

# Jolie Harp Kit



**MUSICMAKERS**

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

## NOTES:

We often have customers call for advice and have more than one question. Sometimes these questions are forgotten during the course of conversation. Use this space to jot down thoughts or questions about your Jolie Harp project and get all your answers, at one time!

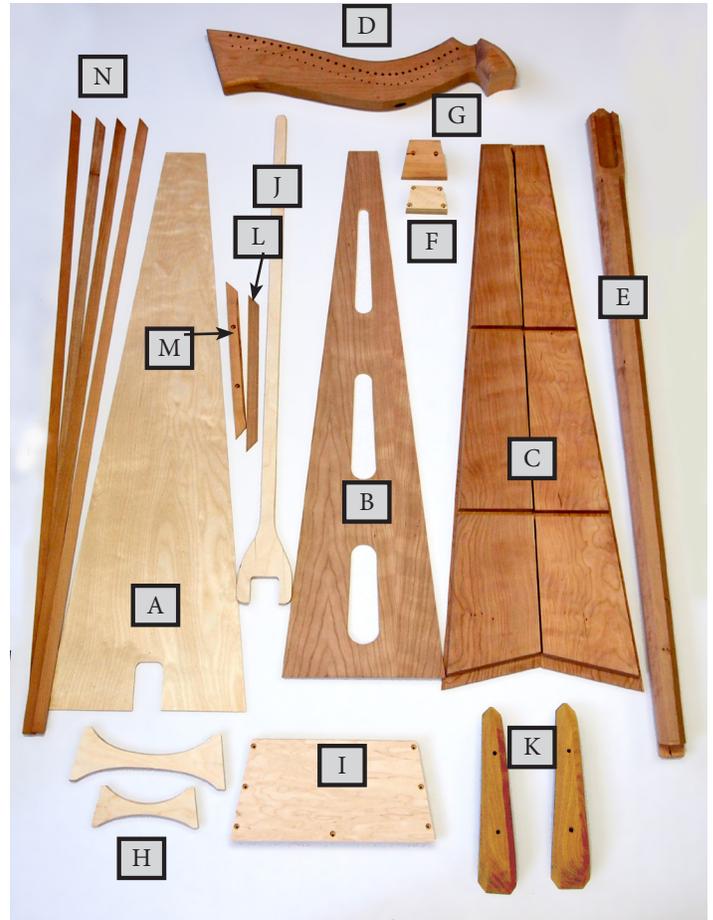
A series of 18 horizontal dotted lines for writing notes, each line bounded by vertical bars at both ends.

# WOOD PARTS: Jolie Harp Kit

- A - 1 Soundboard, Aircraft Birch
- B - 1 Back Panel
- C - 2 Sides
- D - 1 Pre-drilled Neck
- E - 1 Pillar
- F - 1 Top Block
- G - 1 Arched Cap Block
- H - 2 Inner Braces
- I - 1 Base Block
- J - 1 Inner Reinforcement Bar
- K - 2 Feet
- L - 1 Short Trim Strip, Back
- M - 1 Short Trim Strip, Front (Drilled)
- N - 4 Long Trim Strips, Sides

## HARDWARE:

- 1 Scrap Soundboard Piece
- 33 Threaded Tuning Pins
- 1 Brass Driver for Tuning Pins
- 12 Large Brass Eyelets
- 21 Medium Brass Eyelets
- 33 Threaded Bridge Pins
- 1 Allen Wrench, 5/64
- 2 #14 x 2" Wood Screws, square drive
- 1 #3 Square drive bit
- 6 Wood Screws, 1 1/4"
- 10 Wood Screws, 1-5/8"
- 1 Wood Screw, 2"
- 2 Wood Screws 2-1/2"
- 4 Wood Plugs, 3/8" dia
- 1 Wood Plug, 1/2" dia
- 1 Harp Medallion, 3/4" dia
- 1 Wood Dowel, 3/8" x 2"
- 3 Drill Bits, #24", 1/8" & 7/64"
- 2 oz Wire Nails, 3/4" X 18
- 4 Rubber Bumpers for Feet
- 4 Round-head black screws, #8 X 3/4"
- 1 Tuning Wrench
- 1 Set of 33 Harp Strings (with small dowels & stringing instructions)
- 1 Spacing Guide for Bridge Pins
- 1 Assembly Instructions



## BEFORE YOU BEGIN

Please take the time to check over the parts of your kit now, to make sure everything is there. If you discover a problem, contact 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) Clamp the harp sides to your bench. This will prevent the sides from sliding around during the assembly process. (Figure 1)

2) Dry fit the base and inner top block to ensure a good fit. If the pieces aren't perfect, you can adjust them with a hand plane or sanding block. **It's easier to remove the excess BEFORE the parts are glued in place.**

3) Drill 7/64" pilot holes in both sides for the base block screws. Apply glue to one side and insert 1-5/8" wood screws. Allow time to dry (Figures 2 & 3)

4) Flip the harp over so that the glued side is on top. Use the inner top block to help balance the sides together. Align the base block, apply glue and insert the screws for the remaining side. (Figure 4)

5) Stand the frame and lean it against your workbench. Drill pilot holes for top block. Be sure to tilt the drill bit to follow the angle of the sides. **If you drill the holes straight down, you will split the wood of the sides.** Apply glue and screws to top block. (Figure 5)

Angle drill to match sides.

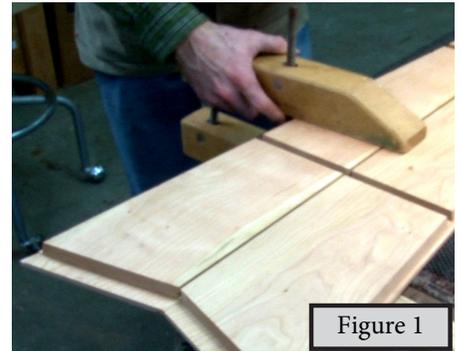


Figure 1

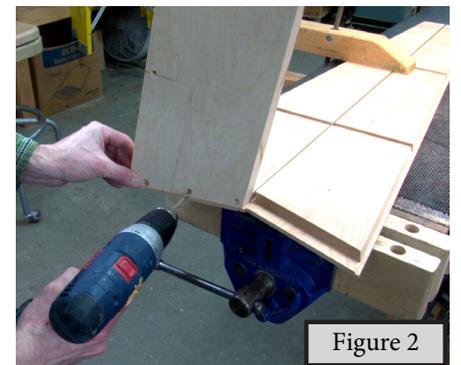


Figure 2

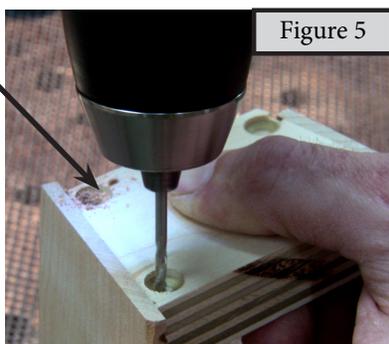


Figure 5



Figure 4

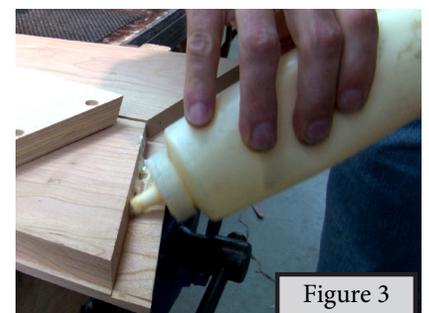


Figure 3

6) Place the frame on your bench so that the front side is facing up. (See figure 6)



Figure 6

7) Find and check the fit of the two inner braces. They will fit in only one direction. Notice that the taper of these braces matches the taper of the body. Be sure that the braces set flush with the soundboard ledge on each side.

**NOTE:** Sometimes the braces are not the correct length to fit between the sides. This can be caused by sloppy cutting on our part, but more likely the sides have bowed a little from humidity changes after we prepared them. You can check that with a straight-edge and push or pull the sides into alignment as you glue the braces in place. If a brace is simply too short, however, you can shim the space with a thin scrap of wood. If too long, use a disk sander to remove a small amount without changing the angle or rounding the end. If the brace is too thick to slide into the dado, you can sand it a little at a time with an orbital sander.

Bracing serves two purposes: 1) to straighten the sides during assembly and 2) to keep the body of the harp from deforming under string tension.



Figure 7

8) Apply glue and clamps. Please note the various different methods of clamping. Choose the one that works the best for you and your working environment. Be sure to clean up excess glue drips that might interfere with installation of the front or back panels.



Figure 8

#### HINT:

Figure 7 details how to utilize elastic/bungee cord. Figure 8 details the use of f-clamps (aka bar or pipe clamps) and a 2 x 4 to help distribute pressure along the length of the sides.

## PREPARING THE SOUNDBOARD

Take note that the soundboard is punch marked on the outside surface of the board. The punch marks are purposely off center toward the narrower end of the board.

9) Using a hand drill or drill press, drill the lowest and highest punch marks with a 1/8" drill bit. These holes will act as a guide for the reinforcement strip. Perform the drilling on a workboard to prevent the wood from tearing out on the soundboard and hold the drill perpendicular. (See figures 9 & 9a)



Figure 9



Figure 9a

10) Flip the soundboard to the inside face. Connect holes with straight edge and mark with a pencil. This line will act as a reference for gluing the reinforcement bar. (See Figure 10)

11) Dry fit the reinforcement bar and trace around each end with a pencil on the inside of the soundboard. (Figure 11) Be sure that the reinforcement bar covers the highest hole. Gather weights or clamps for pressing the reinforcement bar and dry fit the reinforcement bar with the clamps.



**NOTE:** You can sand the inside of the soundboard but this is not necessary.

12) Apply glue along the length of the reinforcement bar and tape on both ends to prevent slippage, then add weights/clamps. (Figure 12 & 12a)



**Hint:**  
This is a great time to sign and date the inside of the soundboard. Your name and skills as a luthier will live on in infamy!



**Point of Interest:**  
A go-bar deck is an optional clamping system using flexible sticks or dowels and your own work bench!

13) Once glue is dry, drill remaining holes. The bottom 12 holes will be drilled with a #24 or 5/32" drill bit. The rest of the holes are 1/8". Use the drill bits provided in your hardware pack to complete this task.

## SUGGESTION

Every time you do some gluing on your project, we advise having a clean damp rag handy for cleaning up the 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 save you lots of time toward the end of the project when you are preparing to apply the finish.

## INSTALLING THE BACK AND SOUNDBOARD

14) Check to make sure the base block, braces, and top block are all flush with sides. Use a file, chisel, or sanding block to remove any spots that are too high. (Figure 14)

15) Dry fit the back. This can be done while you're waiting for the glue to dry on the soundboard reinforcement strip. The back and front are cut slightly large to ensure a good fit. If you need to remove some of the excess, be aware that the board will slide further into the frame, due to the tapering of the box.



Figure 14

16) Check for tight spots and gaps around the perimeter of the back (Figure 15). Remove wood from tight spots using a sander or hand plane. Use caution with power tools. It's easy to remove too much in this way. (Figures 16 & 16a)

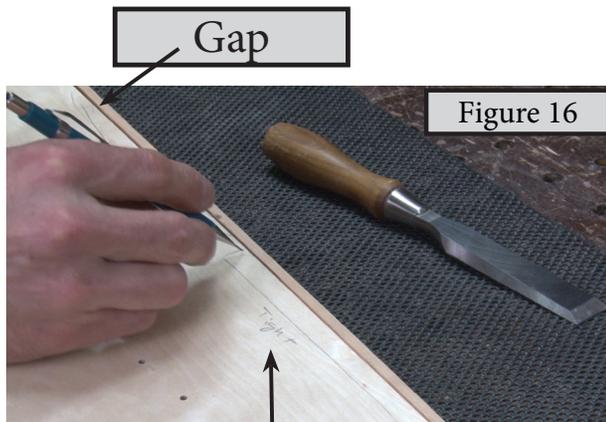


Figure 16



Figure 16



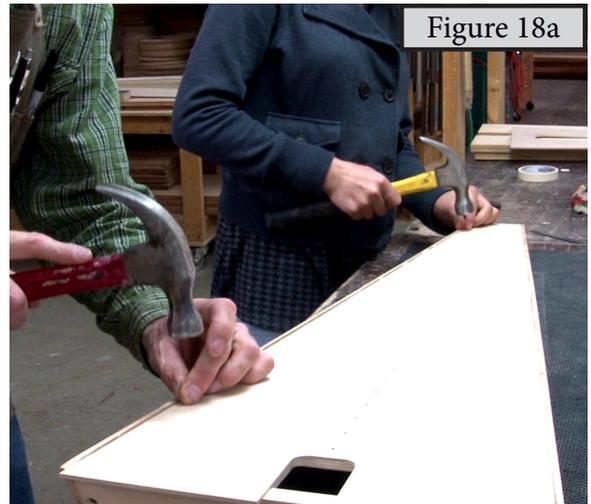
Figure 16a

### Note:

Perfection is not necessary at this stage. The side joints will eventually be covered by trim - so don't sweat the petty things...

17) Once the back is fitting nicely, remove excess overhang from the top and bottom with a saw. This step can be done after gluing, but you may find it easier to do before you glue it to the frame.

18) Apply a liberal amount of glue and proceed to staple or nail the soundboard in place. This step will go easier with an extra set of hands to speed things up before the glue dries. Be sure to NOT staple or nail along the TOP BLOCK as there is no trim to cover this area. You will need to clamp the back to the top block to be sure it gets held down. (Figures 18 & 18a)



## INSTALLING THE SOUNDBOARD

19) Fit the soundboard using the same fitting techniques as you used for the back panel.

20) Test the small front trim strip in place and mark holes where screws will be. DO NOT staple or nail within 1/4" of where these holes are marked. (Figure 19)

20a) When ready, to apply glue to front of frame and nail or staple the soundboard on, positioning your nails close to edges and about 1" apart on the front because of the string tension that will pull on this panel.



21) Attach the soundboard scrap by nailing or stapling the scrap on either side. It's best to avoid the middle of the scrap as this is where the pillar screw will come in. (Figure 20)

22) Use a hammer and nail set or flat head screwdriver to drive the nails or staples just below the surface. This will keep them from interfering with the trim strips. Don't drive the nails too deep. High humidity could cause the wood to swell over the heads of the nails, in the future. (Figure 21)



### Points of Interest

#### I

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. Staples/nails are necessary for the soundboard - because all string tension pulls on the front. This hardware helps prevent "cold creep."

#### II

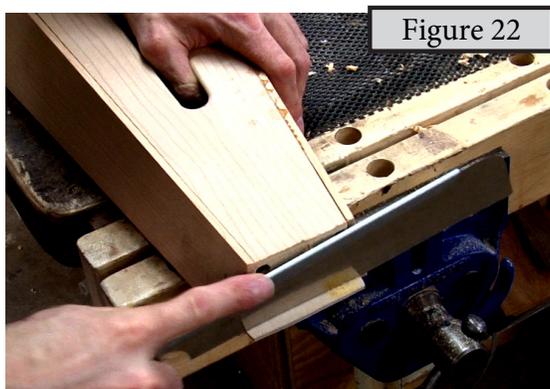
Many people ask why we use laminated wood instead of solid for the soundboard. The reason is that we get much more strength from laminated material than from solid, and virtually no breakage. The superior strength of this material allows us to use a thinner soundboard than if we were to use solid wood,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

#### III

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.

### INSTALLING THE TRIM

23) If you haven't already done so, this is the time to remove the overhang from the top and bottom of the back and soundboard. Use any sort of handsaw to accomplish this cleaning up. Also use this time to double check that all nails or staples are driven down slightly below the surface of the back and soundboard. (Figures 22 & 22a)



24) Using a sanding block or hand plane, remove the ledge of the frame that stands higher than both the back and the soundboard. DO NOT use a flush trim router bit for this step. It's also best to avoid an orbital sander for this step, as this may cause an unintentional rounding of the frame. (Figures 23, 23a, 23b, & 23c)



Figure 23



Figure 23a

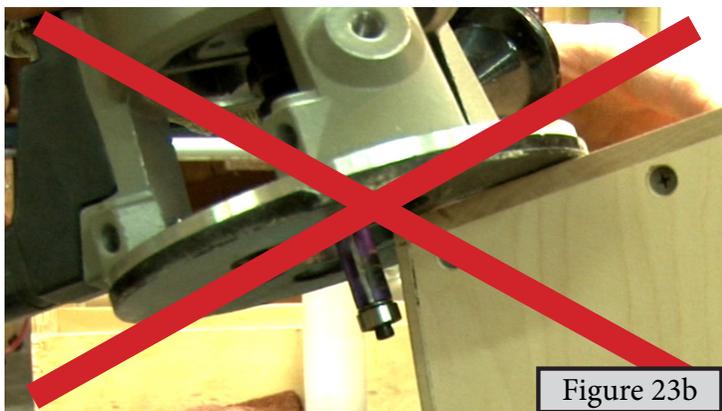


Figure 23b



Figure 23c

25) Sand the access holes in the back panel using a 120- then 180-grit sandpaper. Be sure to clean up the entire perimeter of each hole. This will make for more comfortable handling once the harp is finished. (Figure 24)

26) Use an orbital sander to lightly sand the entirety of the back and soundboard (220-grit). Take extra care to hold the sander flat. (Figure 25)

**Note:** e careful sanding - the back has a VERY thin cherry veneer.

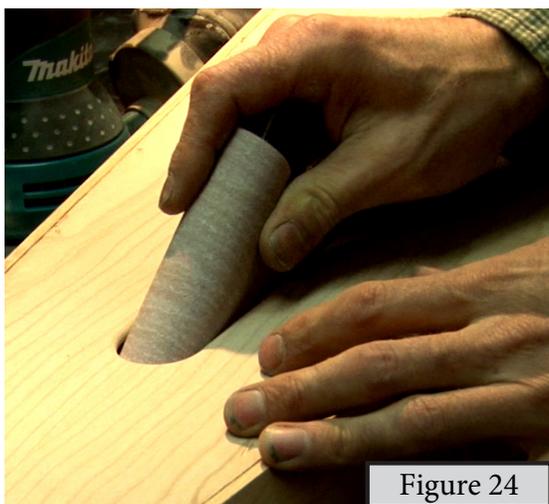


Figure 24



Figure 25

27) Test fit the trim strips. Be sure you know which strip is going where.

28) Sand along the entire inside edge (NOT the edge that will be glued down...) of the trim strips. It is easy to do this step, now. The inner wood of the trim strip will be harder to access once it's glued down. This will ensure that no one will get a splinter from handling the harp near the trim. (Figure 26)

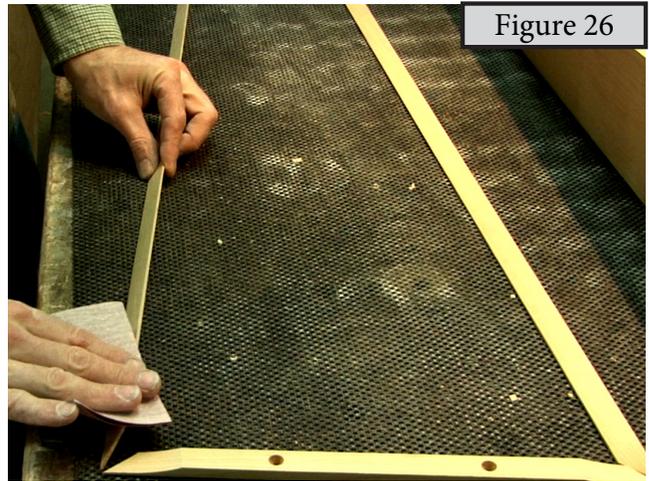


Figure 26

29) Test fit the bottom trim strip with the pre-drilled holes. Check that the mitered edges fit properly without leaving a gap anywhere. (Figure 27)

30) Use a sanding block or disc sander to adjust the miters on the bottom trim strip. The width of this strip should match the width of the harp's soundboard at the bottom. You may need to adjust one side more than the other to get the width and miters to match. If you run out of wood to remove from the bottom trim, the long thin trim strips can also be adjusted for miter angle.

(Figures 28 & 28a)

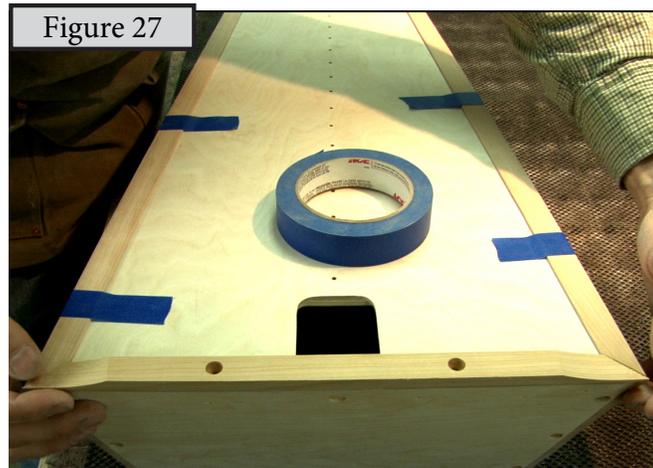


Figure 27



Figure 28

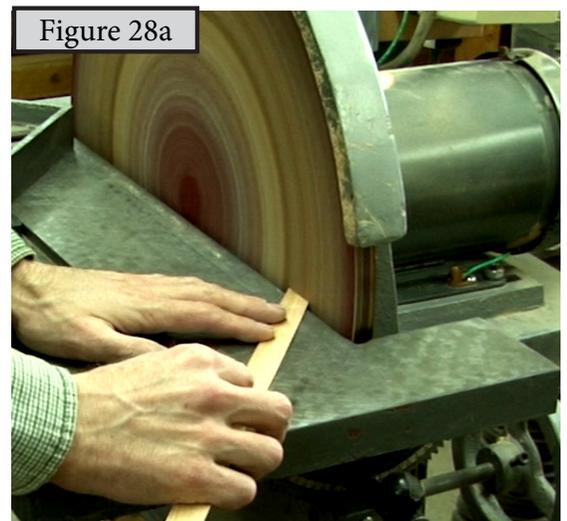
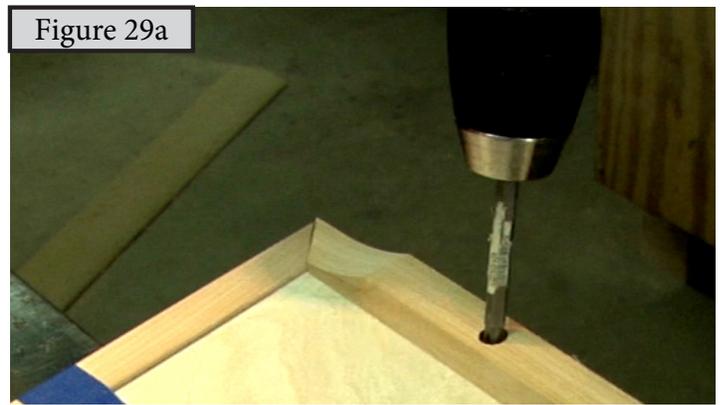
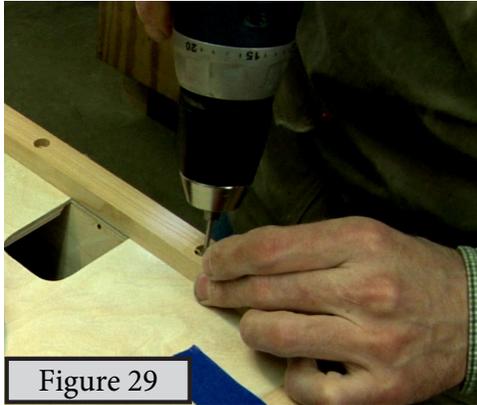


Figure 28a

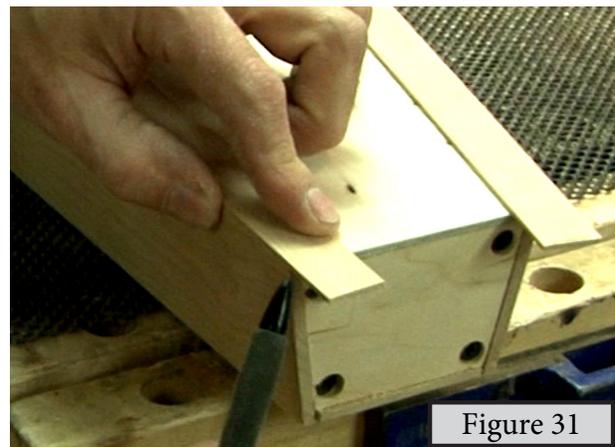
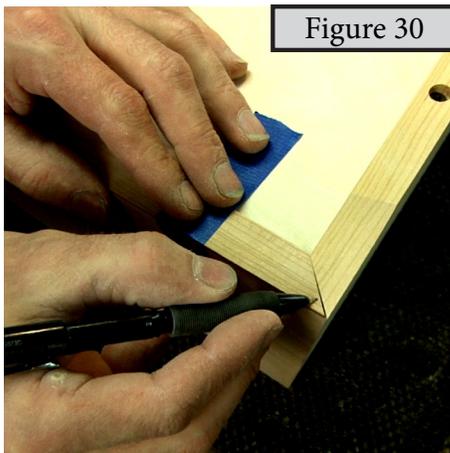
31) When you're satisfied with the fit of the bottom trim, use a 7/64" drill bit to bore pilot holes into the base block. (Figures 29 & 29a)



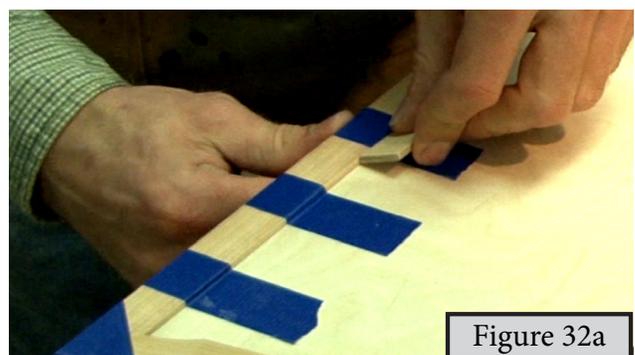
32) Apply glue and use 1-1/4" screws to attach the bottom trim strip to the frame. Be sure to clean up the excess glue right away.

33) Double check the miter angles. Sometimes a gap can occur once the bottom trim has been attached. One more dry fit should correct any problems. (Figure 30)

34) Use a pencil to mark the overhang of the thin side trim strips at top of frame. Cut with any type of saw. Be sure to leave about 1/16" overhang from your pencil line. (Figure 31)

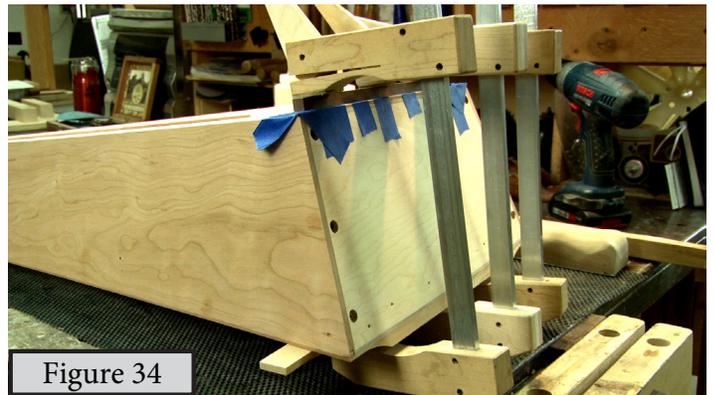
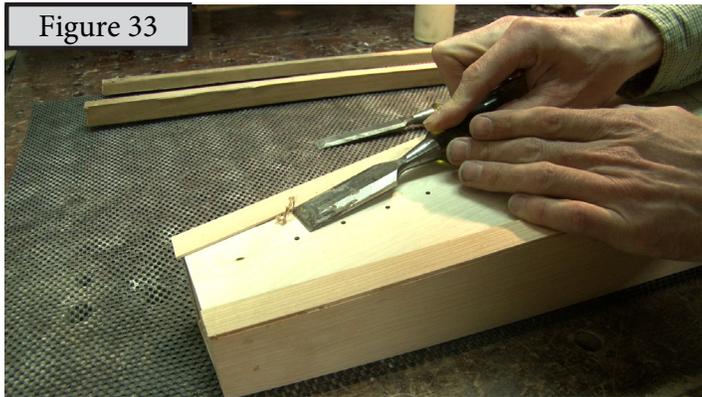


35) Apply glue to the trim. Lay the trim on the body and use cam clamps or masking tape to secure it down. Space the tape about every 1/2". Use a scrap block to push the tape against the inside edge of the trim strips. If using tape, think of applying each piece like a bandage where you are pulling the gap closed. Loose tape holds nothing well. (Figures 32 & 32a)



36) Allow 30-60 minutes for the glue to dry. Then remove the tape or clamps. Remove the excess glue with a purposefully dulled chisel. (We're trying to remove glue... not wood!) (Figure 33)

37) Repeat trim process for the back. Use clamps or tape to secure the bottom trim strip on the back. (Figure 34)



38) Use an 80-grit sanding block or disc sander to flatten the top of the inner top block. Check the block with a straight edge to make sure it's flat across the entire top surface. This will eliminate gaps when fitting the arched cap. (Figures 35, 35a & 35b)



39) Orient the arched cap block on top of the harp and check for best fit. Use two 2-1/2" wood screws and a hammer to make punch marks into the top block for locating your pilot holes. Notice that the back of the block is taller than the front. (Figure 36)

40) Use a 7/64" drill bit to bore two pilot holes, using the punch marks you just made with the screws as a guide.

41) Apply a liberal amount of glue and screw the arched top block into the top block with the same 2-1/2" screws you used as punches. Be sure to clean excess glue! (Figure 37)

41a) Apply glue and insert 3/8" tapered wood plugs into arched cap to cover the screws. Remove excess with a sanding block. Take care to not flatten the top of the arched cap or change radius. You need this piece rounded on the top to match the underside of the neck.



## NECK AND PILLAR ASSEMBLY

### Helpful Hint

Sanding is the largest portion of work that you will put into this kit. The process of sanding makes the difference between getting a professional looking instrument and something that the general population can easily identify as a 'home-built harp.' Take extra time and give special attention to this portion of the project. You won't regret the extra time you took when you see the difference it makes in the finished product! We sand all of our kit parts to 100-grit. It would be wise to start with a 120-grit paper and work your way up to 180-220 grit.

Sandpaper grits are arranged according to number. The lower the number, the rougher the sandpaper. (i.e. Sanding with 80-grit will be more aggressive than sanding with 100-grit. The 80 grit will remove more wood.) The progression of sandpaper grits is as follows: 80 - 100 - 120 - 150 - 180 - 220.

42) Begin by rounding the shoulder of the neck with a hand held belt sander or sanding block. Clean up any pointed areas with a chisel, rasp, or similar. The goal here is to create a smooth flow across the entire neck. (Figures 38 & 38a)



Figure 39



Do not round over this top corner. You'll need the full flat surface for mounting sharpening levers. Just knock off the sharpness of the edge by hand-sanding.



Figure 39a

**NOTE:** It is much easier to sand the neck and pillar before they have been assembled. Do the majority of your sanding before you put these parts together.

**CAUTION:** Be sure to test-fit the neck to the pillar without glue first, to make sure the joint is easy to assemble. If the wood has swollen a little from humidity, you can lightly sand the area to allow a little room for glue. Also, make sure your power screwdriver has enough torque to turn the 2 large #14 screws into the wood. Try it out dry first, using the #3 square-drive bit provided. Change batteries now, if needed.

**HINT:** It also helps to clamp the neck in a vise (with padding) or to your work surface so you can push hard on the power screwdriver. It is important to draw the parts fully together.

44) When satisfied with the fit, apply glue and fit the neck to the pillar. Use the provided #14 x 2" wood screws to draw the neck and pillar together firmly (Figures 40 & 40a). We pre-drill these pilot holes with a 3/16" drill bit, before it leaves our shop, so they should line up perfectly.

Figure 40

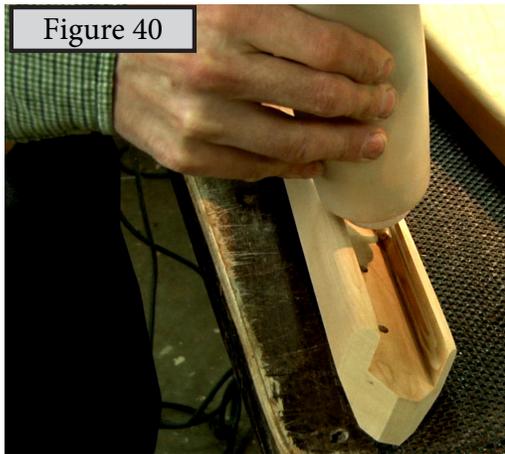


Figure 40a

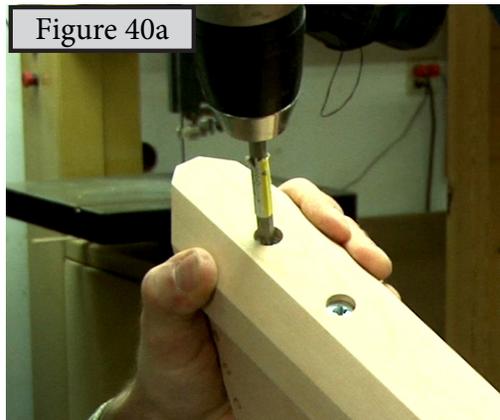


Figure 41



45) Clean up any excess glue residue using a damp cloth and dulled point to get into cracks. A screwdriver or dull chisel will work perfectly for this application. (Figure 41)

46) Once the glue is mostly dry (at least 30 minutes), cover the #14 x 2 1/2" wood screws with the provided wood plugs. Glue them in the holes and allow ample drying time before removing the excess plug material.



Figure 42

47) Using a chisel, scraper, or sanding blocks remove the excess plug material from the front of the pillar. Sand the front of the pillar to match the rest in smoothness. (Figure 42a)



Figure 42a

## FITTING THE NECK AND PILLAR TO THE BODY

**NOTE:** We do our best to ensure the neck and pillar will fit the body of your harp, before it leaves our shop. However, as a result of the building process, sometimes slight variations can occur that will require you to adjust the final fitting at the end of the building process.

48) Place the body of the harp on its back on your workbench. Hold the neck and pillar assembly in place on the body. Check the fit at the back of the neck where it slides into the cap block, and then check how the bottom of the pillar meets the base block. Look at the photos below and make minor adjustments as needed to achieve a good fit.

Figure 48A shows a perfect fit. If yours looks like this, you may proceed to Step 58 on the next page.

Figure 48B shows a small gap of about 1/8" between the pillar and the base block, and this is acceptable. The screw that you install in Step 63 will draw this gap closed very easily. If the gap is wider than an 1/8", however, you may want to fit and glue a shim under the pillar to fill the gap.

Figure 48C shows a pillar that is too long and needs to have some wood removed at the bottom. In some cases you may need to remove a significant amount of wood using a hand saw first, then following up with a sanding block or flat file as needed.



Figure 48a

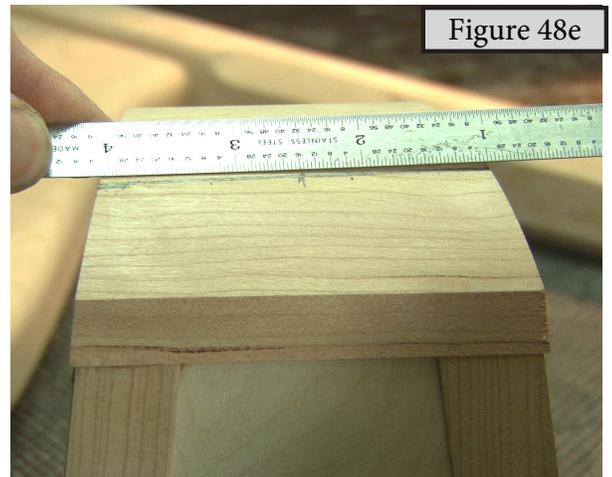
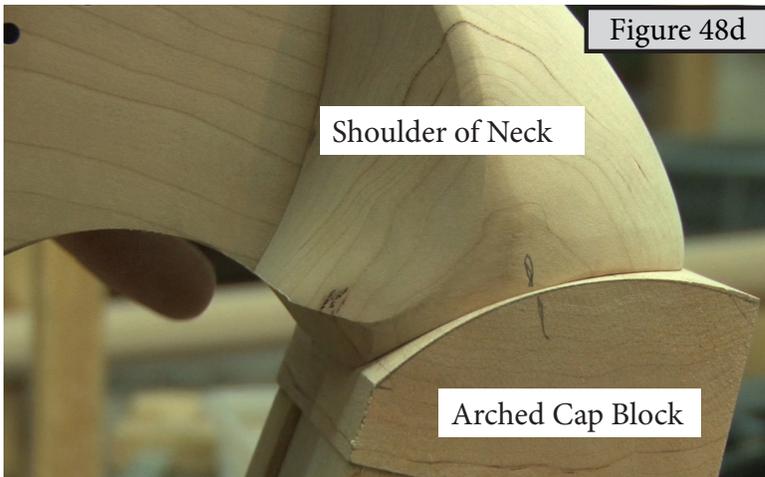


Figure 48b



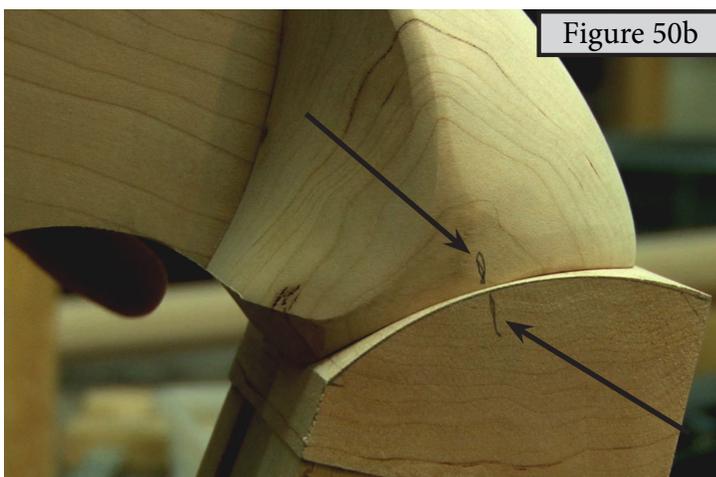
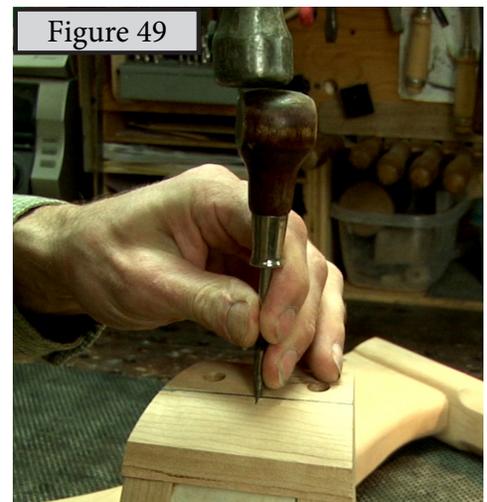
Figure 48c

Stand the harp up, leaning it against your work table, so you can check the fit of the back of the neck on top of the soundchamber. Mark hash marks on both sides of shoulder and top of the arched cap. Connect marks across both pieces using a straight edge. Be sure that marks match on both the arched cap and shoulder. (Figure 48d& 48e)



49) Mark the center of this connecting line and punch with an awl or other sharp tool. This is where you will drill for the hidden dowel that keeps the neck centered on the body. (Figure 49)

50) Again, place shoulder of neck onto arched cap and mark a line for guiding the direction of the drill. (Figures 50a & 50b)



### Helpful Hint:

Use a brad-point bit for drilling this hole if you can. Twist bits are OK, but they tend to wander more than a brad-point. (Figure 45)

51) Use masking tape to mark a depth stop on your 3/8" drill bit at 1-1/4". This drill bit is not included in your hardware pack. However, it's a common size in most drill bit sets. (Figure 51)



Figure 51

52) Using the guide line you just marked, drill both the top of the arched cap and the under side of the neck to the depth of your tape. Rock the drill front to back about 10° to give the dowel potential for a little movement. **DO NOT ROCK THE DRILL BIT LEFT/RIGHT** (Figure 52, 52a & 52b).

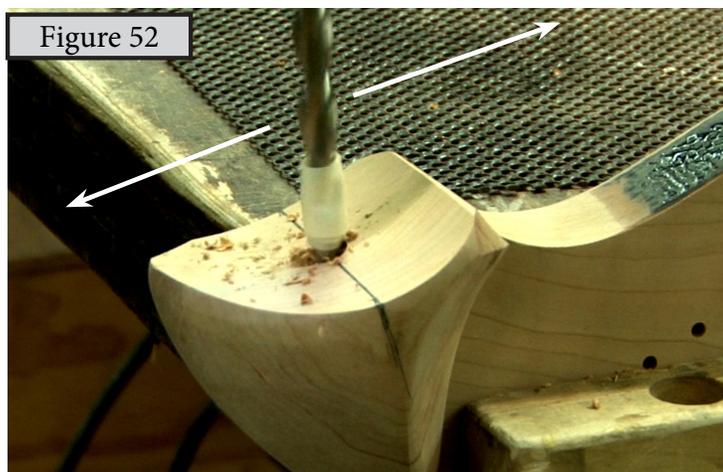


Figure 52

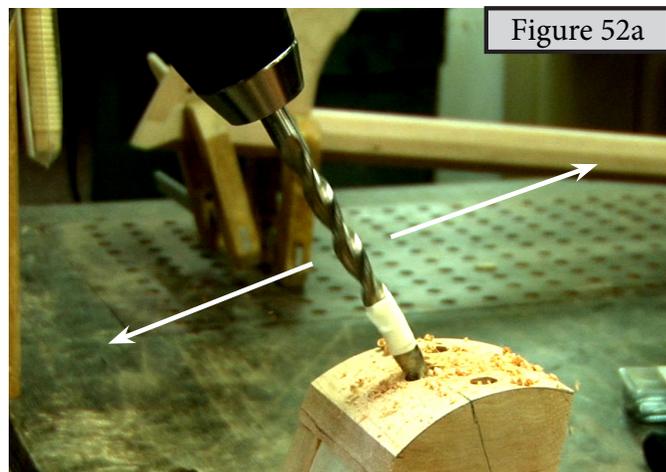


Figure 52a



Figure 52b

52b) After the dowel is inserted, place the neck on the body and set the entire harp on its back, on your workbench. Use a 7/64" drill bit to bore a hole through the base block into the bottom end of the pillar, aiming it upwards to match the angle of the pillar.

52c) Use a 2" wood screw to secure the pillar to the base block. (Figure 52c)



Figure 52c

**NOTE:** You might notice some wiggle room in the neck and pillar once you've inserted the wood screw into the pillar. This movement is natural and will cease once the strings are installed. There is no need for glue on the arched cap block or under the bottom of the pillar.

53) Stand the harp up again and trace the outline of the shoulder onto the arched cap. Then remove the neck/pillar assembly so you can do some heavy shaping and sanding around the arched cap. The goal is the taper and round the arched cap block to reach the pencil marks you just made. Look at the back view of the finished harp on the last page of these directions to get an idea of how this makes the harp look smooth and rounded. (Figure 53 & 53a)

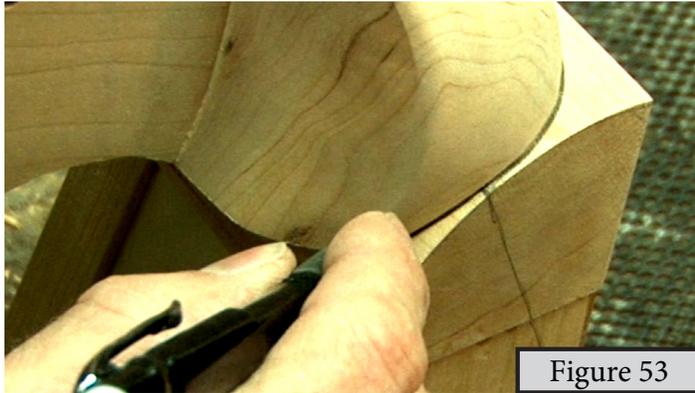


Figure 53



Figure 53a

### Point of Interest

The joint between the back of 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.



Figure 54

### PREPARING THE HARP FOR FINISH

54) Use sanders/planes to create a 1/4” round-over along all four long corners of the box. (Figure 54)

55) With the body separated from the neck/pillar, take time to smooth all corners and remove any machining marks from the entire harp. (Figure 55)

Start with 180 grit sandpaper, sanding with the grain direction. Then switch to 220 grit for the upper shoulder area to create a smoother surface on the most frequently touched parts of the harp.

Be sure to sand the neck/pillar joint flush with each other. This will make for a much nicer looking finished harp. (Figure 55b)

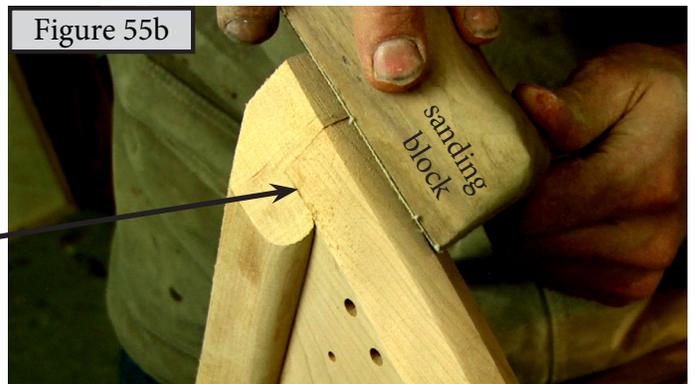


Figure 55b

56) 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 epoxy, wood glue, or super glue mixed to a consistency of putty (wood glue can be thinned 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.

### General Finishing Guidelines

**STAINS or DYES** -- These are coloring agents and should only be used if you want to change 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 best with a clear finish. But, if you want to color the wood, your staining should be accomplished before applying a surface finish such as oil, varnish, or lacquer.

**OIL or WAX** -- Be very cautious about using an oil or wax finish. If the this type of finish gets into the tuning pin holes, it will act as a lubricant, and you may have trouble keeping the instrument in tune. Oil finishes 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. Some people are fond of a beeswax finish for a natural look, but it can show water spots if it gets wet, so you may end up needing to re-wax or touch up the surface in the future.

**POLYURETHANE VARNISH** -- Any regular varnish will work fine on this project, but we think a wipe-on (gel) polyurethane is the easiest to apply because it does not drip or sag -- just wipe on a thin coat and wipe off the excess. Our complete finishing kit includes a half-pint can of satin gel polyurethane (instructions printed right on the can), plus sandpaper sheets, and foam applicator for the first coat. The advantages of this finish are its simple application, minimal odor, good durability, and deep, soft luster.

**LACQUER** -- Many professional instrument makers 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.

57) Apply the finish of your choice, sanding lightly between coats with very fine sandpaper (600 grit) or steel wool (#0000). Don't forget to sand and finish the feet, too!

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

### OPTIONAL DECORATING

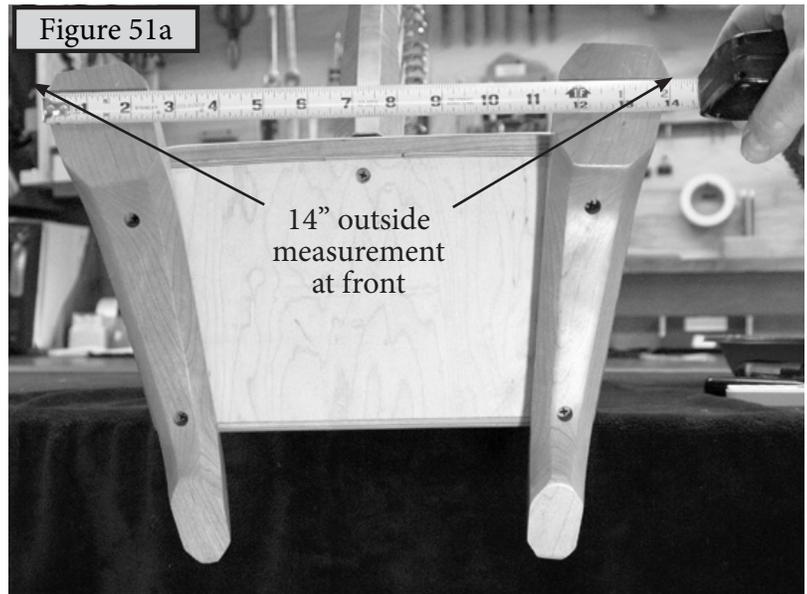
Hand painting or woodburning are fun ways to decorate your instrument. Light painting can be applied between coats of varnish or lacquer very nicely and will not harm the sound of the harp. Some people use acrylic paints, and others decorate with colored pencils or pastels. This is a great way to personalize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

### INSTALLING THE HARDWARE

58) Locate the brass eyelets in your hardware pack. Install the eyelets in the soundboard. The 12 large eyelets will go in the bass (wider end) of the soundboard, near the bottom. Notice we use an awl for pushing the eyelets fully into the holes. (Figure 50)

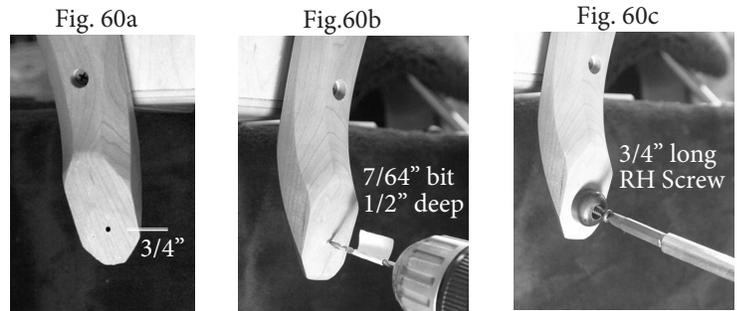


59) Orient the feet on the bottom of the harp with the larger portion of the foot in the front. The feet should be nearly flush with the sides of the body of the harp, but keep the “toes” within 14” on the outside so your harp will fit our gig bag. (Figure 51a)



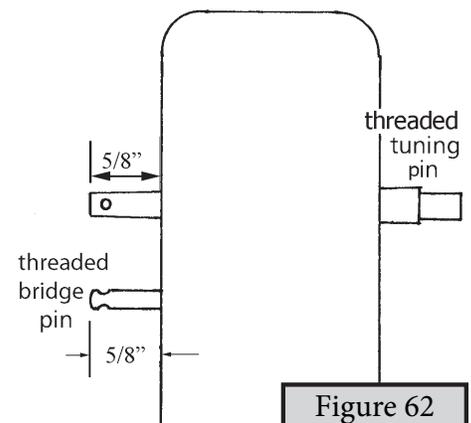
Using an awl, mark where your screws will be located. Bore pilot holes into the base using a 7/64” drill bit. Attach the feet using the 1-5/8” wood screws that are provided in your hardware pack.

60) Install a Rubber Bumper under each end of each foot, being careful with placement -- Make sure that the rubber at the back end of the feet will stay in contact with the floor when you tip the harp back on your shoulder to play, and make sure not to drill the hole for the mounting screw through the top side of the foot. Figures 60a, 60b, & 60c illustrate how we install the bumpers.



**NOTE:** Our threaded bridge pins are adjustable in depth, allowing you to change the space between the harp string and the wood surface of the neck, using a 5/64” Allen Wrench. This will be important later when you want to install sharpening levers.

61) Install the 33 threaded bridge pins into the lower row of holes drilled in the neck. Tap them partially in with a hammer and then turn them in with a 5/64” Allen Wrench until the top is about 5/8” above the surface of the wood. Use the 5/8” spacing guide to check the pin height. (Figure 61)



62) Turn the neck/pillar assembly over so the bridge 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 bridge 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 narrow end extends about 5/8” beyond the surface of the wood. Use the spacing guide to check these pins, too. (Figure 62)

63) Finally you can install the strings. The installation instructions and string chart are packed in a zip-loc bag with the strings. You will need a pair of scissors, a wire cutter, and your tuning wrench for this last operation, but the messy work is over. So grab your favorite beverage and move to a comfortable spot in the house where you will turn this project into a musical instrument!

#### 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 backward to unwind the string, then pull more of the string through the hole and tighten again.

Expect it to take around 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 second look at the stringing instructions - you may need to secure the knots inside the soundchamber or the windings around the tuning pins. A drop of superglue can stop a slippery nylon knot from slowly untying itself...

#### 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 at a string allows you to raise the pitch of that string one-half step by engaging the handle 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 at 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.

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

## Caring for Your Jolie 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 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.

**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 sharpening lever is flipped up (engaged), and you have Universal Levers, there are two possible solutions: You need to screw the small brass bridge pins a little deeper into the wood. This lowers the string height so the strings make more firm contact with the sharpening lever.

If the buzzing occurs when the lever is flipped down (disengaged), the string may be vibrating against some part of the sharpening lever. 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 brass bridge pin on which the string rests above the sharpening lever. (Make sure the string is resting in the groove of that pin.) Use the small (5/64") Allen wrench provided to turn the bridge pin in or out, watching how that moves the string in relation to the sharpening lever.

If the problem is not located around the sharpening 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.

Occasionally we hear of a buzz caused by a loose piece of wood, such as a decorative rosette or inlay strip. Test these things by pressing on the part while you pluck the string to see if the noise stops. When you find the loose part, you'll need to add some glue to hold it firmly in place.

**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 taken apart and removed from the soundchamber to facilitate repair work. Simply loosen the strings and unhook them from the tuning pins. Then remove the screw 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.

**HUMIDITY:** All acoustic instruments are susceptible to humidity. Moisture in the air can make the wood of an instrument shrink and swell. Over time, the shrinking and swelling can cause the wood to crack. The general rule for keeping an instrument from cracking is: If the weather is comfortable for a person, then it's also comfortable for wood.



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