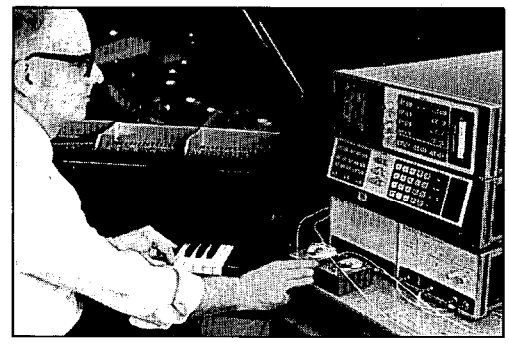
Piano Technicians Journal

April 1988

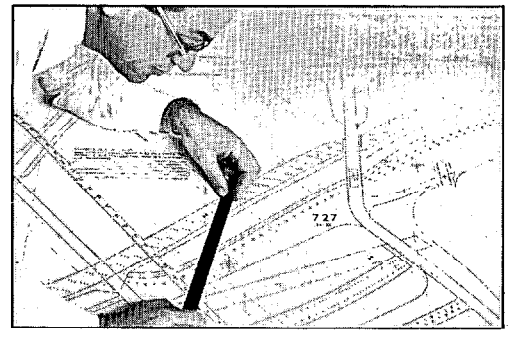
The Baldwin Piano...
You can see why it sounds better

At Baldwin we believe that perfect piano tone is an ideal shared with all those who design, build, play and service pianos. That's why continuous research in piano tone has always been one of our major commitments. And that's why our piano engineering and research department is one of the largest in the industry. And that's why you'll often find in every Baldwin piano innovations to improve piano tone introduced in our SD-10 concert grand.

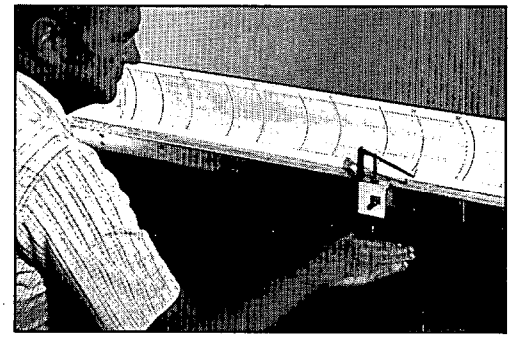
RESEARCH shows us why, as well as how, some things work better because we've taken a pioneering approach to piano improvement. We've substituted scientific testing and analysis for the unquestioning acceptance of traditional solutions. Some of the achievements that have resulted are treble termination bars (U.S. Pat. No. 3,477,331), the Acu-Just™ plate suspension system (U.S. Pat. Nos. 3,437,000 and 3,478,635), and vertically laminated bridges. Our patents are the most significant ones awarded for tonal improvements in grand piano tone in recent years.



ENGINEERING translates research into reality. To support our design innovations, we have produced our own testing and construction equipment and have expanded the use of precision tooling to insure that each Baldwin piano built will exactly match established standards of tone and performance. One example of this is a winding machine (U.S. Pat. No. 4,055,038) developed in connection with the SynchroTone™ Strings (U.S. Pat. No. 3,523,480).



MATERIAL STANDARDS insure continuing quality. For example, stringent standards for weight, dimension, taper, and hardness of hammer felt are established, and each sheet of felt is checked to be sure it meets those standards before it is accepted for production use.

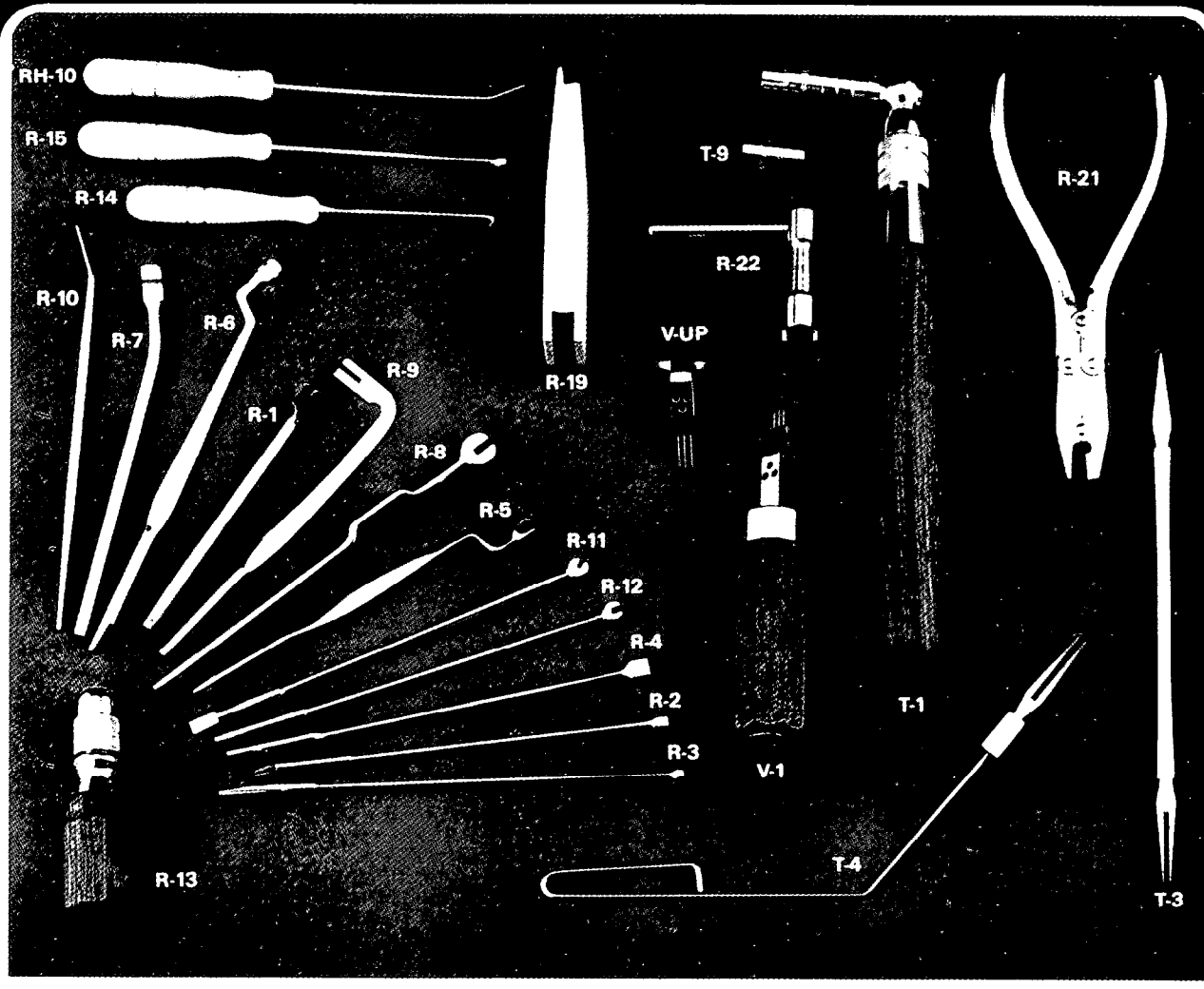


First in a series of informative ads on piano tone published by Baldwin Piano & Organ Company exclusively for the benefit of piano technicians.

Baldwin® – *Leading the way through research*

Schaff now has available...

YAMAHA TOOLS



Through an agreement with Yamaha International Corporation, Schaff is now a Distributor for tools imported by Yamaha International Corporation

STOCK NO.	TOOL DESCRIPTION
R-1	SPACER
R-2	JACK SCREWDRIVER
R-3	STOP RAIL SCREWDRIVER
R-4	REGULATING SCREWDRIVER
R-5	DAMPER REGULATOR (UP)
R-6	DAMPER REGULATOR (SP)
R-7	POST WIRE BENDER (UP)
R-8	OFFSET KEY SPACER
R-9	SPOON BENDER (UP)
R-10	CAPSTAN SCREW WRENCH
R-11	DAMPER REGULATOR
R-12	DAMPER REGULATOR

STOCK NO.	TOOL DESCRIPTION
R-13	COMBINATION HANDLE
R-14	SPRING REGULATOR
R-15	DROP SCREWDRIVER (GP)
R-19	BACK CHECK REGULATOR
R-21	WIRE PLIERS
R-22	KEYFRAME SCREW REGULATOR
RH-10	CAPSTAN SCREW WRENCH
T-1	TUNING HAMMER
T-3	WOODEN MUTE
T-4	WOODEN MUTE
T-9	TIP
V-1	FELT PICKER (LARGE)
V-UP	FELT PICKER (SMALL)

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The Piano Technicians Journal

April1988

Official Publication Of The Piano Technicians Guild, Inc.

Volume 31
Number 4

IN THIS ISSUE...

THE COVER...

High-speed photography or slow-speed action centers? Read the Technical Forum and find out? (Photo by Susan Graham)

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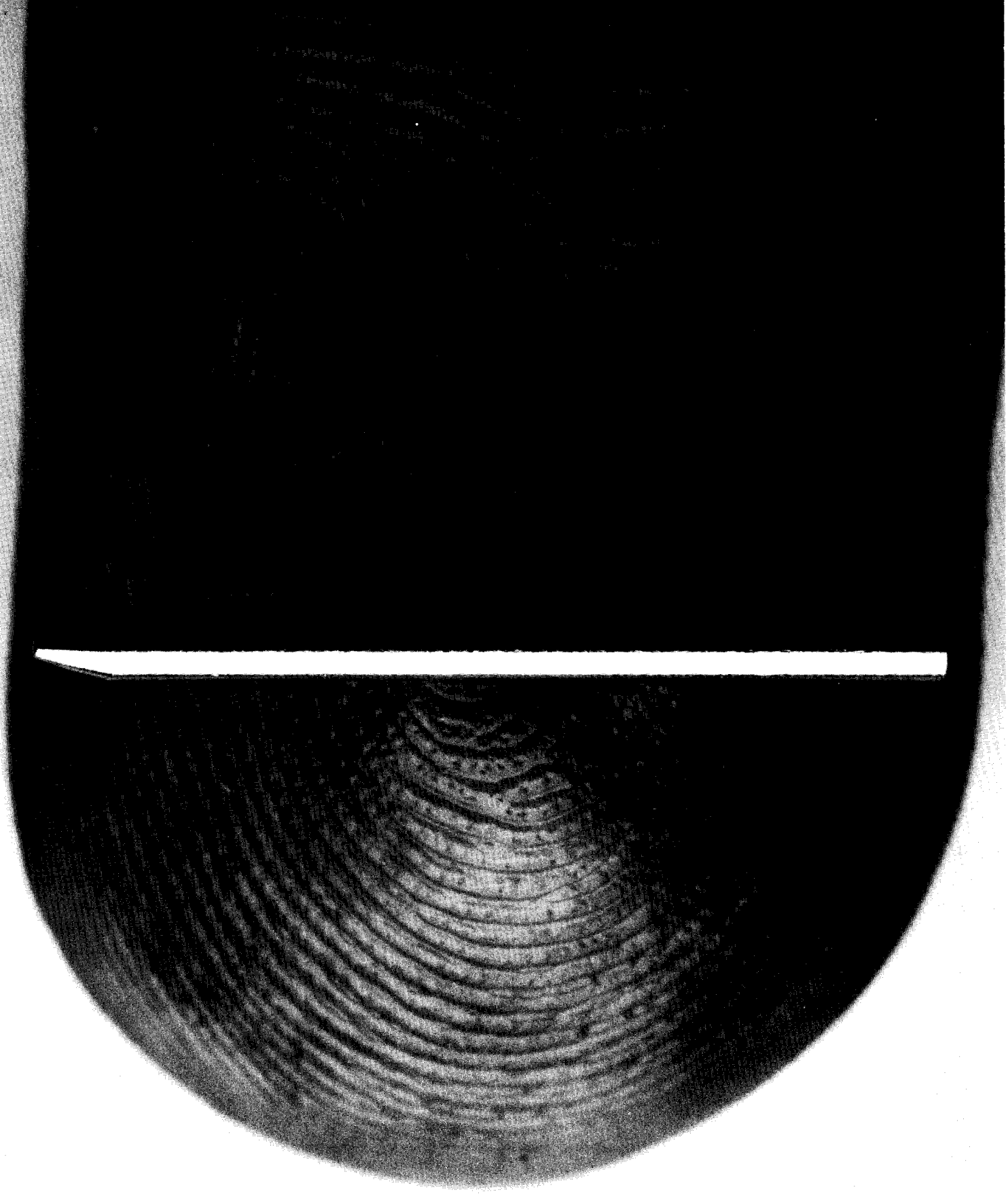


At Young Chang, there's nothing too small to improve.

No one notices a center pin until there's a problem.

Most manufacturers make them out of brass. Eventually they tarnish, and can cause verdigris to form. But it usually happens after the piano has left the sales floor. And often after the warranty has expired.

At Young Chang, we make our center pins of non-oxidizing German silver. They don't tarnish. So they move freely for the life of the piano. Chances are you'll rarely need to repin or ream the bushings of a Young Chang action. And chances are our efforts will go completely unnoticed.

You also may not notice we coat many of our action parts with Emralon™ to reduce friction and noise and eliminate graphite penetration in felt and buckskin.

Or that we're using an improved premium English hammer felt that lasts longer and produces a bigger sound. Or that there's now whippen auxilliary springs on our 7′ and 9′ grands for finer touch adjustments.

Or that we've strengthened our grand keystop rails to prevent damage during moving, and steel-reinforced our grand keyslips to minimize warping due to changes in the weather.

We've also developed a moisture absorbent finish for our black keys and a new satin case finish to bring out more of the natural wood grain highlights.

While these recent improvements have gone largely unnoticed, our 12 year *full* warranty is getting all kinds of attention. It's the kind of promise people understand. And the kind of promise no other manufacturer is prepared to offer.

Little by little, we keep refining our pianos. Because it's the little things that make the difference between a good instrument and an extraordinary one.

For more technical information, please call Ed Whitting at (213) 926-3200. Or write to him at Young Chang Technical Services, 13336 Alondra Blvd., Cerritos, CA 90701 for a free copy of our Service Guide and Technical Specifications Manual.

YOUNG CHANG

The best the world has to offer.

President's Message

M.B. Hawkins
President

Practice Makes Permanent

Let us suppose for a minute that next Wednesday you received a phone call notifying you of one hundred thousand dollars tax free waiting for you at the local bank. Would you be ready to handle this? Your answer may be "Of course, do you think I'm stupid?" While that is the answer most people would be expected to give, would you really be ready to deal with the change this would cause in your life? I doubt it, but that is what I'm getting at. Practice makes permanent.

Practice makes perfect is a statement most everyone is familiar with. When is the last time you practiced spending a hundred thousand dollars? Allow me to suggest you take paper and pen and start spending this type of money. You will have changed many things that appeared on the first draft. Each time you do this you will refine your thinking about how you intend to deal with this money. You will in fact be starting to feel more comfortable with dealing with larger sums of money.

You may be asking by now what on earth does this have to do with anything? Actually it has a lot to do with many things. Right now let's see how it may affect us as independent piano technicians. As a small business person it is tremendously important to "act as if." By this I mean in your mind you should have a picture of what you want your business to be. The picture is a must, but to make it a reality you will need to act in a fashion you expect the picture to reflect, and then practice.

Just as it was suggested to sit down with pen and paper and proceed to spend a hundred thousand dollars, one needs to do the same thing relative to one's business. Sit down with pen and paper and proceed to write out a verbal picture of what it is you want your business to be. Just as with the money you will find that the third or fourth time around the shape of your business will change quite a bit. This is absolutely vital. For example, if you want to begin working at noon each day and are finished at six p.m. it is necessary you write this down. What it is you expect to gain monetarily must also be reflected in what you write on the paper. How you will dress, what you will drive and all of the things involved with your business need to be written down time and time again. Remember, "act as if"; that is, act in the fashion you would if you were already there, and then practice. Remember, practice makes permanent.

Each year PTG's Annual Convention/Institute is presented in order that piano technicians have a means of continuing to develop skills to support the service we as technicians deliver to the piano-owning public. Chapter technicals, state seminars and regional conferences exist for the same reasons. Attendance at these various functions needs to be as much a part of the written expectations of your business as any other facet. Remember, "act as if" and practice makes permanent.

In a few more months we will be in St. Louis — this year the "Gateway To Excellence." There is time enough left for anyone who really wants to be there to cause this to materialize. One approach is to begin writing down what it is you want to happen. Do it over and over and over. I will guarantee your subconscious mind will take over and you will find yourself doing what is required for you to be there, without recognizing it. Remember, "act as if" and practice, practice, practice. It makes permanent.■

Tech Gazette

Yamaha Piano Service April, 1988

Parts, etc.

FLITZ Metal Polish

Here's the scenario: You've just completed an extensive regulation, voicing, and tuning job on a beautiful polished ebony piano. Your tools are packed. As you slide the bench toward the piano, you notice that the inlaid brass name on the fallboard is barely visible. As you look closer, you see three pedals that appear to be more brown than brass. The piano plays and sounds like a new piano—*better* than a new piano! You've given your customer 120% on this job, but it doesn't quite *look* it...

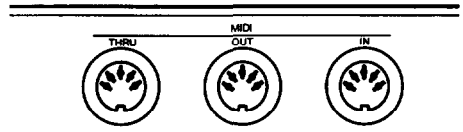
Sound familiar? Every problem has a solution. The solution for this problem, and virtually any other that involves tarnished metal is **FLITZ**. FLITZ is a multipurpose metal polish and fiberglass cleaner that is safe to use on almost any surface. FLITZ comes in two sizes; a fifty gram tube, and a three gram "job size" foil packet. For prices and additional information, call our parts department toll free at: (800) 521-9477.

MIDI Corner

In previous issues of "Tech Gazette" we've talked about the world of MIDI in fairly general terms. Now that you have some idea of the "why" of MIDI, we can begin to delve deeper into "what" MIDI is and does, and "how" MIDI works.

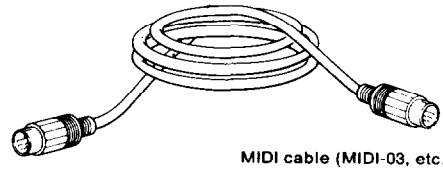
As we mentioned last month, MIDI is the industry standard for "digital communication between musical instruments." Specifically, information relating to any musical operation—such as playing a key on a synthesizer or changing voices—can be transmitted from one piece of MIDI equipment to another. This information (or data) is sent via a special MIDI cable, causing the receiving equipment to perform the operation designated by the received information.

Take a look at the diagrams of a MIDI cable and MIDI terminals. Internally, the MIDI cable consists of a braided, two-wire cable that is shielded to prevent interference. On each end of the cable is a plug called a **"DIN"** connector. A standard MIDI cable can be connected to any



of the three corresponding DIN connectors of a MIDI-capable instrument.

These corresponding connectors or **"terminals"** are labeled **MIDI IN, OUT** or **THRU**. The MIDI IN terminal receives data from other equipment, the MIDI OUT terminal transmits data to other equipment, and MIDI THRU terminal simply re-transmits data received at the MIDI IN terminal. Three MIDI terminals allow different system configurations and help increase versatility.



MIDI cable (MIDI-03, etc.)

We already know that one MIDI instrument can transmit musical information to another. But how is this accomplished? Each piece of MIDI equipment contains a microprocessor (a tiny computer) system which is waiting for an **"event"** to occur. An event can be the playing of a note, a program change, etc. The microprocessor then generates a signal in digital code that describes the event and transmits the signal via the MIDI OUT terminal. When this signal reaches the MIDI IN terminal of the receiving instrument, the receiving microprocessor decodes the signal, deciphers the instructions, and then causes the corresponding event to be performed by the receiving instrument. This may seem like little more than a sophisticated form of remote control, but it is only the beginning. To be continued...

Personnel Profiles

HORTENSIA TAFOLLA

In our last issue, we talked about Mark Wisner, our Parts Coordinator. Well, we understand that to do an efficient, effective job at providing piano parts support for you and our dealers, it takes more than just one able-minded person. This month, we are proud to introduce another of our more recent additions to the Piano Service team, Hortensia Tafolla. Hortensia is our Customer Service Representative in the Piano Parts Department.

Her many responsibilities include handling incoming calls on our Parts lines, entering the many orders for parts that come our way through both the telephone and the mail, coordinating with our Credit and Distribution departments for processing orders, handling credit card billings, and a host of other things. Hortensia lives in Anaheim with her two children, Manuel (14) and Christina (6).

Calendar of Coming Events

April 8-10:	New Eng. Regional Newport, RI
April 15-17:	Pennsylvania State Altoona, PA
April 22-24:	Pacific Northwest Eugene, OR
April 29 & 30, May 1:	Michigan State Livonia, MI
May 13-14:	Intermountain Sem. Salt Lake City, UT
June 24-28:	Summer NAMM Atlanta, GA
July 18-22:	31st Annual Conv. St. Louis, MO

YAMAHA

From The Home Office

Larry Goldsmith
Executive Director

Public Goodwill

Telling the world about yourself is easy. Getting the world to listen up isn't. First you have to get its attention.

My pocket Merriam-Webster Dictionary defines public relations as "the business of fostering public goodwill toward a person, firm or institution." That encompasses a pretty wide range of activities, from making sure you wear a tie into a customer's home to your advertising in newspapers and phonebooks. In a sense, everything you do is part public relations — call it marketing, if you like.

The first step in an effective public relations program is developing a plan. It should be in writing and should come from your business plan (you do have a business plan, don't you?) and your annual budget (you do have a budget, don't you?). From the business plan comes the market area you want to reach and the type of work you want to do. From the budget, naturally, comes the amount of money you have to spend on self-promotion. Once those are in place, you can move on to the mechanics: "I will send out three press releases this year to these publications," or "I can afford only this much money for advertising; therefore, I will place one Yellow-Pages ad and quarterly ads in this publication." Plan for the year, and try to leave some budget for unplanned opportunities. Keep track of where your new business comes from and evaluate each activity frequently with that in mind.

The same rules apply for chapters wanting to promote their own programs. In a way, it's easier to get publicity for a chapter, because it's a non-profit organization trying to get its message out for the public good, rather than one individual who is doing this strictly for his own profit.

The most effective and cheapest form of public relations is one satisfied customer telling a prospective one that you did an excellent job at a reasonable price. The problems are, first, getting and keeping the customer satisfied and, second, getting him or her to walk up and down the street telling the neighbors about you. Most feel that paying your bill is thanks enough.

In a way, the easiest form of public relations is advertising. It's that time-honored approach favored by bureaucrats everywhere — simply throw money at it. If you have enough money to spend, you can make yourself a household word in any market. Advertising agencies will do the creative work and figure out where you should advertise. Publications will fall all over themselves to run your ads. All you have to do is handle the flood of phone calls and pay the bills.

If it sounds as if I'm making fun of the advertising industry, I'm sorry. I'm really not doing that. Advertising has its place in many business PR programs, but if your resources are finite, you have to be selective. Plan your ads carefully from design to placement, and you'll reap the rewards. Besides the obvious — the most-read Yellow Pages in your target area — you'll want to consider such alternatives as newsletters for churches, garden and music clubs, or so-called "shopper" publications which blanket a fairly narrow geographic area with tabloids containing nothing but advertising. They may not be glamorous, but many people read them.

Editorial placements are cheaper than advertising, but they require more planning and more work with less certainty of success. It basically comes down to three steps: thinking up something to say about yourself that people will be interested in hearing; figuring out how to say it and who to say it to; and convincing someone to say it for you. Newspaper and magazine articles or a mention on the evening news aren't for sale, so the more genuine news value your story has, the better your chances of success.

As this is a topic every business deals with, please feel free to chime in at any time with your own successful programs. Next month, we'll talk about that basic tool of public relations, the press release. ■

Gateway To Excellence

Welcome To St. Louis

When the world-famous St. Louis arch was built in 1966, it was designed to be a memorial to westward expansion — the wagon trains, homesteaders, railroad builders, gold-miners and all the others who crossed the Mississippi River at St. Louis on their way to another life in the west.

Today, it stands as a dramatic symbol of welcome to visitors from all over the world. St. Louis is a vital, cosmopolitan city, eastern in vision, but with midwestern hospitality. From its beginnings as a fur-trading post in 1764, it has grown to a population of 2.4 million. More than a dozen Fortune 500 companies call it home.

St. Louis is easy to reach. It's a major airline hub. It's easily accessible by rail or major interstate highway. The Adam's Mark Hotel, site of this year's convention, is a new hotel located downtown overlooking the arch and the Mississippi River. The hotel is approximately 20 miles from Lambert-St. Louis International Airport and less than 100 yards from Interstate 70.

It's a restaurant town, full of good eating places that testify to the city's diverse ethnic background. It's the home of good Dixieland jazz and ragtime. It's home to the world's largest brewery, acres of parks, a wonderful zoo, major league sports and plenty of places to shop — both St. Louis Center, which houses 140 shops and several restaurants, and Union Station, a grand old train station beautifully restored to include shops, restaurants and a hotel, are near the Adam's Mark.

At the same time, it's a good environment for the arts. It has one of America's great outdoor sculpture parks, a world-renowned symphony, opera and dance.

Fun places to visit include Grant's Farm, the birthplace of U.S. Grant, which has been preserved as a game preserve and home of the famous Budweiser Clydesdales. For the more adventurous, there's Six Flags Over Mid-America, one of the midwest's largest theme parks. Busch Stadium, home of the baseball Cardinals, is right down the street, and the team will be in town at least part of our convention week.

As you can see, there's plenty to see and do in this friendly, fun city. But the convention will be here before you know it, so make your plans to "meet in St. Louis" now.■

'88 Convention Includes Expanded Institute

The 1988 convention promises to be our biggest and best ever! New classes, exciting instructors, an expanded tutoring program (What do you need to know? We'll find a tutor to help you out), the popular mini-techs, and exhibits by manufacturers and suppliers. Here's a brief schedule of convention activities:

Sunday, July 17
Guild Council meeting

Monday, July 18
Guild Council meeting
Exhibit Hall opens
Convention Opening Session

Tuesday, July 19
Institute Classes begin

Wednesday, July 20
Institute Classes
Auxiliary Tour
Guild Regional Programs
Convention Awards Banquet

Thursday, July 21
Institute Classes

Friday, July 22
Institute Classes (morning)
Closing Luncheon

Economic Affairs

Carl D. Root
Economic Affairs Committee

Getting Started

This article will try to show an important correlation between a piano technician's early education, training and working environment and the business practices, attitudes and assumptions about competent piano service that grow out of those early experiences. It is intended primarily for those who are in the early stages of their career in piano technology and who may have questions about opportunities available. Since the early '70s, there has been a noticable increase not only in the number of technicians entering the field, but also a greater variety in terms of age, sex and formal education. As always, some seek part-time work, some full-time. Some will emphasize field service, some shop work. Some anticipate a salaried position, some self-employment. Some will offer their services directly to the public, others will work as subcontractors. Freedom to determine your own direction remains one of the attractions to piano work.

Before we examine education and training opportunities, let's look at the talents that are useful in piano work. Many piano owners assume that we technicians all play the piano wonderfully, and a technician who is skilled might indeed benefit the customer by having a greater sensitivity to such things as action regulation. Voicing and treble tuning would be enhanced by a solid musical background on an instrument.

Mechanical aptitude is an obvious necessity to those who intend to work in a shop, but starting tuners who expect to work in the field may underestimate its importance. The amount of time spent doing non-tuning field service or shop work depends in part on your clientele, but the ability to use tools correctly and efficiently is essential for all technicians. Tuner/technicians who do not pay sufficient attention to this aspect of service will be branded as "tooners" by those who take a more comprehensive approach.

Diagnostic ability is a talent which may be even more crucial than mechanical aptitude, at least in the field. The systematic elimination of possible causes of problems sometimes takes more time and head scratching than the correction of the problem.

All types of work — tuning, repairing, rebuilding — must be sold if the cost exceeds the piano owner's expectations. A concise, straight-forward approach emphasising benefits to the owner rather than a technical symptoms and cures gets the best results. Don't be pushy, be patient. Some estimates take years before the work can procede. Technicians who enjoy talking to other people — about piano, family, jobs, weather, ... anything — tend to do well as field service technicians. Selling yourself comes before selling the job. Technicians with abrasive personalities are at a disadvantage.

Do you think of yourself as a professional? What members of the business community do you see as your peers? Many technicians are attracted to the craft aspect of this business which suggests an identity with labor. But most of us are sole proprietors, so, we must look at our work from the standpoint of management as

Continued on page 12

Getting Started . . .

well. Established technicians might consider analyzing every aspect of their business as being defined either by labor or management and consider making changes to restore a balance.

Now that we've looked at the applicable talents, let's briefly examine the educational options. If you can afford the time and cost, full-time courses in piano technology are available. Check your PTG ads for more information. There are correspondence courses that can be researched in the same way. There may be evening courses at your local community college that are worth considering. Some manufacturers offer special schooling for qualified students. Try to interview recent graduates of these programs.

There are a number of books worth reading. Books by Travis, Howe, Wolfden, White and others were helpful to me when I started, and a number of those have appeared more recently which should be added to a recommended reading list. Do you have a complete set of service manuals available from all the manufacturers? Befriend an RTT and gain access to stacks of old *Journals* (an index is available to help you find articles on specific subjects).

The annual national PTG convention is a special opportunity. The variety of classes and inevitable after-hours technical and non-technical discussions cater to both novices and experts. Regional and local seminars and meetings are also good sources of formal and informal on-going training. It takes courage for some technicians to walk into a meeting for the first time, especially if they are not gregarious or if they lack confidence in their knowledge or skills. Do it anyway.

Once you've completed the first phase of your education, formal or informal, you are ready to begin on-the-job training. Expect to be paid very little in the beginning. In fact, paying for the privilege could be an excellent way to begin a career in piano service. A modern version of this medieval system would be ideal if the apprentice could be compelled to remain with the master for a specified length of time and if the master could be compelled to provide a comprehensive program covering all aspects of piano technology. Since most shops seem to have difficulty finding enough work on quality pianos, this option is rarely available, at least in comprehensive format.

Working in a shop that does quality work is worthwhile even if you do not expect shopwork to be an important part of your future. There is no substitute for tearing down pianos, making repairs, replacing parts, and doing fine adjustments that make a piano a musical instrument. Every technician, regardless of specialty or work situation, should be able to examine a piano and know how the design and condition of each system in the piano affects its performance and longevity.

Inevitably, nearly all of us will need to learn how to tune pianos. This may seem like an unnecessary skill to someone who hopes to work in a shop full-time, but if you can't tune, your voicing skills will be severely limited and you will have to rely on someone else to finish and ultimately measure the success of your work. Learn the proper tuning procedures from someone who has the reputation for quality and efficiency and then get to work.

Once you've tuned a thousand pianos, you'll have pretty good idea of what you're doing. This assumes that you have good ears, manual dexterity, and no small amount of stamina. And you'll still have room for improvement. You might well ask "What poor pianos will be subjected to my first one thousand attempts?" Working for a piano dealer doing prep and free service tunings on selected pianos is a reasonable training ground considering the inherent instability of new pianos. The drastic changes affecting pianos in the public schools or in churches may also allow for less than perfect tunings. These and other similiar working environments that require tuning a minimum of pianos a day will usually reduce your tuning time to an hour or so.

When you get out in the field doing tunings acquired from a variety of sources, you will quickly learn why we make a distinction between a piano "tooner" and a technician. We are concerned initially with those repairs and adjustments that are essential to making pianos work — period. But we must also be concerned when everything works, but not as well as it could. Trying to figure out what bothers the player (as opposed to what bothers you) is not always as easy as it sounds. Do not overlook the possibility of servicing the piano to a higher level of performance than was requested. This kind of work is harder to sell but often the most satisfying when we are able to share in the player's delight at the unexpected improvement.

Applying your skills and training appropriately comes with experience. It is also the natural result of running a successful business. Success is necessary because it is hard to be objective when you're preoccupied with paying accumulated bills. To look at every piano as a means of maximizing your income places your short-term interests above those of the customer and will ultimately scar your reputation. The decision to tune, regulate, repair, rebuild, or recommend replacement should be based on your understanding of the customer's needs as well as the condition of the piano. Your income needs, narrow skills, or preference for one kind of work over another should not affect your recommendations. The more broad-based your field service and shop experience, the more objective your recommendations are likely to be.

Commit yourself equally to the piano, the customer, and your own best interests and you will likely succeed in this business.■

Super Bowl Halftime — 88 Kimball Grands Take The Field

Raymond Reuter
Kimball Professional Products Manager

This year the half-time show was different. Pianos and pianists, instrumentalists and dancers all combined to make the statement that music is for everyone and that it entertains. It also said that you don't have to be a "John Elway" to make it to the Super Bowl, being a musician can give you as many opportunities to display your talents to America as playing football.

At 8:00 AM on January 21, 88 Kimball pianos arrived at Jack Murphy Stadium, site of Super Bowl XXII, and set-up began. As the pianos were put on their legs, Brian DeTar (craftsman member in San Diego) and I pulled and untied each action and checked that everything functioned properly. By evening we had 88 5'2" and 5'8" grands, both black and white polyester, set up, covered and stored in a large tent ready to go.

Since there were eight days before the entire mass of pianos were to be tuned, I planned on tuning eleven pianos each day so that by Saturday the 30th, each piano would be tuned once. Although I did not get through every piano, I found that the 5'2" laminated soundboard pianos were all close to pitch while the solid spruce 5'8"s were all quite sharp. So I focused my attention on the 5'8"s and brought them down to pitch. The only problem being that by tuning day (January 30) they had crept somewhat sharp due to the sun, heat, cold, humidity, and the fact they were sharp to begin with.

The half-time show was produced by Radio City Music Hall Productions and directed by Mr. Barnett Lipton. Kimball and Bosendorfer are the official pianos of Radio City, and Barnett joined the Music Hall after directing the opening and closing ceremonies for the '84 Olympics (where Kimball grands were featured). So when it came time for Radio City to do this show, Mr. Lipton called Kimball.

Back row: Ken Ponche, Bob Shallenberg, Beth Chaffey Hon, Mark Adams, Eric Mobrey, Jane Paulus Seated: Ray Reuter (Kimball), Brian DeTar

Production at the Kimball piano factory was increased by one piano a day for the last four and a half months and the pianos shipped to California as they were completed. Once all the pianos were there, they each were unboxed, blanket-wrapped, and put on skid boards for the final trip to the stadium in San Diego.

The tuning of the pianos began on Saturday morning at 8:00. Along with myself and Brian DeTar, the following technicians assisted in tuning 88 pianos in one day: Jane Paulus, Beth Chaffey-Hon, Mark Adams, Bob Shallenberg, Eric Mabrey, and Ken Ponche, all from the San Diego chapter of the PTG. We used four Accu-tuners that had each been programmed to an average between the Kimball 5'2" and 5'8" scale; thanks to the help of Al Sanderson and Rick Baldassin.

The procedure that we followed was one of a production sequence. Working in teams of two, one tuner, using the Accu-tuner, tuned one string per note and the other tuner followed along and set the unisons. This allowed for total time per instrument to be approximately 30 minutes. With four teams working we managed to complete the job by late afternoon.

Although the pianos were maintained outside (covered with a fitted cover and a nylon drop) and were tuned throughout a full day, we did accomplish the goal. Eighty-eight pianos that were at pitch and satisfactory to the pianist to perform on with the soundtrack.

Of course, on Sunday, the half-time show happened without a flaw, giving America a chance to see that performing on a piano can be just as exciting as playing quarterback for the Washington Redskins.

This event also gave piano technicians a chance to promote piano tuning. Both Brian DeTar and Jane Paulus were featured in the San Diego papers and the tuning of the pianos were mentioned in many articles that were published throughout the United States.

I hope you enjoyed seeing Kimball as part of Super Bowl XXII.

Kawai Names Chandler

Kawai America has appointed Ray Chandler as Manager of the Piano Technical Support Division. His responsibilities will include warranty administration, institutional sales administration, dealer relations and customer relations.

In his new position, Mr. Chandler will represent Kawai at both regional and national conventions as well as teaching various technical courses. He has been active as a Registered Craftsman member of the Piano Technicians Guild and in his new capacity as manager of Kawai's Technical Support Division, Mr. Chandler will serve as technical liaison with the Guild.

Prior to joining Kawai, Mr. Chandler was actively engaged in a piano re-manufacturing business in Salt Lake City. He has been Chief Technician with the Utah Symphony Orchestra and has worked with major artists throughout the world. A magna laude graduate in music from Utah State University, he continued advanced studies in London for two years, which also included an apprenticeship in piano technology under the tutelage of H.A. Lyddall.

Ed Whitting Joins Young Chang

Edward Whitting, Jr., former principle artist piano technician for the Los Angeles Philharmonic Orchestra and the Long Beach Symphony Orchestra, has joined Young Chang America as Director of Technical Services. In making the announcement, Lloyd Robbins, Vice President said, "We are very pleased with the addition of a man of Ed's talent and reputation to our management team." Since 1979 Whitting has been self-employed.

In addition to working with the L.A. Philharmonic and the Long Beach Symphony, he performed service work for Kawai, Yamaha, Steinway, and Baldwin. He is an active member of the Piano Technicians Guild, and has held various national and local offices. "Whitting will act as technical liaison with our engineers and manufacturing facilities in Korea," said Robbins, and "he will also be meeting with the leading scale designers around the world." Whitting, his wife and two children make their home in Huntington Beach, California.

THE
TECHNICAL
FORUM

Action Centers

Susan Graham
Technical Editor

This month we resume the discussion of "heavy touch" in a grand action. An older, rebuilt Steinway action is the starting point; we are discussing problems specific to that action as well as to grand actions in general. The cleaning and lubricating procedures detailed in a previous issue have eliminated some excess friction: the next logical place to look is at action centers.

Action center or centerpinning friction is hardly a glamor topic — it's about as exciting as an oil change. It is a dull subject which is extremely important, however — we might say that the function of a piano hinges on its action centers (although it is such a poor pun perhaps we won't say so.) Problems of action center friction fall into three categories: bad mechanical fit, contamination or corrosion, and, occasionally, lack of lubrication. A treatment appropriate for one problem may have no success with another, and may in fact interfere with the correct solution. Success in treating action centers depends on understanding both the cause of a problem and the ways in which solutions work.

How should the action center itself work? The centerpin must be held tightly in the unbushed male part, but must be free enough in the bushing to allow rotation of the female part. The center pin itself should not rotate, regardless of whether it is held in a standard wooden part, a butt plate, a brass flange or any other configuration: the center pin remains fixed and the bushed part turns around it. Friction between the bushing and the pin is set or adjusted to allow the proper freedom of movement while maintaining the resistance necessary for control. It is a balance which is crucial.

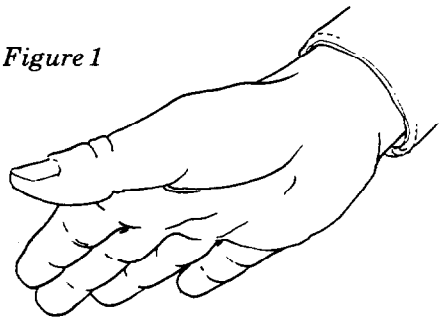
Potential causes of trouble are many: moisture, cleanliness, inherent "genetic" problems, and wear are most common. We deal with old and new parts. We find cloth reacting with center pins, cloth which is contaminated, cloth treated with teflon or with graphite, cloth which has been mistreated by other technicians, cloth of poor quality, bushings of pure teflon, and so forth. When the factor of reaction to changes in climate is included, it becomes a small miracle that a piano action works as well as it does.

With this variety of problems, it is no surprise that there are many solutions. The longer I am in piano work, the more complicated action center treatment becomes. Various methods are tried, work for a while on some actions, and then fail miserably just when everything seemed to be going so well. As stated, a common cause for failure in action center work is simply using the wrong treatment for the problem. An inappropriate treatment may work temporarily: then the problem returns, creating the impression that the method was inherently ineffective. More likely, the problem was misdiagnosed — or more than one factor is at work. We can't fix on a favorite method of working with action centers: effective treatment requires a battery of methods and a thorough understanding of how each works. For instance, the Steinway action with new shanks and flanges and the original wippens has potential to contain almost all of the common action center problems. It serves as an excellent reminder that the cause of problems should be determined before treatment is undertaken.

Diagnosing the extent and nature of the problem is the first step in treatment. In the field, I use a quick "bounce" test to detect hammer flange tightness or looseness: raise a group of five hammers off the rest and let them fall, watching for any which fall at

a different rate or rebound noticeably more or less than the others (fig. 1). You can also detect problem centers by holding the action stack by the bracket feet and rotating it so the hammers swing freely (or try to...) and then inverting and rocking it so the wippens are free to swing. This also can be done with the action in an upright action cradle, leaving both hands free to chalk-mark problem flanges (fig. 2). These "gang-test" methods quickly isolate samples of both the tightest and loosest centers.

Figure 1



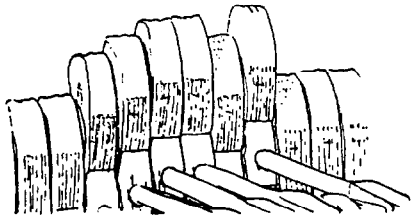
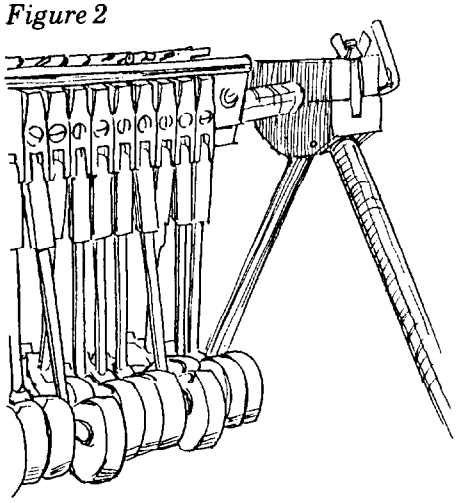


Figure 2



Remove those parts and test them individually, either by swinging or by measuring the friction with a gram resistance gauge (fig. 3). This indicates the range of friction within an action, and suggests whether further diagnosis and treatment are necessary.

To detect action centers which may be too tight in one bushing and too loose in the other — averaging out to an apparently correct friction but still a potential source of noise and poor performance - slide a slightly rough screwdriver blade from side to side under the shanks, and watch for any which "wink" sideways (fig. 4). This is also a gang test; individual parts can be tested by feeling for sideways motion at the center — the "click" as the center pin moves in the bushing.

Figure 3

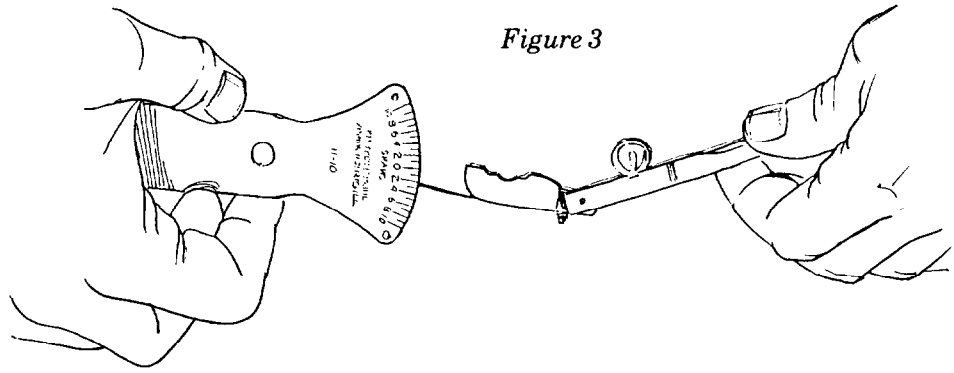
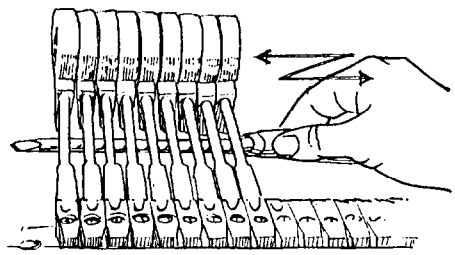


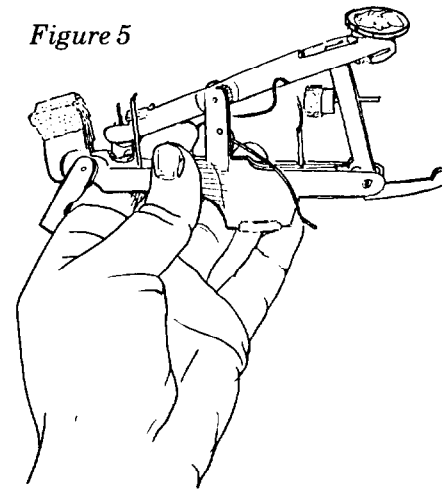
Figure 4



Spot-remove wippens to test flange and repetition post pinning, again after swinging the action to isolate problem parts. Many of us develop an ability to feel sluggishness in jacks by quickly going down the line of wippens and tripping the jack toes even though the springs are still engaged (if the stack is removed from the keys the shanks are resting on the cushions and there is no knuckle pressure on the top of the jack). Suspicious-feeling jacks can be checked further with the wippen removed and the spring disengaged. Pinning of the repetition lever is critical and often ignored: chronic problems adjusting spring tension may result.

The rough specifications are that a grand hammer should swing 5-7 times, the wippen flange should support the weight of its own screw but should drop slowly if shaken slightly to break inertia, the jack (free of the spring) should fall back and forth freely when the wippen is tilted, and the repetition lever (also free of the spring) should support the weight of a nickel (or the 2- and 3-gram touchweights looped together on a string) on the drop leather (fig. 5). Gram resistances are: 5-8 gm. in the hammer flange, 3-5 in the wippen flange, 1-3 in the jack and 4-7 in the repetition post. These figures are general (some manufacturers may vary by a gram or so) but reasonable guidelines. The closer these specifications can be maintained, the better the chances for good action function. I rarely find it productive to attempt to cure touchweight or repetition problems by making radical departures from the standards in center pin friction: looser pinning does not necessarily create a lighter action, since there are other factors of weight and control which still must be maintained. There are constant fluctuations in pinning tightness due to climate and use, but if the starting point is correct there is a reasonable chance of staying within an acceptable range.

Figure 5



To be honest, in my shop we

spend very little time in pinpoint diagnosis on old Steinway actions — we dryclean everything. Most technicians are aware that older Steinway action parts have a problem with verdigris — corrosion of the brass pin reacting with the bushing cloth of the action center. Often the problem is so bad that visible green gunk is growing out of the bushing, and into the wood of the flange. The condition tends to be worse in the hammer flange center, but can appear throughout the action. Two theories prevail as to the cause. One maintains that it is a reaction between lanolin in the bushing cloth and the center pin. The other is that the paraffin which was used for a time to treat action parts (in attempt to "humidity-proof them") leaches into the bushing cloth and reacts with the pin. Whatever the cause, the result has been extremely sluggish action centers. In addition to eroding the surface of the pin, corrosion attacks the bushing itself, causing permanent damage. The structure of the cloth is destroyed. Even if it could be completely cleaned it cannot function well. Once this is understood, it becomes apparent that replacing parts is the only real cure. (Take an opportunity to see Willis and Dave Snyder's action remanufacturing class, which includes excellent slides to demonstrate this fact.) If it is true that the problem was due to the original cloth itself, then rebushing and repinning would solve the problem — but that's a lot of work. The possibility that the problem is due to paraffin - treated action parts suggests that to rebush and repin the old parts may not be effective over the long term, since there may still be enough wax in the parts to recreate the problem. To avoid any possibility of problems in the future, I prefer to replace parts.

Those are the hard facts. The reality that we face is that not every action with this problem is a candidate for immediate rebuilding. It hardly seems fair (or conducive to good customer relations) not to offer some remedial, if temporary, measure. What can be done for these actions?

First, reiterate in your mind and express in firm tones to the customer that any treatment may have variable results and may need to be repeated periodically. Understanding that, there are several procedures which may help restore such an action to reasonable working condition.

The first treatment is cleaning with one of the products available for home drycleaning, sold in hardware and drug stores. Renews-it is the product I customarily use, although I have heard good reports of "1,1,1," (trichlorethylene). Some technicians use perchlorethylene, but, as stated in previous articles, I regard it as too dangerous a chemical. Naphtha is also a good cleaner. This is a product we usually purchase from paint supply stores, but a handy tip is that Ronsonol lighter fluid is pure naphtha, and can be used to clean action centers. This is particularly useful on the road, since there is almost always a convenience store or even a gas station mini-mart carrying Ronsonol, conveniently packaged in a plastic bottle with a squirt top. It is not exactly cost-effective, but in an emergency it can enable a technician to get an action working well enough to tune the piano (and demonstrate the need for further work).

The procedure is very simple. I usually remove the stack from the keyframe (partly for neatness and partly because there is always other cleaning to be done). The action centers are soaked with drycleaning fluid (parts still on the rails) and worked by hand or by tipping the stack to swing the parts. While the parts are still wet, they are blasted with compressed air to drive the fluid into the cloth. A little gentle heat may be applied; hairdryer heat, *not* the heat gun. If the problem is caused by paraffin in the wood parts, heating them with the heat gun is likely to melt more wax out of the wood, which is counterproductive. The action is left to dry overnight.

This treatment may or may not have an effect. If not, the cleaning process is repeated with a different product — if Renews-it was used first, then we try naphtha. Sometimes a second treatment can be very effective in breaking through corrosion.

If, after that second attempt has dried, the problem still exists, a methanol and water solution is applied to try to shrink the cloth. Since the centers have just been cleaned, the methanol/water solution has a better than usual chance of penetrating and doing some

good. Shrinking solution proportions are usually eight parts methanol to one part water, with a few grains of ivory soap as a wetting agent. Do not become confused about proportions - remember that it is methanol with a *little* water and not the other way around. (In these particular actions it may not matter, but in others it will...) This shrinking solution is usually used in conjunction with gentle heat, exercising restraint so as not to overheat parts. Methanol is used because it is a very pure alcohol; it can be obtained from a pharmacist or more cheaply in bulk from a chemical lab supplier (look in the Yellow Pages). Other alcohols such as isopropyl may have oils or perfumes in them and are not appropriate.

In general, shrinking solution is most effective not for this particular problem (verdigris) but for actions which are sluggish due to moisture, or in those parts which were bushed with cloth which was inadequately shrunk and still needs to be sized and stabilized. It must be used cautiously. Apply as little as possible to the action center, and work the part briefly. The center will become extremely stiff as the cloth swells. Heat it gradually with a hairdryer - *not* a heat gun (unless you plan to repin due to overshrinkage). Continue with the heat and working the part until it begins to free up, and then allow it to airdry overnight. It is very easy to get an over-reaction with this solution, particularly if too much water is used. Some methanol contains water already — if you are using a particular brand for the first time, it is advisable to attempt shrinking with the methanol as it comes straight from the bottle. Shrinking with methanol alone is also advisable when treating brand-new parts (more about this later) or if treating any parts which may have been repinned. The reaming process in repinning often leaves loose fibers which will pack when treated with a shrinking solution and an action which was repinned originally because it was too loose (if reaming is followed with burnishing this is less likely to happen). Now do you see why this simple job can be so complicated?

Whenever an action is treated with a shrinking solution, flange screws will need to be checked after drying is complete since the parts may expand and then shrink slightly, loosening the screw.

The shrinking treatment will often work on teflon-impregnated cloth, but since it dissolves the teflon and removes it from the bushing, the manufacturer of these parts does not recommend the procedure. As with any procedure which alters the manufacturer's specifications, a technician assumes an added responsibility for the present and future functioning of the instrument.

Shrinking may also work on graphite-treated cloth, although these centers are inclined to overshrink even if no water is included in the solution and no heat is applied. I feel it is worth the extra time to stabilize the cloth with shrinking even if if does require subsequent repinning — but that is a decision which must be made individually.

Back to our rebuilt Steinway action, which has now had the remaining original parts cleaned twice and shrunk once. If none of this has been effective, chances are that nothing will be, but it worth trying an application of the silicone oil-naphtha solution. This is a product specifically made for piano action centers (also used by some on key and damper guide rail bushings), and is not to be confused with any other form of silicone. Containers of silicone oil are available from Yamaha and Wurlitzer; it is mixed with VMP naphtha (a purer product than paint thinner) and must be stored in a tightly sealed glass container, since the silicone will creep out through the seam in plastic. It is designed to lubricate an action which has a correct mechanical fit but due other circumstances may tend to build up excess friction. There are two cautions to be observed in its use. One is that it is a lubricant, and does not shrink or clean the action center (although the naphtha component probably does some breaking down of corrosion). Once it is applied to an action center, no other solution will be able to penetrate, since silicone "waterproofs." Therefore, if it is applied to an action which really needs shrinking or cleaning, it may not only be ineffective but may also interfere with the proper treatment. The silicone treatment may also interfere with rebushing in the future since it seems unlikely that the surrounding wood will provide a good gluing surface. I have no experience in attempting to do this, but if there were any likelihood in my mind that parts would eventually need rebushing, I would not apply the silicone solution.

A traditional lubricant for action centers is eight parts naphtha to one part light mineral oil. In the case of an action which has a verdigris problem, this again may or may not help but cleaning and shrinking first are advisable.

Two treatments which seem to work for other technicians are use of the "zapper" or a heat gun to heat the center pin and action center so the verdigris essentially burns away. It is impossible for me to control these methods and I usually end up with a scorched centerpin hole in the unbushed

part, which is undesirable. If you have old verdigris parts which are no longer in use, it might be useful to experiment with these methods and see if they will work for you.

At this point we have exhausted the reasonable possibilities for dealing with verdigris without either replacing parts, or completely rebushing and repinning the old ones. Repinning old verdigris parts without rebushing is not recommended —it is time consuming and usually no more permanent than the other measures outlined. Remember that the cloth is actually damaged and has lost its ability to function properly; the problem is generated within the parts themselves and is always likely to return. It is not our fault that this problem exists; we attempt treatments as a service to our customers but the reality is that replacement of parts is the only permanent cure.

All of the procedures mentioned here can be effective in treating other actions. Cleaning can be helpful in very dirty actions, or those which have been mistreated by other technicians (I know of no solvent for WD-40, unfortunately — this product in *NOT* suitable for action centers). Shrinking is helpful in pianos sluggish due to moisture, and to stabilize cloth, and are useful where the fit and condition of parts is correct but a friction problem still exists. Next month we will finish up action centers with repinning and rebushing.

Additions, Corrections And Comments

On the subject of acetic acid as a component in a glue-dissolving solution: Norman Neblett recommends against it, reminding us that it is a very unpleasant and dangerous chemical. Contact with the skin can cause burns, and the fumes will attack membranes of the eye and nose and even the enamel of our teeth. It you are going to use it, please be very careful. Norman prefers to use just hot water and wallpaper remover, reiterating that the hotter the solution, the better it will work. (I mix it in a jar and put that in a hot water bath in the glue pot.)

Several people, including Ralph Nelson, have suggested to me that a tiny soft cotton buffing wheel in a moto-tool does a wonderful job of cleaning repetition spring heads.

The following is an excerpt from a letter sent by a member regarding the state of the *Journal*. What I appreciate the most is that he not only has taken the time to write, but also to submit some material of the sort he feels has been lacking.

"Years ago, our *Journal* had so many more practical and down-to-earth articles. We need more of this. Most of our business is made up of working on old pianos, and for people with limited funds. Piano rebuilding is an area unto itself... I am all for learning all you can but we need more on everyday problems for average people."

Think-Analyze

Success in this work is dependent on thinking a problem through and finding a solution. You will need to constantly be reading and studying your manuals and catalogs. Become familiar with tools and parts used in our work and be able to identify them. Do not feel you will have to experience every repair several times before you can do it properly. There are many repairs you may only do once or twice a year but this does not mean you cannot do them quickly and right.

Learn to find a problem as soon as possible and repair it in the best but quickest way; time is money, especially in this work. You cannot afford to spend several hours on a job that should be done much faster. You can only charge a customer so much for each particular repair.

When checking a key out that doesn't play properly, go through all the usual checks as they will only take a few minutes when you get used to them.

1. Is the key going down about 3/8 of an inch?
2. Is there any obstruction next to the key or in the action?
3. Is the key broken?
4. Is the fly jack loose (unglued)?
5. Is the spring broken under the fly jack?
6. Is the key height correct?
7. Is the hammer letting off properly and falling back the proper distance?

These are a few; there may be other problems but it only takes a minute to check all these things out. It will soon become a matter of habit. Most repairs can be made easily and quickly and with little effort if you have the proper tools and parts with you. The basic parts should be in your case and outside in your car if you need them. Unnecessary trips will also cost you time and money.

CHECKING FOR SLUGGISHNESS AND POOR REPETITION: One important thing to remember is to play each note with the pedal (sustain) DOWN. If a key has any tendancy to be sluggish, it will show up when you are using the right or sustain pedal. The damper spring is not in play when the pedal is down. When the pedal is not being used, the note is more likely to play properly due to the fact the damper spring is helping the cycle as the damper lever pushes against the spoon which is on the back of the wippen.

Don Flippin

My thanks to those who are sending chapter newsletters (and encouragement to everyone to do so). Next month I hope to resume printing excerpts of some of the fine writing which is being done at the chapter.

TUNING UP

"Picasso" Tuners, More on Beat Rates, and "Heifetz and Ping Pong"

Rick Baldassin
Tuning Editor

As I sit to begin this month's column, I cannot help but reflect upon what a fast-paced life we live and how relatively quickly it goes by. While attending the California convention this past month, I received news of the untimely passing of one of our members. He always treated me with kindness and encouragement. I remember him best for his "smooth" political maneuvering in the council sessions over the past six or eight years. In addition, he had more uses for an electric drill than any man I ever knew. His style and his smile — I will surely miss Bob Russell.

This month I received an interesting letter from Frank Gebel, of Edmonds, Washington. It reads:

An intriguing comment was made about tuners-as-artists during Ben McKlveen's "Tuning Techniques" class at the Philadelphia PTG Convention in July 1980. Those remarks have reached disturbing proportions now that tuning can be measured most precisely and strictly evaluated with very well-defined parameters, as demonstrated by the latest Guild exams and your previous own "On Pitch" series. Here is a part of that discussion transcribed from the PTG tape of that class:

"There is a guy who is tuning for Baldwin and he's a 'Picasso' if I ever saw one. The guy stretches like you wouldn't believe. And the artists swear by him. He could not pass the test to get into the Guild. I do not criticize because, the man is truly a gifted tuner. He can produce that same sort of tuning all the way, and it sounds like a million dollars on the whole: you play Rachmaninoff, you play Bach, you play Mozart, you play Brahms, and it's fabulous! But if you and I sat down and ran that temperament, you wouldn't believe it. And the stretching the guy does? You wouldn't believe what kind of stretching he's got. But the man is truly a 'Picasso' in the tuning professional world.

It's unreal. Unreal! But the artists swear by him because he has something in what he does that is so charismatic, when you play that piano it blows your mind. Now I don't know how to reproduce that."

"But the artists swear by him because he has something in what he does that is so charismatic, when you play that piano it blows your mind. Now I don't know how to reproduce that."

How is this possible? How can his, or any tuning (Picasso-style or no), on the one hand not satisfy accepted temperament tests and

apparently exceed the usual boundaries of stretching for any type of octave and thereby not pass the Guild exam, but then on the other hand, overwhelmingly please artists (and tuners) and produce tonal results equally well-suited to widely differing musical styles?

Does this unconventional tuner-artist really know something that master theoreticians like yourself or Albert Sanderson don't?

If so, it would be most disturbing to find that a "concert tuning" which has just passed the exam at near 100 percent, while quite satisfying to critical ears (and instruments alike), might actually be far from as pleasing as it could be! What do you think?

There are several issues which must be addressed here. First, Ben McKlveen uses the term " Picasso" to describe this particular tuner. It is important for us to understand exactly what he meant by this. I phoned Ben, whose initial reaction was surprise that eight years later his words were coming back to him. I asked him to give me a little background on the class he was teaching, and the passage just quoted. He replied that the class was a class on basic tuning. During the class, a question came up as to how octaves were to be tuned, trying to define them in absolute terms. To illustrate that an octave is not a "perfect" interval, and that tuning is not only a science, but also an art form, Ben used the term " Picasso" to describe this particular tuner. By this did Ben imply that Picasso was his favorite tuner? I think not. If we study the artwork of Picasso, we find that in his later work, he used the technique of visual distortion for a purpose. By referring to this tuner as a "Picasso" Ben was suggesting that this fellow also used the technique of distortion — of the octave. He stretched the octaves to the point that to some, they would sound distorted, yet were still recognizable as octaves. Done consistently, the piano as a whole could still sound quite nice.

As to the issue of this person not being able to pass the tuning exam, Ben clarified that it was his belief that the person could pass the tuning exam, but that this type of tuning would not pass the tuning exam, because it was stretched more than the exam would allow. Because this tuner tuned with extreme stretch for concerts would not preclude him from tuning in a different prescribed manner for an examination. After all, the early works of Picasso were very realistic.

Concerning the temperament, Ben indicated that it was "equal temperament" set in a very stretched octave, which would make the beat speeds of the fast intervals even faster.

In conclusion, Ben stated that it was comforting for him to know that someone out there was doing something more radical than he was. This gave him a feeling of security that he was more in the "mainstream."

As to Frank's question about how this type of tuning could be out of the usual boundaries of octave stretching and thereby fail the tuning exam, yet overwhelmingly please artists, let me begin by saying that the tuning examination is set up to be a test of a person's ability to perform in a prescribed set of conditions. This does not mean that this set of conditions will be best under all circumstances, or for that matter, under any circumstance. If the stretching was done consistently, as indicated, then it probably did follow some sort of framework. To one who normally tunes the treble in single octaves, a double-octave treble tuning would likely sound "radically stretched." Yet to one who tunes the treble by triple octaves, or by arpeggio, the same double-octave tuning might seem rather "conservative." In addition, some feel that one type of tuning may sound better than another depending on the instrument and location. It is quite likely that the single-octave treble tuning would sound as bad on a concert stage as a triple-octave tuning would in a customer's home. As to the issue of artist satisfaction, most artists seem to be more concerned about consistent action regulation than how much the octaves are stretched.

Whatever method we use, we must do it for a reason. The best reason is because it "sounds best." This is, of course, subjective, and accounts for the fact that some customers prefer one technician, while other customers prefer another. Therefore, to be safe, whatever the customer likes is what sounds best.

In the October issue, a graph was presented, which depicted the tuning curve of the data supplied by Dr. Sanderson. The treble tuning in this data was based on single (2:1) octaves plus one cent stretch. For fun, I took the data and created treble tuning curves based on single, double, and triple octaves. The original tuning curve is also shown in bold.

Fig. A shows treble tuning curves based on single, double, and triple octave tuning. The original curve is based on single octave tuning plus one cent, and is shown in bold.

Because each of the curves is smooth, this piano tuned with any of these curves will have a smooth progression of fast beating intervals. The octaves, however, will sound quite different. Even so, they will still sound like octaves. With triple-octave tuning, note C8 is over 18 cents sharper than with single octave tuning. With double-octave tuning, note C8 is about nine cents sharper than with single-octave. Single-octave tuning will produce the smoothest sounding octaves, but will tend to sound flat to double and triple octave chords and arpeggios. Triple-octave tuning might sound best for arpeggios, but gives rather active sounding octaves. In general, double-octave tuning provides the best of both worlds. In homes, often a compromise between double- and single-octave tuning is necessary.

In conclusion, Ben McKlveen's reference to this particular tuner as a " Picasso" is fitting since this fellow distorted octave tuning for a purpose — to achieve a particular effect on a concert stage. Though this type of tuning would not pass the Guild examination because of its stretching parameters, the tuner himself could surely have passed the examination by stretching within the prescribed limits, just as Picasso could draw a woman which looked like a woman. Since the stretching was executed evenly, and consistently, it was obviously performed within some framework, though that framework may have been wider than we are used to. Finally, I feel it unnecessary to be disturbed or alarmed. Find comfort and refuge in the mainstream.

Our next submission comes from Fred Tremper of Elmhurst, Illinois. It starts out as a letter, and soon transforms into a very well written article. Fred writes:

Reading your recent colloquy with Charlie Huether (*Journal,* January 1988) regarding the use of checks in tuning, I was impressed by what we might call a literary standoff. Both of you were in agreement, that tuning is an art as well as a science. You both agreed that published beat rates were to be taken as a guide rather than gospel.

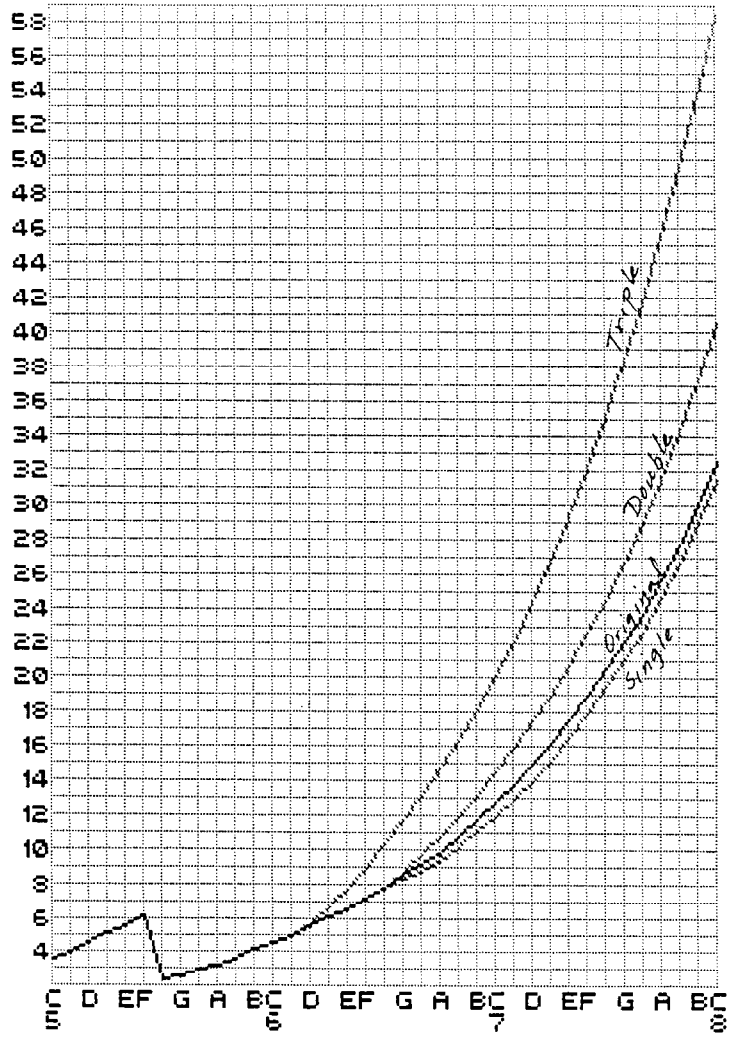
It is common practice to refer to charts of theoretical frequencies to determine the beat rates of various intervals. We compare these beat rates to estimate the proper setting of the note being tuned. When all is done we listen to the steady progression of these beats up and down the scale and pronounce a tuning good or bad.

A knowledge of the comparative beat rates is important to the tuner. We find that the beat rate of an F major third is 6.93 beats per second and that the beat rate of an F major sixth is 7.92. From this we learn that the sixth should be 0.99 beats faster than the third and that the fourth should beat at the rate of 0.99 per second. With experience a tuner can estimate these rates with remarkable accuracy.

You point out that "beat tables are unreliable as absolutes," and you quote Michael Kimball's caution that "beat rates are approximate, since the beat rate will vary slightly from piano to piano due to inharmonicity." The question that might come to the inquiring reader is, why? What is it that causes this difference?

The answer really is simple: the inharmonicity of one piano is different from another. The charts of theoretical beat rates have one outstanding flaw: they do not apply to the piano. The charts are constructed under the assumption the vibrating body (the string) is perfectly flexible, which well describes the column of air circulating in the pipes of an organ. The piano, however, is a different animal. The strings, which flex under the impact of the hammer and offer a resistance to change, are anything but perfectly flexible, and this is the main source of what we know as inharmonicity. The factors that go into inharmonicity are, primarily, the frequency at which the string

Figure A



vibrates and the diameter and length of the string. Since pianos have different scalings (i.e., string diameters and lengths) their "inharmonicities" will be different.

In a theoretically (i.e., perfectly flexible) string the partials that emanate from it as it vibrates are in whole number relation to the fundamental; that is, the frequency of the second partial is as twice that of the fundamental, etc. The result of inharmonicity, however, is that the partials that emanate from the vibrating string are not in a whole number relationship with the fundamental; that is, the second partial has a frequency greater than twice the frequency of the fundamental and the third partial is more than three times the fundamental, etc.

In recent years much has been made of inharmonicity and the effect it has on tuning. To an electronic tuner the phenomenon of inharmonicity does not have an obvious meaning. He does not measure inharmonicity, nor does he calculate the effect it has on the job at hand. The tuner compares beat rates and he makes his adjustments to the best of his ability. The "stretched" octave has real meaning to an electronic tuner: he measures with remarkable accuracy the difference between one partial and another; but to the aural tuner "stretching" has little meaning. He tunes and compromises until the octaves sound as best as he can make them. It wasn't until the advent of the stroboscope that tuners found they were tuning up, up, and up in the treble, down, down, down in the bass; i.e., they were stretching the octaves.

Looking at it from a different angle, it is understandable that the unsuspecting tuner would assume that a temperament is correctly set when his frequencies are the same as found in the charts. So, if he were to set theoretical frequencies the results would be the same. Not so; they will be subtly different.

To show this difference and to show the effect of inharmonicity on beat rates, I measured the string lengths and diameters in the temperament section of two outstanding pianos and from these calculated the inharmonicity of each string. The beat rates of the intervals in the temperament section were then calculated and graphed. These graphs are compared with graphs of the temperament section of the theoretical beat rates. When the graphs are compared the differences can then be easily seen.

To compare one frequency to another in terms of cents is, to a practicing tuner, not very revealing. To say that a particular frequency is three cents higher or lower than another doesn't tell much. The tuner works with beats — how fast here, how slow there. Accordingly, when working with the numbers in the Figures I put everything into beats in the hope it will make more sense to the reader.

It is important to keep in mind that the purpose of this exercise is only to show the effect of inharmonicity on the beat rates of the various intervals. If there were no inharmonicity in a string and if the strings were set to their theoretical frequencies all of the parallel thirds, fourths, fifths, and sixths would progress smoothly. A measure of the effect of inharmonicity, then, is the extent these smooth progressions are interrupted when inharmonic frequencies are plotted. The graphs are intended to show the differences between the two.

In this exercise there are two different formulas, the first giving theoretical beat rates, the second the actual beat rates of inharmonic partials. Both of these formulas use frequency, and the same frequency was put in both. As the Figures show, there are real differences between the two.

Earlier it was mentioned that the two pianos studied were outstanding instruments; however, the graphs would seem to indicate some flaw in the scaling. Not at all. On each piano can be set a solid temperament. I thought it best to omit the

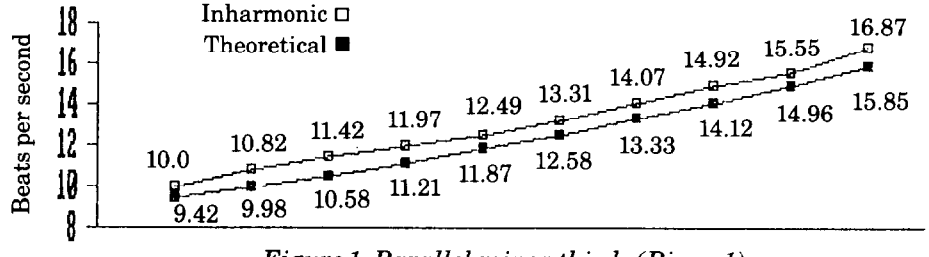


Figure 1. Parallel minor thirds (Piano 1)

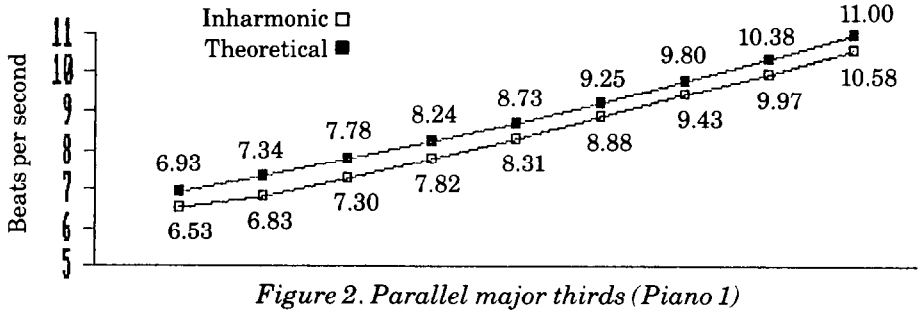


Figure 2. Parallel major thirds (Piano 1)

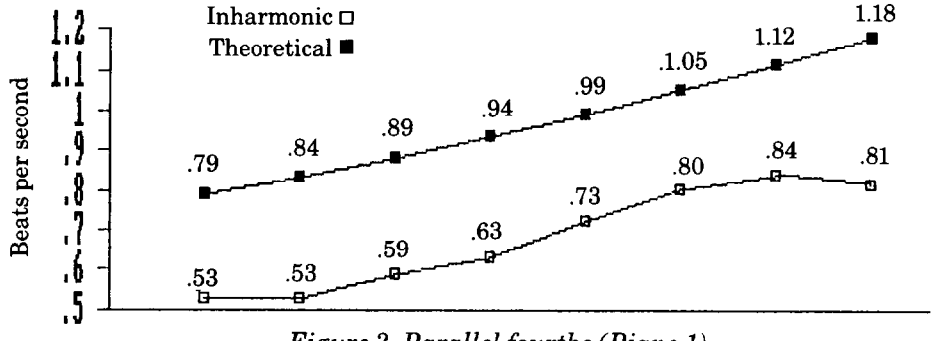


Figure 3. Parallel fourths (Piano 1)

names of these pianos should there be any residual doubt about their quality. Remember, the graphs tell us that when a good temperament is set we should not expect the frequencies to be the frequencies found in the charts of theoretical beat rates, albeit the better the scale the closer they will be (I think). It is the chart of theoretical beat rates that should be suspect.

What is shown is the effect of inharmonicity. I did it by entering the theoretical frequency of the fundamentals into the formula and letting inharmonicity dictate the frequency of the partials. The resulting difference in beat rates shows dramatically how inharmonicity affects our tuning and the adjustments we make whether or not we realize it.

In each of the Figures the parallel run of two intervals are shown. The even progression, marked as a blackened box, is that of a theoretically perfect interval. The more irregular, indicated by an open box, is that of the inharmonic intervals.

Let us recall that the purpose of this exercise is only to show the effect inharmonicity has on our tuning practice. The degree of inharmonicity (that is, the extent the actual frequencies vary from the theoretical), dictates the adjustments we make while tuning. The greater this variation the greater the adjustments we make. One can see from the Figures that, generally, the major and minor thirds and sixths run parallel to the theoretical line and that fourths and fifths are a bit more ragged. Since it is possible

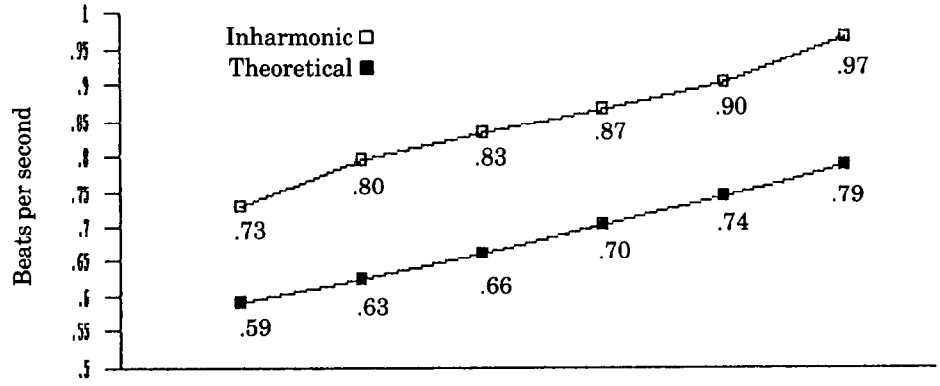


Figure 4. Parallel fifths (Piano 1)

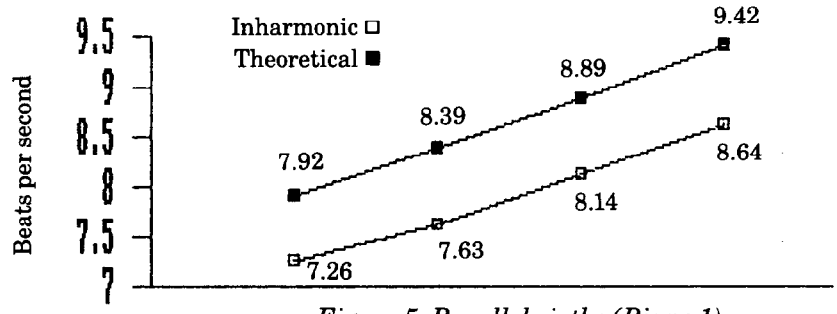


Figure 5. Parallel sixths (Piano 1)

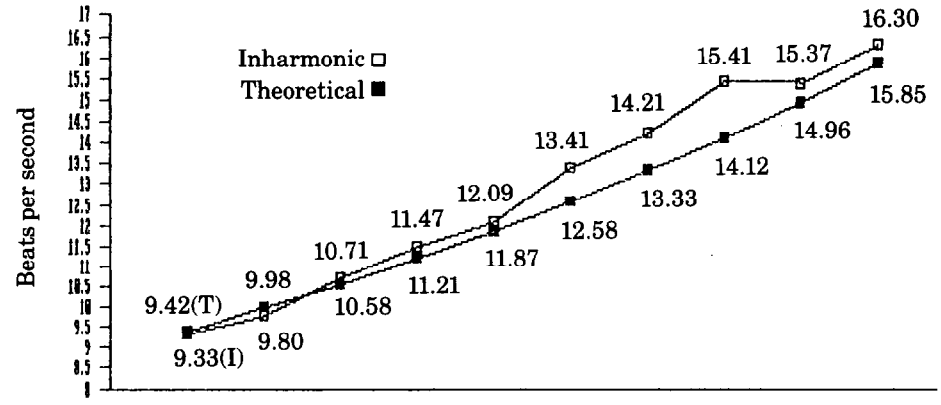


Figure 6. Parallel minor thirds (Piano 2)

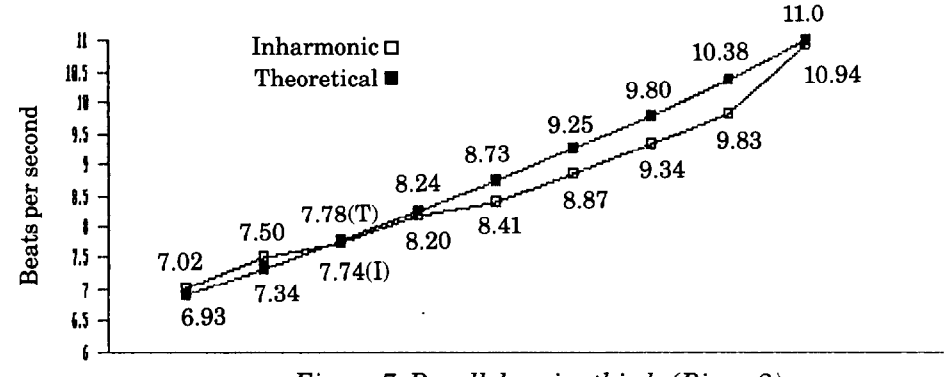


Figure 7. Parallel major thirds (Piano 2)

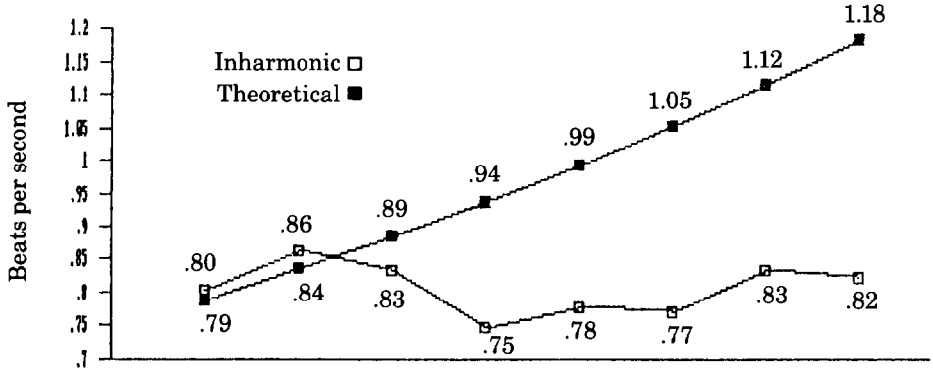


Figure 8. Parallel fourths (Piano 2)

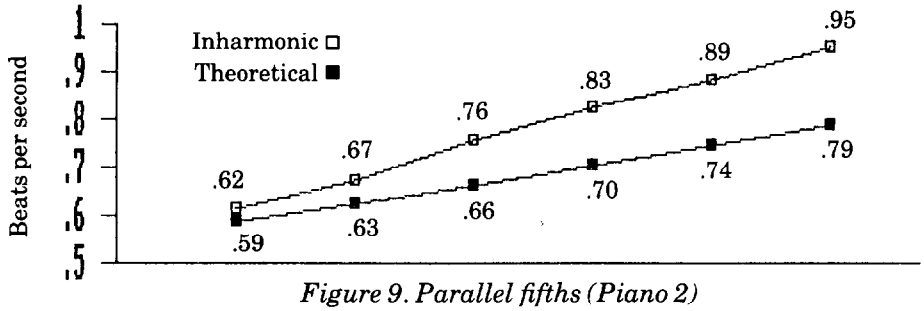


Figure 9. Parallel fifths (Piano 2)

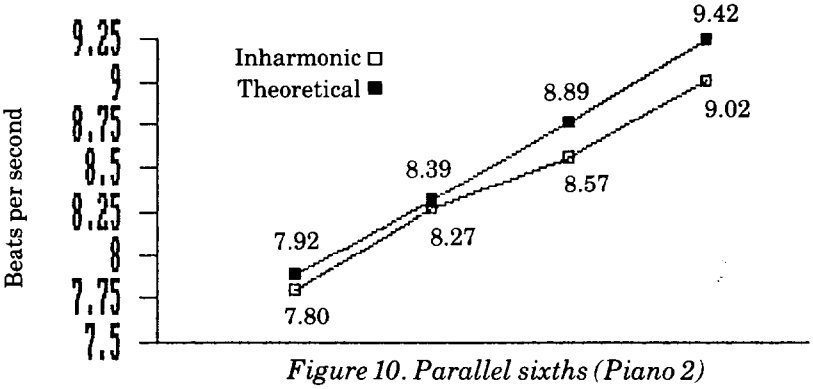


Figure 10. Parallel sixths (Piano 2)

to set a very good temperament on these pianos one would assume that these variations are well within the bounds of acceptability. I would like to have the data from lesser pianos. If anyone has the string lengths and diameters of such pianos I would be pleased to plug the data into my fancy computer to see what happens.

Finally, Rick, I was impressed by your comment that the possession of knowledge leads to freedom of choice. I recall a passage in Moby Dick I think is appropriate: *Is it not curious, that so vast a being as the whale should see the world through so small an eye, and hear the thunder through an ear which is smaller than a hare's? But if his eyes were as broad as the lens of Herschel's great telescope; and his ears capacious as the porches of cathedrals; would that make him any longer of sight, or sharper of hearing? Not at all. — Why then do you try to "enlarge" your mind? Subtilize it. Herman Melville, Moby Dick, Chapter LXXIV: The Sperm Whale's Head — Contrasted View*

It is interesting to see how the beat rates vary from one piano to another due to differing inharmonicities. It was illustrated over a year ago how inharmonicity affected the beat speed of a single interval, and here Fred has shown the effects of all of the temperament intervals for two different pianos when the fundamentals are tuned to theoretical pitches. The optimized temperaments for these pianos would have to be different yet, since the octave F-F would have to be made wider to account for the inharmonicity there, and this increased width distributed throughout the temperament notes.

Our thanks to Frank Gebel for his letter and questions, to Ben McKlveen for his help with the answers to those questions, to Fred Tremper for his letter/article, and to Bob Russell for being Bob Russell. Please enjoy in closing "Memories of Heifetz, Part II — Heifetz and Ping Pong" by Norman Neblett, a light-hearted, humorous look at the Heifetz artistic personality.

Until next month, please keep the mail coming. ■

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PROVO, UT 84601

Memories Of Jascha Heifetz: Heifetz and Ping Pong

Norman H. Neblett

My second visit to Jascha Heifetz was rather unique. Although I did not know it at the time, he was a ping pong enthusiast. A hint of this was given to me by my customer, Muriel Kerr, who was a faculty member at USC and one of the finest pianists that I have ever heard. She had known Heifetz for years and had played chamber music with him occasionally.

I mentioned to her that I had been to his home and she answered, "Next time you see him, he is going to ask you to play ping pong before you go to work." I answered that I had played ping pong seriously at one time, but that I had not picked up a paddle for years. "Well, you had better practice because he is good," she replied.

Not believing this, I arrived at the Heifetz doorstep to be greeted with, "Before you start on the piano, we are going to play ping pong." To my surprise, we went to an outdoor sheltered area next to his studio. The table and equipment were all set up. Heifetz announced that we would play two out of three games.

After warming up we started. Needless to say, I was rusty. After defeating me 21 - 11 and 21 - 12, Heifetz indicated that we would proceed to his studio. Following him through a short hallway, I noticed a few autographed conductor's pictures and a picture of pianist-composer Sergei Rachmanoff. Much later in our relationship, Heifetz confided in me that he considered these artists among the greatest musicians in his life.

The room was pentagon shaped with this design carried to a slight peak in the center of the ceiling and constructed entirely of wood. An ebony Steinway B stood over to one side. Heifetz dismissed himself stating, "You know what to do and I will be back later to check your work."

I found that "checking my work" meant Heifetz playing all sorts of chord combinations, plus octaves and double octaves until he found a note that did not suit him. Invariable, he described it as being "flat." This procedure, with my corrections, sometimes took as long as 15 minutes.

In some ways this was demeaning, so a plan germinated in my mind. Why not deliberately not set two or three notes flat allowing Heifetz to find the notes that did not suit him quickly and save all of this hassle? Operating on this plan produced instant results. With the realization that Heifetz had to be the final authority on tuning, this scheme served to get me out of the house in short order after his evaluation.

The "final authority" concept was also true for areas of music not concerned with the violin. Once after attending a Los Angeles performance of my daughter, Carol, singing the lead soprano role in "Coc'Dor," Heifetz awakened her early the next morning to announce that she had sung a high B instead of a B-flat. Hastily throwing some water on her face, she produced the score, and over the phone, Heifetz quoted the page, line and measure where this occurred. Carol responded that the note in question was as she had sung it. He asked, "Are you looking at the Urtext?" "No." she replied.

Heifetz responded, "Your copy is incorrect. I want you to look it up and call me this evening." She did, and had to admit that he was correct.

I am convinced, from this incident and others that I knew about, that Jascha Heifetz knew every note, phrase, and expression mark of the entire score when he performed, be it piano, orchestra or strings. How does one compete with such genius?

I was ready for him the next trip to the house, having practiced ping pong off and on for two weeks prior with a friend. Much to my relief, Heifetz was defeated 21 - 1 and 21 - 2. This ended our ping pong relationship forever.

A sequel to this story followed during a conversation about Heifetz with Raymond Kendall, dean of the USC School of Music. Kendall asked me if I had ever been required by Heifetz to play ping pong before getting down to business. I replied that I had, but that that phase was over between us, having defeated him on the second visit. Kendall replied that this part of their relationship was also finished.

Ray had defeated Heifetz 21 - 0, 21 - 0. However, swearing me to secrecy, what Heifetz did not know was that Kendall had been the California State amateur ping pong champion in his youth.

It was obvious that Heifetz was an intensely competitive man, could not stand defeat, and had to be the final authority on anything concerning him.

In the next article, we will explore Heifetz and air conditioning. ■

Downbearing: A Link in the Energy Chain

Nick Gravagne
New Mexico Chapter

The previous article in this series related that a common agreement seems to exist in the minds of piano builders that a suitable pressure for a piano string to exert on a bridge is one-fortieth of its tension. So, apparently for tonal and mechanical well-being, a string pulling at 160 pounds should press on the bridge with four pounds. At first glance this may seem so completely arbitrary that one wonders if perhaps the practice might be democratically dismissed and new numbers voted in. After all, how many times have we heard that less bearing is better (assuming some bearing) than too much as the former permits full-bodied freedom of soundboard movement while the latter is a crushing blow to good piano tone? Indeed, I have said it myself. The problem is in quantitatively defining too much and too little downbearing within the relatively narrow parameters which are understood. For example, a responsible piano builder could not recommend seriously a 45-degree angle of deflection with its accompanying 113 pounds of pressure on the bridge. No contemporary soundboard could withstand such a ravaging force.

But herein lies the first evidential clue in support of a one-fortieth pressure theory. It simply has to do with the fact that soundboards are made out of soft wood and not reinforced concrete. Modern soundboards vary very little in the essentials for a given size of piano. Their shape, configuration and wooden mass, which are more similar than dissimilar from one make to another, have been experimentally determined over many years of production refinement. More specifically, the compressive stress and strain that they are able to withstand has likewise been determined and found to be non-excessive at 1000 pounds downweight. (They have been known in practice to withstand much more than this. The question is, for how long and at what cost?) The developmental history of the piano tells us that as piano wire manufacturing grew up and matured, the piano itself evolved carrying higher tensions and heavier supporting structures. So, it is probably safe to say that the modern soundboard, considered as a loadbearing member, has been more influenced by string tensions than any other single factor. Considering this state of affairs, then, we have pressure on the soundboard at some appropriate level. And, since the compressive deflection, we find ourselves back to a 1.5 degree angle of deflection which produces one-fortieth of the tension as a safe bridge pressure.

"The problem is in quantitatively defining too much and too little downbearing within the relatively narrow parameters which are understood. For example, a responsible piano builder could not recommend seriously a 45-degree angle of deflection with its accompanying 113 pounds of pressure on the bridge. No contemporary soundboard could withstand such a ravaging force."

Although it is clear to see that too much force on the soundboard can simply crush it out of existence, there are still muddy waters of opinion as to just what is the right amount of bearing. Take for example the one which advocates

setting the bearing to the smallest amount (small rear angle) possible while maintaining a safety factor for soundboard shrinkage in a dry season. The idea here is that downbearing is something of a necessary evil and that, as long as the string is pushing on the bridge at all in December (when the in-home relative humidity might be 20 percent) there is enough bearing. Anything more than this might choke out the tone. Although I tend to agree with this approach in rebuilding a piano where the old, partially crowned soundboard is being retained, I have found that a new soundboard deserves better. Allowing for fuller downbearing on the fuller crown amounts to fuller tone quality. Why this is so is perhaps a more difficult position to support, but it too, has a very real basis in mechanics and physics.

The production of a piano tone is undeniably a chain of events involving energy transference. Muscular energies in the arm, wrist and fingers are transferred to the piano key which receives the energy and transfers it to the action and hammer. The accelerating hammer delivers the energy to the string. Now this energy, which started out in the muscles, has been transformed into vibrational energy. The vibrating string must now deliver its energy to the soundboard and nowhere else, causing a definite mechanical action in the board. The soundboard energy is transferred to the air mass which delivers the energy to the eardrum. The vibrating eardrum moves some tiny bones which, in turn, deliver tiny energized electrical impulses to the brain. And the music goes round and round....It is rather like a relay race where each member of the team takes a turn to run with the baton. However, if there is only one break or partial breakdown in this energy chain, there will be energy wasted as heat (dissipation) or else worked disproportionately with respect to its link in the chain. Our present concern, then, is in isolating, if possible, the conditions of downbearing which encourages a full transference of energy from the string to the soundboard.

I can remember a piano technician once remark, upon hearing a big, full tone from a piano, "Now that is one hard-working piano!" The comment, although accompanied with smiles between friends, would have been forgetable had it not inadvertantly contained the concept of a fundemental truth in physics — *work*.

"

What this all has to do with downbearing and soundboards is simple. A vibrating piano string possesses kinetic (moving) energy and the ability to do work. But in order for the moving string to actually do some work, it must move something for distance — the soundboard in this case.

"

Whatever else this word may conjure up in the mind it has a very definite meaning in physics. When a force acts on a body, the force has a tendancy to move that body. Work is defined as the product of a force and the distance through which the force moved an object (in formula $U = F(\Delta s)$ or work = force times distance). For example, if a horse pulls a 150-pound cart a distance of three feet, that horse has done 750 foot-pounds of work. Energy is often defined in a general way as "the ability to do work," and energy can be converted into work. What this all has to do with downbearing and soundboards is simple. A vibrating piano string possesses kinetic (moving) energy and the ability to do work. But in order for the moving string to actually do some work, it must move something for distance — the soundboard in this case. And, quite literally, the farther the soundboard can be moved (primarily up and down) the more work is being done. A piano string barely pressing on a bridge, although vibrating violently, simply cannot transfer its energy very well to the soundboard. In short, the string does relatively little work to the soundboard causing it to move proportionately less. The energy chain has partially broken down. Energy is never lost; it merely changes its form or expression in transference. This is why so often a light to zero bearing can produce such a long ring time and decay (assuming no bridge roll) yet have a thin, weak tone which also lacks in a nice, round swell. That some might prefer this kind of tone is another story altogether and would necessitate a journey into a wilderness of subjectivity.

We are now at a most intriguing point which has to do with the mechanical condition of a strung soundboard which is, for all practical purposes, in the form of a compressed spring if there is adequate downbearing. Now all compressed (or stretched) springs or elastic materials are great depositories of something we have been discussing — energy and work! Yes, a compressed automotive valve spring, a compressed jack spring, a stretched elastic band or a compressed soundboard have stored in their beings an energy/work potential which only needs to be triggered in order for movement to occur. This stored energy is sometimes referred to as elastic energy or *resilience*. So when work has been done to resilient body such as a spring (i.e., a force has compressed it some measurable amount and held it there even though only for an instant) that work is said to be recoverable because that spring is ever ready to push back against the restraining force. Should it push back and completely remove the force which initially deformed it, it does so by returning exactly the same energy and doing the same amount of work which was originally introduced into it.

Now, in order to make these mechanical concepts relevant to our specific subject let's sum them up by first considering a crowned soundboard glued to the rim but with no strings or pressure from downbearing.The board is resilient in that if it is forced downward (or upward) it will recover to its origi-

nal position as the force is removed. If a 10-pound force is statically applied (such as a 10-pound weight placed on a soundboard), the board, according to Newton's law that action equals reaction, will apply any equal reacting force of 10 pounds. Although the soundboard has compressed under the 10 pound load, it is also literally pushing upward by the same amount. Now, if the 10 pound weight is left on the soundboard and another 10 pound force is applied as an impacting blow instead of statically, the soundboard will react against the blow with equal force. The fun thing here though is that the impacting blow was removed as quickly as it was delivered causing the soundboard which was originally carrying the 10 pound dead weight, to be carrying 20 pounds but only for an instant. And, you guessed it, the soundboard reacted against 20 pounds for that instant causing the 10 pound dead weight to be thrown into the air. In other words, the soundboard was "fooled" into thinking it had to carry another 10 pounds. But by the time it had reacted against the additional 10 pounds this extra weight was gone. By now, however, the upward thrust of the soundboard force was greater than the downweight and the board could do nothing else but spring up. (What we call a bouncing ball is actually the reacting force of the floor pushing the ball away from it with as much force as the ball applied to it.)

Now if the piano is strung and the pressure is 1000 pounds of downbearing, the soundboard is reacting by pushing up on the strings and plate by equal amount. When the hammer strikes the string it does so with a force. This force energizes the string by causing it to vibrate and this vibration is converted to work at the point where the string is pushing on the bridge thereby causing a momentary force on the bridge (remember work is force times distance). The soundboard, sensing the small increase in downweight, responds in kind by momentarily resisting it, ounce for ounce, and actually "pops up" for a fraction of a second. As incredible as it seems a soundboard actually does move against the pressure of downbearing when it is played.* This soundboard pop is a most critical element of piano tone and is essential for attack and swell of the tone. But it is more evident in a soundboard which is compressed by downbearing than in a soundboard which has very little or negative bearing. Long strings with little bearing (particularly bass strings) are somewhat immune insofar as causing tonal bearing deficiencies simply because their weight, lower frequencies, and rather wide excursions cause them to fly down upon the bridge, effectively creating more downbearing and soundboard movement than they otherwise should. The shorter, stiffer strings, however, cannot get away with this and any inadequate downbearing is painfully obvious. All in all, however, a plus or minus 1.5 degree angle of deflection on a suitably crowned soundboard has been a proven source of quality piano tone through mechanical exploitation of soundboard compression.

A piano is resting in equilibrium when its 18 tons of string tension is being resisted by the plate and its 1000 pounds of downbearing is being resisted by the soundboard. There is no movement in spite of a complex system of trememdous forces. It is a great irony, is it not, that when this quiet equilibrium is violently upset by a pianist, and when the system is relentlessly struggling to restore its natural calm, the piano is singing.

*Although these mechanical concepts are very basic to the fields of statics and kinematics, a personal observation can be made in your shop. Arrange for a dial indicator gauge to be zeroed out and supported so that its probe is contacting the bridge. The piano may be strung or unstrung. Tap the soundboard or bridge with the side of your fist and watch the dial indicator as it moves unquestionably (but quickly) in a short downward and upward direction. I have done this on a strung piano using the action to strike a string which in turn "strikes" the soundboard and the results are the same. It makes no difference whether the string is struck from above or below. I took pictures of how it is rigged up and may present them at some future date in the *Journal*.

Zumpe's Second Action

Jack Greenfield
Chicago Chapter

Although Zumpe square pianos with the English single action had many limitations, they were considered by Burney and others as better than the copies being made by other London builders during the 1770s. Zumpe continued to prosper and he sold his pianos as fast as he could make them. In 1769, Gabriel Buntlebart had joined him as a partner. About six years later, the partnership ended and Zumpe retired. It is believed that, now a wealthy man, Zumpe returned to Germany. Listings by Harding taken from contemporary London business directories show 1784 as Zumpe's last year and first year for Schoene and Company, located at Zumpe's former address. Schoene and Company advertised "Successors to Johannes Zumpe."

During his final years in business, even though he may have had thoughts of retiring, Zumpe worked on improvements in his original action. He must have been aware of the efforts of some of his competitors to meet the more critical demands as the use of the piano continued to expand.

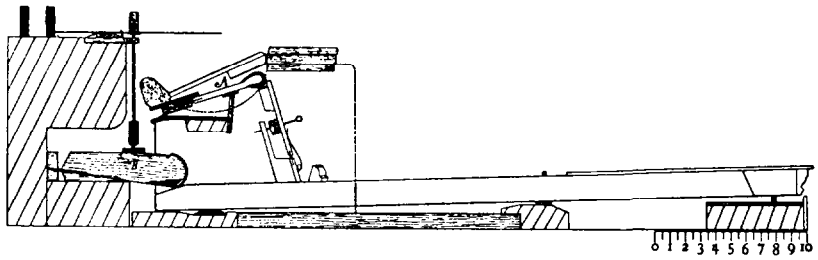
Zumpe's second action was seen in two square pianos in Paris collections listed by Harding. Evidently both pianos, dated 1788, were built by Schoene after Zumpe retired although one has Zumpe's name. The other has a Schoene and Company label. In taking over Zumpe's business, the new firm would have rights to use Zumpe's name and designs. Copies of Zumpe's second action have been observed in pianos made by several French and Flemish builders including Sebastian Erard.

"

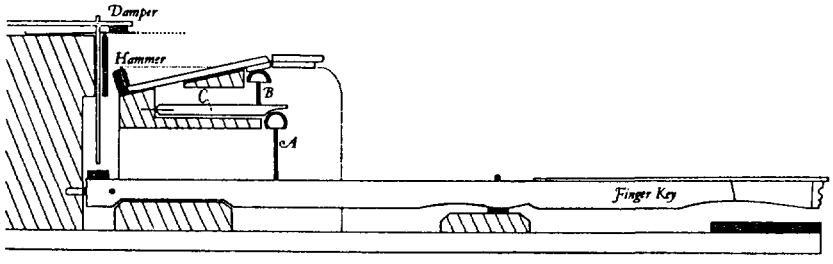
During his final years in business, even though he may have had thoughts of retiring, Zumpe worked on improvements in his original action. He must have been aware of the efforts of some of his competitors to meet the more critical demands as the use of the piano continued to expand.

"

Zumpe's second action, a crude modification of his first, was improved by the addition of an intermediate lever which functions on principles originated by Cristofori (*Journal* March 1986, page 16). The intermediate lever, hinged to a rail below the hammer heads, acts as a wippen until released just before the hammer head strikes the string. There is a small jack consisting of a leather-covered hemispherical knob on top of a short stiff piece of wire on the front end of the intermediate lever which lifts against the underside of the hammer butt. The intermediate lever itself is lifted by a similar jack but larger, positioned on the back half of the key lever so that it will slip out from under the front end of the intermediate lever for let-off. Harding's drawing of Zumpe's second action, not to scale, does not make it clear how the jack on the key lever slips back into place under the front end of the



English Double Action — modification of Geib's design used by Broadwood and others after 1800.



Zumpe's second action

intermediate lever after the key is released.

Although the use of an intermediate lever made it possible to eliminate blocking and in addition gave more efficient leverage control, the crude design does not appear dependable. It is evident that with wire construction used, "touch" would be too variable and the action would not withstand the forces of hard playing. The action has no backchecks.

Geib Action Introduced In Longman And Broderip Pianos

Square pianos were improved considerably by the invention of a more satisfactory action by John Geib (1744-1818), a German-born piano technician working for Longman and Broderip. Geib had been employed by Shudi previously. Longman and Broderip was a prominent London firm dealing in musical instruments, music publications and supplies. The firm started as a publishing house in 1767. Besides offering music of native English composers, it published works of prominent foreign-born composers such as J.C. Bach, Clementi, Haydn and Schobert and lighter keyboard music such as country dances, sheet songs, and transcriptions of theatrical show overtures. The 1789 Longman and Broderip catalog listed almost 1,000 items for keyboard, not including instrumental solos requiring keyboard accompaniment.

"

Longman and Broderip engaged in aggressive marketing practices...It advertised such models as 'pianofortes in commodes, sideboards and dressing tables,' 'portable grand pianos' and small pianos that 'may be conveyed and even performed on a coach.'

"

The firm built up enough musical instrument business to establish its own shop to provide some instruments. Others were obtained with Longman and Broderip "stencil" labels from other builders. This firm's harpsichords were similar to those built by Shudi and Kirkman. A Longman and Broderip harpischord numbered 735, acquired by George Washington, is on display at present Mount Vernon.

As pianos started to become more common in Great Britian during the 1780s and early 1790s, Longman and Broderip engaged in aggressive marketing practices. This firm appears to have started the practice of flamboyant presentations continued by others in the industry. It advertised such models as "pianofortes in commodes, sideboards and dressing tables," "portable grand pianos" and small pianos that "may be conveyed and even performed on a coach." While the merits of some of these may be questionable, Geib's action, advertised with the claim it "can never fail in the operation...whereas in other Instruments the Hammer dances on the Jack," was a genuine advance in piano design.

Geib's successful action came closer to the design of the actions in Cristofori's pianos of the 1720s than any of the others that had appeared since then except for the almost direct copies built by Silberman and several others. Geib, who settled in London around 1760, had come from the nothern region of Germany where Silberman had a strong influence on piano building. Geib's action contains an "underhammer," the term applied to the intermediate level which functions the same way as in Zumpe's crude, economical construction with wire. Geib's jacks are straight wooden pieces mounted in slots in the back half of the key levers to allow movement forward and spring-loaded for return the same as in Cristofori's design. In addition, Geib's jacks are also held by center pins.

As in Zumpe's second action, when the key in the Geib action is depressed, the jack slips out from under the front end of the intermediate lever just before the hammer strikes the string. When the key is released, the back end (weighted with lead inserts) drops, the top of the jack slips back under

the front end of the intermediate lever and the jack under the pressure of the jack spring returns to rest position. Geib also incorporated the crank damper mechanism (*Journal* February 1988, page 26) with the back end of the key levers raising damper levers.

In the original drawing for Geib's patent 1786 shown by Pfeiffer (Fig.24 in *The Piano Hammer*), the position of the jack for let-off is regulated by means of a small, thin lever attached perpindicular above the base on one end and holding a regulating button and screw with its bottom point pressing down on the key lever at the opposite end. Geib called the L-shaped jack with regulating button attachment the "hopper," shortened from "grasshopper." Afterward, Geib's term "hopper" was also given to jacks in some other types of actions. In later modifications of Geib's design, the size and shape of the jack and the arrangement for the regulating button and screw attachment were changed. Geib's original drawing does not show backchecks.

Use Of Geib Actions Spreads

After introduction in Longman and Broderip square pianos, the Geib action was adopted by other English builders for the better square pianos. Its use in England became much wider after Geib's patent expired and it became known as the "English Double Action" or "Double Action," while Zumpe's first action was the "Single Action" Piano builders in France, Italy and United States continued to use the Single Action and Zumpe's second action longer but finally also changed to the Double Action for square pianos. The Double Action was used for some types of English vertical pianos during the 19th century but it did not replace the English grand piano action introduced by Backers in 1772 or earlier. This direct blow design with backchecks was considered more satisfactory for grand pianos.

Geib's "Buff" Stop

Geib's 1786 patent also included a "Buff" stop system for use in tuning. Buff stops used before in harpischords for tone modification, consisted of a rail with narrow strips of leather which muffled or muted the tone when brought into contact with the strings by a system of levers. In Geib's design, when raised for tuning, the rail placed below the strings completely mutes out the sound of one string in each pair of unisons. The use of such Buff stops in English pianos for tuning became a common practice during the early 19th century. This method of tuning was also used after the introduction of Una Corda pedal shifts to position the hammers for striking one, two, or three strings.

Geib Establishes His Own Firm

Later in 1786 after his patent was granted, Geib left Longman and Broderip to start his own business. He was quite successful, reaching a production rate of eight to ten pianos per week. In addition, he also built a small number of church and chamber pianos. Geib had an interest in combining instruments and developed a design he patented in 1792,

"A New Musical Instrument, the End and invention of which is to play the Pianoforte, Clavichord, or Spinnett, with two Sets of Keys, to which either of these Three Instruments may be joined together."

Geib's patent drawing shows a two-manual piano-clavichord. Although they were not included in the patent, Geib also built combination piano-chamber organs.

Geib Settles In The United States

In July 1797, after almost 11 years in which he had built about 5,400 pianos as well as other keyboard instruments in his own business, Geib with his wife and seven children left London for New York. He found work soon after his arrival here. One of his first projects was construction of an organ completed late in 1798 for the German Luthern Church in New York. By 1800, he established the firm known as John Geib and Company. A Geib advertisment in the *American Spectator* in March 1800 offered: "Grand and Patent small Piano Fortes" (combination piano-organs) "Pedal Harps," and others. Geib was assisted by several of his sons who continued the business after his retirement in 1816, two years before his death. The firm was now also engaged in music publishing which it had started in 1814. Management was passed on from brother to brother as they grew older and died one by one. Geib piano were manufactured until the middle of the century. The last entry in the Pierce Piano Atlas is number 9200 for the year 1850.■

Calendar Of Coming Events

Date	Event
April 8-10, 1988	**New England Regional Conference** Viking Hotel and Conference Center, Newport, RI Kirk Russell; 13 Liberty Street; Wakefield, RI 02879, (401) 783-1966
April 15-17, 1988	**Pennsylvania State Conference** Sheraton, Altoona, PA Fred Fornwalt; 1333 Logan Blvd.; Altoona, PA 16602; (814) 942-1489
April 22-24, 1988	**Northern Illinois Seminar** Northern Illinois University, DeKalb, IL Jack Greenfield; 259 Riverside Drive; Northfield, IL 60093; (312) 446-9193
April 28-30, 1988	**Pacific Northwest Conference** Red Lion Inn; Eugene, OR Clay DeForge; 479 Dublin Ave.; Eugene, OR 97404; (503) 688-5152 Donna Byrd; 2293 Birch Lane; Eugene, OR 97403; (503) 344-3840
April 29 - May 1, 1988	**Michigan State Conference** Holiday Inn West, Livonia, MI Hugh Gulledge; 175 Degross; Walled Lake, MI 48088; (313) 669-4325
May 13-14, 1988	**Intermountain PTG Conference** Rodeway Inn; 1292 S. University Ave.; Provo, UT 84061; (801) 374-2500 Jack Reeves; 486 N. 300 W., Orem, UT 84057 (801) 225-1757
July 18-22, 1988	**31st Annual Piano Technician Guild Convention & Institute** Adams Mark Hotel, St. Louis, MO Home Office: 9140 Ward Parkway, Kansas City, MO 64114, (816) 444-3500.
Sept. 30-Oct. 2, 1988	**Florida State Seminar** The Jacksonville Hotel, Jacksonville, FL John Pelick Jr.; 1567 Townsend Blvd; Jacksonville, FL 32211-4944; (904) 724-4795

Categories of Membership

Ronald L. Berry
Vice President

The recent membership changes gave us two basic categories of membership, RTT and Associate. RTT is as it always was and requires passing the written, technical, and tuning test. The Associate category has been expanded to include all other members. Associate now ranges from the hobbyist to the piano refinisher, the owner of a piano dealership, those who replace keytops, and technicians who have not yet passed the RTT exams. We have no time limit in which an Associate must upgrade to RTT. Since Associate now includes many who never intend to be full time technicians, such a requirement would be inappropriate. In the past we had a regulation stating that Apprentice members had to take the exams every 6 months in order to have their progress monitored; this was virtually unheeded because of the demands on examiners' time.

So what about the eternal Associate member? To begin with, the dues were made the same for both RTT's and Associates so there would not be a negative incentive against upgrading. Why continue to pay the same dues without getting all the benefits of membership? What are the differences in member benefits between RTT and Associate? An Associate member may identify with PTG as "Associate Member, Piano Technicians Guild." Only RTT's may use the title "Registered Tuner-Technician" and the RTT logo. While literature in the past has encouraged the public to look for "a member of the Piano Technicians Guild," new literature will have them looking for "a Registered Tuner-Technician in the Piano Technicians Guild." New this year is a registry of RTTs listed by state. This will be used to help us promote the Guild with teachers groups and dealers. Only RTTs are franchised and thereby have the right to determine the course of PTG. A number of pamphlets and business aids are available for RTTs only.

These differences are all valuable but the real difference is inside the head of the member. You are either on one side of the line or the other. The chance to have your skills objectively evaluated and and compared against other technicians in North America is really a privilege more than a burden. The self-confidence that comes from passing the test will show in your own business and help you continue to become a better technician. It's reasonable that some will be apprehensive about putting their skills on the line, but if the tests were easy to pass they wouldn't mean much once passed.

The membership changes have on one hand seemed to lessen the difference between RTT and Associate. A technician could go along for years as an Associate member and maintain a successful business. A non-member can maintain a successful business also. *However,* by becoming an RTT and gaining the respect of your peers you will be even more successful. Guidance from the chapter will be the best source for a technician to know when he/she is ready to attempt the tests. The chapter also has the responsibility to push along those who should attempt to upgrade.

Keep in touch with your chapter and go to seminars to have a good idea of how ready you are for the tests. While there are no bylaws telling you when to upgrade, becoming an RTT should be the goal of any technician regularly doing tuning and repair work in the field. ■

New Members During February 1988

REGION 1

Maine, ME — 41

Philip H. Norris
Piano Acres
East Blue Hill, ME 04629

Montreal, PQ — 60

Jean-Pierre Gagne
Che Bellevue
Mansonville, QC JOE 1X0
CANADA

Toronto, ON — 62

James R. Tennyson
335 Markham Street
Toronto, ON M6G 2K8
CANADA

Connecticut, CT — 64

David S. Kendle
25 Fairy Dell
Clinton, CT 06413

Capitol Area, NY — 122

Gail Y. Crawford
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Ballston Spa, NY 12020

W. Carter Johnson
P.O. Box 504
Northville, NY 12134

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3647 Chadwick Court
Pasadena, MD 21122

Richmond, VA — 231

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Matoac, VA 23803

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839 Lockland Avenue
Winston-Salem, NC 27103

Pamlico, NC — 278

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Morehead City, NC 28557

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H. Clifton Galloway
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Wilson, NC 27893

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Charlotte, NC 28212

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Bayamon, PR 00619

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1211 East Tuck
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Flint, TX 75762

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Katherine C. Young
6366 Candler
Utica, MI 48087

Milwaukee, WI — 532

Nicholas E. Mauel
2757 N. 53 Street
Milwaukee, WI 53210

Chicago, IL — 601

Mark S. Prokop
2423 W. 51st Street, #2F
Chicago, IL 60632

Joseph E. Tumino
10055 S. St. Louis
Evergreen Park, IL 60642

REGION 5

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Joseph A. Swenson
2738 Wyoming
Omaha, NE 68112

REGION 6

Tucson, AZ — 857

Roy D. Billberg
250 N. Maguire, #130
Tucson, AZ 85710

Orange County, CA —

Raymond A. Biasella
16522 Wheeler Circle
Huntington Beach, CA
92647

San Francisco, CA —

Michael A. Campi
1555 Oak Street, #3
San Francisco, CA 94117

Puget Sound, WA —

Erren K. Barnhard
E321 Olympic View Street
Belfair, WA 98528

Reclassifications During February, 1988

REGION 2

Memphis, TN — 381

Charles Gage
714 McConnell
Memphis, TN 38112

REGION 4

Cincinnati, OH — 452

David Jackson
1234 Oak Knoll Drive
Cincinnati, OH

The Auxiliary Exchange

President's Message

ST. LOUIS,...you should see it now and this may be the year you choose to do so through the eyes of our children. St. Louis is alive and thriving, with more than jazz, museums and parks.

If you plan to make this a family vacation, plan to see the Clydesdales at Grants Farm; stop by the world-famous St. Louis Zoo. The kids will love it almost as much as they will love the exciting rides at Six Flags...your first-class ticket to fun. Enjoy the "Screamin' Eagle" roller coaster, and the sensational Thunder River whitewater ride. For those who are not quite so adventuresome, visit Looney Tunes Town, home of Bugs Bunny and his Looney Tunes friends, a haven for both parents and children. Parents are invited to play with their children on soft-play attractions, such as Sylvester's Cat Climb — a cargo net mounting to a crest of a 30-foot tunnelslide, and Porky Pig's B-B-Ball Park, where 30,000 vivid plastic balls will amuse the little ones all day. A stroll through the grounds adorned with over 1,000 baskets of hanging flowers, giant wistera shade arbors and at last, the welcome sight of a park bench to sit and enjoy a scrumptious ice-cream cone before returning to the hotel and adult fun. Receptions, banquets and parties! Yes, this year you can do both. We will have the names of three professional child-care agencies and a list of baby-sitters available through members of the St. Louis Chapter. Visit the Auxiliary Membership Booth to obtain more information. We hope this will enable you to share the week with your children and attend the Auxiliary and Guild functions.

Ginger Bryant

Striking It Rich In Piano Tuning

People often wonder what kind of a living a person can earn as a piano tuner. Sometimes people worry because it seems piano tuning is not a field which brings in lots of money even though it is a profession which requires lots of training.

Whether it is fair or not, the worth of a profession is often valued only by the annual income it produces. Using that index alone, piano tuning might not look like a desirable profession.

Those who are married to and/or are close friends with a piano technician need to be able to help our technicians and ourselves evaluate how much money can be made from the business. However, we also need to learn to balance the money that can be made with the satisfaction that is derived from being a piano technician.

First we must remember that get-rich-quick schemes — or even well-developed portfolio management programs — don't always fit in with the life and philosophy of a piano tuner. Many tuners have chosen their profession because it sidesteps some of the rat race and brings them a certain inner peace. Many of them had opportunities to enter other more lucrative fields. Some of them have left higher paying positions to embrace the life of a piano tuner.

If you are trying to turn a contented piano tuner into a Wall Street Wizard you might be trying for a long time without great success. This is not to say that a person can not be a happy piano technician and still make and manage money successfully; it is just to make the point that people are attracted to piano tuning for reasons other than financial rewards.

Many technicians work long hours away from the office. The office is often located at home. Many technicians bring in their checks and leave them in the office for their secretaries (often their spouses) to record and deposit. The same secretary/spouse is often left to use the money to pay the bills. This means that you who read this column might very likely be the ones who have to try to make ends meet while the technicians are busy tuning pianos. This situation can put a lot of stress on you if those ends do not meet too easily. What can you do?

Here are some suggestions that might work for you:

1. Try to set aside time on a regular basis to discuss long-term and short-term goals with the technicians. If you are both working toward the same goals the job will be easier. Use this time to discuss the business in general, too. Sometimes there are little changes that can be made that will increase your income a little here and there; i.e. scheduling appointments closer together, following up sooner on accounts to be billed, developing a better way to keep track of receipts etc.

2. Plan your price increase in advance. Know how long you have been charging the current price. Keep abreast of how much the cost of living is increasing and how much of an increase union groups are requesting. Keep track periodically of how much the cost of gasoline, piano parts and social security taxes have gone up since your last price increase. If costs have risen dramtically but your tuning prices have not increased at all, then the technician has actually taken a cut in pay!

3. Be sure the technician carries with him a list of current prices for on-the-spot quotes. Re-evaluate all repair prices as you re-evaluate tuning prices. Practice quoting the new prices, write them down beside the phone, and know that you have earned all your raises. (We know a tuner who tried to raise prices for a few days but went back down because people did not like the new price. We think the tuner did not feel comfortable with the new price and conveyed that feeling to his customers. At the same time, in the same city, we were charging that same price and not encountering any static.)

4. Encourage the tuner to be a technician as well (and an RTT of course!) There is money to be made and there are customers to be satisfied by a person who can fix a sticking key, voice a note, tighten the hinge on a piano bench and keep the damper from ringing. Money that is made without additional travel time is worth a lot.

Customers who call you back are also invaluable. They know the technician listens to them, their concerns, their questions and gives their piano total care.

There are ways we can help our technicians make more money from their chosen profession. There is also a time to sit back and be grateful they know what to do and they are doing it.

Julie Berry

Oooops...

Before Peter Goodrich of Steinway spots our typo in the February '88 issue of the *Journal*, be advised that the Steinway Piano company is approaching completion of its 500,000 piano (and not five millionth). If we happen on further news items concerning this extraordinary instrument, we will share them with you.

Editor

Hear Ye! Hear Ye!

The Cleveland Chapter of the Piano Technicians Guild Auxiliary proposes the following amendments to the Bylaws:

Delete Article III Section 2c. Replace Article III Section 3 with the following:

a. Each Auxiliary member shall become a member of a local chapter automatically. The local chapter shall be that chapter which corresponds to the Guild chapter of the Auxiliary member's sponsor.

b. An Auxiliary chapter may have one or more members and may or may not be active.

Replace Article VII, Section 4a with the following.

a. Each chapter may elect a delegate and an alternate.

Delete Article VII, Section 4b. Reletter Sections 4c, 4d, and 4e accordingly.

REASONING: This straightforward reorganization plan keeps the Auxiliary coordinated with the plan our parent organization, the Guild, has adopted. It allows our active chapters to continue their activities as usual while we nurture other chapters without making them feel guilty or inadequate because they are not active.

Many Guild members do not attend chapter meetings but they are still members of the chapter. (Some Guild chapters are not too active.)

At our annual convention council meeting, every chapter may have a delegate. No Members-at-large. We would increase delegates, not as many as you would think, and the representation would be fair as to regions and ideas. For example, if Wyoming had only one Auxiliary member, she would be able to represent her chapter. One chapter, one vote.

In Memoriam

Our esteemed honorary life member, Bertha Schwendeman, died last July 28, 1987, according to word received from her niece, Mrs. Barbara Menz-Smith, of Scituate, MA. Bertha and George Schwendeman were significant activists and organizers among the piano technicians who developed the Boston Chapter of the Piano Technicians Guild. After George's death Bertha still counted the area technicians and their families as her close friends and associates. For almost 30 years Bertha taught needle craft to the trade-school students in what is known now as the North Bennet Street School and after her retirement she "mothered" the young men who rented rooms from her while they attended the area colleges or universities. Her association with young students kept her young, aware, and eager to always do for others. This writer's only encounter with her a few years back is still vivid. Bertha Schwendeman was a great lady.

Agnes Huether

The Swamp Of Louisiana

The Atchafalaya Basin is the largest river basin swamp in America. If one has never seen the Atchafalaya Basin Swamp it is not possible to image the beauty of the wildlife, the landscape, and the peace and serenity which exist in this place. The Basin is located right in the middle of Louisiana west of the Mississippi River from just south of Alexandria, LA, all the way south to the Gulf of Mexico. At some points, the basin is nearly 20 miles wide.

The Atchafalaya River which runs through the basin, was once the course of the mighty Mississippi River millions of years ago. The Mississippi River flood control through a spillway system now dumps into the basin when the river is dangerously high and this is depositing silt in the basin which is raising areas of the basin and the result is a loss of the wetlands.

For two hundred years or so the Cajuns who have lived in or near the basin have been blessed with bountiful hunting, fishing, trapping, rich soil for agriculture, and for a time a flourishing cypress lumbering industry. Many still enjoy this good life without the hectic pace of the rest of the world.

The basin is one of the reasons that Louisiana is called the "Sportsman's Paradise." Whether you are making a living in the swamp, out for the weekend fishing trip, or just to launch your boat and go for a leisure day ride in the many hundreds of miles of small bayous, you will witness one of the most peaceful and beautiful places on earth; a place to reflect on our Maker's creations. During any season you will see towering cypress maybe 150 feet tall with long festoons of dead Spanish moss hanging from the high boughs, the great cypress knee looming up through the warm haze and peeping up from nooks where the water is transparent, and the fanning palmettoe leaves standing wherever there is a ridge in the swamp. Some of the small bayous are like tunnels with the trees lined on each side making a canopy over the passage way. A camera bug could have a holiday.

The gift to South Louisiana is another reason why the Cajuns are so laid-back and take the time to enjoy and absorb what Mother Nature has blessed us with.

Deanna B. Zeringue

Exchange Editor:
Agnes Huether
34 Jacklin Court
Clifton, NJ 07012

Index Of Display Advertisers

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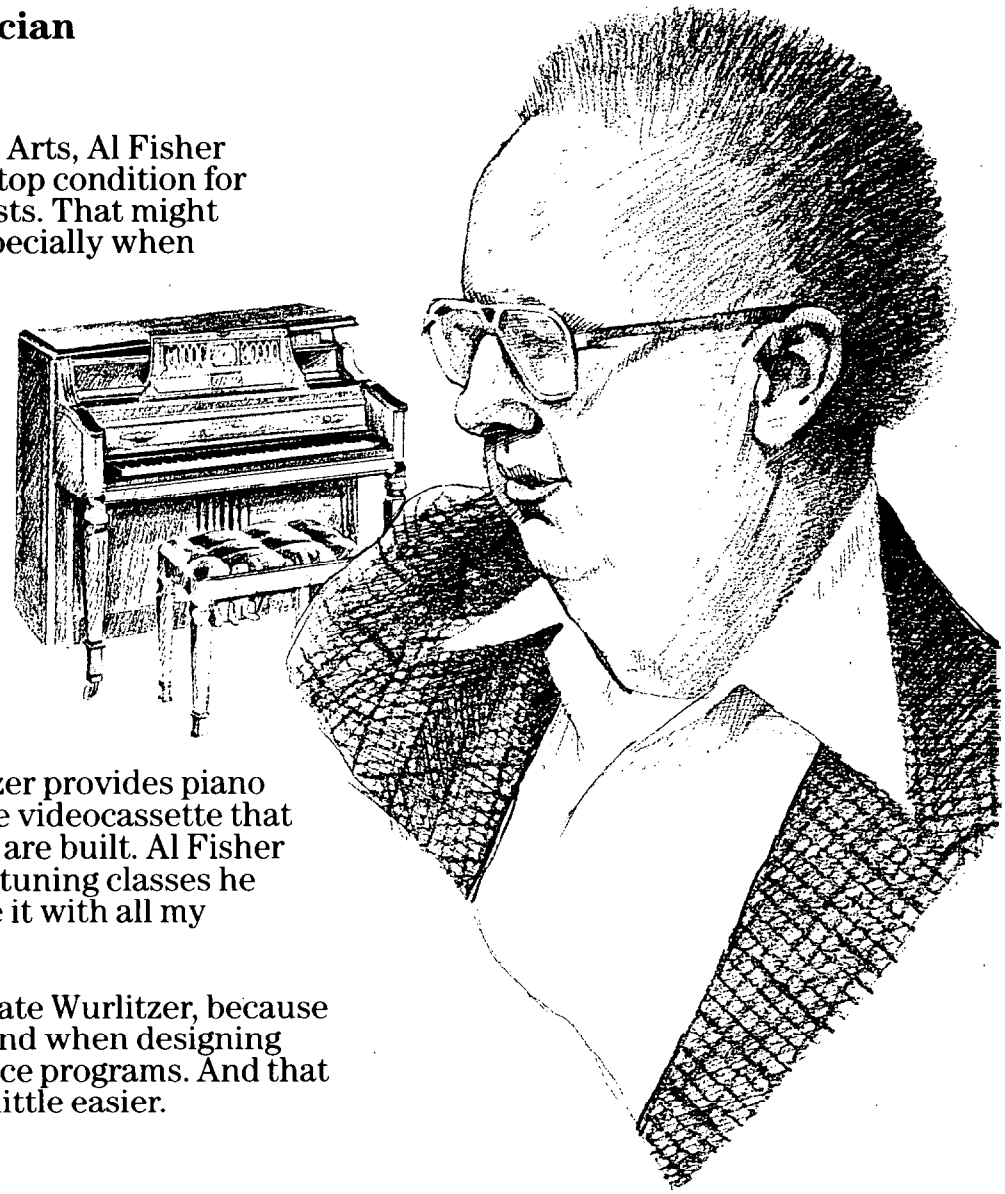

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