

KINDER HARP KIT Assembly Instructions



WOOD PARTS

- A. Plywood Top, punch-marked with soundhole pre-cut
- B. Plywood Bottom
- \Box C. Pin Blocks (2 each)
- D. Short Side
- E. Long Side
- \Box \Box F. Bridge, pre-drilled
- G. Bridge Pad, pre-drilled
- H. Wood Donut, large

HARDWARE

- I. L-Handle Tuning Wrench
- □ □ J. Drill Bits: 1/16" & 3/16"
- K. Tuning Pins, 15
- L. Med Brass Eyelets, 15
- \square \square M. Machine Screws (4), #6 x 32
- □ □ N. Lock Nuts (4), #6 x 32
- O. Large Decorative Rosette (your choice)
- \Box \Box P. String set, steel or nylon (your choice)
- Q. Felt pick
- \Box \Box Set of Song Sheets (not pictured)
- Set Assembly Instructions

Musicmakers 14525 61st ST CT N Stillwater, MN 55082

BEFORE YOU BEGIN

____A. Please check off and inspect all your parts before beginning. If anything is missing or defective, please notify us right away.

PHONE: 651-439-9120

EMAIL: info@harpkit.com

____B. It is a good idea to read through the entire assembly instructions before you start, just to get an overview of the project. You may want to gather a few tools and supplies ahead of time so you don't waste time later when you need them.

We recommend standard woodworking glue for this project such as the yellow-colored Elmer's Carpenter's Glue or Titebond Wood Glue.

Tools & Supplies Needed for this Project

Flat work table Large sheet of paper Damp rag Heavy weights or lots of clamps Phillips screwdriver Router or Belt Sander Scissors Wood glue Masking tape Filament tape or Duct tape Electric Palm Sander 5/16" wrench Finishing Materials Wire Cutter Pencil or Sharpie Straight Yardstick Long Flat Sanding Block Electric Hand Drill or Drill Press Hammer Awl

ASSEMBLING THE BOX

____1. Tape a large sheet of paper to your work table and draw two parallel lines 10 inches apart, and at least 30 inches long (fig 1). Hey, if your work table doesn't mind, just draw the lines right on the table top. This will help you arrange the box frame symmetrically.



____2. Find the two pinblocks and the short and long sides, and arrange them carefully on your work table as shown in the photo (fig 2). The pin blocks only fit one way, so check carefully.



The long and short sides of the box MUST be parallel, as shown.

____3. The joints in the corners should fit as shown in these enlarged photos (Figs 3 & 4).



Bottom corner joints



Top corner joints

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_4. Before gluing the frame together on your paper, we recommend placing clear tape or thin plastic (baggie) material under the 4 corners to prevent glue from adhering to your paper (or table).

Test-fit the BOX ASSEMBLY on the paper again, ensuring that the long and short sides are parallel to your guide lines. We recommend outlining it with a pencil so you can remove and re-position the parts quickly and accurately after applying glue.

You will need some strong tape (Duct or Filament or Shipping tape) and your woodworker's glue for this step.

Apply glue to all 4 corners and use strong tape to pull and hold the joints tightly together (figs 5-7).

Check to be sure that the frame has not been tilted out of parallel -- you can push things back into alignment before the glue dries.

Allow at least 30 minutes to dry (longer in high humidity)

__5. The soundboard (top panel) is the thin piece with the large hole in the middle for a decorative rosette. Notice that one side has punch-marks along the right slope. Find all 15 of these marks and darken them with a pencil point (or punch them a little deeper with an awl), just to make sure you can see them clearly when you come to drilling for tuning pins. If they are faint, you might need to shine a light at a low angle to locate them.

Filament Tape

_6. This would be a good time to glue the ring to the underside of the sound hole. Squirt a narrow line of glue near the OUTER EDGE of the ring (fig 8) and position the soundboard on top so you can center the ring under the hole (fig 9).

CAUTION: Make sure the ring is glued to the underside of the soundboard! The top face has the punch-marks along the right side of the board.











- While the ring is drying, you can move to the frame again and 7. check over the joints in all 4 corners. Use a sanding block to remove excess glue and to level the wood around each joint to prepare for gluing the soundboard (top) in place.
 - Scrub the sanding block back and forth over the joint while holding the board flat against the frame (fig 10). This prevents rounding over the frame, ensuring a nice flat surface.

Sand the joints on both sides now so the frame will be ready for both the front and back. The frame itself is symmetrical, so it does not matter which side you put the soundboard on.

- _8. Double-check the fit of the frame on the inside of the soundboard (with the donut ring showing up), as shown (fig 11). Check that the soundboard extends a little beyond the frame all the way around.
- __9. Squirt two lines of glue on the edge of each pinblock and one line of glue on the edge of each thinner side piece, as shown in fig 12.

Some people spread the glue evenly on the wood, but that is not necessary, and it sometimes gets messy. Use a damp rag to keep things clean, especially your fingers!

_10. Now flip the frame over on top of the soundboard (which is facing down on your table). Put some weights on the frame so you see glue squeezing out all the way around the frame (fig 13).

> DOUBLE-CHECK TO MAKE SURE THE FRAME DOESN'T SLIDE OFF THE EDGE OF THE SOUNDBOARD AS YOU PRESS IT DOWN!









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Add more weights than shown in fig 13. You can use bricks, heavy tools, or even bags of sugar, flour, sand, fertilizer, potting soil, etc. for your weights.

Or, if you have access to a bunch of clamps, you can use those instead of weights, as shown here (fig 14).

Allow to dry.

_11. When the glue is dry, drill the 15 holes marked on the front side where the punch marks are located.

> Use the 3/16" drill bit provided, and wrap a piece of masking tape around it to mark the depth of 1-1/4 inches, as shown (figs 15 & 16).

> It helps to use a drill press for this step, but you can do it with a hand drill if you hold the tool with both hands to keep the drill steady and vertical.

_12. We want to trim and round over the top edges of the box before installing the bridge because it is easier to do now, especially if you use a router. We like to use a 1/4" roundover bit (fig 17) to accomplish both the trimming and rounding at the same time.

If you use an electric sander instead, you can begin with coarse paper (80 grit) to remove the excess soundboard that hangs over the frame, and switch to 120 grit for smoothing out the scratches left by the coarse paper.

_13. You can also do some significant rounding at all 4 corners of the frame, as shown in fig 18. Use 80 grit sandpaper for that type of aggressive shaping, and then switch to 120 grit for smoothing.

No need to spend a lot of time smoothing the sides of the box at this time though. Just do the rounding around the soundboard and establish the shape of the corners for now. You'll be doing more coarse trimming and sanding after the back is installed.









_14. We also like to sand the top of the instrument now, before installing the bridge, because it is difficult to sand around obstacles like the bridge.

Use 120 grit sandpaper in your palm sander to make quick work of smoothing out the top surface (fig 19).

Be careful not to sand too deep on top -- this soundboard is made up of 6 very thin layers of birch. It will look odd if you sand through the top layer.

___15. When the top is nice and smooth, test fit the bridge in place as shown in fig 20, WITHOUT GLUE, just to make sure the four mounting holes line up well.

> IMPORTANT: The bridge needs to be oriented with the high ridge toward the sound hole, and the mounting screws toward the edge of the instrument. If you glue it in place the wrong way, it will be very difficult to remove and replace!

- __16. Put masking tape over the head of each screw (fig 21) to hold them in place when you turn the instrument over.
- ____17. Then turn the instrument over and test fit the bridge pad, again WITHOUT GLUE, just to see how it fits. The flat surface is meant to contact the underside of the soundboard (fig 22).
- ____18. Read steps 18 & 19 before starting the gluing process. When you have your tools and glue ready, go ahead and apply a conservative amount of glue to the underside of the bridge and the flat face of the bridge pad, as shown. Too much glue will just make a mess when it squeezes out under pressure. Look closely at figures 23 and 24 to get an idea of sufficient glue.







FIG. 22





_19. Then replace the bridge on the front of the soundboard WITH THE SCREWS ON THE LEFT SIDE OF THE TALL PART OF THE BRIDGE, and turn the box over to place the bridge pad over the screws and thread the lock nuts on to the ends of the screws.

The easiest way to tighten the screws is to stand the box on the long edge so you can reach the head of the screw with the screwdriver in one hand as you hold the wrench or nut driver on the nut with the other hand (fig 25). Or, ask a friend to help you -- that's even better!

- **CAUTION:** The screws are small, so don't over-tighten them. Just watch for glue to squeeze out from under the bridge -- that's the sign that you've tightened enough. Over-tightening just makes the screw heads bury themselves deeper than necessary in the wood.
- 20. Test-fit the back panel to the box, making sure the two long cut-outs of the back will be oriented on the left side, under the bridge, as shown in fig 26. You might think it will be difficult to reach strings through those holes, but it will work fine to poke the strings through from outside the box.





SUGGESTION: Now is a good time to sign and date your instrument on the inside of the back where you can see it through the sound hole, as shown above.

____21. Use glue and weights or clamps to close up the box by pressing the frame down against the back panel, just as you did for gluing the top in place (fig 27). Make sure the frame does not slide off the edge of the back panel when you add weights or install clamps.



- ___22. When the back is dry, trim and round over the back edges just as you did for the front, with router and/or sanders. Then go over the entire box with 120 grit sandpaper to remove glue residue and deep scratches. A palm sander makes quick work of this process. Check for glue around the bridge too. Use a sharp chisel or razor knife to cut away glue bumps, and sandpaper to remove thin glue film from the wood. Fill any gaps you find with wood filler paste to match the wood (natural color for light wood, mahogany color for cherry wood).
- 23. When the box looks nice and clean, switch to 220 grit paper and hand sand the entire instrument to make it silky smooth. Work the sandpaper in the same direction as the wood grain whenever you can. Some woodworkers go to even finer grit paper before applying a finish, but we find that 220 is smooth enough for the wood surface. We hold off with the finer grits until smoothing out the first and second layers of finish.

24. One more thing: You need to drill through the bridge, soundboard, and bridge pad, with 1/16" drill bit provided (fig 28), at each of the 15 string holes in the bridge. These small holes are big enough for the strings but will prevent the ballends or knots from pulling through when the strings are tightened up to pitch.





If you plan to darken this instrument with stain, we suggest leaving the decorative rosette un-stained. Skip step 25 for now and do the staining before installing the rosette. If you plan to apply just a clear varnish, however, then go ahead and install the rosette next. It looks great when varnished to match.

_25. OK, one MORE thing: You can now glue your rosette into the soundhole of the instrument (fig 29). Test how it fits -you may need to sand the edges of the rosette a little to get it down flush. Also check if there are glue blobs around the donut that might prevent a flush fit.

Squirt a thin bead of glue around the exposed surface of the <u>donut</u> (not the rosette) and press the decoration into place. Be sure to orient the pattern the way you like it. Then add a small weight to hold it until dry.



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. The cherry sides and back will darken naturally as it ages, and the birch front will age to a light gold patina. We generally discourage people from trying to stain hardwood projects because the natural grain is so beautiful with just a clear finish. Adding stain sometimes makes things look blotchy and uneven, so be cautious with stain -- test it on scrap wood first.

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 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 gel 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. The reflective surface tends to highlight every odd dimple and speck of dust!

LACQUER -- Many instrument-makers still prefer nitro-cellulose lacquer for their finish. The most readily available lacquer is called Deft Clear Wood Finish (Semi-Gloss is best). If you choose this product, it will work best if you seal the wood first with clear shellac, such as the Zinsser brand. When the sealer dries, you can lightly sand that with very fine (400 grit) sandpaper as smooth as a baby's bottom before spraying the aerosol can of lacquer for the final coats. The advantage of this finish is its quick drying time, but the disadvantage is the strong odor of the lacquer spray.

____26. So choose your weapon and proceed with finishing all the wood parts (fig 30). Plan on applying at least three coats of finish, and sanding lightly between coats with 400 grit sandpaper. Be sure to follow the directions on the can.

> By the way, if you wish to add other decorations to the instrument (decals, paints, etc.), it is smart to do that work between layers of clear finish. The base coat will seal the wood and make a very smooth surface for decorating, and the next coat of clear finish will seal your decorations permanently to the instrument.



STRINGING AND TUNING HINT: From here on, we recommend placing a towel on your work table to prevent scratching the fine finish you so carefully applied.

_27. When the finish is dry, find the tuning pins in your hardware pack and pound them into the 15 holes you drilled along the right side of the instrument. Orient them with the fine threads going into the wood, and the square shaft facing up so you can turn the pins with the tuning key.

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, setting them all at the same height (7/8"). (fig. 30)

_28. Install the eyelets into the string holes of the bridge. They should push right into the pre-drilled holes, though you may need to press them down firmly with a screwdriver, awl, or small block of wood (fig 31).

FIG. 32

Locate your string set and consult the String Chart in the same bag to see what gauges of wire go where on the instrument. The top string is #1 at the top of the chart, and the bottom string is #15. We have labelled them by their thickness, in thousandths of an inch.

We offer this kit with either wire or nylon strings. If you purchased nylon strings, skip to step 30 for the instructions for installing those.

The slots near one side of the back are access holes for stringing. Wire strings need to be poked up through these slots from the back side, whereas nylon strings can be poked down through the holes in the bridge and then fished out so you

can tie knots in the end that will anchor the strings firmly inside the instrument.

You can also use these slots for carrying the harp in one hand if you like. The finger hole in the short side is also for easy lifting/carrying the instrument, and is also a good place to grip the instrument with one finger for holding the harp on one arm as you pluck the strings with the other hand.

Wire Strings

29. Wire strings have a brass ball at one end, which will be pulled up against the bridge pad inside the instrument. This means you must poke the strings through the box from the back side, as shown here (fig 33).

We recommend poking all the strings through before attaching any of them to the tuning pins. This saves time

and the confusion of turning the box over for each string. Start with the thickest strings #14 & 15 (.025"), and poke them through the first 2 holes nearest the long side of the instrument, as shown (fig 33).

Continue up the string chart, keeping the sizes in order so the thinnest strings go through the last 4 holes, closest to the short side of the instrument.





Turn the instrument over and push all the strings out of the way toward the short side of the box (fig 34). That way you can just pull one string at a time to its proper tuning pin as you install from the bottom (long side) up to the top (short side).

So find the fattest string at the bottom of the bridge and pull it vertically fully up against the inside of the sound board. Then stretch it across to the furthest tuning pin. The string is much too long, so cut off the excess about 2 inches beyond the tuning pin, as shown (fig 35).

Pull the string back until the clipped end just barely shows through the hole in the tuning pin (fig 36). Then turn the pin clockwise to wind the string onto the pin, directing the windings upward on the pin (fig 37) so as to leave space under the strings for the song sheets.









Nylon Strings

_30. If you are installing nylon strings, it is easiest to poke one end through the bridge from the front to the back of the instrument instead of poking it up through the inside.

Nylon strings require tying a knot in the end to prevent the string from pulling back up through the bridge when tuned up to pitch, and that knot varies with the thickness of the nylon, as shown below:



A simple overhand knot is sufficient for nylon sizes .050" & .045".



Poke the "tail" back through the knot for nylon sizes .040 &.036".





Turn the tuning pins clockwise to wind the string around the pins, guiding the winfings upward so the strings are high enough above the soundboard for the song sheets.

NOTE: If you find it difficult to tie bulky enough knots in the smaller strings (.028, .032, .036) you can use one full length of nylon for a pair of neighboring strings. Just poke both ends of the long nylon through the appropriate holes inside the back and wind each end onto neighboring tuning pins. That will save you some full-length spare strings for the future too.

TUNING

The Kinder Harp is tuned to the key of G major which has one sharp "F" note in each octave. All this means is that the bottom note (G3) is Do in a do-re-mi scale and that you must tune your Fs to F-sharp. The piano keyboard shows where the notes are in relation to Middle C on the piano. If you don't have a piano available for matching pitches, you can use our free online keyboard:

www.harpkit.com/online-tuner

Or navigate to the product page on our website and get your pitches from the Virtual Kinder Harp:

www.harpkit.com/kinder-harp

<u>NOTE:</u> Nylon strings take longer to stretch and stabilize than steel, so we recommend tuning nylon 3-4 times a day for the first week to hasten the process.

| WIRE String Chart Ball-end acoustic strings. | | | | | | NYLON String Chart Monofilament nylon strings. | | | | | |
|--|--------|-------|---------|---------------------|--|--|--------|-------|---------|---------------------|--|
| String | Note | Gauge | Code | Vibrating Length | | String | Note | Gauge | Code | Vibrating Length | |
| 1 | G5 | .012" | BALL012 | 8-7/8" | | 1 | G5 | 028" | NYI 025 | 8-7/8"" | |
| 2 | F#5 | .012 | BALL012 | 10 | | 2 | F#5 | .028 | NYL025 | 10 | |
| 3 | E5 | .012 | BALL012 | 11 | | 3 | E5 | .028 | NYL025 | 11 | |
| 4 | D5 | .012 | BALL012 | 12 | | 4 | D5 | .028 | NYL025 | 12 | |
| 5 | C5 | .014 | BALL014 | 13 | | 5 | C5 | .032 | NYL032 | 13 | |
| 6 | B4 | .014 | BALL014 | 14-1/8 | | 6 | B4 | .032 | NYL032 | 14-1/8" | |
| 7 | A4 | .014 | BALL014 | 15-1/4 | | 7 | A4 | .032 | NYL032 | 15-1/4 | |
| 8 | G4 | .014 | BALL014 | 16-1/4 | | 8 | G4 | .032 | NYL032 | 16-1/4 | |
| 9 | F#4 | .016 | BALL016 | 17-1/4 | | 9 | F#4 | .036 | NYL036 | 17-1/4 | |
| 10 | E4 | .016 | BALL016 | 18-3/8 | | 10 | E4 | .036 | NYL036 | 18-3/8 | |
| 11 | D4 | .018 | BALL018 | 19-3/8 | | 11 | D4 | 040 | NYI 040 | 19-3/8 | |
| 12 | Mid C4 | .018 | BALL018 | 20-3/8 | | 12 | Mid C4 | .040 | NYL040 | 20-3/8 | |
| 13 | B3 | .022 | BALL022 | 21-1/2 | | 13 | B3 | .045 | NYL045 | 21-1/2 | |
| 14 | A3 | .025 | BALL025 | 22-1/2 | | 14 | A3 | .050 | NYL050 | 22-1/2 | |
| 15 | G3 | .025 | BALL025 | 23-1/2 | | 15 | G3 | .050 | NYL050 | 23-1/2 | |



LEARNING TO PLAY SONGS

The Kinder Harp is great for teaching music to beginners of any age (even non-musicians) because you can slide song sheets under the strings and just follow the notes from left to right to pluck a melody. Be sure to align the sheet with the strings on the instrument. We have more songs you can download from our web site and print out for yourself:

www.harpkit.com/kinder-harp

You can also make copies of the blank sheet included with your songsheets for writing out your own songs.

STORY-TELLING

The Kinder Harp can also be used for sound effects to enhance story-telling or guided imagery. Check our web site for video demonstrations. Adding sounds to a story can be lots of fun and help the more active kids to pay closer attention. You'll probably think of more fun sounds than we did! We plan to add to our collection as time goes by.





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