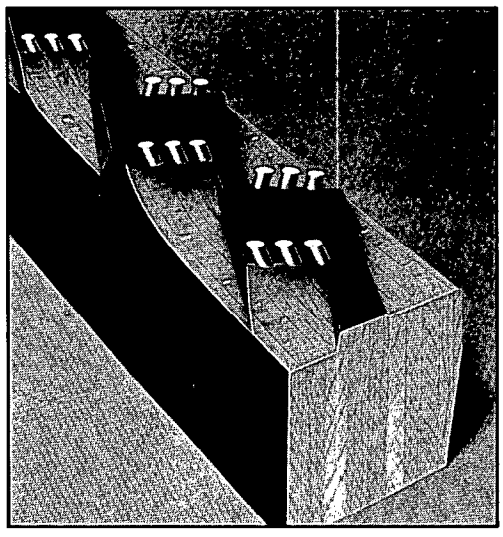
PIANO TECHNICIANS
Journal
JUNE 1989

The Baldwin Piano...
You can see why it sounds better

The bridge is a critical component of the tone-producing system. It must precisely terminate the speaking length of the strings, and it must transmit vibration efficiently to the soundboard. In addition, it must be extremely strong to withstand the force of sidebearing and to resist splitting.

Traditionally, bridges have been capped so that they can be notched easily and the height altered for downbearing by planing. Our patented AcuJust™ plate suspension and hitch pin design gives us complete accuracy in setting downbearing, so we no longer need to plane our bridges down after installation. And we now notch all bridges by machine to gain increased precision and consistency.

In addition, our research showed that eliminating the capping, in combination with the above changes, gave us a definite improvement in tone. We gained maximum tone quality, greater efficiency in transmission of vibration, and improved reliability. At the same time we eliminated problems previously associated with capping: (1) occasional loose capping, (2) checking and splitting of the cap, (3) grain direction which was not always parallel to the line of the bridge, and (4) the potential tone barrier of a horizontal glue joint in the bridge.



THE BALDWIN GRAND BRIDGE: Thin vertical laminations are bent for continuity of grain from one end of the bridge to the other without horizontal glue joints. Baldwin researchers have found this design contributes significantly to outstanding tone quality.

Third in a series of informative ads on piano tone published by Baldwin Piano & Organ Company exclusively for the benefit of piano technicians.

Baldwin® – *Leading the way through research*

SCHAFF YOUR SUPPLY HOUSE FOR

DAMPP-CHASER® *PIANO LIFE SAVER*®

HUMIDITY CONTROL SYSTEMS FOR ALL PIANOS

ENDS "DRY" PROBLEMS	ENDS "DAMP" PROBLEMS	STABILIZES TUNINGS
LOOSE TUNING PINS	STICKING KEYS	TUNING WILL NOT HOLD
LOOSE ACTION	SLUGGISH ACTION	OR STAY ON PITCH
CRACKED SOUNDBOARDS	RUST	WITHOUT FREQUENT TUNINGS

VERTICAL PIANOS

5PS- COMPLETE 5-PART SYSTEM FOR VERTICAL PIANOS

KIT INCLUDES:

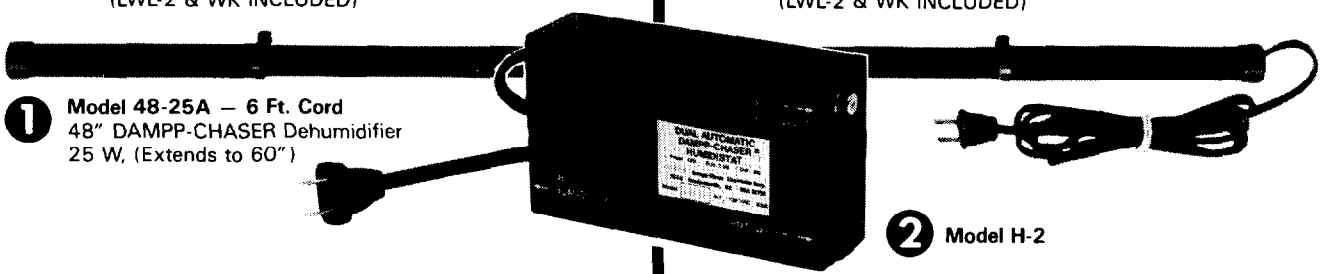
1. 48-25A DAMPP-CHASER DEHUMIDIFIER ROD
2. H-2 DUAL AUTOMATIC HUMIDISTAT
3. HM-2 3-PART HUMIDIFIER KIT (LWL-2 & WK INCLUDED)

GRAND PIANO

G5PS- COMPLETE 5-PART SYSTEM FOR GRAND PIANOS

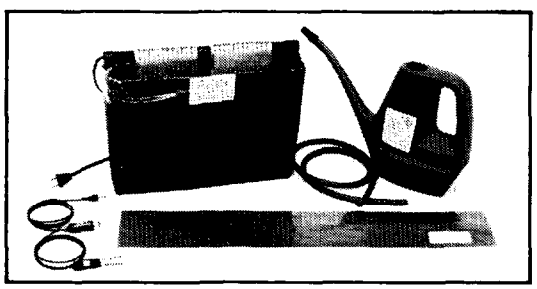
KIT INCLUDES:

1. 48-25A DAMPP-CHASER DEHUMIDIFIER ROD
2. H-2 DUAL AUTOMATIC HUMIDISTAT
3. GHM-1 3-PART HUMIDIFIER KIT (LWL-2 & WK INCLUDED)

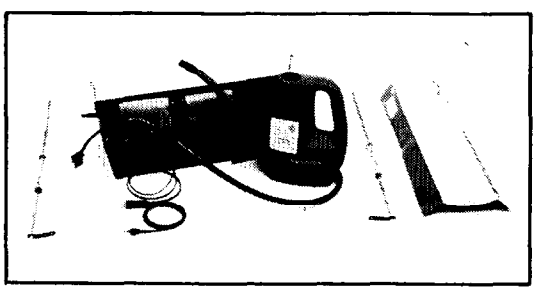


1 Model 48-25A — 6 Ft. Cord
48" DAMPP-CHASER Dehumidifier
25 W, (Extends to 60")

2 Model H-2



3 Model HM-2



Model GHM-1 **3**

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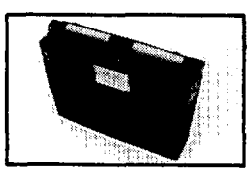
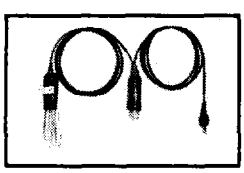
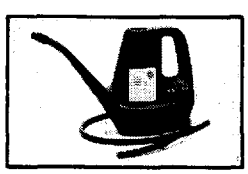


Model HM-1ST
Vertical Humidifier Bucket



Model LWL-2
Vertical & Grand Low Warning Light



Model WK
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PIANO TECHNICIANS
Journal

JUNE 1989 — VOLUME 32, NUMBER 6

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President's Message

Convention: Opportunities Await

The 32nd annual PTG convention is approaching July 10-14 in Portland, Oregon. Now is the time to register for this event if you have not already done so. You will find 3 1/2 days of instruction by the top experts in the world. Beyond the classes themselves, just getting nearly 1,000 technicians together provides constant opportunities to talk over specific ideas or problems with others. Nearly as much learning takes place in the halls outside the classes as within them.

Ronald L. Berry, RTT
President

You will also find large scale exhibits from most piano manufacturers, parts suppliers, and a host of other businesses that provide piano-related products. We have always had remarkable support from our manufacturers.

On Tuesday night the Portland Chapter is putting together a carnival at a carousel museum that is right across the street from the hotel. This promises to be a highlight of the convention, giving everyone a chance to relax with some nostalgic fun.

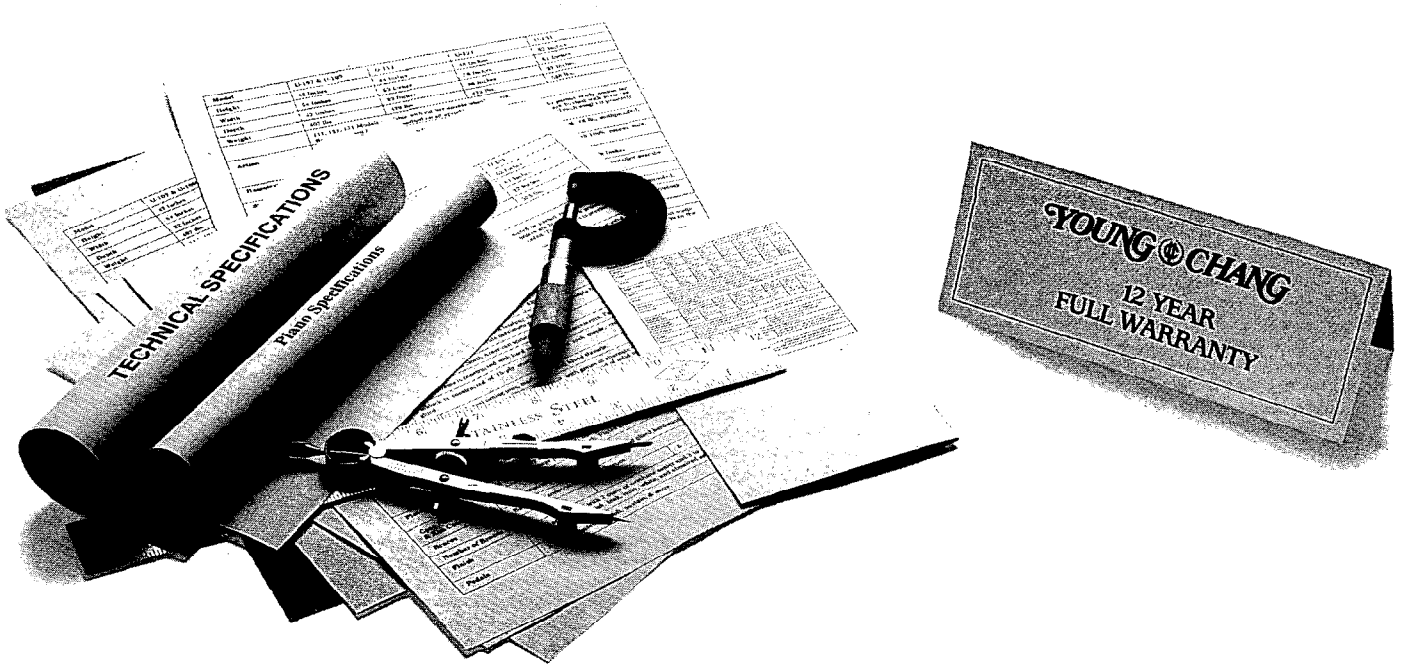
I know that it is sometimes hard to come up with the money for a trip to a convention. You need to think of it as an investment rather than just an expense. Yes, it is a lot of money to spend, but you have the potential of learning things that will make you more efficient at what to do. That efficiency will pay for itself many times over. You may find new products to sell or whole new areas of piano service to get into. Or you may find people to subcontract some jobs that you cannot do efficiently, leaving yourself free to do what you can do best.

Beyond the learning are the friendships that are made at the convention. There are many PTG people that are more important to me than some of my family members. We have found that we can depend on these people when we need support either for happy or not-so-happy events.

By now you have received the convention brochure with the specific list of classes and you can see the wide choice of technical subjects covered. You won't find this great a choice of technical teaching anywhere else. Since instructors donate their time to the organization, we can provide it all at such reasonable prices.

Besides all the other reasons to come, Portland is a beautiful city with spectacular mountains off in the distance. Portland, in all likelihood, will be the only reasonably cool place in July in North America. Come to this beautiful city, see your friends, and learn a lot. See you there.

While most manufacturers offer proof of performance in feet and inches, we offer our proof in years.



A great piano has to do a lot more than look great on paper.

That's why Young Chang pianos are designed to offer remarkable tone, quick response, reliable intonation and consistent performance.

Whether enduring the rigors of a full teaching schedule or the demanding hours of serious practice, Young Chang studio pianos are crafted to provide extraordinary performance week in, week out, year after year.

And our promise is a 12 year *full* warranty. So if a customer should have a problem with a Young Chang piano, we'll fix it or replace it at no cost to them.

Many manufacturers consider such a promise bold, even risky. But we consider every Young Chang piano a testament of our dedication to uncompromised integrity, as well as acknowledgement of your own.

For technical information on Young Chang grand and vertical pianos, write to me, Alan Vincent, Director of Technical Services at Young Chang America, 13336 Alondra Blvd., Cerritos, CA 90701. Or call (213) 926-3200.

Because when it comes to great performance, time is of the essence.

YOUNG CHANG

The best the world has to offer.™

From The Home Office

Investing In Your Future

Over the years, conventions have developed a bad reputation: herds of drunks in funny hats, demolished hotels, smoke-filled rooms, scantily dressed dancers popping out of cakes, small cliques who run the things while those on the outside hold up the walls, and so on. It's true that those things still go on in some groups — ask any hotel sales manager — but PTG conventions are not your normal get-together.

At our convention, even the folks in the funny hats are talking pianos.

Larry Goldsmith
Executive Director

Last month I told you about the number of people involved in planning this 1989 convention in Portland, OR, and how much time is spent in putting together a program of real value. That should tell you that this is a serious event, an investment in professional development.

Look at the list of classes printed in this issue. There's not much fluff there. Our records indicate that most people who go to the convention are in class each period. The challenge for the Institute Director is planning the schedule so there's something for everyone in each class period. From all reports, they do a great job.

The list of reasons why you should attend this convention goes on and on — learning new skills, making contacts, recharging your batteries, and so on. You say, "Yes, but it costs money to fly to Portland and stay in a hotel. Even fast-food restaurants add up. And I'll be spending money instead of working that week. I can't afford to go."

Let's do it this way: Ask yourself, "What one thing will make me a better technician? What do my customers need that I can't provide right now?" Or the bottom-line question, "What do I need to make more money as a piano professional?"

Then take a look at the class schedule. If your problem is technical in nature, you can probably find the answer there. If not, all you have to do is ask. We can set you up in a private tutoring session on any topic you choose with a recognized expert in that specialty. If it's a business-related problem, there are plenty of people who would love to compare notes with you — everyone, even the instructors, is there to learn, too. Thinking of computerizing your business? The registration list includes people who use just about every type of small-computer system in their businesses.

So what about the money? If your new-found knowledge helps you do an extra job every now and then for the next year or so, you should recoup your expenses. That makes it a pretty good investment. After that, it's pure profit.

There's only one catch. You have to be willing to work for it, because it's not the sort of knowledge that can be handed to you in a neat package. You have to be willing to introduce yourself, ask questions, and pose problems. You'll talk to a lot of people, but then everyone can use more friends. At our convention, even the folks in the funny hats are talking pianos.

I think a key indicator is the number of people who come back year after year. One technician who has been in the business for easily 30 years told me that he attends every year, concentrating only on tuning classes, and he always learns something new. He'll be back this year.

One more thing. If you think of something we're not offering, please drop me a note. We might not be able to do anything about it this year, but it might be helpful in planning next year's convention.

And for those who thought the scenario in the first paragraph sounded pretty good, well, you're on your own there. You probably don't need my help anyway.

A Classic Descendant

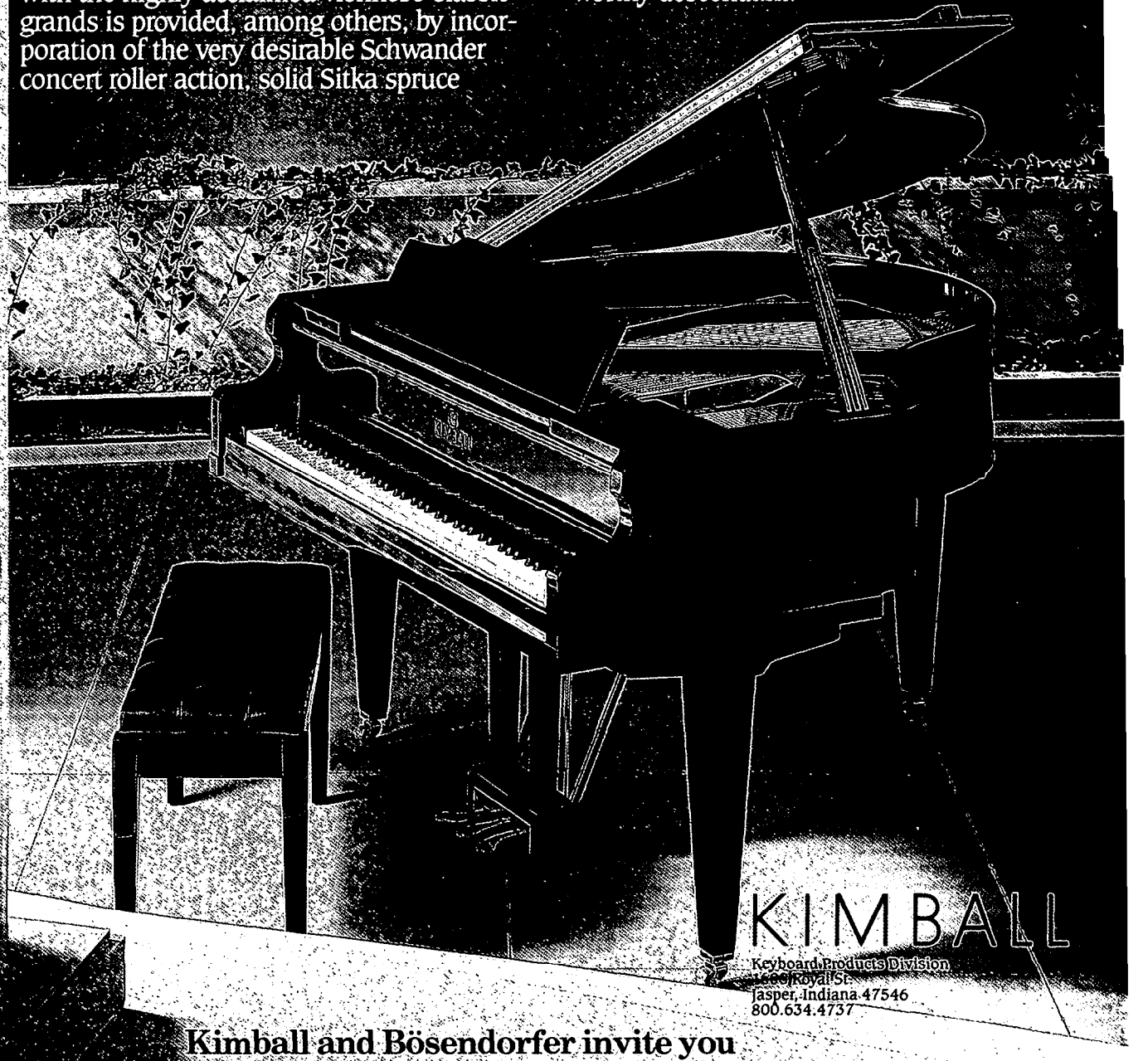
The natural evolvement of a great piano tradition.

The new 5'2" Viennese Classic grand is a prodigy evolving from an elite line of classic instruments; the beneficiary of a heritage that includes the stately 9' Viennese Classic concert grand as well as the incomparable 6'7" and 5'8" grands as its proud pedigree.

Evidence that the new 5'2" grand continues those quality attributes associated with the highly acclaimed Viennese Classic grands is provided, among others, by incorporation of the very desirable Schwander concert roller action, solid Sitka spruce soundboard and heavier professional quality hammers. These beautiful new pianos are offered in five popular wood finishes.

The new Kimball 5'2" grand now takes its rightful place at the side of its forebearers representing the finest in piano architecture, state-of-the-art engineering and production craftsmanship.

The 5'2" Viennese Classic grand . . . a worthy descendant.



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Follow The Oregon Trail...

Getting The Most From Institute Classes

Ben McKlveen
1989 Technical
Institute Director

For the past several months I have been writing about the classes and activities that we will be presenting at the convention in Portland, July 10-14, 1989. The Institute will be offering a veritable cornucopia of educational opportunities. Highlights include: expanded tutoring, the introduction of a new vertical action and classes about it, classes on tuning, repair and regulation of grands and verticals, tuning and servicing historical instruments, self-improvement classes, business classes, new products, a new rebuilders forum, a stunning group of mini-technicals, classes on how to give the PTG exams, how to prepare for and take the exams, all of this taught by top-notch instructors.

Having said all of the above in past articles with as much persuasive rhetoric as I can muster, this month I would like to offer some suggestions to make the convention more productive for you.

Have you ever said to yourself, "I didn't get a thing out of that last seminar. It was a waste of time!?"

Wouldn't it be more satisfying to say, "I thought that the last convention was great! I picked up two or three great ideas that I put right into effect and I'm doing some serious thinking about several other ideas that were triggered by the classes."

What made the difference? Preparation. Some of the steps outlined below will prepare you for the upcoming national Institute and help make it more meaningful.

Plan and Prepare. Study the list of classes carefully. Establish priorities. When you arrive in Portland and receive the class schedule booklet, take time to establish your class order. There is so much offered and so much going on that it is easy to wander around with no real plan. It is risky to operate in this fashion. Some classes fill up quickly, so you need to know which classes that you want and then be on time so that you are assured a seat. This is one way to benefit from your expenditure of time and money in coming to the Institute.

Open Your Mind. Technicians go to seminars to learn. They invest time and money for the purpose of acquiring knowledge to help in their work. To get the most out of what the instructors say, keep your mind open to new suggestions. They may differ from what you believe is best, but until you hear it all and think it through objectively, you don't really know. Progress comes through change. This does not mean that all new ideas are good, practical or useable in every situation, but they should be listened to, evaluated and carefully and objectively considered.

Take Notes. Note-taking has two important functions. It helps organize what you hear while you are there, making listening more systematic. It also becomes a permanent record of the classes for your future reference.

Often during the presentation a question comes to mind, but it is not the right time to ask it. So you will not forget the question, use the last page of your notebook to jot it down, saving it for the appropriate time. On another page of your notebook, write down good ideas you pick up from the instructor or from the people entering into the discussion that might apply to your servicing problems.

Of course, many of you buy the tapes of the classes that are made available for your use. But, be sure to have reliable note-taking facilities for all those little details that may not be recorded, or need illustration. Organize!

Ask Questions. Don't hesitate to question the speaker when the opportunity arises. On the other hand, don't waste other people's time with trivial questions. Make questions clear and brief. The question that isn't asked, isn't answered.

Contribute Ideas. When the opportunity presents itself, some people will always contribute more than others while some just sit and listen. When asked why they do not participate more fully, they say, "Why should I give my ideas to these people? Some of them are my competitors and I won't give away my trade secrets."

Nobody expects you to say anything in public that will damage your competitive position or your reputation. However, most discussions are not of this nature. They apply to most technicians and the experience of one helps the others. By contributing ideas, you provide richer experiences for the others, which, in turn, results in a more fulfilling experience for yourself.

Don't Sit With Your Friends. Sit in a space where you know very few other people. It will be from these other technicians (strangers to you at first but in a short time helpful acquaintances) that you will pick up several ideas to adopt. Attendees often can learn as much from other participants as from the instructors.

Summarize. After the institute, review your notes while they are still fresh in your mind. Write down the names and addresses of instructors, contributors and other people you met at the Institute who may be sources of information in the future. You would be surprised at how much information flows back and forth over this country

Continued on next page

Institute...

through the private channels of friendship. Every good technician that I know has a coterie of friends and colleagues with whom he or she shares information during the rest of the year. Start to develop yours by recording names, addresses and phone numbers.

Apply What You Have Learned. If nothing is done with the information that you have learned at the convention, you have wasted your time and money. Put your new-found ideas into practice.

This is my last opportunity to speak to you before the convention. As the Institute Director, I am amazed as I watch an institute come together, first, on paper, then in reality at the host hotel. It is to me always a miracle of planning and co-operation on the part of so many people—men and women—who travel to Portland to give their classes or make their contributions so that the general rank-and-file member can benefit and so that our craft can improve the way that it contributes to music in this country and around the world. Thank you for coming to Portland! While you are there, stop at the Institute office and say "hello" to me and my staff. We are grateful for every one of you!

1989 Technical Institute Classes

Tuning

AURAL FINE TUNING FOR ELECTRONIC TUNERS - Al Sanderson

Electronic tuners need to know some aural tuning techniques, not only for quality-control purposes but also to be able to achieve true concert-quality tunings. Stretch tunings and generic tunings may only be good to within one or two cents. Aural tunings can be much better. Learn how to close this quality gap with aural checks and tests that work best on "nearly tuned" pianos. Aural tuners are also welcome.

BASIC PIANO TUNING - George Defebaugh

This class will include all basics, such as muting for most efficient tuning, setting the "A" with the fork, beat counting, unison tuning, hammer technique for solid tuning, temperament setting, etc. Nothing will be left to your imagination by this master teacher.

Keyboards And Actions

IMPROVED VERTICAL PIANO ACTION - Darrell Fandrich & Chris Trivelas

Learn the difference between standard grand and vertical piano actions. These two talented inventor-technicians will discuss these differences and then lead you through a discussion of the development of their new improved vertical action. You will have the opportunity to see and play this action in a demonstration piano.

CONCERT PREPARATION: MULTIPLE CHALLENGES - Stephen W. Davis

So much to do, so little time! No area of a technician's work presents a greater variety or intensity of challenges than the concert stage. Whether preparing for a local unknown or an international artist, success rests on some very definite skills and priorities as well as the art of diplomacy. This artist-technician will discuss shortcuts and specifics to enable you to do the most in the least amount of time.

RENNER & BOSENDORFER - HAMMERS & FINE PIANOS - Rudolph Genger (Renner) Dennis Burger & Ray Reuter (Bosendorfer)

Mr. Genger of Renner will illustrate and discuss the manufacture of Renner hammers. In the second half of the program, Dennis and Ray will show how these hammers are adapted and voiced in the Bosendorfer piano.

GRAND REGULATION - Kimball Factory Team (Jon Light, Dale Lassiter, Roger Weisensteiner)

This excellent and informative class has been given some new luster this year with CAD (Computer-Aided Design) illustrations and brand new Grand Regulation Manuals. Action models and tools will be provided by Kimball for this hands-on class. It will consist of analyzing the specific regulation requirements for the various actions used by Kimball and Bosendorfer. A high-speed film will reinforce and clarify the action functions discussed. Detailed slides, in addition to hands-on adjustment, cover each phase of grand regulation.

FROM THE BOTTOM UP - Norman H. Neblett

A detailed slide lecture-presentation of representative upright and grand trap-lyre systems and how they perform. Repairs, reconstruction and problem-solving will be covered. The class has been revised to include modern imported systems, plastics, rubber and parts manufacturing. Shop tips by this master teacher will be presented to encourage technicians to get involved in this challenging, necessary and profitable work. Of course, you can depend on hearing a good supply of Norman's old and new stories!

GRAND DAMPERS - John Zeiner

A class about grand dampers which will take you through all phases of this work, from the damper tray to damper levers and top flanges, wires, heads, guiderails, felt selection and orientation, adjustment, replacement and troubleshooting, done with thoroughness and authenticity by an established expert.

KEY REBUSHING - Fern Henry & Bill Spurlock

This class will show you how to rebush a set of keys completely, with top-quality results, in the time it takes to do an average tuning. They will cover all aspects of the job including removal of old bushings, cloth selection, and the use of tools and cauls. Key mortise repairs, keypin polishing tools and keypin replacement, making your own hot hide glue pot, bushing with leather, and more are examined by this talented team.

TROUPLESHOOTING VERTICAL PIANO NOISES - Carl Root

Carl will discuss causes and remedies for at least 30 different kinds of clicks, buzzes, knocks, squeaks and groans and demonstrate these in a "prepared" garden-variety console piano. Mastery of this subject will enhance your reputation and keep the referrals coming.

TONE AND FRICTION: FACTS AND FICTION - Rick Baldassin

There are many factors that determine the tone quality of a piano. In this presentation, Rick will demonstrate the important influence of friction. Too much or too little friction in the action of the piano may have a great bearing on the ultimate musical quality. This is another class that is an absolute must for those who pride themselves in doing "more than just tuning."

PIANO DIAGNOSTICS - Ray Chandler (Kawai)

This class will help you recognize and identify frequently overlooked piano disorders (without the use of divining rods). Learn how to approach and resolve idiomatic piano snafus in an analytical way.

VERTICAL PIANO REGULATION - Doug Neal (Western Iowa Tech)

This class could be subtitled "Educate the Client - Sell the Job — Perform the Service," and will focus, in a holistic way, on the service needs of vertical pianos. This class will address our responsibility to our clients to help them protect their piano investment through the proper maintenance of their pianos. The class will also deal with how to bring a vertical piano back into good regulation after the regulation has been allowed to

deteriorate through the client's normal day-to-day playing.

GRAND REGULATING, STEINWAY STYLE - Franz & Michael Mohr (Steinway)

At long last, we will have Franz Mohr, of the Concert and Artists Department of Steinway & Sons, at our national convention, and as a bonus, he is bringing his son, Michael! This talented duo will talk about the preparation of a Steinway for concert performance, and in the process, cover all the fine points of high-quality grand regulation and any other questions that you may want to ask about Steinways or piano care.

PIANO TOUCHWEIGHT AND LEVER MECHANICS - Alan Vincent (Young Chang)

This class deals with touchweight problems, techniques and service, from the basics to the advanced. Starting with definitions and measurements, and progressing through the action mechanics which affect touchweight, items such as friction, weight (and weights), inertia and leverage are discussed. The effect of action spread, capstan location and hammer line on touchweight are also explored, along with voicing, practical examples of touchweight problems and factory procedures for key weighting. The class is important for any technician wishing to perform high-level grand action service and reconditioning.

REGULATING THE VERTICAL PIANO - Richard Elrod (Wurlitzer)

This is a very informative hands-on class. Action models with keys are used. In addition to complete regulation of the action, broken parts, squeaky springs, noisy damper rods and many other problems will be discussed. If generic regulation skills are your need, this class is for you!

Rebuilding And Repairs

THE END OF AGRAFFE AGGRAVATION - Isaac Sadigursky

If you missed this class last year, here's another chance to see it — don't miss it again! This fast, informative presentation, expanded this year to three hours, will help to eliminate some of the mistakes and "mystique" on the subject. Isaac will cover invention, development and different types of agraffes, as well as the removal of broken agraffes. Tools and techniques as well as "booby traps" will be discussed and shown. War and horror stories about agraffes will be included, and a hands-on session for a few brave people - "brain surgery on a dummy plate," as Isaac puts it. (Take him to dinner and he will tell you wonderful stories about being a piano tuner in the Soviet Union.)

ALL ABOUT HAMMERS - Wally Brooks

Included in the contents of this class by a seasoned expert will be an overview of piano hammer construction, hammer selection, preparation, boring, hanging techniques, preliminary voicing, plus all manner of tips and suggestions for successful hammer replacement.

THE HOSPITAL FOR HOPELESS PIANOS - Gary Neie

Every piano technician comes in contact with an example or two of "the tired old uprights of this world" sometime or another in the course of a career. This class deals with the many problems that these pianos present, such as loose tuning pins, unglued jacks, unglued ribs, separated pinblocks, corroded keypins, broken strings, and many other repairs, presented by an expert in this field.

SPINET REPAIRS: THE INS AND OUTS - Jim Hess

Repeating his excellent class from last year, Jim offers a practical approach to common repairs encountered in servicing spinet pianos. Included will be action removal and replacement, elbow replacement, and other common problems, along with the appropriate repairs.

HOW THE SOUNDBOARD REALLY WORKS - Del Fandrich

Del brings us a class that is both informative and surprising. He will show and discuss how soundboards are bellied and installed in the factory, and go on to explain and demonstrate how soundboards work, how the sound is produced, and how design factors influence piano sound. Wood, grain orientation, why a soundboard should be replaced and when, crown, bridges, etc., all are factors that will be explored.

QUESTIONS OF SOUNDBOARD DESIGN - Steffen Seiler (Seiler Pianos)

Ever since strung keyboard instruments have been used to make music, the makers of these instruments have been confronted with questions of decisive importance on how to create a more effective or improved soundboard or amplifier for these vibrating strings. Until the present, there has been no complete success in the research of the perfect soundboard and its function. Therefore, there is hardly any useful literature available concerning this subject. Mr. Seiler hopes to be able to add to your understanding of how these parts should amplify the actually weak sound of the string in such a fashion as you should be able to expect in a quality piano.

COPING WITH PINBLOCK DRILLING - Webb Phillips

Pinblocks can be nightmares if, after being installed, they don't produce the desired results. This new class by an acknowledged expert will teach you how to do it right. Webb will show some new procedures and some new tools that produce excellent results. The class will include information and specifications for working with most of the pinblock materials available today.

SUPPORT YOUR LOCAL GRAND PIANO - Susan Graham

Susan, who is the *Journal's* Technical Editor, repeats her excellent class from last year on repairing, refastening and solidifying grand legs and lyres. Techniques useful to the technician who is often alone in the field will be emphasized, as well as methods for improving existing systems.

MASTERING THE ART OF STRINGING - Joel & Priscilla Rappaport

This new class by this talented team will show you how to achieve professional results within a reasonable time frame. Methods and procedures as practiced by factory stringers are discussed. Topics include drilling the block, coil and tuning pin uniformity and time-saving routines.

GRAND PIANO REMANUFACTURING - Willis & Dave Snyder

Willis and Dave will discuss and demonstrate techniques of piano remanufacturing. Included are soundboards, bridges and case work. A "teardown" model of a grand piano, a soundboard press, a bridge press and a rib press will be used to support and illustrate the lecture.

REBUILDERS FORUM - Ken Kadwell, Moderator

This year the Institute will feature a rebuilders forum. This will be a high-level meeting for technicians actively involved in the complete rebuilding of all kinds of pianos. It will include discussion and the exchange of ideas on such subjects as advertising, bookkeeping, economic factors, estimates, labor problems, processes, taxes, and rebuilding techniques, as well as quality and sources of materials. Please note that this forum is not an educational forum for students and apprentices. Student attendance is welcome but confined to the observing and listening mode. If you are a rebuilder who plans to attend this forum, please drop a note or call Ken Kadwell, 591 Leonard Rd., Onalaska, WA 98570 - (206) 978-4913. Ken would be happy to know about any contributions you wish to make.

Allied Arts

THE NEGLECTED PIANO TOOL - YOUR BODY - Fred Bath

This class could also be called. "The Misunderstood Piano Tool." It is surprising how many technicians work at their craft with pain or discomfort. In this class, the participants will have a chance to learn about and experience what it is like to do piano service procedures with greater ease and comfort through the employment of the Alexander Technique. The Alexander Technique is named after F.M. Alexander, an Australian actor who discovered that by changing the way he used his whole body, he could eliminate what he thought was an isolated vocal problem. It is taught by a combination of verbal and hands-on instruction in which people can learn to identity the difference between enhancing or interfering with their natural ease of motion. Bring your own piano tools if you plan to participate.

HUMIDITY STABILIZATION & THE COMPLETE TECHNICIAN — WHAT'S NEW? - Steve Smith

You can't do the whole job of maintaining pianos unless you can control the humidity, or the lack of it. This is the theme of this class taught by the master himself, Steve Smith, owner and CEO of Dampp-Chaser. In addition to demonstrating and explaining the various systems of humidity control. Steve and Randy Potter will show you the latest innovations in their products.

IVORY: THE GOOD, BAD AND UGLY - Gary Green (Steinway)

This presentation will include the history of the trade, including the development of the companies that utilized ivory. Problems of the hunters in Africa and the trading center in Zanzibar will be covered. Various samples of ivory products will be shown, as well as a description of the way in which the tusk was cut to produce key fronts and tails.

PIANOS: A MOVING EXPERIENCE - Jim Geiger

Jim and our convention moving team will tell about moving pianos and show you what to wear, what equipment to use, exercise, balance and leverage, tight corners, stairways, whether to use a truck or trailer, preparing the piano, and tying it down—all this and more—and there will be a question-and-answer period.

NICKEL AND DIME QUALITY TOOLS - Jim Harvey

The title can be misleading. What it really means is that Jim will show you how to make good-quality, useful tools out of nickel-and-dime stuff like boards, bolts string, wire, cans, scrap metal and other readily available items. The class is a repeat from last year by popular demand. The classes last year were jammed.

SERVING OUR "GRANDE" CUSTOMERS - Yamaha Team

The very nature of our business demands it, but only a very few of us are trained to deal with it. It is the human relations side of any service organization. This class looks at some of the general principles of customer service and shows how you can apply them to your business.

DISKLAVIER AND MIDI GRAND: AN OVERVIEW - Bill Brandom (Yamaha)

Yamaha has recently introduced two exciting new pianos, the Disklavier and the MIDI Grand. Twenty-first-century electronic and fiber-optic technology has been incorporated into these acoustic pianos, giving them musical potential never before possible. But because they are both acoustic pianos, they require the same service that other pianos need. This class, in addition to showing how to perform standard piano maintenance on the unique instruments, will give you a taste of their performance capabilities.

ANTIQUE PIANOS - THE PROPER APPROACH - Joe Garrett

This class will be taught by an enthusiastic and skilled restorer of "antique" pianos, with the hope that some of this enthusiasm will rub off on the students. Techniques of repair and tuning are to be the main topics of discussion. Those who have the artistic wish to take on this very specialized facet of the piano industry are urged to attend.

TUNING THE HISTORICAL TEMPERAMENTS BY EAR - Owen Jorgensen

A knowledge of history is essential to our understanding of the present. We, as technicians, need to know where our craft came from and how we got to where we are today. Owen Jorgensen, author of the definitive book on historical temperaments and a leading American authority on the subject, will open a whole new world of tuning for you. In recent. years, colleges and universities have shown a renewed interest in the authentic performance of older music and much of this music is being recorded on authentic old instruments and played with historical tunings. Learn how these temperaments developed and how to tune them from a master of the art.

Special Classes

ADMINISTERING THE NEW PTG TECHNICAL EXAM - Bill Spurlock

All aspects of technical testing will be covered, including helping examinees prepare, gauging their readiness, acquiring the exam props, running the exam, and handling the paperwork.

PREPARING FOR THE PTG TECHNICAL EXAM - Bill Spurlock

This class is designed to help technicians prepare for the PTG technical exam, but it contains much valuable information for everyone. Bill will cover the choice of the correct measurements for use when regulating, the most efficient order of regulating steps to follow, and proper tool use and technique. Efficient methods and tools for doing string repairs, hammershank replacement, hammerfiling, bushing and pinning will be shown.

ADMINISTERING THE PTG TUNING EXAM - Dr. Al Sanderson

This class is for CTEs and CTE trainees. Included in the material presented will be recent revisions of the exam of which the examiners should be aware. A general overview by Dr. Sanderson will will help the class have a better understanding of the original intent of the exam. This class will also permit experienced CTEs to dust off their exam manuals, if they haven't given any exams lately, and regain confidence in exam procedures.

PREPARING FOR THE TUNING EXAM - Jim Coleman

This is not a tuning class. The session will include a brief history of the exam and an outline of the steps that candidates can take to prepare for it. There will be a demonstration of the tuning tolerance required, plus a general "walk-through" of the exam to familiarize everyone with its content.

MINI-TECHNICALS - Fred Fornwalt

This popular feature is a series of 20-minute classes on a wide range of subjects. It offers an opportunity to many technicians who have something to say but might not otherwise have the chance to teach.

COLLEGE AND UNIVERSITY TECHNICIANS SEMINAR - Tom McNeil

The College and University Technicians Seminar is sponsored jointly by the College and University Technicians Committee of PTG and the Department of Music at Portland State University. Participation is open to all who register for the Technical Institute. A $15 seminar fee is payable in advance and covers continental breakfast, luncheon and coffee breaks, which will be provided on the PSU campus. The seminar features Dr. Dean Shank, RTT, of the artist faculty of the Shepherd School of Music, Rice University. He will speak on "A University Technology Program for Enlightening Pianists," and "A University Training Program for Piano Technicians." There also will be a mini-recital on the Hamburg Steinway "D" in PSU's Lincoln Hall Auditorium. Don Person, RTT, PSU concert technician, will conduct a tour of the university's facilities. Committee Chairman Tom McNeil, RTT, will chair a "College & University Technicians Forum," where participants will have an opportunity to share problems and concerns. The committee will also present the final version of its "Guidelines for Effective Institutional Piano Maintenance."

TUTORING - Raye McCall

Tutoring in almost any piano-related subject is available in an expanded format this year. You must apply early for a time and an instructor. Don't delay! This popular feature fills up rapidly.

TEACHER RELATIONS COMMITTEE FORUM - David Rostkoski, Chairman

This committee is planning a full session for teachers entitled, "Meet the Piano Professionals: A How-To Conference for Pianists and Teachers." Technicians are welcome. The schedule runs from 9:00 a.m. to 3:00 p.m. Wednesday, July 12.

PIANO TECHNICIANS JOURNAL WRITERS MEETING - Larry Goldsmith, Susan Graham, Rick Baldassin

An open meeting for *Journal* contributors, readers and anyone who has even thought about writing an article. Sponsored by the editorial staff, this time will be used to discuss suggestions, plans, and problems for the future of the *Journal*. Come and bring your ideas.

To Excellence...

Touring The Oregon Coastline

Taylor Mackinnon
Portland Chapter
Liaison

When I started writing these articles for the *Journal* I was sure I'd run out of things to say after the second or third article. This is the sixth article and now I'm afraid I won't get to tell you all that I want to about Oregon and Portland. But I'm going to try!

About 80 miles west of Portland is the Oregon Coast. The most extraordinary thing about the coast is its rugged beauty; and second is the fact that the entire Oregon Coast is publicly owned. This is one of those places where one picture is worth a thousand words, but I would still need hundreds of pictures to give you a fair knowledge of the coast. There are agate and sand beaches, tide pools, dramatic rocky shores, quaint coastal towns, museums, surfing (bring a wet suit), fishing, camping, and always the ocean. It is so beautiful. And so accessible!

If you drive to the coast on Hwy. 30 you end up at Astoria, full of early Oregon history, at the mouth of the Columbia River. If you go via Hwy. 26 (Sunset Highway) you come to the coast at Seaside and Cannon Beach. Here you'll find lots of tourist shops, fine restaurants and the famous Haystack Rock. The Wilson River Hwy., Hwy. 6, brings you through the coastal range to Tillamook, home of the Tillamook Cheese factory and a maritime museum, Tillamook Bay and many small coastal towns. Hwy. 18 from Portland brings the traveler to Lincoln City with its wonderful beaches. Any one of these routes will be worth the drive. You could go to the coast on any one of these routes, travel the coast on Highway 101, and come back on any other highway you want.

Driving to the coast takes you through the coastal range of mountains. Here, too, there is camping and fishing, hiking and sightseeing. These mountains aren't as high as the Cascades but they do form the western rim of the Willamette Valley. And so back to Portland.

There are so many and varied things to see and do in and around Portland that I'm not sure how to organize them all in a neat package. Maybe I'll just list some items. Across the street from the Convention Hotel is a big ice skating rink in the Lloyd Center. It might be a real cool place if the temperature gets way up there. There's a shop in that shopping center that sells only things made or grown in Oregon. Less than a mile from the hotel is a woodcrafters store where one can buy all sorts of exotic woods, hard woods and fine wood working tools and supplies.

The Willamette Valley is fast becoming known for its wine. There are about 35 wineries in the area and most welcome visitors for wine tasting. You might be a wind surfer. The Columbia River up near The Dalles is one of *the* places to wind surf. There's a sternwheeler boat trip up the Columbia with stops at Cascade Locks and Bonneville Dam. The list can go on and on. Portland is truly a friendly, comfortable, exciting place to spend some extra time exploring. Make it a family affair.

Next month I'll try to summarize and give final instructions, helpful hints and information. Be sure to come see us at the Host Chapter table. Don't forget the Post Convention Tour up to Posey Manufacturing Plant and Mt. St Helens. Also, keep Tuesday night open for the Portland Chapter Carnival.

Tuesday Is Carnival Night In Portland

Randy Potter
Carnival Sponsorship Coordinator

Tuesday evening two piano manufacturers and several suppliers will sponsor a Carnival for those attending the 1989 Annual PTG Institute and Convention in Portland, Oregon. Entertainment, food and fun activities will take place all evening—from 6 p.m. to midnight. The Looff Carousel Park, the Carousel itself and Museum will open at 6 p.m. All registered convention attendees, their spouses and children will be admitted at no charge, courtesy of Young Chang, Samick and several industry suppliers noted below.

Portland is the Carousel Center of the World, and our hotel is right next to the Looff Carousel Park and Museum. Of the 17 working carousels owned by the Perrin family of Portland, which is 10% of the existing 170 working carousels in the world, the Looff is the largest. Throughout the evening, convention attendees and their families will be able to ride the Looff. We will also have guided tours through the Carousel Museum and Restoration Facility. The museum houses the largest collection of carousel chariots, over 100.

The Woody Hite Orchestra, the Pacific Northwest's leading swing band, will play from 7-9 p.m., and the Bouncing Baby Boomers, a leading 50's and 60's show band, will play from 10-12 p.m. Both bands will be accompanied by a Young Chang grand piano provided by Cascade Music, and this entertainment is sponsored by the Young Chang Piano Company.

Food will be provided all evening, and will include traditional carnival fare, hot dogs, cotton candy, soft drinks and so on. All convention registrants will receive food coupons in their registration packets, which may be redeemed at the park for free food. Additional food may be purchased, as needed, for family members who are attending. The food is provided courtesy of the Samick Piano Company.

Other activities are planned for the midway. These include Deano the Clown (Guild member Dean Petrich), who will entertain children and adults alike with balloons, juggling, storytelling and mime. Door prize drawings will take place throughout the evening from the bandstand for action models, tools and supplies furnished by manufacturers and suppliers. Support for these items, as well as the carousel and grounds rental, is still coming in, but already committed are: GRK Manufacturing (MafCo), J&M Fabrications/Piano Covers, Webb Phillips Dampp-Chaser Supplier, Randy Potter School of Piano Technology, Ronsen Piano Hammers, Schaff Piano Supply, and Charles Walter Pianos. ≣

Economic Affairs

The Official PTG Rebuilding Contract

Carl D. Root
Economic Affairs
Committee

For some time, the Home Office has stocked a billing pad for use by members which has been intended for both in-home service and minor shop work. As part of our effort to expand and improve on the business aids that are currently available, we have now designed a form to be used exclusively for major shop work. There are two basic styles currently being used by technicians who have designed their own. One has numerous items which can be checked off; one provides blank space for writing down the various operations to be performed on the piano. I prefer blank space because it allows for different degrees of detailing the information and alternate ways of grouping various operations. If you prefer a check list, we are considering designing a work sheet which could also be used as part of a contract as a second page.

While the contents of most of this form are self-explanatory, a few items are included which are not in common use but are highly recommended. The 10%-40%-40%-10% payment schedule provides for the following: The first 10% allows the piano owner to reserve shop time and implies that by putting off a decision, he may be postponing the work longer than intended because your services are in such great demand. This also helps you to get a commitment without having to pick up the piano before you are ready to start work. Notice that there is no starting date, only an estimate of how long it will take. The 40% at delivery is customary and permits you to pay for parts and labor without incurring serious cashflow problems. A 40% payment upon completion is appropriate.

I once had a piano and its owner move across country without making a major payment so I like to get paid before delivery. Also it encourages a customer to come to your shop to inspect the piano if he is concerned about the results of the work. Visits seldom occur in my experience so the 10% final payment gives them a measure of security as well. Notice that I include in-home service after delivery which is, in effect, pre-paid.

Entering a figure for the fair market value of the piano prior to work provides protection in the event of excessive claims against you in case of fire or other damage in your shop or by a subcontractor. An approximate figure for the re-sale value after completion of work should help to sell the job unless the work is not cost effective and is being done for sentimental reasons.

The 90- day price guarantee encourages decisiveness on their part and gives you the option of increasing prices at some future date to reflect higher costs. It's surprising how often technicians are contacted long after the contract was submitted. (Always make three copies; two with your signature to send to the piano owner and one to keep on file.)

It is probably true that the wording of this contract could be changed to make it more legally sound. While some legalese is no doubt advisable, too much could result in a contract that is intimidating and would reduce its effectiveness as a sales tool. The primary purpose of the contract is to explain as clearly as possible what commitments are being made by both parties. It's highly unlikely that you will run into any legal problems or even find yourself in a competitive bidding situation with an-

Continued on next page

CARL D. ROOT
Piano Services
3 Tapiola Court, Rockville, MD 20850
(301) 279-2440

PIANO REBUILDING CONTRACT

between and

address -

telephone -

piano -

fair market value before work - after completion -

rebuilding details -

Estimated time necessary to complete work is months. All work is guaranteed for years. This limited warranty is null and void if there is evidence that damage or malfunction is caused by exposure to extreme high or low temperature or humidity or if evidence of competent recommended service can not be provided.

The cost of the itemized work is $ to be paid as follows: $ to be returned with a copy of the signed contract, $ when piano is picked up, $ when shop work is completed prior to delivery, and $ at the first in-home tuning. Prices are guaranteed for ninety days from the date of the contract.

. . . . . .technician (signed, date)

I (we) do hereby accept your proposal and authorize you to proceed.

. . . . . owner (signed, date)

Industry News

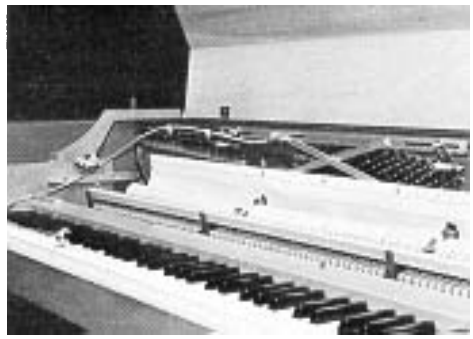
Quiet Keys Introduced

The Quiet Keys company recently announced a new product designed to fit all pianos (except grands) to lessen the volume so that pianists can play without creating disturbances, even in apartment dwellings.

A piano fitted with the Quiet Keys kit will function normally in every way, and no change can be seen in the instrument's appearance, the company states. An on/off knob mounted unobtrusively under the key permits the pianist to dramatically reduce the volume of the piano without changing its touch or playability. The piano can be played with or without the device engaged.

Without exception, the Quiet Keys product can be easily installed in any vertical acoustic piano, regardless of size, age, design, or origin. Grand pianos are not served at this time. All pianos have tuning pins that dimensionally conform to allow for a standardized tuning tool. Quiet Keys exploits this universal element of piano construction with its innovative design. All components in the easily-installed kit are built to last as long as the piano itself.

Every part necessary for installation is provided. A screwdriver, wire cutter, and scissors are all the tools required to complete the installation. The kit will have no impact on the pitch of the piano but when tuning is needed, it can be removed and replaced very quickly, helping to contain the expense of professional service. Quiet Keys will also increase the instrument's value by more than the cost of the kit ($59.95), but more importantly, it will enhance the usefulness to the owner.



Quiet Keys

McCall Sander

For additional information, including a color brochure with order form, please write to Rt. 3, Box 179 PJ, Austin, MN 55912, or call toll-free: 1-800-777-5397.

Contract...

other rebuilder if your work comes from your own clientele rather than aggressive advertising.

If you have suggestions that you think will improve this contract and make it useful for more technicians, write to Carl D. Root, 3 Tapiola Ct., Rockville, MD 20850. We are also considering changes to the official PTG billing form. I would like to group items according to performance (tuning, touch, tone) and focus more on in-home service and less on shop work. If you have comments on this form, let me know if you are currently using it.

Young Chang America Names Alan Vincent

Vincent

Alan Keith Vincent, RTT, was recently named Director of Technical Services at Young Chang America, Inc., announced Young Chang Vice President Lloyd Robbins. In this position, Vincent will act in a supervisory capacity for dealer and field technicians. In addition, Vincent will write piano service literature, act as an instructor at PTG seminars, and present technical classes throughout the Young Chang dealer network.

Before joining Young Chang, Vincent was manager of technical services for the Baldwin Piano & Organ Company. Previously, he was the piano technician at Reidling Music in Albuquerque, NM, and has also worked in the tech department at Aeolian. He now resides in Buena Park, CA.

Miniature Sander Introduced

McCall Piano Service of Pomona, California has developed a miniature hand-held, variable speed, reversible, soft belt sander, designed for shaping hammers on either grand or vertical actions. The sander is designed to improve the quality of the job, reduce work time by up to 50 per cent, and allow the completion of the task without removing dampers on vertical actions.

The miniature sander retails for $95.00. For more information, call Raye McCall at (714)622-8826, or write to McCall Piano Service, 1078 E. Third St., Pomona, CA 91766.

Musical Instrument Exports Up 30% In 1988

U.S. exports of musical instruments, parts and accessories during 1988 increased for the third consecutive year, growing 30% to an all-time high of nearly $215.3 million, according to the American Music Conference's (AMC) annual interpretive analysis of U.S. Department of Commerce data.

Imports of musical goods to the U.S. market slowed during 1988. Total value was reported at $846,841,000, a 7% increase over 1987, compared to a 36% increase between 1986 and 1987.

Industry experts attribute the 1988 export growth in large part to the dollar's decline against foreign currencies. Last year's total value surpassed the previously recorded high for exports of $211 million reported in 1980.

Acoustic piano exports showed solid gains in 1988, up 24% to nearly 7,000 units and 34% in total value to $9.4 million. Canada purchased the largest number of units; 2,627 valued at more than $3 million. The largest unit increase was reported for France, up 953% from 104 units in 1987, to 1,095 units in 1988.

At $151,231,000, acoustic pianos represented the second largest import category in terms of total value; an increase of 7%. Unit shipments were up 1% to

Continued on next page

82,609. Imported vertical pianos represented 59% of total units shipped in 1988, and 34% of total value. Grand pianos were up 7% in units to 33,785 and 9% in value to slightly more than $100.2 million. South Korean imports accounted for 52% of all vertical units and 50% of their total value.

South Korean grands rose 32% in units compared to 1987, and represented 54% of all grands shipped to the U.S. Japanese grands dropped 21% to 13,595 units and represented 40% of all grands, compared to a 52% share in 1987.

The average per-unit value of Japanese grands was up 12% to $3,585 in 1988; South Korean grands rose 7% to $2,406 per average unit.

THE TECHNICAL FORUM

Touchweight

Susan Graham
Technical Editor

We return to the subject of touchweight in grand actions with contributions from a variety of sources. They include an article by Fred Tremper, explaining the basic elements involved in analyzing touchweight in grand actions. For my part, I will discuss practical guidelines and suggestions for measuring touchweight, and for putting lead in—or taking it out of—grand keys. We also have some remarks from Paul Rice on the subject. Paul's ideas depart somewhat from standard thinking; they are interesting and intelligently put and merit consideration. Finally, since Paul's thoughts were submitted in response to remarks made by Rick Baldassin, there is a reply from Rick. All of this should serve not only to inform but to stimulate thought (and, I hope, further discussion) on an interesting and increasingly popular topic.

This month's issue also includes an article on Posey, the soundboard manufacturing company in Hoquaim, Washington. It originally appeared in *Forest World*, an Oregon-based publication for the wood industry. With our upcoming convention in Portland, it seems appropriate to focus on the local (same coast, anyway) talent.

Included in this *Journal* is a long-overdue review of *The Piano Book* by Larry Fine. There will be an updated edition of this work appearing this fall, but there is enough interest in the book in its current form to warrant publication of a review now (with the possibility of an update when the new edition appears). I plan to make such reviews a regular feature of the *Journal*. There is a good deal of material being published which is of interest to piano technicians. As I see it, the best function that reviews can serve is informational, rather than judgemental: the aim is to let potential readers know what is in a book and how well the material is presented. I am looking for potential reviewers—anyone interested is invited to send a statement of interest and a writing sample. As with all articles in the *Journal*, any opinions expressed in book reviews are those of the reviewer and not representative of an official "Journal" position.

Touchweight in Grand Actions

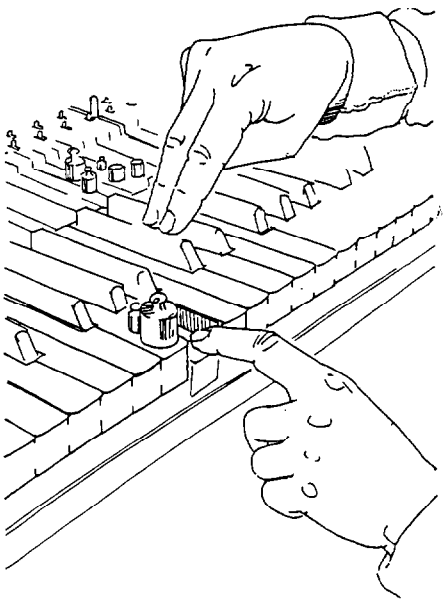
In case you missed it, the current interest in this subject was originally stimulated by a question from Michael Tocquigny, regarding a Steinway action with new shanks, flanges and hammers which now has "too heavy a touch." For several months (March - July '88) the Forum dealt with all the *other* possible solutions: cleaning, lubrication, regulation, and removal of wood from parts. It should be reiterated that these things are done *first*. Reweighing an action by adding or removing lead from the keys is a final step which will yield accurate and satisfactory results only if proper preparation is made first. In my experience, these "preliminary" steps often eliminate the need for releading keys.

Then, however, there are those other jobs....Even in excellent working condition, some actions simply drive like trucks. The leading in the keys is insufficient or incorrectly placed and does not serve to counter the weight of the action parts. This is often found on rebuilt actions, in which the new parts are usually heavier than were the originals. Sometimes, however, we encounter rebuilt actions in which the new parts are lighter—or operate with lower friction due to pinning, quality of knuckle buckskin, etc.—the action is very light but "sluggish", since the light downweight is accompanied by a light upweight and the key does not return quickly enough. Finally, although we tend to regard this as a problem created in rebuilding, new and all-original grand pianos may display the same problems. This may be due to "pattern leading", in which a sample action of a particular model is weighed and the pattern of leading is simply transferred to all action of that model without individual testing. Objections to a new action also arise from the taste of the particular pianist: some people simply seem destined to purchase pianos which do not completely satisfy them, and they need a sympathetic and skilled technician to improve the situation. Wear and climate also come into play, although it is usually better to solve those problems directly than to add lead to the keys merely to disguise the symptoms.

Let's take the problem of the action with a very heavy downweight and a very high upweight: it may take 80 grams or more to depress the key, but it will lift 35 on return. This is the common "heavy due to weight of parts" scenario. It has a characteristic feel of resistance at the very beginning of the keystroke: the weight of the parts can be felt as an increase in inertia. However, the key does return very quickly. With such a quick upweight, there is room to lighten up the downweight and keep a satisfactory quickness in the action. In all leading, remember that this is the tradeoff: whatever is gained in improving one half of the equation—either up or down—will be lost in the other. Leads are mindless: they work in both directions.

Where to begin? The first place might be with the set of weights used for measurement. The stacking gram weights sold by suppliers tend to be on the heavy side: with access to a balance scale, you can calibrate them by filing or drilling out small quantities of metal. These weights are useful and compact for taking initial measurements, but trying to reweigh an action with them is a slow process, since it requires stacking and restacking of weight combinations, with constant adding and subtracting with each change. Something such as the set of graduated weights pictured in the

Figure 1



Drawings by Valerie Winemiller

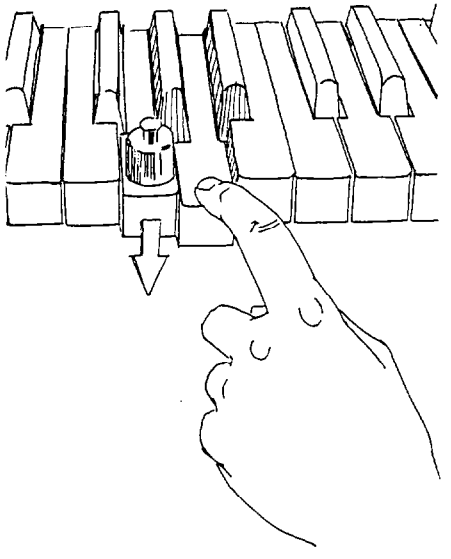
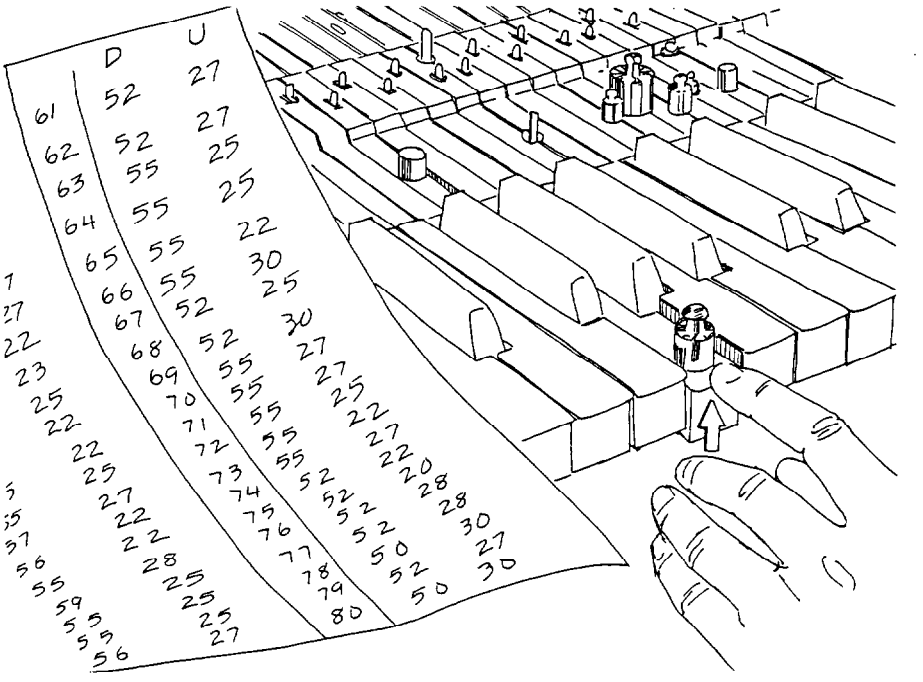


Figure 2

Figure 3



illustrations is more practical. I obtained these at a convention from a fellow technician. Where he got them I can't recall (bootleg gram weights?) but similar sets could probably be found through scale companies, chemical/lab supply sources, or possibly what are referred to as "head shops." If you have access to a lathe and a good quality balance scale, you can make suitable weights from metal stock.

The individual weights in the set I use are 50, 20, two 10's, 5, two 2's, and 1 gram, and come from the Ohaus Scale Corporation. There are also a couple of sources amongst our fellow technicians: Bill Spurlock makes a set of weights for key reweighing, with the advantage that each increment of one gram is represented by a separate weight; no combining is necessary. Don Peterson, of Highland, Utah, also makes a set for reweighing which feature two-part weights. The combination of two weights measures downweight and then the upper weight is lifted off, giving the upweight measurement.

Apart from the nuisance of addition, weights requiring combination can result in some inaccuracy. When measurements are taken, the weight should be placed in exactly the same forward-and-back position on each key, since moving closer or farther from the fulcrum (the balance rail) will affect the result. This is easiest done by aligning the weight with something constant: the front edge of the key, the bushing mortise, whatever. If combinations of non-stacking weights are necessary, be consistent in placement. We always align the largest weight to the front edge of the keycover, and work back, adding smaller weights as necessary.

How is downweight measured? The action can be either on the bench or in the piano. If it is in the piano, the weight of the underlever must not restrict the movement of the key: the pedal should be engaged and blocked to lift the underlevers. The weights are placed on the key, and the action is bumped or jolted slightly to break inertia. This may be done by delivering a slap to the underside of the keybed or bench, by depressing a neighboring key and tapping it (fig. 1), or some similar method. One or two blows should be sufficient; the point is to break inertia, not jar or vibrate the key enough to cause it to sink. A caution is that repeated testing of the same key will yield a drop in the reading. This has to do with static friction at the keybushing. The key should drop, lifting the wippen, until the toe of the jack just contacts the let-off button: the key will not drop to contact the front rail punching but will stop somewhat above it (fig. 2). The least amount of weight required to do this consistently is the downweight.

Upweight is measured (with the same precautions for consistency) starting from the point of jack contact which ends the measurement of downweight. The key is held at that point by hand, the weight placed on top of the keycover (fig. 3) and the key is released to return, lifting the weight to the full level position. The greatest amount of weight which the key will reliably lift is the upweight.

Fred Tremper's article explains the effects of action parts weight and friction on touchweight. The information obtained by measuring touchweight can indicate a number of problems: I refer you to his article and to previously-mentioned series in the Forum for more thorough guidelines for analyzing results. This article now assumes that the

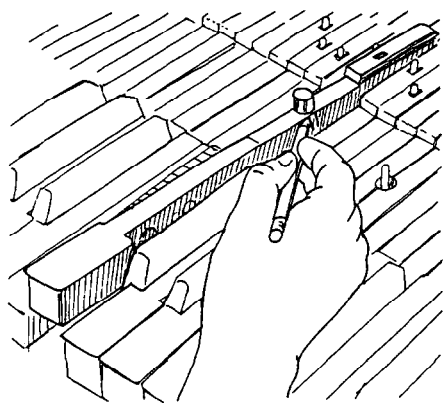
problem has been isolated as requiring releading of keys.

When an action is in my shop for reweighing, we begin by measuring down and upweight on sample keys, making a small chart of figures for a "before" reference and determining the general pattern of weight throughout the action (fig. 3). When the data from the sample keys has been measured and recorded, we proceed to mark the keys for leading.

Three sizes of keyleads are available from our suppliers (there are also damper underlever leads which are smaller but may come in useful for very fine work). The question becomes: what size lead and where should it go?

As elementary geometry teaches us, the farther the lead is from the balance point, the more effect it will have on the downweight. A small lead inserted near the front of the key can be as effective in reducing downweight as a larger lead placed closer to the balance point. However, the effect on the return of the key is different. Simply put, the closer the leads are to the balance point, the less they slow the return of the key: even though the measurable upweight may not be significantly different, the inertia is less. Since the ideal is to reduce the downweight without making the key slow in returning, putting leads nearer the balance rail, even though it may require larger or more leads, usually yields a better performance. The feel of the action will be different—a subtle, indefinable but preferable behavior of the key seems to result from leading nearer the balance rail than the front of the key. (Moving the leading closer to the balance rail was one of the changes made when Steinway "accelerated" its action.)

Figure 4



Therefore, we keep the lead(s) as close to the balance rail as possible. Once again, a reminder that it is critical in determining their location that both downweight and upweight are considered.

Location is determined by trial and error: placing a sample key lead on the top of the key, measuring the resulting down and upweights, and continuing to move the lead around or replace it with larger or smaller leads until the satisfactory combination is determined. After a few keys the cause-and-effect of the differing sizes and placements becomes apparent, and the process speeds up. As the location for leads is determined on each key, the key is raised and marked on the side (fig. 4). A simple I, II, III system (or S, M, L) (remembering whether the lead is centered over the mark or in front or back) is utilized.

The rule of thumb is that the leads should be no closer together than the width of the lead itself. In other words, there should be a leads'-width worth of wood between each lead. This may sometimes require removing an existing lead, plugging the hole, and then determining the correct location of the new lead. Plugs should be cut from well-dried spruce stock (the moisture content should, ideally, match that of the key). The grain in the plug should match the grain in the key: commercially available dowel stock is not suitable since that results in incorrect grain orientation, and is also a harder wood which is not as compatible with the key. ≡

Another View

Hammer Flange Pinning and Touch Weight

The Unavoidable tradeoff

For years I have wrestled with the problem of getting piano actions to weigh off to manufacturers' touch weight specifications. I have polished and/or lubricated every friction point, eased keys, removed excess material from action parts and hammerheads, and altered action geometry in my quest for "the" solution to the heavy touch problem. My experimentation has yielded the following conclusions:

1. Hammer flange resistance is the major factor in obtaining desired touch weight.

a. In almost all cases the pinning must be quite loose, in the neighborhood of seven swings or more, to achieve factory touch weight specifications.

b. Teflon shanks must be pinned as loose as possible short of clicking in order even to approach factory specs.

c. The three-to-five-swing test advocated by some will absolutely guarantee an action which cannot be weighted off properly (unless a heavier than normal touch weight is desired)

2. Tight key bushings are the second most important factor in achieving proper touch weight

a. The difference in touch weight between a tight key and an over-eased key is negligible (1-2 grams).

3. Polishing capstans and key pins (assuming no burrs are present) has virtually no effect on touch weight.

4. Type or condition of knuckles has virtually no effect.

5. Action geometry, unless severely out of whack, has little or no effect.

6. The pinning of the jack and balancier has no effect and wippen support flange very little effect.

7. Heavier than original action parts and hammers can be compensated for by adding lead to keys and do not prevent the action from weighing off properly.

8. Original touch weight specifications vary greatly with both the age and manufacturer of the piano in question.

9. Virtually all actions, regardless of age or manufacturer, can be improved by careful releading of keys, whether action parts have been replaced or not.

My advice to fellow technicians based on the above is as follows:

1. Check the existing touch weight before beginning any major action work.

2. Ask the customer whether the existing touch weight is to his or her liking

3. Compare the existing touch weight to current manufacturers' specifications, if available.

4. Expect to do at least some releading, especially if any parts are to be replaced.

5. Plan to spend the better part of a day releading, especially if lead must be removed and old holes plugged.

6. Charge accordingly.

Paul Rice, RTT, Phippsburg, ME

I appreciate the opportunity to respond to the letter "Hammer Flange Pinning and Touch Weight—The Unavoidable Tradeoff" by Paul Rice. In my class "Tone and Friction—Facts and Fiction" presented in St. Louis, I advocated the three-to-five swing test for hammer flange pinning because of its effect on tone. Paul's letter deals with the effect of hammer flange pinning on touchweight. There is no doubt in my mind that tighter hammer flange pinning increases touch weight. It does not necessarily follow, however, that the pinning should, therefore, be loose.

Too often we isolate one part of the system, assuming that regulation of this part alone will provide the desired result. There is a current trend in manufacturing to make the key balance hole extremely tight. In order for the key to function, both balance and front rail bushings are then eased to the point that they are virtually not in the system any longer. This, of course, makes for a considerable amount of excess side movement of the keys. Paul correctly points out that the difference between a key that is properly eased and one that is over-eased is very small. The solution, therefore, is not to over-ease the key bushings to compensate for a key balance hole which is too tight, but to properly regulate the tightness of the key balance hole, along with proper key easing.

The same principle can be applied to hammer flange pinning. There are several factors which account for the total friction and which have to be factored into the touch weight equation. Hammer flange pinning is one of them, but this alone cannot be expected to compensate for all of the other areas. Paul mentions several of these areas, but dismisses three areas which I feel are very important as having little or no effect on touch weight. These include polishing capstans and keypins, action geometry, and knuckles.

The capstans and keypins can be sources of considerable friction, even when no burrs are present. In reality, burrs are quite often present, especially around the edges of the capstan, and on the other sides of the keypins. The burrs on the capstans are usually present from manufacture, while the burrs on the keypins are often the result of poor technical work. They are easily detected, often being accompanied by a felt dust which they have abraded from the action cloth they are in contact with. Even in the absence of burrs, the capstans and keypins are often tarnished or covered by a gummy substance. This creates a drag which need not be present. In addition to polishing the capstans and keypins, lubricating them can also be helpful. I have found that spraying with McLube 1725 not only makes these surfaces slipperier, but the coating seems to keep the pins form tarnishing again so quickly.

The action geometry can cause considerable friction when the parts are not oriented properly. Not only is the action spread (distance from the hammer flange center to the wippen flange discussed by Chris Robinson in his articles and classes are extremely important. On one occasion, I observed Chris make a 10-gram reduction in down weight by simply adjusting the action spread by less than 1/16 inch. In addition, my partner Carl Teel and I have had a great deal of success in reducing action friction by adjusting the height of the action frame on the keyframe, creating the proper relationship of the wippen center, capstan, and key balance point. This also can correct several other problems too lengthy to cover here.

The knuckle is another great source of friction. Carl related to me that while he was a Kawai dealer, he was able to reduce the downweight as much as five grams by doing nothing more than tack-

Table 1

Note #	Downwt.	Upwt.	Lubricant	Conditions
45	73 gm	30 gm	none	knuckle squeaks
	68 gm	33 gm	1-Puff	no squeak
	66 gm	33 gm	McLube 1725	no squeak
40	67 gm	26 gm	none	knuckle squeaks
	63 gm	29 gm	1-Puff	no squeak
	61 gm	30 gm	McLube 1725	no squeak
59	61 gm	29 gm	none	knuckle squeaks
	56 gm	33 gm	McLube 1725	no squeak
	55 gm	33 gm	1-Puff	no squeak
60	64 gm	24 gm	none	knuckle squeaks
	60 gm	28 gm	McLube 1725	no squeak
	59 gm	28 gm	1-Puff	no squeak
55	66 gm	33 gm	none	knuckle squeaks
	63 gm	34 gm	talc	no squeak
	62 gm	34 gm	McLube 1725	no squeak
	62 gm	35 gm	1-Puff	no squeaks
64	55 gm	27 gm	none	knuckle squeaks
	49 gm	28 gm	talc	no squeak
	47 gm	29 gm	mcLube 1725	no squeaks
57	59 gm	26 gm	none	knuckle squeaks
	51 gm	29 gm	Teflon Powder	no squeak
	50 gm	31 gm	McLube 1725	no squeak
	50 gm	29 gm	talc	no squeak
67	47 gm	21 gm	none	knuckle squeaks
	45 gm	23 gm	McLube 1725	no squeak
	45 gm	23 gm	Teflon Powder	no squeak
54	63 gm	24 gm	none	knuckle squeaks
	59 gm	28 gm	McLube 1725	no squeak
	58 gm	28 gm	Teflon Powder	no squeak

ling the knuckles. In preparation for writing this letter, Carl and I conducted a few experiments dealing with knuckle friction. We had in the shop at the time an action which had new hammers, shanks and flanges, and wippens which had all been re-pinned, felt and cloth parts replaced, and wooden surfaces cleaned, smoothed, and lubricated with McLube 1708 (because it was grey in color). The shanks were of Japanese manufacture, and had the bright yellow knuckles, known for their good looks and ability to squeak. Our experiment was to measure the effect of four lubricants on knuckle squeaking, and touchweight. The four lubricants included McLube 1725 which was sprayed on the repetition lever and jack top (not the knuckle), talc, 1-Puffs, and Hoppe's powdered teflon, which were applied to the knuckles. The results are shown in table 1.

The following conclusions were drawn from those results:

1. Knuckle friction has a definite effect on touch weight.
2. All of the above lubricants eliminated the squeaking.
3. In all cases, the first lubricant applied removed most of the friction.
4. In most cases, the second lubricant gave a slight improvement.
5. The average net improvement was six grams less down weight, and three grams more up weight.
6. McLube 1725 eliminated the squeaking, which was present with the McLube 1708.
7. The Teflon powder seemed slightly more effective than the 1-Puff, which was slightly more effective than the talc.

It is hard to say how long these lubricants will last before the squeaks return. I have heard from several technicians that lubricating the knuckles is very temporary, and that the process needs repeating every six months or so. Nearly three years ago, the knuckles on the Utah Symphony Steinway were squeaking. I sprayed the repetition levers and jack tops with McLube 1725 (with no treatment to the knuckles), and the squeaks have yet to return. This treatment is very quick to perform and seems long-lasting.

So far, I have made no mention of hammer flange pinning. I will admit that I have made no experiments as to the direct effect of pinning on touchweight, though I concede that tighter pinning will make the touchweight increase. Carl and I have not had problems getting actions to weigh off as we would like them, even after we have repinned all of the action centers to the specifications listed in the review of my class. In fact, in the last two concert grand actions we have completed, we have removed one to three leads from each key, and plugged the holes before we finished re-weighing the action. After properly regulating the friction at all of the points, the tight flange pinning was not an obstacle to obtaining the desired touch weight.

I agree with Paul that actions can be greatly improved by reweighing, but caution against changing the keyleads until the action friction has been properly regulated. Re-leading should be the very last thing you do.

As I mentioned at the onset, the reason for the tight pinning was for tonal considerations. In my St. Louis class, I was able to demonstrate a marked difference in tone by changing the flange pinning from eight swings to three. This change was heard by those in the class, and was measured graphically by Chris Robinson's spectrum analyzer. It has been my experience that since Carl and I have been re-pinning to these tighter specifications and tolerances, the amount of time spent voicing has been reduced dramatically, and the final sound is much improved.

I have enclosed a letter from Thomas Servinsky of Vero Beach, Florida, which I received several months ago. It details an experience he had with hammer flange pinning and tone.

In conclusion, the total friction in a piano action is made up of several components, all of which must be carefully regulated for the system as a whole to function properly. Care should be taken not to isolate any one component to compensate for problems in the other areas. Though tighter hammer flange pinning increases touch weight, this should not be a problem if the other friction areas have been regulated properly. Changing the key leading should be the last step in adjusting the touch weight of an action.

Rick Baldassin

I was in attendance at your class on "Tone & Friction" at the St. Louis Convention and wanted to talk to you about this particular phenomenon as a means of elevating tonal response. I had experienced this same corrective measure in the past, but didn't have explanations or graphic proof as to what actually improved.

Today I had the pleasure of experiencing (and correcting) this phenomenon on a Baldwin L that I had regulated one month ago. There were several dead spots in this piano that I (initially) treated as hammer deficiency. After attending your class and actually seeing a graphic illustration on the "true" effects of adequate friction in the hammer flange, I was curious if this could be the culprit for this particular piano. Sure enough, the hammer flanges were too loose. The average swing was 10-12 times. I experimented with several different "swing-fits" and I did find that the "4-5 swing" relationship had much more pronounced fundamental. Once I had re-pinned the flanges I (finally) was able to go further into the voicing process, which made the rest of the job a breeze.

Thanks for the insight. This has opened a new perspective in my approach to tonal control. Again, Thanks.

Tom Servinsky, RTT

At Large

Touchweight

Fred W. Tremper, M. Mus., RTT
Bluegrass Chapter

When a piano technician considers touchweight the first two words that spring to mind are downweight and upweight. Unseen, however, are the elements of touchweight, and it is these elements that inform the relationship between downweight and upweight. The purpose of this article is to discuss these elements, the weight of the wippen and hammer and the resistance given by friction. We hope to develop a clearer understanding of the role each plays in the weighing off of an action. We will not discuss procedures and methods; these have been covered very well in articles in the *Journal* as well as in demonstrations at national conventions and regional seminars.

Throughout the article we will use the terms "action weight," "friction," "downweight," and "upweight." Let us define each of these terms.

Action weight. The weight of the wippen and hammer bearing on the capstan screw.

Friction. When the key, wippen, and hammer are in motion there are several points where friction is produced: 1. where bushings rotate on their center pins—the wippen flange and hammer flange—and 2. the points where two parts rub together—the capstan screw and wippen felt; the knuckle and repetition lever; the jack and the knuckle; the front rail and balance rail bushings against their respective pins; and the balance rail pin hole.

Downweight. When the key is in the rest position the action weight (the wippen and hammer), which bears on the capstan screw, holds up the front of the key. We place gram weights on the key front until the key starts its descent, lifting the wippen and hammer. The rise should be slow and steady, stopping when the tender of the jack touches the let-off button and the front of the repetition lever comes in contact with the drop screw. We define downweight, then, as the weight required to overcome the resistance of friction and lift the wippen and hammer to the point of let-off. In short, the gram weights on the key front measure the amount of downweight.

Upweight. When the key is in the down position the wippen and hammer still bear on the capstan screw. When enough gram weights are removed from the front of the key, the wippen and hammer overcome the resistance of friction and the remaining gram weights and force the return of the key to the rest position. The gram weights remaining on the key front measure the amount of upweight.

Let us now symbolize the elements of touchweight. Throughout the article let

Aw=Action weight (the weight of the wippen and hammer);
Dw=Downweight;
Uw=Upweight; and
F =Friction.

If the study of touchweight requires that action weight and friction be examined separately, is it possible to separate one from the other? Yes, and here is how it is done.

Assume the key is in the rest position and sufficient gram weights are placed on the key front to cause the wippen and hammer to rise to the point of let-off. We then say that downweight is equal to the weight of the action plus the friction in the moving parts. Symbolically

Dw=Aw+F

Now assume that the key is in the down position and that gram weights are removed from the key, causing the action weight to force the key to return to the rest position. From this it is apparent that the upweight is equal to the action weight plus the friction.

Aw=Uw=F

Manipulating symbols, we see that upweight is equal to the action weight minus the friction:

Uw=Aw-F

We now have equations that describe downweight and upweight:

Dw=Aw+F, and Uw=Aw-F.

With a little algebraic manipulation we can now separate action weight and friction and find values for each. By substituting (Aw+F) for Dw and (Aw-F) for Dw and (Aw-F) for Uw:

(Dw+Uw)=(Aw+F)+(Aw-F)
=Aw+F+Aw-F
=2Aw

(Dw+Uw)/2=Aw, which means that the action weight (the wippen and hammer) is equal to one half the sum of the downweight and upweight.

What is the amount of resistance caused by friction? Again, we substitute (Aw+F) for Dw and (Aw-F) for Uw:

(Dw-Uw)=(Aw+F)-(Aw-F)
=Aw+F-Aw+F
=2F

(Dw-Uw)/2=F; i.e., friction is equal to one half the difference between the downweight and upweight.

When we recondition an action in preparation for regulation we try to bring back each part to its original condition. It is important that we remove as much unnecessary friction as possible. To eliminate excessive friction at the points of rotation we free up or repin the wippen flanges and hammer flanges. To eliminate excessive friction where parts slide together, we polish the capstan screws and recondition or replace the wippen felts, we graphite and burnish the tops of the repetition lever and jacks, we ease the keys at the front and balance rails, and we make sure the balance rail hole is not too tight on the balance rail pin.

Generally, manufacturers recommend that touchweight be about 50 grams downweight and 20 grams upweight and that the touchweight graduates, heavier in the bass and lighter in the treble. These numbers, as are many numbers in piano work, are really close

work I did setting the touchweight on one of the keys.

According to Michael Mohr of Steinway, Steinway's specifications for the model B are:

Key	*Downwt.*	*Upwt.*
1-16	51 grams	at least 20 grams
17-32	50 grams	at least 20 grams
33-45	49 grams	at least 20 grams
46-61	48 grams	at least 20 grams
62-75	47 grams	at least 20 grams
76-88	46 grams	at least 20 grams

Here was my procedure. After having reconditioned and regulated the action, I placed 51 grams of weight on the front of the key #1 and then positioned key leads on top of the key until the wippen and hammer rose to the point of let-off. Leaving the key leads in place, I removed gram weights from the key front until the key returned to the rest position. The upweight measured 16 grams. Using our formulas for action weight (Aw) and friction (F):

Aw=(Dw+Uw)/2 and F=(Dw-Uw)/2,

and plugging Steinway's specifications into the formula I looked for the following values for action weight and friction:

Aw=(51+20)/2
=71/2
=36;
F=(51-20)/2
=31/2
=16.

I found, however, the following values:

Aw=(51+16)/2
=68/2
=34;
F=(51-16)/2
=34/2
=18.

Since my downweight was correct, the value 18 being greater than 16 told me there was too much friction somewhere in the action. I first checked the pinning of the hammer flange and wippen flange to see if they were too tight. They weren't. I rubbed talcum powder into the knuckle and was surprised to see how profoundly it reduced friction.

Reducing the friction in the action also changed the downweight. To keep it at 51 grams I returned the 51 gram weights to the key front and moved the key leads closer to the balance rail. Again I removed gram weights from the key front until the wippen and hammer returned to the rest position. I had a new upweight—17 grams.

Again applying the formula, this time with the new upweight figure, I found:

Aw=(51+17)/2
=68/2
=34;
F=(51-17)/2
=17.

Still not free of friction. I eased the balance rail bushing. No change. Then I noticed the hammer was positioned a bit to the right such that it was ever so lightly touching hammer #2, preventing its free rise.

Making that correction and repeating the procedure, I replaced the 51 gram weight at the key front and moved the key leads to a new position, closer to the balance rail. Again I removed gram weights from the key front until the wippen and hammer returned to the rest position. The upweight measured 19 grams.

Applying the formula again with the new upweight figure:

Aw=(51+19)/2
=70/2
=35;
F=(51-19)/2
=32/2
=16.

The value for friction was correct, but now the Aw value was too low. To increase it I would have to move the key leads toward the capstan screw, which simultaneously would increase the downweight to more than 51 grams and the up weight to less than 19. There was something in the action that would not let me get Steinway's specifications. I opted for a consistent downweight. I had gone as far as I could. It was not a comforting thought that I had 87 more keys to go. Such is piano work.

Making touchweight adjustments is frustrating and time consuming, but well worth the effort. Pianists, particularly sensitive and accomplished ones, seem to be more concerned about evenness of touch than anything else. Adjusting the touchweight helps make this possible.

Finally, a word of credit and appreciation. I am indebted to Mr. Ray Chandler, RTT, manager of the Technical Support Division of Kawai American Corp. It was he who first put me on to the relationship between downweight and upweight, action weight and friction. If ever you have the chance to attend one of Ray's classes at a convention or seminar, be sure to attend. It will certainly be worth your while. ≣

Raising Pitch

Rick Baldassin
Tuning Editor

Our first letter this month comes from Peter Briant of Great Falls, MT. Peter writes:

I am writing in regards to an article entitled "Climate Control and Stabilizing Pitch" by Lou Tasciotti, which appeared in the Spring 1989 issue of The Piano Quarterly. *While the piece is mainly concerned with humidity and its consequences for tuned pianos, it also contains statements about the piano's reaction to changes of pitch (tension) and the effect that such changes may have on the instrument's capacity to stay in tune. I am skeptical about the following statements:*

1. "...one of the most common causes for a well tuned piano to be unstable, *assuming that both the tuner and the piano are good, is that the pitch has not been* stabilized." *(Emphasis added).*

2. "Since the pitch of the piano must be kept relatively constant, any substantial changes will cause the soundboard and bridges to begin flexing...Even if the technician goes over the tuning several times, the piano will continue to be unstable for days afterward." *(Emphasis added).*

3. "The only way to achieve tuning stability when you have to substantially change pitch, is through a series of tunings."

4. "The number of tunings needed for the piano to stabilize depends on how much the pitch has to be altered."

A few years back, Dr. Sanderson taught a class called "Pitch Raising Without Pain." This was one of the best classes I have ever taken from PTG. He had done a number of studies, from which he had developed charts that showed pianos before, during, and after the pitch raising process. He was able to compare procedures to learn if one method was more efficient, or required less overpull. He made the point that the piano's structure responded to a stress change instantaneously, not over an extended period of time, as was commonly thought. He was the first I heard suggest that the plate also responded to a change of tension, not just the soundboard and bridges. As a consequence, I began finding books on structural design and materials science. A great deal of information from those fields can be applied to piano technology.

I do not recall that Dr. Sanderson's material was ever published in the Journal. *I think many tuners would benefit from an article summarizing, or updating the information. Perhaps some who avoid electronic tuning classes, thinking none of the material applies to them as aural tuners, would gain greater understanding of the piano, its stability, and predictability.*

Our thanks to Peter for his letter. Having read the article carefully, a few thoughts come to mind. We have often heard in classes and articles that you cannot tune a piano unless it is already (nearly) in tune. This means that the pitch of the piano cannot be altered much if we expect the piano to stay in tune when changed and accomplish a fine tuning in one pass, but a change of somewhere between four and 10 cents is generally accepted. In the article, Mr. Tasciotti states, "Pulling a piano up to a higher pitch is going to leave the piano unstable. This kind of major change in the pitch of the piano demands that the piano be tuned more than once to stabilize pitch." He later states, "It is generally accepted that a pitch change of eight cents or more will exhibit noticeable instability." This agrees with my own thinking, except I might say "...the piano be pitch raised and tuned..." rather than "...the piano be tuned more than once to stabilize pitch." The amount of eight cents falls well within the range of four to 10 cents which I mentioned earlier.

The author later comments, "Even if a technician goes over the tuning several times, the piano will continue to be unstable for days afterwards." Dr. Sanderson's research showed that the pitch drop, which occurs when the pitch is raised, happens almost immediately. By the time the sixth or seventh note is tuned, the first note will have already dropped. Tasciotti later states, "The only way to achieve tuning stability when you have to substantially change pitch, is through a series of tunings." Certainly by the criteria we have discussed, a pitch raise and tuning would suffice. There may be a problem with semantics here, as the author later states, "The first and second tunings in a major pitch raising process do not really resemble tunings...Technicians usually refer to these preliminary tunings by other names, such as pitch raising..." The only thing which is unclear to me is whether the "series of tuning" referred to constitutes a pitch raise followed immediately by a tuning, or several tunings which happen over an extended period of time.

Mr. Tasciotti also states, "The number of tunings needed for the piano to stabilize depends on how much the pitch has been altered." It has been my experience that pitch changes of up to about 80 cents should be handled in three passes. The first pass is to pull the piano to pitch, with no overpull. The piano will be flat upon completion. The second pass incorporates a pitch raising method, with overpull. This should leave the piano at pitch. The final pass is the fine tuning. Tasciotti's statement is in agreement with this procedure to the extent that his statement applies to pianos which are more than about 80 cents flat. Otherwise the pitch raise and tuning should be successfully accomplished in two passes.

These guidelines apply to "normal home" situations. They certainly do not apply to concert situations. Concert instruments should never be allowed to go that far out of tune. A concert instrument cannot be tuned unless it is already in tune at the correct pitch. This is for two major reasons: first, the performance demands on the instrument are so great, and second, the acceptable tolerance for notes going out of tune through the concert instruments are less

forgiving to changes of both environment and tension. Quite often if a concert piano has not been played or tuned for some time, it can be pitch raised and tuned for the rehearsal, then re-tuned for the concert, with good stability.

In the late 1970's, classes were being taught on pitch raising by George Defebaugh, Jim Coleman, Albert Sanderson, and others. They all subscribed to the idea that if the piano was low in pitch, once the pitch was raised it would drop by the end of the procedure. For this reason it was necessary to overcompensate, or anticipate this drop. Coleman and Defebaugh called their method the "Anticipated Drop" method for pitch raising. This could be accomplished either by ear, or with an electronic device. Over the past few years, I have seen several methods advocated. The percentage of overpull has varied from 25 to 50 percent of the amount of the piano is flat. The main variable in determining the percentage is the method used to tune the unisons. If the unisons are tuned to the center strings as you go, then 25 percent works quite nicely. If all of the center strings are tuned, followed by all of the right strings, then all of the left strings, 33 percent is required.

What complicates this procedure is that the piano is seldom uniformly flat. Some areas are inevitably lower than others. This makes it impossible to assign a single number to the flatness of the instrument. In addition, because of inharmonicity, the piano is not tuned at A-440, with each note at zero cents, but to a tuning curve. The amount of flatness must, therefore, be determined in reference to zero. This situation is further complicated by the fact that once the first octave of notes has been tuned, the next octave of notes is flatter than when you started. The amount of flatness must also be determined at the time the note is actually being tuned, as opposed to preliminary evaluation at the onset.

Pitch raising has been discussed on several occasions over the past couple of years in the *Journal*. Pitch raising procedures were covered in the reviews of the Coleman-Defebaugh and Sanderson classes at the Toronto convention in the September 1987 issue, pages 25-29. A list of points for determining whether or not to raise pitch was presented in the review of the mini-technical by Sid Stone in the September 1988 issue, page 24. The effects of the environment and pitch raising were discussed in the review of the mini-technical by Ruth Brown in the October 1988 issue, pages 19-20.

My experience has shown that taking a little extra time to do a more careful pitch raise really pays off when it comes time to do the final tuning. In addition to changing tension, if we can accomplish a certain amount of string settling and tuning pin settling during the pitch raise process, we are that much ahead in the final tuning pass.

In conclusion, the piano must be (nearly) in tune before it can be tuned. If the piano is low in pitch, it must be pitch raised to accomplish this. Dr. Sanderson's research showed that the pitch drop happens almost immediately, which means that the tuning can be completed following the pitch raise, without waiting several days in between. Pitch raises of up to about 80 cents can usually be accomplished in two passes—pulling up to pitch with no overpull, then pitch raising with overpull, followed by a tuning. These guidelines apply to "normal home" situations, but not to concert situations which are much more critical and demanding. The percentage of overpull varies according to the system of unison tuning. Be careful not to mix and match percentages with different systems. The amount of flatness should be measured against the tuning curve for that note at the time the note is to be tuned. This will give the most accurate results. Finally, a little extra time spent on the pitch raise pays real dividends in time saved during the tuning.

Our next letter comes from Charles Gibson of Caledonia, Michigan. Charles writes:

*Thanks for taking the initiative for the interview with Andre-Michel Schub. Your questions were sensitive and well placed. Moreover, this interview was greatly appreciated, and I think I speak for all piano technicians who have read this gem: Simply ****(four stars)! P.S.: Wouldn't it be wonderful if all symphony managers, concert hall stage managers, and music critics were to share in this information?*

The interview with Mr. Schub was one of the most enjoyable experiences I have had since becoming Tuner Editor. If the response remains favorable, I have more interviews planned in the future. Thank you for your letter of support.

Until next month, please send your questions and comments to:

Rick Baldassin, Tuning Editor
2684 W. 220 North
Provo, UT 84601

Efficient Piano Tuning, Part I

Charles P. Huether, RTT
New Jersey Chapter

In this article we will be considering tuning the piano from a somewhat different angle. We will examine the function of tuning and piano service from the standpoint of a business intended to produce a reasonable income. To organize the presentation we will discuss three general categories: You, the Tools, and the Piano. This month, let's take a good look at ourselves.

I will assume that most of us are working at this business in order to produce a reasonable income. To do this, one must do some frank and honest self-analysis. Working for oneself in a service business, which relies for the most part on direct customer contact, requires a special kind of person and a special attitude towards the work.

The first thing to remember is that there is nothing any one of us can do which most of our customers cannot have done to their satisfaction by someone else. We are not irreplaceable. Customer loyalty grows primarily out of their attachment to us and the way we relate to them. It is not too far-fetched to say that no customer is better able to judge our work than we are ourselves. We are the best and ultimate judges of how well we did the job. The customer appreciates our work and recommends us to others for reasons other than because "*no one* can do the work better."

The second point to keep in mind is that we must be able to handle the work in a reasonable length of time or we will not survive. The product we are selling is essentially time. Do whatever you can to minimize those things which steal time from you.

With these two points in mind, we come to the almost obvious conclusion that we carry around a great burden—one which places on our shoulders the responsibility for the quality of the job we do, plus the burden of making sure we convey to our customer our sense of responsibility.

Fundamental to this relationship is a genuine interest in people. If you can not get along with people, you are in the wrong business, for we do not repair or tune pianos as much as we relate to customers. One has to be comfortable in customers' homes, respect their opinions and feelings, listen more than talk when problems are discussed, accept the fact that we do not always speak the same language (not a foreign tongue, but piano vs. non-piano), and have different preferences and attitudes. We will never find out what is bugging the customer about the piano until we stop and listen and recognize the fact that he/she does not speak "piano" and that what is a "click" to the customer may be a "squeak" to you.

To be a good service person, you must like people and enjoy being with people. You must have respect for other people's opinions, feelings and property and have tact and diplomacy. You must be honest in your dealings and have a strong feeling for the value of what you do. Most important, you must have reasonable skill in what you do.

Assuming that you qualify in all of these points, let us ask another question: How well do you function under stress? Tuning is a stressful occupation, in spite of a recently published listing of stressful occupations which placed piano tuning as the second least stressful job right after actuary.

One tends to relate stress with the magnitude of the job or decisions being made. But research has shown that stress is most often generated by small things. One who has to make numerous and continuous small decisions is working under more stress than one who makes occasional large decisions. When you tune a piano, even in the best of circumstances, you make about 10 decisions every time you put your tuning lever on a tuning pin. Multiplied by the number of strings, you have the basis for a very stressful hour or more.

One can minimize stress by coming prepared. Know your craft; know your customer; know the piano; know yourself. Of all of these, the last one is probably the most difficult to achieve.

You learn your craft by reading, studying, and by taking part in chapter meetings, seminars and conventions. You know your customer by keeping detailed records, listening, and developing rapport. You know the piano by keeping detailed records, by talking with others whenever the opportunity presents itself, and by listening, both to the customer and the piano. You know yourself by listening (there's that word again), this time to yourself, being frank and honest with yourself in assessing your strengths and weaknesses.

In addition to the above, one must learn to reduce tension. Tension makes everything more difficult, even those things we do well. That tension can affect what one does—one need only to watch those athletes we see so often on television. How would you react being at bat in the ninth inning, with two out, three balls and two strikes the count, with the tying run at second, and you the winning run at the plate? It happened in one game of last year's World Series. Almost as bad as tuning on stage when the concert is scheduled to begin in 30 minutes and the incoming audience is *very* noisy.

One can help reduce tension by coming prepared, with confidence, and by developing some sort of tension-reducing techniques. Learn a little Zen; don't rush out of the car and into the house—sit for a minute and take a few deep breaths; learn a little self-hypnosis; make sure you leave in good time for your appointments; drive with care.

To be successful working at a service business, one must relate well with people, and do everything possible to reduce stress and tension. The difficulties of that which we are attempting to do are great enough by themselves without adding to that difficulty by having negative attitudes.

Next month we will talk about the tools of the piano technician.

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Wool Cloth Bushings

Bill Spurlock
Sacramento Valley, CA, Chapter

When I first looked at a piano action I was immediately impressed by the bushing cloth "bearings" in the action centers. I can remember thinking that wool cloth should not be durable enough to hold up; and yet, here was a 60-year-old upright piano action with the hammers heavily worn but with action centers that were still quiet, smooth, and free of excessive play. Indeed, from an engineering standpoint, the simple wool cloth bushing has a number of advantages over the more "sophisticated" bearing types: unlike metal or "plastic" bearings, wool bushings are largely unaffected by a dusty environment, need little or no lubrication, tend to be very quiet, and have the "springiness" to tolerate some jarring loads without permanent damage. For the piano technician, wool cloth bushings offer the additional advantage of being easily made in any required size using only glue, bushing cloth, and simple tools.

As simple and straightforward as wool cloth bushings are, however, they do have unique requirements for manufacture and service. I believe that these requirements are not widely known among technicians (and possibly not completely understood by manufacturers, judging from the action center problems that have occurred with some makes over the years). While I certainly do not have all the answers, I have tried to gain some basic understanding of cloth bushings and how to work with them successfully, and would like to present some methods here that might help others improve their work.

Let us start by looking at what characteristics we want in a bushed part. For lyre rod guide bushings, holes in keybeds for trapwork dowels, grand damper guide rails, etc., we need only have a soft, durable bushed hole with adequate clearance for a smooth, clean dowel or rod to operate with minimal friction. But in the case of action centers, pedal pin bushings, vertical damper lift rod bushings, etc., we need very firm, dense bushings capable of carrying a high load without allowing the part to wobble. We may deliberately strive for a certain amount of friction in an action center bushing to achieve best action function; in other parts we may just accept friction as a condition of an extremely firm (wobble-free) bushing. The density and friction of bushings result from the type of bushing cloth used, the means of sizing the hole, and the fit of the pin in the bushing.

We also want our bushings to be stable; in other words, they must maintain their fit and friction level with use. Stability depends upon the quality of cloth used, how (or if) the bushing is glued in place, and the means of sizing the hole. Stability is also influenced by several factors beyond our control, such as the type of material holding the bushing (wood, metal, or plastic), corrosion of the pin in the bushing, climate variations, and heavy use.

When I first tried to rebush a hammer flange, I understood that I wanted it to have a certain friction level and firmness, but following the standard directions given for rebushing did not work for me.

I drilled out the old bushings, then tore a strip of flange bushing cloth, and pulled it into the flange. Applying a little glue to the cloth, I pulled it a little further into the flange, inserted a center pin, let the glue dry, and then trimmed the cloth. The pin fit too tight in the bushing so I reamed, as I had been told, to get my four to six swings. After sufficient reaming and a little compacting with a burnisher, I assembled the part; and presto! I had a part with the correct friction that wobbled like crazy. Obviously, there must be more to rebushing then I had been told.

It seems to me now that the single most important aspect of rebushing an action flange is the proper sizing of the bushed hole in such a way as to leave the cloth compacted and dense as opposed to chewed up and loose. The best way to accomplish this in most cases is to mold the bushing cloth into the desired shape with a sizing solution and ream as little as possible. This maintains the integrity of the bushing. Excessive reaming removes cloth and fluffs up what is left, leaving a less dense bushing that is more likely to wobble.

Sizing Bushings

Before looking at the actual rebushing process, let's look at how bushing cloth reacts to sizing (commonly called shrinking) solutions. Most technicians are aware that alcohol and water mixtures can be used to "shrink" action bushings. I feel the term "sizing" more accurately describes what happens when we wet a tight bushing with alcohol and water and let it dry to achieve a freer fit.

Shrinking is what happens when you wash a wool sweater in hot water. The sweater shrinks; the sleeves will be too short and the bottom edge will no longer reach your waist. The sweater's wool fibers have gathered up and the cloth has become thicker, as a result of having been wet and left to dry in an unrestrained state. Wool bushing cloth reacts in much the same way; as an experiment, run 10 balance rail punchings through the washer (hot) and dryer, then stack them up next to 10 unwashed punchings. You will find that the "shrunken" punchings are thicker and softer than the originals. However, if you wet 10 punchings and clamp them between two boards to dry, they will be "sized" down much thinner than original. Wetting the wool cloth puts it in a mold-able state, and confining it into the desired shaped as it dries locks it into that shape. In the case of a tight action center, bushing cloth is captive under pressure between the wood and the pin.

Wetting the bushings with alcohol and water allows the wool fibers to relax and assume their captive shape when dry, relieving some of their pressure on the centerpin. This method of sizing cloth bushings is useful for easing existing action centers that are too tight, as well as for sizing a newly made bushing into a stable shape and correct fit.

Easing Tight Action Centers

The first question to consider here is why the centers are tight. One possibility is obvious corrosion such as verdigris on older Steinways. In this case a sizing solution will have no effect on the presence of the verdigris and is, therefore, not the right treatment. (As treating verdigris is off the subject of this article, I will not cover it except to put in my vote for parts replacement in most cases.) Another very common situation is the five- to 20-year-old piano which has been sitting unused and is found to have become sluggish even though not stored in a damp area. I suspect the problem here is oxidation of the centerpins and/or some slight reaction between the pins and cloth which develops while the parts are inactive. I have always found alcohol and water to work well in such cases, even if the centers have been previously treated with a lubricant. Moderate heat to speed the drying of the centers will increase the effect of the sizing solution. I have never found generic "centerpin lubricant" to have any significant heat; in such cases it was probably the heat alone which eased the centers by drying and ironing. The only centerpin lubricant I use regularly is that supplied by Wurlitzer for use on their actions; it works instantly and reliably on their action centers but has had no effect on other brands of pianos for me. In some cases sluggish centers seem to develop as a fairly new piano is played; in such cases I suggest contacting the manufacturer's service representative for brand-specific advice.

In almost all cases I find the sizing solution to be the most predictable and permanent cure for sluggish centers. The main active ingredient in the solution is the water, although straight anhydrous (containing no water) methanol will usually have a slight easing effect on tight centers. The higher the proportion of water to alcohol, the greater will be the easing effect. There is no way (other than to repin) to tighten up an overeased bushing, so it is essential to start out conservatively and increase the proportion of water as necessary for successive treatments. Be aware that common isopropyl rubbing alcohol contains around 30% water and is, therefore, a very strong sizing solution. As various actions respond differently, I prefer to use methanol from a chemical supplier and add my own water as needed to get the desired effect.

My procedure is as follows: with the action in the piano (verticals) or on the bench (grands) I get some idea of the extent of the sluggishness. If only a spot problem exists, I chalk the affected parts, then remove one very sluggish and one not-so-sluggish part and test treat them with straight methanol (available anhydrous or with 1/2% to 2% water), setting them in a warm place. When dry, I "exercise" them by swinging a few times and observe the result. Many times the straight methanol will correct slight sluggishness. If necessary I will follow with a 10% and possibly a 20% water solution to achieve sufficient easing. It is much better to ease gradually and in stages than to overdo it and end up with wobbly parts. Gentle heat and a fan can be used to expedite the process; however, excessive heat might produce a dramatic initial easing effect with sluggishness returning later.

Rebushing Action Centers

Achieving a firm, dense bushing in an action part begins with removal of the old bushings. First, the old bushings should be pushed out with a centerpin tool rather than drilled out, because the drill can often cut partially into the wood and eave an enlarged and oblong hole. Secondly, the right size drill should be used to clean the hole. All flange holes I have seen measure approx. .104'"; do not clean the hole out with the 7/64" (.109") drill the supply houses provide for this purpose or the hole will be enlarged, setting the stage for a wobbly pinning job. Use a #37 (.104") drill instead, turning it first counterclockwise into both holes, then clockwise one turn to remove any remaining cloth or glue.

Next, pull the point of a torn strip of flange bushing cloth through the flange and almost to the end. The cloth strip should be wide enough to fit very tightly into the flange. Apply a small amount of aliphatic resin or hot hide glue to the cloth adjacent to each flange ear and pull the glued portions on into the flange. Select the size centerpin to be used (that which is tight in the birdseye) and insert it into the bushed part. Allow the glue to dry about 20 minutes and trim the excess cloth flush with the flange.

At this point the usually recommended procedure is to ream the bushing to fit. However, as already discussed, reaming tends to result in a mushy bushing. We want to do everything possible to compact and densify the cloth to create a free fitting bushing but one that will support a lot of load without wobbling. This fit is best achieved by wetting the bushings with a 10% water/alcohol solution, inserting the centerpin and allowing the part to dry in a warm place. If rebushing a number of parts in the course of a major action job, I suggest letting the parts sit for a couple of days after sizing to fully stabilize before proceeding with final fitting. If rebushing a part in the field, the part can be treated with straight methanol (for fastest drying) immediately after glueing and insertion of the pin and set in a sunny window or under a piano lamp to dry for 15 minutes.

Next, test for correct and equal fit of the pin in both bushings. If sized with the methanol solution, the fit should feel only a little too tight; if so, pin the parts together and check for friction. It is here that most people go wrong: the newly pinned part will immediately loosen up with some initial exercising, and stabilize at that point. If the part is reamed, burnished, or sized to have the desired friction level when first assembled, it will be too loose after a small amount of use or handling. A hammershank and flange might swing only three or four times immediately upon pinning. However, holding the flange firmly between the fingers and swinging the shank vigorously back and forth 20-30 times should cause it to free up to five to seven swings. Further exercising should not result in any further loosening. You should expect this initial loosening and therefore, strive for a fit that seems a little too tight, breaking the part in by swinging before judging it okay and clipping off the pin.

When reaming is necessary, I suggest keeping it to a minimum and using tools which take as fine a cut as possible.

In the field, I use a centerpin (one size smaller than the pin to be fitted) roughened by rolling under a file, and held in a pin vise. In the shop I have just started using the system described by Don Mannino in the October 1988 *Journal*, page 16, using broaches made from sections of straight smooth wire roughened in one area with the edge of a file. These are essentially broaches and smooth burnishers all in one, that allow very controllable and consistent results. I believe that at present these are only available from Renner in Germany. I am not a fan of the square tapered reamer; they seem to me to be too coarse a tool to be controllable, sort of like combing your hair with a rake. Whatever tool you use, the bushing should be compacted with a smooth burnisher and broken in as above. The final and most important test for a pinned joint is the test for wobble. Even if a part has the desired friction, if one side is much looser than the other the part can wobble. To test, hold the flange down firmly on a solid surface and gently flex the part side to side. If any wobble is felt, or if the centerpin appears to move back and forth in the bushing, the bushings are not dense enough or one side is too loose.

Choosing Bushing Cloth

For any piano bushing that will carry a heavy load, always use firm dense cloth. This usually means red flange bushing type cloth with the white center. Why is the center white? According to action cloth makers, cloth dying methods in the old days were such that the dye would not penetrate the dense cloth all the way, and so the center remained un-dyed. Today, the cloth could be dyed all the way through, but customers (us) have come to associate the white center with quality, and so the manufacturer must go through additional steps to produce a cloth that is only surface-dyed so we will like it. All white-center cloth sees to be of the dense variety, but some solid-color cloth is also very good. The white-center cloth made in this country is all essentially the same thickness, while some available from Europe is available in a variety of thicknesses. Peter Van Stratum of Charles House Felt Co. says that their woven felt for pianos is "decated" (something similar to permanent pressing in clothing) and that this makes it more stable through humidity changes.

Rebushing Other Piano Parts

The methods just described can be used for other cloth bushed parts in the piano to produce the best result in the most efficient manner. One such part is the vertical piano damper lift rod bracket. This is usually a metal bracket bushed with cloth, which frequently squeaks when worn. This part carries a heavy load, so it must have a very dense bushing. At the same time, it must have very little friction so the lift rod falls freely away from the damper levers, otherwise ringing dampers can result. To rebush this part, remove the old cloth and tear a strip of firm flange bushing cloth wide enough to line the hole, with the torn edges of cloth wide enough to line the hole, with the torn edges of the cloth butting together tightly where they meet. As a rule of thumb, the width of the cloth strip should be three times the diameter of the hole to be bushed. Dry-fit the cloth in the bracket and slide it over the damper rod hanger; the fit should be very tight. Apply a small amount of glue to the cloth, insert and trim, then slide the bracket onto the damper rod hanger (or a drill bit of equal diameter) to dry. After 30 minutes size the bushing with a fairly strong (30%) water/alcohol mixture, with the hanger or drill still in place, and let dry in a warm area. For a quick field repair, skip the gluing and just size, dry and reinstall. When reassembling, put a small amount of VJ Lube on each hanger. Double check that the lift rod falls freely back to the action rail when the action is tilted back slightly.

Pedal pivot pin dowels can be rebushed in the same manner as above, except that the fit does not need to be so free of friction.

Rebushing grand damper guide rails is the job that really convinced me of the value of sizing bushings. As with action flange rebushing, I followed the standard procedures which conclude with instructions to ream or compress the new bushings so the damper wires will fall freely. My experience here was that compressing did not last; the cloth would always spring back and cause sluggish dampers. Reaming would enlarge the holes but left the cloth fluffed up with a lot of fuzz dragging on the wires. If reamed enough to eliminate all drag, my bushings were too sloppy to accurately guide the wires.

Besides producing stable, accurately sized bushings, the alcohol/water treatment takes much of the work out of the job. My procedure is as follows: Remove the old bushings by dabbing each with a brush and wallpaper remover/water solution (if they were originally glued in), and poking them out. As in removing flange bushings, a drill can sometimes cut partially into the wood, causing an enlarged and misspaced hole. If necessary, use a drill carefully after bushing removal to clean the holes. Next, choose a proper width and thickness of bushing cloth such that when placed in the guide rail dry, the damper wires will not drop through but can be pushed through with little effort. Once the proper cloth is found, tear four or more identical strips. Clamp the guide rail vertically in a vise so you have access to both sides and insert cloth (from the bottom side of the rail) into as many holes as you have strips. By using multiple strips you minimize wasted motions in tool handling and speed up the work. You may wish to locate the joint of the cloth on a particular side of the hole that will experience the least pressure from the wire. I personally feel that if the cloth fits the hole properly the joint will be indistinguishable from the rest of the cloth. Pull the strips almost to their ends, apply a small amount of aliphatic resin or hot hide glue, and pull in until flush with the bottom of the rail. Poke an awl into each bushing to seat the cloth against the holes and trim all cloth flush with the top of the rail. Bush every other hole first to give yourself more working room. When the glue has dried a short time, turn the rail over and dab each bushing with methanol (water content not important), immediately insert a #7 bridge pin (.086") into each bushing, and let dry thoroughly. You will find that the bushings turn out completely smooth, round and free of fuzz; they should be ready to accept their wire with no adjustment whatsoever.

A word about glue; I always glue damper guide rail and other bushings in, even if they were not glued originally. Some feel that glue might cause noise; that should not be a problem if the correct amount is used. A small amount of the proper glue gives a structure to the outside of the bushing cloth and

bonds it to the wood. Together with proper sizing methods, this creates a stable bushing shape.

In summary, accurate long-wearing bushings can be easily made by following these principles:

1. Remove the old bushings by some means that does not enlarge or damage the hole to be bushed.

2. Select good quality bushing cloth of the proper thickness and tear to width so that when installed, the torn edges merge well.

3. Glue all bushings in place with a small amount of glue of a type that tacks quickly before penetrating far into the cloth and sets up rigidly (aliphatic resin or hot hide glue, not cold hide glue which remains liquid too long).

4. While the glue dries, clamp the cloth with the pin to be used.

5. Size the bushing with alcohol/water solution to mold it into the desired shape. Ream if necessary, but carefully to avoid fluffing up the body of the cloth, and follow with a smooth burnisher.

6. Lubricate heavily loaded bushings such as pedal pivots and damper lift rod hangers sparingly with a "clean" lubricant such as VJ lube.

7. "Exercise" the part after assembly to check for final fit; check for wobble.

Next month Fern will continue this series with a look at springs in vertical actions. ≣

Setting the Plate on the Dowels

Nick Gravagne
New Mexico Chapter

Whether building a new piano, or rebuilding an old one, "setting the plate" is about as important to quality results as any one phase of the work can be. In fact, some will say that setting the plate, either correctly or incorrectly, is defined as a function of overall piano performance. As will be explained, this definition is more literally true than it might seem on the surface.

Aside from the obvious purpose in resisting the pull of the strings, generally it is the function of a piano plate to establish downbearing and to set the height of the strings relative to the keybed. The word *function* is specifically used here as in higher mathematics, i.e. y is a function of x, [expressed y=f(x)], if for every change in the value of x there is a corresponding change in the value of y. The value of y is said to be *dependent* on the dictates of the *independent* value of x. (An intimate knowledge of these mathematical concepts is not necessary in order to read this article).

Relative to plate setting, this terminology may seem superfluous and unnecessary. Actually, this concept represents a line of reasoning which is quite helpful in keeping the horse before the cart, not only in piano technology, but in all technical, natural, and social investigations. As to our subject at hand, where there is a change in plate height (our independent and controlling variable x), there is a direct change in both downbearing and action mechanics (our dependent variables which are a function of, and controlled by, x). It follows, then, that setting the plate is a function of overall piano performance. This concept of an independent variable controlling a dependent one is basic to the following discussion and will come up again.

Since this article introduces setting a plate for downbearing it would be helpful to briefly consider a few basic approaches used by new piano makers.

Usual Plate Setting Practices

As most of us know, the usual practice for setting downbearing in a new piano is to allow for the bridge height to be the dependent variable. That is, the height of the bridge in the finished piano depends on where the plate is set. This being true, it matters little if the soundboard crown is a bit more or less from one piano to the next, or if the plate castings vary a little, or if, for whatever reason, the plate happens to be set a tad higher in one piano than another. Any of these variations, or inconsistencies, can be accounted for at the bridge height. With bridges that are purposely capped or built too high, it is a relatively simple matter to set downbearing by planing the bridges down until the specified angle of downbearing is achieved. Using our math terminology here, the plate is the independent variable (x), and the bridge is the dependent variable (y which is a function of x). Hence, downbearing in this type construction is a function of plate setting. This is still the most straightforward and easily comprehensible approach to setting the bearing.

The unique Baldwin accu-just concept for downbearing, although it might seem radically different, is also a function of plate setting. The difference is that instead of the bridge height being the variable factor which must be altered, it is now the rear string length which must be manipulated to set a downbearing angle. Baldwin accu-just pianos do not have rear string rests, such as duplex bars; but the effect of setting bearing in these pianos is as if they had rear string rests which were adjustable up or down.

Another possible method for setting bearing is actually the reverse of those just mentioned. That is, instead of the plate being the independent variable with dependent bridges or rear string lengths, it is now the bridge height, as set to a predetermined level, dictating the height of the plate. In such a case we say that the bridge height is the independent variable and the plate height is now dependent upon the bridge. This method, which is not common among piano makers, can be tricky—and potentially very frustrating—if everything isn't well thought out. You can imagine an instance where the plate has been finally maneuvered into some semblance of optimum downbearing, that the string height may be all wrong, or the pinblock may have to be dimensioned according to four different readings (at the four corners) in order to accommodate a combination of side-to-side plate canting and fore-and-aft tipping. This system necessitates excellent quality controls at all levels of the manufacturing process—materials handling, processing, workmanship—in order for uniformity and convenience of product quality to be realized. Still, the advantages are similar to new Baldwin construction (although stricter) in that certain processes are not duplicated or eliminated altogether, i.e., having to install the plate, test and gauge for bearing, kerf the bridge tops, remove the plate, plane the bridges down, and, finally, notch and pin the bridges where they are in their most inconvenient location—attached to the soundboard which is glued to the case. Of course, after all this is done the plate needs to be reinstalled.

The purpose of these brief explanations is not so much to remind us how piano makers build their pianos, but to channel our thinking on the types of conditions, logical processes and possibilities which must be reckoned with in setting downbearing from the standpoint of the rebuilder. As it turns out, the rebuilder will have to face one of these two types of construction approaches depending on what is done *with the bridges*. That is, downbearing will either be a function of setting the

plate and working the bridges for proper bearing, or it will be a function of setting (for retaining) bridge height and working the plate for proper bearing.

Considering what has been discussed so far, the process of setting a plate over a new soundboard is most radically affected by whether the old bridge is being reused. Finding good, reusable bridges in a piano which otherwise needs a new soundboard is a mixed blessing. True, major bridge reconstruction is avoided, but partially at the expense of having to take greater pains in the following: duplicating the existing thickness dimensions of the original soundboard, particularly in the grading directly under the bridges; taking a good, intelligent guess at how much crown probably existed when the piano was new; in setting the plate simultaneously for optimum downbearing, for practical pinblock dimensioning, and for proper string height. Nonetheless, a good bridge is a good bridge and any extra thought or pains which must be taken regarding the other aspects of belly work is still less trouble than making a new bridge. All of these aspects of rebuilding will be covered in due time. For now, let's consider—

Setting the Plate on Dowels: New Soundboard and Bridges

The remainder of this article assumes that the plate is going to be set over new bridge caps. Considering the preceding discussion, the plate can be considered the independent variable and does not have to answer to the bridge height. A future article will consider setting the plate relative to the original bridge height.

Keep It Simple

Although it may not seem obvious, the most logical place to re-set the plate is back in its original location. This is a generalization, of course, but it is oftentimes true of many old instruments. It can be reasonably assumed that the plate was initially located for proper downbearing and action mechanics. Presumably, the soundboard is being replaced because it is either flat (inadequate bearing), or seriously cracked and compromised, or simply dead (although crown may be evident). In these instances it is no the position or condition of the plate which is wrong (or has gone wrong) but the soundboard. It is evident, then, that replacing the old soundboard with a newly crowned and resilient one is the required remedy, not upsetting or discarding the original settings and dimensions relative to the height of the plate.

Precautions

Obviously, this line of reasoning is assuming that the original specs and components look as though they are worth recording and duplicating. But this kind of investigation is nothing new. It is done all the time regarding the original hammers, the strike line, the pinblock, the stringing scale, and a host of other replaceable parts and systems. But how do you know if setting the plate back to its original (or settled) position is a good idea?

Well, for one thing, do the original dowels look sound? Or are they hopelessly crushed and misshapen or even loose in their holes? For starters, the dowels should look firm and solid. Are the dowels actually protruding above the soundboard or are several of them flush with it or even crushed below the soundboard surface due to plate tightening and retightening over the years? Look for dowels which are protruding some measurable amount (it may be small), above the surface of the soundboard.

Something else to consider is plate straining. Clearly, it is poor practice to seriously strain piano plates. Upon loosening the lag screws, most plates will relax and lift a bit off the supports indicating that the plate was not sitting on the dowels, but was, rather, being flexed down to them and held there. If the plate rises off the dowels by significant amounts (1/16 to 1/8"). something is wrong. Remember, since the pinblock screws should be in for this test, and the nosebolts should be down below the underside of the plate, a lifting plate would indicate that the pinblock is preventing the plate from sitting evenly on the dowels. Another possibility is that the plate is sitting on the pinblock and, perhaps, a few dowels, and these random points of contact are preventing contact elsewhere. In any case, it makes no sense to follow the old plan when it is found to be too far out of whack.

But if the plate does not seriously lift off the dowels, and the dowels themselves look healthy both as to soundness of shape and ample protrusion above the top of the soundboard, you should be able to confidently consider the original location of the plate to be a valid primary reference.

Now, since the bridge caps need replacing, the logical sequence of events in setting bearing is to attach the new, oversized capped bridges to the new soundboard and then install the assembly in the case. Next, the plate is repositioned (in all three axes) according to original position. String tests are made and the bridges are kerfed to effect some desired angle of downbearing. The plate is removed and the bridge is planed, graphited, drilled, notched and pinned. But notice in this sequence that installing the plate to its original position of the plate must be *known*, that is, notes and measurements need to be taken at tear-down time.

The Original Plate Location—Where is It?

Repositioning the plate to original specs is really very simple in concept but requires careful measuring and duplicating. First, it is clear that the pinblock dimensions must be duplicated, which is really to say that the tuning pin face of the new block must lie in the same plane as the old block regardless of whether the underside of the replacement block must be planed, or shimmed at the ends in order to accomplish this. The other critical dimensions to note are the individual heights of the nosebolts which should be recorded in your notebook. We use a long straight-edge across the top of the outer rim and measures down to the top of the bolt. At the same time we file a small notch in the tops of the bolts so that all notches are pointing toward the front of the piano. At installation time the combination of turning the nosebolt down to the recorded amount as well as orienting the notches assures the proper height. However, as was mentioned in a previous article, you will be taking erroneous notes if, at tear-down time, the nosebolts are not first *turned down* enough to clear the underside of the plate, and then back up just enough to clear the underside of the plate, *before* the lags are loosened. (Note: the more common understanding of both side-to-side plate location and pinblock work will be ignored here.) When it is understood that the new pinblock will

be dimensioned according to the original, and after the original heights of the nosebolts have been recorded, it remains to consider that final set of components which complete the plate support system—the dowels.

Notice that the dowels are considered last in the sequence. That is because the heights of the finished bridges, the pinblock, and the nosebolts all depend on the required height of the plate; that is, they are all dependent variables which are a function of the plate height. For the moment we are concerned with simply relocating the plate more or less according to its original position—which simplifies matters.

In order to get a good mental picture of all this, imagine that the plate is magically suspended in air and lowered over a new soundboard which has oversize bridges. Those items not yet in place are the pinblock, the nosebolts and the dowels. The plate is slowly lowered until, simultaneously, the string height is the correct dimension from the keybed, and too much downbearing is apparent, and the underside of the plate perimeter is not touching the top of the soundboard, (although it may be very close). When the plate is in this location the magic word (stop) is uttered and a pinblock appears in place, nosebolts materialize, turning upward to make contact with the underside of the plate, and wooden dowels extrude upward out of the inner rim until they make contact with the plate. That's it. That's where the plate belongs with all its support components in place and adjusted. Except for the mumbo jumbo, the rebuilder needs to make those settings, and in that sequence.

The Dowels

We've covered the easier aspects of the pinblock and the nosebolts, but what about the dowels? Let's continue.

Making a quantum leap forward now, imagine that the new soundboard with bridges (and oversize caps) is, in fact, installed. Bearing has not yet been set. The lag holes have not yet been drilled through the soundboard and the dowels have not yet been installed. The new pinblock should be in. (Actually, if the old block hasn't been removed yet, you can work with it for this procedure since it only serves to position and support the front of the plate. You must

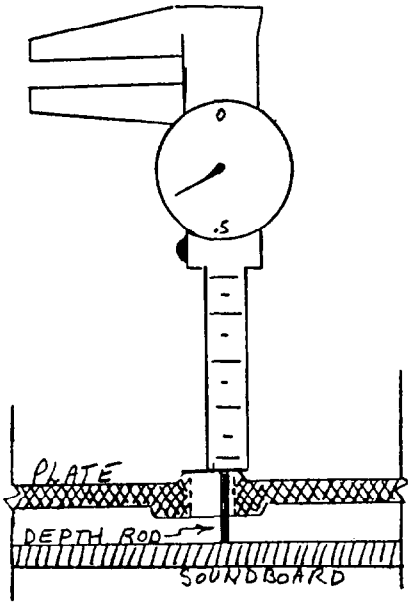

Figure 1

have confidence, however, that duplicating the old block dimensions is not going to be a problem.) A few selected nosebolts should be in and turned down to their original heights. At this point in the rebuild the plate will be lowered in place for the first time. (It will have been the second time if the rebuilder's preference required it for new pinblock positioning. I generally don't work that way and will explain in some future article.)

Some words on plate considerations and preparations are in order here. When the plate is upside down for pinblock fitting it is in a convenient position to accomplish some other necessary work. The string bearing under the capo bar should be cleaned up and reshaped with files and then polished. Additional work on the plate, the purpose of which will be made clear momentarily, should include filing or grinding to a flat surface those places on the underside of the plate which will contact the dowels. These areas are often nubby and untrue. Use metal files and cutting fluid or a portable grinder. The idea is to even out the surfaces and create a more or less even thickness in the plate bosses at the lag screw holes. Don't get carried away or too fussy here. Lastly, measure the thicknesses of all the plate bosses and record the dimensions in your notebook. The best tool with which to make this measurement is dial calipers; it should give readouts in .010 inch increments. There are very inexpensive, plastic models available (which may cause a machinist to chuckle) that are very suitable for this and many other shop applications.

It is now time to accomplish the following: establish downbearing at the bridges; make measurements for dowel heights; and drill the lag screw holes through the top of the soundboard, (the holes in the inner rim will be right underneath). Although establishing bearing at the bridges is the next logical step, it will have to be covered in the next article since it is a subject unto itself. Anyway, this immediate discussion is about getting the plate back to its original support height. With that in mind, it is time to consider the dowels.

At this point the plate should be temporarily installed and attached to the pinblock with every third screw (or so) and also secured to the nosebolts with the nosebolt nuts. It is not necessary to install all the nosebolts, but however many you put in, they should be set to their original heights. The plate is thus supported at its front and middle sections but is, as yet, unsupported (suspended) at the perimeter. It is now that the required dowel heights must be determined. The dial caliper mentioned earlier is the tool to use since it should have a depth gauge feature. Place the gauge on end near a lag screw hole (as shown in Figure 1) and lower the depth gauge rod through the lag hole until it touches the soundboard. Pay attention to hold the calipers at a right angle to the plate. Check the measurement and make a mental note. Retake the measurement around the hole in a couple of places for assurance's sake. Note the measurement in your notebook next to the plate boss thickness measurement taken earlier. Now it should be evident that the difference between these two dimensions (the depth measurement taken through the lag hole minus the plate boss thickness) is the required height of the new dowels. Let's say, for example, that the depth dimension through the lag hole is .780-.650 which is .130 inch. That's fine—but how do we actually set a dowel to a prescribed height?

Before removing the plate, mark the position of the lag screw on the soundboard using the plate holes as guides. Don't forget to drill through to the hole underneath before you reinstall the plate later on. Cutting the lag holes through the soundboard will expose freshly cut

wood fibers: swab the inside of the hole with shellac or varnish to protect against moisture.

Installing the Dowels

This operation entails setting the dowels to the required heights as well as locating them as to their proper distance from the lag hole while insuring that they will be under the thickened plate boss; not half under as you may have found them. If you remember that the locations of the dowels should form a straight line with the lag hole, there isn't much more to say except to center punch their locations for drilling. Dowel diameters are typically 7/16 or 1/2 inch. Unless there is some reason not to, I always use 1/2 inch dowels.

Before you drag out your 100-pound leviathan power drill, recall the nature of spruce. If you start drilling those big holes (lag holes or dowel holes) with an ordinary jobber bit at slow RPMs, you will tear up the soundboard. It is a better idea to drill these necessary holes through the spruce only with a gentler Forstner type bit which will make a nice clean hole. A spade bit can also be used but it's not as clean. This first drilling can be done using a smaller high-speed power drill. If you don't have a bit extension, you will have to angle the drill a little in order to clear the outer rim. Long spade bits are commercially available. When the spruce has been cleanly drilled, it is time to get rough.

The inner rim is hard and dense requiring a heavy-duty drill something on the order of seven amps and one HP. Set a piece of masking tape as a depth gauge on a 1/2-inch bit somewhere about 1 1/2 inch from the point. The bit should be long enough to clear the top of the outer rim. These long bits are generally available for purchase. Place the pointed tip of the bit into a hole, being careful to maintain a right angle to the hole. If necessary, clamp a block of wood to the inside of the rim for a visual guide in maintaining a vertical entry of the bit into the inner rim. A perfectly vertical hole is not essential, though. Steady yourself and the tool against that first surging torque and drill the holes.

Although ordinary hardware store dowels will work, hardwood dowels, such as oak or birch, are preferable. Cut them about a sixteenth of an inch longer than they need to be in either a miter box or on the band saw. Don't forget that the lengths are not all the same. Cut in a vertical groove to allow for glue to escape. Swab the side and bottom of the hole with glue and tap in the dowel. Clean up excess glue and let dry.

Trimming the Dowels

My favorite tool for this is a Forstner type drill bit on an extension as was mentioned in last month's article. The bit's centering spur will leave a small dimple in the top of the dowel as it trims the wood. Depending on your confidence and skill, you can do this trimming either free-hand with or without a visual guide block, or with the aid of the dowel trimming jig also mentioned in last month's article. For me, the jig is indispensible for plate canting (non-uniform lowering), but is not essential for general dowel trimming such as we are presently considering. If using the jig appeals to you for this application, remember it is slower going than free hand but it is very accurate and insures a flat, non-sloping top to the dowel. It is necessary to stop and re-start the trimming process in order to measure the dowel height with the depth rod on the dial calipers. Be careful not to trim off too much; but if you do, a first class remedy is to bore a 3/8-inch recess in the top of the dowel (again Forstner bits are ideal) and glue in a hardwood plug (birch usually), the kind used for covering over recessed wood screws. This plug will have a lower diameter of 3/8 inch and the diameter of the mushroom shaped head is 1/2 inch. When dry, trim again. When all the dowels have been trimmed they should be coated with shellac or varnish.

To reiterate, the logical sequence of events should dictate that the bridges be kerfed for downbearing *before* the plate is removed for dowel installation. When the plate is removed, the bridges are planed down and finished and the dowels are installed. Unmistakably, the height of the bridges and of the dowels are functions of setting the plate.

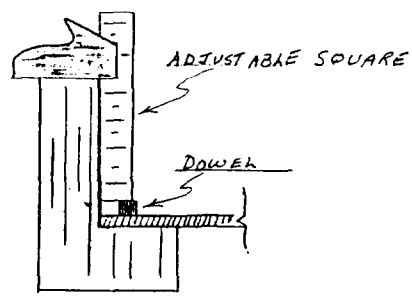

Figure 2

Copying the Original Dowels?

It may have occurred to you that since the dimensions of the new pinblock can be duplicated based on those of the old block, and since the original heights of the nosebolts can easily be reset, it should follow that the heights of the original dowels can simply be measured and new dowels installed to those settings. This would seem to simplify things by eliminating the processes of grinding the plate bosses flat, measuring the thickness of the plate bosses, taking depth measurements through the lag holes, and making several subtractions to determine new dowel heights. Yes, this is true—but not always possible or recommended. The criteria are the same mentioned earlier under the heading "Precautions." But if the existing heights of the old dowels look as though they are worth recording, they need to be measured before the old soundboard is removed.

Measuring the Heights of the Original Dowels

The original heights of the many dowels may be measured relative either to the top of the old soundboard or to the top of the outer rim. But note that the new soundboard, by either small error or design, may not be the same thickness at the rim as was the old board. For this reason (and simply because I find it easier) I am in the habit of measuring dowel heights from the top of the outer rim. Figure 2 shows one way to measure the dowels. Note that the straight-edge/ruler part of the adjustable square is hugging the case; this insures consistency, and there is no question when it is time to install the new dowels as to how the measurement was made. Because some dowels were not originally positioned directly under the thickened plate bosses (as they should have been), they are stepped. Make the measurement to the lower step and compare it to its non-stepped brother. Use the dimension which will work for both dowels and make a note to move that errant dowel closer to the lag screw hole where it will be fully (or more fully) under the boss.

Book Review

Larry Fine's The Piano Book

Michael A. Campi
San Francisco, CA, Chapter

Larry Fine, author of *The Piano Book*, is a registered craftsman member of the Piano Technicians Guild. He received his training in the Department of Piano Technology at Boston's North Bennet Street School. Mr. Fine holds a B.A. from the State University of New York and has been a piano technician in Boston since 1975.

The Piano Book is very well laid out, the information is presented clearly and concisely and the "How To Use This Book" section at the beginning will save many a piano buyer some time when initially consulting the book.

Following is a brief outline of the chapters and their content. This, I hope, will save many a technician some time when initially deciding whether or not to read the book.

Chapter one, "How the Piano Works," explains how the piano is assembled with illustrations showing each part and how it fits together with each succeeding part to form a piano. This is followed by a section on how grand and vertical actions operate. It is good, basic information that should help the novice technician as well as the buying public.

Chapter two, "Buying a Piano: An Orientation," provides good information on how to isolate one's requirements in a piano and how to begin your search for the piano of your dreams.

Chapter three, "Buying a New Piano," is a very good chapter that will enable all who read through carefully to steer a course through the rocky waters of the piano purchase with success. It is also a good chapter for the novice technician as it contains a discussion of stringing scales, bridges, soundboards, and other items that can be of use either in buying or selling a piano.

Chapter four is entitled "A Consumer Guide to New & Recently Made Pianos." I found this chapter to be exceptionally interesting because of the historical notes describing piano companies in the U.S. It includes facts that may come in handy for a technician who does appraisals. Also, the list of companies gave me a clearer picture of exactly what pianos were and are produced by what manufacturers. My only objection to this chapter is the mention, on page 72, that a satisfactory piano that is average, mediocre and uninspiring would be suitable for a beginner. I would also like to see a more expanded miscellaneous section with more detailed information on the European pianos.

Chapter five is called "Buying a Used Piano." The recommendation that an experienced technician go along with people buying a new or used piano is without a doubt one of the most valuable pieces of advice in the book and, once again, in this chapter the brief historical notes are very interesting. How to check out a used piano is thoroughly covered and well thought out and will help immensely in preventing the readers of this book from getting off on a bad foot with their piano purchase.

Chapter six, "Steinways Old & New," contains good historical information and an interesting overview of the Steinways of the past and present and also the opposing viewpoints as to whether or not the Steinway is as good as it used to be. Coverage of the ownership changes and how that affected the quality of the piano is included as well. The chapter then goes into an explanation of various technical points such as the accelerated action, teflon bushings and other innovations and inventions credited to Steinway. It closes with a complete list of Steinway models from 1853 to the present which was quite informative.

Chapter seven, "Piano Moving and Storage," gives a fairly good idea about what is involved in a piano move. Having moved pianos myself for about a year in various cities and states, I was rather curious to find out who the movers were that preferred to use a hoist and go through a window rather than the stairs on anything other than a first floor move. I know this is done on occasion, but in my experience, and having talked to quite a few movers, I have yet to meet even one who prefers a hoist to stairs or has ever even used a hoist.

The section on international moves, who does it and what it entails, is good as is the suggestion that pianos not be stored if it can be avoided. The effects of moving and storage in the closing part of the chapter will be useful when a technician must explain what happens in these situations and why some extra service may be in order.

Chapter eight, "A Beginners Guide to Piano Servicing," should be excerpted by Larry Fine and sold as a pamphlet to technicians so that they can give them to their customers. This would help in making the piano playing public aware of their piano's needs and help the technicians in arranging a satisfactory service agreement.

All in all I thought it was a good book and could possibly be used as a text for musicians who are interested in learning more about their pianos. I for one hope that the piano buying public reads this book thoroughly. ≡

Good Vibrations...

Take measurements at all the dowels and enter the data in your notebook along with a drawing.

Why go to all the trouble with dowels when the Baldwin all-thread screw type suspension system can be used? Answer: the Baldwin system *cannot* always be used. For example, the lag holes in the plate may be grossly out of round or the plate perimeter screws may be deeply countersunk.

We'll have to continue next month. Stay tuned. ≡

At Large

Posey Sounds Off

Jim Fisher
From *Forest World*, Spring 1988

One of the best-kept secrets of the forest industry in the Pacific Northwest can be found today along the Pacific Coast in the state of Washington. Located in the city of Hoquiam, population 10,000, is a forest products company with a special market for the Sitka spruce it purchases.

For more than 75 years, the Posey Manufacturing Company has gone about its business on the shores of Grays Harbor. So quietly has this company operated in the midst of some of the giants of the industry, such as Weyerhaeuser Company, that few people in the community can explain just what they manufacture.

Since 1909, Posey has manufactured many specialty products from the fine-grained lumber of Sitka spruce, but their major product has been sounding boards and other parts for the world's finest pianos. In the past three-quarters of a century, more than five-and-half million sounding boards have been produced by Posey.

These parts are shipped throughout the Midwest to Indiana, Arkansas and Mississippi. Another customer is located in Hong Kong, and the company may expand to other overseas markets.

Baldwin and Kimball are among the better-known names that currently have Posey sounding boards. In the past, another customer was the Steinway Company, whose owner, John Steinway, praised the quality products as "the singing voice of the piano."

Over the years, Posey has manufactured a number of other specialty products, ranging from tongue depressors to wooden bowls and trays, from table tops to wooden water pipes, from mail order gift boxes to a piece of history that hangs today in the Smithsonian Institution in Washington, D.C.—Sitka spruce was used in Lindbergh's *The Spirit of St. Louis.*

So insistent was founder John V.G. Posey in selecting only the best Sitka spruce for his vertical grain lumber, that he was known in the piano world as John "Vertical Grain" Posey.

The story of the Posey Company began around the turn of the century in New York state. A man named Dolge had started a company there, making piano sounding boards using eastern spruce species. He decided to move to Los Angeles where he took on a partner to start a similar company using Sitka spruce. In 1909, the Dolge-Posey Company relocated to Hoquiam in Washington to be closer to the supply of spruce growing along the Pacific Coast from Alaska down into the Pacific Northwest and northern California.

Posey and Dolge had been attracted to Sitka spruce, *Picea sitchensis*, like many lumbermen before and after them. These trees, found in a climate of major rainfall and usually rich soil, grow slowly to heights of 200 feet and diameters of 10 feet or more. Some of the giants may have been growing for more than 800 years along the fog-shrouded coast. Besides a fine quality of appearance and sound characteristics, Sitka spruce is tasteless (good tongue depressors) and has a reputation as the strongest wood in the world for its weight.

Dolge soon sold out to Posey and the Posey Manufacturing Company continued operation. After a few years, Posey sold the management of the company to others, but remained an investor until his passing in 1969.

The company successfully manufactured piano sounding boards and other parts for many years. They even weathered the Great Depression of the 1930's when piano sales dropped off. The company went to making novelty items, such as wooden bowls, trays and plates to keep their employees working and the company in business. Recently, a letter arrived from a woman in the eastern United States asking for background information on some wooden plates she had acquired with the Posey name on them. This sparked an interest by the company to learn more about its history. They purchased the plates and have started a collection of products produced by Posey over the years to display in the office.

In 1986, after seven years of financial losses, the owners of Posey decided to divest themselves of their operation. Two piano companies had gone broke following the recession of the early 1980s and the owners were not interested in taking additional risks at their advanced ages. The 39 employees of the company, down from a high of 150 during the good years, were offered the opportunity to purchase the stock. The sale was arranged and the company's life was extended with Frank Johnson as president and Duane Granstrom as vice president/general manager.

A look at the production plant showed it to be an old facility, but still in good condition. The machinery was equally as old, but still the best equipment available in the minds of the new owners. There was, moreover, the best resource of all available—the quality Sitka spruce lumber and the skilled craftmen to do the work. What was needed were some new markets.

One of the first markets developed was garage door insert panels. Soon after this product started doing well, a piano company that had done business with Posey years ago started purchasing parts for both grand and upright pianos. Gradually, the company returned to a profit-making business and the number of owner-employees that had dropped to 13 began to increase.

Johnson and Granstrom credit two actions to their recovery—a more aggressive marketing of their products to piano manufacturers and a more selective approach to the purchase of high quality logs from Alaska, as well as Canada and Washington.

From start to finish, the manufacturing of piano parts by the Posey Company is almost a work of art. With the careful guidance and watchful eye of employees, whose length of time with the company averages 20 years, the wood is carefully selected for specific parts, sawn and resawn, and painstakingly handled by the skilled craftsmen using

much of the original machinery. The results are sounding boards of a vertical grain, diagonally matched, edge-glued Sitka spruce that will produce the high quality sounds demanded by fine piano manufacturers.

Recently, the company began purchasing standing timber in Alaska that meets their high standards. The logs are rafted to their plant in Washington for processing. The Alaska logs are preferred since they come from large diameter trees and produce fine grain from their slow growth. Sitka spruce logs from Oregon, for example, are more coarse-grained. The company also buys spruce logs locally from other mills in the area, always keeping to their high standards of quality.

Sitka spruce from the Pacific Northwest has also played an important role in aircraft manufacture, starting with World War I. Posey did not sell spruce to aircraft companies at that time, but the company did during World War II. In fact, the company switched over completely to making glider parts for military use, working shifts around the clock, seven days a week, to keep up with the demand.

The company's greatest achievement in aircraft manufacture, however, from a standpoint of pride and accomplishment, came during the 1920s. The Ryan Aircraft Company of San Diego, California, received a contract from a group of private investors to build a special airplane. Spruce was needed for strength of construction and lightness of weight in the wing frame. The company chose Posey to produce these parts from Sitka spruce.

Posey's inspectors carefully selected 100 pieces of the finest spruce. These pieces were trimmed and reinspected, leaving about 70 pieces for the next step. Other workers cut away surplus wood to reduce weight, while keeping the strength of each piece. Some minor defects were uncovered, reducing the number of pieces to just 30. Further inspections and processes finally produced 10 pieces of Sitka spruce that were of perfect quality, perfectly aged and perfectly machined.

Ryan Aircraft Company used these pieces in the wings of a plane named "The Spirit of St. Louis." When Charles Lindbergh flew his plane into the air on May 20, 1929, at 7:52 a.m., on his historic non-stop flight to Paris, Sitka spruce from the Posey Manufacturing Company went with him.

That 33 1/2-hour flight changed the history of aviation for the world. It also gave the Posey Company a place in that history, in the minds of today's owners-employees.

Today, you can visit The Spirit of St. Louis and a little bit of the Posey Company at the National Air and Space Museum of the Smithsonian Institution in Washington, D.C. It hangs from the ceiling, close to the first aircraft of the Wright Brothers and John Glenn's space capsule.

Johnson and Granstrom have heard that Howard Hughes purchased some of the wood for his famous "Spruce Goose" from Posey, but this hasn't been documented. If it is true, spruce was used only in the spars of the plane with birch wood used for the rest. Therefore, they say the "Spruce Goose" might be better named the "Birch Goose."

Piano sounding boards and other piano parts remain the primary products of the company today. They do manufacture boards used for small gift boxes, but no other special products are being made at this time.

While they have tried working with other species of wood, they have not stayed with them, always returning to spruce. "We know spruce best," they say.

Only one other company manufactures similar products in the United States. Located in Dolge, New York, it is the original company founded by the former owner-partner of Posey years ago. It uses the much smaller eastern species of spruce.

Today, the number of working owner-employees at Posey is up to 34. They continue to look for better ways to perform their labor-intensive work at the plant, just like John Posey did years ago. He helped develop the first radio frequency press for gluing sounding boards in 1945, and the press is still located at the plant.

Do either Johnson or Granstrom play the piano? No—Johnson is a banjo player and Granstrom "plays the radio." But both of them, like many music lovers, have a deep appreciation for the quality of sounds that come from pianos with the "singing voice" of Sitka spruce from Posey Manufacturing Company. ≡

Photographs by Jim Fisher

Left, John V.G. Posey. Below: Duane Granstrom, Vice President/General Manager. Bottom: specially designed equipment is used to reduce spruce logs into small pieces of quality lumber for piano parts.

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Member Recruitment, July 1988 — April 1989

Larry Crabb	5	Don Bennett	2	Doug Neal	2
Ed Barber	4	Joe Buscio	2	Gary Neie	2
Danny Boone	4	Norman Charles	2	Ralph Onesti	2
Gary Dunn	4	Arthur Flashman	2	Al Seitz	2
Matt Grossman	4	David Frease	2	Michael Sloan	2
Margie Williams	4	James Grebe	2	Brian Steward	2
Liz Baker	3	Dave Hanger	2	Jeff Stickney	2
Andre Bolduc	3	Norman Heischober	2	Jean-Marc Beauchamp	1
Clayton Harmon	3	Paul Hornberger	2	Dennis Berryhill	1
Steve Jackson	3	Michael Kimbell	2	Roland Bessette	1
Danny Lyons	3	Tom Kuntz	2	David Betts	1
Gary Miles	3	Willard Leverett	2	Tom Bingham	1
Randy Potter	3	Mordecai Lurie	2		
Thom Tomko	3	Don Mannino	2		

Continued on next page

Membership Status

Northeast Region	812
Northeast RTTs	543
Southeast Region	585
Southeast RTTs	393
South Central Region	313
South Central RTTs	213
Central East Region	619
Central East RTTs	407
Central West Region	386
Central West RTTs	283
Western Region	895
Western RTTs	618
Total Membership	3653
Total RTTs	2457

Member Recruitment...

Vivian Brooks	1
Dean Brown	1
Glen Brown	1
Peg Browne	1
Jim Bryant	1
Wilbur Bullock	1
Robert Callaghan	1
Denele Campbell	1
Ralph Caskey	1
Harry Cardwell	1
Marcel Carey	1
Drew Caunter	1
Leonard Childs	1
Ken Churchill	1
Ernest Cofield	1
Scott Colwes	1
Bob Conrad	1
Ellin Corrigan-Hartwiger	1
Merril Cox	1
Alan Crane	1
George Crawford	1
Dennis Curtis	1
Richard V. Dante	1
Bruce Dornfeld	1
Vincent Durante	1
David Durben	1
Dale Erwin	1
Richard Flegle	1
LeRoy Fritz	1
Peter Funk	1
Richard Gann	1
Jim Geiger	1
Peter Goodrich	1
William Grogan	1
Dave Gustafson	1
H.L. Gustafson	1
Ward Guthrie	1
Nancy Hazzard	1
Fern Henry	1
James Hill	1
Kathleen Hodge	1
Francis Hollingsworth	1
Charlie Huether	1
Robin Hufford	1
Barney Johns	1
Don Junker	1
Judy Kazanjian	1
James Kerch	1
Don Korb, II	1
Ralph Kratzer	1
Janet Leary	1
Jon Light	1
Brenda Mamer	1
Mark Mateya	1
Steve Maytan	1
Keith McGavern	1
Michael McGuire	1
Guy McKay	1
Francis Mehaffey	1
Fred Mills	1
Bill Moonan	1
Jere Morris	1
Paul Mueller	1
Charles Muse	1
John Neubert	1
Kerry Nicholson	1
Paul Olsen	1
Earl Orcutt	1
Ron Orr	1
Gerald Peterson	1
Karla Pfennig	1
Allan Phillips	1
Floyd Pitts	1
Aiko Porter	1
Teri Powell	1
Ernie Preuitt	1
Richard Quint	1
Ramon Ramirez	1
Jack Reeves	1
Robert Reeves	1
Michael Reiter	1
Fred Rice, Sr.	1
Christopher Robinson	1
Lisa Roselinsky	1
David Sanderson	1
Ron Sanford	1
David Schaller	1
Sam Schorr	1
Ken Serviss	1
Sister Marian Shellady	1
Dan Skelley	1
Arthur Nick Smith	1
Harry Smith	1
Mary Smith	1
Virgil Smith	1
Theodore Snyder	1
Lewis Spivey	1
Sid Stone	1
Ken Svec	1
David Thomason	1
Marvin Todd	1
Don Valley	1
Gene Vollen	1
Frederick von Behren	1
James Walmsley	1
Kurt Weissman	1
Candace Wilken	1
Martin Wisenbaker	1
Robert Wolf	1
Donn Young	1
Lila Zastrow	1

Coming Events

July 10-14, 1989	**32nd Annual PTG Convention & Technical Institute** Red Lion Lloyd Center, Portland, OR Contact: Home Office, 4510 Belleview, St. 100, Kansas City, MO 64114 (816) 753-7747.
Sept. 23-24, 1989	**Milwaukee Chapter Days** Howard Johnson, 611 W. Wisconsin Avenue, Milwaukee, WI Contact: Rudolph Moroder, 3916 N. Frederick Ave., Shorewood, WI 53211 (414) 332-8474.
Sept. 23, 1989	**Rhode Island State One-Day Seminar** Providence, RI Contact: Robert Case, 24 Sunnyfield Dr., Westfield, MA 02790-4825 (508) 636-4691.
Oct. 1-3, 1989	**Florida State Conference & Seminar** Clarendon Plaza, 600 North Atlantic Avenue, Daytona Beach, FL 32018 Contact: Walter Pearson, 1128 State Avenue, Holly Hill, FL 32017-2728 (904) 255-4804.
Oct. 6-8, 1989	**Ohio State Conference** Holiday Inn North, Dayton Contact: Francis Hollingsworth, 2271 E. Spring Valley Paintersville Rd., Xenia, OH 45385 (513) 372-1981.
Oct. 13-15, 1989	**Texas State Association** Lubbock, TX Contact: Bob Johnson, 3224 92nd, Lubbock, TX 79423 (806) 792-9712.
Oct. 20-22, 1989	**New York State Conference** Queensbury Hotel, Glens Falls, NY Contact: Robert Reeves, RD #1, Galway Rd., Ballston Spa, NY 12020 (518) 885-5472.
Oct. 27-29, 1989	**North Carolina State Conference** Hyatt Winston-Salem Contact: John Foy, 195 Fayetteville St., Winston-Salem, NC 27107 (919) 773-1754.

The Auxiliary Exchange

President's Message

"June is bustin' out all over..." according to the song writer, and so are all of you who anticipate attending the annual Piano Technicians Guild Convention in Portland. Travel agents are contacted for flight tickets, the family car is checked out by those who plan to drive west or north, summer clothing is assessed and perhaps some new items purchased. All the necessary considerations and options are made in advance of your trip to fairly guarantee an enjoyable and profitable holiday in Oregon.

It is all too true, there are some of you who will be unable to attend this year for a variety of reasons. The travel distance may be too great for you. There is a wedding coming with the attendant matters of entertaining future in-laws, bridal showers, or maybe a grandchild is expected, one of the nicest of reasons. We realize, too, that health problems have visited some of our members and as much as they would like to come, they must forego any thoughts of journeying to the convention. We will look for you, inquire about you of your friends, and we will miss you. Yet, we shall be optimistic enough to presume to see you next year—in Dallas '90 or in '91 in Philadelphia.

To you who will remain at home, we want you to know this is your Auxiliary and we welcome letters of inquiry, suggestion and/or clarification, just as you might ask a companion were you in actual attendance. Our Council meeting, our Organizational Forum, are your meetings, just as much as if you were president at the Red Lion Inn. This Auxiliary Exchange is your column, too. For it to live up to its name, **Exchange**, ideas, data, news and information must be given and received in a reciprocal manner.

Some of our members have said it is often hard to get their hands on the *Journal* to read the Auxiliary Exchange. Their spouses generally 'squirrel it away' in their shop or office and they rarely see it again. We hope our *Newsletter* can help to offset that little problem. Each member receives the *Newsletter* generally around Thanksgiving and late spring. Most all of you have a copy of it by the time you read this issue.

Agnes Huether, President

Birthday Celebrants—May 21st-June 20th: Geminians

Geminians, whose 'sign' is Twins,
Have double virtues, double sins.
The fact that everything they do,
is always multiplied by two!

Jeanne Wislon, May 21st; Jeanne Davenport, May 22nd; Walter Trohan, May 25th; Helene Kingsbury, May 23rd; Joan Pulsifer, June 2nd; Ruth Levitch, June 3rd; Dorothy Neie, June 5th; Antoinette Tassoni, June 10th; Susan Birch, June 13th.

In Memorium

The Central Illinois Chapter of the Piano Technicians Guild has chosen a unique and ongoing manner to honor the memory of Lynn Susan Mumaw Pitsch who died early this year. She was the wife of David Pitsch, one of their member technicians. The generous contribution to the Piano Technicians Guild Auxiliary Scholarship Fund will be used to provide scholarships and other worthwhile educational opportunities for piano students.

1989 Auxiliary Schedule—July 10-14—Three Sisters Room

Monday, July 10

9:00 a.m.	Executive Board Meeting and Luncheon
9:00 a.m.	Informal walking tour to acquaint members with the area, especially Lloyd Center and the Light Rail System.
2:00 p.m.	Film *Hearts and Hands* narrated by David McCullough
7:00 p.m.	Convention Opening Session.

Tuesday, July 11

8:30 a.m.	Auxiliary Opening Assembly: Welcome to the Northwest; Mrs. Wilda Fries Memorial; Phyllis Tremper
9:30 a.m.	Get acquainted Coffee and Danish.
10:00 a.m.	Member-At-Large Meeting
10:30 a.m.	Council Meeting
1:30 p.m.	Program on Antique and Art Glass; by Nita Kadwell
3:00 p.m.	Tea: Program by Auxiliary Scholarship Recipients.

Wednesday, July 12

9:00 a.m.	Optional DeLuxe Tour of Portland, including the internationally famous Rose Test Gardens; World Forestry Center; Japanese Gardens; Pittock Mansion with luncheon at the Chart House Restaurant.
4:00 p.m.	Return to the Red Lion Inn. Note: The AuxiliaryHospitality Room will be in use during this tour for the Teachers Relations Committee presentation of an informative program for Piano Teachers invited from the local area. The Committee extends a warm welcome to Auxiliary members not going on the tour to attend this program.

Thursday, July 13

10:00 - 11:30 a.m	Business Class by Ginny Russell
12:30 p.m.	Installation Luncheon—Installation Officer, Deanna Zeringue, New Orleans Entertainment: Randy Potter
4:00 p.m.	Post Council Executive Board Meeting

Friday, July 14

9:30 a.m.	Openended Organizational Forum—Julie Berry, Moderator

Some Tools of the Trade

A common item that most all of us use every day is the zipper. Its inventor and the origin of its name are seldom written about and perhaps many of us never knew this information. However, all you 'fabric-oholics' who have made your final plans to come to our annual convention in Portland this July may know the following data. It was news to this writer and I felt it only fair to share it with the rest of my friends.

The zipper was originally called the "C-Curity Placket Fastener" by its inventor Witcomb Judson back in the 1890's. As with many 'new-born' inventions it was not a total success, but others modified and improved on his idea. B.F. Goodrich for one, developed a slide fastener to be sewn on rubber boots and Wellingtons. In his advertising slogan he employed the slogan, "Just zip'er up and zip'er down." History was made! The word zipper has been with us ever since. Some time later a company named TALON was organized for the sole purpose of refining and redesigning the slide fastener. Later the slide fastener was developed with metal teeth to be used in place of hooks and eyes. There would be no more 'high-button' shoes!

Subsequently, Coats & Clark, formerly Clark of Newark, New Jersey found a way to die-cast the zipper, attaching the metal teeth directly to a fabric tape and ending forever the earlier problems that plagued the 'zipper.' This light weight, flexible fastener with its almost unlimited versatility may 'get our goat' once in a while when we snag it, but it is one of the great inventions of our times. We may "bless it" now and then, but we seldom notice and praise it.

One of the first designers to use the remarkable zipper was the French designer of Italian descent, Elas Schiaparelli. She had the zipper sewn into the center of the bodice of a pale satin evening gown. To see the gown today at the Fashion Institute of Technology in New York City, one may smile at the rather crude appearance of the zipper. There one sees the 1/4 inch-wide zipper on a beige fabric sewn smack-dab in the center of the gown. Someone asked why the designer placed it in such a remarkable place and the reply was given that the wearer would wish to show off this innovation for its elegance and perhaps even seductive aspect. To this viewer it seemed to be rather like the first incision a surgeon might make in chest surgery. No longer is this sort of error made.

The zipper is so extensively used that it is now classed into three general categories: the *conventional* zipper, closed at one end and most often required in dress-making; the *separating* zipper opens at both ends and is generally found in sport and hunting jackets. The *invisible* zipper is designed so that only the pull tab shows when properly inserted. The zipper is so universally used it can be found everywhere—on handbags, pencil boxes, luggage, camera cases, baby buntings, attache bags—you name it. it would be difficult to get along without the zipper! Thanks to Judson, Goodrich, Talon and Clark.

Agnes Huether, Editor

Nominating Committee Reports

The Nominating Committee under the Chairmanship of Pauline Miller has submitted the following slate of officers and recommended them for your consideration at the 1989-1990 Council and election of officers to the Piano Technicians Guild Auxiliary: President—Agnes Huether; Vice President—Arlene Paetow; Recording Secretary—Christine Monroe; Corresponding Secretary—Judy White; Treasurer—Barbara Fanrich.

As has been the custom, nominations from the floor will be accepted. P.T.G.A. holds elections by secret ballot even if there is only one nominee for a position.

From Our Best Cooks

The cook books have arrived! They will be on sale in the Hospitality Room and Nita Kadwell, our cook book editor, will be in charge. The cost in Portland will be $8.00 and $9.00 to have a cook book mailed to your home or friends. Its cover is so attractive, with a large tureen holding what appears to be a beef stew, a delicious-looking apple pie in the forefront, attractively placed on a country type table. You'll want to buy several books. They will make handsome and worthwhile hostess gifts.

Editor

I Think I Can...

This is the last chance that I will have to encourage your attendance and involvement at the Portland Convention. There will be friends, knowledge, travel, recognition, and a chance to help others. Some of you are already registered, but I wish to encourage those "on the fence." It is your chance to make a choice that could have long-range positive effects.

With the long awaited green of spring, many of us are facing the remains of winter hibernation, career decisions and the day-to-day choices that seem to make or break us.

Our success with these changes and choices made me recall the story of the *Little Engine.* It was a favorite record/book of mine as a little girl and in my professional reading I keep running across articles and reports on the effectiveness of the mind. It is called by many names—imagery, mental conditioning, assertiveness training, positive thinking, wellness, meditation, visualizing, etc. However, they all have the same underlying theme as the *Little Engine*—"I think I can...I knew I could."

Judy R. White, Corresponding Secretary

P.T.G.Auxiliary Executive Board

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Vice President
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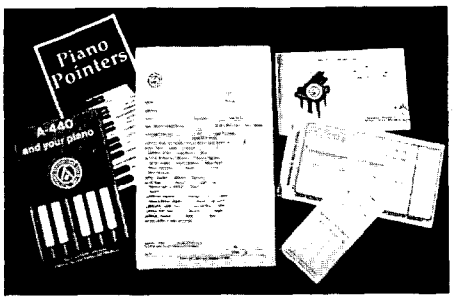


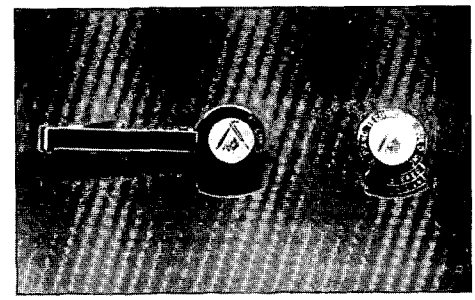

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Billing Pads* — 2-part with logo, 50 per pad: 1/$4.00, 3/$10.00	_____	_____
Piano Service Appointment Forms* — Green, 6-part: 100/$22.50	_____	_____
Service Stickers* — red and blue with logo: 100/$6.00, 200/$900, 500/$20.00	_____	_____
Personalized with your name & address 500/$50.00, 1,000/$90.00	_____	_____
Pamphlets* — 100/$12.50, 500/$55.00 (must be ordered in lots of 100)		
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Care of Your Piano	_____	_____
Piano Pointers	_____	_____
How Often Should My Piano Be Tuned?	_____	_____
The Tuner To Turn To	_____	_____
The Unseen Artist	_____	_____
Should I Have My Piano Tuned In Summer?	_____	_____
Reminder Cards	_____	_____
Publications		
"Piano Parts and Their Functions" by Merle Mason (hardcover, revised edition)		
Member price: $10.50	_____	_____
Non-member price: $15.50	_____	_____
"Classified Index Supplement" compiled by Merle Mason (covers 1979-1983)		
Member price: $12.50	_____	_____
Non-member price: $15.00	_____	_____
Journal Binders: Brown, holds one year's issues 1/$6.50, 2/$12	_____	_____
"The Unseen Artist" video — VHS: $29.95	_____	_____
Merchandise		
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Coffee Mug — "The Piano Technicians Guild, Inc." in blue on white ceramic 1/$4.00, 4/$13.00, 6/$18.00	_____	_____
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Ads appearing in this publication are not necessarily an endorsement of the services or products listed.

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For Sale

FOR SALE: African Mahogany Veneer, 1/28x14"x14' per roll. Matches old Mahogany pianos. Please send $17.50 + $2.50 shipping and handling to: **Dusberg Piano Co., 3861 Silsby SW, Cleveland, OH 44111.**

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SO YOU WANT TO BE A CONCERT TECHNICIAN, by Norman Neblett. This informative lecture, professionally recorded and edited in May 1988, is now available on cassette. $10 post paid. **Rick Baldassin 2684 W. 220 North, Provo, UT 84601.**

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FOR SALE—*A Guide To Restringing*. Paperbacks $16.50 plus $1.50 for postage and handling. Hardbacks $21.50 plus $2.00 for postage and handling. Order today. Sorry, no C.O.D. Make check or money order payable to: **JOHN TRAVIS, 8012 Carroll Ave., Tacoma Park, MD 20912.**

NILES BRYANT OFFERS TWO HOME STUDY COURSES: Electronic Organ Servicing: Newly revised. Covers all makes and models-digital, analog, LCI's synthesizers, etc. Piano Technology: Tuning, regulating, repairing. Our 87th year! Free booklet: Write or call **NILES BRYANT SCHOOL, Dept. G, Box 20153, Sacramento, CA 95820—(916)454-4748 (24 hrs.).**

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"LET'S TUNE UP" $20.00 per copy. Last few hardbacks will soon be gone. No immediate plans for another printing. Paperbacks still available at $17.50. Make checks payable to **John W. Travis, 8012 Carroll Avenue, Takoma, MD 20912.**

VICTOR A. BENVENUTO VIDEO TAPES, PIANO TUNING AURAL/ELECTRONIC,—$175. The most accurate approach in fine tuning. KEY MAKING, $124.75. GRAND REBUILDING(2 tapes), $225.75. Preparation, pinblock replacement, damper installation, restringing. GRAND REGULATING, $175.75. SOUNDBOARD REPLACEMENT, $94.75. Ship old board—new board comes to you ready for installation. Please specify VHS or Beta. All prices include shipping. **THE PIANO SHOPPE, INC. 6825 GERMANTOWN AVE., PHILADELPHIA, PA 19119. (215)438-7038.**

PLATING-PIANO HARDWARE. Stripping, buffing, and NICKEL plating, with hinges up to 60" lengths $125-$225/set, depending on quantity of parts included. Enclose packing list indicating number of screws with description and quantity of items. REFERENCES AVAILABLE COD delivery in 2-3 weeks. A.R.O.M. throughout the U.S.A.! We will serve you with quality & reliability. **CRAFTECH ELECTROPLATING, #46R Endicott St., Norwood, MA 02062, (617)769-0071 days, (617)469-9143 eves.**

NEW SOUNDBOARDS MADE FOR YOU. Ship old board. New board comes to you ready for installation. Send for instruction on: **Victor A. Benvenuto, 6825 Germantown Avenue, Philadelphia, PA 19119. (215)438-7038.**

Wanted

THE OBERLIN CONSERVATORY has an entry-level, SHOPWORKER'S POSITION available. The appointed will help manage the piano technology shop. Tuning experience not necessary but desirable. Must have some shop experience in piano technology or reasonable substitute (instrument making, cabinet work, etc.). Monthly salary of $1362.05 with excellent benefits. Send resume with three letters of reference to **Office of Personnel, Oberlin College, Oberlin, OH 44074** by July 15, 1989. AA/EOE.

WANTED!! DEAD OR ALIVE "Steinway Uprights." Call collect, Ben Knauer (818)343-7744.

LEARN PIANO TUNING AND REPAIR in one of the Southeast's leading cities: Charlotte, North Carolina. **Central Piedmont Community College** is now in its tenth year of offering a full one year diploma course covering aural tuning, regulating, repairing, and rebuilding of grand and upright pianos. Well-equipped facilities and an instructor with twenty-five years experience makes it possible for students to prepare for a truly rewarding career. Next class begins September 5, 1989. For further information contact **Arthur M. Williams, Program Director, Piano Tuning and Repair, Central Piedmont Community College, P.O. Box 35009, Charlotte, N.C. 28235. (704)342-6618.**

WANTED: Still looking for Steinway player grand in fancy case (prefer unrestored). Will also consider Mason & Hamlin, Knabe or Chickering. Reward for successful leads. **Kavouras, 2740 Lighthouse Ct., Lynwood, IL 60411 (312)474-8787.**

TWO POSITIONS OPEN with leading central New York piano dealer. **Piano Service Manager,** RTT required; minimum 5 years experience. **Piano Technician,** RTT preferred; minimum 3 years experience. Both positions full-time with excellent salary and benefit options. Send resume and references to **Evan Tublitz, Syracuse Artist Piano, Ltd., 5780 Celi Dr., East Syracuse, NY 13057. ph.(315)446-5660. fax(315)446-2219.**

UP TO $1000.00 Finders' Fee will be paid for successful purchase of a Mason and Hamlin Ex-Player. I have mechanism to install. Pls. call collect **(317)259-4307 or evenings (317)849-1469. Jim Brady, 4609 Cranbrook Dr., Indpls., IN 46250.**

REWARD. $1000.00 Reward offered for information leading to recovery of one Yamaha U1A upright piano, ebony polish, serial #4041146. Confidentiality assured. **Please phone (212)206-8794.**

WANTED!!! PIANO TUNER/TECHNICIAN for New York market. In need of experienced and well qualified piano technician. Hamburg Steinway factory training a real blessing!!! Well attired, good personality. Willing to work and work and work and work. **Pro Piano, (212)206-8794/(800)367-0777**

WANTED: DUPLEX SCALE BARS for Steinway Grand Model A #137982. Call or write **Randy Jensen, 1860 Radcliffe Drive, Reno NV 89502. (702)329-8088.**

PIANO TECHNICIAN II, Department of Music, Humboldt State University, Arcata, CA. Applicants must have comprehensive knowledge of all aspects of piano work including regulation, action rebuilding, pinblock installation, rebuilding, and concert-quality voicing and tuning; minimum of two years experience; ability to maintain/tune harpsichords. Salary range presently $27,552 to $33,156 annually. Send letter of application stating qualifications, resume and name/address/phone of three references by 6/23/89 to **Personnel Department, Humboldt State University, Arcata, CA 95521.** Applications from qualified women and minority candidates are particularly encouraged. The University is an Equal Opportunity/Affirmative Action/Title IX Employer.

WANTED: Piano Rebuilder with expertise in soundboard and pinblock replacement. Full time, permanent position available in quality rebuilding shop. **Call (415)676-3355 or write: Piano Finders, 1000 Detroit—Space L, Concord, CA 94518.**

THE OBERLIN CONSERVATORY has a PIANO TECHNICIAN'S POSITION available. The position requires RTT status and ability to tune at the CTE level. The appointed will work in all phases of piano technology including exacting concert preparation and the rebuilding of quality pianos. Experience in these areas necessary. Salary commensurate with experience. Excellent benefits include one month's vacation. Send resume with three letters of reference and salary requirements to **John Bingham, Associate Dean, Oberlin Conservatory of Music, Oberlin, OH 44074** by July 15, 1989. Late applications may be accepted until position is filled. AA/EOE

PIANO TUNER—Install, test and adjust piano; requires 1 year experience. $1,5000 per month. Job and interview site, L.A. area. Send this ad and resume to **Job #NOF402, P.O. Box 9570, Sacramento, CA 95823-0570,** not later than June 23.

GREAT OPPORTUNITY for self-motivated person to learn professional remanufacturing of pianos. Having expanded and moved into our new factory and distribution center, we now need to train more people to become craftsmen capable of meeting our high standards of workmanship. Send resume to: **Webb Phillips, 1836 Stout Dr., #16, Ivyland, PA 18974.**

WANTED: USED ACCU-TUNER, prefer year or two old. Write to **Don, 4025 Wilcox Rd., Mississauga, Ontario L4Z 1B7, Canada.**

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Tech Gazette

Yamaha Piano Service June, 1989

MIDI Corner

Our conviction that electronics will become a part of the piano technician's future has been confirmed at each of our recent Disklavier™ and MIDI Grand classes for PTG. A consistent 10% or more in attendance have reported being called on to service the Disklavier.™

Consequently, you will soon be hearing about new seminars to cover complete electronic and acoustic service for the Disklavier™ and MIDI Grand, plus a separate one devoted specifically to the needs of the Concert Technician. Look for more information in upcoming issues, or contact Yamaha directly or your local Yamaha dealer.

New Products

Thanks to MIDI technology, the new Yamaha Disklavier™ piano far exceeds the capabilities of old player pianos. Instead of receiving information from paper rolls, the Disklavier™ receives digital signals from computer floppy disks. Our library of this software is constantly growing, and now includes selections for a wide spectrum of musical tastes:

Entertainment Collections:

- CHILDREN'S
  Disney Songs
- CHRISTMAS
  Sacred and Secular
- CLASSICAL
- CONTEMPORARY
- COUNTRY
- MUSICALS AND SHOWTUNES
  Broadway Musicals
- ORIGINAL ARTISTS
  Pop and Classical
- SACRED
- YESTERYEAR
  Hits of the Past

Educational Collections:

- YOU ARE THE ARTIST SERIES
  Piano Method

Several floppy disk albums are available in many of these collections. Each disk contains ten or more complete songs, so you can see that our library is already quite large.

Yet our in-house recording studio continues to add titles each month! For example, Chick Corea, Steve Allen and Patrice Rushen each cut new, soon-to-be-released disks for us last month. And we are putting the finishing touches on recording a piano accompaniment series for use by students, professionals, hobbyists and conservatories. This series includes nearly all the standard repertoire for vocal, brass, winds and strings . . . and allows anyone to practice with the Disklavier™ providing piano accompaniment.

Parts, Etc.

PianoCorder Parts & Information: As you may know, Yamaha has purchased the assets of PianoCorder. While we do not plan to produce new PianoCorder units, we have made arrangements to assist technicians with parts and information to repair units currently in the field.

For non-warranty parts for PianoCorder units, contact:
Schaff Piano Supply
451 Oakwood Road
Lake Zurich, IL 60047
1-800-326-0341

For warranty-related parts and answers to technical questions about PianoCorder units, contact:
G&A Associates
6 Collingwood Lane
Taylors, SC 29687
1-803-244-8049

Yamaha Profiles

YOJI SUZUKI

You may already recognize our new Director of Piano Services in the Piano Department of the Keyboard Division. Yoji Suzuki has a long track record with Yamaha, serving in various capacities all over the world, including a brief position as a technical advisor in the United States during 1969. His many credentials include having been chief instructor of the Yamaha Piano Technical Academy in Japan, and establishing similar facilities in both Canada and Australia. Most recently, he was in charge of worldwide piano service and warranty for Yamaha Corporation in Japan. Welcome back to America, Yoji, and may you enjoy success in your new capacity here!

Yamaha will participate in:

May 27-June 11:	The Van Cliburn Competition Fort Worth, TX
June 16-18:	Summer NAMM Chicago, IL
July 10-14:	32nd Annual PTG Convention Portland, OR

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