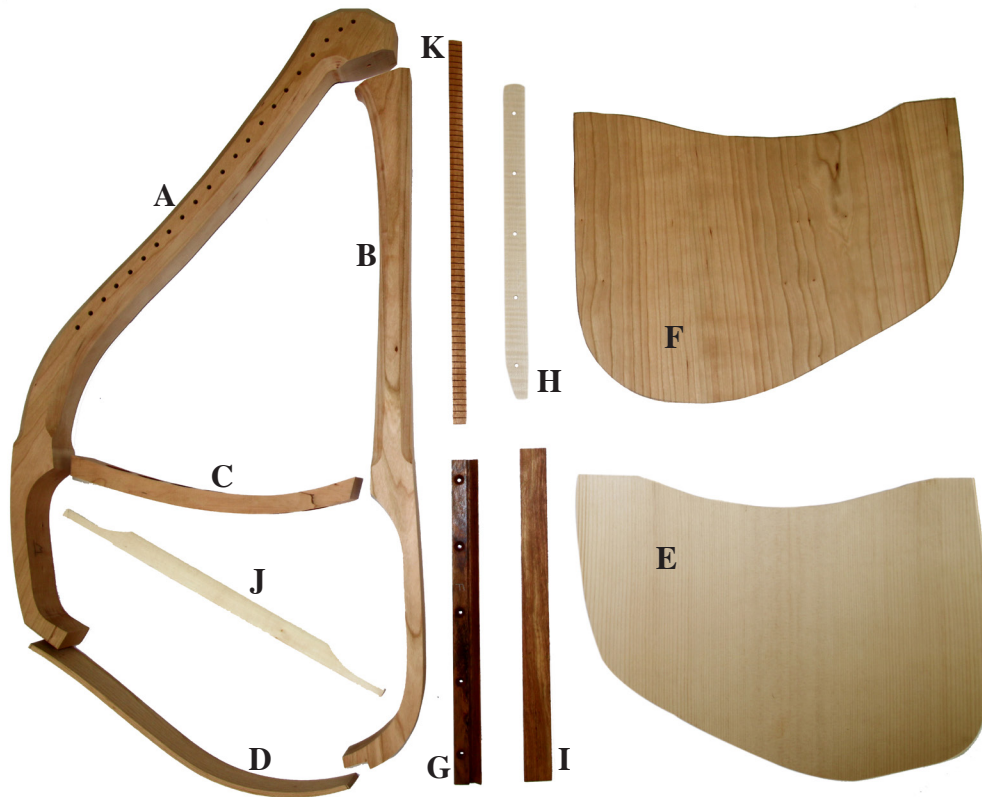




THE LYNDA LYRE KIT

Updated March 2020



WOOD PARTS:

- ☐ ☐ A - Side A
- ☐ ☐ B - Side B
- ☐ ☐ C - Soundhole Arch
- ☐ ☐ D - Tail Strip
- ☐ ☐ E - Front Panel (Soundboard)
- ☐ ☐ F - Back Panel
- ☐ ☐ G - Bridge
- ☐ ☐ H - Bridge Pad
- ☐ ☐ I - Bridge Cap
- ☐ ☐ J - Inner Brace
- ☐ ☐ K - Kerfing Strip
- ☐ ☐ 1 Stand base (not pictured)
- ☐ ☐ 2 Stand fins (not pictured)

HARDWARE PARTS:

- ☐ ☐ 1 Wood Screw, 3"
- ☐ ☐ 4 Wood Screws, 2-1/2"
- ☐ ☐ 12 Zither Pins
- ☐ ☐ 10 Zither Pins with enlarged holes
- ☐ ☐ 5 Machine Screws, flat head 6-32 x 1"
- ☐ ☐ 5 Stop Nuts 6-32 x 5/16"
- ☐ ☐ 1 Drill bit - 9/64"
- ☐ ☐ 5 Cherry plug, 3/8" dia
- ☐ ☐ 1 set of 22 strings, nylon or wire
- ☐ ☐ 1 Strap w/mounting button and screw
- ☐ ☐ 1 L-handle tuning wrench
- ☐ ☐ 1 Cardboard bridge template
- ☐ ☐ 2 Brown felt strips for stand
- ☐ ☐ 2 foam pads for stand
- ☐ ☐ 1 Harp medallion (3/4" dia) for stand
- ☐ ☐ 1 Assembly Instructions

Musicmakers
14525 61st ST CT N
Stillwater, MN 55082

BEFORE YOU BEGIN

—A. Inventory and inspect all your parts carefully. If anything is missing or defective, please call us right away.

651-439-9120

—B. It is a good idea to read through the entire assembly instructions before you start, just to get an overview of the project.



A NOTE ABOUT 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 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 wood-working adhesives.

ASSEMBLE THE FRAME

—1. Test-fit the frame parts together so you can be sure everything fits well and that you understand how each part is oriented. Note that the Soundhole Arch looks like it might fit either way, but it fits best only one way. Same for the Tail Strip. (Fig. 1)

All parts should match in thickness quite well, but you may need to sand a little to get the joints to mate nicely. You might want to sand off any burn marks or rough spots on the arms of the frame before assembly because some areas will be hard to access after assembly.



FIG. 1

—2. Please take time to clear enough space on a flat table for assembling the frame. Begin assembly by gluing and screwing Side A to Side B, as shown here. (fig. 2) Make doubly sure that the frame remains flat and level on your work surface.

If you discover a twist in the frame after the glue dries, you're likely to experience some frustration, and we'd like you to avoid that!



FIG. 2



The screw is important for drawing the parts together, but it may also shift them slightly, requiring some sanding to even out the faces, and that is fine. The cherry wood is easy to shape with a sanding block or a hand-held random orbital sander. Cover the screw by gluing the cherry wood plug into the hole.

- ___3. Once the two sides are joined, you can fit the soundhole arch in place. This may require shaping the ends a little with a disk sander to change the angles slightly.

Make sure to orient it as shown in the parts photo. (fig. 1, fig. 3A) It should fit most easily that way. The important thing is to have a tight-looking joint where it will be visible on the outside of the finished instrument. A gap on the inside will be covered by the front and back panels.



FIG. 3A

When satisfied with the fit, apply glue to each end of the Arch and position it between the sides. Install the (4) 2-1/2" wood screws in the pre-drilled holes in the frame. (fig. 3B) Make sure to wipe up any excess glue that squeezes out with a damp rag.

Cover the 4 screw holes with the remaining tapered cherry wood plugs by gluing them in the holes. Once the glue dries (about 45-60 minutes,) you can sand them flush with the frame.

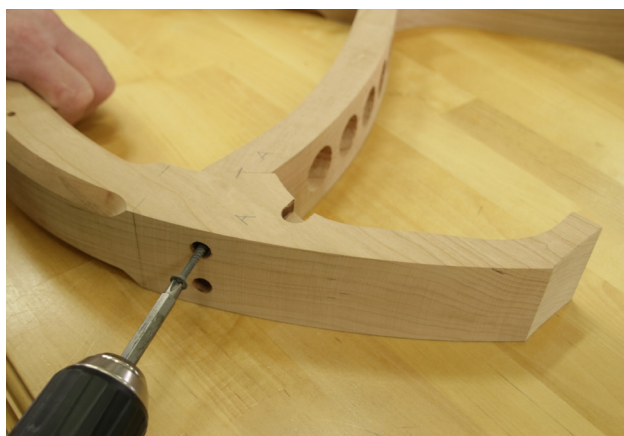


FIG. 3B

- ___4. Test fit the curved tail strip to the bottom of the frame. It fits best only one direction, but you may need to do a little sanding of the frame pieces or the ends of the tail strip so they fit together nicely. Check specifically how the joints will appear on the outside of the instrument when assembled, so there will be no open cracks showing.

When satisfied with the fit, apply glue to the mating surfaces and use clamps to hold the parts together until dry. We have specifically made these joints to be easy to clamp, either with c-clamps or spring clamps, as shown.

When dry, saw off the excess tail piece (fig. 4a) and sand it to blend with the side of the instrument.



FIG. 4

INSTALL THE KERFING

- ___5. Cut the kerfing strip to fit inside the tail piece as shown -- it does not need to fit perfectly tight at each end. The purpose is simply to give more glue surface for the soundboard in this area.

When satisfied with the fit, glue and clamp the flat side of the kerfing to the tail piece so the wider edge is flush with the the edge of the tail piece. (fig. 5) Use small spring clamps or clothes pins to hold the kerfing in place until dry.

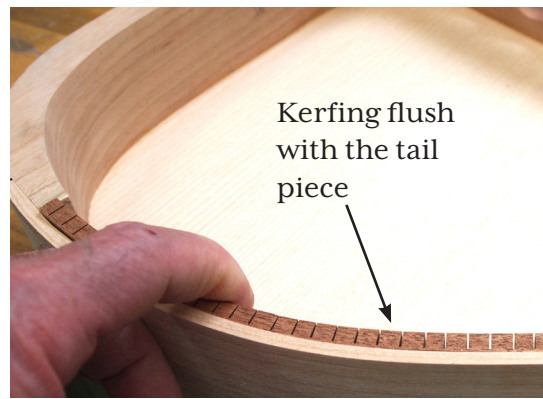


FIG. 5

- ___6. Use a long flat sanding block with coarse sandpaper (60 grit) to sand the joints & kerfing level, as shown at left. (fig. 6) You'll be gluing the spruce front on this frame, and that panel is thin and fragile, so it is very important to smooth & even edges on the frame. Otherwise you might crack the spruce as you clamp it in place. Better to have a gentle slope at a joint than an abrupt "step".



FIG. 6

INSTALL THE INNER BRACE

- ___7. Test fit the brace into the two slots in the frame. The flat side of the should face up to make contact with the soundboard. (see fig. 7A and B)

Generously apply glue to the bottom of the slots and then insert the brace. Apply clamps or weights to where the frame meets the brace. (fig. 7A) The excess glue will squeeze out around the sides. Wipe off any excess glue that may squeeze out onto the surface of the frame. Allow 45-60 minutes for the glue to dry.

Once the glue is dry, use sandpaper to taper the brace flush with the frame on both sides. (fig. 7B)

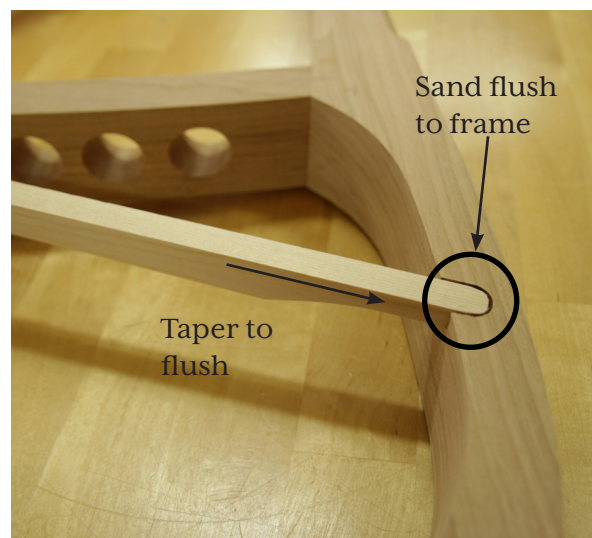


FIG. 7A,B

INSTALL THE SOUNDBOARD

The Soundboard is the light colored spruce wood with straight grain. We have packed a roughly cut piece that is oversize, just to make sure you can cover the sound chamber of the instrument all the way around. When we position the soundboard, we like to have the top edges of the spruce lined up just above where the soundhole arch meets each side piece. That reduces the amount of sanding needed to taper and blend the spruce with the arms of the lyre.

- 8. You'll need to gather a number of clamps to press around the perimeter of the sound chamber when gluing the Soundboard in place. If you are short on clamps, you can use scraps of wood on top of the spruce to help distribute your clamping pressure over more of the perimeter. Most any kind of clamps will work, as long as they open far enough -- c-clamps, spring clamps, cam clamps, etc. (fig. 8A)

It is also good to have a clamping board to put the under the instrument while you clamp the soundboard in place. The spruce is soft, and will easily dent. The clamping board will help protect the spruce soundboard from the clamps, as well as distribute the pressure.



FIG. 8A

We like to turn the frame upside-down when gluing the soundboard in place. This makes it easier to see that your clamps are squeezing out glue all the way around the frame, and the excess glue will not drip down the cherry frame and onto your table. Make sure to use a healthy amount of glue.



Make sure to put glue along the flat side of the brace that will be against the soundboard. It is important for the brace to have a good bond to the soundboard. Also, make sure you clamp/apply pressure to the brace as the glue dries. Fig. 8B, shows 3 different combinations of clamps/clamping blocks you can use. Cutting a notch in the bottom of the clamping blocks will help when securing the clamps.

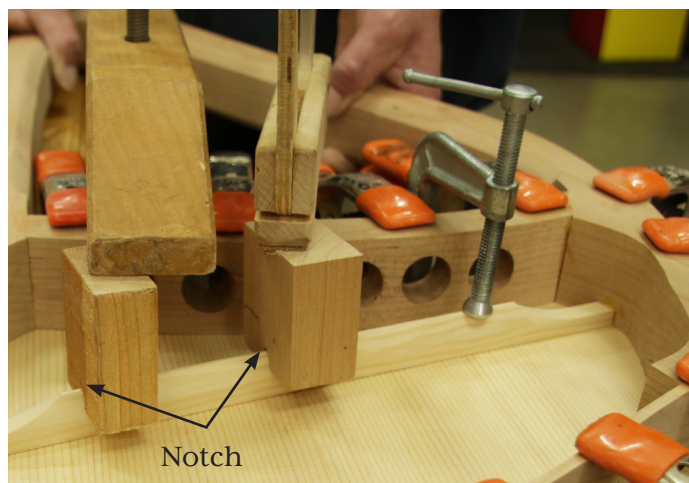


FIG. 8B

- 9. When the glue is dry, you can trim off the excess spruce around the edges. We use a flush-trim router bit for this job, moving the router clockwise around the frame. But you can also use a coarse sanding block or random-orbital hand sander to wear away the overhanging panels. The spruce is quite soft, so it sands down quickly, but work carefully so you don't chip the wood or cause splinters that deface the top surface.



FIG. 9A

Once the spruce is trimmed close, you can round over the edges lightly around the frame and tackle the two places where the spruce needs to be bevelled to blend into the cherry arms. We love a random-orbital hand sander for this purpose. (fig. 9A) You can literally sculpt the wood to the shape you want, blending the bevels of the cherry frame into the spruce, as shown below. (fig. 9B)



FIG. 9B

INSTALL THE BRIDGE

- 10. Find the bridge parts shown. (fig. 10) The bridge and bridge pad are carefully drilled so the holes line up for 5 mounting screws. The parts will fit correctly only one way, with the flat surfaces facing each other. Check it out to make sure. You may have to flip the bridge pad end-for-end to get all 5 holes into alignment.



FIG. 10

Also find the cardboard bridge template provided.

- 11. Carefully align the cardboard to the wood frame. The bridge should be centered in the opening at the bottom, as shown at right. The template should cover most of the soundboard, with the arms fitting above the box and the top edge of the cardboard aligned with the curved soundboard arch.

When aligned, use masking tape to hold the template in place. (fig. 11)

Then position the wood bridge against the cardboard opening at the bottom of the template, as shown.



FIG. 11

- ___12. Use tape to hold the cardboard in place so it does not slide out of position as you work on the bridge. Then check the distance from the first tuning pin to the top of the triangle where the first string will pass over the top. It should be close to 8 inches (203 mm). Don't worry if it is 1/8" (3mm) different either way -- that is close enough. Make adjustments if needed.

Check the span of the last (longest) string too. It should be about 25 inches (635 mm). (fig. 12)

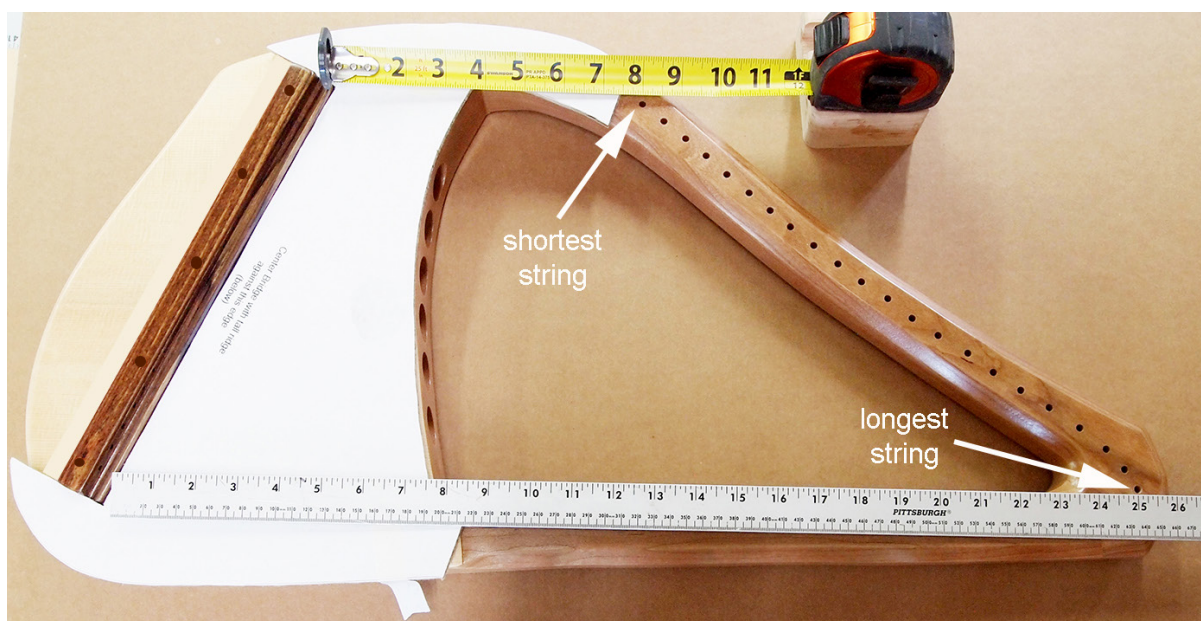


FIG. 12

- ___13. Find the 9/64" drill bit supplied in the kit and hold the bridge in place as you drill just one hole straight through the bridge and soundboard as shown. (fig. 13)

You may notice that the bridge wiggles a little as you drill, and that's why you must be careful to drill one hole at a time and push a mounting screw into each hole as you drill, just to make sure the bridge stays in place.

Drill the hole at the opposite end next, and place a screw through that one.

Then you can drill the other three holes.



FIG. 13

- ___14. **Do this step without glue.** When all five mounting holes are drilled through the soundboard, flip the instrument over.

(HINT: If you place masking tape over the screw heads, they won't fall out when you flip the instrument over.)

Test-fit the bridge pad over the screws. Remember it will fit only one way. Make sure the flat surface is facing the soundboard and the screws line up, as shown at right. (fig. 14)



FIG. 14



If the bridge pad interferes with the frame of the sound chamber, feel free to trim the ends so it fits. We like it to come fairly close to the edges of the frame.

- ___15. When you are satisfied that everything fits, we recommend marking an “X” near one end of the bridge pad so you remember how it should be oriented.

We also suggest sanding the outside face of the soundboard now, before gluing the bridge in place. It is easier to sand in the direction of the grain without the bridge in the way. Use 180 or 220 grit paper for this fine sanding. Also, we recommend using the same grit sandpaper to smooth any roughness of the bridge now, while it is easy to hold up to the light and inspect.

ITEMS REQUIRED FOR GLUING BRIDGE:

Power screwdriver with Phillips bit

5/16” socket wrench, or nut driver, or end wrench to fit stop nuts

Glue

Damp rag

Two spare hands for holding, and spare eyes for seeing, both inside and outside of sound chamber at once. If you don’t have a helper available, use a clamp or two to hold the frame on its edge as shown on next page.

- ___16. Use a vise or large clamp to hold the instrument firmly on its edge so you have easy access to both sides of the soundboard (inside and outside). (fig. 17)

Apply glue to the flat mating faces of the bridge and bridge pad, as shown. You don’t need a lot of glue, but just enough to get spread over the surfaces when clamped. (fig. 16) You’ll use your wet rag to clean up the excess glue after the screws are tightened.



FIG. 16

Start by putting the 5 screws through the bridge and through the soundboard. Then you can place the bridge pad inside onto the same 5 screws.

- ___17. Use your 5/16” wrench in one hand and the power screwdriver in the other to fasten the 5 lock nuts firmly in place, so they draw the bridge and bridge pad tightly together on either side of the soundboard. (fig. 17) This is the only clamping pressure you need to hold these parts -- the screws and nuts will be left permanently in place to make sure the string tension does not gradually pull the bridge off the front.



FIG. 17

- 18. Before the glue dries, we recommend cleaning off the excess that squeezes out from under the bridge and bridge pad, as shown below. (fig. 18A)

The outside front of the instrument is the most critical, so be thorough about cleaning around the bridge, using fresh parts of the rag to make sure you are not just spreading the glue further out on the surrounding wood.

We use a flat screwdriver inside the folded rag to help get into the tight corners for final cleanup. (fig. 18B)



FIG. 18A

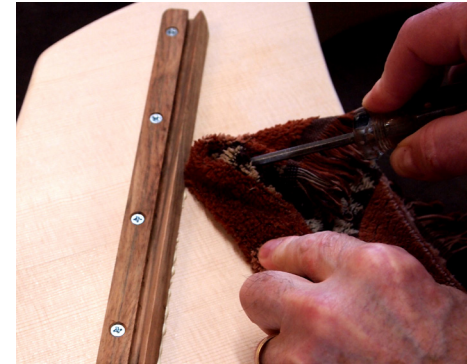


FIG. 18B

- 19. **(Optional)** This is a good time to sign and date the inside of the back panel. We like to create a label on our computer and print it on parchment style paper, (fig. 19), but you can easily sign with pencil or pen right on the wood itself. Your signature should be positioned so it can be seen through the sound holes.



FIG. 19

- 20. **(Optional)** Before closing up the sound chamber, be sure to decide if you want to install an electric pickup for amplification. The Lyre has good sound without a pickup, but if you plan to use it for performing or recording, you might like amplifying the sound. If so, install that hardware now, as shown below. The sensor should be centered between the brace and the bridge pad, above the middle screw. (fig. 20)

If you purchase one of our piezo pickups, you can mount it through a 1/2" diameter hole in the frame near the lower end of the bridge, as shown. The sensor disc will be glued directly to the soundboard with adhesive provided with the pickup.

Be sure to gather the excess lead wire into a little bundle that will hang free of the soundboard -- otherwise the wire might vibrate against the soundboard or back panel as you play the instrument. Use good tape to secure the wires together permanently.



FIG. 20

- 21. Check the edges of the frame to make sure all the joints are smooth and level before gluing the back panel in place. When satisfied, put a bead of glue all around the circumference of the sound box and clamp the back panel in place.

Just as with the front panel, this requires a lot of clamps, but you can use many different kinds -- c-clamps, spring clamps, cam clamps (fig. 17a), etc. Be sure to keep the clamping pressure close the edges. You don't want to deflect the wood downward in the center of the box. Look for glue to squeeze out all around the perimeter. You will be trimming and sanding the outside after the glue dries.



FIG. 21

- 22. When the glue is dry, you can trim off the excess back material and round over the corners of the sound chamber using a router (1/4" radius round-over bit), a random-orbital sander (120 grit), or a sanding block. You want the edges of the box to be smooth and rounded so it feels good in your hands.

Be careful to not to sand through the thin veneer on the back panel. The back is quite smooth already, so it should only require very light sanding with 220 grit paper.

- 23. The long thin bridge cap will form a little “roof” (fig. 23A) over the string ends to clean up the appearance of the bridge. This piece requires a little trimming to match the length of the bridge and light sanding to soften the sharpness around the edges.

When ready, apply glue sparingly to the flat top of the bridge, as shown. (fig. 23B) use just hand pressure or masking tape for clamping, unless the cap tends to warp and lift up or something. In that case a little weight should hold it down until dry.

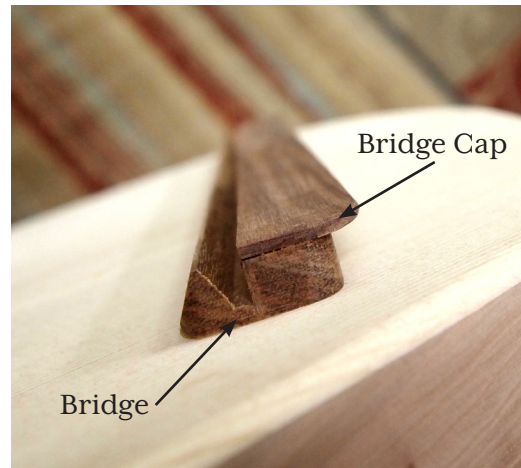


FIG. 23A



Make sure the cap does not slide out of position under the pressure. We like to line up the leading edges of the bridge and cap so the cap overhangs the back of the bridge, as shown.



FIG. 23B

STAND

- 24. We've included a simple stand kit with the Lynda Lyre to help you hold the instrument more easily and comfortably. Find the wood parts for the stand and sand them smooth, removing any burn marks and scratches from all the surfaces. (fig. 24)

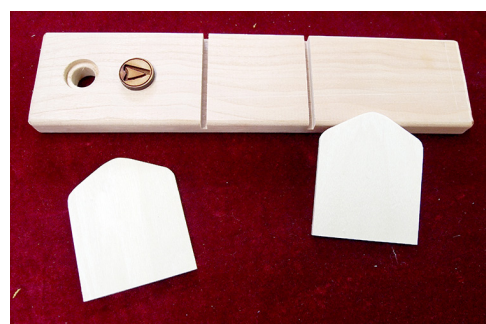


FIG. 24

- 25. Test-fit the two thin plywood fins into the slots in the base, (as shown in fig. 25). If they are too tight, sand the lower surfaces of the fins to thin them out a little.

When they fit easily, squirt a tiny amount of glue in the slots and press the fins into place.

Apply finish to the stand and the top of the harp medallion. (See finishing notes on pg. 12) The through hole is meant for hanging the stand for drying the coats of finish.

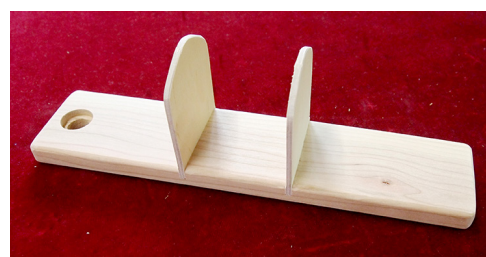


FIG. 25

- 26. When dry, glue the medallion in place to plug the top of the hole. Superglue works well for adhering finished parts.

Install the sticky-back felt strips to the inside surfaces of the fins and base as shown in fig. 26.

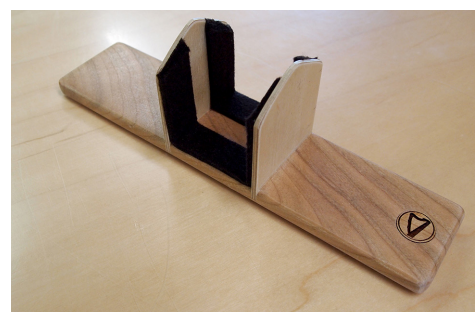


FIG. 26

FINAL SANDING

- 27. When the glue is dry, use a chisel to scrape off any excess glue that squeezed out from the bridge cap, and begin your final sanding of the whole instrument. There are two main goals for this step: 1) smooth all wood surfaces so they feel good (no machine marks or roughness), and 2) remove any glue residue that might show up when you apply finish. You should be able to accomplish the smoothing and cleaning with 180 grit sandpaper and then switch to 220 grit to make everything “baby-bottom” smooth.

You may have some small cracks to fill at the joints of the frame too. We like cherry- or mahogany-colored putty from the hardware store to match the cherry frame. If there is a dimple to fill in the front soundboard or the light-colored band around the plywood back, a natural or birch filler paste will work for those areas. Some woodworkers like to mix up their own paste using sanding dust from the same wood. Just add a little glue and a drop of water, and you can stir the fibers into a nice paste that will dry to the same color as the rest of the wood.



HINT: If the sound holes have irregular coloring on the inside from our drilling, you can paint those inner surfaces black with acrylic paint (from an art or craft store) to make them look uniform in color. If you get a little paint on the top of the arch, just sand it off after it dries.

FINISHING

Now you are ready to apply the finish. Here are some recommendations:

STAIN -- Stains are coloring agents and should only be used if you dislike the natural color of the wood. We generally discourage people from trying to stain this project because the natural wood grain is so beautiful with a simple clear finish. If you are a novice at finishing, or facing a deadline for completion, we especially recommend avoiding stain.

OIL -- An oil finish (such as Watco Danish Oil) 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, unless you use the more expensive gunstock oils that require a lot of hand polishing.

POLYURETHANE -- Any polyurethane will work fine on this project, but we like the solvent-based ones better than water-borne versions. Our favorite is a wipe-on gel polyurethane, available from hardware stores and building centers. Two good brands are Minwax and General Finishes. The advantage of a wipe-on finish is that it is simple to apply (no drips or runs), and it has excellent durability, and a deep, soft luster. We recommend avoiding a high gloss finish, as that is very difficult to apply successfully.

LACQUER -- Many professional instrument makers still use nitro-cellulose lacquer for their finish. The most readily available lacquer is called Deft Clear Wood Finish. If you choose this product, it will work best if you seal the wood first with clear shellac, such as the Zinsser brand. Then you can lightly sand the first coat smooth and spray the aerosol can of Deft lacquer for the final coats. The advantage of this finish is its quick drying time, but the disadvantage is the strong odor and toxic lacquer fumes.



OPTIONAL: If you wish to add other decorations to the instrument (decals, paints, etc.), it is smart to do that work between layers of finish. The urethane will seal the decorations permanently to the instrument.

STRINGING & TUNING

- ___28. When the finish is dry, find the tuning pins in your hardware pack. Note that some pins have enlarged holes to accommodate thicker strings. Install these pins first in the holes for strings #22-18 (C3 - G3) and strings #15-11 (C4 - G4). Consult your string chart to locate these holes in the lower range of the instrument.

Orient the tuning pins with the fine threads going into the wood, and the square shaft facing up. You can tap the pins partway in with a hammer, and then turn them in further with the tuning key, setting them all at the same height (7/8”) as shown. (fig. 28)

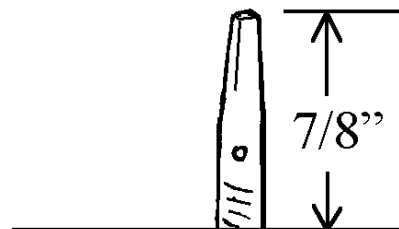


FIG. 28



HINT: If you have a drill press (turned off please!), you can “press” the tuning pins in using the handle of the tool to push the chuck down against the pins.



We offer this kit with either nylon or wire strings. If you have wire strings, skip to step 27 for the instructions for installing those.

NYLON STRINGS

- ___29. Find the longest and fattest string -- a red one with a leather washer at the knotted end. This washer may need to be clipped a little to fit under the bridge cap. Use a scissors to cut a small wedge off one side. (fig. 29a)

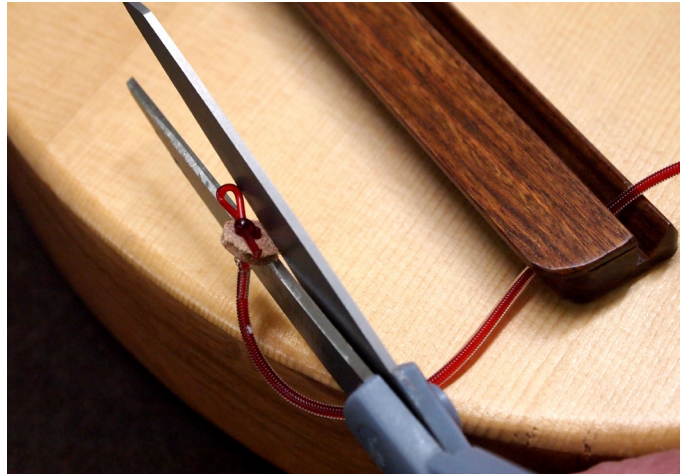


FIG. 29A

Thread the other end into the hole in the back of the bridge. It may be difficult to work it up and over the triangle edge. We lay the blade of a butter knife or a small metal or plastic ruler against the slope to guide the nylon upwards.

Pull the string all the way through until the leather washer fits nicely under the bridge cap.

Then poke the sharp end of the string through the small hole in the first tuning pin at the point of the frame and pull some of the slack through, leaving enough slack below the pin to allow for 2-3 windings around the pin as you use the tuning wrench to turn the pin clockwise. We like to guide the first wrap or two down under the hole of the pin and then lift the next wrap over those previous wraps as shown here. (fig. 29b) This cinches the string around the circumference of the tuning pin so it won't slip when you tune it up to pitch.



FIG. 29B

Repeat this process for the rest of the wound strings that already have knots at the end. Make sure to install them in order according to the string chart. The red strings will be tuned to C notes, and the blue strings to F notes. We have indicated which octave each note is by a number. Middle C is C4, and the first red string (C3) you just installed is one octave below Middle C4. The other six wrapped strings go up the C-major scale, just like the white keys of the piano (C3-D3-E3-F3-G3-A3-B3).

- ___30. When you get to the fattest smooth nylon strings (.055" diameter), you need to tie a simple overhand knot at one end, as shown at right.(fig. 30) Poke these three strings through the next three holes, beginning with the red one, and wrap them onto the next three tuning pins the same as the others.

Overhand Knot



FIG. 30

- ___31. The next two strings are .050" diameter (blue F4 and clear G4) strings. Install these in the same way. The overhand knot will tighten up a little smaller but should still be bulky enough to prevent being pulled through the hole when you tune it up to pitch.

- 32. When you come to the .045" diameter strings, you'll need to tie a bulkier knot at the end, as shown here. Begin with the same overhand knot, but before pulling it closed, poke the tail end back into the knot, just to increase the bulk of it. (fig. 32) You will tie the knot this way for the next several strings until you come to the .032" size.

It helps to secure the knots with a small drop of Superglue on top of the knot. Be careful to avoid gluing the string into the bridge. Just a little bit of glue in the knot will prevent the slippery nylon from slowly untying itself under tension when you tune it up to pitch.

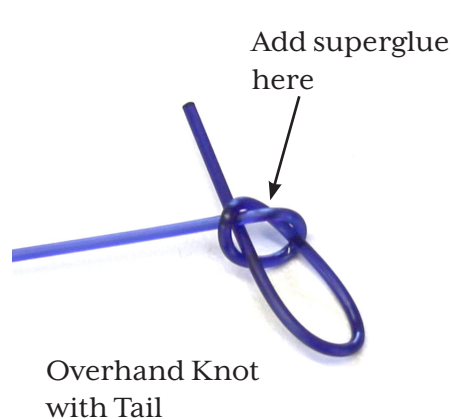


FIG. 32



Be sure to check that all your colored strings are in the right place. C strings are red and F strings are blue.

- 33. When you get to the .032" and .028" diameter strings, you need to add even more bulk to the knots, as shown at right. Cut a short (1/2") length of leftover thick nylon from the larger strings and insert that scrap into the knot as you pull the knot tight. (fig. 33A) Add the drop of Superglue, and install these highest strings to the proper tuning pins.

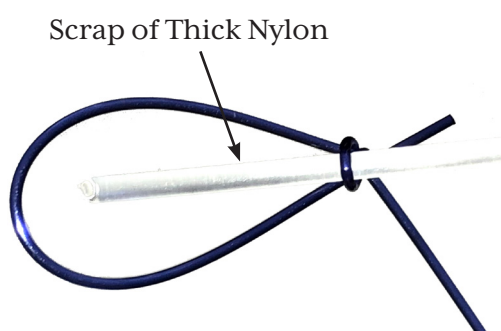


FIG. 33A

When all the strings are installed, tune them up to pitch according to the string chart. If you need help hearing the correct pitch, we recommend using an electronic tuner or a tuner app on your smart phone. This type of device will hear the note that you pluck and tell you the exact pitch of what it hears. That should help you figure out if you need to raise the pitch or lower it to get the proper note in tune. If you need further assistance, find a musical friend who can help you discern the pitches.

Notice that each tuning pin has 3-5 wraps of string around it when tuned up to pitch. (fig 33B) Too many windings tend to look messy and bulky. If you need to rewind a few tuning pins, go ahead -- just turn the tuning pin backwards and pull more or less of the slack through the tiny hole before tuning the string up again.



FIG. 33B



Please note that it will take several tunings before the strings will stretch to a stabilized tension and stay in tune. If you tune the instrument 2-3 times a day, it should settle nicely in a few days, staying in tune longer each time, and eventually require only occasional tuning.

For nylon strings, we recommend trimming off the excess string tails to about 1/4" from the tuning pins after they are installed. If you leave long tails, they may interfere with the vibration of neighboring strings.

WIRE STRINGS

- 34. Refer to the string chart for the proper gauge (thickness) of string to install in each position. The steel strings are not pre-colored to mark the F and C strings, but you can use colored paint markers from a local art/hobby store after they are installed. Some people mark just a short area near each end of the wires so the colors don't wear off on their fingers.

Start with the thickest wound strings (.032" diameter). Find the tiny brass washers in your string pack and add one washer to each string, as shown. (fig. 34)

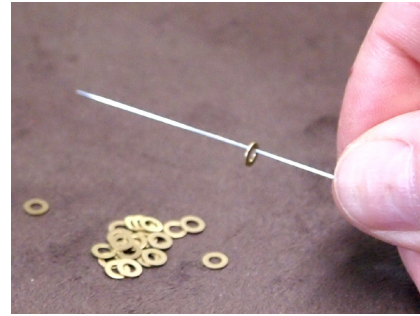


FIG. 34

Then thread the strings through the first two holes at the “lowest” end of the bridge. These will be the longest strings that play the lowest notes.

Draw each string across to the first tuning pin near the point of the instrument and cut off the excess 2" beyond the pin. This shortens the string enough to allow 2-4 wraps around the tuning pin before it comes up to pitch. Too many wraps around the pins will be messy!

Watch our video about installing wire strings:

www.harppkit.com/blog/installing-wire-strings/

- 35. Insert the end of the string into the tiny hole in the proper tuning pin just far enough so the end is visible, as shown, so the sharp end will be hidden inside the tuning pin, unable to snag your clothing or poke your fingers.

Turn the tuning pin clockwise about 1/2 turn before pulling on the wire to “set the hook,” as shown here. This should create a sharp bend in the wire where it enters the hole and allow you to continue holding tension on the wire as you turn the pin until the wire is taut. No need to tune it to pitch yet -- just get the strings tight enough so they make a clear sound when plucked.



FIG. 35

Install the rest of the wire strings in the same way. Be sure to put them in the proper order according to the string chart (included with your string set)

When all the strings are installed, start at the bottom (longest string) and tune it to C3 (one octave below Middle C). If you don't have a piano or other instrument to check for proper pitch, you can buy an electronic tuner or download a tuner app to your smart phone to use for perfect pitch. Be sure to get a “chromatic” tuner. That means it will hear all the notes of the piano, not just the 6 notes for tuning a guitar, for example.

STRAP BUTTON

___36. Mark the center of the “side B” piece near the bottom corner of the instrument (along the straighter side), as shown. Punch-mark for drilling a pilot hole for the mounting screw. The drill will poke through into the cavity of the box, and that is fine -- there is still plenty of wood to hold the button securely. (fig. 36)



FIG. 36

___37. Install the button tightly against the wood. Most guitar straps will fit this button, and they will have a string at the other end that can be used to tie around the “Side A” (neck), between two of the tuning pins, at whatever position you find comfortable for holding the instrument on your lap. (fig. 37)



FIG. 37

USING THE STAND



CONGRATULATIONS

You have completed the project. We hope you enjoyed the process and will make good use of your new musical instrument. Let us know if you have any feedback or suggestions for improving this kit. We appreciate hearing ideas that might help future builders and players. Thanks for doing business with Musicmakers!

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