

# Voyageur Harp



**Musicmaker's Kits**

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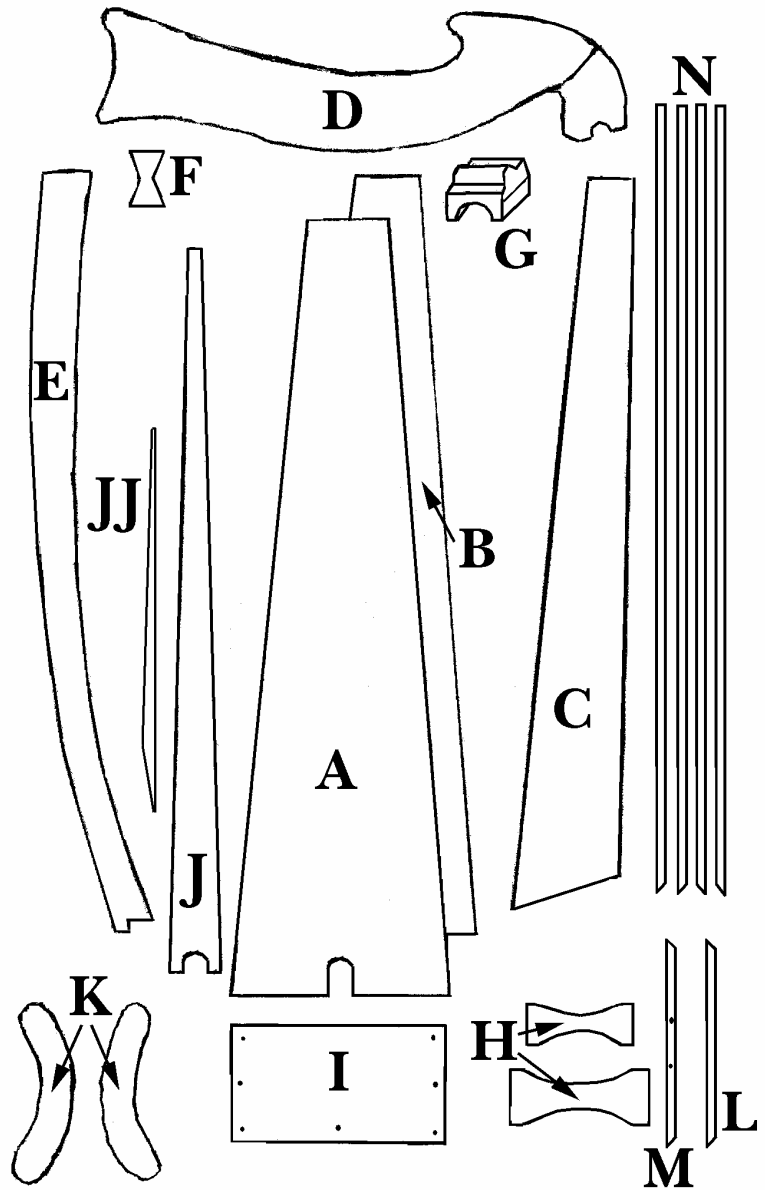
# Voyageur Harp

## WOOD PARTS:

- A - 1 soundboard, aircraft birch
- B - 1 back panel, plywood
- C - 2 sides, solid cherry
- D - 1 pre-drilled neck, solid cherry
- E - 1 pillar, solid cherry
- F - 1 Butterfly key (joint reinforcement)
- G - 1 top block, walnut
- H - 2 inner braces, hardwood
- I - 1 base, hardwood
- J - 1 inner reinforcement bar
- JJ - stiffener brace
- K - 2 feet, solid walnut
- L - 1 short trim strip, back
- M - 1 short trim strip, front (drilled)
- N - 4 long trim strips, sides

## HARDWARE:

- 33 threaded black tuning pins
- 1 Brass driver for tuning pins
- 33 brass eyelets, medium
- 33 threaded guide pins
- 2 wood screws, 1" drywall
- 11 wood screws, 1-5/8" drywall
- 2 wood plugs, 3/8" dia
- 2 drill bits, 1/8" & 7/64"
- 2 oz wire nails, 3/4" X 18
- 2 dowels for neck/pillar joint, 1/2" X 2"
- 1 small dowel pin, 3/8" X 1-1/2"
- 1 scrap soundboard piece
- 4 round felt pads for feet
- 1 tuning wrench
- 1 set of 33 harp strings  
(with 21 plastic beads)
- 1 assembly instructions



### **BEFORE YOU BEGIN**

Please take the time to check over the parts of our kit now, to make sure everything is there. If you discover a problem, call us right away so we can rectify it quickly without causing you much delay in your project. We also suggest skimming through the entire directions before beginning, just to get an overview of the project. You may decide that you need to gather more tools or purchase a few optional decorations or accessories to enhance the finished instrument. Now is a good time to decide so you can avoid delays when you reach those steps of construction.

### A NOTE ABOUT GLUE

**DO NOT ASSEMBLE THIS PROJECT WITH CHEAP EPOXY, SUPERGLUE, OR HOT MELT GLUE!**

Find a good woodworking glue. Many luthiers (guitar & violin makers) still use the natural hide glues that have been around for centuries, carrying on a fine old tradition, but that does not mean that you should do the same. Animal glues require lots of experience for successful use. **WE BUILD THIS INSTRUMENT WITH MODERN WOODWORKING ADHESIVE, SUCH AS ELMER'S CARPENTER'S WOOD GLUE OR TITEBOND (yellow aliphatic resins), because they hold the parts even more securely than the old hide glues. The few advantages that some people claim with hide glue are more than offset by the strength, durability, ease of application, and availability of the modern woodworking adhesives.**

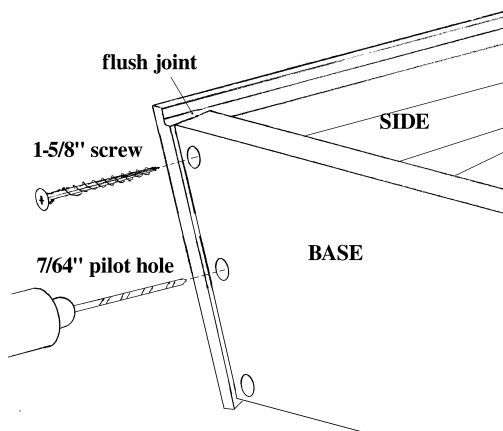
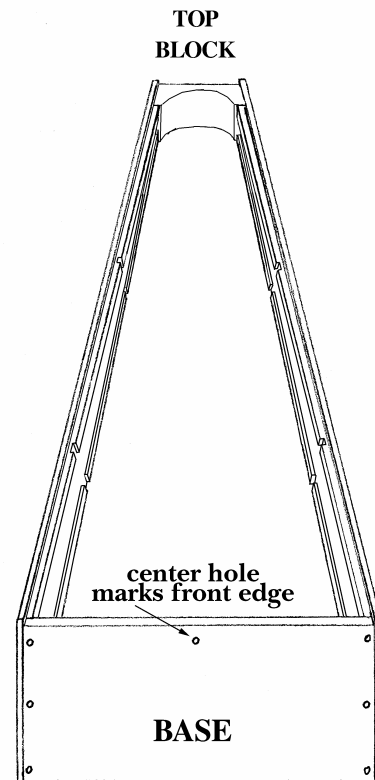
When gluing parts together, be sure to put enough glue on the joint to wet the entire surfaces to be joined. A good sign of proper gluing is that a little excess will squeeze out around the joint when clamping pressure is applied. Too little glue may cause the parts to separate later, whereas too much glue makes things messy. We always keep a damp rag handy for quick cleanup, as necessary. It is especially helpful to keep your fingers clean while gluing, because gluey fingerprints have the embarrassing tendency to appear on the finished product in places you never expected. Most woodworking adhesives "set" sufficiently after 30 minutes of clamping to allow you to proceed. Check your dispenser for recommended drying times.

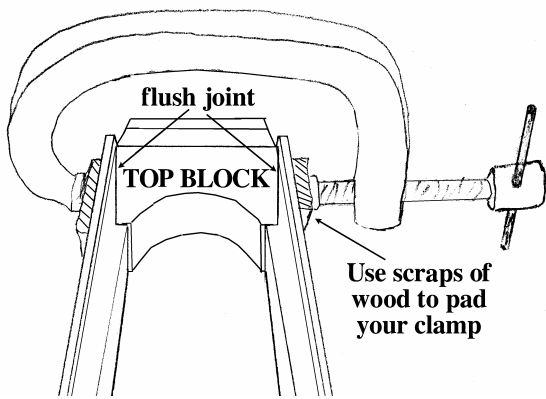
### THE SOUNDCHAMBER FRAME

\_\_\_ 1. Check all parts of your kit against the parts list. Note that we have written the letter "F" on certain pieces to indicate "front".

\_\_\_ 2. Find the two SIDES, the BASE, and the TOP BLOCK for the soundchamber frame. Hold them together dry to check the fit of each joint. These parts will only fit properly one way!

\_\_\_ 3. This illustration shows the parts arranged with the front facing up, but you may want to turn them all over to make it easier to assemble them. Drill pilot holes for wood screws at each end of the BASE, as follows: Hold the BASE in position at the bottom of the SIDE pieces with all edges flush and tight. Drill through the BASE into the SIDE pieces with a 7/64" bit.

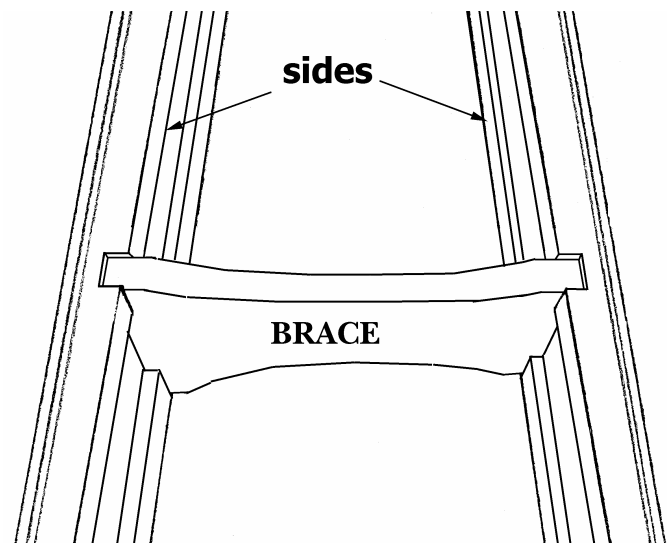




\_\_\_ 4. When ready to assemble the frame, apply glue to the joints at the **BASE** first, holding the pieces together while you insert the screws to draw the **SIDES** tightly onto the **BASE**.

\_\_\_ 5. Test fit the **TOP BLOCK** between the **SIDES** at the other end of the frame. It can only fit one way! Apply glue to the contacting surfaces, place the parts together and clamp them, making sure all edges are flush.

\_\_\_ 6. Find and check the fit of the two inner **BRACES**. They will fit only one direction - look for the letter "B" on one corner marking the back of the harp. The braces do not need to make contact with



the front or back panels. We deliberately trim them a little narrower than the sides, so you should have a little gap at the front and back, as shown.

**NOTE**

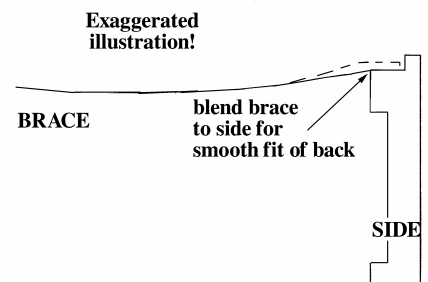
Sometimes the **BRACES** do not fit perfectly between the **SIDES**. This could be caused by sloppy cutting on our part, but more likely the **SIDES** may have bowed a little on their own. We recommend checking the **SIDES** with a straight-edge and fitting the **BRACES** so as to push or pull the **SIDES** into alignment As you glue them. If a **BRACE** is too short, you may shim it with a scrap of thin wood. If too long, use a disk sander to remove a small amount of material without changing the angle or rounding the end.

When satisfied with the fit of each **BRACE**, glue them in place and apply pressure (clamps or tape) to pull the **SIDES** together against the **BRACES** until dry.

\_\_\_ 7. Be sure to clean up excess glue drips that might interfere with installation of the front or back panels.

**THE BACK**

\_\_\_ 8. Check over the back edges of the harp frame. If any of the **BRACES** stand above the ledge on the **SIDES**, sand the excess material down flush with the ledge.



\_\_\_9. Test fit the BACK panel to the frame. It should seat into the ledges of each SIDE. Our parts are often generously sized. You will have excess plywood extending beyond the TOP BLOCK and BASE of the frame which must be sanded flush later.

If necessary, you may sand or plane along the edges of the BACK to adjust the fit against the SIDES. We use a hand plane to accomplish such fitting. No need for perfection, as slight gaps will be covered over later when you add TRIM PIECES. It would be nice to get a tight fit at the top, though, because a gap there will show at the end.

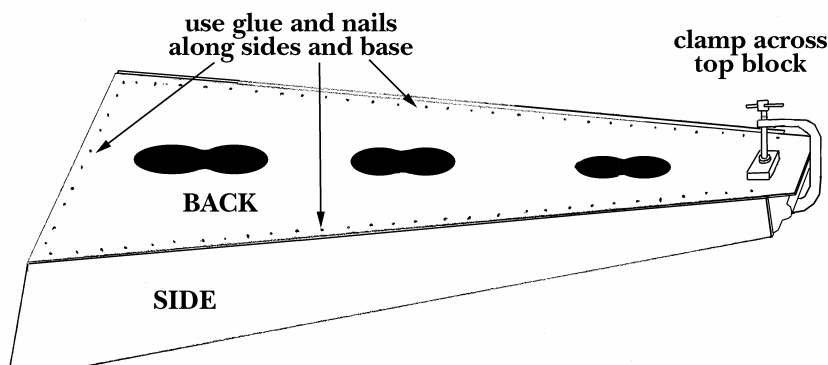
**HINT:** It would save you time and effort to trace and trim off the majority of the excess overhang at each end of the BACK before installing it. Leave just enough excess that will be easy to sand off later.

\_\_\_10. Clean off all sawdust from the frame and the back panel before gluing.

#### GOOD SUGGESTION

Every time you do some gluing on your project, we advise having a clean damp rag handy for cleaning up excess glue that squeezes out of the joints. Keep your fingers clean too. Rinse the rag frequently to avoid spreading glue around as you wipe. Make sure all glue residue is removed. This will help save you lots of time toward the end of this project when you are preparing to apply the finish.

Apply a thick bead of glue to the backside of the entire frame where it contacts the BACK panel, including the BRACES, TOP BLOCK, and BASE.



Place the BACK in position with one clamp at the TOP BLOCK to prevent it from sliding downward on the frame. Make sure the panel fits into the ledges of each side.

Tack the plywood BACK to the frame using the nails provided. If you have a power tacker or stapler, that will be fine too. Place the nails about 1" apart

and about 1/2" from the outside edge of the harp frame. This hardware will be covered over later by the TRIM STRIPS which are about 3/4" wide. Do not place tacks across the top of the harp where they would show on the finished instrument.

**GO EASY WITH YOUR HAMMER!  
TRY NOT TO DENT THE SIDES OF THE HARP.**

Try to work quickly, before the glue becomes too thick.

#### POINT OF INTEREST

We use nails here because most people do not have enough clamps to hold the entire BACK in place at once. The nails do a nice job of holding the parts together until the glue dries. If you prefer to clamp the BACK in place, you may do so, as there is not much stress on this part of the instrument. You would, however, need a good number of clamps to span the entire perimeter of the harp at one time.

Clean off excess glue with your damp rags right away, making a thorough job of it.

## THE SOUNDBOARD

### POINT OF INTEREST

Many people ask why we use *laminated* wood instead of solid for the soundboard. The reason is that we get much more strength from laminated material than from solid, and virtually no breakage. The superior strength of this material allows us to use a thinner soundboard than if we were to use solid wood, so we also get better sound with a laminated front than we would with a solid front.

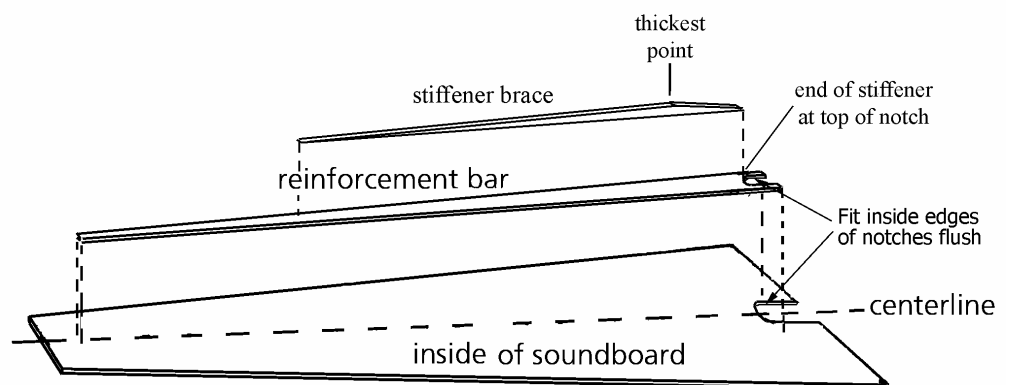
Some people ask if they can customize this project with a solid wood soundboard of their own making, such as solid spruce. To do that successfully, you'd have to alter the way the pillar attaches to the bottom of the harp, so as to avoid cutting a notch in the soundboard. Any hole in a solid wood soundboard would weaken the front panel so that it will break under the 1,000 pounds of string tension. We recommend consulting the book Folk Harp Design and Construction, by Jerry Brown, if you want to experiment with the way this harp is built.

\_\_\_11. Find the **SOUNDBOARD** and note which face has the punch-marks down the center. Put the **SOUNDBOARD** on your table with those punch-marks facing down, so the **inside of the panel is facing up** (if you like the plain face better, you may drill through at each punch mark and reverse the board). Draw a centerline down the length of the **SOUNDBOARD**, on the **inside face only**.

\_\_\_12. Orient the **INNER REINFORCEMENT BAR** and **STIFFENER BRACE** as shown on the centerline of the soundboard. Note that these parts should fit flush with the "notch" at the bottom, reinforcing the corners of that hole. Trace around these pieces so you can make sure they do not drift out of alignment as you glue them.

Glue the **REINFORCEMENT BAR** first so the notches line up, and the narrow top end is centered. Note that this piece is tapered as it proceeds up the harp. Use weights and/or clamps to hold it while the glue sets.

Then glue the **STIFFENER BRACE** on top of the **REINFORCEMENT BAR**. Note that the thickest point of this part should be oriented near the bottom of the soundboard.



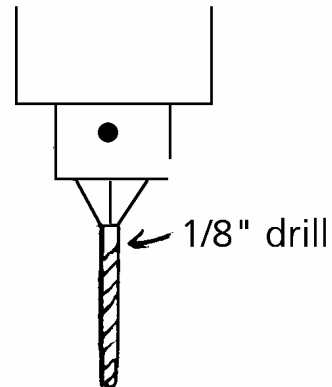
**IMPORTANT:** Make sure the parts do not slide out of alignment under pressure. This would be a good time to sign and date your harp, on the inside of the **SOUNDBOARD**, where it can be seen through one of the access holes in the **BACK**.

### POINT OF INTEREST

Some people ask about finishing the inside of the soundchamber. We do not recommend it. Guitars and violins are not finished on the inside, so this instrument need not be sealed on the inside either. We understand the concern about the effects of humidity on the wood, but this instrument box is glued firmly all around, so there is no chance of warping from humidity. Besides, varnish cannot seal the wood from humidity (water vapor). It can only prevent liquids from soaking in, and even then only for a limited time.

\_\_\_13. Turn the **SOUNDBOARD** over and note the punch marks along the centerline. Use the 1/8" drill bit provided to bore these 33 holes through all the layers of wood in the **SOUNDBOARD** assembly.

NOTE: These holes should be vertical (perpendicular to the soundboard)

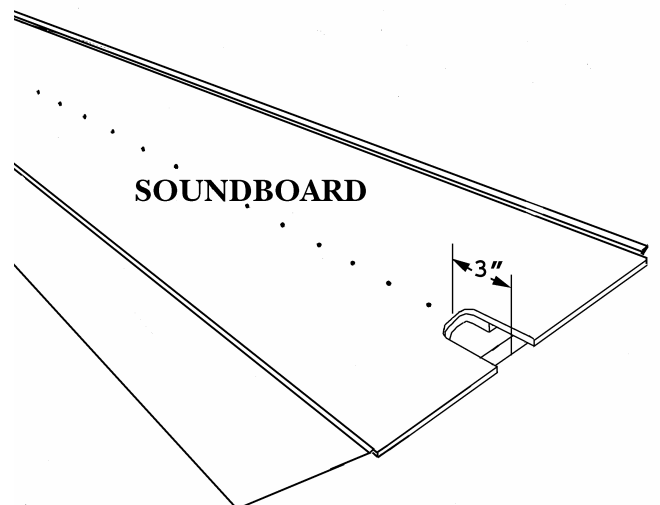


### INSTALLING THE SOUNDBOARD

\_\_\_15. Test fit the **SOUNDBOARD** to the front of the frame so the **NOTCH** at the bottom extends at least 3" above the bottom of the **BASE**, as shown.

You may need to shave a little off each side of the **SOUNDBOARD** to make this piece fit further up into the ledges of the **SIDES**. We use a small hand plane for this fitting. You don't need a perfect fit along the sides, however. Slight gaps will be covered over later when you add the **TRIM STRIPS**, but we recommend trying to get a tight fit at the top of the frame, as a gap there will show at the end.

To save time later, trace & trim off the excess at each end before installing the **SOUNDBOARD**.



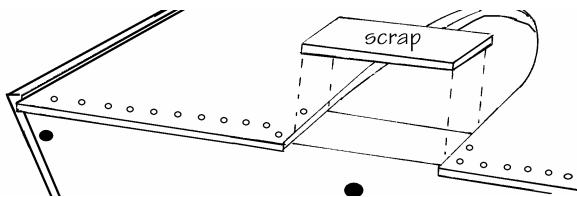
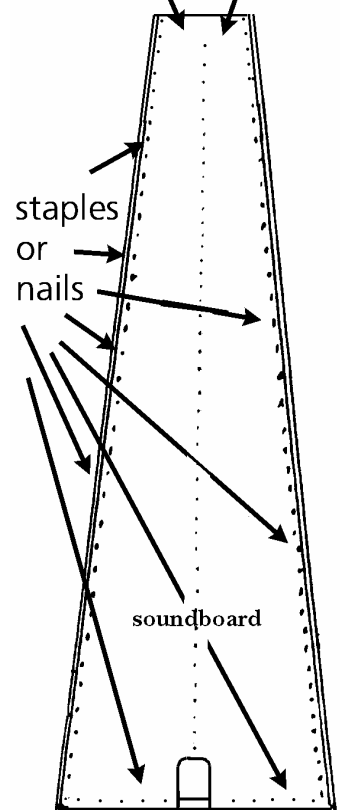
\_\_\_15. Apply a thick bead of glue around the four edges of the frame that will contact the soundboard. Quickly place the **SOUNDBOARD** in position and nail it in place along the bottom and sides, just as you did the **BACK** panel, using clamps at the **TOP BLOCK**.

Clean off excess glue with your damp rags right away, making a thorough job of it.

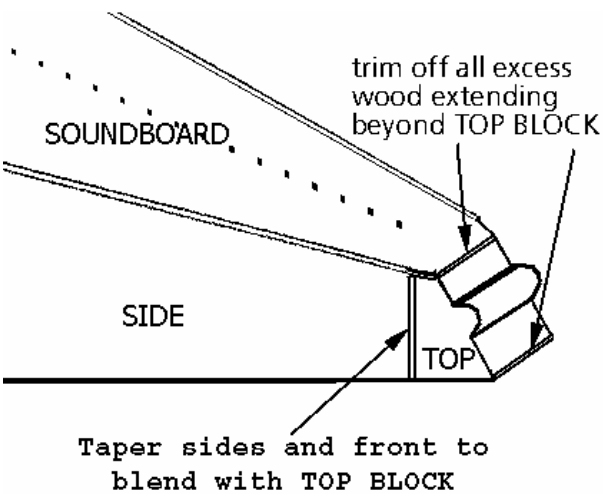
**CAUTION: BE SURE TO USE NAILS OR STAPLES FOR ADDED SECURITY.**

Some woodworkers ask if they can simply clamp the soundboard in place, but we have found that mechanical fasteners, such as nails, staples, or screws, are necessary to avoid having the strings gradually pull the **SOUNDBOARD** off the frame. Yes, most glues are stronger than the wood itself, but we have found that high humidity can cause even the best glues to soften enough to allow the parts to creep slowly out of position under the high tension of the strings. If you omit the nails, don't complain to us if the **SOUNDBOARD** comes loose!

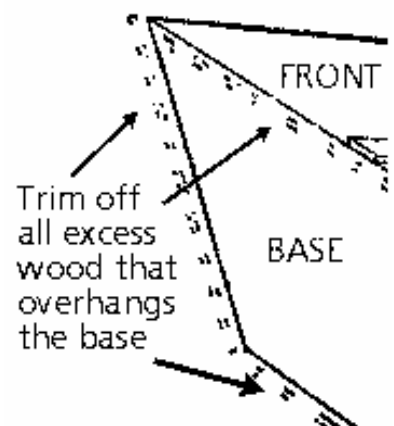
Use clamps instead of nails across the top



\_\_\_16. Add a scrap of soundboard material across the gap in the **BASE** that is exposed in the notch, as shown. Glue and nail it in place.



\_\_\_17. When the glue is dry, sand off all excess wood that hangs over the top and bottom of the harp. THIS IS IMPORTANT to ensure that the **FEET** will fit flat against the **BASE**. Take the time to do a nice job with this. An electric hand sander with 80 grit paper does this job quickly, but you can do it by hand with coarse sandpaper wrapped around a scrap 2 X 4 block of wood.



## ADDING TRIM STRIPS

\_\_\_18. Check to see if any nail heads along the **SOUNDBOARD** or **BACK** panel are raised up above the surface of the wood. If so, tap them deeper with a nail set and hammer.

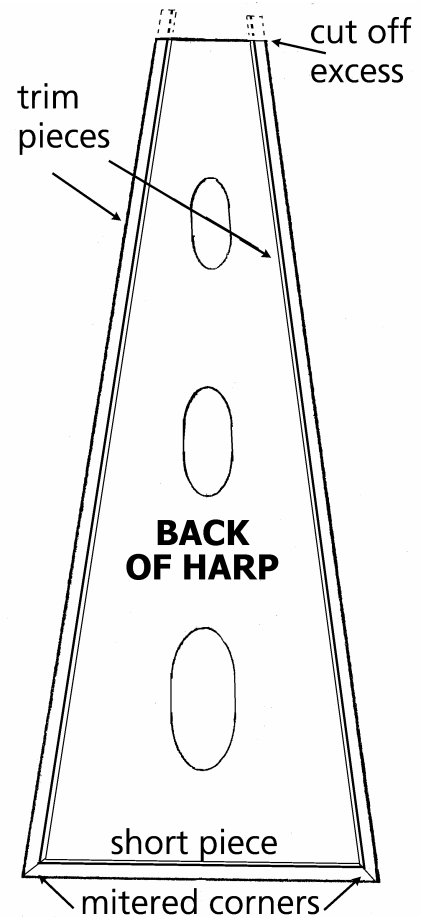
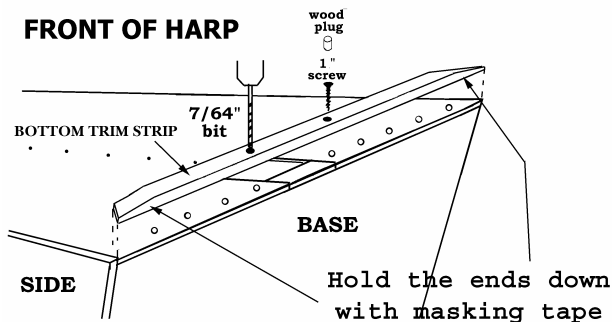
\_\_\_19. Note that the **TRIM STRIPS** have an angle cut at one end. Take care to orient them correctly so the miters fit nicely at the bottom corners.

\_\_\_20. Begin with the back of the instrument.

- Use masking tape to hold the pieces in place **WITHOUT GLUE** on the frame of the harp, flush with the outer edge, until you are happy with how they all fit together.
- Trace and trim the excess length of the side trim pieces.
- When satisfied with the fit, remove one piece at a time, apply glue to the underside, and then install it again permanently, using masking tape to hold it in position.
- Proceed the same way with the other two trim strips.
- Allow at least an hour for drying before you turn the body over and install trim on the front.

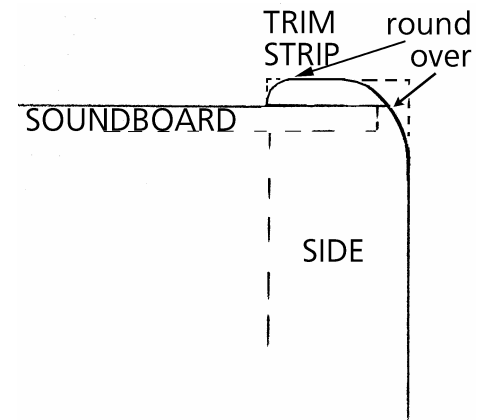
\_\_\_21. On the front of the harp, the bottom **TRIM STRIP** needs to be glued and screwed in place. Install the bottom **TRIM STRIP** in this sequence:

- Drill pilot holes into **BASE**
- Insert short wood screws (1")
- Glue wood plugs over screws (If the plugs are too tall, you can chop them in half with a chisel or razor knife before installing)
- Sand plugs flush with surface of **TRIM STRIP**
- Install side trim pieces in the same way you did on the back.



## SANDING THE SOUNDCHAMBER

\_\_\_22. We like to round over the sharp corners along the **SIDES** of the harp quite dramatically to soften the look and feel of the harp. If you have a router, you can use up to a 1/4" radius round-over bit to make quick work of this step (be sure to make your router cuts in shallow steps, gradually lowering the bit with each pass to prevent chip-out). If you don't have a router, we recommend using 80-100 GRIT sandpaper on an electric sander or a sanding block to round over the sharp edges.



Remember that your forearms will make frequent contact with these corners of the soundchamber as you play, so make them feel comfortable. A sure sign of amateur woodworking is sharp corners. Your harp will look and feel like a professionally built instrument if the corners are softened this way.

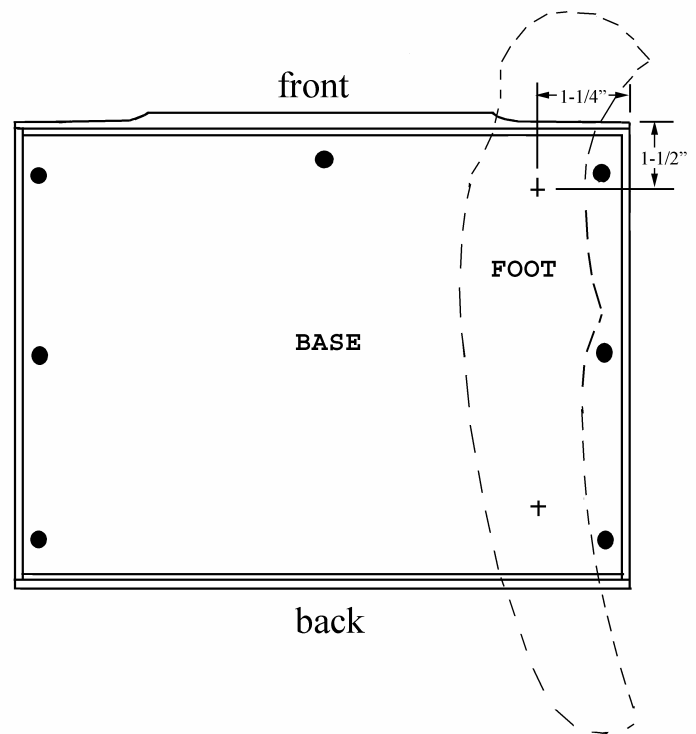
Blend the SIDES, SOUNDBOARD, and BACK to the TOP BLOCK to remove sharp edges and corners.

23. Switch to a medium grit (120) sandpaper to smooth off the scratches made by the coarse paper. This time, be sure to sand with the grain of the wood so you don't add more scratches.

### INSTALLING THE FEET

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24. Stand the soundchamber upside down on something soft on the floor and lean it against your work table with the bottom of the BASE showing up. Position the two FEET on the base, as shown, so you can just see the three screws along the edges. We have measured the location of the forward hole, but not the one toward the heel of the foot. We recommend installing the forward screw in each leg and then rotating the heel end of the legs however you like before installing those rear screws.



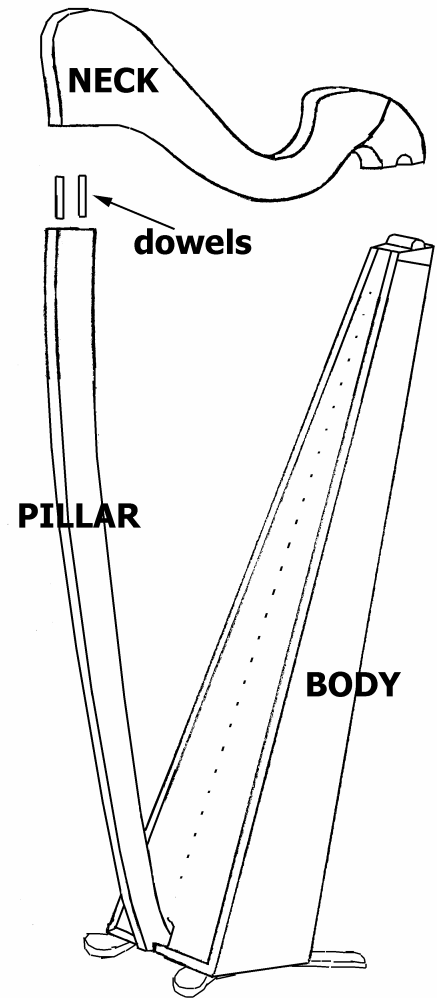
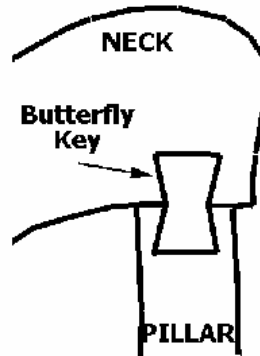
25. Use a 7/64" bit to make pilot holes for the wood screws, and then install 1-5/8" screws through the FEET into the BASE of the harp. No need for glue on this step, as you'll want to remove the feet later.

Now the harp body will stand up on its own two FEET!

## ASSEMBLING THE NECK AND PILLAR

\_\_\_26. Test fit the NECK and PILLAR to the soundchamber, as follows:

- a) Place the DOWELS into the holes in the NECK and PILLAR, making sure the parts come together completely. If the DOWELS are too tight, you may need to sand them slightly.
- b) Rest the back of the NECK on top of the harp body, as shown.
- c) Lightly test the fit of the walnut BUTTERFLY KEY into the routed space, as shown below. This should fit very tightly, so don't bother pushing it all the way in yet - you'll have trouble removing it. If necessary, you can use a flat file to reduce the size of the KEY to get it to fit into the routed hole. Don't make it too loose though! It is meant to fit snugly.
- d) These parts should fit nicely already, as we machine them to fit a sample harp body in our factory. If there is any major mis-fit to these parts, be sure to contact us before proceeding with the project.



When satisfied that the parts will fit nicely, proceed with the next step of gluing the NECK to the Pillar.

\_\_\_27. Get your damp rag ready. Remove the BUTTERFLY KEY, take the NECK and PILLAR apart, and squirt some glue onto a scrap of cardboard or wood. Use a small stick to take glue and spread it inside the holes for the DOWELS in the NECK and PILLAR. It is important to have some glue on these inside surfaces for full strength of this joint!

Then apply glue to the DOWELS and the flat surfaces that make contact and slide all the parts back together again quickly, making sure the joint is tight. Use your damp rag to wipe off excess glue so you can see that the joint is tight all around.

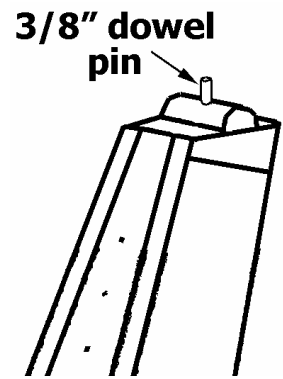
Glue the BUTTERFLY KEY into place immediately to lock this joint securely. You may need a clamp and block of scrap wood to push the KEY fully into place. It will stand about 1/8" above the surrounding wood when fully seated.

We like to stand this assembly back on the harp again just to make sure it fits well. Let it dry standing in place, and use strong (filament) tape to pull the neck down fully against the pillar on the side opposite the BUTTERFLY KEY.

### *Point of Interest*

This is our first harp kit that uses a BUTTERFLY KEY in the NECK/PILLAR joint. We hope you have no difficulty assembling these parts. Some of our other harps utilize external reinforcement OVERLAYS across this joint to counteract the torque of having all the strings pull on one side of the NECK, giving a kind of "I-beam" strength to the joint. We believe this system will work better, and we rather like the distinctive appearance.

\_\_\_\_ 28. (OPTIONAL) The 3/8" DOWEL PIN shown here is an optional piece that you can hide inside the back NECK and the TOP of the body. It might help hold the parts in alignment as you string the instrument, but this dowel pin is NOT structurally necessary. Normal string tension will hold the neck in place after the harp is strung. If you decide not to use the dowel, just be sure to center the NECK on the ARCH as you install the strings.



If you would like to use the DOWEL PIN, here is how to install it: Find the center point on each part and drill the holes slightly larger than the dowel. You can accomplish this by using a 3/8" drill and "wobbling" it a little in the hole to insure a comfortable fit.

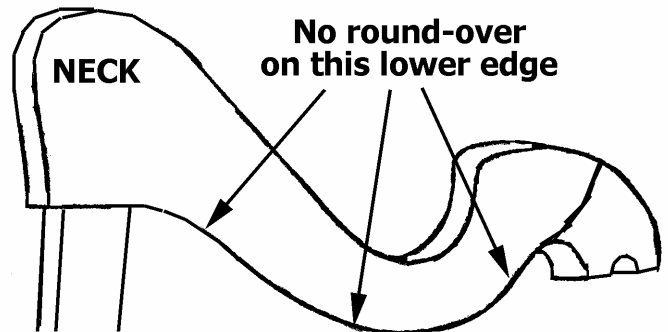
#### *Point of Interest*

This joint between the NECK and the TOP of the body will remain dry – no glue. The reason is to create a sort of "knuckle" that allows the harp to flex slightly under string tension over time. It also allows you to take the NECK/PILLAR assembly off the body of the harp in the future, by simply removing the strings and the screw at the bottom of the PILLAR. That permits you to make repairs, add decorations, or refinish the harp easily, as necessary, down the road. It is one of the best features we have incorporated into our harp designs, saving much time and consternation in some cases.

\_\_\_\_ 29. This is the best time to do final sanding and shaping of the NECK/PILLAR assembly. Here are some guidelines:

Sand all the edges to remove machining marks, scratches, and glue residue. Medium sandpaper (150 grit) should suffice for this. Hold the parts in different lighting to check for scratches and glue spots. They can be elusive!

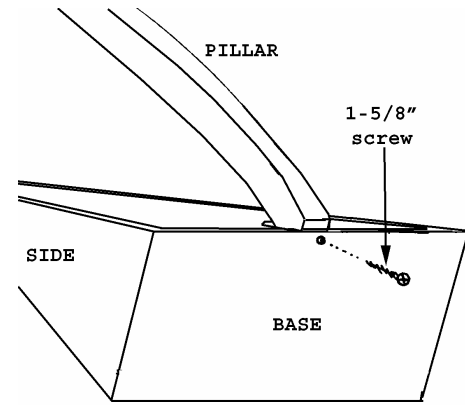
Note that we have rounded over all edges of the NECK *except one*. This lower edge should be left square so you have room for mounting sharpening levers later.



Any minor cracks can be filled with your favorite wood putty. If you have trouble finding a paste filler that will match this wood, make up your own out of fine sawdust (from sanding the harp) and Elmer's glue mixed to a consistency of putty (thin it with a drop or two of water). Another option is to use filler that is light in color and then darken it later with wood-tone touch-up pens.

\_\_\_\_ 33. Do your final sanding with about a #220 grit sandpaper, always working with the grain so as not to scratch the wood. Dust the instrument well with a clean rag or tack cloth before applying the finish.

**33a Install the NECK/PILLAR assembly to the body of the harp with one screw through the BASE into the bottom of the PILLAR, as shown, use a 7/64" bit to drill a pilot hole first.**



## **FINISHING**

**Here are some finishing options, along with a few hints from our experiences with finishing materials.**

**STAIN** -- STAINS are coloring agents and should only be used if you dislike the natural color of the wood. We usually do not apply stains to our projects, especially when they are made with naturally beautiful hardwoods such as cherry or walnut. These woods look very nice with just a clear finish. But, if you want to color the wood differently, your staining should be accomplished before applying a surface finish such as oil, varnish, or lacquer.

**OIL** -- An oil finish will give your wood a low luster appearance, bringing out the natural color of the grain, but it tends to soak into the wood and appear dry and "thirsty" after awhile. The principal advantage of an oil finish is that it can be applied and wiped dry immediately, so you can proceed to installing hardware (and strings) right away. The disadvantages of oil are that it usually does not give much surface protection or sheen, although there are some brands that include waxes and/or varnishes to give more surface build-up and luster.

**VARNISH** -- Any regular varnish will work fine on this project, but we recommend our wipe-on polyurethane called MUSICMAKER'S INSTRUMENT FINISH. Our complete finishing kit includes sandpaper sheets, tack cloth, foam applicator, and lint-free wiping cloth, along with a pint can of semi-gloss polyurethane varnish (instructions printed right on the can). The advantages of this finish are its simple application, durability, and deep, soft luster.

**LACQUER** -- Many professional instrument makers still use lacquer for their finish. The most readily available lacquer is called Deft Clear Wood Finish. It is best to purchase a can of liquid to brush on as a sealer coat first, and then use an aerosol can of the same product to spray on the final coats. The advantage of this finish is its quick drying time, but the disadvantage is the strong odor of the toxic lacquer fumes. **CAUTION:** Lacquer finish will not work over Heat Transfer decorations -- it dissolves the toner.

### **OPTIONAL DECORATING**

**Hand painting or woodburning are fun ways to decorate your instrument. Light painting can be applied between coats of varnish or lacquer very nicely and will not harm the sound of the harp. Some people use acrylic paints, and others decorate with colored pencils or pastels. This is a great way to personalize your harp.**

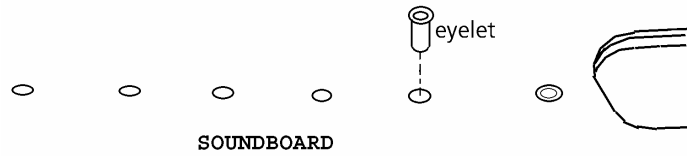
**34. Apply the finish of your choice, sanding lightly between coats with very fine sandpaper (600 grit) or steel wool (#0000).**

**HINT: You will find it easier to apply the finish if you disassemble the harp.**

## ATTACHING HARDWARE

\_\_\_ 35. Find the **BRASS EYELETS** and push them into the holes in the front of the **SOUNDBOARD**.

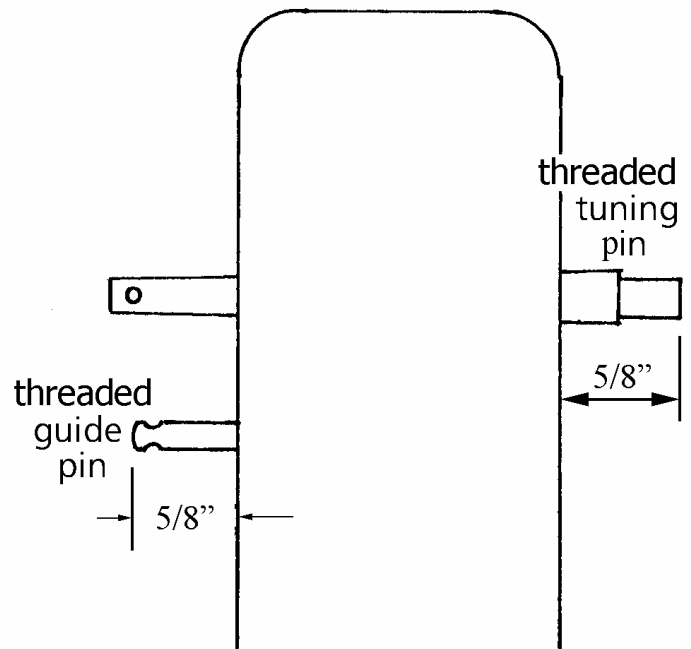
We also like to adhere round felt pads under the feet (at heel and toe ends) to protect from scratches when sliding the harp on the floor.



\_\_\_ 36. You can install all the **THREADED GUIDE PINS** into the lower row of holes drilled in the **NECK**. We like to lubricate them first by scraping the threads across some candle wax. Then you can tap them partway in with a hammer and then screw them in with a #1 size phillips screwdriver until the top is about  $5/8$ " above the surface of the wood.

**NOTE:** Our **THREADED GUIDE PINS** are adjustable in depth, allowing you to change the space between the harp string and the wood surface of the neck, using a #1 Phillips screwdriver. This will be important later when you want to install sharpening levers.

\_\_\_ 37. Turn the **NECK/PILLAR** assembly over so the **GUIDE PINS** are hanging over the edge of your work table, but the **NECK** is still firmly supported. Use the **BRASS DRIVER** in your hand drill to push and turn the 33 **THREADED BLACK TUNING PINS** into the upper row of holes in the **NECK**, from the opposite side of the **GUIDE PINS**. **DO NOT LUBRICATE THE THREADS OF THESE TUNING PINS!** When you push firmly as you turn them, they will drive in quite quickly, skipping threads. Don't rely on the microthreads to seat these pins – that takes too long and it heats up the pins to extreme temperature. Push hard and turn slowly until the square end stands about  $5/8$ " above the wood.



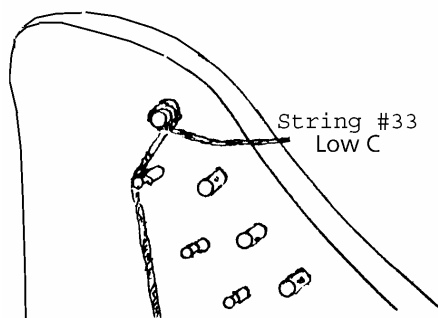
## STRINGING & TUNING

\_\_\_ 38. Assemble the harp back together again, tightening the screw securely into the base of the **PILLAR** so you can stand the harp back up. Stringing a harp is somewhat of an art. We recommend that you read through these last pages of directions completely before beginning, so you know what to expect.

Occasionally, people call us in a panic because their harp either a) won't stay in tune, or b) keeps breaking its strings. Careful installation will do much to eliminate these problems. We string this model harp regularly and tune it up to concert pitch right away with rarely a broken string, but it takes a little patience and concentration.

The strings are numbered from 1 (for the smallest) to 33 (for the longest), and they are color-coded to help guide you as you play. "C" strings are all red, and "F" strings are blue.

**NOTE:** If the color on the strings should happen to fade, you can restore it with permanent marker.



\_\_\_ 39. Start at the bass (longest) end of the harp with string #33, a long red string that is very thick. Push the string through the lowest hole in the **SOUNDBOARD** from back to front. Pull it all the way until the knotted end contacts the **REINFORCEMENT BAR** inside the harp.

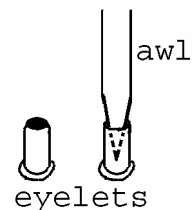
\_\_\_ 40. Thread the other end of the string through the last **TUNING PIN** near the point of the **NECK**, pulling it through the pin, but leaving enough slack below the pin to allow several windings before coming taut.

\_\_\_ 41. Use the **TUNING WRENCH** to turn the pin *clockwise* (from the viewpoint of the tuning wrench on the backside of the **NECK**) and guide the windings neatly around the **TUNING PIN**.

\_\_\_ 42. As the string begins to tighten, place it in the groove of the **GUIDE PIN** as shown.

\_\_\_ 43. Thread the next 4 wound strings in the same way, taking care to keep them in the correct order.

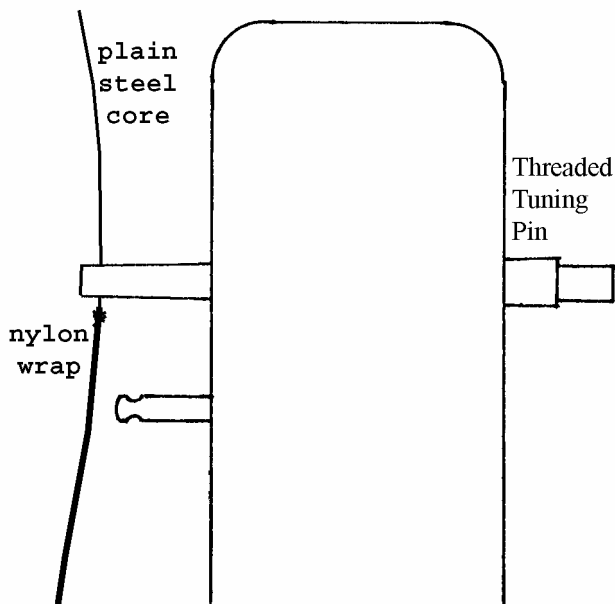
\_\_\_ 44. The next two strings, Steel-A and Steel-B, have a steel core with nylon wrapping. The nylon wrapping is purposely tied off shorter than the steel core strand. If you have trouble threading these strings through the brass eyelets, it is because the bulky knot is a bit large and the eyelets are pursed a little at the end. Use an awl to flare the eyelet slightly, as shown:



**CAUTION!**

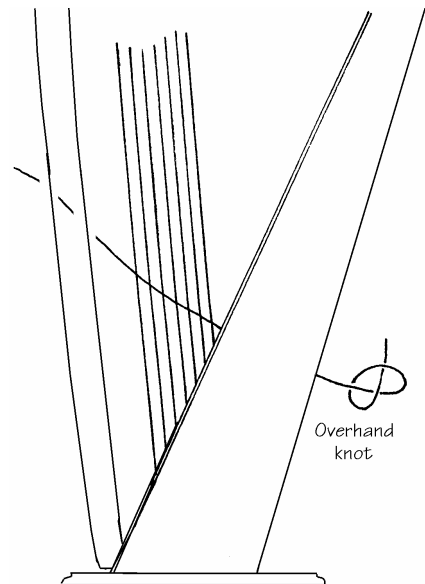
These **WOUND STRINGS** are very fragile and expensive to replace. Some people break the first one they install by over-tightening. They don't expect it to come up to pitch so quickly. Take care to avoid that costly mistake. It is very helpful to pluck the string as you tighten it, so you can hear the pitch go up as you increase the tension.

For these two strings, we recommend pushing the plain steel core through the tuning pin up to the point where the nylon wrap begins. Then start turning the pin to wind up the excess slack below the pin. When you are satisfied with installation of these strings, use a wire cutter to clip off the excess wire, close to the **TUNING PINS**. These sharp ends are *dangerous!* Cut them short so they won't poke you or catch on your clothing. **CAUTION: DO NOT CLIP THE STRING BELOW THE NYLON WRAP.** The nylon is tightly wound around the core and will unravel if it is cut.



\_\_\_45. The remaining 26 strings are plain (monofilament) nylon that have no knots tied in them yet. You may insert these strings from the front of the harp, if that is easier, and then reach inside the back to find the end. Tie a simple overhand knot at the end, as shown.

Put a drop of Superglue or Krazy glue on the knot, then pull the knot tightly against the inside of the SOUNDBOARD (right away, before the glue has set up). No, we don't want to glue string to the harp, we just want to "freeze" the knot itself, so the slippery nylon doesn't untie itself when the string is tuned up to pitch.



**NOTE: Pull straight through the hole, not at an angle, to avoid scratching the nylon against the brass eyelet.**

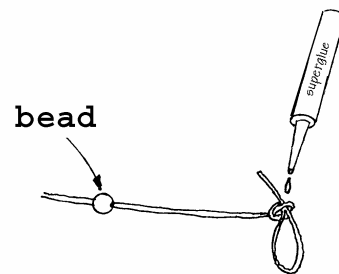
Thread the other end of the string through the next TUNING PIN, pulling it through the hole until there is only a little slack in the string below the PIN. How much slack? About 2-4 inches. You'll catch on—too much slack makes for bulky accumulations of string around the TUNING PIN, and too little means you won't have enough to even wrap once around the PIN. Ideally, you'll have 3 to 4 wraps of string around each TUNING PIN for security.

Turn the PIN clockwise with the tuning wrench as you take up the slack with the other hand, guiding the string as it winds around the pin. As the string begins to tighten, place it in the groove of the GUIDE PIN.

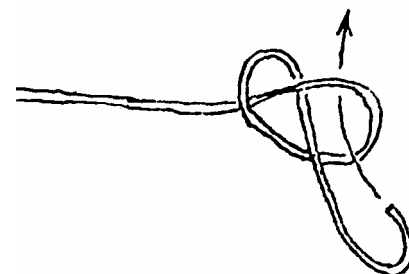
Once the string is satisfactorily installed, you may clip off the excess nylon close to the pin (leave ¼" stub), and tune the string up to its proper pitch (no, it won't stay in tune yet, but it helps to begin stretching it right away).

\_\_\_46. Install all six of the large (.060") strings this same way, taking care to put the colored ones in the proper positions. We have included one spare clear string in each bundle in case you break one.

**Helpful Hint**  
Do not accumulate a lot of windings of string around the TUNING PINS, especially with the thick bass (low) strings. They become bulky and cumbersome. If you have that problem, turn the TUNING PIN backwards to unwind the string, then pull more of the string through the hole and tighten again.

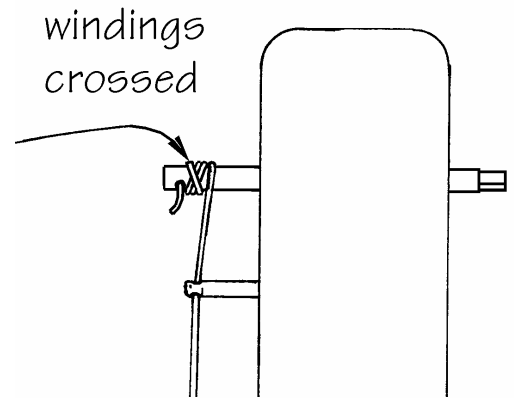


\_\_\_47. When you come to the mid-range strings (sizes .050" and .040"), thread a small plastic bead onto each string, as shown, and then tie the bottom knot a little differently to give it more bulk. Start with the same overhand knot, but before tightening it, push the loose end part way back into the knot, just to add one more thickness of string to the knot.

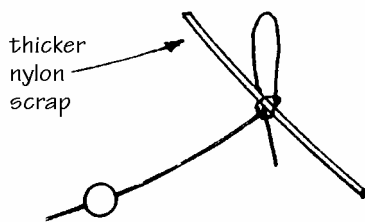


**IMPORTANT:** It is necessary to also anchor the tops of these strings (and all the lighter ones) securely to the tuning pins, as follows:

Guide one or two windings of string on the **TUNING PIN**, then guide the next winding over the others so the string helps “pinch” itself tightly to the **PIN** as you tune it up to pitch. If you don’t do this, you will surely experience string slippage and breakage, especially in the upper half of the instrument.



\_\_\_48. The next two sizes of strings (sizes .036” and .032”) are thinner and more fragile. Take care to avoid scratching them as you install them, and don’t forget the **PLASTIC BEADS** and the Superglue!



\_\_\_49. The last four strings are the most delicate. Take your time with them. This nylon is so thin that even a double knot will sometimes pull through the hole in the bead. The solution is to insert a short piece of thicker nylon into the knot to make it bulkier, as shown.

When all the strings are installed, tune the entire harp up to pitch so the instrument begins to adjust itself to the tension.

The strings should all be tuned to the natural C major scale (white keys on the piano). All the red strings will be C notes and the blue ones F notes. Middle C is string number 20 from the top. The lowest note is two octaves below middle C.

Many people are not certain if they are tuning their harp strings to the correct octave. Tuning the strings an octave too low will result in flabby harp strings that don't provide much volume. Tuning the strings too high will cause strings to break. To make sure you are tuning your harp strings to the correct octave, you can double-check the pitch on our website with our "online tuner" at [www.harokit.com](http://www.harokit.com)

**NOTE:** Expect it to take 50 tunings before the harp will fully stabilize. That means if you only tune the harp once a week, it will take a year for it to settle in! So we recommend tuning it two or three times a day. Persevere, and be patient! It should get better each day. If you find that it does not get better each day, then something else may be wrong. Take a good look at the "Care and Feeding" page at the end of these instructions. There is no reason for this harp to be unstable in tuning.

**CONGRATULATIONS!** We hope you have enjoyed building this harp and that you enjoy many years of musical pleasure from playing it. We stock a good number of teaching materials and accessories to help you get started playing music. Don't hesitate to call us for more information or for help if you encounter difficulties with your instrument.

# SHARPING LEVERS

Sharping levers are used on folk harps to facilitate key changes. Installing a lever over a string allows you to raise the pitch of that string one-half step by engaging the cam against the string. Thus an F-string can be raised to F# by a simple flick of the lever. Similarly, a B-string may be tuned to Bb so that the lever will raise it to B-natural and release it back to B-flat, as needed.

Most folk harp players set the key signature (sharps or flats) on the harp before starting each piece of music. For the key of G, you would engage the levers on all the F strings to produce the F# notes needed for that key (making sure all other notes on the harp are natural). If the following piece were then to be played in the key of F, you would then release the levers on all the F strings to produce F-natural, and also release all the B-string levers to produce Bb.

You may install a lever over every string on the harp, or, if you think you won't use all of them, you can save money by installing only the levers necessary for the keys you are likely to play in.

KEY OF E:	requires F# and C# and G# and D#
KEY OF A:	requires F# and C# and G#
KEY OF D:	requires F# and C#
KEY OF G:	requires F#
KEY OF C:	requires no sharps or flats
KEY OF F:	requires Bb
KEY OF Bb:	requires Bb and Eb
KEY OF Eb:	requires Bb and Eb and Ab

Check our website or current catalog for prices

**Loveland Lever**



**Universal Lever**



**MUSICMAKER'S KITS, INC.  
PO BOX 2117  
STILLWATER, MN 55082-3117**

**(651) 439-9120**

**[www.harpkits.com](http://www.harpkits.com)**

## CARE AND FEEDING OF THE VOYAGEUR HARP

**TUNING TIPS:** It is best to tune the harp with all sharpening levers flipped down (disengaged), so there will be no interference from the levers. Please note that this means you may be tuning some strings to flats instead of natural notes. If you have levers on the B strings, for example, you should tune those strings to B-flat when the lever is flipped down. You will then flip these levers up when playing in the key of C.

Note that the **THREADED TUNING PINS** drive themselves a little deeper as you turn them clockwise to tighten the strings. If you find that they go deeper than you want, you can turn them counter-clockwise to raise the square ends back to a normal level. When you change strings in the future, you should turn these pins 3-4 complete revolutions counter-clockwise before installing the new strings.

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**BUZZING STRINGS:** Your harp need not suffer the problem of rattling or buzzing sounds when you play. If you hear such noises, you can correct them. Here are some troubleshooting hints:

If the buzzing sound occurs only when the **SHARPING LEVER** is flipped up (engaged), then you need to tighten the **LEVER** more firmly against the **NECK** of the harp.

If the buzzing occurs when the **LEVER** is flipped down (disengaged), the string may be vibrating against some part of the **SHARPING LEVER** itself. If you have Loveland brand levers, look very closely at the position of the string as it passes through the **LEVER** bracket. It may be rattling against the plastic cam (the part that you flip up & down), or against the small "fretpost" (the part that the cam pinches the string against when engaged.) You can change the position of the string by raising or lowering the **THREADED GUIDE PIN** on which the string rests above the **SHARPING LEVER**. (Make sure the string is resting in the groove of that **PIN**.) Use a #1 size Phillips screwdriver to turn the **GUIDE PIN** in or out, watching how that moves the string in relation to the **SHARPING LEVER**.

If the problem is not located around the **SHARPING LEVER**, you may have a loose end of string that is rattling inside the soundchamber. Put your hand inside the harp and touch the knotted ends while plucking the harp to see where the problem is located. Oftentimes you can solve it by simply trimming off a loose end of string or by twisting the knotted end in a different direction.

**HARP REPAIRS:** If you ever need to repair the wood parts of your harp, you will be glad to know that the **NECK/PILLAR** assembly can be removed from the soundchamber to facilitate repair work. Simply loosen the strings and unhook them from the **TUNING PINS**. Then remove two screws at the **BASE** of the harp to allow the **NECK/PILLAR** to come free of the harp body.

**SCRATCHES & DENTS:** You can restore the luster to the finish of your harp with a furniture polish like Old English with lemon oil. This will help hide scratches too. We avoid using polishes with wax because the wax will interfere with future refinishing or touch-up work.

# THE VOYAGEUR HARP

<b>VOYSTRG</b>		<b>FULL SET OF 33 STRINGS</b>			<i>(Standard Set)</i>	
STRING	NOTE	GAUGE	CODE	COLOR	VIBRATING LENGTH	LOVELAND LEVER SIZE
1	G6	.025	NYL025	clear	4"	00
2	F6	.025	NYL025	blue	4-3/4	00
3	E6	.025	NYL025	clear	5-1/2	00
4	D6	.025	NYL025	clear	6-1/4	00
5	C6	.032	NYL032	red	7-1/8	0
6	B5	.032	NYL032	clear	8	0
7	A5	.032	NYL032	clear	8-7/8	0
8	G5	.032	NYL032	clear	9-7/8	0
9	F5	.036	NYL036	blue	10-7/8	4
10	E5	.036	NYL036	clear	12	4
11	D5	.036	NYL036	clear	13-1/8	4
12	C5	.036	NYL036	red	14-3/8	4
13	B4	.040	NYL040	clear	15-5/8	5
14	A4	.040	NYL040	clear	17	5
15	G4	.040	NYL040	clear	18-3/8	5
16	F4	.040	NYL040	blue	20	5
17	E4	.050	NYL050	clear	21-1/2	7
18	D4	.050	NYL050	clear	23	7
19	Mid C4	.050	NYL050	red	24-5/8	7
20	B3	.050	NYL050	clear	26-1/4	7
21	A3	.060	NYL060	clear	28	9
22	G3	.060	NYL060	clear	29-1/8	9
23	F3	.060	NYL060	blue	31-3/8	9
24	E3	.060	NYL060	clear	33-3/8	9
25	D3	.060	NYL060	clear	34-3/4	9
26	C3	.060	NYL060	red	36-1/2	9
27	B2	.022/6/.014 SFN	VOYLOWB	clear	38-1/4	9
28	A2	.028/6/.016 SFN	VOYLOWA	clear	40	12
29	G2	.022/4/.008 SFB	VOYLOWG	clear	41-5/8	9
30	F2	.022/6/.009 SFB	VOYLOWF	blue	43-1/8	9
31	E2	.024/5/.010 SFB	VOYLOWE	clear	44-3/4	9
32	D2	.024/6/.012 SFB	VOYLOWD	clear	46-1/4	9
33	C2	.026/4/.015 SFB	VOYLOWC	red	47-7/8	9

(Full set includes one spare clear string of each monofilament size)

**NOTE: 21 small beads added for upper strings**

Musicmaker's Kits, Inc  
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Stillwater, MN 55082

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[www.harppkit.com](http://www.harppkit.com)

# THE VOYAGEUR HARP – PERFORMANCE STRING SET

<b>VOYSTRGPF</b>	<b>FULL SET OF 33 STRINGS</b>	<i>(Performance Set)</i>
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STRING	NOTE	GAUGE	CODE	COLOR	VIBRATING LENGTH	LOVELAND LEVER SIZE
1	G6	.025	NYL025	clear	4"	00
2	F6	.025	NYL025	blue	4-3/4	00
3	E6	.025	NYL025	clear	5-1/2	00
4	D6	.025	NYL025	clear	6-1/4	00
5	C6	.032	NYL032	red	7-1/8	0
6	B5	.032	NYL032	clear	8	0
7	A5	.032	NYL032	clear	8-7/8	0
8	G5	.032	NYL032	clear	9-7/8	0
9	F5	.036	NYL036	blue	10-7/8	4
10	E5	.036	NYL036	clear	12	4
11	D5	.036	NYL036	clear	13-1/8	4
12	C5	.036	NYL036	red	14-3/8	4
13	B4	.040	NYL040	clear	15-5/8	5
14	A4	.040	NYL040	clear	17	5
15	G4	.040	NYL040	clear	18-3/8	5
16	F4	.040	NYL040	blue	20	5
17	E4	.050	NYL050	clear	21-1/2	7
18	D4	.050	NYL050	clear	23	7
19	Mid C4	.050	NYL050	red	24-5/8	7
20	B3	.050	NYL050	clear	26-1/4	7
21	A3	.060	NYL060	clear	28	9
22	G3	.060	NYL060	clear	29-1/8	9
23	F3	.060	NYL060	blue	31-3/8	9
24	E3	.064 (5 <sup>th</sup> oct.)	LEVERGUTE	clear	33-3/8	9
25	D3	.068 (5 <sup>th</sup> oct.)	LEVERGUTD	clear	34-3/4	9
26	C3	.071 (5 <sup>th</sup> oct.)	LEVERGUTC	red	36-1/2	12
27	B2	.073 (5 <sup>th</sup> oct.)	LEVERGUTB	clear	38-1/4	12
28	A2	.076 (5 <sup>th</sup> oct.)	LEVERGUTA	clear	40	12
29	G2	.022/4/.008 SFB	VOYLOW G	clear	41-5/8	9
30	F2	.024/6/.009 SFB	VOYLOW F	blue	43-1/8	9
31	E2	.024/5/.010 SFB	VOYLOW E	clear	44-3/4	9
32	D2	.024/6/.012 SFB	VOYLOW D	clear	46-1/4	9
33	C2	.026/4/.015 SFB	VOYLOW C	red	47-7/8	9

(Full set includes one spare clear string of each monofilament nylon size)

<b>NOTE: 21 small beads added for upper strings</b>
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[www.harppkit.com](http://www.harppkit.com)

# THE VOYAGEUR HARP – THERAPY STRING SET

<b>VOYSTRGTH</b>	<b>FULL SET OF 33 STRINGS</b>	<i>(Therapy Set)</i>
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STRING	NOTE	GAUGE	CODE	COLOR	VIBRATING LENGTH	LOVELAND LEVER SIZE
1	G6	.025	NYL025	clear	4"	00
2	F6	.025	NYL025	blue	4-3/4	00
3	E6	.025	NYL025	clear	5-1/2	00
4	D6	.025	NYL025	clear	6-1/4	00
5	C6	.032	NYL032	red	7-1/8	0
6	B5	.032	NYL032	clear	8	0
7	A5	.032	NYL032	clear	8-7/8	0
8	G5	.032	NYL032	clear	9-7/8	0
9	F5	.036	NYL036	blue	10-7/8	4
10	E5	.036	NYL036	clear	12	4
11	D5	.036	NYL036	clear	13-1/8	4
12	C5	.036	NYL036	red	14-3/8	4
13	B4	.040	NYL040	clear	15-5/8	5
14	A4	.040	NYL040	clear	17	5
15	G4	.040	NYL040	clear	18-3/8	5
16	F4	.040	NYL040	blue	20	5
17	E4	.050	NYL050	clear	21-1/2	7
18	D4	.050	NYL050	clear	23	7
19	Mid C4	.050	NYL050	red	24-5/8	7
20	B3	.050	NYL050	clear	26-1/4	7
21	A3	.060	NYL060	clear	28	9
22	G3	.060	NYL060	clear	29-1/8	9
23	F3	.060	NYL060	blue	31-3/8	9
24	E3	.064 (5 <sup>th</sup> oct.)	LEVERGUTE	clear	33-3/8	9
25	D3	.068 (5 <sup>th</sup> oct.)	LEVERGUTD	clear	34-3/4	9
26	C3	.071 (5 <sup>th</sup> oct.)	LEVERGUTC	red	36-1/2	9
27	B2	.073 (5 <sup>th</sup> oct.)	LEVERGUTB	clear	38-1/4	12
28	A2	.076 (5 <sup>th</sup> oct.)	LEVERGUTA	clear	40	12
29	G2	.081 (5 <sup>th</sup> oct.)	LEVERGUTG	clear	41-5/8	12
30	F2	.084 (5 <sup>th</sup> oct.)	LEVERGUTF	blue	43-1/8	12
31	E2	16/.008 FB	THERAPY E	clear	44-3/4	9
32	D2	22/.008 FB	THERAPY D	clear	46-1/4	9
33	C2	20/.010 FB	THERAPY C	red	47-7/8	9

(Full set includes one spare clear string of each monofilament nylon size)

<b>NOTE: 21 small beads added for upper strings</b>
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