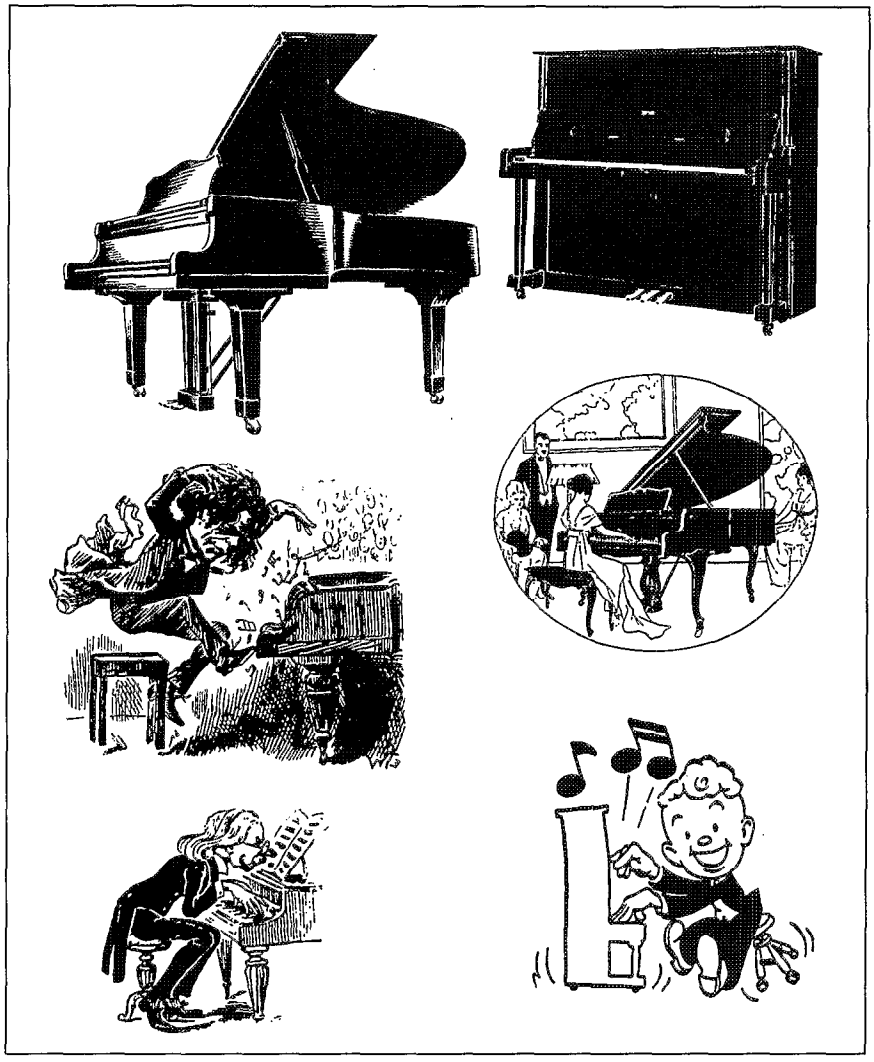
REGISTERED PIANO TECHNICIAN

Bob Jones, RPT
123 Main St.
Oakland, CA 95667



Examples of clip art contained in the Business Resource Manual

Printing

For small quantities, photocopying will be comparable in cost to printing on a press. There is a big variation in print quality among copy machines though, depending upon their design and how well they are maintained. A good machine should be able to produce clear, clean copies. The minimum quantity run for a printing press is usually around 100 copies, at a cost similar to that of photocopying. For larger runs, the cost per copy of press printing drops quickly.

An attractive paper will really enhance the appearance of your newsletter compared to printing on plain white stock. Most printers and copy shops have a variety to choose from. These custom papers let you add color without the expense of two-color printing. Remember that you want to portray a professional image. I'd suggest a nice parchment or speckle-tone paper in a muted color. Hot neon pink may work well on a garage sale poster, but it's not appropriate for someone trying to sell old-world craftsmanship!

Newsletters are a great way to build a positive reputation with clients. By providing information that helps them understand their piano and better care for it, you demonstrate concern for their needs, not just your own self interest. In return you gain their trust and their business.

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LESSON PLAN

Technical Lesson #14

Vertical Regulation— Adjusting Checking Distance and Setting Sharp Key Dip By The Equal Checking Method

By Bill Spurlock, RPT
Sacramento Valley Chapter

This monthly lesson plan is designed to provide step-by-step instruction in essential skills. Chapters are encouraged to use this material as the basis for special Associate meetings, or for their regular meeting program, preferably in a hands-on format. This method allows the written information to be transformed into an actual skill for each member participating.

In brief

This lesson will cover adjustment of hammer checking for natural and sharp keys. In addition, participants will learn how to set sharp key dip using checking distance as a measure of equal capstan lift between natural and sharp keys.

Getting started

In order to pursue any serious study of piano technology, one must obtain basic resources. Catalogs from several piano supply houses, both large and small, are essential. Besides offering the necessary supplies, their pictures and item descriptions are valuable sources of information. Piano manufacturers' service manuals are also essential sources of valuable information. Most are available at no cost. Most important to participating in this Lesson Plan series are the PTG Exam Source Books, both the tuning and technical versions. Articles in these books will serve as reference material for the lessons.

Hands-on session setup

To teach this lesson in a hands-on format, you will need one or more direct blow vertical pianos in good condition. Used pianos in a dealership or practice room pianos at a college are good candidates, as long as they have only light wear. Ideally the following work will have already been done on these pianos: parts alignment (lessons #8 & 9), choosing blow & dip dimensions (lesson #10), adjusting lost motion & leveling keys (lesson #11), setting white key dip (lesson #12), and setting let-off (lesson #13). At minimum, the following adjustments should be reasonably set: backcheck-to-catcher alignment, backcheck rotation, white key dip, and lost motion.

Depending upon time available, this lesson may consist of each participant adjusting checking on one or two octaves or an entire piano.

Additionally, meeting setup should include:

- Extra regulating tools

Estimated lesson time

1 1/2 hours

Tools & materials participants must bring

For this lesson, participants should bring a selection of regulating tools, including:

- wire bending pliers
- wire bending tool *(see Figure 1-page 25)*
- dip block
- 8"-12" straightedge or ruler

Assigned prior reading for participants

PTG Technical Exam Source Book (PTG Home Office, 816-753-7747), pages III.8 to III.9

General instructions

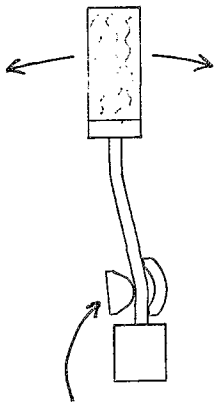
Backcheck function:
The purpose of the backcheck is to catch the hammer assembly as it rebounds from the strings, holding it close to the strings in preparation for a repeat blow. Remember that before a quick repeat blow can be played, the key and wippen must return at least part way toward rest, allowing the jack to disengage from the let-off button and rotate back underneath the hammer butt. If the hammer assembly were to rebound unchecked all the way back to the rest rail, the key and wippen would likewise have to return completely to rest before the jack could get back under the butt to play the note a second time. In this case repetition would be very slow, and only possible if the player released the finger from the key completely between each blow. Checking, however, stops or at least slows the rebound of the hammer assembly close to the strings. The springy wire and felt cushion of the backcheck then act as a spring, exerting a separating force between the wippen and hammer butt, allowing the wippen and key to return slightly ahead of the hammer. The jack is then able to slip back under the hammer butt before all parts return to their rest positions, allowing faster repetition and repetition "within the key stroke"; that is, repetition can occur without necessarily allowing the key to come all the way back up or removing the finger completely from the key.

The actual repetition ability depends upon the action type and design. Those with full-sized parts

Backcheck Alignments—Figure 1

A) Alignment*

Align backcheck heads side-to-side with catchers and vertical.



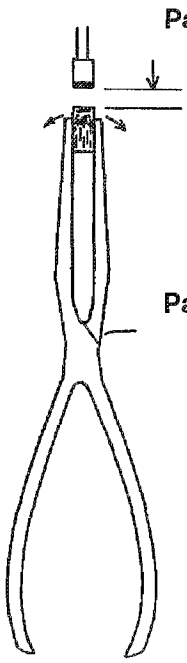
Wire bending pliers

***These adjustments were covered in lesson #9**

B) Rotation*

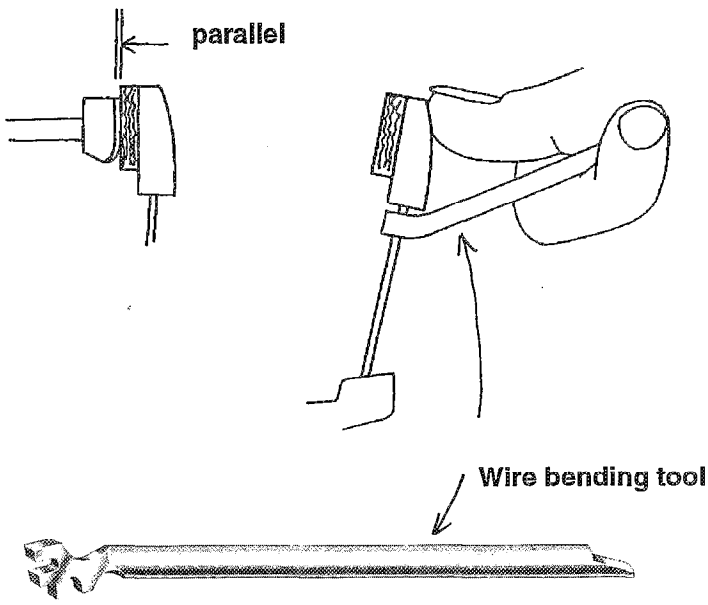
Rotate backcheck heads parallel to catchers.

Top view



C) Angle

Hold backcheck wire stationary with wire bending tool; use thumb to adjust head angle so catcher and backcheck meet approximately parallel.



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LESSON PLAN

perform best, "compact" console actions may not repeat as well, and spinet drop actions often require full key release to repeat reliably. In addition to acting as a repetition spring of sorts, the backcheck simply serves to maintain control of the rebounding hammer. Without this control the hammer would bounce back and forth between the hammer rail and strings several times after a hard blow.

Judging sharp key dip via checking distance

Two methods of setting checking will be discussed in this article:

1) simple adjustment of checking distance for both natural and sharp keys. This assumes that key dip has already been set for both;
2) a procedure for setting checking of natural keys, adjusting sharp backchecks, and adjusting sharp key dip as part of a single operation. This method assumes that key dip has only been set for the natural keys so far.

Backcheck adjustment:
Most manufacturers specify a checking distance of 1/2" to 5/8". Consult manufacturers' service manuals and the PTG *Piano Action Handbook* for specific recommendations.

Before adjusting checking distance, the backchecks should be aligned to the catchers and checked to see if they are meeting the catchers at the correct angle, as shown in Figure 1. The catcher leather and backcheck felt should meet approximately parallel, when viewed from the side. To test, set the checking distance to 5/8" on one note and play with varying force. If the checking distance varies more than about 3/8" between a soft and hard blow, try bending the backcheck wire to tilt the head out at the top (away from the catcher) slightly. Make this change by holding the wire stationary just below the backcheck with a wire bending tool, then bending the backcheck head backwards with the thumb so the catcher and backcheck no longer meet parallel. (Note that the bending tool is used just to hold the wire, while the fingers are used to make the bend right where the wire enters the backcheck head.) Readjust checking distance and re-test.

Conversely, if the hammer does not check reliably, especially on a soft blow, bend the backcheck wire so the head tilts inward slightly at the top. This will prevent the catcher from bouncing out of check on a soft blow.

Photo 1: With white key dip, hammer blow distance and lost motion carefully adjusted, test checking distance by playing three or four adjacent keys as a group, trying to play with equal force. If the key dip is already set for both naturals and sharps, checking can be set for all keys at this time and the job will be done. If only white key dip is set, then adjust only the backchecks of natural keys at this time, as shown in this photo. Then, proceed as shown in Photos 2-4.

You can use a gauge or ruler to measure checking distance every so often, then just estimate by eye. Re-check with the gauge occasionally to keep your eye calibrated. Checking distance will vary with playing force, so play each group of keys several times until you can see a consistent pattern.

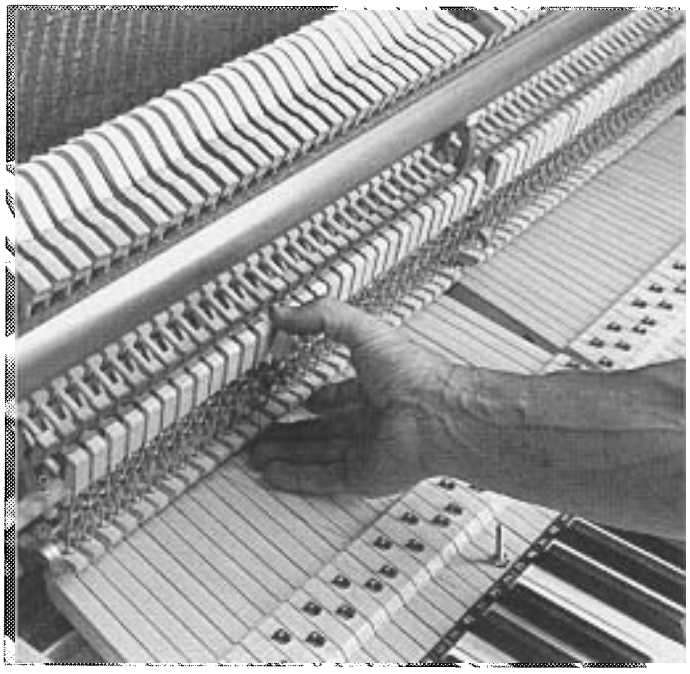

Photo 2: Adjust checking distance where necessary by bending the backcheck in or out slightly as shown here. A slight bend will make a big change in checking distance.

Photo 3: When checking for all natural keys is set, bend the backcheck wires of all sharp keys to put their heads in line with those of the naturals. Test with a ruler.

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Photo 4: Now the sharp key dip can be evaluated by comparing the checking distance of sharps and naturals, as follows: Recall from lesson #12 that key dip should result in equal capstan travel—and therefore equal wippen travel—for all keys, whether they are sharps or naturals. Therefore, assuming that natural key dip is set, lost motion adjustment for all keys is even, and all backchecks are in line at rest, then backcheck movement (checking distance) becomes a measure of how far a wippen is travelling and thus a measure of key dip. A key with greater dip will lift its wippen higher, pushing its backcheck closer to the strings and checking its hammer closer to the strings. A key with less dip will not raise its wippen as far, causing its hammer to check farther from the strings. Thus we can use the checking distance of the sharp keys as a measure of their key dip, and add or remove front rail punchings from the sharps until their hammers check the same distance from the strings as their natural neighbors.

In this photo, notice that the third hammer checks farther from the strings than its neighbors. Thus, we would remove front rail paper punchings from this key (a C#) until its hammer checked evenly with the others. The end result of this process would be sharp dip and checking correctly set.

Limitations of the equal-checking sharp dip setting method:

This method assumes that action parts are uniformly made and have minimal wear, so that all catchers are in line and all catcher leather and backcheck felt is of even thickness. (If catcher shanks were of unequal length, for example, the backcheck heads would have to be offset accordingly instead of being set in a straight line.) Therefore this method is most valid for well-made pianos with light wear.

In practice, you will find that after setting checking of all naturals as in Photo 1, not all natural backchecks will be exactly in line. This is due to discrepancies in your natural key dip and lost motion settings, variations in playing force used while adjusting, and dimensional differences of parts as mentioned above. Nonetheless, this method works quite well and actually offers a cross-check on other regulation settings. Backcheck alignment can be varied from a straight line to compensate for uneven catchers. In addition, inconsistencies in the backcheck line might indicate uneven natural key dip or lost motion, which can then be re-checked. All in all, this method of setting sharp dip and checking generally gives good results and is quite fast.

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LESSON PLAN

Tuning Lesson #14

Tuning 4:1 Double Octaves

By Michael Travis, RPT
Washington, D.C. Chapter

This monthly lesson plan series is designed to provide supervised practice of tuning skills as a supplement to independent study and practice. Chapters are encouraged to use this material as the basis for special Associate meetings, or for their regular meeting program. Each lesson is designed to take about one hour, with about four participants. Participants are assumed to have essential reference materials and tuning tools (see PACE checklist) and access to a well-scaled large upright or grand piano for independent practice

In brief

In this lesson, participants will practice tuning both pure and expanded 4:1 double octaves over the octave 2-4 range, using the M3-M17 test, the M3-M10-M17 test, and other octave tests (lessons 7-9). Each participant will tune one double octave just, another 1 bps wide, and will then tune the two single octaves within each double octave so they are equally clean-sounding. An analysis of the single octaves using 2:1, 4:2 and 6:3 octave tests, and the M3-M10-M17 test, will follow. This lesson will demonstrate the inter-relationship of double octave and single octave tuning and testing in the midrange. And, since most pianos will sound in tune when 4:1 double octaves over the entire keyboard are about 1 bps wide, this lesson should help give participants a powerful tool to expand a temperament into the bass and treble.

Chapter meeting set-up

These lessons are most conveniently taught to a small group of four or five. Each group should have its own piano and RPT instructor. Each piano should be in a quiet environment for close listening. Avoid using pianos that present serious obstacles to tuning, such as deeply grooved or misaligned hammers, string termination noises, etc.

Tools & materials participants must bring

Tuning hammer and wedge mutes.

Home study assignment for participants

Review PACE Tuning lessons 7-9, on octave tuning, and practice the principal octave tests for 2:1, 4:2 and 6:3 octaves. Also, study the tests for 4:1 double octaves in Owen Jorgensen's *Tuning*, MSU Press 1991, p. 758, bottom third of page. Some of these tests also appear at the end of this lesson.

Practice setting several 4:1 midrange double octave pure and several others 1 bps wide, also tuning and testing the two single octaves within each double octave, as in the outline accompanying this lesson.

General instructions

Begin the session with a brief explanation of what each participant should accomplish in 10-15 minutes: two adjacent unisons in octave 4, two double octaves and unisons in octave 2, two single octaves and unisons in octave 3 – a total of six unisons, including the two double octaves and the octaves in the middle of each. This is a lot to do for four participants in about an hour, so it's important to minimize the talk and get right to work.

First, simply clean up two unisons in octave 4, working on two notes descending chromatically from B4. Then, mute the corresponding two unisons to single strings in octave 2 and tune the double octaves from the previously tuned unisons, as follows. Tune the upper double octave pure, using the equal-beating M3-M17 test to prove it; then tune the lower double octave expanded by 1 bps, using the same M3-M17 test with the M3 beating 1 bps slower than the M17 to prove this degree of expansion. Then unison-tune the two notes in octave 2, and retest; this will help show the subtle differences between single-string and unison tuning. Then mute the corresponding octave 3 notes to single strings and tune them "between" the previously tuned notes in octaves 2 and 4, so that the single octave up sounds about as good (or bad) as the single octave down in each case. Then tune the octave 3 unisons, and allow the next participant to begin cleaning up unisons of the next two notes in octave 4.

Once everyone has gotten this far, we will as a group test the single octaves and see what we have. With volunteers doing the testing, we will look at the single octaves as 2:1 (M10-M17 test), 4:2 (M3-M10 test) and 6:3 octaves (m3-M6 test), and judge whether they are expanded, pure or contracted. Also, we will listen to parallel ascending M3-M10-M17 tests of the single and double octaves, (muting test notes as needed), and talk about how this test gives a lot of information about the 2:1, 4:2 and 4:1 intervals. Remember that after the double octave tuning, there should be one whole-tone series of pure double octaves, and another whole-tone series of expanded double octaves. Listen for these differences as you run the tests.

Here are some additional equal-beating 4:1 double octave tests participants can try for further ear-training practice, if there is time left over. In each case, first tune the double octave nearly pure at the 4:1 level by aurally focusing on the upper D8ve note. Take advantage of a piano with a

Double Octave Practice Outline

I. Tuning and testing a pure 4:1 C2-C4 double octave, tuning C3 between C2 and C4, and testing the C2-C3 and C3-C4 single octaves that result.

A. Tuning a pure C2-C4 double octave: Wedge mute C4 to a single string, and tune the C4 unison as cleanly as possible. Wedge mute C2 to a single string, and tune it to the C4 unison. Use the sostenuto pedal, if available, to sustain the interval while tuning. Focus on eliminating the beat at the C4 level while listening only to the double octave. When you are satisfied, tune the C2 unison strings.

B. Testing for a pure C2-C4 double octave: Wedge mute test note G#1 to a single string and adjust for a comfortable beat rate at the C4 level on the wide side of pure (3-4 bps) with both C2 and C4. Then:

1. Test the C2-C4 double octave by playing the M3, G#1-C2 vs. the M17, G#1-C4. If the M3 = M17 beat rate, go on to part I-C. If the M3 < M17 beat rate, go to step 2 immediately below. If the M3 > M17 beat rate, go to step 3.

2. Wedge mute C2 to a single string, raise it to speed up the M3 and retest; when you are satisfied that the M3=M17, tune the C2 unison strings and go to step 1 immediately above.

3. Wedge mute C2 to a single string, lower it to slow down the M3 and retest; when you are satisfied that the M3=M17, tune the C2 unison strings and go to step 1 above.

C. Tuning C3 between C2 and C4: wedge mute C3 to a single string, and tune it so that the single octaves C2-C3 and C3-C4 sound similar. When you are satisfied, tune the C3 unison and listen to the single octaves again, muting and retuning C3 if necessary.

D. Test the single octaves: using the principal octave tests from PACE tuning lessons 7-9, test C2-C3 and C3-C4 as 2:1, 4:2 and 6:3 octaves, muting and adjusting test notes as needed. Observe in each case whether the octaves are wide, pure or narrow.

E. Apply the M3-M10-M17 test: play in sequence and observe any differences in beat rates of G#1-C2, G#1-C3, and G#1-C4.

II. Setting pitch at A4, tuning and testing a 1 bps wide 4:1 A2-A4 double octave, tuning A3 between A2 and A4, and testing the A2-A3 and A3-A4 single octaves that result.

A. Setting pitch at A4: wedge mute test note F2 to a single string and adjust for a comfortable beat rate on the wide side of pure (about 4 bps) with an A-440 pitch source. Then wedge mute A4 to a single string, and tune it to an A-440 pitch source, equalizing the M17 beat rates F2-A4 = F2-A440. When you are satisfied, tune the A4 unison as cleanly as possible, and retest.

B. Tuning A2-A4: wedge mute A2 to a single string, and tune it to the A4 unison. Use the sostenuto pedal, if available, to sustain the interval while tuning. Focus on tuning so that the beat at the A4 level is about 1 bps wide of pure while listening only to the double octave. When you are satisfied, tune the A2 unison strings.

C. Testing 1 bps wide A2-A4: play the M3, F2-A2 vs. the M17, F2-A4.

1. Count the bps of the M17, subtract one, and see if that equals the bps of the M3. If the M3 < M17 beat rate by 1 bps, you have a 4:1 double octave 1 bps wide, and may proceed to D below. For example, if the M17 is at 5 bps, the M3 should be at 4 bps. Or if the M17 is at 4 bps, the M3 should be at 3 bps. If the M3 is too fast – which now means either less than 1 bps slower, equal to or faster than the M17 – go to step 2 immediately below. If the M3 is too slow – which now means more than 1 bps slower than the M17, go to step 3 below.

2. Wedge mute A2 to a single string, raise it slightly to speed up the F2-A2 M3 and retest; when you are satisfied that the M3 < M17 by 1 bps, tune the A2 unison strings and go to step 1 immediately above.

3. Wedge mute A2 to a single string, lower it to slow down the F2-A2 M3 and retest; when you are satisfied that the M3 < M17 by 1 bps, tune the A2 unison strings and go to step 1 above.

D. Tuning A3 between A2 and A4: wedge mute A3 to a single string, and tune so that the single octaves A2-A3 and A3-A4 sound similar. When you are satisfied, tune the A3 unison and listen to the single octaves again, muting and retuning A3 if necessary. Tune by comparing and equalizing the overall octave sounds, with no other tests at this step.

E. Test the single octaves as 2:1, 4:2 and 6:3 octaves as in I-D above.

F. Apply the M3-M10-M17 test, playing in sequence and observing the differences in beat rates of F2-A2, F2-A3 and F2-A4. If necessary, adjust A3 so that the M10 beats at a rate midway between that of the M3 and the M17.

III. Compare the double and single octaves C2-C3-C4 with A2-A3-A4. Compare octave test results. Compare M3-M10-M17 test results.

sostenuto pedal, sustaining and tuning double octaves while listening to the beats directly. Note that some of these tests require adjusting the test note and/or ghosting for an audible beat rate. These are usually less convenient and/or more difficult to hear than the principal M3-M17 (fifth partial) test featured in this lesson.

1. P4-P12 (a third partial test) – using a test note a P4 above the lower double octave note and a P12 below the upper. Adjust the test note for a suitable beat rate and a wide P4 and narrow P12. Ghost the P4 at the upper double octave note to hear the proper beat rate. Tests 4:3 P4 vs. 3:1 P12.

2. P5-P19 (a sixth partial test) – using a test note a P5 below the lower double octave note and a P19 below the upper. Adjust the test note for a suitable beat rate and narrow P5-P19 test intervals. Ghost the P5 at the upper double octave note to hear the proper beat rate. Tests 6:4 P5 vs. 6:1 P19.

3. m7-m21 (a seventh partial test) – using a test note a m7 below the lower double octave note and a m21 below the upper. Adjust the test note for a suitable beat rate and wide m7-m21 test intervals. Ghost the m7 at the upper double octave note to hear the proper beat rate. Tests 7:4 m7 vs. 7:1 m21.

4. M9-M23 (a ninth partial test) – using a test note a M9 (8ve-M2) below the lower double octave note and a M23 (T8ve-M2 below the upper. Adjust the test note for a suitable beat rate and narrow M9-M23 test intervals. Ghost the M9 at the upper double octave note to hear the proper beat rate; this may require a sostenuto pedal to accomplish. Tests 9:4 M9 vs. 9:1 M23.

5. M10^2-M24 (a tenth partial test) – using a test note a M10 below the lower double octave note and a M24 below the upper. Adjust the test note for a suitable beat rate and wide M10-M24 test intervals. Ghost the M10 at the upper double octave note to hear the proper beat rate (second pair of M10 coincident partials); this may require a sostenuto pedal to accomplish. Tests 10:4 M10 vs. 10:1 M23.

Note: *Do you find these lesson plans valuable? Do you have specific suggestions for changes or clarification? Please direct any comments or suggestions to the author c/o the* **Journal**.

An Every-Which-Way-You-Can Temperament Sequence

By Kent Swafford • Contributing Editor

In his last column as tuning editor of the Piano Technicians Journal, *Rick Baldassin quoted Nels C. Boe of Kansas City, who wrote as follows in the January 1925 issue of the* Tuner's Journal *in response to a request for instructions on how to tune a temperament sequence which used thirds and sixths:*

"There are so many different 'formulas' or 'ways around' to divide the temperament octave into 12 equally-distant semitones that we shall not attempt to give you any special method, or formula, because, first, we are not a sixth and third tuner, and therefore cannot from experience recommend any special system to be preferred to another; and, second, if we suggest one method someone is sure to come back at us and say, 'That is not a good one, mine is better.' Every tuner believes he has the best temperament."

With tongue firmly planted in cheek, may I say that I am a sixth and third tuner and can suggest from experience the best way yet devised to tune a temperament. I hope that the 69 year delay in getting an answer to this question will have caused no inconvenience to anyone.

Seriously, I never set out to inflict yet another temperament sequence on the piano-tuning world. After reading Carl Roots' March 1981 Journal *article, "Evaluating Temperament Sequences," I put together a temperament sequence that seemed to satisfy the requirements as set forth in that article. The sequence also incorporated ideas that I had learned from George Defenbaugh, Newton Hunt, and my piano tuning teacher, Marty Hess. I have been using this temperament sequence in my tuning classes for the past six years or so, and quite a number of people have told me that they have adopted it as their own, so I believe a complete discussion of the sequence is in order. I am aware that others have also developed this same temperament sequence independently. A short description of this sequence was published in the July 1992* Journal, *in a beautiful single-page layout. I hoped that students would find it convenient to make a photocopy of the sequence and carry it with them and refer to it while actually tuning pianos. When the sequence was reprinted in the Piano Technicians Guild* Tuning Exam Source Book, *the layout was altered. The most recent one page version is available directly from me to anyone willing to send me a polite request for it.*

As for the name of the sequence, prominent in Carl Root's article was the temperament sequence by William Stonaker called "Both Ways from the Middle." I figured that if one could tune both ways from the middle, one could also tune the middle from both ways. So, because the question of whether one is tuning with thirds and sixths and checking with fourths and fifths, or tuning with fourths and fifths and checking with thirds and sixths, is blurred at times in this sequence, the name for this temperament sequence became clear upon release of the Clint Eastwood movie "Every Which Way But Loose."

Voila! The Every-Which-Way-You-Can Temperament Sequence...

This discussion assumes general knowledge of musical scales and intervals, beats, the expansion and contraction of tuning intervals, and perhaps some knowledge of beat rate checks as well.

Tune A4 to an A=440 pitch reference, using test note F2 or B1. First, tune the piano A4 beatless with the pitch reference A4. It is important to first eliminate the beats between the A4 on the piano and the pitch source. Don't make the mistake of skipping this step and listening to the beat rate between the test note and the A's first, because in doing so there is a slight chance that you would be "checking" the wrong relationship. After eliminating the beats between the piano's A4 and the pitch source, make the beat rate of the F2-A4 M17th on the piano exactly equal to the beat rate of the M17th between the piano F2 and the pitch reference A4, or make the beat rate of the B1-A4 double-octave m7th on the piano equal to the beat rate between the piano B1 and the pitch reference A4. You need not check the A4 with both the M17th and the double-octave m7th. The M17th is the more common test interval, but the double-octave m7th will work just as well if, for example, the M17th cannot be heard clearly for some reason. The tuning of the test note may be adjusted to form a beat rate with the A's that can be heard comfortably. The interval formed between the test note and the A's should be expanded, not contracted.

Tune A3 to A4, using test note F3. Tune a clean-sounding octave and make the F3-A3 M3rd beat slightly slower than the F3-A4 M10th. These are conflicting requirements, to make the M3rd slower than the M10th while at the same time keeping the octave clean-sounding, because the difference between the beat rates of the M3rd and the M10th will be the same as the beat rate of the octave at the 4:2 level. Balancing these two requirements should help the tuner zero in on the correct width of the octave. Octaves with slight "movement" (that is, very slow beating) are considered by many tuners and musicians to be more beautiful than perfectly beatless, or "dead," octaves. To be used as a test note, the F3 needs to form expanded intervals with the A3 and A4 that beat at rates that can be heard comfortably. If necessary, go ahead to the next step of tuning the F3, then recheck the tuning of the A3.

Tune F3 to A3, approximating 7 beats per second (bps) expanded. The exact beat rate of this interval varies from piano to piano and cannot be determined at this point. It will have to be adjusted later.

Tune D4 to all of the following:

...**to F3,** approximating 8+ bps expanded.
...**to A3,** approximating 1+ bps expanded.
...**to A4,** approximating 1/2 bps contracted, almost "clean."

Stop. The "stopping" points in this sequence are places where the tuner can evaluate how the overall temperament is progressing, and are places where adjustments may need to be made to notes tuned previously. The A3-D4 P4th should beat faster than the D4-A4 P5th, and in order for that to be the case, the A3-A4 octave must be "stretched" at the 4:2 level. In other words, the D4 is another test note for checking the A3-A4 octave, albeit for the same 4:2 relationship that was checked by making the F3-A3 M3rd slower than the F3-A4 M10th. After tuning four notes, the relationships of the various intervals that have been formed are already getting complex. The F3-D4 M6th should beat faster than the F3-A4 M10th, insuring that the D4-A4 P5th is contracted properly. The F3-A4 M10th should in turn beat faster than the F3-A3 M3rd, insuring that the octave is stretched. But the beat rate differences here are slight because the F3-D4 M6th need be only about 1 bps faster than the F3-A3 M3rd to insure that the A3-D4 P4th is expanded properly. Adjust the A3 and the D4 as necessary to achieve the proper relationships; the A4 is "set in stone" and the F3 cannot yet be tuned with certainty.

Tune A#3 to both of the following:

...**to D4,** approximating 9+ bps expanded.
...**to F3,** approximating 1+ bps expanded, much the same as the A3-D4 P4th.

Stop. Tuning the A#3 completes a "tuning loop" made up of F3, D4, and A#3. A tuning loop is a set of notes where the last note tuned has a known, checkable relationship to the first note tuned. Be sure that the beat rates of the F3-A3 M3rd, the F3-D4 M6th, and the D4-A#3 M3rd progress (approximating 7, 8+, 9+ bps, respectively) and that the F-A#3 P4th beats about 1+ bps, similar to the A3-D4 P4th (perhaps a bit slower). Adjust both the F3 and the A#3 as necessary to achieve the proper relationships. The F3 can be tuned now with a bit more certainty. This stopping point is important; until the 7, 8+, 9+, 1+ beat rate relationships between the F3-A3 M3rd, the F3-D4 M6th, the D4-A#3 M3, and the A#3-F3 P4th, respectively, can be achieved, there is no reason to even try tuning the rest of the temperament sequence.

A major feature of a number of temperament sequences is filling an octave with contiguous M3rds. This procedure works great for some tuners, but I always found achieving the necessary 5:4 beat rate relationships between contiguous thirds to be very difficult. In the "Every-Which-Way-You-Can" sequence, the F3-A3 M3rd and the A#3-D4 M3rd are tuned first, and with any luck can be used as guides to tune the contiguous thirds.

Tune F4 to both of the following:

...**to F3** using test note C#3.
...**to A#3,** approximating 1/2 bps contracted, much the same as the D4-A4 P5th.

Tune a clean-sounding octave and

make the C#3-F4 M10th beat faster than the C#3-F3 M3rd. The C#3, being outside the F3-F4 temperament octave, need not be tuned itself, other than to form expanded intervals that beat at "comfortable" rates. The F3-A#3 P4th will beat faster than the A#3-F4 P5th, similar to the difference between the A3-D4 P4th and the D4-A4 P5th.

Tune C#4 to both of the following:

...to A3, duplicating the beat rate (on the slow side) of the A#3-D4 M3rd.
...to F4, to beat somewhat faster (5:4 ratio) than the A3-C#4 M3rd.

Stop. Make the contiguous major thirds F3-A3, A3-C#4, C#4-F4 (and F4-A4) progress smoothly (4:5 ratio). Adjust C#4 and F4 as necessary. If adjustments are necessary to F3 and A3, make the adjustments as small as possible. I put the F4-A4 M3rd in parentheses only because the beat rate of this interval is rather fast and can be difficult to hear, especially for the beginners. Indeed, when I was a beginner, I had difficulty hearing the beat rate of the C#4-F4 M3rd, let alone the beat rate of the F4-A4 M3rd.

Tune F#3 to both of the following, beginning a new loop:

...to A#3, duplicating the beat rate (on the fast side) of the F3-A3 M3rd.
...to C#4, almost-clean P5th, about 1/2 bps contracted, much the same as the A#3-F4 P5th.

Tune D#4 to both of the following:

...to F#3, duplicating the beat rate (on the fast side) of the F3-D4 M6th.
...to A#3, duplicating the beat rate of the A3-D4 P4th.

Tune B3 to both of the following, completing a loop:

...to D#4, duplicating the beat rate (on the fast side) of the A#3-D4 M3rd.
...to F#3, duplicating the beat rate of the F3-A#3 P4th.

Tune G3 to both of the following, starting a new loop:

...to B3, duplicating the beat rate (on the fast side) of the F#3-A#3 M3rd.
...to D4, duplicating the beat rate of the almost-clean F#3-C#4 P5th.

See that the G3-B3 M3rd duplicates the beat rate of the F3-D4 M6th. This is the first opportunity to use the "outside M6th, inside M3rd" test.

Tune E4, to all of the following:

...to G3, duplicating the beat rate (on the fast side) of the F#3-D#4 M6th.
...to A3, duplicating the beat rates of the G3-D4 P5th and the A#3-F4 P5th.
...to B3, duplicating the beat rate of the A#3-D#4 P4th.

See that G3-E4 M6th duplicates the beat rate of the A3-C#4 M3rd.

See that the E4-A4 P4th beats 1+ bps, and that it beats faster than the D4-A4 P5th.

Tune C4 to all of the following, completing another loop:

...to E4, duplicating the beat rate (on the fast side) of the B3-D#4 M3rd.
...to G3, duplicating the beat rate of the F#3-B3 P4th.
...to F3, duplicating the beat rate of the F#3-C#4 P5th.
...to F4, duplicating the beat rate of the B3-E4 P4th.

Tune G#3 to all of the following, completing the temperament sequence:

...to C4, duplicating the beat rate (on the fast side) of the G3-B3 M3rd and duplicating the beat rate (on the slow side) of the A3-C#4 M3rd.
...to D#4, duplicating the beat rates of the almost-clean G3-D4 P5th and the A3-E4 P5th.
...to C#4, duplicating the beat rates of the A3-D4 P4th and of the G4-C4 P4th.
...to F4, duplicating the beat rate (on the fast side) of the G3-E4 M6th.

See that the G#3-F4 M6th duplicates the beat rate of the A#3-D4 M3rd and that the G#3-C4 M3rd duplicates the beat rate of the F#3-D#4 M6th.

It should be the easiest thing in the world to tune the G#3 since it can be checked from every-which-way. If there is difficulty tuning the G#3, there are mistakes in the temperament. Tune through the sequence as many additional times as necessary, using all of the available checks from the beginning. For example, check F3 against A#3, C4, D4, and F4.

Check the temperament for final refinements that can be made by playing through all of the parallel tuning intervals (M3rds, P4ths, P5ths, and M6ths) and by making each progress as smoothly as possible, and by seeing to it that the P4th associated with each note is faster than the P5th associated with that note. For a complete discussion, see the article entitled, "Temperament Refinement Procedures" in either the August 1992 Piano Technicians *Journal* or in the PTG *Tuning Exam Source Book.*

INHARMONICITY & THE TEMPERAMENT

ARTICLE • 3
Considerations of Octave Size

Daniel Levitan, RPT
New York City Chapter

Last month's article, about the effects of inharmonicity on isolated temperament intervals, showed how increasingly higher levels of secondary inharmonicity in an interval make that interval appear narrower. It does not follow, however, that in a well-tuned piano with high secondary inharmonicity all the narrow intervals beat more quickly, and the wide ones more slowly, than in a piano with no inharmonicity. In this article we'll find out why, as we explore the ways that secondary inharmonicity affects the size of the octave within which the temperament is set.

Let's begin by doing some more tuning on our imaginary piano in which we can vary the primary inharmonicity of the strings at will. If the primary inharmonicity in the piano is zero, we can tune the octave F3-F4 pure at all its levels: 2:1, 4:2, 6:3, 8:4, and so on. If we increase the primary inharmonicity of all the piano's strings, secondary inharmonicity will, as we have discovered, make the octave appear narrow. And, like the fifth in last month's article, the octave will be narrower to a greater degree at successively higher levels of coincident partials. For example, because the fourth partial is sharper above the second partial than the second partial is sharp above the first, the octave will be narrower at the 4:2 level than at the 2:1 level.

Two factors cause this greater difference between coincident partials at higher levels: first, the partials of piano wire climbing sharper at a geometric rate as they ascend the harmonic series; and second, the numbers of the partials which are coincident being more widely separated at higher levels.

If we retune the octave by widening it to be pure at the 2:1 level, it will still be narrow at all higher levels. If we widen it more to be pure at the 4:2 level, it will still be narrow at the 6:3 level and above, but it will now be wide at the 2:1 level. If we tune it pure at the 6:3 level, it will be wide at the 2:1 and 4:2 levels and still narrow at the 8:4 level and higher. This is, in fact, the kind of octave tuning that we ordinarily find in most real pianos.

Let's return the primary inharmonicity of our imaginary piano to zero, retune our perfect octave F3-F4, and then set an absolutely perfect equal temperament within the octave F3-F4. By a perfect equal temperament within the octave I mean a series of thirteen notes which exactly subdivide the octave into twelve equal steps. Since our imaginary piano now has the condition of zero inharmonicity under which the standard beat rate tables have been calculated, all the beat rates in our imaginary temperament will match the theoretical rates exactly.

If we now increase the primary inharmonicity in the piano without retuning any notes, all the temperament intervals will appear to narrow, just as before. But as tuners we would reject this temperament out of hand because the octave within which it is set would now sound much too narrow and therefore out of tune.

Notice that this is just the sort of temperament that would result if one tuned the fundamentals of the notes of the temperament of a real piano to the theoretically ideal frequencies of equal temperament by using a tuning device without any stretch compensation. This sort of tuning was probably not uncommon when the strobe tuner first became widely available, and as is well-known it resulted in temperaments that were commonly found to be unacceptable to the ear.

If we widen the temperament octave to make it sound more acceptable, we must also change the pitches of all the other notes in the temperament to accommodate that widening. (In our imaginary piano, of course, this readjustment takes place automatically whenever we change the width of the temperament octave.) After readjustment the temperament will be perfect once again—the fundamentals of the notes of the temperament will again exactly divide the distance between the fundamentals of F3 and F4 into twelve equal steps. All the temperament intervals will have been widened: the semitones by exactly one-twelfth the amount by which we expanded the octave; the major seconds, by two-twelfths, or one-sixth, that amount; and so on. This widening of all the intervals will slow down the beat rates of the narrow intervals, and speed up the beat rates

of the wide ones. We can generalize this observation as—

Rule of Thumb #3 (for Rules of Thumb numbers 1 & 2, see last month's article): **The wider the octave within which a temperament is set, the more quickly will beat the fourths, major thirds, and major sixths, and the more slowly will beat the fifths, minor thirds, and major seconds.**

As octave size alters, all the intervals of a particular size—all the major thirds, for example, or all the perfect fifths—change by the same amount, and as a result the ratios among their beat rates remain constant. For example, if we use the ratio of the speeds of the three contiguous major thirds that make up the octave—F3-A3, A3-C#4, and C#4-F4—as a benchmark, we will find that as we widen the octave, all these thirds will widen by the same amount, and even though they will beat faster, the ratio of their speeds will remain constant. This is our—

Rule of Thumb #4: Changing the size of the temperament octave does not affect the ratio of the speeds of the intervals of a particular size relative to each other.

Notice that widening the temperament octave to accommodate secondary inharmonicity negates to some extent the earlier effect that secondary inharmonicity had on the beat rates of the temperament intervals. The wide intervals, which secondary inharmonicity slowed down, now speed up again as the octave widens. The narrow intervals, whose beat rates increased due to secondary inharmonicity, now slow down.

In our imaginary piano, we altered the level of primary inharmonicity to the same degree in all the strings. This uniform level of primary inharmonicity resulted in a uniform level of secondary inharmonicity for all intervals of the same size, and for that reason the beat rates of those intervals changed by the same relative amount as the inharmonicity increased. As a result the ratio of their beat rates remained constant. In the special case of our imaginary piano, therefore, there is a point in our widening of the octave to compensate for the narrowing effect of secondary inharmonicity when the intervals of a particular size are widened just enough to exactly compensate for the amount that secondary inharmonicity originally appeared to narrow them. At that octave size all those intervals beat at exactly the same rate as they did when there was no inharmonicity at all.

Unfortunately, this compensation point is different for each size of interval. For example, we can make the octave just wide enough that all the major thirds beat at the same rate that they would if there were no inharmonicity; but at that octave width none of the other intervals beat at their theoretical speeds.

It would be useful to know where, in this imaginary piano, the compensation points for the various temperament intervals lie along the continuum of octave widths that runs between the pure 2:1 octave and the pure 8:4 octave. Unfortunately, we don't yet have the quantitative tools which will enable us, in the fifth article in this series, to determine those points exactly. We can, however, make a few general observations about their relative positions.

Let's first examine the four temperament intervals whose coincident partials lie at neighboring levels in the harmonic series: the 3:2 fifth, the 4:3 fourth, the 5:4 major third, and the 6:5 minor third.

Notice that in each successive interval the neighboring partials are higher in the harmonic series. Each will therefore have been made narrower by the effect of secondary inharmonicity, and so each successive interval will require a greater amount of widening to reach its compensation point.

Notice also that expanding the octave by a certain amount expands an interval within the octave by only a fraction of that amount. For example, a fifth, which is seven semitones wide, expands by seven-twelfths the amount that the octave expands, while the minor third expands by only three-twelfths, or one-fourth, of that amount. In this group of four intervals, the ones with higher partial levels are also the smaller ones. Therefore, each successively smaller interval will require an even greater octave expansion to reach its compensation point.

Therefore, the smaller the interval in this group, the wider the octave size that will be necessary to take the interval to its compensation point.

The two remaining temperament intervals are the 5:3 major sixth and the and 6:4 fifth. The high partial levels and the gap of a partial in both these intervals indicate that they might need more widening than the temperament intervals in the group we just examined to reach their compensation points. On the other hand, octave widening will have a greater effect on these larger intervals—the major sixth is nine semitones wide, and the 6:4 fifth, seven semitones wide. It would seem reasonable to speculate that the compensation points of these two intervals would probably be close to the compensation points for the major and minor thirds.

We can also speculate on the placement of the compensation point of the 3:2 fifth relative to the various octave widths. The 4:2 octave has a gap of one partial, which would make it a good deal narrower than the 3:2 fifth. On the other hand, the fifth expands at only seven-twelfths the rate that the octave expands. A reasonable guess would be that the compensation point for the fifth would be an octave slightly narrower than 4:2—which, as we shall see later in the series, is in fact the case.

At octave sizes of 4:2 or greater, in other words, the fifth is always wider than its theoretical size; and in real pianos it is not at all unusual to find fifths that are enlarged to the point that they are pure or even wide of pure. Here is one more reason to trust the rule of thumb

mentioned in the last article, that we should choose, if we must, a too-wide fifth in the temperament over a too-narrow fourth. If we want, as most tuners do, a temperament octave size somewhere between 4:2 and 6:3, all our 3:2 fifths will necessarily be wider than the theoretical amount. (The same is not true of 6:4 fifths.) Conversely, smaller fourths in a temperament will necessitate a smaller octave size. Granted, real pianos are not the same as our imaginary piano, because in our imaginary piano all the strings have the same primary inharmonicity; but as a general rule, a comfortable octave size, between 4:2 and 6:3, for an inharmonic temperament does usually result in 3:2 fifths which are noticeably wider than in theory. In fact, 6:3 octaves in real temperaments on smaller pianos routinely result in wide 3:2 fifths.

We also now have the means to examine another common rule of thumb that cautions us not to choose too small an octave size for a temperament in a small piano. Sometimes the reason given for this rule is that a temperament "won't fit" within too narrow an octave. Taken at face value, this reason makes little sense, because no matter how small an octave, there will always be a series of pitches that divide it into twelve equal parts. Sometimes the reason given for this rule is that the temperament fifths will be too small if the temperament octave is too narrow. But as we have seen, 3:2 fifths of about the correct theoretical size correspond to octave widths of 4:2 or less; and these narrow octaves are often intolerably noisy in a small piano.

Avoiding a small temperament octave in a small piano does make sense, though, and the reason is that it keeps the fifths from being too noisy at higher partial levels. Even a pure 3:2 fifth in a small piano can be quite noisy due to rapid beating at the 6:4, 9:6, and 12:8 levels. Larger octave sizes, while they may result in 3:2 fifths that are pure or wide, also result in fifths that are wide enough at the higher levels to be tolerable.

We have seen that changing the octave size of a temperament does not change the beat rate ratios among intervals of the same size. Changing octave size does, however, change the beat rate ratios among intervals of different sizes. This becomes especially evident if we compare the changing speed of any narrow interval to the changing speed of any wide one. As the octave widens, the narrow interval slows as the wide one speeds, and as a result the ratio between their speeds changes dramatically.

In this light, let's examine the dominant seventh, second inversion test. This test says that in a well-tuned equal temperament a minor third should beat at about the same speed as the major third whose lower note is a major second above the upper note of the minor third. For example, the test says that F3-G#3 should beat at about the same rate as A#3-D4. This test works well under conditions of little secondary inharmonicity. If secondary inharmonicity is high, however, because one of the intervals in the test is wide and the other one is narrow, we can expect the ratio of their two beat rates to vary tremendously with the size of the temperament octave. The test will work well at only one particular octave size, which may well be different from the one we have chosen. For this reason, this test is very unreliable in a smaller piano.

Let's examine the relative rates of beat rate change among the same four temperament intervals we examined earlier, those whose coincident partials lie at neighboring levels in the harmonic series—the 3:2 fifth, 4:3 fourth, 5:4 major third, and 6:5 minor third. Two factors influence their rate of change as the octave size changes. One, as we saw earlier, is that the larger the interval, the more it will widen or narrow as the octave widens. For example, widening the temperament octave will widen the fundamentals of a fifth, seven semitones wide, more than it will widen the fundamentals of a minor third. However, the beat rates of the smaller intervals are more sensitive to changing width because their coincident partials are farther apart, being higher in the harmonic series. These two factors tend to cancel each other out as the octave changes size, resulting in similar rates of change for all four of these intervals. Of course, the 3:2 fifth and the minor third, being narrow, will change in the opposite direction from the fourth and major third.

The two remaining intervals, the 5:3 major sixth and the 6:4 fifth, change speed at about double the rate of the other four intervals. Both intervals' partials are high in the harmonic series, both have a gap of one partial between their coincident partials, and both are relatively large. All three factors make their beat rates very sensitive to changes in octave size.

This sensitivity makes intuitive sense in terms of basic temperament tests. Consider the 6:4 fifth test, which determines the width of the 6:4 fifth by comparing the minor third above the lower note to the major third below the upper note. As the octave changes, we know that the speeds of these two test intervals will change at about the same rate; but they change in opposite directions, because the minor third slows as the major third speeds up. We would expect, therefore, the beat rate of the 6:4 fifth to change at about double the rate of its component intervals as the octave size changes.

Similarly, the 4:3 fourth test determines the size of a fourth by comparing the speed of the major third below the lower note to the major sixth below the upper note. Because all these intervals are wide, and because as the size of the octave changes, we know that the beat rates of both the major third and the fourth change about the same amount, and so we would expect the sixth to change at about double that rate.

Which lead us to—

Rule of Thumb #5: As the size of the temperament octave changes, the speeds of the 3:2 fifth, the fourth, and

the major and minor thirds will change at about the same rate; the speeds of the major sixth and the 6:4 fifth will change at about twice that rate.

In the light of this rule, let's examine the other dominant seventh test, the third inversion. This test states that a major sixth should beat at about the same rate as the major third whose lower note is a whole step above the lower note of the sixth—for example, F3-D4 should beat at the same rate as G3-B3. Since the beat rate of the major sixth changes at twice the rate of the major third, the ratio of the two beats will alter with the size of the temperament octave, making this dominant seventh test quite unreliable in pianos with high inharmonicity.

The fact that the beat rates of all the temperament intervals and their ratios depend on the size of the temperament octave gives us an excellent reason, when tuning aurally, to use a temperament sequence that begins with the setting of the octave size. The octave is the only pure interval in the temperament, and therefore its tuning is crucial, especially in an environment of high inharmonicity. The number of beats per second in the other intervals is of much less consequence, as long as they are consistent. Octave size should therefore be the primary consideration, and octave size will determines the beat rates of the other intervals. Conversely, a specific beat rate for any interval other than the octave implies a particular octave size, and so if one begins a temperament sequence by tuning any interval other than the octave, one has effectively chosen the octave size by default. That octave size may not prove to be the best choice for that tuning.

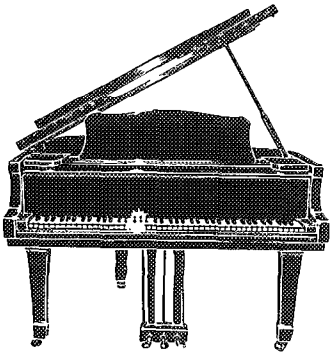
In a large piano, temperament octave size is usually not much of an issue; secondary inharmonicity is low enough that the octave has a relatively narrow range of acceptability. In a small piano, no octave size may sound much better than the others, and so we have wide range of octave sizes to choose from. This freedom of choice can be turned to our advantage. The fact that a narrower octave will result in a narrower fifths, which can be noisy when inharmonicity is high, is a major consideration in choosing octave size, but there are others. Taste is one; perhaps a certain octave size just sounds better. However, there is often not much to choose among a noisy 4:2 octave, a noisy 6:3 octave, and noisy octaves that split the difference. In that case, other factors can come into play. Perhaps the piano is often played in unison with a synthesizer; then a narrow temperament octave, which will result in tighter bass and treble octaves, might be a good choice. Perhaps the pianist likes well-stretched octaves; then a wider temperament octave might be appropriate.

In a home situation, a solid tuning that lasts may call for a choice of octave size that takes into consideration other factors, such as the anticipated motion of the tuning due to humidity changes, or the anticipated time of the next service. If it's the beginning of the heating season, and the tuner has a sense that the temperament octave will widen as the piano dries out, he or she may decide that a narrow temperament octave, along with strategically chosen treble and bass octave sizes, will give that tuning some extra room to drift in the anticipated direction before it starts to sound noticeably out of tune.

I don't recommend any particular strategy for choosing an octave size. My point is simply that the inherent impossibility of tuning a pure temperament octave on a small piano can be an advantage. It makes available a range of temperament octave sizes for us to choose from, leading to a greater flexibility and creativity in the process of coming up with the best tuning for a given situation. But to take advantage of that flexibility we need to have the ability to tune a temperament equally well at a variety of different octave sizes.

So far we've been exploring inharmonic temperaments using an imaginary piano in which inharmonicity is constant throughout the temperament.

Next month we'll take a look at what happens when, as in real pianos, inharmonicity changes within the temperament.



Everyday Piano Prepping

Or...The Return of Emma Schwartz & Her Hated Piano

By Nick Gravagne • Contributing Editor

A while ago we began a series called "I Hate My Piano and What Can I Do About It?" You may recall that three characters entered into the scenario: Emma Schwartz the piano owner, the grand piano she used to love but now hates, and the piano technician who evaluated the instrument and found it lacking in every way that Emma had indicated. Where there was once an even and responsive action along with a full and strong tone there now existed a flabby action and thin, harsh tone. The piano technician, after having determined that the soundboard, bridges, and bearing were okay, discovered the following reasons for deterioration.

Tone
Bright attack, short decay. This is to be expected since the piano is out of tune, and the hammers, apart from being too hard or having packed in too hard, are suffering from noticeable string cuts. In addition, the string spacing is bad in sections, the strings are not seated or level, and the action and plate screw are loose.

Regulation
No (or very little) aftertouch, especially in the center of the keyboard. The regulation isn't horrible, but it is uneven; the dip is too shallow and half the repetition springs are weak. The damper levers are knocking against the stop rail, the knuckles are squeaky, the keyframe knocks, there is lost motion and squeaks in the soft and sustain pedals, the sostenuto is unreliable, the sustain pedal lifts the dampers too high and damper lift is uneven.

Whew. A lot to correct. But all these items are correctable and the instrument is worth the effort.

Oh yes, there was a fourth character in the drama, RPT Richard Davenport of Los Angeles, a high-level but down to earth technician who supplied us with a general Time Evaluation breakdown of the work to be done. For hammer shaping, surfacing, squaring to strings, setting and leveling strings, and with a pitch raise and fine tuning, the tone work will take about six hours. Add another ten hours for action tightening, cleaning, thorough regulations (including dampers and pedals), and another two hours for incidentals.

Total time: 18 hours.

Richard writes, "Although the job could be performed entirely in the home, spending a day at the shop (traveling and aligning hammers and setting let-off) would allow me to spend only one full day at the customer's. Before removing the action, I would also tighten the plate, seat and level the strings and raise pitch to A-440. With the action in the shop, parts are aligned and tightened, hammers shaped more efficiently, and cleaning more easily accomplished. The action is returned in a semi-regulated condition. Everything spent making the necessary damper, pedal and trapwork adjustments, sanding the keybed and cleaning the instrument. Final regulation, tuning and voicing would complete the day." Thus the piano is "prepped."

EVERYDAY PREPPING

Prepping, or preparing a piano, is usually understood in connection with either concert prepping or dealer showroom floor prepping of new, incoming pianos. But considering the above work and time outline presented, prepping can be an everyday procedure for those piano technicians who are dedicated to good work, have the knowledge and skills to perform the work along with efficient and organized tools and supplies, and, lastly, possess the personal temperament to stay focused for hours at time on-site. For me, and many of my technician friends, this sort of piano work is challenging, enjoyable, builds reputations, and pays well for a day's work.

Now this series ran several articles (and, incidentally, concurrently with Dale Irwin's and Bob Evan's *Everyday Voicing* series) on tone and hammer work. We left it at that. But what about the rest of the work such as action regulation? Well, a step-by-step outline would be inappropriate and redundant here. There are many books and other source materials, such as offered by piano manufacturers, which supply all the info needed along with beautiful photos. A comfortable knowledge and experience level must be in place before a technician can consider prepping either on the stage, or showroom, or living room. Now having said that, in order for a piano action to be considered "preppable" it must basically be in working order, not falling apart or in need of wholesale repinning or replacement of parts. The action typically needs parts alignment, adjustment, and tweeking. And the experienced technician knows well ahead which aspects of these procedures are most important and which will affect the biggest change in the least amount of time.

With this in mind, a Top Ten list of action regulations, what I call a **high point** regulation, and not be confused with an all-out full-blown do-every-step routine, follows. Inspections, adjustments and corrections made to these items will always improve the performance of a piano action.

TEN CRITICAL ACTION "HIGH POINTS"

First, and don't underestimate this! The alignment/travel of parts, especially hammers-to-strings and wippens-to-knuckles must be correct. Shanks should travel straight and parallel and hammers should be vertical on their shanks. If not, travel shanks and burn-in hammers, align hammers to strings, then align wippens to knuckles. This is the foundation. **You simply must do this first.** Do this, then tighten all action screws and clean out action with brushes and vacuum cleaner. Experience has shown that on the typical prep job these procedures take about 40 minutes Also, most of the parts already travel and align correctly. When the action is aligned, travelled and cleaned look to the following:

Top Ten High Points

1. Key level/height (reasonable) and glide bolts solid
2. Dip within manufacturer's or industry parameters
3. Blow distance within parameters
4. Jack position fore and aft (reasonable)
5. Repetition springs working (remember, a solid hammer line depends on this as well)
6. Escapement (let-off and drop — they're a team)
7. Aftertouch (relative to items 1, 2, 3, 6)
8. Hammer line, security based on jack wink relative to repetition spring strength
9. Backchecking, even and reasonably high, important for good repetition
10. Damper timing at one-half blow distance

If these items are attended to the action will be noticeably improved.

Yes, there are many other items found on the typical regulating list such as key spacing, and finer jack adjustment and centering, and finer dip setting, etc. But, if not causing problems, these can wait until another tuning and service is set up. More on this later.

A CASE IN POINT

Recently I was called out to service a six foot plus, 15-year-old Bosendorfer grand. Over the years it had received some tuning but precious little else. After evaluating the instrument I estimated the time required to accomplish the above alignments and High Point regulations along with cleaning, tunings and voicings to be one full day. In actuality, and excluding a lunch break, the job took nine hours. Now in practice, it should be remembered that the most demanding work of the day — fine tuning and needle voicing — comes at the end of the day when the aroma of dinner floats heavily in the air and certain customers get fidgety. Some technicians prefer to schedule an estimated eight or nine hour job in two visits in order for everyone to be fresh for tuning and voicing.

Notice that this Bosendorfer grand required the High Point regulation only, and moderate action parts alignment. It also required pitch raising, belly and action cleaning,

string seating and lifting to strings. Fine tuning and needle voicing completed the work. Nine hours of solid work were spent on the job. Now note that of the Top Ten High Point items above the key level and height and dip were more or less close, requiring only a few touch ups. This is important to assess at the outset since serious key leveling and dip work will always rack up the hours! So remember to focus first and quickly on these items in your initial evaluation. The other high point items, e.g., numbers 3 through 10 are "screw turning" or "wire bending" adjustments and go much faster than "punching work" Keep this in mind!

A special note about glide bolts. Checking these at the same time that key level and dip are checked is the only way to go. Indeed, the glides, when properly seated on the keybed, serve as the foundation for key height, level, and dip. To check for glide seating place a screwdriver blade (from the top of the action which is in the piano) at the base of each glide bolt and tap with the palm of your hand. If you hear a knock, that glide bolt is not touching the key bed. Turn it down until the knock is gone, but don't overturn it such that it lifts the entire keyframe, including the front rail, off the keybed. In fact, if all the glides are found turned down too far, look for the front rail to be off the keybed and for the action to slightly rock front-to-back. In this case all the glides will have to be backed off until they **do** knock, and then, one by one, turned back down to stop the knocking.

If in your initial evaluation of the piano you find serious glide bolt maladjustments, expect to increase your time on the job by at least two hours since correcting the glides will almost certainly mean a lot of punching work will be required in leveling keys and setting dip. On the one hand, it happens at times that correct setting of glides might be happily accompanied by a corresponding correction made to a too-shallow dip and sagging key level. In any case, here, in punching work related to key height, level, and dip, is where you lose much time, or, said another way, where you must allow the time to accomplish. Had the Bosendorfer required this sort of work I would have had to allow two to three additional hours of work. That being so, the job would have been scheduled in two visits and charged accordingly.

Again **Don't underestimate the time required for key work!** "Punching work" with tweezers, straightedges, etc. goes much slower than screw turning work.

Nothing has been said about the pedal system. Fortunately, the Bosendorfer required only a rod adjustment. But I knew that going in or I would have had to allow more time for possible minor repairs, or to locate elusive groans and squeaks.

So, to sum up the time evaluation in general we can suggest this typical scenario. An 8-to-10 hour job, depending on your skills, tools, and efficiency levels would typically include finding the instrument in the following condition and correcting as outlined below:

A Typical One-Day Prepping

Tuning — needs pitch raise and at least one fine tuning.

General Belly — plate tightening, seating and lifting strings, possible string spacing (a few).

Action — High Point regulations only, NO serious key leveling or bedding work; moderate parts alignment and spacing; screw tightening; lube knuckles; McLube keybed glide bolts and shift spring.

Tone — hammers need reshaping, surfacing, squaring to strings, and processed with needles, liquids, or both for a firm, strong but not harsh tone.

Dampers — A handful need re-timing or straightening out, maybe one or two is ringing but no serious problems here; the upstop rail usually needs adjusting downward.

Pedals — screw tightening, rod adjusting, and lubing only.

Cleaning/Misc. — soundboard, plate, tuning pins, cloths, etc., brushed and vacuumed; action vacuumed (especially hammer filings) and keybed cleaned out.

A focused technician working methodically, efficiently, and with tools and supplies carefully laid out will accomplish the job in 8 to 10 hours, and without undue stress and fatigue. Such experienced technicians will remember to make life easier on themselves by taking along personal items such as electric fans when the weather is hot, or electric heaters when cold. And they will remember flashlights and/or electric drop lights, action racks, and grand action dollies (such as offered by Paul Janssen). Snacks and drinks may be included if kept away from the work. I always take along my shop apron — I can't seem to work without my shop apron. Well, you get the idea.

Interested but sometimes nosey customers need to be politely informed that they, along with their cherished pets and precocious, darling children should allow you undisturbed quiet space or your concentration and focus will be lost. Occasional peering in along with the genuinely asked question by the paying custumer should be, if not outright encouraged, not coolly discouraged either. They have a right and an interest in knowing what you are doing. After all, considering the usual jobs people have, our customers find what we do to be quite interesting, even magical and refreshing in an otherwise cynical era.

Again considering the time estimation, any technical items falling outside of the above typical scenario — for example, the odd string replacement and bass string twisting, or more involved key leveling or bedding, or repinning of action centers, or minor repairs to pedals or to keys and ivories or loose balance center holes, or loose bridge pins which need super-gluing — will definitely push the job into a two-day (up to 18 hours) time frame. Avoid this trap. Although only a suggestion based on my experience and that of others, the above typical scenario plus or minus an item or two amounts to a full one-day job. Anything else will push the job into another day or part of another day. Notice that in Richard's time breakdown for Emma Schwartz's piano much more time is factored in, up to ten hours alone on action regulations, which will have to include more involved work with key leveling, height and dip, and more attention paid to pedal work, the sostenuto in particular.

Lesson

Evaluate the job well! When called in to assess the piano's ills and what you propose to do about them use the above suggestions as a guideline. Develop a comprehensive checklist on all things which are right about the piano and all things that need attention. If you approach this evaluation stage too lightly you will almost certainly lose money, or else cut the job short and disappoint yourself and your trusting customer. No referral for you. And don't forget to **charge for your evaluation time**, or else add that time into the total work time and collect at the end of the job.

As to our dear friend Emma, she and her piano actually exist. The piano was finally prepped in 16 hours. The action responded much better and more reliably, and the tone elicited more fundamental and roundness, without that explosive and percussive attack which gave rise to a disappointing, thin and non-singing tone. Emma loves her piano again.

In the next installments we will provide a basic Evaluation Checklist, along with a suggested program for ongoing, not-just-tuning-only service. Finally, some ideas on charging for these services will be discussed. Bye for now.

The Tuner

By Paul Monroe

This article is usually written for the benefit of the beginning tuner. However, for this article I want to include RPT members also. The subject is **Raising Pitch.** I know of many members who are reluctant to raise pitch to standard 440 HZ for several reasons. One is, they know that using their present method the piano will need tuning in a few weeks instead of 4 to 6 months and their clients don't want to pay for another tuning that soon. The method that follows is a remedy for that problem.

Before beginning the details about raising pitch, I want to give credit to George Defebaugh who is responsible for the temperament that I have written in previous articles and for this method of raising pitch which has improved my speed and stability. George spent his time helping our profession become what it is today.

This method of raising pitch will reduce your tuning time and build in stability so that when you complete the regular tuning process, the piano will stay in tune for almost the same length of time as your standard tuning. In many of the pianos where I have raised the pitch 1/2 step, the pitch and tuning has held for as long as two years without any tunings between times. In one case I returned to a fifty-year-old Shoninger upright two years after I had raised the pitch a 1/2 step and there were three notes in the temperament that did not require any change. I hope I have whetted your appetite enough to try it — you'll like it.

The first step is to make sure all the plate screws are tight. Next, ascertain how much A4 is below the standard 440HZ. This is a fact that must be determined as you must raise the pitch of A4 sharp (above 440HZ) 25% of the amount it is below pitch (33% for the Accutuner). For instance, if A4 is 8HZ below pitch, you must raise it to 2HZ above 440 or to 442. The pitch during the initial pitch raise will drop that amount. If you were to raise A4 just to 440, you will never get the piano to stay at 440, all other things being equal — i.e.: temperature and humidity.

Why does this fact exist? Picture the soundboard and the bridge. When you increase the tension of the string the bridge twists and rolls due to the side bearing on the string caused by the staggered bridge pins. See Figure 1 for what it should look like and Figure 2 showing the rolling and twisting configuration. The wood in a bridge has good memory and will do its best to return to its original position. This means that as the wood moves it changes the tension on the strings and the pitch will be unstable. This is the reason to overshoot 440HZ by 25%. As the wood moves it will stop its movement at the desired tension keeping A4 at 440.

Now that you have set A4 to the proper number of beats sharp, tune A3 to it and proceed to set a quick temperament as outlined in previous issues of the *Journal.* Do not spend a lot of time setting the temperament. If you spend more than a couple of minutes the beat rates will change by themselves so be as accurate as possible remembering to spend a very short time in setting the initial temperament.

Proceed on to tuning octaves. I usually start the octave tuning starting with the first note above the temperament and proceed through C8. If there are any plain wire strings between the temperament and the wound strings, I tune those before proceeding.

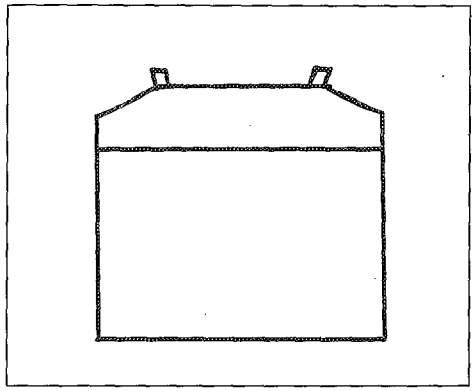


Figure 1

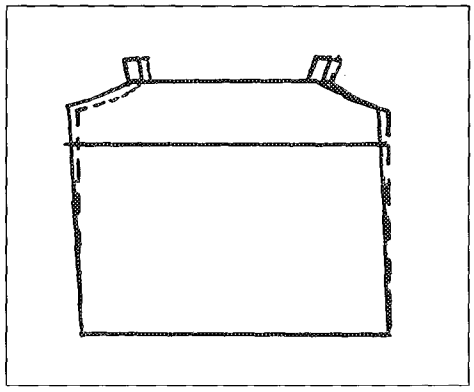


Figure 2

When you start tuning A#4, you will have to expand the octaves. I suggest you start with one beat per second on A#3-A#4 and keep on expanding the one bps so that when you arrive at C5 the interval of a 12th, F3-C5 is expanded to at least a slow roll. At this point picture in your mind a graduated scale, increasing evenly in beats per second through C8.

Another test interval to use at C6 is the interval of a 19th, F3-C6. It too should be explained. Be aware that this is true only in raising pitch. Expanding the 12th and 19th intervals does not apply to regular tuning.

The next step in raising pitch is one of the most important. It is the

method of tuning unisons. If you will recall that in the article on unison tuning, I suggested you start at C8 on pin #1 and proceed to the tenor-bass break on this pin, then return up the keyboard on pin #3. This method of tuning unisons is what builds in stability.

If you were to tune the unisons turning pins #1 & #3 instead of just #1, you will cause the bridge to roll and twist much more than if you turn only one pin at a time. The more movement in the bridge and soundboard, the less stability in your tuning. In effect, what you have accomplished by tuning the unisons in this manner is a more even distribution of tension causing less movement in the structure and as I iterated before, the less movement in the structure, the more stable your tuning.

After quickly and accurately tuning the unisons in the treble and tenor sections, proceed to remute these sections and reset a quick temperament. With this accomplished, raise the pitch in the bass section. When you start on the octaves in this section they should be contracted to a slow roll, the opposite of what you did in the tenor and treble octave tuning. The reasons are the same, however. This section will drop and should end up where you want them to be.

When you arrive at F2, I suggest you start making the octaves pure at this point. This will assist you to do the final tuning expanding the bass octaves. This is the area also where you can start listening for the partial structures in the wound strings. It will tell you if you want to tune the octaves using the 2-1, 4-2 or 6-3 combinations of the coincidental partials. Refer to previous articles on octave tuning in the *Journal* for information regarding the use of partials in octave tuning.

A few important reminders. Before raising pitch make sure all plate screws are tight. If you find any that will not tighten, remove one at a time and repair the screw hole. Do NOT remove more than one at a time. There are many ways to accomplish this task; however, I find the fastest method is to insert an ice cream stick the length of the screw threads. The sharp edges on the stick help hold it in place better than a hammer shank. Another method is to repair with epoxy. If you have never used this method before, ask an experienced technician who has for details. If you do want to try it without asking first, do a test in your shop on a piece of scrap wood. Do not experiment on a client's piano. You may cause yourself a financial headache later on if you do.

On verticals check the pressure bar screws. They should be snug. If you have to turn any of them more than 10 degrees. I suggest you repair the screw hole as I just described.

Before raising the pitch check the tenor and bass bridges. If the bridge is checked or cracked next to the bridge pins, the piano most likely will not hold a tune no matter what you do short of bridge repair.

Also, check the bridge cap if it has one and make sure it is intact and not separated from the body of the bridge.

Another item that will preclude good stability is the soundboard separating from the ribs. The tone production of course is usually reduced when this condition exists, but if the board is free to move unrestricted due to temperatures and humidity conditions, it will have a noticeable and undesirable effect on the tuning.

The most important item to check is the pinblock. It is most difficult to know the pinblock condition until you have actually started raising pitch. There is however, one way of being alerted to the pinblock condition and that is the state of the tuning before you start to mute the piano. If there are many unisons radically out of tune, you should check those tuning pins for their condition in the block. This is a good place to use your torque wrench if you have one. If you don't have one, with a little experience you will know by the feel in your tuning hammer if the pinblock will stand a raise in pitch.

Another clue that will also help learn the condition of the pinblock is when it can be seen, as in some old-style verticals. There are a few grands that have an exposed block, including a well-known imported brand. Observe the condition of the wood around each of the tuning pins. These conditions are indicators of a poor pinblock.

As usual you can write endlessly about this subject, explaining the many nuances you experience with each piano, and it is my hope that this article will provide sufficient information to assist you to increase your tuning speed and stability. It's a great feeling.

Correction

In "The Tuner" article on page 42 of the August Journal, the paragraph at the top of the third column should have read:

"In some pianos, the transition from plain string to wound string causes a hitch, as some technicians call it. In other words, you cannot have the beat rates of every interval you have tuned fit in with perfection. You will have to compromise; ie: as you progress down the keyboard the beat rate of the M3rds should slow down evenly. You may find that M3rd C3-E3 may have the same beat rate as C#3-F3. This can happen not only with M3rds but with all of the other intervals such as the M6ths, 4ths, 5ths, etc. However, I consider it unacceptable to have the M3rd C3-E3 beating faster than C#3-F3."

Techno-Stuff

By Richard Anderson, RPT
Feature Writer
Chicago Chapter

Here's a method I've devised for quickly repairing a chipped ivory keytop using ACC (super glue) and a powdered filler.

1. Make sure the keytop and front are secured to the key. Reglue if necessary.

2. Clean the underside of the chipped area. Any dirt will be trapped and show up as a dark outline of the repair.

3. Make a dam for the ACC with a piece of masking tape by folding the tape back on itself over a sharp tool, sticky side out, and placing the fold in the underside of the keytop/keyfront joint. Don't worry about getting the tape sung into the corner. You want the ACC to form a fillet for reinforcement under the lip.

4. Make a pile of some sort of white or off-white powder over the chip. Make sure there's more than enough powder to fill the chip. I use talcum powder since it's handy. Powdered ivories would be ideal, but I haven't found a way to efficiently powder them up yet.

5. Put the smallest drop possible of ACC, thin or medium viscosity, on the pile of powder. The trick is to have the powder to ACC ratio as high as possible for the most opaque repair. Too much ACC will result in a translucent repair.

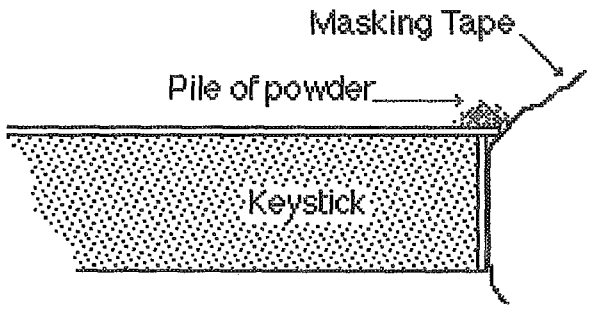
An alternative method for steps 4 and 5 is to place the powder on the keytop off to the rear of the chop, apply the ACC into the chipped area, and then push the powder into the ACC with a swab or other device. Use whichever you like.

6. Spray the pile with accelerator if you're impatient like me. Don't be alarmed if the whole mess turns yellow. The yellow will disappear in a few seconds.

7. Once the ACC has hardened, blow off the loose powder and trim the repair with a razor blade. Repeat steps 4, 5, and 6 if the chip isn't completely filled.

8. Remove the tape dam and finish off the repair with a file or sanding block with about 240 grit paper. When finishing the front it helps to have the key back in the keyframe with the other keys to keep the front straight and square. Smooth, but don't remove the fillet of stuff on the underside of the overhang. That's needed to reinforce the repair.

9. If the repair is too translucent, darken it by applying some color to the bottom of the repair. If that still doesn't make it dark enough, color the top, or remake the repair.



PTG Review

Dedicated To PTG News • Interests & Organizational Activities

PIANO TECHNICIANS GUILD

CHAPTER MATTERS

By Keith Bowman, RPT

Chairman • Chapter Services Committee

Last month, I put the focus on chapters and how we all depend on the collective strength of chapters to provide the best benefits for members and make the biggest impact in the industry. So, forgive me if I say it again — chapters matter.

There is great diversity among PTG's chapters. Consider that the largest chapters are 10 times bigger than the smallest. That some chapters comprise a very small geographical area while others take up a whole state. Some chapters meet very often and others only a couple of times per year. And consider also the local and regional economics, politics and cultural factors that make each chapter unique.

Is it any wonder, then, that what works well for one chapter might not for another? Chapter bylaws or guidelines that, for example, define new member requirements, chapter dues, exam screening procedures, commentating policies for guest technicals, and meeting quorum, could differ dramatically between two neighboring chapters.

My point here is, what a tremendous resource we have in this diversity. No matter what kind of problems your chapter may encounter, whether it be low meeting attendance, depleted operating funds, motivating Associate members to upgrade, or ineffective teacher outreach, there is bound to be a chapter somewhere on the map that has the solution, or at least a new idea to try.

Of course, if you don't know about that particular idea it won't do you any good. That's where the Chapter Services Committee (CSC) can help. If the committee knows about your activities and creative solutions because you are communicating with us, we can in turn get these ideas into print for others to read about. There are some very easy ways to apprise CSC of your activity. If you publish a newsletter, make sure that both your CSC Representative and I are on your mailing list. If you are planning a publicity event, call your CSC Rep so that we have advance notice. Less time-sensitive information can be included in a periodic report to the committee.

Report did you say? Yes, the committee has deliberated carefully to find the best chapter activity reporting procedure. We used criteria like: keep it simple; make it convenient; avoid any unnecessary printing and administrative work. Most importantly, give chapters a reason to participate. Here is the reporting procedure we will be using this year:

REPORT FORM - A convenient, one page form will be sent on a quarterly basis with a LeaderLetter. This form will ask for attendance, meeting and activity information for the previous three months. For example, the September LeaderLetter contained a form for the months of June, July and August. This is a one-part form which is sent only to your CSC Regional Rep. If any report indicates a big project, technical series or other activity, you may get a follow-up form to provide us with more details. And now, the best part. This form is optional.

TELEPHONE INTERVIEW - If your chapter prefers, a chapter officer can call your CSC Rep instead of using the report form. Your rep will conduct a brief interview to gather the same information and it will be filed in the same way.

FOLLOW-UP - If, after a reasonable period of time, your CSC Rep doesn't hear from your chapter, s/he will follow up by calling your chapter president and will attempt an interview at that time.

CALENDAR - The reporting year will be from June 1st to May 31st. The reporting quarters are June-July-August, September-October-November, December-January-February, March-April-May.

Please work with us and give this new system a try. A relatively small effort on your part might make a big difference for one of your fellow chapters.

Please have a look at the box (pg 46) to see who your CSC Regional Representative is. Next month, I will talk about the recognition award system and newsletter award contest, as well as other chapter matters.

Chapter Matters Continued from page 45—Chapter Services Committee Representatives

Northeast: *New York, Rhode Island, Connecticut, Vermont, New Hampshire, Massachusetts, Maine, Newfoundland*

Bill Ballard
R.R. 3, Box 875
Putney, VT 05346
802-869-9107

Northeast: *Pennsylvania, New Jersey, Delaware, Quebec, Ontario, Maritime Provinces*

Mary Zoshak
7 Barbara Drive
Malvern, PA 19355
610-644-1465

Southeast: *Tennessee, Alabama, Mississippi, Florida*

James Arledge
1050 Parkwood Terr.
Nashville, TN 37220
615-255-7818

Southeast: *Georgia, North Carolina, South Carolina, Virginia, Maryland, Washington, DC*

Lewis Spivey
15 Rachel Drive
Nashville, NC 27856
919-937-4777

South Central

Bernard Mollberg
512 E. St. Elmo Rd. #101
Austin, TX 78745
512-444-2210

Central East

Kim Fippen
10 King Arthur Ct.
Westerville, OH 43081
614-890-2197

Central West

David Brown
1617 29th St. NE
Cedar Rapids, IA 52402
319-365-3742

Western

Pamella Consoli
2528 Stonehill Ct.
Claremont, CA 91711
206-842-3721

Pacific Northwest

Jeannie Grassi
9170 Ferncliff Ave. NE
Bainbridge Island, WA 98110
206-842-3721

EVENTS CALENDAR

All seminars, conferences, conventions and events listed here are approved PTG activities.

Chapters and regions wishing to have their function listed must complete a seminar request form. To obtain one of these forms, contact PTG Home Office or your Regional Vice President.

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

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

October 6-9
Ohio State Conference
Cleveland, Ohio
Contact: Janet Leary
18817 Hilliard Blvd.
Rocky River, Ohio 44116
216-331-5605

October 8
San Diego Annual One Day Seminar
Marina Village Conference Center
West Mission Bay, San Diego
Contact Dan Litwin
2701 Elyssee Street
San Diego, CA 92123
619-560-6105

October 13-16
New York State Conference
Sheraton Inn
Syracuse, NY
Contact: Paul Kupelian
PO Box 162
Constantia, NY 13044-0162
315-623-9484

October 27-30
Texas State Association
Sheraton Inn
Wichita Falls, TX
Contact: Dale Probst
4447 Cunningham
Wichita Falls, TX 76308
817-691-3682

October 29
Lehigh Valley One Day Seminar
Lehigh Valley Chapter
Holiday Inn
Contact John Zeiner, Jr.
830 Hanover Avenue
Allentown, PA 18103
610-437-1887

November 3-6
North Carolina Regional Conference
Radisson Hotel/High Point, NC
Contact: Evelyn Smith
1041 S. Aycock Street
Greensboro, NC 27403
919-230-1783

PTG

SHORT TAKES

HOUSTON CHAPTER DEMONSTRATES SPIRIT

The Texas Music Teachers Association, 64 associations strong, held their annual convention in Houston at the J.W. Marriott Hotel and Convention Center, June 10-14, 1994. The Houston Chapter of PTG was there in force demonstrating the desire of piano technicians to make the aims, goals and skills of PTG known to music teachers, students and parents of students. Involvement was in three capacities: manning an exhibit booth, awarding scholarship checks to three levels of winners and presenting a one hour seminar on piano technology.

The exhibit booth was rather imposing on the major part of the exhibit area. Many who came into the exhibit area had their attention drawn to the lighted sign of the RVP literature display. It reads "Piano Technicians Guild" and has the new PTG logo on it. We had a TV and VCR, loaned by Martin Conroy, on which we played three videos continuously including the "Unseen Artist." The other two videos were from the National Piano Foundation, obtained by Jack Wyatt of the Dallas Chapter and president of the TSA, PTG. Jack also provided the booth with over 200 miniature pianos with red apples on top on which was printed, "To My Piano Teacher." These were given to teachers in hourly drawings. Also for giveaway, to everyone who came to the booth and wanted one, flowers made on a loom from yarn of assorted colors. These had been made by the Houston PTGA over the past several years and included some made by the late Ruth Pollard. Both flowers and miniature pianos had a tag affixed by Beva Jean Wisenbaker, PTGA, reading "Compliments of PTGA or PTG" respectively.

Saturday evening, scholarship checks were presented to three piano competition winners at the winners' concert: $75.00 to Jr. High winner, Mayumi Tsujikami, $150.00 to high school winner Olivia Liang and $250.00 to college winner, Roger Wright.

On Sunday afternoon, Jim Geiger gave a good presentation as he expounded on partials, voicing and some on regulation as it relates to tonal quality. There was much audience participation.

Overall, there was much more participation between TMTA conventioners and PTG presenters this year. The teachers are gradually learning who we are and why. Through persistence we will persevere until parents understand that they must work together with the teacher and the technician to produce fine musicians. *—Martin Wisenbaker*

DALLAS/FT. WORTH CHAPTERS TAKE BALDWIN FACTORY TOUR

The Dallas and Fort Worth Chapters toured the Baldwin Grand Factory in Conway, Arkansas, Friday July 12th. The Baldwin Factory representatives were gracious hosts and made the tour feel most welcome. Kent Webb and Barry Bradshaw were in charge of the tour. We split into two groups, Kent taking one and Barry taking the other. They answered every question that was asked and were very patient in trying to keep the group together. New innovations that Baldwin has developed were explained in detail.

In the afternoon a question and answer session was held and a general discussion of service problems were brought up. Then the group was asked for suggestions as to how the factory could improve their product or their service department. All in all you got the feeling that the Baldwin factory has their act together, so to them we say a hardy thank you. Kent and Barry, you are truly professionals.

—Jack Wyatt

Dallas/Ft. Worth Chapter members who attended the Baldwin Factory tour include: (L to R) Joe Tom McDonald, Richard Tilton, Bill Powell, Jack Wyatt, Sue Speir, Leon Speir, Bob Lang, Larry Porter, Al Heersink, Joel Swafford, Doug Parsons, Karen Parsons and Ross W. Anderson.

EXAMINATION & TEST STANDARDS COMMITTEE

Mitch Kiel, RPT

Movin' On Up

Where did today's RPT exams come from? How did they evolve?

Here's a brief history.

The Piano Technicians Guild was created in 1958 when the American Society of Piano Technicians and the National Association of Piano Tuners joined. Acceptance for membership in PTG's early years was contingent solely upon a recommendation from a PTG member. Exams were not defined nor regulated.

Jim Pierson recalls his PTG exam from the 1950s. He tuned a piano in a Seattle rebuilder's shop. Jim's tuning was observed by a few PTG members who also evaluated his tuning afterwards. He didn't take any other exams.

In the mid 1960s, Maurice Roseborough and his Iowa chapter developed an RTT (now RPT) exam, using a points system administered by a chapter committee. They evaluated three areas of the applicant's skill: a complete tuning, a bench test (now the technical test), and an oral exam (now the written test).

But there remained great inconsistency in exam procedures among chapters. In some instances an applicant might tune only a few notes, then be awarded a passing grade based on reputation and personal connections. There are tales of tuning exams given on old uprights with missing hammers that needed a pitch raise. Jim Coleman, Sr. recalls an examinee failing the oral exam because he couldn't correctly spell "inharmonicity."

Because there was so much variation in acceptance procedures, being an RTT was not as meaningful as many members wished. Although the number of members doubled from the mid-60s to the mid-70's, overall RTT skill levels did not keep pace. To protect PTG's credibility among members and the public, it became important to create a better exam. In 1977, PTG president Don Morton asked Dr. Al Sanderson and Jim Coleman Sr. to develop a universal tuning exam that would be objective, repeatable, and quantifiable. These two men created an exam based on aural and newly-available electronic methods, and field tested it for two years on more than 400 members. They designed scoring criteria so 80% of the RTT membership could pass with a score of 80. Ron Berry was instrumental in writing the examiner's manual and creating the cadre of examiners needed to implement the new exam.

In 1980 in Philadelphia, Council accepted this exam as the official RTT tuning exam. Those who were already RTT members were "grandfathered" in; that is, they retained RTT membership without having to take the new exam. This "grandfather" procedure has been granted with all exam updates.

In 1986 at the Las Vegas Council session, the tuning exam underwent some major changes. The responsibility to provide an accurate tuning fork was passed from the examiners to the examinee. Scoring tolerances were tightened: the multiplier for temperament was increased from 2 to 2.5 and the midrange multiplier increased from 1 to 1.5. The test blow weight increased from 6 ounces to 8 ounces, and the time allowed decreased from 2 hours to 1.5 hours. In 1989, passing score for the aural portion of the electronic tuning exam was increased from 70 to 80.

These changes had the effect of making the exam more difficult. This was deliberate; years of accumulated exam scores indicated the original tolerances were too modest. The original scoring criteria (80% of the membership able to pass with a score of 80) were no longer stringent enough. One reason for this was the skill and competence of RTTs had risen, and the exam scoring standards had to be raised to keep up with those new levels of skill and knowledge.

The technical test went through a similar evolution. In the mid-1980s the old "bench test" was replaced by two separate technical exams, the Chicago version (created in large part by Otto Keyes) and the LA version (created in large part by Norm Neblett). Bill Spurlock was chair of ETS's technical test sub-committee in 1987, and led the effort to reconcile the two. In Portland in 1989, Council voted to accept the unified version of the technical exam we use today.

Concurrently, the old oral exam (which sometimes included discussions of business practices) evolved into our written exam. Originally created by Sid Stone, it's been modified and updated by such people as Danny Boone, Bill Spurlock, Jack Stebbins, and many others. Its most recent revision was in 1989.

Why have the exams received so much attention from so many people for so many years? Why have hundreds of PTG members worked hard and long to create the RPT exams, and why do hundreds of examiners every year volunteer their time to administer them? It's because they all believe that the RPT exams are fundamental to PTG.

Passing the RPT exams can be — and should be — an important moment in a piano technician's career. But the RPT exams are more than a one-time event; they're also an ongoing symbol of identity and connectedness.

We define ourselves as PTG members, either Associate or RPT. PTG defines itself, in large part, through the RPT exams. Without them, PTG might be just a frivolous fraternity, rudderless and stagnant.

For PTG, the exams are the hub of the wheel and the center of the whirlpool. The RPT exams are:
- an important goal for Associates to strive for
- the benchmark for minimum standards for professional competence
- a public declaration that PTG is the leader in setting standards
- a momentum builder for lifelong learning
- a tool for advancing our understanding of the state of the art of piano technology

But let's be realistic too. The RPT exams are neither the end of the road nor the top of the mountain. In practice and in design, the RPT exams are not:
- a PTG guarantee that every RPT will always perform RPT-level work
- a test for concert-level tuning ability
- an examination of every single repair and rebuilding skill
- an excuse to ignore the need to continually improve our skills
- a substitute for personal responsibility

This brief history of the RPT exams should help us realize that our organization and our exams have undergone major changes in the very recent past. We've certainly changed more in the past 13 years than in the first 23, and we've experienced major revisions to the exams as recently as 4 years ago.

Two statistics underline how new these changes are: about half of our RPTs have passed the 1981 (or later) tuning exam. And less than 20% have passed all three current exams. (This should engender some compassion for the growing pains recent Councils have grappled with.)

The three RPT exams — tuning, technical, and written — have finally reached a point of development where we can expect them to remain (relatively) unchanged— for a while. But improvements in education and technology will undoubtedly foster higher standards in future RPTs, and we should expect the RPT exams to continue to evolve with them.

As always, send your comments and questions to the ETS committee via the Home Office.

The Examinations and Test Standards Committee needs your help. In our efforts to improve our administration of the exams, we'd like you to fill out the self-addressed postcard in the back of this issue and send it back to the Home Office. It will only take a minute of your time, and will help us immensely.

P A S S A G E S

Reclassifications to RPT

REGION 2

352-BIRMINGHAM, AL

KIRK S. ALFORD
805 LINWOOD CIRCLE
BIRMINGHAM, AL 35222

LARRY S. MITCHELL
517 EDGECREST DRIVE
BIRMINGHAM, AL 35209

395-MISSISSIPPI-GULF COAST

A. LYNN EVANS
RT. 2, BOX 14A
TAYLORSVILLE, MS 39168

JENEANE K. MIXON
1409 POST ROAD
CLINTON, MS 39056

REGION 3

752-DALLAS, TX

DAVID M. PORRITT
1427 JUDY DRIVE
PLANO, TX 75074

771-HOUSTON, TX

CHARLES T. RAINWATER
4038 COLTWOOD
SPRING, TX 77388

791-NORTHWEST TEXAS

KEVIN R. FORTENBERRY
5709 45TH STREET
LUBBOCK, TX 79414

REGION 4

454-DAYTON, OH

THOMAS M. RODBERG
165 S. PELHAM DRIVE
KETTERING, OH 45429

REGION 6

956-SACRAMENTO VALLEY, CA

ALEXANDER J. HERNANDEZ
2049 13TH AVE., W #3
SEATTLE, WA 98119

37th ANNUAL CONVENTION & TECHNICAL INSTITUTE

An Industry Update

By Yat-Lam Hong, RPT
Western Michigan Chapter

In the September issue of the *Journal*, we included coverage of the 1994 Convention and Technical Institute which was held this past July in Kansas City. This article concludes that coverage by taking a look at some of the many piano manufacturers who were represented there.

This year's PTG Convention in Kansas City, Missouri, offered me a chance to catch up with the technical representatives of several major piano manufacturers I didn't get to interview at the trade show of the National Association of Music Merchants. (See *NAMM Show '94* in the May and June 1994 *Piano Technicians Journal*.) What these manufacturers are doing is an important part of the current piano scene.

BALDWIN

I managed to get hold of Kent E. Webb, Baldwin's Technical Service Manager, one day before he even had a chance to have his morning coffee, but he was gracious enough to take the time to show me the changes Baldwin is making in its pianos. According to Webb, continuing quality improvement is the primary goal of the Baldwin Piano & Organ Company, the largest piano manufacturer in the United States. The flagship of the company is the Artist Series grands, which consists of five sizes in six models. These are the models M (5' 2"), R (5' 8"), L (6' 3"), SF-10 (7' 0"), and SD-10 (9" 0"). The 5' 8" model R is also available in the French Provincial style, called model 226.

While the 226 is normally available only in cherry, the other five models come in either ebony or mahogany. "Consumers' taste in furniture is changing," Webb said, "They now seem to prefer mahogany over walnut whenever they want a brown piano." However, Baldwin verticals are still available in walnut and oak. To make its pianos more appealing to a wider public, Baldwin now has an "Options Program," whereby, on special order, any piano can be made available in just about any type of wood or furniture style in either satin or high-gloss finish.

Mechanically, Baldwin's Artist Series grands have undergone many changes. For example, they all have adjustable pedal rods, a quick-detach key slip, and end blocks fastened by wing nuts. With the lift-up fallboard that has been in use for many years, a technician can now pull out the action for service without using any tools. The front rail of the action now rides on a series of studs in the 21-ply poplar keybed, which are accessible for adjustment through holes on the underside. These are similar to balance-rail studs mounted in reverse. They reduce friction during shift when the left pedal is in use, and simplify the process of remedying knocking key frames in dry weather. All these changes should make the technician's life much easier.

To improve the consistency and responsiveness of the action, the Artist Series grands now use thinner hammershanks, which reduce the weight and minimize the need for excessive key leads. The 7' and 9' grands use treble termination bars made of nickel-cadmium, which are much more resistant to grooving, and provide better termination points for the strings. If the ringing front end (the segment between the termination bar and the tuning pin) bothers the technician, it can be easily muted off during tuning and is not a problem. To improve their appearance, these pianos now have beveled edges on the lids.

These grands also use large German-made locking castors. To keep the pianos at the normal height, the legs are shortened accordingly. If these pianos need to go on dollies, special blocks are available to compensate for the shortened legs so the lyre won't drag on the floor. For models M, R, and L, the legs still use the bolt-on T-Nut system.

The changes also extend to the less visible parts of the pianos, such as the damper system. All Baldwin grands now have individual damper-adjustment capstans. The neoprene sostenuto tabs

have been replaced by the traditional wooden ones covered in red bushing cloth. "There's nothing wrong with the neoprene tabs," said Webb, "but some customers get turned off by synthetic materials. So, this change is to give the damper system not just quality, but the appearance of it, too."

The 7' and 9' grands both use the Renner action, while the smaller models have the Baldwin action, but all of them use Baldwin hammers made of felt from Baldwin's own felt-manufacturing department. All Baldwin keyboards are made at Baldwin's own Pratt-Win plant in Juarez, Mexico. "When we make most of our own parts, we have maximum quality control over our products," said Webb.

To inspire consumer confidence, every customer who buys an Artist Series grand gets a video tape of the factory tour, showing the meticulous care with which his piano was built, and a Baldwin Quality Assurance Pledge and a Certificate of Excellence, which is signed by Dick Harrison, Baldwin's chief executive officer and president. The two certificates are printed in black and gold, complete with Baldwin's "Handcrafted in America" seal, and held in a red leatherette folder with a gold tassel around it. This very impressive folder looks more like a degree from a prestigious university than a run-of-the-mill warranty card. It looks like something an Artist Series owner would be proud to display on his piano. When the company president personally guarantees his product, it can't fail to generate customer confidence and satisfaction. It seems Baldwin has made a brilliant marketing move here.

Besides the Artist Series, Baldwin also has two other lines of grands. The Classic Series consists of two models: B1 (4' 10") and C (5' 7"). They have the same action parts as the Artist Series, but their two-piece rim construction greatly simplifies the manufacturing process. The key word here is *affordability*, as these pianos cost substantially less than those in the Artist Series. Although the older B1 had a reputation for tuning instability, Baldwin believes the problem was taken care of when it switched from using the Accu-Set hitch pins to the Accu-Just hitch pins.

For customers who prefer their grands in polyester finish, there's the D. H. Baldwin series, which is made by Samick of South Korea for Baldwin. There are three models in this series: the C142 (4' 7"), C152 (5' 1"), and C172 (5' 8").

Baldwin also makes five sizes of vertical pianos: 36", 40", 42-1/2", 45", and 52". The 36" is the spinet, and Baldwin and Wurlitzer (which is also owned by Baldwin) are the only two manufacturers of spinets today. The 52" (model 6000) is the Concert Vertical, which incorporates many of the same features used in the Baldwin grands.

The 45" (model 243) is, of course, the famous "Hamilton" (after company founder Dwight Hamilton Baldwin's middle name), with which most technicians are very familiar. With string lengths and soundboard area equivalent to those found in a typical 5' 8" grand, a full-blow action, solid spruce soundboard, and 19-ply pinblock, this piano has a well-deserved reputation for toughness and durability, and is favored by public schools and universities, where pianos often get unbelievable use and abuse. It's probably not an exaggeration to call the Hamilton the "workhorse of the piano industry." "Some Hamiltons are 30 or 40 years old or older, and may look like hell," said Webb, "but they still perform. It's not only the best-selling model for Baldwin; it's the best-selling model in the entire history of the piano." Without the Hamilton, Baldwin would have been a much smaller company. Although the Hamilton has never been known for its looks, this has changed, too. Now there's the Hamilton Designer Series, and this piano is available in mahogany, cherry and oak in attractive styles for the home.

Currently, Baldwin's annual production is 20,000 pianos, 3,500 of which are grands. Of these, about 50 are the SD-10 concert grands. Its 1,500 employees are spread out at several locations, determined by function: the office headquarters is in Loveland, Ohio. The Conway, Arkansas, plant makes the Artist Series grands; the Trumann, Arkansas, plant makes the Classic Series grands; the Greenwood, Mississippi, plant makes verticals and does general woodworking; the Juarez, Mexico, plant makes actions and keyboards; the Fayetteville, Arkansas, plant houses the electronics division; and a warehouse for finished parts and raw materials is in El Paso, Texas. Each site was chosen for the locality's availability of quality labor and materials.

With between 800 and 1,000 dealers throughout the United States and Canada, Baldwin has a network in place to serve its North American customers just about everywhere. The many changes Baldwin is making are a sign that the company is future-oriented and on the move, and not incidentally, keenly aware of the fact that the technician is an important link between the manufacturer and the customer. "Although business is going well," Webb said, "we have to watch the consumer trends closely to face the future."

Kawai

KAWAI

In prestigious concert circles, Kawai has been making quite a name for itself. World-renowned Argentinian pianist Martha Argerich performs on a Kawai, which is the official piano of the Aspen Music Festival and the San Francisco Opera. It's also used at numerous international piano competitions, such as the *Frederic Chopin International* (Warsaw, Poland), the *Arthur Rubinstein International* (Jerusalem/Tel-Aviv, Israel), *International Piano Competition "F. Busoni"* (Bolzano, Italy), *Concours International "Vienna da Motta"* (Lisbon,

Portugal), the *Gina Bachauer International* (Salt Lake City, Utah), the *Georges Enesco International* (Bucharest, Romania), and other international competitions such as those held in Hamamatsu and Tokyo (Japan), Sydney (Australia), Dublin (Ireland), Cologne and Munich (Germany), Santander (Spain), Taipei (Taiwan), and others.

The winner of the 1993 *Van Cliburn International Piano Competition* (Fort Worth, Texas) won his gold medal performing on a Kawai, and so did both of the two top prize winners at the 1994 *International Tchaikovsky Competition* (Moscow, Russia). In fact, Kawai was chosen by finalists in 15 of the world's most prestigious piano competitions, and in six of these, the first-prize winners won on a Kawai. It should be pointed out that, at these high-stakes international competitions, the contestants are free to choose from a large number of concert grands of various makes for their performances, since their careers and reputations (and those of the piano manufacturers, too) are on the line. While many concert pianists prefer the Steinway, Bösendorfer, Yamaha, and others, the fact remains that it can't be a coincidence when so many prize-winners picked Kawai.

The company *has* to be doing something right, and over lunch one day, I asked Ray Chandler, Kawai's Piano Technical Support Division manager, about this. His response was surprisingly straightforward: These 9' 1" Kawais (model EX) used at the competitions (and elsewhere) are all *hand-made* pianos. Strictly speaking, *all* pianos are hand-made to some degree, since no machine can do everything, but Kawai's hand-made pianos are built by an elite crew of about 20 master technicians, who work in a special area at Kawai's grand factory—totally separate from the regular production-lines. Not only are these special pianos hand-made to a much greater degree than the production-line Kawais, each piano, once past the initial stages of manufacturing (rim-making, soundboard installation, pinblock-fitting, etc.), is built by *one* master technician only, not by a team. This master technician is in total control of the piano he's building, and does everything the way he feels needs to be done. When his piano is completed, he signs his name on the end key, and accepts total responsibility for its quality.

These master technicians range in age from 35 to the early 70s. All of them are long-time Kawai employees, many of whom have been working for Kawai since they were 18. By the time they are selected to join this elite crew, all have had years of piano-building experience behind them, and each one is allowed to do his own thing because the company has total confidence in his ability, judgment, integrity, and character. And they all work behind closed doors in a department separate from the rest of the factory. Somehow, I get the feeling that Kawai is a bit secretive about this department. When the PTG-IAPBT tour visited Kawai in 1989, we walked past a set of closed (and windowless) doors next to the research department. At the time, I assumed those were just private offices, and never suspected that this special crew was working right on the other side of those doors. Our tour guide never said a word about it, as though this department didn't exist. But that could be because it's off-limits to visitors, especially since our group included employees from Kawai's competitors.

Unlike the production-line Kawais, every EX is different as it reflects the personality of its builder. Ray Chandler told me an interesting story about a particular EX he once came across. Although not especially powerful, this piano had a sweet tone and an action that's incredibly responsive, even, and fast. He became curious and wanted to know who made it, and found the name "Maruyama" on the end key. As it happened, Chandler knows Mr. Maruyama, who is a polite, soft-spoken gentleman in his early 70s with a mild demeanor, and an incredibly knowledgeable and efficient craftsman. "His piano is just like him," Chandler said. It's probably the difference in the pianos' personalities that appeals to the concert pianist, since chances are good that he'll find the Kawai that matches his own musical taste. Now, there's even a hand-made Kawai grand (model RX, 6' 5") in Chopin's birth house in Zelazowa Wola, Poland. Even if you're not familiar with the hand-made models, there's an easy way to tell them apart from the production-line Kawais: by the price. The hand-made version costs as much as 50% more than the regular Kawai of comparable size.

The most exciting new product from Kawai's regular line is surely the "Anytime Piano" (model AT-170). As its name suggests, this piano can be played *any time*, day or night. There's no need to be concerned with waking up the family or neighbors, if the pianist chooses to practice at 3:00 a.m. This 49" vertical with a built-in digital keyboard is really two pianos in one. Unlike typical electronic keyboards where the keys are spring-operated, the electronic piano in the AT-170 functions off the acoustic piano, with the same touch and feel. With the electronics on, the catchers are stopped by a special rail mounted under the hammer rest rail, so the hammers are stopped about 10 mm from the strings. In this mode, the pianist listens to the sound of a Kawai concert grand through the headphones. The pitch is adjustable between plus and minus 50 cents of A-440 Hz., and he can choose the reverb for a room, a stage, or a large concert hall, and the tone quality of an acoustic piano, harpsichord, or vibraphone. Through the external jacks, the piano could be wired to MIDI, recording devices, speakers, etc. It's a truly versatile instrument and an electronic marvel.

All Kawai grands are still made in Japan, but some of its verticals are now made in Kawai's factory in Lincolnton, North Carolina, about 30 miles northwest of Charlotte. They're essentially the same verticals as those made in Kawai's Hamamatsu plant, as they use the same actions, keyboards, hardware, etc., imported from Japan. Building them in the United States makes these pianos more price-competitive for the North American market.

Some of these American Kawais are even *exported* to Japan, since some consumers there prefer the more rounded and less "boxy" contours of the American models. A very interesting thing happens here: After paying two rounds of import duties (first as components imported from Japan, then as completed pianos imported from the U.S.) and two rounds of shipping costs, these pianos made with cheap American labor

Mason & Hamlin

(!) are still competitive in price on the Japanese market with the totally Japanese-made Kawais. Talk about the intricacies of international commerce!

MASON & HAMLIN

Since 1854 when Henry Mason and Emmons Hamlin joined talents and founded their piano company, Mason & Hamlin has had more than its share of ups and downs. It once made pianos of such superior quality that virtuoso pianists like Sergei Rachmaninoff, Ossip Gabrilowitsch, and Harold Bauer regularly performed on them. Since then, the company had gone out of business, moved, and changed owners several times, and the details of its history are too convoluted to go into here. (Someone should write a book about it.)

In June, 1989, the Seattle entrepreneur Bernard Greer bought what was left of the Mason & Hamlin Piano Company, and hired Lloyd Meyer, a former Steinway & Sons president, as its chief executive officer to rebuild the company and restore this great piano to its former glory. At this year's PTG Convention Exhibit Hall, I finally caught up with Meyer and Paul Monachino for a rather hurried interview. Monachino is perhaps the longest-serving Mason & Hamlin employee still around, and he has gone through many of the changes with the company since "way, way back."

The Mason & Hamlin Piano Company is now located in a former shoe factory in Haverhill, Massachusetts, about 35 miles north of downtown Boston. Including the basement, the six-story building has a total area of 70,000 square feet. Mason & Hamlin also owns Sohmer and Falcone. It recently closed Sohmer's factory in Elysburg, Pennsylvania, and moved its vertical piano operation to Haverhill. (Sohmer grands are currently not in production.) Due to slow demand, production of Falcone pianos has also stopped. Instead, the company is focusing its energy on rebuilding the Mason & Hamlin line.

To restart Mason & Hamlin production in Haverhill, the first thing the new management did was to go back and meticulously document the specifications of the original model "A" (5' 8-1/2") and "BB" (7' 0") grands. This involved studying the original blueprints, manufacturing jigs and templates, and old pianos made in Mason & Hamlin's heyday. Working with a sophisticated computer-aided-design system, a team headed by Allen Harrah recreated drawings and specifications for each of the pianos' 12,000-plus parts. "There was never any question that, intrinsically, the Mason & Hamlin was a superb piano scale," Meyer said. "Our challenge was to make sure that we were working from the right scale drawings and that we had everything documented, so we could manufacture consistently."

The new Mason & Hamlin grands now use all-maple rim, Adirondack white spruce soundboard, Vermont hardrock maple bridges, 7-ply maple pinblocks, Kluge keyboards, and Renner actions made to Mason & Hamlin's specifications. The original Tension Resonator (commonly known as the "spider") is still there. To ensure proper downbearing, the plate, soundboard, and bridges are all hand-fitted. By paying a higher-than-prevailing wage scale, the company has been able to attract and hold a highly skilled labor force. "To build the best, we start with the best," Meyer said. "And we skimp on nothing."

Due to their extra-thick all-maple rim construction, Mason & Hamlin grands are the heaviest pianos in the industry for their respective sizes. The 7' grand, for example, is even heavier than many 9' concert grands of other makes. Their weight provides a solid foundation for tone production. The new computer-guided machinery has also made high-precision work possible. For instance, the hitch pin holes in the plates are now so accurately drilled that the aliquots not only properly set the string bearings, they also make the duplex scale perfectly in tune with the strings' speaking lengths. Gone are the old-style wippens which had repetition lever springs hooked onto the nylon loops. In their place are the specially designed Renner wippens with "butterfly" springs, which are easily adjusted through the noise-free teflon spring-tensioning screws. Then, there are the new hammers.

The Mason & Hamlin grands all have Renner's Premium Blue Label hammers with mahogany moldings, and lacquer is not used at all. Meyer said these hammers are so superior that all the desired qualities in good tone (power, projection, brilliance, clarity, evenness, warmth, etc.) are already *built* into them, and no lacquer is needed. Besides, lacquer solidifies the wool fibres and deadens the tone. All that the technician needs to do with these hammers is to bring out these qualities in the right proportions through skillful voicing. This concept is rather like the old Zenith television ad that claims its quality was "built-in, not added-on." And Lloyd Meyer means business: Any Mason & Hamlin employee caught lacquering hammers is fired on the spot.

Meyer said it takes an enormous amount of time, energy, and money to authenticate a piano scale so it's possible to build it right. So far, there are only three Mason & Hamlin models in production: the A, BB, and model 50 (the 50" vertical). The current annual production is about 250 grands and 800 verticals. As soon as resources permit, the next Mason & Hamlin to reappear

Young Chang

will be the long-awaited model CC-2, the 9' concert grand. After that will come the AA (6' 3" grand), which was last built in 1963.

These ambitious plans ought to keep the Mason & Hamlin factory and its 60 dealers in the United States very busy. Now, what about skeptics who still say that today's Mason & Hamlins are not built like the old ones? Meyer's response is plain and simple: "Yes, they're right. Today's Mason & Hamlins are built better."

YOUNG CHANG

Donald E. Mannino, Young Chang's National Service Manager for Acoustic Pianos, also shared with me some of the things this Korean manufacturer is doing. Ever since Young Chang bought a lumber mill in Tacoma, Washington, in 1993, much of the wood it uses (mostly maple, spruce, oak, cherry, and walnut) is now air-dried, milled, and kiln-dried there before being shipped to Korea for piano-making. (Thus, when the finished pianos are exported to the U.S., the wood in the pianos would be back in its native country. Some believe this contributes to stability.)

All Young Chang grands and verticals now have the new type of 17-ply pinblock containing different varieties of maple. According to Mannino, these mixed-maple pinblocks make the drilling more consistent, and they also facilitate tuning. For case parts, the consoles use some MDF (medium-density fibreboard), but the grands use only laminated wood. For soundboards, Young Chang still sticks to the 12-grains-per-inch standard, and laminated boards are not used in any of its pianos.

The company is experimenting with a lower-mass grand action, with the theory that when mass is reduced, repetition would speed up. If the theory proves correct, this should improve the control a pianist has over the action, and the piano could produce a brighter tone without excessively hard hammers.

Like all piano manufacturers, Young Chang has to watch its production costs. Recently, it opened a plate foundry in Tientsin in northeastern China, which uses two different techniques for plate casting: standard sand casting for the Chinese market, and vacuum process for the U.S. market. The more expensive vacuum process plates are smoother and less subject to warpage, which would make the actions fit better, too. Also under construction in China is a new Young Chang piano factory, which is expected to be ready by the end of 1995. When its pianos eventually get up to standard, they will be exported to the U.S. To stay competitive in this global market, Young Chang's hope is to produce Korean-quality pianos with low-cost Chinese labor.

Currently, Young Chang's 4,000 employees turn out 120,000 pianos a year, about 24,000 of which are grands. 80% of these grands are for the U.S. market, and are sold under brand names like Young Chang, Weber, Wurlitzer, Nakamichi, and Cline. Young Chang's 12-year warranty applies only to Young Chang pianos. The other brands are warrantied by their respective distributors: Weber by Samsung America, Wurlitzer by Baldwin, etc.

Since the *Won* (South Korean currency) fluctuates with the dollar, prices for Young Chang pianos in the United States are not affected nearly as much as those for pianos made in other countries. This gives Korean pianos an important advantage over their competitors.

Samick

SAMICK

Samick Music Corp. is a wholly-owned subsidiary of Samick Musical Instruments Mfg. Co. Ltd. of Inchon, South Korea. To learn more about this company and its products, I had a good talk with Richard H. Elrod, Samick's Piano Technical Services manager, at the Convention, and later by phone, with Robert J. Jones, Samick's executive vice-president and general manager. I'm grateful to both gentlemen, who were forthcoming with answers to my many questions.

Samick was founded by Hyo Ick Lee in 1958, who was also its president until his death in 1993. Now, his son, S. J. Lee, has taken over the presidency, and the company

continues in the same direction set forth by his father, that is, a company primarily devoted to the manufacturing of *acoustic* pianos. The senior Mr. Lee was a very religious Christian, and according to Jones, he credited his business success to Divine guidance. I remember well the upper floor of his main factory that was made into a church, complete with pews, hymn books, and Bibles, and decorated with crucifixes and pictures of Jesus. Samick's employees and their families are welcome to worship and attend services there. One doesn't have to be a Christian to work at Samick, but, thanks to Mr. Lee's religious fervor, the company does attract a sizeable number of employees who are Christians. This is also proof that religion and business *can* mix.

Samick is a large corporation with its own components mill, action factory, plate foundry, and rough mill in Korea. Overseas, it owns a factory near Jakarta, Indonesia, which makes guitars, and has plans for piano production soon, and another one in Harbin, China, about 700 miles northeast of Beijing, which makes pianos and guitars mainly for the Chinese market.

Samick Music Corp., the U.S. subsidiary, is located in City of Industry, California, about 23 miles east of downtown Los Angeles. Built in 1989, its 85,000-square-foot facility houses the executive offices, showroom, warehouse, and a piano factory, which is the only Korean piano factory in the United States. Samick started selling pianos in the U.S. in 1976. Besides making Samick pianos, it now also makes pianos for other companies under names such as Altenburg, D. H. Baldwin, Hyundai, and Kohler & Campbell. With a total annual production of over 150,000 units, Samick is now the world's largest piano maker.

Unlike the situation with some manufacturers, business at Samick has been booming. According to Jones, Samick has been growing every year, and its U.S. market has doubled its size in the last six and half years. In fact, business has been so good that it can't make parts fast enough to keep up with production demands, and has to buy some of them from Kimball and a few other companies. Today, about 700 or 800 dealers in the U.S. carry pianos made by Samick, and some 300 of these, with about 600 outlets, sell the Samick brand.

Since Samick started working with Klaus Fenner, the well-known German scale designer, all its models have been re-scaled. The grands now have a high-tension scale, a broader tail for larger soundboard area, and a solid spruce soundboard stabilized by veneers on both sides. Its seven sizes are: 4' 7", 5' 1-1/2", 5' 7", 6' 1", 6' 8", 7' 4", and 9'. The three larger sizes use the Renner action, and the rest use a Renner-type action made by Samick.

Samick's vertical line consists of five sizes: 42", 43", 46-1/2", 48", and 52". For the Korean market, two additional sizes are available: 41" and 50". These verticals all feature the super-accelerated, Schwander-type direct-blow actions. Both grands and verticals use Royal George felt from England, 21-ply Delignit pinblocks and Röslau music wire from Germany, Sitka spruce soundboards from Alaska, and nickel-plated, cut-thread tuning pins from Japan.

The wood used in Samick pianos is pre-seasoned outdoors for up to two years. It's then kiln-dried down to between 5% and 6% moisture content before the manufacturing process begins. For maximum stability, the pianos for the U.S. market all undergo a special seasoning process.

"Samick continues to strive for improved quality and productivity," said Jones. "We're committed to the acoustic piano market long-term, because digital and electronic pianos just can't produce the subtle nuances for fine music-making." As evidence of this commitment, Samick will be introducing two brand-new grand models (4' 11" and 7') at the 1995 NAMM Show.

I'm grateful to the representatives of these companies for taking the time to tell me about their pianos, especially since these interviews all took place under rather difficult circumstances. To accommodate me, they had to contend with delayed coffee breaks, interrupted lunches, rescheduled appointments, and sometimes, accompaniment of someone pounding on a piano three feet away. These companies seem to think that the decline of the industry has hit bottom, and the situation is stabilized. Each in its own way is now poised for new growth. For our sake as well as theirs, let's hope they're right.

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CASE STUDY

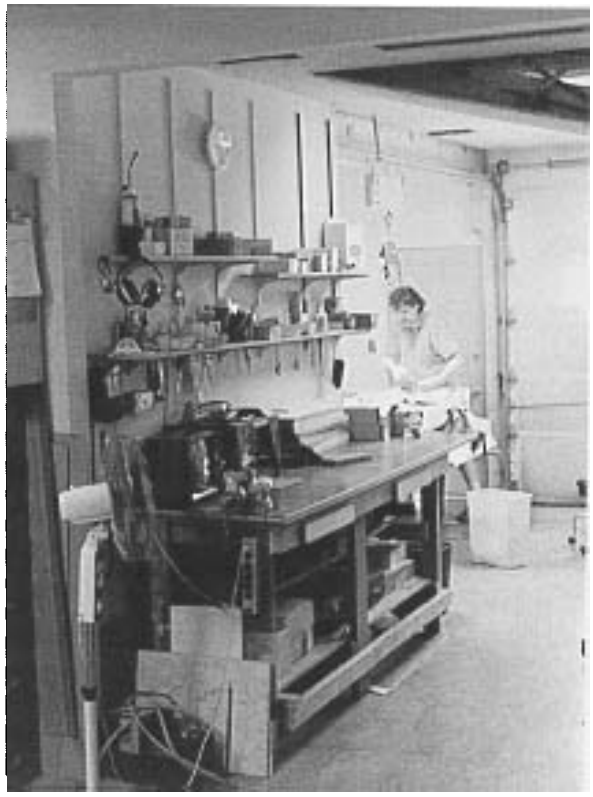
Case Study:

Organizing For Maximum Efficiency

By Larry Goldsmith

Just as each piano is different, every piano technician has his or her own ways of organizing life, work and business. In this department, we'll take a look at a different aspect of the profession each month. Curious about how the other half lives? Is there something you think other members might be interested in hearing about? Tips and suggestions will be gratefully accepted. Just send them to the Home Office and we'll get on the beat!

Considering all the different tasks that go into piano work, how do you organize a shop for maximum efficiency? For Dave Vanderlip and Kathy Smith, mobility is the key to flexibility. In their Anaheim, CA, shop, virtually everything, from parts cabinets to a hotbox to benches dedicated to action work, is on wheels.



According to Vanderlip, he and Smith started with one big advantage, purchasing their Anaheim, CA, house from another piano technician. The former owner, who specialized in player piano work, had remodeled the former garage into a piano workshop after closing his store, so the shop space already existed. That part of the structure is heavily insulated, so noise is not a problem, either for neighbors or people elsewhere in the house.

"When you're in the shop, you can play until late in the evening without bothering anyone. In the back bedrooms of the house, you can't even hear it. As far as tools go, the router is the loudest. You can't hear the tablesaw at all, because sound doesn't seem to carry very much. Of course, I try not to run it late in the day anyway," Vanderlip said.

> ***"There's a mobile parts cabinet with 30 small drawers. It's mounted on a piano dolly, and the tablesaw and bandsaw both have mobile bases as well."***

The shop space is divided into three sections. At the front is a 20' by 20' foot space, with a double-wide garage door. That's where most of the final prep work takes place — keys, dampers, voicing, etc. "We can fuss it up at the front end and mess it up at the back," he said.

The middle section, which is approximately 10 by 10 feet, is mostly occupied by a permanent 8-foot by 31-inch bench. "It's an all-around utility bench," Vanderlip said. "It's where we do gluing, assembly and woodworking projects. Large clumsy items like plates and casework can be stored there as well.

The back of the shop, which is approximately 11 by 18 feet, has one unique feature — a one-car-wide garage door that opens

onto a patio in the back yard. "That way, if things get really messy, we can just move them outside," he said. And the pleasant Southern California climate just makes it that much better, he added.

Vanderlip and Smith have two workbenches on wheels so that tools can be taken to where the work is, rather than the other way around. It's also helpful when other technicians work in the shop. Both have storage space underneath, and both are dedicated to specific tasks. One has letoff racks and other parts-alignment fixtures. The other has three portable tools: a cutoff saw, a combination disk/belt sander and a drill press.

"On that bench, one side has four drawers for different things we're always grabbing — drill bits, router bits, sanding disks, and so on. On the other side, there are open shelves, so we can store a router table underneath and just pull it out when we need it. We can keep a lot of portable tools tucked away, but still within easy reach." Vanderlip said.

He said the benches have worked fine for some 10 years, but now that he has refined things this far, he plans to make some changes. "Now I'm being a little more finicky. I want to change the benches that we use for action work. They'll be similar to what we have now, but slightly lower. If you want to take the action apart, there'll be space underneath for the keyframe and other things you want to store."

There's also a mobile parts cabinet with 30 small drawers. It's mounted on a piano dolly, and the tablesaw and bandsaw both have mobile bases as well. There's also a big green metal cabinet that houses all the combustibles. It's on wheels, too.

"We just built a huge hotbox, because we've put in two or three soundboards. We don't manufacture them ourselves, but we wanted to keep them at a constant humidity. The hotbox is on wheels, too."

In the back of the shop is Vanderlip's pride and joy, a plate hoist he built himself on a maple base. Each of the hangers has ball-bearing wheels on four points. The hoist slides on a 10' track. "It's rated to hold 2,000 pounds," he said. "It's overkill for pianos — I could lift the whole piano if I wanted to. I can get a D plate out, move it to the side and set it down by the piano."

We all know there's no such thing as a perfect shop, especially for the kind of people who work in shops. There's always something that can be improved or at least tinkered with. But Dave Vanderlip and Kathy Smith have created an efficient shop environment that's pleasant to use. That's a tough combination to beat.

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Today is an historic day. Today is the grand opening of our Auxiliary Scholarship Store. Our catalogue, to date, is the ad that you see on the facing page. Proceeds of the sale from this effort will go into our scholarship fund in order to support the Piano Technician Guild (PTG) and its members; to develop understanding, goodwill and support in the music world and to promote music education. This is our main goal and purpose as stated in our bylaws. (Our other purpose is to plan and provide the PTGA program for the annual PTG convention.) Since this activity is our main goal and purpose for having the Auxiliary, I ask that each and every one of you get behind this effort and promote the sale of articles in our Scholarship Store. There are nearly 4,000 Guild members at the present time. If just a percentage of those members did their holiday shopping through this store for gifts for their clients and associates, our scholarship fund would soar. We would be a tremendous success in reaching our goal and fulfilling our purpose. Our success depends on your involvement. There will be a special award for the state/chapter that sells the highest dollar volume between now and July 1, 1995. "Just Say YES." We will also be selling the merchandise we still have on hand from previous fund raising efforts, such as the greeting cards, piano pens and cookbooks.

By the time you read this, we will have completed our pre-convention planning conference. That meeting is scheduled to take place the second weekend of September, but since I'm writing this is in early August, I can't tell you what happened yet! Publications have an amazing way of putting a time warp on my message to you. My November issue will update you about our next annual convention plans for Albuquerque, New Mexico.

October is the beginning of fall and all the beautiful colors as the weather turns from hot to cold. It is also Halloween, a time to be with the children and grandchildren, have fun and don't eat too much of their candy. Enjoy and stay tuned!

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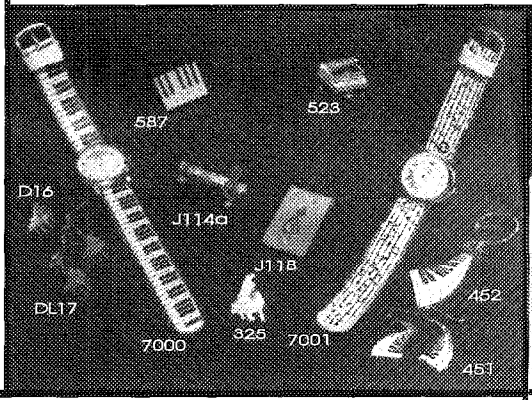

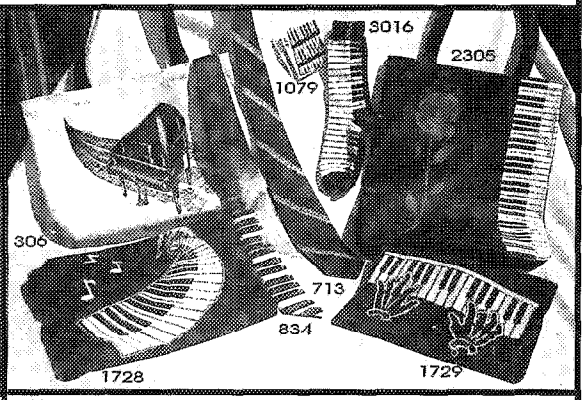

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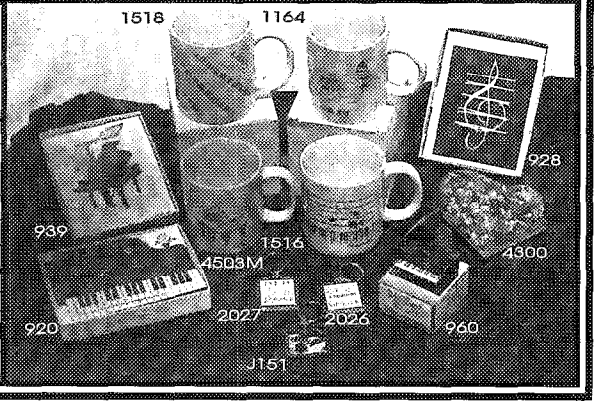

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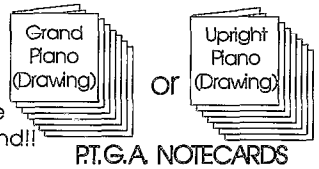

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VIDEOS

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PTG's First BUSINESS*Craft* Seminar

November 3, 1994
High Point, NC

(Preceding The North Carolina Regional Conference)

The craft of piano technology sets us apart from other professions. The combination of artistic skill and technological precision, developed over many years, makes our calling unique. As we develop our technical skills, however, there's another craft we must learn — that of operating our businesses efficiently.

PTG's BusinessCraft seminar is being developed to help you acquire these skills. Built on our new Business Resource Manual, this new day-long seminar will be offered for the first time November 3, right before the North Carolina State Conference in High Point.

- ***Evaluate your own business activities. Learn more about your own business — and what it should be!***
- ***Get new ideas to help you operate more efficienily — and decide whether they will work for you!***
- ***Learn how to build your business image, through effective use of PTG's Business Aids and the PTG Business Resource Manual. Bring your own business cards, stationery and promotional materials - we'll work together to tune them up.***

Instructors Will Include:

Fern Henry and Bill Spurloch; Larry Goldsmith, PTG's Executive Director; and Representatives from SCORE (the Small Business Administration's Service Corps of Retired Executives)

Here's How To Register:

PTG's BusinessCraft Seminar will be available as an optional one-day pre-conference addition to the North Carolina Regional Conference Registration. There will be an additional fee of $35 for the BusinessCraft Seminar. Note: this seminar is open only to PTG members. For conference registration information, contact Evelyn Smith, RPT, at (910) 230-1783.

WANT TO BUY PIANO TUNING BUSINESS in rural/semi-rural area, within 3 hours drive of NYC. Near excellent skiing and hiking preferred. L.I. RPT wishes to relocate. 516/928-8123.

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DISPLAY AD INDEX

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PianoDiscussions™

Fall '94 Software Issue

News From The World Of PianoDisc

Peter Nero records for PianoDisc

Famed Steinway jazz artist Peter Nero recently visited PianoDisc's recording facilities in Sacramento to perform a variety of his favorites for an upcoming PianoDisc Music Library release.

Peter Nero has built an impressive reputation as a composer, symphony conductor and arranger, in addition to his career as a virtuoso pianist. Record industry accolades include ten Grammy nominations and two Grammy awards, a million–selling gold "single" and album, *Summer of '42* and a citation from Cashbox Magazine as "The world's Number One instrumentalist". A whirlwind of unlimited energy, he conducts over 100 symphony performances a year, and is Pops Music Director and Conductor for orchestras in Florida, Oklahoma and his native Philadelphia. "Peter's musical virtuosity and drive make him the sort of artist well suited for the PianoDisc Music Library Artist Series", says Steve Merritt, Talent Booking.

The PianoDiskette, which will feature such favorites as "Stormy Weather" and "When I Fall In Love", as well as a spectacular medley from "Phantom of the Opera", is scheduled for release in October.

New Music Releases

Here are several recent releases from the PianoDisc Music Library

Artist Series

PD 1003 Floyd Cramer (Country)
PD 3016 Andreas Klein (Classical)
PD 3017 Laura Spitzer (Classical)
PD 6004 Jessica Williams (Jazz)

Musical Memories

PD 2204 Gershwin Collection

Candlelight & Wine

PD 2407 Unforgettable
PD 12402 I'll Be Seeing You

Classical

PD 3017 The Great Composers: W.A. Mozart

Jazz

PD 16004 Trio Paradiso—Live!
PD 16005 Fascinating Rhythm (Gershwin)

Christmas

PD 9006 Contemporary Christmas Classics

Extended Play

PD 9207 Holiday Harmonies (Christmas)

Coming Soon

PD 5009 Artist Series: Butch Thompson
PD 6005 Artist Series: Peter Nero
PD 5010 Jelly Roll Morton & Fats Waller

PianoDisc

4111 North Freeway Blvd.• Sacramento, CA 95834
Phone: (916) 567-9999 • Fax: (916) 567-1941

New PianoDisc music diskettes available this fall

A live jazz trio, a Steinway Artist recital and two different Gershwin releases top the list of PianoDisc Music Library additions for Fall, 1994. Also on tap are Artist Series performances by Nashville giant Floyd Cramer and "A Prairie Home Companion" stride artist Butch Thompson (see right).

The Steinway Artist Series continues to grow with the addition of West Coast favorite Laura Spitzer's PianoDisc Grand Opening Recital diskette. Ms. Spitzer's fiery performances of the Chopin "Heroic" Polonaise and of Mily Balakirev's daunting "Islamey" were highlights of PianoDisc's Grand Opening festivities last fall, and this release offers a glimpse into the excitement of that day. The diskette includes works by Mozart, Chopin, Joplin and Gershwin performed during the Grand Opening recital.

Gershwin is also the focus of two other new releases, one for piano solo and the other with Symphony accompaniment. These diskettes feature some of Gershwin's finest musical compositions, performed by some of PianoDisc's finest artists.

One trio of artists, Trio Paradiso, have made a unique contribution to the PianoDisc Music Library with their new release, "Trio Paradiso—Live!". Music for this release was all performed live in the PianoDisc Recording Studios using MIDI instruments–a piano equipped with PianoDisc's TFT strip, a set of MIDI drums and a MIDI bass. The result is a live performance that rivals any ever recorded for player piano. So watch for it!

Butch Thompson performs early jazz for PianoDisc

Remember "A Prairie Home Companion"? It was that delightful homespun radio show that aired live every weekend from the World Theater in St. Paul, Minnesota. Audiences were delighted every week with Garrison Keillor's "News from Lake Wobegon" narratives, and thrilled to the early jazz stylings of the Butch Thompson Trio. The show was a marvel of understatement and elegance.

Well, "A Prairie Home Companion" is gone now (except for reruns and occasional reunion shows), but Butch Thompson is still going strong. With performance commitments across the country and around the world, Mr. Thompson's music has been heard by millions around the globe. "PianoDisc is grateful for the opportunity to capture his performance", says Steve Merritt, Talent Booking. "Butch is world famous for his Jelly Roll Morton interpretations and for his dazzling stride technique. These recordings will be unique and historic".

Mr. Thompson's performances are tentatively scheduled for release in October.

Floyd Cramer joins PianoDisc Artist Series

Famed country artist Floyd Cramer recently completed two days of recordings for the PianoDisc Music Library. Mr. Cramer recorded one full hour of solo piano which will be released soon in the PianoDisc Music Library Artist Series, both as a 3.5" diskette (compatible with all PianoDisc control boxes) and in PianoDisc's new PianoCD™ format. Also, Mr. Cramer recorded several songs which he performed with a 18 piece orchestra and 8 voice backup chorus, and these perfomances will be released in the PianoCD™ format, as well as on two spectacular PianoVideo™ tapes.

All of Mr. Cramer's PianoDisc performances will be available in the fall.

Tech Gazette

Yamaha Service October, 1994

Looking Forward

In our last month's issue of *Tech Gazette* (and in case you were among the fortunate visionaries who, while attending the convention in Kansas City this past July, happened to pick up a copy of our convention issue of *Tech Gazette*), we took a peek into our "corporate kitchen" to see what's cookin' there.

We hinted at some fairly significant and far-reaching steps that are being taken down the road of customer service and support.

To be sure, there are some exciting developments taking form and substance. But before we say too much about what's happening on the inside, let's take a look at the world of music on the outside, and see how things are evolving.

Here's the picture: You are walking into a home, tool kit in hand, all set to service the piano that's always been over there in that corner of the den. But the setup looks somehow different than it did when you were there before. Beside the piano, where once sat a cute little magazine table, is one of those satin-black brushed aluminum framework structures. Perched on it is some kind of electronic keyboard, a variety of other little black boxes with knobs & dials, and a computer. And behind it all, there's what looks like about a hundred miles of black spaghetti connecting everything together, with a couple of strands of it strung over to the piano.

While you're in the midst of trying to assimilate all this, your customer saunters in, sporting a poorly concealed grin. "Oh, I forgot to tell you about this," you hear through foggy ears. "It's my new MIDI studio. My brother in Duluth got me started, and it's been great fun. We hardly talk to each other nowadays, but we send music back and forth through our modems all the time. And next month, we're gonna try our hands at doing a little movie score. Oh, you can go ahead and tune the piano, it won't bite. Just let me unplug it first, okay?"

Well, there you have it. Pianos and electronics, once considered almost rivals for the musical attentions of their audiences, are now courting each other. And, wonder of wonders, it looks like this marriage is gonna last.

Doesn't it make sense, then, that the service networks for our unlikely couple should join hands, as well? As long as these newlyweds are going to be spending so much time together, couldn't we all benefit by sharing the service technologies available to both of them? And when you stop and think about it, YAMAHA is the company to launch such an ambitious plan. Watch for details in future issues.

YAMAHA