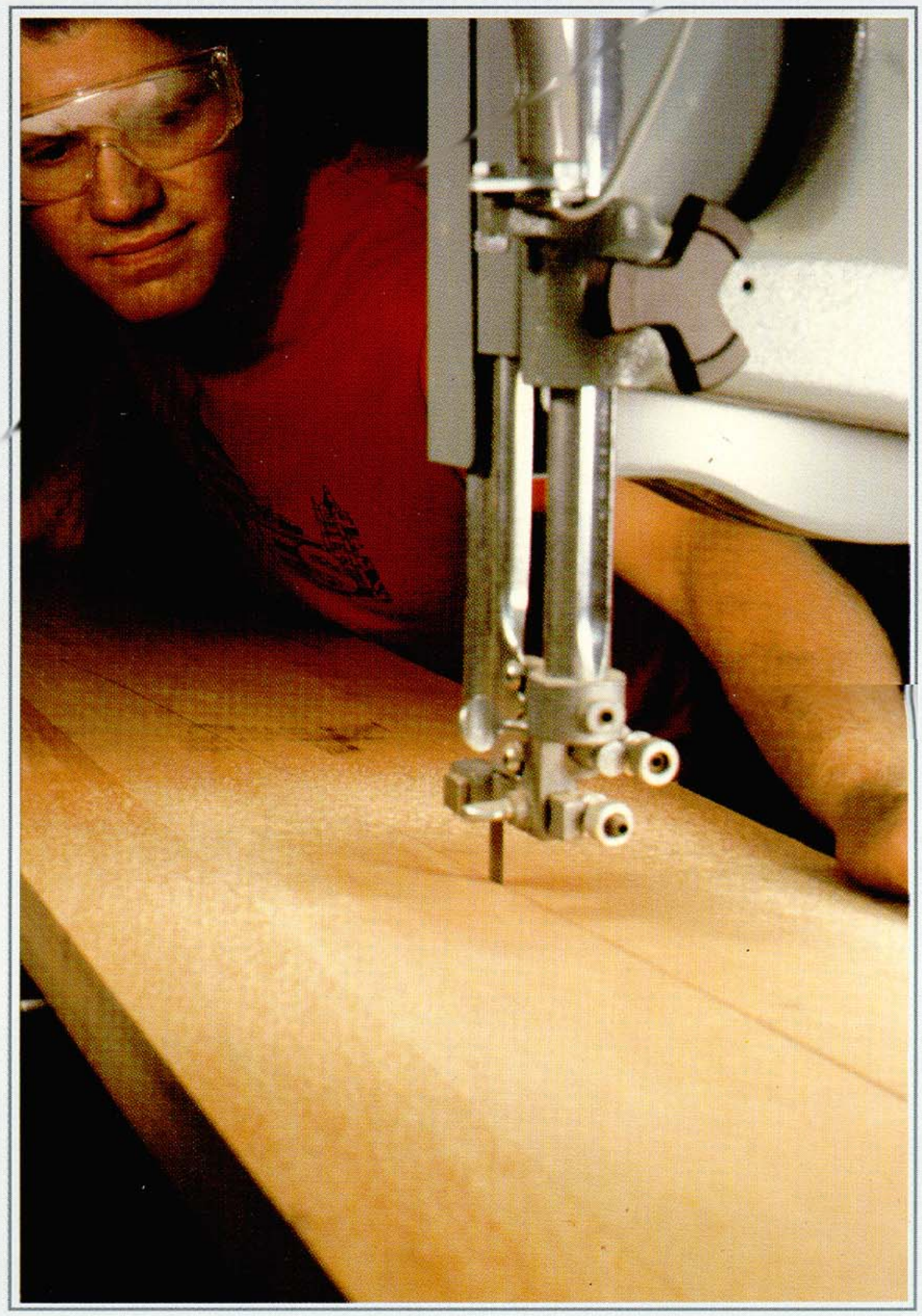
PIANO TECHNICIANS
Journal
August 1991



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PIANO TECHNICIANS
Journal

AUGUST 1991 — VOLUME 34, NUMBER 8 OFFICIAL PUBLICATION OF THE PIANO TECHNICIANS GUILD, INC.

ABOUT THE COVER:
This month's cover shows John Ellinthorpe cutting a pinblock.

1991-1992 Piano Technicians Guild Board Of Directors

The Piano Technicians Journal (ISSN 0031 9562) is the official publication of The Piano Technicians Guild, Inc., 4510 Belleview, Suite 100, Kansas City, MO 64111. The *Journal* is published monthly. Second class postage paid at Kansas City, MO., US ISSN 0031 9562 foreign and domestic. POSTMASTER: please send address changes to: *Piano Technicians Journal*, 4510 Belleview, Suite 100, Kansas City, MO 64111.

Annual subscription price: $85 (US) for one year; $155 (US) for two years; $7.50 (US) per single copy. Piano Technicians Guild members receive the *Piano Technicians Journal* for $45 per year as part of their membership dues.

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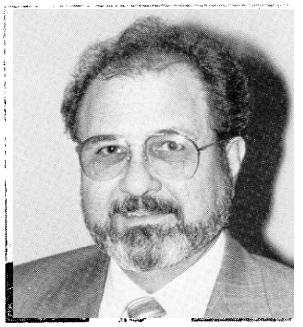
Listen To Your Customers



Nolan P. Zeringue, RTT
President

We need to listen to our customers and be sure we understand what they are talking about when they tell us of complaints with their pianos before we spill out a dissertation on what we assume is the problem. Jumping to our own conclusion before we have a clear picture of what it is they are trying to convey to us might be hazardous to our reputation. We understand the terminology, technology, and nomenclature, but many times the customer does not, and will speak in terms that really are not describing the problem that is associated with the piano not performing in the manner which the customer is expecting.

There is a story of the old Cajun farmer who had heard a rumor that a committee in his church was talking about buying a new chandelier for the church and were to have an open meeting with the congregation after services on the coming Sunday. Well, he thought that this was sure important enough for him to go and speak out loudly in opposition to such foolish spending of the limited funds that the church was able to raise.

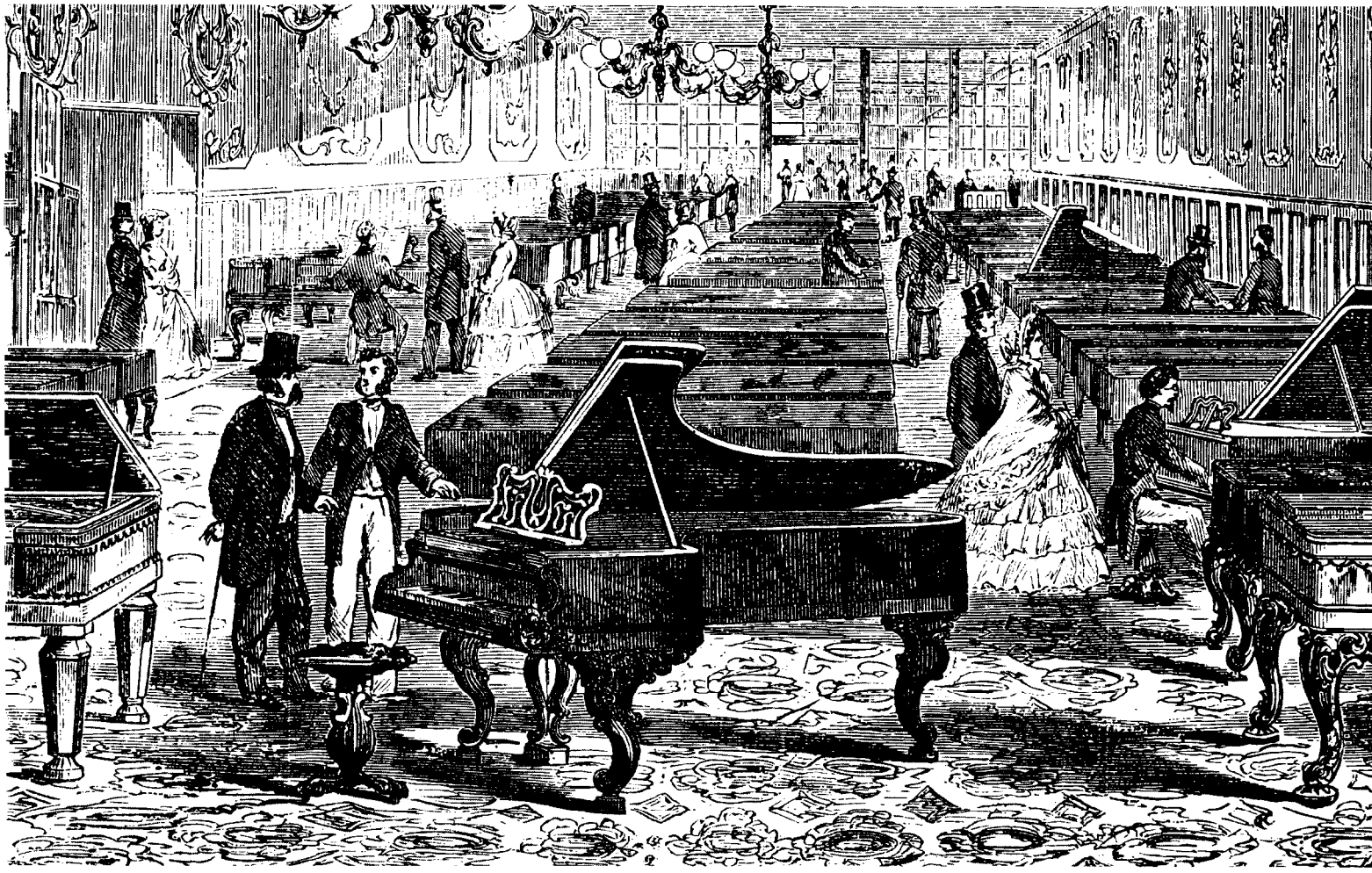
When the meeting opened he was the first to stand and get attention turned to him, and listed all the things that the church needed and how the meager funds in the treasury could be spent for the good of all. Angrily he turned to leave the meeting after he had said his piece and said, "We don't even have anyone in this church who can play that thing, and what we really need most of all is more light in this church!"

I serviced a customer's grand piano recently and she told me she wanted me to add more bass to the piano, but the bass section was just fine. She was playing the piano and telling me that she was using her "hi-fi" as an example. There is a treble and a bass control on the hi-fi and what she described to me was in the tenor and treble section of the piano she wanted me to "turn the treble down and turn up the bass." I let her finish all she had to say and asked her a few questions with the thought of voicing in my mind.

I spent about 30 to 45 minutes voicing the tenor and treble sections and she was perfectly happy with it. She was explaining as best she knew how, but if I had not listened and just passed her off as some kind of a nut, the end result would not have been the same.

We must learn to listen as carefully as we can to the customer complaints remembering that they might not know how to describe really what the problem is. Good reputations will grow and you will be known as a most competent technician if you continually pursue your technical education and listen attentively to the customer complaints with their pianos.

Some manufacturers ask your customers to invest in their past.



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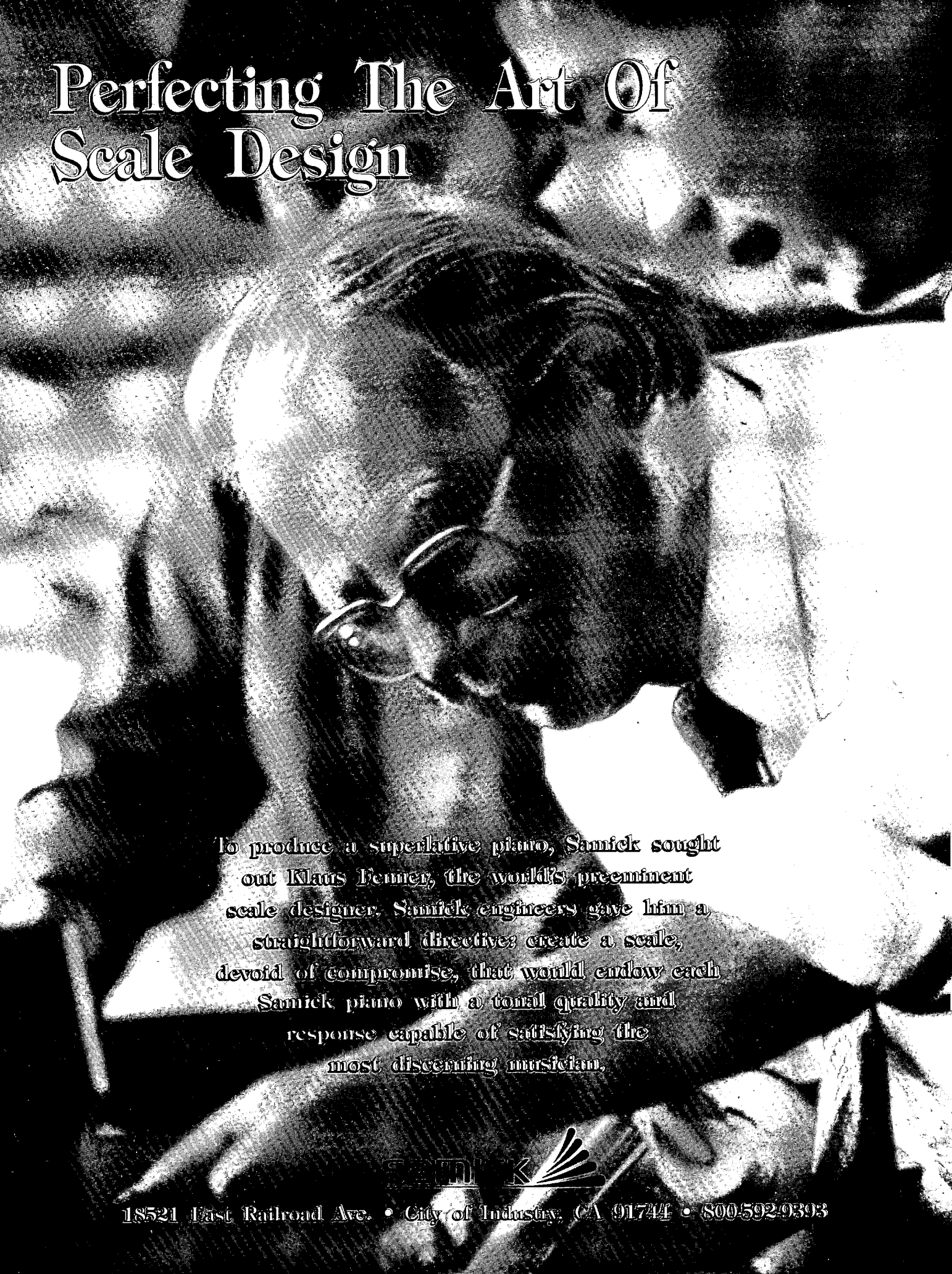

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Replacing A Full-Fit Grand Pinblock

Susan Graham, RTT, Technical Editor
Walter Brooks, Jr., RTT, Connecticut Chapter

Pinblock replacement in a grand piano is often a technician's first foray into structural rebuilding. We often encounter grands which need restringing; the block must be replaced as part of this job if there is any doubt that tuning pin tightness can be insured.

There are several indicators for block replacement. Deterioration may be visible — delamination of layers or cracks around tuning pin holes. There may be contamination — mystery liquids or "tuning pin tightener" spilled or added to the block. If the original tuning pins have been pulled forward (toward the strings) and are standing straight up or leaning forward, or if they are binding against the holes in the plate webbing, block replacement is necessary. A less common reason is poor fit of the original block, or poor choice of material used. A final reason is our familiar "Why not?" Rather than restring in the old block with the slightest doubt about the quality or longevity of the job, why not just go ahead and replace the block?

Well, some might say, "why not" is that I don't have a shop, or a drill press, or the customer doesn't want to pay for moving and so I'm restringing in the home. These are exceedingly poor reasons on which to base a technical decision. Such reasoning seriously compromises your ability to do professional and high-quality work. Reconsider your priorities — or stay out of such work until you are better prepared.

Fear and/or lack of expertise may seem similarly insurmountable. We can overcome them, however, and offer our customers the high quality of work they deserve.

Ironically, the pinblock we are likely to encounter for replacement is most likely to excite the fear reaction: the full-fit or Steinway style block. This block is not only glued and dowelled to the inner rim at both ends, but is glued to the stretcher, with blind dowels (not visible from any surface) reinforcing the joint. This installation helps create the solid structure believed necessary for the characteristic tone and stability of this piano. It is a style of piano design which holds that the case and structure provide strength and rigidity, rather than act as resonating members. They should be as rigid as possible to reflect energy and vibration back into the soundboard where resonance takes place. The instruments which employ this style of construction bear out the validity of the thinking (although other construction styles demonstrate their own validity).

Once again, our general practice in rebuilding seems the most prudent: put things back the way we find them.

So, now that we have reasons for doing it, all we need is a good technique. Of the methods I've tried, the one which turned out to be the most straightforward, least time-consuming and minimally aggravating, is the method used and taught by Wally Brooks. Most of us know Wally and his eminently-practical approach to high-quality rebuilding and will find this to be no surprise.

It probably also comes as no surprise that Brooks simply isn't the type to write an article on the subject. He did take the time, however, to sit down and help me record his procedure. His method is a refinement of procedures he learned from Steve Jellen and Wendell Eaton — a first class pedigree if ever there was one. I am extremely pleased and grateful to have the information for the *Journal*. This series on pinblock replacement is the result — a collaboration between Wally's brains and my word processor which I hope will be informative and helpful.

The first problem of a full-fit block is to get it out intact enough to serve as a template for the new block. There are systems utilizing jacks, applying chemicals to dissolve the glue joint, sawing out pinblocks by hand, routing out sections and putting in pieces of new material, etc. etc. etc. Many of these I've tried myself... sometimes they worked well, and sometimes I lost several years off my life (not to mention several notches off my sanity).

Wally's method relies on accurate measurement of very small increments. His first suggestion is: use metric measurements in recording location indicators. Millimeters are simply much easier to read, add and subtract than fractions of an inch. Stick to metric and don't bother converting into English rule. It rapidly becomes familiar and is easier for fine work. For this job, a simple scale and a small square are all that are necessary (and you can slide by with an English rule square).

We begin after data about bearing, sustain, stringing scale, etc. are recorded and the piano is unstrung. The next step is to register location of the plate relative to the case. This is done by making reference marks on the plate with a prick punch (figure 1). Four punches are made: in struts nearest the bass and treble, and

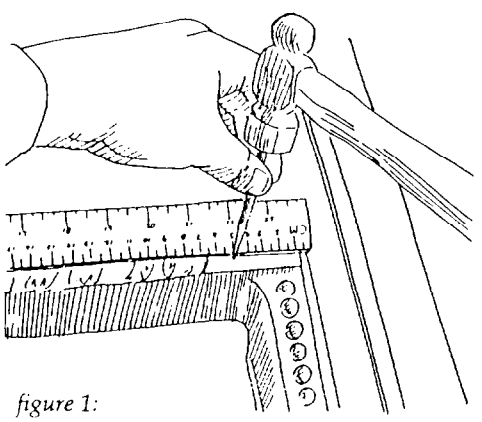


figure 1: marking punch

on both ends of the lip of the plate nearest the stretcher. These marks don't need to be craters, but must be deep enough so they aren't lost if the plate is refinished. On your data sheet, make a simple diagram of a piano plate and a pinblock (figure 2) so you can record the information in a simple, nearly foolproof fashion.

Now, before you start randomly marking holes in the plate, think a little. If you use your scale to measure to the strut and locate a convenient distance, why not mark there? Nobody says you have to make the mark first and then measure to wherever it happens to fall. This way, you end up with nice round figures like 30 mm instead of 28-and-a-half-or-maybe-its-closer-to-29.

Next is to drill two holes through the plate webbing into the pinblock (figure 3). Now, don't freak out — as Wally says, the piano is full of holes, so what's another two? He also says to pay attention to the visual aspect and put the holes where they will blend with the pattern of the tuning pin holes. Be sure not to drill through the flange, although these holes should be closer to the flange than the stretcher so there's room for accurate measurement. Use a drill bit which nearly matches the diameter of a small finish nail: he uses an 8D (something with a diameter of .100 —.125 is suitable). The bit should be just enough larger so the nail fits snugly into the hole. Yes, you really can drill through cast iron with an ordinary bit. Let the bit cut without leaning too heavily on the drill (or you may bend or snap it), and keep the bit vertical. Drill all the way through the plate and into the block about 10 mm.

Remove the plate.

You now have an exposed pinblock with freshly-drilled holes in each end. Using your metric scale, referencing from the stretcher and then from the side of the case and measure carefully to the middle of the holes (figure 4). Record these measurements on the diagram.

Record the height of the top of the pinblock: measure from the top of the block to the top of the side of the case, and the top of the stretcher. Use your square across the top of the case to "extend" the case and make it easier to read the scale. Watch out for a lip of wood where the top surface of the block may have been routed to lower the plate in the final factory fitting. Measure not to the lip but the actual surface which was supporting the plate. (This lip will be directly up against the stretcher or the sides of the case). When you calculate the thickness of the new block, it should match the dimension of the old block where the plate actually contacted, not the thickness at that lip (if there is one).

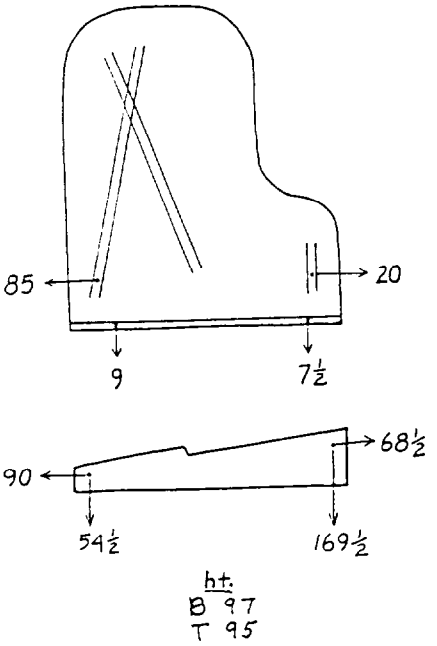
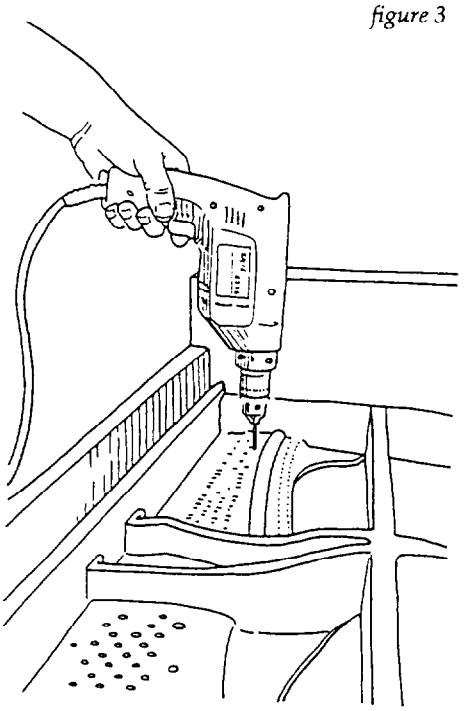


figure 2

figure 3



You now have measurements which reference the plate to the case, the block to the case, and the plate to the block. Although some technicians prefer wedges or devices which physically fit between the plate and stretcher, etc., any such device can get lost or possibly change dimension. Measurements, especially in millimeters, are easy to record and save permanently.

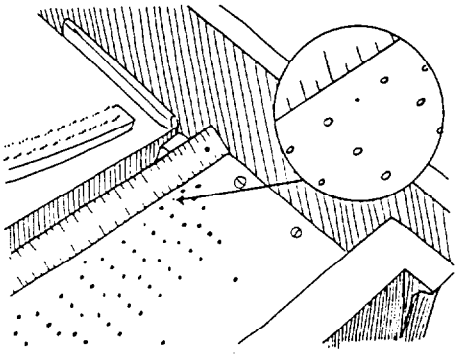


figure 4: nail in pinblock (plate out)

The pinblock is going to be removed using a reciprocating saw such as a Sawzall. Since these saws do not cut flush to the case, some of the pinblock will be left attached to the stretcher and sides. Therefore, some reference must be made so we know the original dimension of the block and can cut the new block to the same size.

This is done by drawing a template line on the old block before it is removed. The line is drawn parallel to the sides and the stretcher. It must be far enough from those edges to allow clearance for the saw, leaving it as a reference mark *on the section of block which is removed to be used as a template,* not on the small portion which will remain in the case. In other words, it is not the cutting line!

Once again, it is easiest if the line is a round-figure distance from the case. Calculate how much space the foot of the saw requires to operate: the foot or saw body may bear lightly against the stretcher (which should be padded or otherwise protected) but mustn't get too tight up against it or it may jam. There's also the inner rim to consider. This supports the ends of the block; you will feel exceedingly foolish and quite aggravated if you cut into these narrow, vital shelves with the saw.

The easiest way to draw a good straight template line is if you happen to have something such as a four-foot scale which is the right width to provide saw clearance (figure 5). Otherwise, you may need to measure out from the case in several places and then connect the lines. Record the distance that the line has

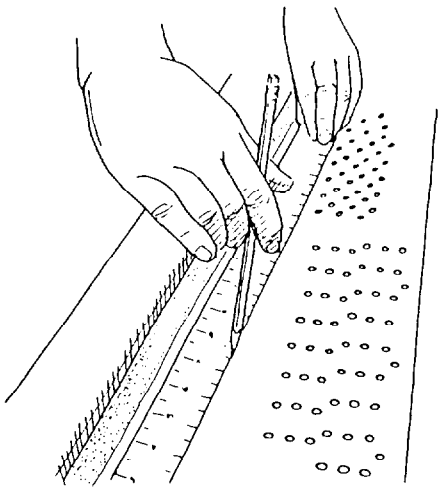


figure 5: drawing line on pinblock

been drawn from the case simply by writing the measurement on the top of the block in several places along the long edge and at both ends. This is a convenient place to store this information and it will be right in front of you when you need it (in marking the new block for cutting).

Drill clearance holes at least one-inch in diameter so the saw blade can be turned at the inside corners (figure 6). These holes can be centered on the corners of the template line but should be no farther into the center of the block. This works with the large reciprocating saws such as the Sawzall (which have the blade in line with the motor body). If you are using a saber or jig saw, which has the motor body at right angles to the blade, drill a hole in the middle of the long side (make it slightly closer to the stretcher rather than centered on the line), since you won't be able to turn at the corners and will need to start in the middle and cut toward each end.

Drill out any dowels in the ends of the block (inserted vertically into the shelf of the inner rim), and/or remove any screws.

Pad the stretcher by taping several thicknesses of newspaper over it, or with felt-lined metal case protectors. You are now ready to cut out the block. The saw must be powerful: either a reciprocating saw (*editorial note:* if you are still in the tool acquiring stage, this is an expense which can be postponed by renting, since it is a quick and simple one-time use) or a powerful saber or jig saw. Wally recommends the reciprocating type, since it will be quicker and uses a more substantial blade: he uses a six-inch, six TPI (teeth per inch) reciprocating saw blade for this job.

Observe the standard precautions in using power equipment. Remember that the line you've drawn is not your cutting line. It will provide a reference, so you don't need to be too concerned about keeping the saw cut even. Cut as close to the case as possible without jamming the saw body or foot. If the foot of your saw is narrow enough to allow you to cut fairly close to the stretcher (within 1 1/2" or so), the ends of the dowels running horizontally into the stretcher will probably be visible once the block is cut out (figure 7). Use a flat-bottomed bit such as an expansion bit (speedbore) or a Forstner to drill out the

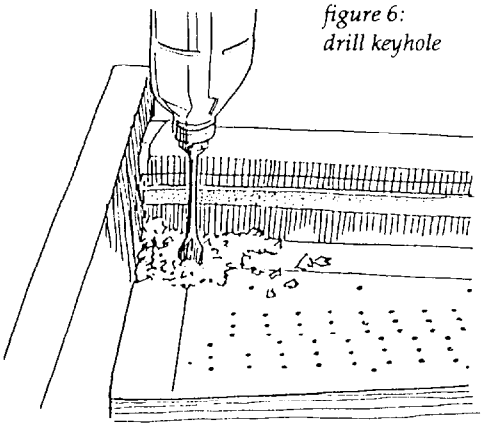


figure 6: drill keyhole

dowels up to but not into the stretcher. There are usually five. If the dowels are not visible, work carefully as you chisel out the remaining pinblock material until they are exposed enough to drill out.

A narrow band of pinblock material remains attached to the case. It's usually most efficient to cut out, fit and epoxy-fit the new block and remove that band of old material while the epoxy sets up. When you do, use a wide-bladed chisel (figure 8). Start from the top lamination and work down gradually in layers. The bottom layer is critical, as it is easy to catch and tear pieces of veneer off the lower edge of the stretcher. It's helpful to cut into the block vertically, using a backsaw to slice it into segments. In addition, make the horizontal slices very thin as you approach this bottom edge with the chisel.

If you do a fair amount of block work you may be buying material in panels. Otherwise, be sure that the new blank is at least 1/2" wider than necessary. It's much more difficult to trim a very small amount off an edge than a more substantial piece: you need that much "waste" to work accurately. There also needs to be at least 3/4" waste at each end to allow for fitting to the notch.

Thickness is critical. The new block must be no thicker than the old one, at least not in any place that the plate actually contacts. If the old block varies in thickness (check it with a caliper), the new one should match the thinnest end: the new block can be shimmed at the support if necessary. If the blank is too thick, it must be thinned with a router or thickness planer. If over 1/8" of material must be removed, take an even amount off both sides. The new block must also be no more than 1/8" thinner than the old block, so very thick blocks may require some care in finding replacement material.

It probably goes without saying that doing all this work but using cheap pinblock material is a waste of time. Various materials are available; ask someone whose experience you trust for advice in selection.

Before using the old block as a template, invert the plate on sawhorses or a tilter so the flange is exposed and check the fit of the old block. There may be room for improvement which can be made in cutting out the new block (correcting an excessive gap, for instance).

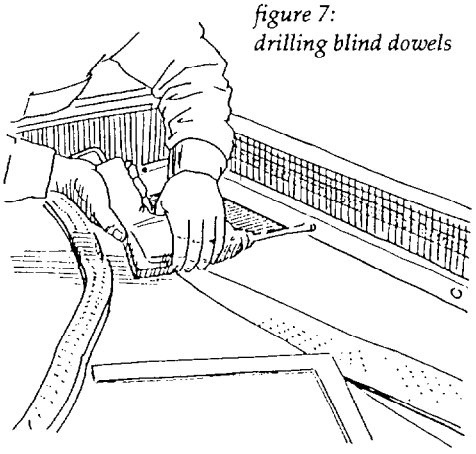
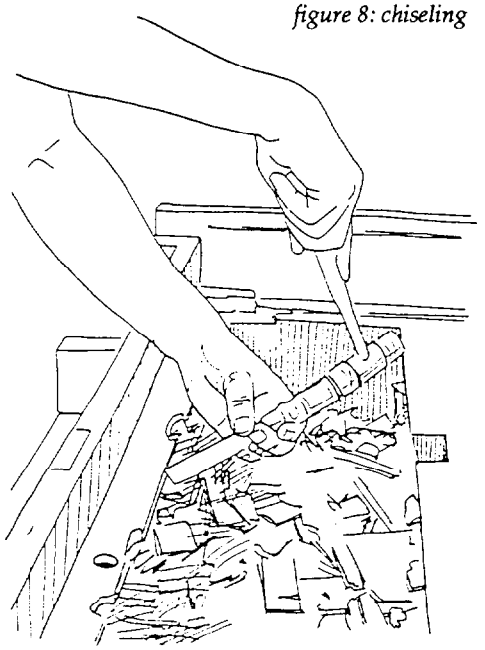


figure 7: drilling blind dowels

The simplest blocks to cut are those which have an unbroken straight edge along the flange. Those with a "notch" where the plate flange curves are more difficult. Obviously, the more the flange face curves, the more care must be taken in cutting and fitting the block (and the more excess you should leave at the stretcher edge until the final fitting to

figure 8: chiseling



the case).

Some pinblock material is bowed. Reduce the work of fitting by matching to the bow (if any) of the webbing of the plate. Either eyeball the old block or use a straight edge to check the webbing. If it is bowed, orient the new block accordingly (in almost all instances of bowing, the block will curve upwards in the middle).

Clamp the old block on top of the new panel with roughly 1/2" of the new material extending out from the flange edge. The back or stretcher edge must have enough excess to allow for the added dimension ("D" in figure 9), determined by measuring from your template line, to make up what was left in the case when the block was cut out, and another 3/8" of waste to permit an accurate cut.

Use a sharp pencil to trace the front or flange edge. Extend that line to the ends of the new blank, using a straight edge.

What you now have is a tracing of the *bottom* edge of the old block, but it is on the top surface of the new one. This is one reason to be sure to leave sufficient waste on the other side. If it is a notched block, you'll need to redo the tracing in the notch area or else you'll have a lot more work to do in fitting. One side of the notch — the bass end — will be a relatively straight cut directly into the block (roughly 90 degrees to the long edge). This cut is angled, so the bottom edge you have just traced is quite a bit closer to the treble end than the top. Since the line you have traced is on the top of the new block, you need to move it toward the bass to be accurate. Use a square against that edge on the old block to eyeball the distance you need to move that line.

The block face and plate flange are angled (figure 10). This is done so the plate can be removed (as soon as the plate starts to lift, surface contact with the flange diminishes, reducing friction and creating room to maneuver).

This angle must be duplicated in the new block. Most of us cut pinblocks on a band saw. Either measure the angle of the front face with a square and a protractor and set the saw table to that angle or hold the old block on the table and eyeball as you set the table so the blade is parallel to the relevant surface.

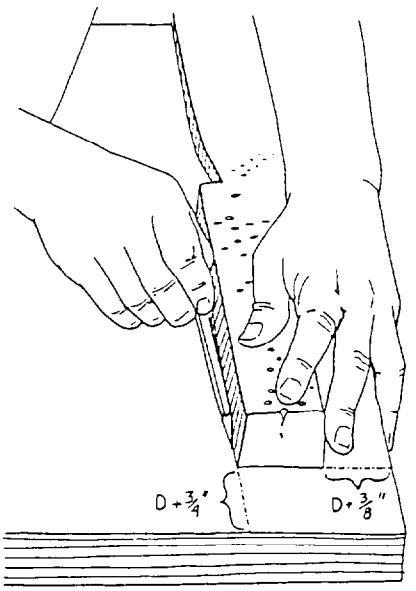


figure 9: tracing

If the flange face is curved, use a straight edge to draw a rough cut line (if you are cutting the block from a large panel) being sure to leave plenty of waste (3/8" or 10 mm). Make this rough cut with a hand-held circular saw, and then take the block to the band saw to cut the curved line.

The angled table will allow you to duplicate straight blocks. The place that's tricky is, once again, the notch. Unless you have a very large band saw, the notch falls too far from the bass end to allow you simply to turn the block and make the short cut that runs into the body of the block. You then have a problem cutting the longer, curved portion, since you can't just run the blade in and then turn the block to continue the cut. If your band saw table tilts in both directions, you can get the cut close by completing the initial cut and then changing the table and working back into the notch from the opposite direction. Just remember that the bottom edge of the short bass-end cut angles toward the treble. (Remember that amount you calculated with the square when you moved the tracing line?) It may be possible to finish the rough cut in the notch by "nibbling" at it with the blade. A hand-held saber saw may also work if it is powerful enough.

Straight blocks can be cut with a skill saw or hand-held circular saw if the base can be set to a tilt to duplicate the flange angle. The same problems at the notch occur and must be dealt with.

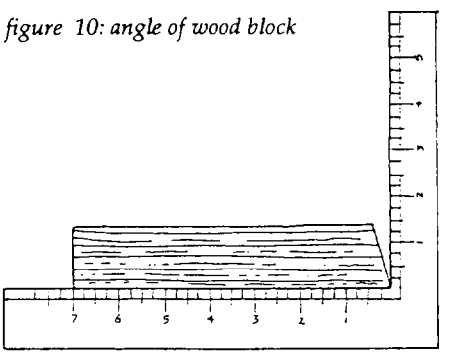
We'll break here and continue next month with fitting the block to the flange.

The Forum continues with a few items from various sources. In case you're wondering, Bill Spurlock hasn't dropped off the face of the earth — he's just taking a much deserved break, as is Nick Gravagne for the month. We can look forward to the return of both these fine columns.

This is a reprint of "Sticks And Stones," by Bob Bartnik. It appeared in the Richmond, VA, Chapter *Richmond Update* newsletter.

Item: In the "Now I've heard of everything" category, a new stain concentrate is now available that is non-toxic, odorless, has an unlimited shelf life and color retention, cleans up with soap and water, comes in eight colors (including Modern Mahogany, Walnut, Classic Oak, Meadowlark (???), Azure Blue, Periwinkle Green, Strawberry and Grape) and is reasonably priced at $4.95/pint, $6.95/Qt., and $15.95/Gal. What makes this so unusual? This stain is thinned with regular cooking oil!!! Not only does it look beautiful on fine furniture, but I bet it makes one heck of a salad too!

figure 10: angle of wood block

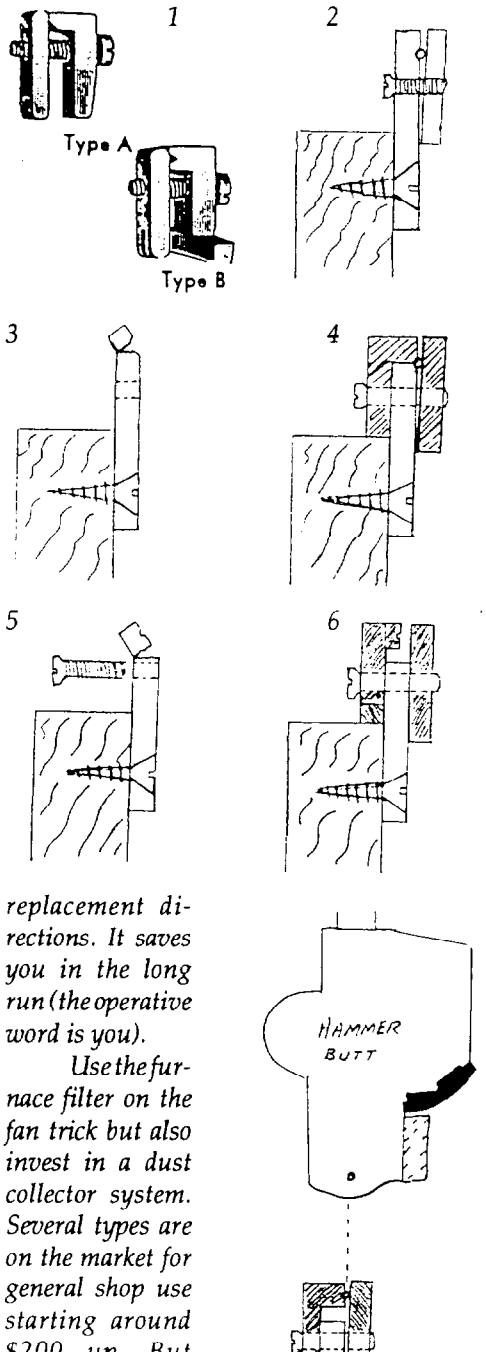


Item: For those of us wanting to try the new HVLP (High Volume Low Pressure) turbine spray system that so successfully controls overspray but already own compressors, take heart. DeVilbiss, one of the top names in spray equipment, has an add-on that converts the air from your compressor (five h.p. minimum) thus giving you the best of both worlds. List price around $560.00 — a couple of hundred under a separate turbine price.

Item: Our illustrious Wordmeister Alan Hallmark has come up with a great idea for your universal bass strings. Now, I like to just toss mine helter skelter into a heap and pour them into an old suitcase, thereby spending much time and effort searching for a string only to find out I don't have it! Alan found a plastic portable file case and has organized his strings into hanging file folders with five sizes in each folder. Each folder is marked with the appropriate micrometer size as well as the assigned "universal" number size making it a breeze to locate, identify, inventory, etc. his stock! The case will accommodate a complete set of universal strings. It can be found at office supply stores and it costs about $10.00 (plus folders).

Item: Be kind to your lungs, you only get one pair per customer — this warning seems to be more and more "popular" in the woodworking establishment as we see the damage we can do to ourselves while doing shopwork. Let's face it, we are a type of specialized woodworker, with refinishing, veneering, wood replacement and parts fabrication, sandblasting old parts, etc.... the list goes on. Each and every one of these endeavors can produce various degrees and quantities of dust particles. These particles can be dangerous to your health and steps should be taken to protect yourself and your fellow workers.

Warning! It is not enough to tape a furnace filter onto a fan and say you have a dust collector. This works alright, but only on those particles that are so big they would fall to the ground on their own! It's the little buggers you have to worry about. Think safety and think stages! Wear a dust mask under most wood sanding operations and a respirator when spraying, sandblasting, chemical bleaching, or any application where fumes and/or billowing dust may occur. A respirator will run you in the neighborhood $20-50 — cheap at twice the price. Use it and remember to change filters regularly. Don't try to get by or save a few pennies on filters. Follow manufacturers' recommended



replacement directions. It saves you in the long run (the operative word is you).

Use the furnace filter on the fan trick but also invest in a dust collector system. Several types are on the market for general shop use starting around $200 up. But don't stop there if you do a lot of woodworking and/or dusty work. NSA, makers known for their water purification systems has come out with two models of air filtration systems. The smaller of the two is a multi-stage filter system about the size of a bookcase speaker and is designed primarily for room use and people with allergies, hayfever, and micro-organism intolerances, but makes a dandy little life saver as it will pull particulate dust measured in microns! The larger model 7000A Environmental Air System consists of a Pre-Filter, Tri-Media Filter, and a High Efficiency Particulate Air Filter. For more information write to NSA, 4260 East Raines Road, Memphis, TN 38118 or come by and see them at my shop!

How many of us use an air compressor line to blow dust and such off of us? Seems like a quick and harmless way to get the dust off our clothes and back on the piano where it belongs, but think about what you may be doing... High pressure air blowing who knows what across your skin, face, eyes... nose... better to use a soft bristle brush and a facecloth to clean up with. I know the compressor is easier and tempting, but a scratched cornea was a result of blowing "just plain dust" off my neighbor's shirt! It happened where he works and he was very lucky... they also picked a metal sliver from the corner of his eyelid that was millimeters away from blinding him... Beware!

Good news to water-reducible lacquer users! Harper Bros. Hardware, located at historic 18th and Broad Street, Richmond is offering a new type of water reducible lacquer that is looking very, very good — and is very reasonable to boot!

Item: Dust — a four-letter word for shops and a pain in the, well, you know where it hurts... How do you control sanding dust? Build a dust sucker table! Make a frame of 2x2 or 2x4 lumber and sandwich it between two pieces of 1/2" plywood. With your hot-melt glue gun temporarily secure a piece of pegboard to the top sheet of plywood, then drill out the holes, using the pegboard as a template. Remove the pegboard when done and sand and finish the plywood top. Flip the sandwich over and install a hose mount so you can connect your shopvac to the box to provide the vacuum suction needed to remove the dust. Seal inside edges of frame with caulk or sealer and use screws to assemble. Mount the box according to your shop needs and size. A good overall size is 2'x2' for small parts and 2'x4' for larger pieces. Legs can be added or you can insert it into a workbench top, etc.

Item: Don't you hate to make a great gadget like a dust sucker table only to put it away when not in use? Well, use it for other things. Make up some dowels and cams to fit the holes and you have a neat assembly table for glue up, carving and shaping parts, aligning parts... only your imagination stops you!

This is a reprint of "One solution for the Repair Clip Blues," by Robert Bayley, RTT, taken from *The Vancouver Beat*, published by the Vancouver, BC, Chapter.

Ever notice how some pianos just seem

to sing (but not 'till after you've tuned them) and others just kind of mumble at you? Like the one I was working on recently. It didn't sing — it just said, "click... click... bzzzzz... zup... thak... doink!"

Right! You knew all along it was an old action with brass rails and cracked butt plates, didn't you. One can hardly imagine the weird sounds that come out of some pianos, but they really do — honest!

This type of action, once it starts making noises like the above, will not only nickel-and-dime you to death, but will surely test your sanity. Just when you think you have the noisy offender fixed with a new butt plate, another one starts making noises after you play a few more bars. Needless to say, this play on words could lead to all kinds of things, so let's get back to what I started to describe, what the actual problem/problems were and one way I found for a solution.

Do any of you tuners get the satisfaction of a good repair with the brass rail repair clips that the supply houses give you? Too often I have found this is not the case. I hope I can explain one good reason why.

For now, let's concern ourselves with two main types, shown in figure 1. They are the type A and type B repair clip. The "A" type is used when the tongue is broken at the groove. One half of the old groove is used and the broken part is replaced by the repair clip.

The "B" type is used when the tongue has broken just above the screw hole.

How well do these repair flanges work? Let's take a look at them.

Figure 2 shows a close-up view of the normal rail and butt plate arrangement. Figure 3 shows the top portion broken off at the groove. The "A" clip usually works but if the break is uneven, you wind up with a wobbly hammer that also leans. This is where the test of your sanity comes in. Sometimes after you try every trick you know, it still won't work properly. It may be necessary to file down the broken tongue and use the type B repair clip instead. More on this method a little further on.

If the broken tongue and the repair clip go together well, it will look similar to figure 4. I have had minimal success using this type as the repair clip tends to act like a pivot. For a good example of this, after you have installed one and it appears to be solid, take your finger and push slightly on either side of the hammer. If it moves and stays in the same place, and then you can move it back, you now know what I mean. A pianist with a fairly firm touch can also make the same thing happen. One good proof, if you can call it good, is that the action will let you know which note has the repair clip on it. You give a note a good test blow and the action talks right back to you... thak!

Figure 5 shows the tongue broken off at the screw hole (actually just slightly above). This is where you use the "B" type repair clip. As I mentioned before, if the "A" clip will not stay put, file down the tongue to just above the screw hole. Make sure the screw will be able to go through all three parts. (It won't if the tongue is too high.)

Now we are ready to get things working again. After installing the clip, and putting the hammer back in place, you now find it is loose and wobbling all over the place. Take a look at figure 6. Do you see anything wrong? There is a big gap between the notch for the centre pin and the butt plate and even though the screw is tight, there's no way the butt plate can ever fully contact and hold that centre pin. The solution — file the side of the repair clip that sits against the tongue until the edge of the notch lines up with edge of the tongue, as shown in figure 7. What you have effectively done is make the repair clamp a little thinner, but a lot more stable. The butt plate now holds the centre pin tight and the bottom "T" part of the repair flange rests on the wooden rail to stop the pivoting action.

If you want to be sure the repair clip doesn't ever wander, and you're a little daring, try a drop of C.A. glue at the base of the "T" part of the clip. (I've never attempted this, but it sounds reasonable in theory.) I don't know if I would want to try this while the action is still sitting on the customer's piano. One drop in the wrong place or on you and you will then find such a bonding with the piano you won't be able to tear yourself away! (and your customer is thinking how nice it is to see a man happy in his work)

I leave you with this: Action noisy? Don't throw a fit. File it's tongue. That's the end of it.

Here's a suggestion for modifying a moving dolly by adding a locking latch which can be engaged in the wheels to stabilize them:

Dear Susan,

For years I moved uprights with the Selpo rolling-pin style piano dollies that attach to the sides of the piano. Finally I decided to buy a dolly that would not force me to choose between destroying my back or destroying the customer's floor every time the piano had to be moved sideways.

My new "piano" dollies arrived from Elkay. There was a slot on the casters that would allow them to be locked for going straight. Very handy on a ramp. However, there was no provision for using this feature built into the product. Also, the base was clearly designed for stoves and refrigerators with no understanding of the peculiar shapes under upright pianos.

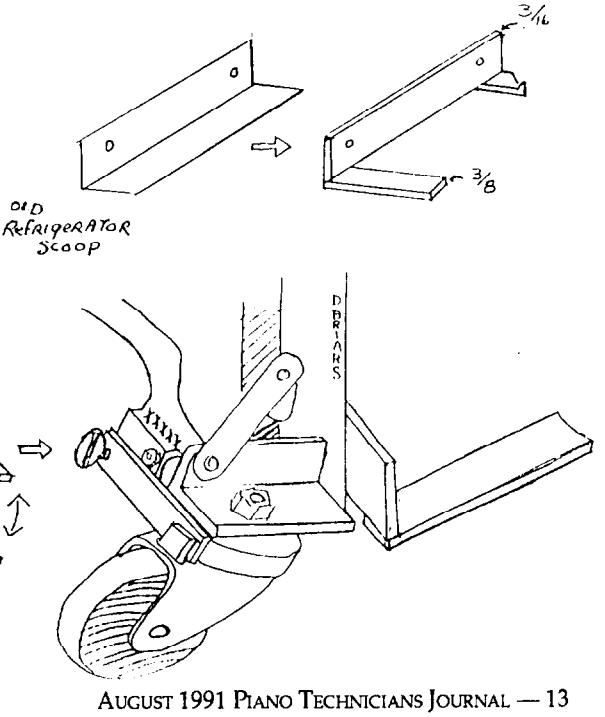
The pictured modifications have made this a very nice product. It's amazing the company can manufacture and sell this dolly for years without being forced to do this. The piano scooper part was inspired by the Selpo truck. The wheel lock is made out of scrap metal. There is a small nut welded onto the wheel lock which holds it down when it's locked and holds it out of the way when it is not needed.

David Briars, Craftsbury, VT

Last but not least, here's a response to an item about Steinway pitman modification.

Dear Susan,

At the end of this month's contribution, you mention an "informative tip from Doug Wood re: modifying pitman/tray intersection in the you-know-whose piano." Norman Neblett discusses this modification



in his trapwork class. I also modify every old-style Steinway pitman system. I can find no fault with Doug's methods or description, but would like to add a couple of items to the process.

First of all, a thick 7/8" front rail punching hot-glued to a 1/2" dowel works beautifully. One benefit of using the smaller size dowel is the size of the keybed hole. Instead of needing a 13/8" hole, I get by with one inch. I also find that wedging a tapered piece of scrap wood between the tray and keybed makes for a much neater exit hole.

There is only one detail omitted from Mr. Wood's method. How does he determine the length *of the dowel? In most instances, this modification takes place as part of a complete pedal and trapwork overhaul. In older Steinways, the pedal rods are not adjustable. Many stops have been replaced including the pedal rest cushions and the leather punchings at the rear of the pedals. Tray felt may not be exactly the same thickness etc., etc. I guess if one were wiling to add and subtract all the differences, a length could be determined. Even with adjustable rods, I've seen differences that can cause the pitman length to change over 3/8". Wouldn't it be nice to make the dowel exactly the right length without trial and error?*

The jig I've designed is used after *all pedal and trapwork restoration work is performed. It's an adjustable pitman with two thick front rail punchings hot-glued to the ends. Once the non-adjustable damper pedal rod is in place, or the adjustable one is optimally adjusted, I determine the correct dowel length by raising or lowering my jig until the appropriate lost motion occurs between the tray and the underlevers. Once established, the thumbscrew locks the position. It's a simple matter to measure the jig's length between the two punchings and cut a 1/2" dowel to that measurement.*

Richard Davenport

TUNING UP

Tuning Spinets

Rick Baldassin, RTT
Tuning Editor

This month we have a letter from Bill Swackhammer, RTT, of the Redwood, CA, Chapter. Bill writes:

The latest information from PTG is that 32% of our technicians tune as many grands as verticals, meaning that 68% tune more *verticals than grands. How many of these verticals are small consoles and spinets is not listed, but would we be surprised if it was 75% of all the verticals?*

In my opinion, it is much more difficult to tune these small verticals to a good standard than it is to tune grands. It is also true that most of the information we are taught relates primarily to grands. This situation probably exists because those technicians who advance to the point where they are exploring new techniques have also developed a business where their work is primarily on grands.

The fact that small verticals can be tuned to higher (and higher, and higher!) standards will only be proved when we technicians exchange the results of our experiences with a large enough group of like-minded tuners.

If you agree with me and want to disseminate more information on small verticals, let me get the ball rolling:

One of the many problems with small verticals is the lack of duplex scales. Is it possible that tuning the top 1/2 octave (F#7 to C8) very *sharp will cause it (to some extent) to act as a duplex scale? In other words, is it possible to tune this half octave so the piano will "sing" more when played in the middle and bass sections?*

Thank you for providing a forum for these questions.

As to the statistics, in my case I would have to answer "no" to the question of whether I tune as many grands as verticals, because I tune nearly all grands, and hardly any verticals. I realize that this makes me abnormal (at the least in this instance). I concede that there are many who work primarily on verticals, or uprights. I am not sure if I could agree that 75% of these verticals would be consoles or spinets. There are still way too many of those big old uprights hanging around. In any case, this does not diminish the need to discuss the specific requirements of these instruments.

I think the reason that most of the information printed discusses grands is because the better scaling of grands allows us to work through problems and come up with a solution. This is more satisfying than discussing at great length a situation with a spinet, and then concluding that there is no solution. While it is true that with the technology we have today, smaller pianos are being made that can actually be tuned, so many of them that were built 30 years ago can't be. At least not to the standards we have set for ourselves in the 1990s. While we can be thankful that most of the manufacturers in their wisdom have discontinued production of these models, the fact remains that if these spinets last as long as those big old uprights have, then someone will have to tune them for at least 50 more years.

Let's get to the question: Can the treble be tuned very sharp to allow the top half-octave to act as a duplex scale, or to sing more when the middle and bass are played?

One of the characteristics of the spinet piano is that the strings are short, and therefore the inharmonicity high. The strings are short because the string lengths have to increase at a certain rate per octave (usually 1.87 to 1.89). Since the maximum string length is so short, the length of note 88 has to be short, so as to avoid a piano which has about 50 bass notes. This short length has a dramatic effect on the inharmonicity, making it much higher than, say, a big upright. Those who use an electronic tuning device have probably measured it. You may recall from the review last month that the stretch number is actually a measure of the inharmonicity constant for note F4. I am sure that many of you have measured spinets with stretch numbers from seven to nine, whereas most big uprights would measure from three to six.

Taking into account the fact that the inharmonicity increases at a rate of almost three per octave, you can see how much more inharmonic the spinet with a stretch number of nine will be as compared to the old upright with a stretch number of four.

To make the highest treble sing, or sound sympathetically with the middle, never mind the bass, would require tuning triple and quadruple octaves in the high treble. You may recall from prior issues that a well-scaled piano will usually allow the tuning of double octaves clear to the top of the piano. This would imply that the not-so-well scaled pianos would not allow even the tuning of *double* octaves in the treble, never mind *triple* or *quadruple* octaves. Think back to the discussion some time ago of the "Picasso" tuner, so called because he liked to stretch the Baldwin concert grand nearly to triple octaves. This being the case, anyone trying to tune triple or quadruple octaves in a spinet would have to be called a "Salvador Dali" tuner. The octaves would be so out of tune that they would be truly surrealistic.

The real problem with the spinet piano is that it is too small — the strings are too short, and the soundboard does not have enough area. (Never mind the action). This is the primary cause of the lack of sound, in my opinion, not the lack of duplex scaling, and I am not sure it would be worth making the octaves so out of tune to simulate the duplex. It would be kind of like adding more sugar to make up for the lack of salt in a recipe.

My recommendation for tuning the treble of a spinet would be to tune double octaves as high as possible, listening to the resulting single octave, (for example tune F7 to F5, and listen to the resulting octave F6-F7), and revert to single octave tuning when the resulting octave starts to sound too out of tune.

A few other tips for spinet tuning: 1) Choose a temperament octave that is high enough to avoid wound strings. Until recently, the wound strings almost always dropped in inharmonicity as compared to the plain wires. This makes it very difficult to tune a good temperament. 2) When listening to the fifths while tuning the temperament and midrange, be sure to listen to the 3:2 level of the fifth, and not the 6:4 level. This is important because in small pianos, the 6:4 level is almost always louder than the 3:2 level. 3) Be prepared to accept jumps in the beat rates when going over the breaks. The scaling from plain strings to wound strings on the tenor bridge, and from tenor to bass is seldom smooth. This means you may have a nice progression of M3rds, but the fourths or fifths may have a few problems, or all of the small intervals may have problems when the octaves sound correct. With experience, you will learn how to compromise all of the intervals a little, and come up with the least offensive combination. 4) Learn to accept the fact that no matter where you tune the lowest bass notes, they will never sound in tune. These low strings are so inharmonic, that if you match partials six and three, then 10 and five will howl at you, and vice-versa. In addition, the partials are so far out of tune that at times our brains will not assimilate the partials into a tone. It just sounds like a thud, and if you play the octave melodically, you have no idea where you are. In some cases, you just have to listen to the progression of M17ths or m21sts, because the octave gives no clue. 5) Accept the fact that these small pianos have these limitations, and there is nothing that can be done about it. After all, you didn't design the piano. Do your best, and move on.

I hope the above information has been helpful. If any of you have other ideas, send them in, and I will pass them on.

The next two entries come from newsletters. The first was published in the May issue of the *Richmond Update*. It was a review of a technical which was given by Ernie Bremner, RTT, of the Roanoke Chapter. Ernie shared the following thoughts on aural tuning:

Pitch Raising

1. To better guess how flat a piano is, alter an A-440 fork to be 50 cents flat.
2. When pitch raising, try this. It is very accurate. If the piano is 45-50 cents flat, you will most likely want to start about 15 cents sharp. Tune A4 to A-440 fork. Tune A3 to A4. Now tune F3 to A3 pure. F3 is now about 15 cents sharp. For each one beat per second that F3 is raised or lowered, the pitch is changed about two cents.
3. Have the piano within one to two cents of pitch for fine tuning.

Setting Pitch

Most of us use F2 as a check with A4 and our fork. Try using B1 as the test note. Most of the time a very clear beat can be heard.

Temperament

1. Choose a temperament with lots of tests early or alter your present temperament for more early checks.
2. Use contiguous M3rds and P4ths.
3. When checking contiguous M3rds, try Al Sanderson's method. Play the lower M3rd and count the beats as 1-2-3-4, 1-2-3-4, etc. Then play the upper M3rd and count 1-2-3-4-5, 1-2-3-4-5, in the same space of time. They beat in the ratio of 4:5.
4. Be constantly using the M3-M6 test for P4ths, and the M6-M10 test for P5ths.
5. When refining a temperament, try to have two or three intervals agree that a note should be changed before moving the pin.

Treble

For a fairly quick, accurate method for the treble, 1) Try first for clean octaves, 2) then check the double octave; if it is beating, the note is sharp, 3) then check the P12th (octave and a fifth); if it is beating, the note is flat, and 4) if further refining is wanted, check with parallel M17ths.

Bass

1. Of course, use the m3-M6 test.
2. P4ths and P5ths can get you very close (the P5th is usually almost pure) in the mid to upper bass.
3. The P12th is usually pure or nearly so.
4. Parallel M10ths and M17ths run smoothly.

Extreme Treble

Play the octave and double octave below the note being tuned, then press the damper pedal and play the note being tuned. Usually the beats can be clearly heard, and the note easily tuned.

Our thanks to Ernie Bremner for his presentation, and to the *Richmond Update* for the review. The next entry is by Bob Stephenson, Technical Editor of *Soundboard Buttons*, the newsletter of the Twin Cities Chapter. It appeared in the November 1990 and January 1991 issues:

As you no doubt know, there are many ways to set the temperament, or bearings, in tuning a piano. This is one that works well for me, and I have given it the title of the "789 Temperament." With a little variance, this is essentially an approach that was taught by the late George Defebaugh. For many years Defebaugh taught classes on tuning, and I must credit him for the encouragement to step away from the C fork and the "down a fourth, up a fifth" pattern.

We will begin by discussing the first four notes of the 789 Temperament. The numbers seven, eight and nine stand for the approximate number of beats in the three intervals established by these four notes. You just might be as fascinated as I am about their solid logic in building a reference from which to construct a temperament. They also become a framework by which you can finish or expand the temperament in many different ways.

Step 1 — Tune A4 from your pitch source. Check the beat rate of note A4 and the fork against note F2 for equal beating.

Step 2 — Tune A3 from A4, a wide (stretched) octave. Check against F2. F2-A3 should beat slightly slower than F2-A4.

Step 3 — Tune F3 from A3, M3rd, wide at about seven BPS (theoretically 6.9 BPS).

Step 4 — Tune D4 from F3, M6th, wide at eight BPS.

Step 5 — Test A3 to D4, P4th, wide at one BPS.

Step 6 — Tune A# (B-flat) to D4,

M3rd, wide at 9.2 BPS.

Step 7 — Compare F3-A3, F3-D4, and A#3-D4 to feel the slight increase in speed in these intervals: seven, eight, and nine BPS, approximately.

Step 8 — Test F3 to A#3, P4th, wide at 0.8 BPS.

A bit of helpful advice here about checking the perfect fourths and fifths as you work through the temperament: I know from my own early experience, and minor frustration, that I wanted to set these intervals too perfectly (beatless). The frustration, of course, came from discovering that I was not able to get a temperament with gradually increasing speeds, ascending chromatically, in the M3rds. In other words, we must allow that certain roughness in the fourths and fifths in order to arrive at equal temperament. We may not like those intervals, but that minor irritation will disappear with the satisfaction of achieving the graduated thirds and sixths.

The four notes which have been tuned form a very solid base on which to construct a temperament octave, and allow a nice arrangement of gradually increasing and decreasing beats in adjacent M3rds and M6ths. After these initial notes have been tuned, we continue as follows:

Step 9 — Tune F#3 from A#3. This M3rd must beat slightly faster than F3-A3.

Step 10 — Tune C#4 from F#3, contracted fifth. Check A3 to C#4 M3rd, slightly slower than A#3-D4.

Step 11 — Tune G#3 from C#4, expanded fourth.

Step 12 — Tune D#4 from G#3, contracted fifth. Check D#4 to A#3, expanded fourth.

Step 13 — Tune F4 from A#3 (B-flat), contracted fifth. Check F4-F3 octave, smooth but wide.

Step 14 — Tune C4 from F3, contracted fifth. Check C4 to F4, expanded fourth. Check C4 to G#3. This M3rd must beat slightly slower than A3-C#4. Check the sequence of M3rds G#3-C4, A3-C#4, A#3-D4. We must hear a slight increase in beat speeds as we ascend, or a corresponding decrease as we descend.

Step 15 — Tune E4 from A3, contracted fifth.

Step 16 — Tune B3 from E4, expanded fourth. Check B3-D#4 as slightly faster than A#3-D4. Check C4-E4 as slightly faster than B3-D#4. We now have six consecutive Major thirds, G#3-C4 through C#4-F4. Adjust as necessary, but within the smooth fourth and fifth boundaries.

Step 17 — Tune G3 from C4, expanded fourth. Check G3 to D4, contracted fifth. Check G3-B3 M3rd, slightly faster than F#3-A#3, and slightly slower than G#3-C4.

Step 18 — Check all Major thirds to see if they have stayed where originally placed. Adjust as necessary, so they will increase or decrease as needed. If the strings seem unstable, it may be best to tune unisons and then re-tune the temperament.

Step 19 — Check Major sixths F3-D4, F#3-D#4, G3-E4, and G#3-F4.

Tuning the temperament in this way will result in 13 tones, equally spaced from each other, giving graduated Major thirds, and Major sixths.

Our thanks to Bob Stephenson for his contribution, and to the *Soundboard Buttons* for printing it. Until next month, please send your questions and comments to:

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

AT LARGE

The Ideal Aural Tuning, Part IV

James Coleman, Sr., RTT
Phoenix, AZ, Chapter

In previous articles, it has been shown that after string parameters have been measured and used as inputs for a computer program, one can derive the inharmonicity coefficient or constant for each note of the piano, and then each note can be located frequency-wise after balance is established for the thirds, 10ths, 17ths, and octaves. Graphs of the entire tuning can be made from the established location of each note.

In table I you can see the beat rates for the important intervals from note one through note 88. Yes, the first column begins with note #13, but that is the upper note of the A0 octave. In the second column you see that the first partial of A1 is 0.6 beats per second sharper than the second partial of A0. In the third column you see that the second partial of A1 is 0.9 BPS sharper than the fourth partial of A0. In the fourth column you see that the third partial of A1 is 0.8 BPS sharper than the sixth partial of A0. In the next column you see 0 BPS. In the sixth column, the brackets indicate that the fifth partial of A1 is flatter than the 10th partial of A0 by 1.8 BPS. In the 12-6 column you will notice again that the beats are on the negative side and that they are much faster. Only on a nine-foot grand would one dare to tune the A0 flatter to decrease the 12-6 beat rate. In order to cut down this faster beat rate, one would have to lower the A0 which in turn would increase the previous beat rates enumerated in this paragraph. This writer has observed that the majority of good tuners seem to prefer octave matching somewhere from 6-3 to10-5, with the latter being used mostly only on nine- or seven-foot grands.

In the last article it was mentioned that there is a gradual change in a perfect 6-3 match at octave G#2-G#3 down to a perfect 8-4 match at A0-A1. This can be seen in the 6-3 column from note 36 looking up to the first row at note 13 (these being the upper notes of the octaves G#2 to A0). You can also see that the values in the 8-4 column change in a gradual fashion from note 36 to a value of zero at note 13 which is the upper note of the A0 octave.

In table II, the same general relationships can be observed, except in a larger piano it is possible to get a closer matching of the various types of octaves because in the bass

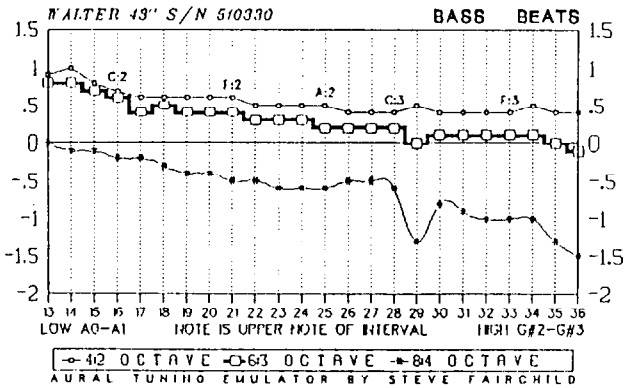


figure 1

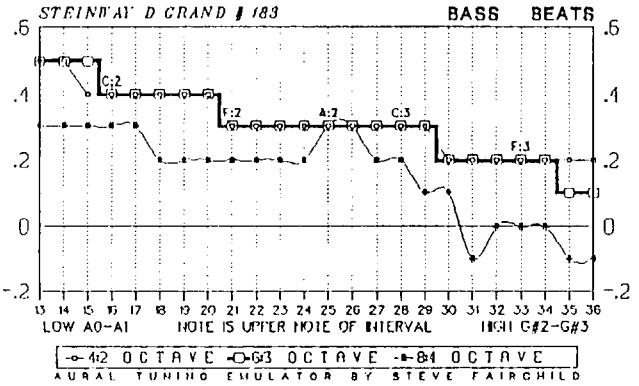


figure 2

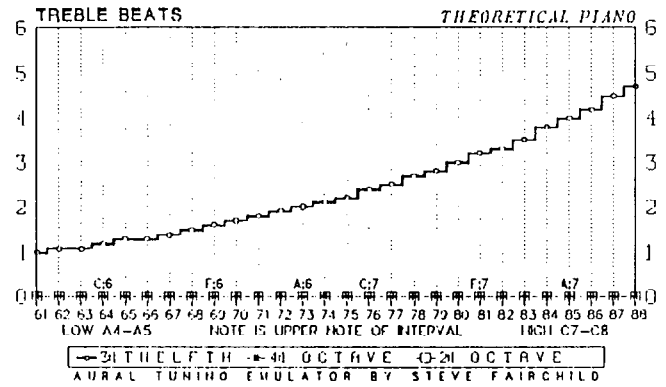


figure 3

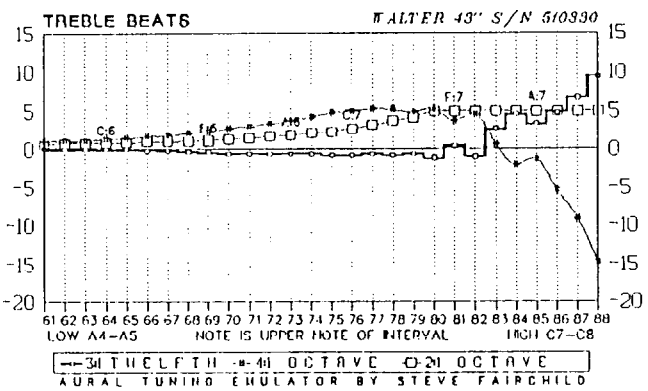


figure 4

STEVE FAIRCHILD
T=(M+C)/12 TUNING

NOTE IS UPPER NOTE OF INTERVAL

BRACKET ( ) MEANS
INTERVALS ON WRONG SIDE

WALTER 43" S/N 510330
FP CONSOLE. JIM COLEMAN

VALUES=BEATS

	8TH 2:1	Octave Partials 4:2	6:3	8:4	10:5	12:6	12TH 3:1	15TH 4:1	17TH 5:1	Mi 21ST 7:1	26TH 12:1	3RD 5:4	4TH 4:3	5TH 3:2
13:A.1	.6	.9	.8	.0	(1.8)	(4.7)						1.9	.5	(.2)
14:A#1	.6	1.0	.8	(.1)	(2.0)	(5.2)						2.0	.5	(.3)
15:B.1	.5	.8	.7	(.1)	(1.8)	(4.6)						2.1	.5	(.3)
16:C.2	.5	.7	.6	(.2)	(1.9)	(4.6)						2.2	.5	(.2)
17:C#2	.4	.6	.4	(.2)	(1.6)	(3.8)						2.2	.4	(.1)
18:D.2	.4	.6	.5	(.3)	(1.9)	(4.4)						2.4	.5	(.2)
19:D#2	.4	.6	.4	(.4)	(2.1)	(4.8)						2.5	.4	(.2)
20:E.2	.4	.6	.4	(.4)	(2.1)	(4.8)						2.7	.4	(.1)
21:F.2	.4	.6	.4	(.5)	(2.2)	(4.9)						2.8	.5	.0
22:F#2	.4	.5	.3	(.5)	(2.1)	(4.7)						3.0	.5	.0
23:G.2	.4	.5	.3	(.6)	(2.2)	(5.0)						3.1	.5	.0
24:G#2	.4	.5	.3	(.6)	(2.3)	(5.1)						3.3	.5	(.1)
25:A.2	.3	.5	.2	(.6)								3.5	.5	.0
26:A#2	.3	.4	.2	(.5)								3.8	.6	.0
27:B.2	.3	.4	.2	(.5)								4.0	.6	.0
28:C.3	.3	.4	.2	(.6)								4.2	.6	.0
29:C#3	.4	.5	.0	(1.3)								4.4	.6	.0
30:D.3	.3	.4	.1	(.8)								4.6	.7	.0
31:D#3	.3	.4	.1	(.9)								4.9	.7	.1
32:E.3	.3	.4	.1	(1.0)								5.1	.7	.1
33:F.3	.3	.4	.1	(1.0)								5.4	.7	.1
34:F#3	.3	.5	.1	(1.0)								5.8	.8	.2
35:G.3	.4	.4	.0	(1.3)								6.1	.8	.2
36:G#3	.4	.4	(.1)	(1.5)								6.5	.8	.2
37:A.3	.4	.4	.0									6.9	.9	.2
38:A#3	.3	.4	(.2)									7.3	.9	.3
39:B.3	.4	.4	(.2)									7.7	1.0	.3
40:C.4	.4	.4	(.4)									8.1	1.0	.3
41:C#4	.4	.4	(.3)									8.6	1.0	.3
42:D.4	.4	.4	(.3)									9.1	1.1	.4
43:D#4	.4	.4	(.4)									9.6	1.1	.4
44:E.4	.4	.4	(.4)									10.1	1.1	.5
45:F.4	.4	.4	(.4)									10.7	1.2	.5
46:F#4	.4	.4	(.5)									11.3	1.3	.6
47:G.4	.4	.4	(.6)									12.1	1.3	.6
48:G#4	.4	.4	(.6)									12.9	1.5	.6
49:A.4	.5	.4	(.8)									13.8	1.6	.7
50:A#4	.5	.4	(.7)									14.9	1.8	.7
51:B.4	.5	.4	(.7)									16.0	2.0	.7
52:C.5	.5	.5	(.5)									17.3	2.3	.7
53:C#5	.5											19.1	2.6	.7
54:D.5	.6											20.6	3.1	.6
55:D#5	.6											22.7	3.6	.6
56:E.5	.6											23.8	3.9	.6
57:F.5	.6											25.2	4.1	.6
58:F#5	.6											27.1	4.4	.6
59:G.5	.6											27.3	4.3	.8
60:G#5	.6											29.6	4.1	.9

1200c	4300c	3400c	2800c	2400c	1900c	400c	500c	700c

VALUES=BEATS VALUES=BEATS

VALUES=BEATS

	Upper Treble 8TH 2:1	12TH 3:1	15TH 4:1	17TH 5:1
61:A.5	.6	.0	1.0	8.0
62:A#5	.7	.0	1.1	8.4
63:B.5	.7	.0	1.1	8.9
64:C.6	.7	(.1)	1.3	9.4
65:C#6	.8	(.1)	1.4	10.0
66:D.6	.9	(.2)	1.6	10.7
67:D#6	.9	(.3)	1.8	11.4
68:E.6	1.0	(.4)	2.0	12.2
69:F.6	1.1	(.5)	2.3	13.1
70:F#6	1.2	(.7)	2.7	14.1
71:G.6	1.4	(.6)	3.0	15.1
72:G#6	1.6	(.7)	3.3	16.3
73:A.6	1.8	(.6)	3.7	17.6
74:A#6	2.0	(.6)	4.2	19.2
75:B.6	2.3	(.8)	4.7	20.8
76:C.7	2.7	(.8)	4.9	22.4
77:C#7	3.1	(.7)	5.2	24.4
78:D.7	3.6	(.8)	5.1	25.9
79:D#7	4.2	(.7)	4.8	27.8
80:E.7	4.9	(1.2)	5.1	29.2
81:F.7	4.9	.4	3.7	29.1
82:F#7	5.0	(1.0)	4.5	32.1
83:G.7	4.9	2.6	.6	28.0
84:G#7	5.0	4.5	(2.1)	27.8
85:A.7	5.0	3.3	(1.4)	28.8
86:A#7	5.0	4.8	(5.4)	25.7
87:B.7	5.0	6.7	(9.2)	24.1
88:C.8	5.0	9.4	(14.7)	17.5

1200c	1900c	2400c	2800c

VALUES=BEATS

table II

VALUES=BEATS

	8TH 2:1	Octave Partials 4:2	6:3	8:4	10:5	12:6	12TH 3:1	15TH 4:1	17TH 5:1	Mi 21ST 7:1	26TH 12:1	3RD 5:4	4TH 4:3	5TH 3:2
13:A.1	.3	.5	.5	.3	(.2)	(1.2)						1.9	.5	(.1)
14:A#1	.3	.5	.5	.3	(.3)	(1.2)						2.0	.4	(.1)
15:B.1	.2	.4	.5	.3	(.2)	(1.0)						2.1	.4	(.1)
16:C.2	.2	.4	.4	.3	(.1)	(.8)						2.2	.4	.0
17:C#2	.2	.4	.4	.3	(.1)	(.8)						2.3	.4	.0
18:D.2	.2	.4	.4	.2	(.2)	(.9)						2.4	.3	.0
19:D#2	.2	.4	.4	.2	(.2)	(1.0)						2.5	.3	.0
20:E.2	.2	.4	.4	.2	(.3)	(1.2)						2.7	.4	.1
21:F.2	.2	.3	.3	.2	.0	(.6)						2.9	.4	.1
22:F#2	.2	.3	.3	.2	(.1)	(.6)						3.0	.4	.1
23:G.2	.2	.3	.3	.2	.0	(.5)						3.2	.5	.1
24:G#2	.2	.3	.3	.2	.0	(.4)						3.4	.5	.1
25:A.2	.1	.3	.3	.3								3.6	.5	.1
26:A#2	.1	.3	.3	.3								3.8	.5	.1
27:B.2	.2	.3	.3	.2								4.0	.5	.1
28:C.3	.1	.3	.3	.2								4.2	.6	.2
29:C#3	.1	.3	.3	.1								4.4	.6	.2
30:D.3	.1	.2	.2	.1								4.7	.6	.2
31:D#3	.2	.2	.2	(.1)								4.9	.6	.3
32:E.3	.1	.2	.2	.0								5.2	.6	.3
33:F.3	.1	.2	.2	.0								5.5	.6	.3
34:F#3	.1	.2	.2	.0								5.8	.7	.3
35:G.3	.1	.2	.1	(.1)								6.3	.7	.4
36:G#3	.1	.2	.1	(.1)								6.7	.8	.4
37:A.3	.1	.1	.1									6.9	.8	.4
38:A#3	.1	.1	.0									7.3	.8	.5
39:B.3	.1	.1	.0									7.6	.8	.5
40:C.4	.1	.1	.0									8.0	.8	.5
41:C#4	.1	.1	(.1)									8.6	.8	.6
42:D.4	.1	.1	(.1)									9.2	1.0	.6
43:D#4	.1	.1	(.1)									9.7	1.0	.7
44:E.4	.1	.0	(.3)									9.8	.9	.8
45:F.4	.1	.0	(.5)									10.4	.9	.8
46:F#4	.1	.0	(.6)									10.9	1.0	.8
47:G.4	.1	(.1)	(.9)									11.7	1.0	.9
48:G#4	.1	(.1)	(1.0)									13.4	1.2	.9
49:A.4	.2	.0	(.8)									14.2	1.7	1.0
50:A#4	.2	.0	(.9)									15.0	1.8	1.0
51:B.4	.2	.0	(1.0)									15.6	1.7	.9
52:C.5	.3	(.1)	(1.5)									15.5	1.6	1.0
53:C#5	.3											16.2	1.4	1.1
54:D.5	.3											17.0	1.4	1.1
55:D#5	.4											17.3	.9	1.4
56:E.5	.5											18.8	.9	1.6
57:F.5	.5											19.6	1.3	1.8
58:F#5	.6											18.5	.6	2.0
59:G.5	.6											19.9	(.3)	2.1
60:G#5	.7											21.4	.4	2.2
	1200c				4300c	3400c	2800c	2400c	1900c			400c	500c	700c

VALUES=BEATS VALUES=BEATS

STEVE FAIRCHILD
T=(M+C)/12 TUNING

NOTE IS UPPER NOTE OF INTERVAL

BRACKET ( ) MEANS
INTERVALS ON WRONG SIDE

STEINWAY D GRAND # 183
HALE PIANO CO. 10/27/1990

VALUES=BEATS

	Upper Treble 8TH 2:1	12TH 3:1	15TH 4:1	17TH 5:1
61:A.5	.7	.3	.7	7.7
62:A#5	.7	.2	.8	8.1
63:B.5	.8	.1	.8	8.4
64:C.6	.8	.2	.8	8.8
65:C#6	.9	.2	.8	9.4
66:D.6	.9	.2	.8	10.0
67:D#6	1.0	.4	.8	10.6
68:E.6	1.1	.5	1.2	11.1
69:F.6	1.2	.6	1.2	11.6
70:F#6	1.3	.7	1.1	12.0
71:G.6	1.5	.6	1.0	12.7
72:G#6	1.6	.6	.8	14.3
73:A.6	1.8	.9	.6	14.8
74:A#6	2.1	.6	.3	15.5
75:B.6	2.4	1.4	(.6)	15.1
76:C.7	2.7	1.9	(.6)	15.0
77:C#7	3.2	.4	.2	16.5
78:D.7	3.7	(.3)	.0	17.2
79:D#7	4.2	(.2)	.6	18.1
80:E.7	4.9	.2	(.1)	18.8
81:F.7	5.0	(.4)	.1	20.0
82:F#7	5.0	(2.9)	(.2)	18.5
83:G.7	5.0	(4.3)	.6	20.7
84:G#7	4.9	4.4	(5.3)	16.2
85:A.7	5.0	5.9	(6.1)	15.7
86:A#7	5.0	7.0	(7.7)	17.7
87:B.7	5.0	5.6	(1.7)	17.7
88:C.8	5.1	10.6	.3	16.9
	1200c	1900c	2400c	2800c

VALUES=BEATS

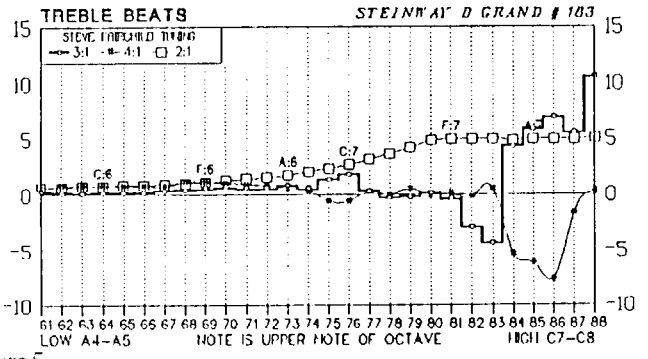


figure 5

the inharmonicity is generally much lower. You can see here that 10-5 and 12-6 octave matching is much more a possibility. In both tables I and II you can see a good balance between the 2-1, 4-2, 6-3, and 8-4 types of octave matching.

Remaining columns of these tables list other intervals. You will notice that the thirds, fourths, fifths, 12ths, double octaves and 17ths are tracked as far as is practical. The m3rds and M6ths are not shown because they generally parallel the M3rds in smooth progression. From note 61 on up, only the most useful intervals are shown.

There is the very definite presupposition in effect for notes 82 to 88 in that the beat rate of the 2-1 octave is held at five BPS. This is due to the harmonic reinforcement of the second partial of the octave below. Experiments have shown that when a 2-1 octave is stretched more than about five BPS, there is more loss of the reinforcing property of the octave below. This is especially true when the sustaining pedal isn't being used. When the sustaining pedal is used, additional stretching could be tolerated to bring into play the reinforcing characteristic of the double octave and the octave fifths. There is provision in the formulas to allow this preference as an option.

In figure 1, you can see how the computer tuned the bass in a way that provides a balance between the curves of the 4-2, 6-3 and 8-4 octave relationships. The better the balance, the better the sonority of the bass.

In figure 2, you again see a good balance between the three kinds of octaves. The vertical scale of the graph is spread out a little more to show more detail. Also, the 8-4 relationship is on the wide side to enable the 10-5 and 12-6 relationships to be better.

Figure 3 shows the treble octave relationships as they would be if there were no inharmonicity. The 2-1, 4-2, 6-3, 8-4 and the double octave relationships would all have zero beats. But, the 3-1 octave-5th would still have quite a sharp sweep in the high treble. This is what has caused some pipe organ tuners to put a little stretch in their treble tuning to slow down the fifths at the expense of the pure octaves.

In figure 4 you see the smoothness of the treble octaves until the double octave is sacrificed in favor of maintaining the five BPS single octave beginning around note 81. In this graph there is a slight reversal of the beats in the 3-1 relationship beginning at note 67 on up to note 80. This indicates that in this case a slight decrease in the stretching of the single and double octaves could be tolerated because of the lower inharmonicity found in the treble of this console.

In figure 5 you see a similar smoothness found in this fine nine-foot grand.

Next month there will be the beginning of the explanation of the formulas which are used in the spreadsheet program for calculating all of these beat rates that have been discussed so far. ≡

Sound Background

Sound Wave And Vibration Studies From Early To Mid-19th Century

Jack Greenfield, RTT
Chicago Chapter

There was considerable progress in the development of experimental methods and demonstrations in the study of vibration and sound wave motion during the first half of the 19th century. Important work included: Young's development of a method for providing a graphic record of sound waves; Wheatstone's experiments with visual demonstrations of sound wave patterns in addition to his other acoustical projects; Doppler's investigation of the alterations in apparent pitch caused by relative motion; and Seebeck's study of the partials in tones produced by bars and rods and the related effect of stiffness in vibrating strings.

The First Graphic Record Of Sound

Besides his other achievements (December 1990 *Journal*, p. 32), the British physicist, Thomas Young was the first investigator who designed a device that could make a graphic record of sound vibrations directly from a source of sound. In a series of lectures he delivered and then published in 1807, Young described an assembly he had designed. His apparatus contained a tuning fork mounted horizontally with its prongs perpendicular to a horizontal cylinder which could be rotated by a hand crank mounted at one end of its axis. A stylus mounted at the end of one prong touching the smoke-blackened surface of the cylinder, drew a wavy line representing sound wave oscillations as the cylinder was rotated. Young's description stated principles that became the groundwork for the development of sound recording that took place later in the century.

Wheatstone: An Instrument-Maker Turned Physicist

Better known for his work in electricity, Sir Charles Wheatstone (1802-1875), a British scientist prominent during the second and third quarters of the 19th century, carried out important research on acoustical vibrations early in his career. Wheatstone became a physicist as the result of unusual circumstances. Born in Gloucester, the son of a music dealer, he had no formal training in science. When he reached the age of 14 years, he left for London to begin work as an apprentice in a firm owned by his uncle, William Wheatstone. The Wheatstone firm manufactured musical instruments — primarily flutes, and published sheet music and books.

Stimulated by his desire to understand the scientific basis for the creation of music sounds, Wheatstone undertook the study of acoustics and began to experiment with musical sounds. When he was only 19 years old, he exhibited a demonstration of his "Enchanted Lyre." Sounds from a piano in a remote location were transmitted by linear vibrations through a long wire attached to the piano soundboard at one end and to the soundboard of the "Enchanted Lyre" at the other end. In a paper published in 1823, Wheatstone explained the acoustical principles underlying his demonstration and discussed the linear transmission of sound waves through wires and rods. He also described his Chladni-type experiments designed to show the nodal line patterns of vibrating plates covered with the fluids — mercury, water, or oil instead of sand (October 1990 *Journal*, p.35).

In 1827, he reported on his "kaleidephone" apparatus displaying vibrations in a beam of light. The beam was directed at the polished free end of a rod or plate held in place at the other end. During vibration, as the result of an optical effect caused by the persistence of vision, the observer could see the vibrating polished rod-end tracing intricate curves. In the same report he discussed experiments with a binaural hearing device used in the same way as the modern stethescope or headphones. His "microphone," the term he originated and applied to the device, contained two concave metal diaphragms to be placed over the ears. Slender brass rods which were attached to the diaphragms, curved around the face and were joined to a single rod. The tip of this rod could be placed in contact with a surface to detect the presence of faint sound waves transmitted through the rod connectives to the diaphragms at the ears.

Wheatstone Invents The Concertina

Wheatstone had not yet given up his work on musical instruments. In 1829, he received patents for two new "free" reed instrument designs, a modification of the accordion which he named "concertina" and a type of mouth organ he named "Symphonion." In both types of instruments, musical tones were produced by the vibrations of thin, flexible metal reeds, now classified as "free-" reeds since they vibrate freely through openings in a closely-fitted metal frame. There had been little interest in free-reed instruments in Europe until late in the 18th century when Father Amoit, a Jesuit missionary returned from China with a *sheng*, a type of mouth organ. Soon afterward, in the early 19th century, European instrument makers began to apply the free-reed principles in new designs for mouth organs, reed organs with foot-operated bellows, and portable accordion-type instruments with air pressure or suction provided by

improved version of earlier instruments with melody buttons on the right and with bass and chord buttons on the left. The early models contained only notes of the idatonic scales pitched in C, D or G. Chromatic notes and piano keyboard on the right were added several decades later.

Wheatstone's concertina was hexagonal in shape and contained notes of the complete chromatic scale tuned in meantone temperament. The original soprano-size instrument was small, light, and easy to hold in playing. The concertina turned out to be a commercial success for the Wheatstone firm.

Wheatstone's Academic Position And Interest In Electricity

During the 1830s, Wheatstone's prestige as a scientist continued to rise with each publication of new papers on vibrations of plates and air columns. His work in acoustics finally led to his appointment in 1834 as Professor of Experimental Physics at King's College, London. While he did lecture on sound in his new post, his research now became more concerned with electricity and optics. Among his studies was the investigation of the possibility of transmitting sound by electricity. This led him to experiment with telegraphy as a means of communication. In 1837, Wheatstone and his colleague, William Cooke, received patents for a telegraph system that was widely used in Great Britain until about 1870.

Wheatstone's other inventions include the rheostat, the stereoscope, and an improved dynamo, but not the device know as the Wheatstone bridge, which is used to measure electrical resistance. Invented in 1833 by Samuel Christie, it was popularized by a paper Wheatstone published in 1843.

Wheatstone was knighted in 1868, one of the few great British scientists to receive such formal recognition. The French honored him several years later by his appointment as a Foreign Associate of the Paris Academy of Science.

Discovery Of The Doppler Effect

The modification of pitch known as the Doppler Effect caused by relative motion between the source and the receiver, was first described in a paper published in 1842 by Johann Christian Doppler (1803-1853). Doppler was an Austrian scientist who held various academic posts in Vienna and Prague as a professor of mathematics and physics. While his primary interests were in these fields, his studies of wave motion resulted in his enunciation of the Doppler principle of pitch alteration. Doppler pointed out that when either observer or the source or both are moving toward each other, the ears of the observer receive a larger number of sound waves per second, thereby producing a sound that is heard as a pitch of higher frequency. When the relative motion is in the opposite direction with either or both the source and the observer moving further away from each other, the apparent frequency is reduced and the observer hears the sound at a lower pitch. Doppler's paper provided detailed explanations and equations that took into account other factors that could influence the perceived as well as the calculated frequencies.

A spectacular demonstration to verify the Doppler effect was carried out in 1845 by the Dutch scientist, C.H.D. Buys Ballot. The experiment was conducted in the countryside along some railroad tracks, with the services of a group of trumpeters and a panel of trained musicians to judge the changes in pitch. In one group of tests, the trumpets were played from an open carriage pulled by a locomotive. The pitch changes were determined by observers at different locations along the tracks. Another group of tests was made with places reversed, the observers in the moving carriage and the trumpets stationary. The changes in pitch calculated with Doppler's equations for the speed of the locomotive matched the changes observed by the panel of musicians.

The extent of pitch alteration by the Doppler effect depends on how fast the distance between the source and the observer changes relative to the speed of sound. This change in frequency can be estimated by a simple mathematical approximations as follows: if o is the speed at which the distance between the observer and the source is changing and v is the velocity of sound, o/v = *the fractional change in frequency*. For example, if an observer on a railway platform hears the whistle of a train approaching at 45 miles per hour (66 feet per second), under typical conditions the fractional change in frequency is: $o/s = 66$ feet per second / 1127 feet per second $= 0.06 = 6\%$.

The sound at the observer would therefore be heard apparently a semitone higher than the sound at the locomotive. If the locomotive continued at the same speed without stopping while passing the observer, the sound of he whistle at the platform would drop abruptly to a semitone below the pitch at the source as the locomotive sped away.

Doppler stated that the effect of motion on other types of wave motion including light waves would also cause alterations in frequency in a similar manner. In the case of light, this is seen as a shift in spectral lines. For scientific purposes, the Doppler principles are more useful for estimating velocities and distance by spectral examination of lights from very distant astronomical bodies. A more recent application is in radar techniques which determine movement from changes in frequency of waves reflected from the moving target.

Seebeck's Measurements And Theory Of Inharmonicity

After his development of an improved siren for more accurate measurement of pitch frequencies and his investigation of pitch perception he reported in 1840 (June 1991 *Journal*, p. 38), A. Seebeck directed his attention to research on the vibrations of strings and bars and study of the partial structure of compound musical tones. The significance in practical music of his results for the vibrations of stiff strings remained unnoticed until about a century later.

Earlier, before the work of Daniel Bernoulli and Leonhard Euler during the second and third quarters of the 18th century, it was widely believed that the frequencies of overtones in musical sounds formed exact harmonic ratios. Bernoulli's studies of the oscillations of heavy cords, bars, rods and chimes indicated that they did not vibrate in harmonic segments. Reasoning from observations of node locations and by application of Hooke's law of elasticity, Bernoulli and Euler derived new theory and equations to explain the presence of inharmonic partials in sounds from elastic bars and rods.

Seebeck continued the research on inharmonic vibrations, conducting his studies on strings as well as bars and rods. In papers published in 1846 and 1849, he presented some of the first scientific determinations of inharmonic partial frequencies ever made and offered his theory and mathematical equations for calculating these frequencies. Seebeck had conducted experiments with strings hung vertically under the tension of suspended weights. The frequencies he had measured using his siren as a pitch standard were higher than the figures calculated with Taylor's formula for a perfectly flexible string. Seebeck believed that these differences resulted from the similarities in the physical characteristics of a stiff string with those of a long thin rod.

According to the theory advanced by Seebeck and now generally accepted, when a steel rod is struck, its inherent elasticity provides the restoring force that sets up the motions that result in sounds. In a stiff wire this effect also occurs and is added to the force of the string tension to cause a slight upward shift in vibration frequency. The partials of tones from rods and bars do not

vibrate in harmonic intervals, however, but are spaced further apart in wider ratios, the widths depending on whether the ends are free or clamped more or less firmly. Seebeck and others found that the difference between calculated harmonic frequencies and the observed frequencies of stiff strings varied as the square of the harmonic or mode number. With mode number as n, theoretical flexible string fundamental as f_0, frequency of the stiff string as f_n and J as a coefficient for the effect of stiffness, the above relationship can be shown approximately by the simplified formula:

$f_n = nf_0 (1 + Jn^2)$

The value of J derived from Seebeck's formula can be shown as:

$J = \Pi^3 d^4 Y/128 T L^2$

when d = string diameter, T = tension, L = length and Y = Young's modulus which represents the restoring force to due stiffness. The frequencies calculated by Seebeck with his formula were close to his measured experimental frequencies.

Modern formulas to show frequency deviation between harmonic and inharmonic partials as inharmonicity in cents, I, were published by Robert W. Young in 1958. With minor changes in terms, these are shown as: $I = B n^2$; $B = 1731 \Pi^2 d^2 Y/128 f^2 L^4 D$ where B is coefficient of inharmonicity, f is frequency of fundamental and D is the density of the steel in the string. Other more convenient formulas for B combine mathematical constants and the conversion factors for measurements in centimeters or inches. Modern studies have confirmed the validity of Seebeck's conclusions.

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October 11-13, 1991	**Texas State Association 1991 Seminar** The Crest Hotel, Austin, TX Contact: Mary Smith; 2002 Oxford Avenue; Austin, TX 78704 (512) 462-0212
October 17-20, 1991	**1991 New York State Conference** Sheraton Inn, Buffalo Airport Contact: Robert Tarbell; 358 Bedford Avenue; Buffalo, NY 14216 (716) 873-5465
November 8-10, 1991	**North Carolina PTG Conference** Adams Mark Hotel, Charlotte, NC Contact: Eugenia Carter; 4317 Commonwealth Avenue; Charlotte, NC 28205 (704) 568-1231
January 3-4, 1992	**Arizona State Seminar** Aztec Inn, Tucson, AZ Contact: Bob Anderson; 5027 E. Timrod Street; Tucson, AZ 84711 (602) 326-4048
February 21-23, 1992	**California State Convention** Red Lion Hotel, Ontario, CA Contact: John Voss; 2616 Mill Creek Road; Mentone, CA 92359 (714) 794-1559

Randy Potter School Purchases Aubrey Willis

As you may be aware, the Aubrey Willis School of Piano Tuning and Repairing ceased to exist September 21, 1990, when Career One, of Phoenix, Arizona, a licensee, went out of business.

Owners of the course Dave and Rose (Willis) Pennington asked us to consider taking over the license, to offer to "teach out" to stranded Aubrey Willis students, and to allow former Aubrey Willis students to transfer into our school as Continuing Education students. Many already have.

David Pennington, RTT, former President and Director of Instruction at Aubrey Willis, said "It was the best course in its day, but it has needed rewriting and updating for many years. When the Randy Potter course was published (in 1987) it was more complete and up-to-date than anything even my father-in-law had conceived of. They have become the industry leader in teaching piano technology. I have been recommending Randy's course for some time." Pennington, was trained by Aubrey Willis and is married to his daughter, Rose.

For more information, see the related News Release in the July 1991 Industry News section of the *Piano Technicians Journal*.

See us at the 34th Annual PTG Technical Institute, Philadelphia, PA, July 13-17 and the Arizona State Seminar, Tuscon, January 3-4, 1992.

Call or write:
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Randy Potter School
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AUXILIARY EXCHANGE

President's Message

One year ago, August 1990, my President's Message contained a plea to all PTGA members to forward any ideas to better our programs, for new projects or for membership boosting. I asked for "light bulbs" turning on in the world of the Guild Auxiliary. Perhaps some of you responded to other Auxiliary Board members, and I never heard your thoughts.

So much time and effort is devoted to gathering talented people together who are willing to pass on some of their knowledge and artistry, their creativity, to the Auxiliary members and their programs. Many of you who have positive, joyful recollections of our just past convention in Philadelphia must understand and appreciate part of this. Without cooperation, belief in what the Guild and the Auxiliary stand for, none of this would be possible.

Please keep us in your thoughts this year, and if a good idea useful for our continued improvement occurs to you or comes from other sources, let us know. Write or phone any Auxiliary Board member. We will listen. We promise!

Arlene M. Paetow, President

Introducing A New Editor!

It's always nice in a volunteer organization when volunteers step forward to do the work that needs to be done. Editing our Auxiliary Exchange column is an important job for our organization because the editor takes a pulse of what is happening to Auxiliary members around the country and channels that information to the rest of the membership. The editor provides the membership with organizational updates and other information that interests people in the Auxiliary.

In the recent past Marion Damon, Luellyn Preuitt, Ginger Bryant, Agnes Huether, and I have each taken turns at editing this column. If you would ask any one of us to describe the most difficult part of the job we would undoubtedly say stirring up contributions from the membership. Even though it is always possible to compile enough information to fill the column, it is always preferable to have lots of input from lots of people in various parts of the country.

Therefore, in this, my last column as editor, I'm going to leave you with some suggestions about the kinds of things an editor would like *you* to jot down and drop in the mail, but first I'd like to give a little introduction to our new editor, Jennifer Reiter.

Jennifer lives with her husband Mike, son David (10 1/2) and daughter Becky (9) in Spanaway, WA, a suburb of Tacoma. The first annual convention she participated in was our 1986 convention in Las Vegas. If you have strolled through the exhibit hall at recent conventions you may remember meeting Jennifer at the JM Fabrications booth. JM Fabrications is Jennifer's business which specializes in custom-made piano covers, shop aprons, and miscellaneous gift items.

Prior to our 1989 convention in Portland, Jennifer wrote articles for us about Portland and the northwestern United States. Jennifer's husband Mike is an RTT in the Puget Sound Chapter of the Guild. In their spare time they grow alfalfa hay and do other interesting things.

Jennifer's address is 902 185th Street Court East; Spanaway, WA 98387. Now in order for Jennifer to be able to keep a pulse on our organization, we in the organization are obliged to keep her informed. Here are some ideas for things you could write to her about:

1. What prompted you to join the Auxiliary?
2. How did you feel the first time you attended an annual convention or a regional seminar? Where was it held? Who did you meet there? What did you do?
3. What is something funny that has happened to you at a convention or other Auxiliary meeting?
4. How do you feel you are the same as other people you have met in the Auxiliary? How do you feel you are different?
5. What do you like best about conventions? About convention hotels?
6. What parts of spouses programs (either PTGA ones or ones in other groups) do you find most interesting?
7. Who is the person in the Guild who sponsored your membership in the Auxiliary? A husband? A wife? A daughter? A parent? A friend? Please tell us a little about that person.
8. How do you think our organization has changed over the years?
9. Are you interested in piano technology yourself? If so, do you plan to become a full-time technician or more of a part-time support technician?
10. What could the Auxiliary do to meet your needs better? How would you like to help facilitate your ideas?

Jennifer is the editor; she will be able to tie up any loose ends if you send her rough thoughts or ideas jotted down on a post card. Don't be held back because you don't fancy yourself to be a writer. The other members of the Auxiliary are interested in what you think. Jennifer will make sure your sentences are complete and your words are spelled correctly, but only you can have the original thought.

Honoring Virginia And Marion Seller

Most technicians and many of their family members have a commitment to music which goes beyond the idea that piano tuning and repair is just another way to make money. It is always gratifying when the commitment is recognized and honored by those around us. Members of Virginia and Marion Seller's church in St. Paul, MN, decided to honor the couple's commitment to music by naming their new music room the Seller Music Room. The Sellers have been members of their church since 1944, and were music directors there for several years. They still sing in the Senior Choir,

and Virginia continues to do choral work with young children in the church.

An article in the church bulletin at the time of the dedication noted that the Sellers' "faithful service to music for Olivet (Congregational Church) laid the foundation of our present commitment to offering the best we can to the worship of the Most High." Congratulations, Marion and Virginia! Virginia is a past president of the Piano Technicians Guild Auxiliary.

Now They Call It Networking

"Networking" is still a buzzword in many circles. It's supposed to designate a desirable way for people to keep in touch with each other. Most piano technicians have been networking as long as they have been tuning. We see lots of technical networking at conventions as they stand in hallways or sit in coffee shops discussing pianos. They share information. They learn new ideas for making them more effective in their jobs. They develop contacts and friendships which will be important to them for years to come.

In the same manner, technicians develop networking contacts with the customers they serve. Many technicians enjoy building rapport with customers they visit year after year. As a result of the contacts they have made they know people in the community who can help them with needs in a variety of areas.

Strategy Sessions Can Be Informal

Piano technicians engage in strategy sessions and board meetings. Although some technicians form corporations with employees and separate corporate headquarters premises, many technicians still prefer to conduct their businesses without a lot of fanfare. Instead of gathering the staff around a boardroom table for a 9 a.m. meeting with donuts and legal pads, many technicians conduct their strategy sessions less formally.

Often we are part of these sessions because we are the people who think enough of them and their work to have joined the Piano Technicians Guild Auxiliary. The session may take place in the car or at the kitchen sink or lying in bed, but it's still a valid strategy session if you are talking about the business and making decisions and plans.

Big and Glitzy Is Not Always Better

Perhaps you are the person who answers the phone and receives the calls urging you to invest in pagers and beepers. Perhaps you read the ads for office space and wonder if it is less "professional" to run your business from your home. Perhaps folks have urged you to expand, incorporate, and develop employee benefit packages. All those things are quite acceptable things to do, but none of them is necessary in order to run a profitable and successful piano tuning and repair service.

At a time when corporate America is experiencing a trend toward businesses which can be operated from the home and service businesses are experiencing a rate of growth and recovery which leads the field, it is certainly reasonable to capitalize on what you have got without changing it just to be big and glitzy. Although there are certainly always ways you can improve the way you do business, there is no reason to believe that you should institute major changes just so you can turn your piano service business into something it was never meant to be.

Why did I write an article like this for the Auxiliary? Maybe I wanted to be a little controversial in my last column as editor so I could stir up some reactions from you and give Jennifer some letters to the editor as she starts her term as editor. No, I think my need to say it's okay for small service businesses to be happy being small service businesses is a message that is properly aimed at the Auxiliary.

Most of us who are close to piano technicians have sensed a special attraction which draws them to their work. It's not as if they peruse the want ads and try to decide among being a wallpaper hanger, an office worker, or a piano technician. Most of them seem to be lured to the art/trade by a fascination for the work. Most of them bring a love of music to their profession. Some people feel they are following a dream — or at least an inspiration — when they pursue piano tuning.

Those of us in the Auxiliary watch them follow their inspiration. Many technicians set up small businesses, and small businesses are known to have a high failure rate, especially in their early years of operation. Many technicians just want to tune pianos and talk to customers without being bothered by paperwork, marketing, and taxes. This may become a source of frustration to us. We want them to follow their dreams, but not in a way that we have to subsidize them financially.

The balancing act, as I see it, involves being able to help the technician follow a dream of becoming a piano technician while at the same time helping the technician's business keep its feet on the ground as an efficiently-run, well-organized, targeted enterprise. When we start helping with that balancing act we may feel the way to go is to help the technician get outfitted with beepers and board rooms and a miniature corporate ladder with employees to climb it. I feel that approach could backfire on you and the technician. Piano service businesses don't usually mix well with delusions of corporate grandeur. Let's be sure we can appreciate our businesses for what they are and in that context make them the best they can possibly be.

Thanks for all you do to support and encourage your piano technician in particular, and all technicians in general. If you are not yet a member of the Auxiliary, but you have decided you would like to show your appreciation of piano technicians and the Piano Technicians Guild, then you should join today.

Julie Berry, retiring editor

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1890s VINTAGE Decker Brothers 7' rosewood grand piano. Ornate carved case and legs, reconditioned soundboard, plate refinished, restrung, new pinblock. Appraised on East Coast for insurance purposes at $18,500. Pictures available. For information or any offers, contact **Peter Remnf (916) 587-5095.**

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Wanted

WANTED: STEINWAY AND MASON HAMLIN GRANDS. All sizes and cabinet styles. **Ask for Karen Bean at (415) 676-3355. Piano Finders; 1073 A Shary Circle; Concord, CA 94518.**

POSITION: KEYBOARD TECHNICIAN/INSTRUMENT REPAIR. Description: (1) Tuning, maintenance, repair of pianos, organs and harpsichords, (2) General repair and maintenance of wind, percussion and string instruments, (3) Instrument inventory. Qualifications: Documented experience and/or proof of quality work. Salary: Commensurate with qualifications and experience. Excellent benefits. Twelve-month contract. Position available: August 15, 1991. Screening of materials will begin immediately and continue until the position is filled. Applications: Interested persons should apply to: **Lawrence R. Mallet, Chair; Department of Music; Doyle Fine Arts Center; Murray State University; Murray, Kentucky 42071.** Applications should include: (1) letter of application, (2) resume, (3) transcripts/certificates, (4) three current letters of recommendation, and (5) supportive materials of the applicants choice. Murray State University is an EO/AA Employer.

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

"I will pay from $100.00 to $5,000.00 finders fee for the following pianos and related items: A. Steinway Ex Duo-Art player, art carved case; B. Mason & Hamlin Ex Duo-Art player in any case; C. Art carved case of Mason & Hamlin, Chickering or Knabe, player or regular grands; D. Ampico or Duo-Art player mechanism or parts; E. Ampico or Duo-Art player rolls; **Please call Jim Brady COLLECT (317) 259-4307."**

MASTER PIANO TECHNICIAN POSITION AVAILABLE. Responsible for final preparation of grand pianos to concert quality levels in a production environment. Must have concert quality action and tone regulating skills. Only applicants with concert experience need apply. Send resume to: **Mason & Hamlin; 35 Duncan Street; Haverhill, MA 01830 Attention: Peter Mohr**

WANTED: Still looking for Steinway player grand in fancy case (prefer unrestored). Also need large Mason & Hamlin player grand with or without player parts, (prefer fancy case). Will also consider Knabe or Chickering. Reward for successful leads. **Bill Kavouras; 2740 Lighthouse Ct.; Lynwood, IL 60411 (708) 474-8787**

EXTRA! EXTRA!

Yamaha Piano Service Gazette

Yamaha Piano Service August, 1991

The Yamaha C6F Grand Piano

A visit to your authorized Yamaha piano dealer in the next few weeks will hold a pleasant surprise. It's the new Yamaha Conservatory Series grand piano, the C6F. ◇ You will be impressed at this piano's exceptional resonance and projection, which stems from a new Yamaha scale design. ◇ Designed to fit between the very popular C5F and the C7FII, the 6′11″ C6F grand piano has been anxiously awaited by artists, institutions, recording studios and home musicians. This outstanding piano will be an ideal instrument for both rehearsal or performance use.

◇ The C6F has all of the traditional Yamaha quality features you are accustomed to. In addition, other refinements include a precision plate mounting system, a boxwood capped treble bridge, a mortised pinblock and redesigned hammers for better overall tone and a wider range of voicing capabilities. ◇ Finish choices for the C6F include satin ebony and polished ebony. Other finishes which can be special ordered are satin American walnut, polished white, polished walnut and polished ivory. Like all Yamaha pianos, the C6F is seasoned for destination. ◇ The piano offers more options for the performer, too. The music desk now has five steps instead of three, and a lid prop that allows for three different lid positions. Of special note is the soft-close fallboard. Because the fallboard now glides gently to a close, it can no longer fall shut on the unsuspecting fingers of performers and technicians. ◇ See the Yamaha C6F grand piano at your local authorized Yamaha piano dealer.

SERVICE: (800) 854-1569 PARTS: (800) 521-9477 FAX: (714) 527-5782

YAMAHA

Tech Gazette

Yamaha Piano Service August, 1991

Parts, Etc.

BASS STRINGS

Here at Yamaha, we're always looking at ways to improve our technical support services. The latest item to come under our own critical scrutiny is our supply of bass strings.

For a number of years, we've tried to maintain adequate stocks of bass strings for virtually all the pianos we've built. The idea seemed like a good one. And for the most part, it worked fairly well.

There were some drawbacks, however. Try as we might, we weren't always successful in fending off the attacks of time and moisture. The result was that in a very few instances, we sent replacement strings to you that weren't as shiny and new as our standards dictated.

Another problem, also time related, was the delay involved in having many of the strings shipped from our factory. And as we all know, when you need a new bass string, you need it now.

So, we decided to turn to the resources already available to all of us, the major string makers in this country. With the capable assistance and cooperation on the part of these string makers, we've developed a way for the technician in the field to obtain factory-fresh bass strings, both for Yamaha and Everett pianos.

Basically, here's how it works: If the piano in question is less than 10 years old, and you need bass strings for it (either individual strings or complete sets), call our Parts Department. We will gladly fill your order. On the other hand, if the piano is more than 10 years old, simply deal directly with the string maker of your choice, just like you always have.

Be sure to have the model and serial number of the piano, along with the string number (count the tuning pins from the #1 bass note). In short order, you'll have a nice, new bass string that will fit right and sound good.

Needless to say, we're excited about this new development, aimed toward providing you, the working technician, with better products and services. The suppliers involved in this effort are:

String Suppliers

Schaff Piano Supply Co.
451 Oakwood Road
Lake Zurich, IL 60047-1516
(800) 747-4266 or
(708) 438-4556

Pacific Piano Supply Co.
11323 Vanowen
North Hollywood, CA 91605
(818) 769-2490

Mapes Piano String Co.
408 N. Pine St.
Elizabethton, TN 37643
(615) 543-3195

Yamaha will Participate in

DISKLAVIER™ SERVICE SEMINARS:
September 16 - 20
October 28 - November 1
November 18 - 22

PTG CONVENTIONS:
Ohio State, Columbus, OH
October 3 - 6
New York State, Buffalo, NY
October 17 - 20
North Carolina State,
Charlotte, NC
November 8 - 10

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YAMAHA®

AUGUST **UPDATE** 1991

Published Monthly For Members Of The Piano Technicians Guild, Inc.

Schroeder And The National Piano Foundation Team Up To Celebrate The Piano

Schroeder, the most musically gifted of all of Charles Schulz' Peanuts characters, has delighted fans for decades with his impassioned piano playing. Now, Schroeder joins forces with the National Piano Foundation to spread the word to other kids that piano playing is fun.

During the month of September, Schroeder and the National Piano Foundation will celebrate National Piano Month with a variety of events and activities that encourage children to explore music participation. Schroeder also will address parents with a message about the developmental benefits of playing piano, such as increased self-confidence, coordination and concentration.

To further promote National Piano Month, Schroeder will star in a video public service announcement with successful individuals who excel in different areas, but also enjoy playing the piano. Oscar-winning actor Jack Lemmon, basketball star David Robinson, football's Marcus Allen, Daily Variety's Army Archerd, political pundit William F. Buckley, Jr. and Senator Richard Lugar are among those scheduled to appear in the video. The video will illustrate how many people from all walks of life enjoy making their own music.

The nonprofit National Piano Foundation wants to make sure that the piano continues as a great form of family entertainment, despite competition from television, computers and video games.

Launched in seven newspapers on October 2, 1959, "Peanuts" is the most widely syndicated comic strip, reaching more than 200 million fans in 2,300 newspapers in 68 countries. Peanuts is syndicated by United Feature Syndicate, a division of United Media, a Scripps Howard company.

For a free brochure entitled "Make A Home With Music," send a self-addressed, stamped envelope to the National Piano Foundation at 4020 McEwen, Suite 105, Dallas, Texas 75244-5019.

June 1991 Membership Status By Region

Northeast Region	847
Northeast RTTs	532
Southeast Region	620
Southeast RTTs	388
South Central Region	318
South Central RTTs	209
Central East Region	638
Central East RTTs	397
Central West Region	378
Central West RTTs	250
Western Region	611
Western RTTs	392
Pacific NW Region	368
Pacific NW RTTs	232
Total Membership	3780
Total RTTs	2400

Focus On Ethics: A Little Off The Top

Colette Collier
Washington, D.C. Chapter

What do you do for a living? Even though there are many facets of piano technology available to us, we must be aware that sometimes those facets can be in conflict, and it will help resolve those issues if we have established a clear order of priorities. Once, on a Caribbean cruise, I had an experience that has affected my business ever since. We were visiting a new island every day, and each evening the cruise director would hold a lecture and information session on the island we would see next. Each lecture was full of advice: where to go, where to shop, and where to find good bargains. Of course, the next day, we would often visit the places he had suggested.

On one such day we were a little later than usual getting back to the ship. From the back of a store, we saw Tony, the cruise director, come into the shop and have a conversation with the person behind the counter. She opened the cash register and handed him some money. It was then we realized that he was making commissions on the business generated by his "informative" lectures! This is "standard practice" on many cruise ships, and to the store, it was business as usual, but I felt cheated. I had trusted this person, paid by the cruise line through us and our tickets, to be giving advice based on our best interests, and not influenced by any other factors.

We stopped listening to Tony after that. His advice did not have the same ring of authority, and he cheapened his reputation with us. He kept his commissions a secret from the passengers, who probably wouldn't have bought as much from those shops had they known his advice was tainted.

Are you primarily a technician? Do you always keep the best interests of your client in mind? Commissions are payment for sales — are your customers really dealing with a salesman, though they think they are dealing with a technical expert?

In Respectful Memory ...

E. Vann Grimley

E. Vann Grimley, 89, of the Midland, MI, Chapter, died Sunday, May 19, 1991, at the Isabella County Medical Care Facility in Mt. Pleasant.

Mr. Grimley was born December 4, 1901, in St. Charles, the son of Ray and Anna (Polauge) Grimley. He married Madolyn Brink in December 1920. She preceded him in death in 1955. Then he married Arlene Marks in June 1956.

Mr. Grimley was a life member of the Seventh Day Adventist Church in Mt. Pleasant. He lived in Mt. Pleasant since 1938.

He spent most of his life in automotive work. He was employed by Battle Motor Sales from 1940 until 1958.

He then was the auditorium manager and piano technician for Central Michigan University from 1959 until 1973.

He was a member of the Mt. Pleasant Kiwanis Club since 1953, and a member of the Piano Technicians Guild since 1959.

He is survived by his wife, Arlene of Mt. Pleasant; three children, Robert of Mt. Pleasant, Mary Ann Baldridge of Greenville and Donald and his wife Lena of St. Charles; nine grandchildren, 14 great-grandchildren, three step-grandchildren; four great-great-grandchildren; and two step-great-grandchildren.

Dates & Deadlines

August 17, 1991
RTT Tuning and Technical Exams. Northern California Exam Board. Application deadline: July 17th, 1991. Contact: Neil Panton, 5 Cedar Court, Menlo Park, CA 95025 (415) 854-8038

October 11-13, 1991
RTT Tuning and Technical Exams. Texas State Seminar. Austin, TX, Chapter Test Center. Application deadline: September 11, 1991. Contact: Bill Cory, 711 Landon Lane, Austin, TX 78705. (512) 472-9358

RTT Tuning and Technical Exams. Dallas Chapter Test Center. Contact: for tuning, Walter Connell (214) 942-2827; for technical, Will Nieberding (214) 247-4048.

Movie Night At Your Chapter Meeting

Randy Potter
Chair, Chapter Program Development Committee

It's the regular meeting night of your local chapter, but tonight is different. Tonight is "Movie Night."

Your chapter vice president has been planning this for a couple of months, and, along with the recommendations provided by the Chapter Program Development Committee's Media Evaluation Forms and the Home Office staff, he has selected several movies or videos that are of particular interest to chapter members.

Ordering them was easy, he found, because all he had to do was call the Home Office and place his order. (In fact, he had also learned, when he needed a technical to fill in for an instructor who could not make it, that he could call and get one on the way *tout de suite* (fast), because the Home Office staff is willing to help in any way possible.) Making the deposit on the films, and paying the (small) $5 rental fee, was also easy. He just gave them his VISA or Mastercard number over the phone.

You see, this was not the first time the chapter had used the Steven B. Jellen Memorial Film Library. They knew, for example, that when they wanted to see a film it was easy to borrow a 16mm projector from one of the local schools, the library or a local church. A light-colored wall works fine as a screen, if none is available. And they also knew that since most everyone has a VCR these days, chapter members were more than willing to bring them to the meeting along with a color TV. By adding a simple splitter, available from any Radio Shack for about $3.99, and a second video cable, two TVs can be set up. Wow! Two George Defebaughs or LaRoy Edwards in the same room.

Most programs like this draw a good crowd, and for several reasons. Most technicians who have been around a long time have often wondered what was in those movies and videos in PTG's film library. And the newer members, why they are usually so hungry to get technical information, they will come to any meeting (bless them). Most members know that the film library (which includes many videos as well) is available for chapter use, rather than for individuals to check out from. Along with the fact that there are multiple copies of some titles, there are always good selections available when needed.

If you have not had a movie night recently, or ever, give it a try. Many large chapters have what they may feel is an excess of teaching talent available. But even they usually do not have factories close enough to visit, nor are most of the instructors you see in these movies available to come to your individual chapter meetings. Some have passed on, and are either too expensive or too busy.

How about a Factory Tour Movie Night, where you could show several factory movies. "Hands Of The Masters" (Baldwin, 16mm, 30 minutes), "88 Keys To A Musical World" (Kimball's older factory tour 16mm, 12 minutes), "Pianorama" (Wurlitzer's older factory 16mm, 30 minutes), Bösendorfer's "Vienna, Joy, Music" (VHS), "Kimball Technical Video" (VHS, 30 minutes), "Pianorama Wurlitzer Factory Tour" (VHS, Holly Springs Plant), "Piano Construction The Yamaha Way" (16mm and VHS) and "Invitation To A Grand" (Yamaha, 16mm and VHS, 30 minutes). That is more than you can see in a normal 1 1/2-hour technical session, so why not decide on 16 mm movies this month, then the VHS movies next month, or a few months from now?

Another option might be Grand Regulating Movie Night. Try Ernie Juhn's "Grand Action Regulation From A To Z" (VHS, 40 minutes), or Yamaha's "Grand Regulation In 37 Steps" by LaRoy Edwards (VHS), or "Aftertouch: The Secret Of Ultimate Piano Performance."

There are, of course, interesting and informative programs on other subjects. The American Felt Company's "The Miracle Of Felt" (16mm, 25 minutes) tells the story of how felt was developed (by a Catholic priest on a

Continued on page 4

Movie Night...

trip) in story form, then takes you into a factory to watch felt being processed into products. Dampp-Chaser's "Humidity Control And The Complete Piano Technician" (VHS, 26 minutes) is an installation instruction guide for piano technicians. Bill Smith's "Ivory" (VHS, 75 minutes) is probably the most complete guide to ivory history, care and repair ever produced, and includes information on other types of keytops as well. "The Balance Sheet Barrier: Business Finance For Non-Specialists" (16mm, 31 minutes) teaches those without business degrees where money comes from, and where it goes, in an easy to understand way, "The Time Of Your Life" (16mm, 30 minutes), by Alan Lakein with James Whitmore, teaches how to prioritize life and work projects, work smarter and gain control of your life, and goes along with Lakein's book by the same name. Additional technicals subjects include action repairs and restoration, bridge repairs, wood, stress problems in pianos, and others. Business offerings include handling customer complaints, piano class demonstrations and, last but not least, the PTG video "The Unseen Artist" (VHS, English or French). Of course, you should not need to borrow this one from PTG, because everyone in your chapter who services pianos probably carries it in their tool kit to show to clients.

After selecting one or more films/videos to show at your technical, the easiest part of planning the night just might be deciding whether you are going to buy big bags of popcorn at the 7-11 on your way to the meeting, or whether you will bring an air popper, popcorn, butter, and salt. Ooops, forgot the bowls, napkins and sodas. Coke, Pepsi or RC?