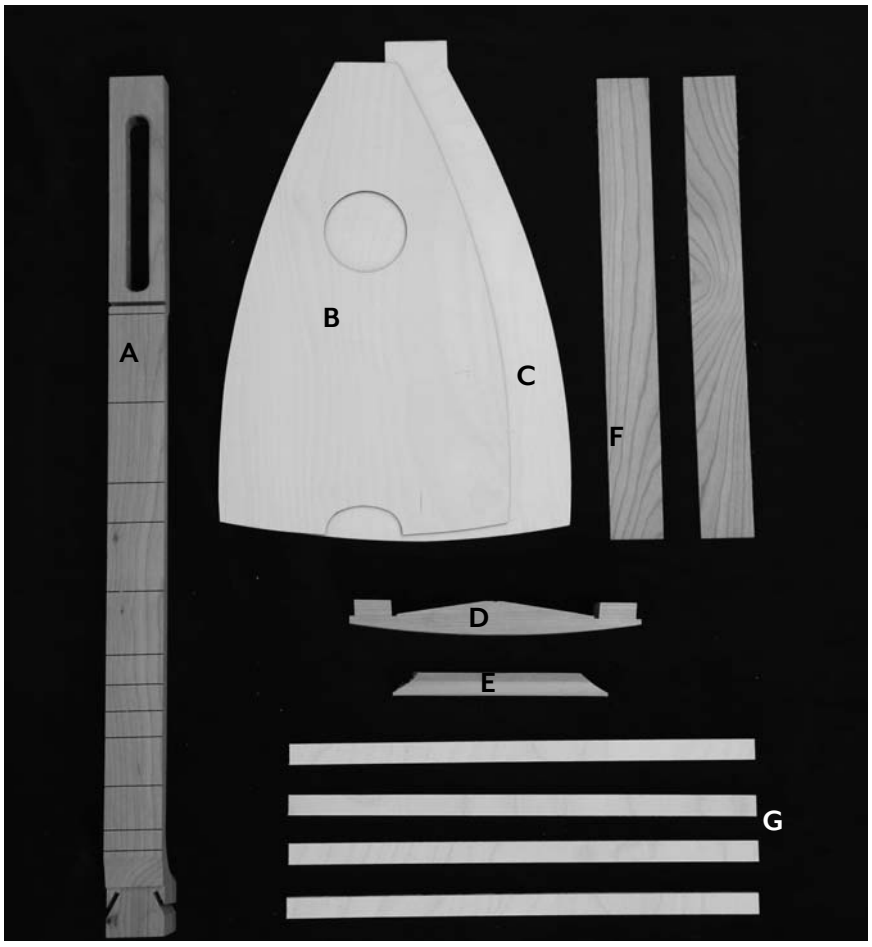
MUSICMAKERS

STRUMBLY KIT
Assembly Instructions



WOOD PARTS

- ☐☐ Neck (A)
- ☐☐ Soundboard (with hole) (B)
- ☐☐ Back (no hole) (C)
- ☐☐ Tailpiece (D)
- ☐☐ Internal Brace (E)
- ☐☐ Bridge
- ☐☐ 2 Sides (F)
- ☐☐ 4 Lining Strips (G)
- ☐☐ Medium Donut for rosette

HARDWARE

- ☐☐ Medium Fretwire (20”)
- ☐☐ Thick First Fret (1-1/2”)
- ☐☐ 3 geared tuners with tiny screws
- ☐☐ Set of 3 Strings
- ☐☐ Plastic Nut (1/8” X 3/8” X 1-1/2”)
- ☐☐ Choice of Medium Rosette
- ☐☐ Flat Pick
- ☐☐ Assembly Instructions
- ☐☐ Songbook

BEFORE YOU BEGIN

____A. Inventory and inspect all your parts carefull. 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

We strongly recommend that you use a common woodworking glue like Elmer's Carpenter's Wood Glue or Titebond because they hold the parts more securely than most other adhesives, and they are inexpensive and easy to use. DO NOT assemble the wood parts of this project with 5-minute epoxy or super-glue or hot melt glue. The yellow colored Elmer's or Titebond is best.

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. 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 prominent places.

ASSEMBLY INSTRUCTIONS

FIG. 1

___1. Begin by gluing the 2 SIDES to the TAILPIECE. Small C-Clamps or some spring clamps should do the trick, as shown. Be sure to seat the parts fully into place and check that the SIDES are parallel with each other. While the glue is drying you can begin working on the NECK. (fig. 1)

___2. Notice that we have punch marked numbers on the side of the NECK. If you want these numbers to be easier to read on the finished instrument, use a ball-point pen to darken them. If you slip with the pen, just sand off the offending ink. You can even color in the numbers with a pen after you have applied a finish to the instrument.

FIG. 2

___3. The NECK has been roughly rounded at the factory. Use some 180 grit sandpaper to sand off any machine marks on the neck. Don't sand the top of the neck where the frets go - Keep that part of the neck flat.

INSTALLING THE FRETS

___4. Once you have sanded the neck to your satisfaction you can begin to install the frets. Place the NECK on a good firm surface for this operation. A flimsy table top will not do. Better to work on a concrete floor or a cement block. Otherwise, your wood will just bounce around as you try to pound the frets into place.

FIG. 3

___5. Find the short piece of THICK FRETWIRE and tap it into the first narrow slot near the end where the geared tuners will be installed. This thicker fret will hold the strings at the right height on this end of the neck. (fig. 3)

___6. Then you can install the rest of the frets using the long length of MEDIUM FRETWIRE. Hold the end of wire over the next slot in the NECK, so the end hangs over the edge of the wood just 1/16" or so. Position the FRETWIRE so that the 'tang" will be driven down in the fret slots (fig. 4).

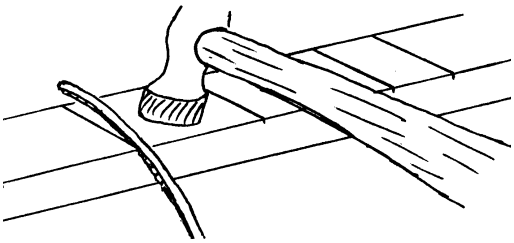


FIG. 4

Use a hammer to lightly tap the FRETWIRE into the slot, until the crown of the fret contacts the wood surface. Yes, the FRETWIRE is slightly curved, but it will straighten as you tap it in.

Tap one end of the wire in first, then the other end, and finally the middle. DO NOT OVERWORK THE WIRE! You should be able to install each fret with four or five taps, total. If you have difficulty with a fret, you can use a chisel to pry it back out of the wood, straighten the wire with plyers, and install it again.

___7. When the FRETWIRE is securely held by the wood, use a wire cutter to clip off the excess, as close to the wood as possible. (fig. 5)

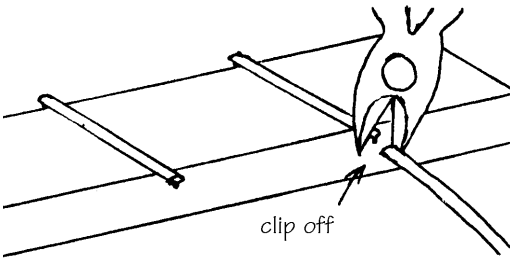


FIG. 5

Proceed to the next fret slot in the same way, and so on until all frets are installed.

___8. After the frets are all installed, look them over carefully to make sure each one fits all the way down against the wood. If one fret stands higher than another, it may cause buzzing problems later when you try playing Strumbly. Now is the time to take care of the problem. A few good taps from the hammer are usually sufficient to seat any frets that are too high. But make sure you are working on a very firm surface. A bouncy table will only make this job impossible.

___9. File (or sand) the ragged ends of the frets down until they are smooth and flush with the sides of the NECK. If you happen to have access to a belt sander, you'll find it very helpful for this part of the project. The FRETWIRE is soft enough metal to work very easily with a sanding belt. Be careful, however, not to gouge the edge of the NECK!

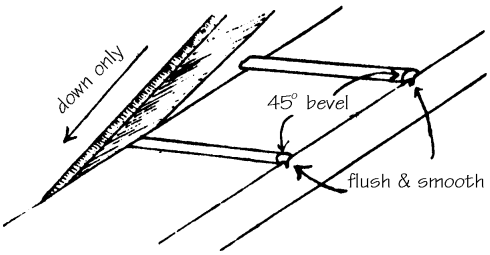


FIG. 6

___10. File (or sand) a 45 degree bevel at the ends of the frets, as shown, working the file in a downward motion only, to avoid lifting the frets up. (fig. 6)

___11. We like to use the same File to smooth off the sharp ends of the heel, where the sides will be glued into those slots. The sharp edges are fragile, so if you leave them sharp, you are likely to chip off a few splinters when installing the sides into the slots. (fig. 7)

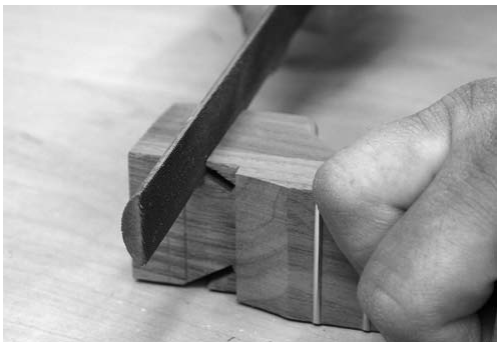


FIG. 7

Just remove about 1/16" from the points, as shown at right.

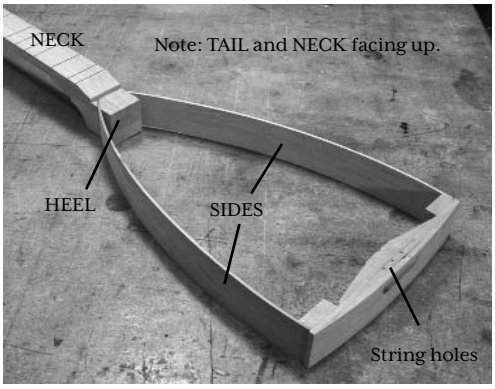


FIG. 8

GLUING THE FRAME TOGETHER

___12. Test fit the parts together first, without glue, as shown. You should be able to bend the SIDES enough to fit them into the slots in the heel of the NECK. If they do not go in easily, sand the ends of the SIDES a little to thin them out until they are easy to slide into the slots. (fig. 8)

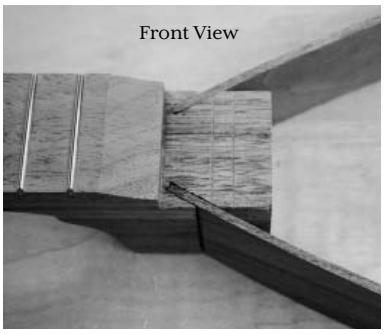


FIG. 9

Test fit SIDES without glue.

CAUTION: It is possible to glue the BODY to the NECK upside-down! Make sure to orient the TAILPIECE so the string holes are facing up when the NECK is facing up.

Make sure the SIDES go all the way into the slots of the HEEL. Look closely from the front and the back views to see that there are not big gaps. (figs. 9 & 10) If you have trouble inserting the SIDES without glue, it will be even harder when you apply glue. Sand the SIDES a little thinner, if necessary, to make them slide easily into place.

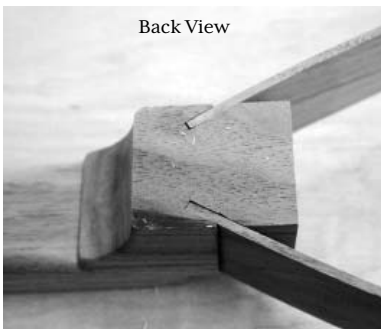


FIG. 10

___13. When satisfied with the fit of these parts, and making sure they are all facing up, use a nail to smear some glue into the slots of the NECK. (fig. 11) Make sure to get some glue on both sides of the slots. Then push the SIDES into the slots, making sure to push them all the way in.

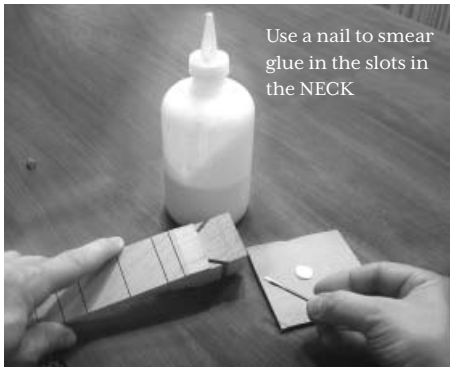


FIG. 11

Check to see that the SIDES are level with the heel of the NECK. We do this by pushing the heel and tail down against a flat surface to make sure the parts are all parallel with the neck, not tilted upward or downward. (fig. 12)

Set assembly aside to dry, supporting the peghead with something so the instrument will remain properly aligned. Allow at least an hour for the glue to set up nicely

FIG. 12

INSTALLING LINING STRIPS

___14. When the frame is dry, glue the 4 LINING STRIPS to the insides of the SIDES, as shown. Try to get the STRIPS to be flush with the edges of the SIDES. This gives you a wider glue surface for adhering the SOUNDBOARD and BACK panels later. Use clothespins (or other small clamps) to clamp the strips until the glue dries. (fig. 13)

The LINING STRIPS are for increasing the thickness of the SIDES where the SOUNDBOARD and BACK will be glued. This makes the instrument stronger.

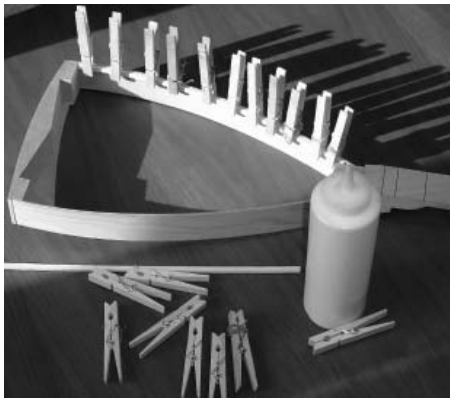


FIG. 13

___15. Once these LINING STRIPS are dry, use a long sanding block to level off the edges of the SIDES in preparation for gluing the front and back panels in place. We like to glue a piece of 60- or 80-grit sandpaper to a flat block of wood, such as a 2 X 4 for this purpose. (fig. 14)

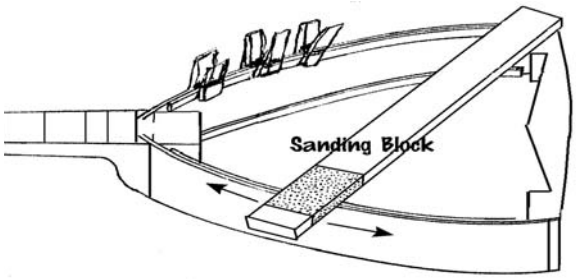


FIG. 14

___16. Draw a center line on the HEEL of the neck, as shown at left. This will be an important guide line when you install the SOUNDBOARD. (fig. 15)

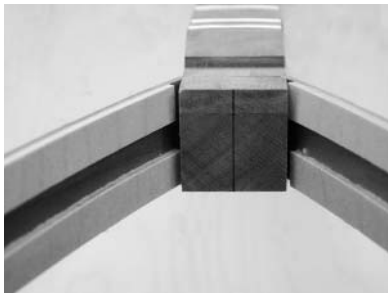


FIG. 15

PREPARING THE FRONT

___17. Draw a centerline lengthwise on the inside of the SOUNDBOARD (choose the lesser quality face to show inside). This centerline will help you to keep Strumbly square and straight.

Also draw a line on the inside of the SOUNDBOARD that is 7 1/2 inches below the top edge and is perpendicular to your centerline, as shown. This line will mark the location of the BRACE.

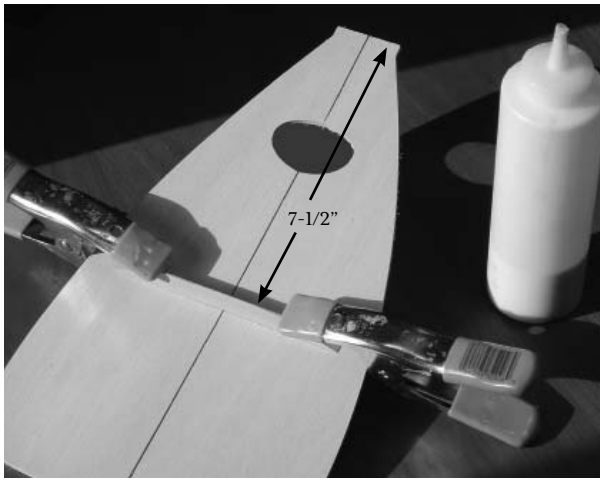


FIG. 16

___18. Glue the BRACE to the inside of the SOUNDBOARD, as shown. Center the BRACE on the intersection of the two lines on your SOUNDBOARD and use two clamps to glue the BRACE in that position. (fig. 16)

INSTALL THE ROSETTE

___19. Dry fit the rosette in the soundhole. You may need to lightly sand the edges. DO NOT GLUE THE ROSETTE YET. With the rosette in place, flip the soundboard over and position the DONUT so that it is completely hidden by the outer ring of the rosette. (fig. 17) Glue the DONUT in place using clamps, tape, or a heavy weight.


FIG. 17

Lightly sand the front of the rosette to remove any residual smoky color from the laser cutting process. If plan to use the plain rosette without coloring it, you can glue it to the ledge of the donut now, making sure to orient the pattern the way you want it to look on the finished instrument. Try to keep glue off the surface of the FRONT. (fig. 18)


FIG. 18

Otherwise, you can wait until you have decorated the rosette, and glue it in after the instrument is finished.

INSTALL THE FRONT

___20. After the BRACE and DONUT have dried, you can test fit the SOUNDBOARD to the frame without glue. Centering the SOUNDBOARD is not difficult if you proceed carefully.

Begin by clamping the narrow end to the front of the frame and then turning the frame so you can see the center lines inside. Shift the soundboard as necessary to align the centerline with the heel first. (fig. 19)

FIG. 19

Align center lines to heel then tail

Once the SOUNDBOARD is clamped and centered at the heel, you can slide the TAIL BLOCK one way or the other until the center lines match up at the tail end. Put a clamp at each corner to hold the parts straight. (fig. 20)

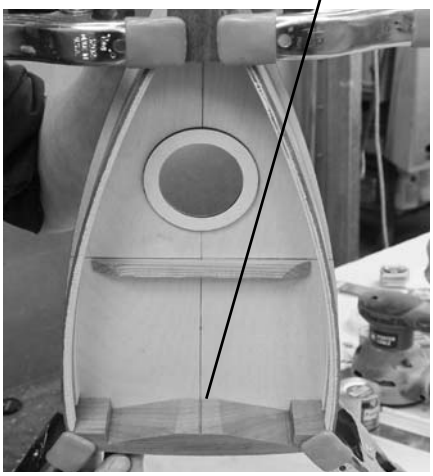


FIG. 20

Double-check to make sure you have clamped the SOUNDBOARD to the front of the frame! You should be able to see the three string holes at the tail end when you turn the frame around to the front side.

No glue yet. This is a rehearsal.

Double-check the alignment of the neck on the front side, as follows: Put masking tape in two places along the neck (near each end) and mark the center of the neck

FIG. 21

Then place a long straight-edge down the center of the neck to see how it lines up with the sound hole and the middle string hole at the tail end. It should be very close. In fact, the only way it could be off-center is if the soundboard is not fully seated against the neck at the narrow end. Make adjustments if necessary to ensure that you have a straight instrument.

OK. This was a trial run without glue. Now that you understand the procedure for aligning the FRONT to the BODY, you can glue the FRONT panel in place. Put glue on all the surfaces that contact the FRONT, including the top surface of the HEEL, the SIDES, LINING STRIPS, and the TAIL block.

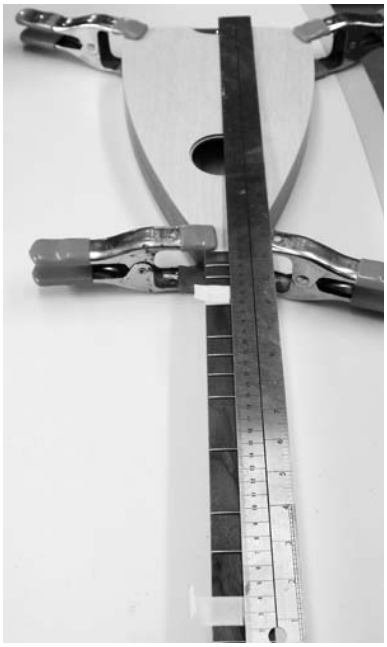


FIG. 22

Start clamping in the same sequence as your trial run, centering the FRONT on the HEEL first, and then clamping the two corners when the centerlines match at the TAIL BLOCK. Double-check the alignment, front and back, and then add more clamps around the perimeter. Once the FRONT is glued, the frame will stay put. No more alignment will be necessary.

___21. It is easier to trim off the excess overhang of the FRONT before installing the BACK. You can do this by hand with a fine-tooth coping saw, though you must be careful to install the blade with the teeth cutting toward the handle. (fig. 23) Don't trim too close! Leave some for sanding with a coarse sanding block.

If you have a router and router table, you can do this job much more quickly and easily. Use a flush trim bit, and stand it high enough to roll along the sides. (fig. 24)

FIG. 23

Caution: Make sure the roller does not "fall" into the groove of the Tail Piece!

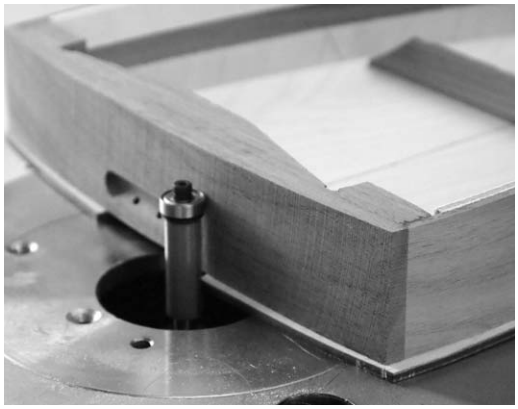


FIG. 24

Regardless of how you accomplished the initial trimming, you will still need to follow afterwards with a coarse (60-80 grit) sanding block in order to finish the job. A sharp chisel or razor knife might help in the corners where the neck meets the body.

INSTALLING THE BACK

You may want to sign and date your instrument before closing it up. This is a good time for that. Find a spot inside the BACK where you'll be able to see your signature through the soundhole.

___22. Now you can glue and clamp the BACK panel in place, showing the better face outward. It is not so important to center this piece perfectly, but you'll want to have some excess material overhanging the body all the way around. (fig. 25)

FIG. 25

___23. When the BACK is dry, trim off the excess overhang all the way around, just as you did for the FRONT.

Wa-La! Your instrument is all assembled. Pat yourself on the back and have some milk and cookies! There's still work to do, but the heavy lifting is out of the way.

SANDING AND FINISHING

___24. Give Strumbly a final sanding before applying a finish. Take your time to do a nice job -- it will pay huge dividends toward the cosmetic appearance of the instrument when it is finished.

Start with 180 grit sandpaper and sand off all the machine marks left by our equipment, as well as any glue spots you might have added during construction. Dried glue may not show much now, but it will stick out like a sore thumb under the finish. Work your way through finer sandpaper if you wish, but many people are satisfied with how smooth the wood is with 180 grit paper.

Now you're ready to apply the finish of your choice. We've listed several options below. Don't forget to put some finish on the BRIDGE.

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.

INSTALLING HARDWARE

___25. Once your finish has dried you can install the hardware. Begin by installing the GEARED TUNERS. Please note that we drill some pegheads for right-mounted gears and some for left-mounted gears, in order to make balanced use of our inventory. You should orient these on the PEGHEAD with the handles pointing down. (fig. 26)

Use a 1/16" drill bit to make pilot holes for the tiny mounting screws. Then a #1 size Phillips screwdriver will work for installing two screws in each tuner to hold the metal plates firmly to the peghead.

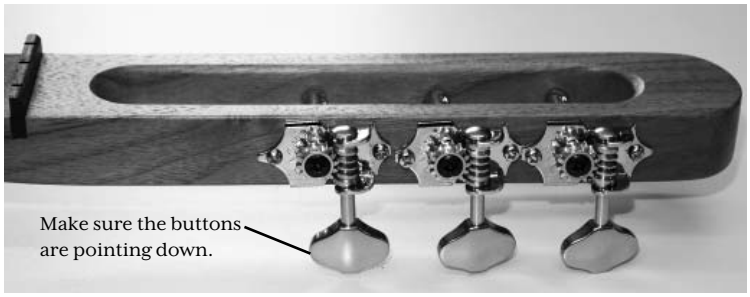


FIG. 26

___26. Trim the length of the black plastic NUT to fit the width of the NECK, and smooth any rough or sharp corners with sandpaper. Then press it into the pre-cut slot near the geared tuners, with the three cuts facing up. These cuts are for spacing the strings properly. Use some epoxy or Superglue to glue the NUT in place if is loose, but no glue is needed if it fits snugly.

___27. Before you install the strings you need to file 3 shallow grooves in the BRIDGE. A small triangle file works well for this. You will make final adjustments to the height of the BRIDGE after the strings are installed. File the middle groove in the center of the BRIDGE first, and space the other two grooves 1/2" on either side. (fig. 27) Shallow cuts are all that is necessary for now.

Bridge

FIG. 27

INSTALLING STRINGS

___28. Thread the end of the thickest (brass colored) string through the left-hand hole in the TAIL and pull it all the way until the ball end stops against the wood. Pull that string up to the other end of the instrument and thread the end through the corresponding GEARED TUNER. (fig. 28)

Cut the wire about 2 - 3 inches beyond the tuning gear. Then pull the end back until it barely shows through the post, and wind the excess string around the metal post by turning the button. It is best to have the string wrap over the top of the post.

___29. After you have the first string installed you can slide the BRIDGE into place. It should sit about 23-5/8" (600mm) from the NUT. *Do not glue the BRIDGE in place*. You can make fine adjustments to the location of the BRIDGE after you have all the strings installed.

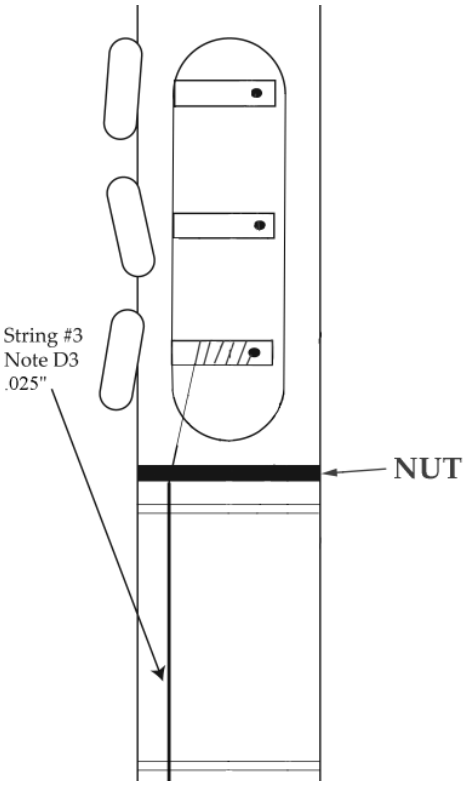


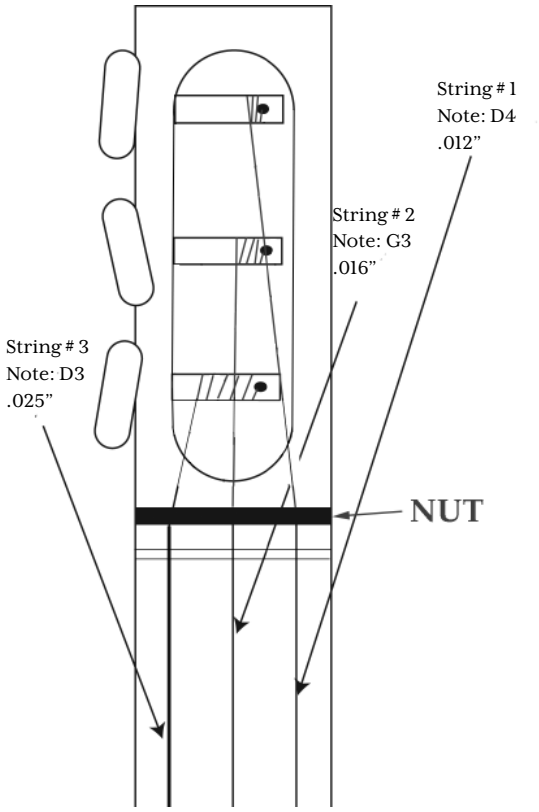
FIG. 28

___30. Proceed to install the remaining two strings according to the diagram. (fig. 29) Notice that you can direct the wraps of wire toward one side of the NECK or the other, depending on how you'd like the string to align with its position in the NUT.

BE CAREFUL not to over-tighten the strings! They may break if you tune them higher than the pitches shown.

Although you can play lots of songs on this instrument without even tuning it (by just playing one string), you'll learn more musical things (like chords) if you tune all the strings properly, as shown in the chart at right. You can tune to a piano or an electronic tuner, or you can visit our website and use the free online tuner on our website at www.harpkit.com/freetuner.

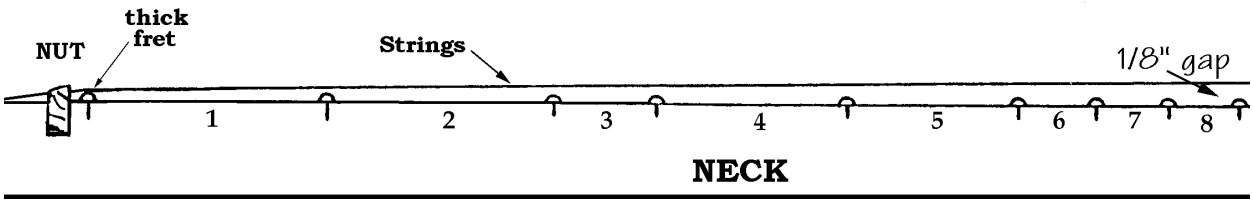
FIG. 29



___31. The THICK FRET (near the NUT) should hold the strings at the proper height at that end of the NECK, but you need to check the gap over the 8th space. You will adjust the height of the BRIDGE to achieve the 1/8" (3 mm) gap shown in the illustration. (fig. 30) An easy way to check the string height is to see how a 1/8" drill bit fits between the string and the wood at the eighth fret (near the body). Setting the string height like this will make a big difference in the playability of your instrument.

If your strings are just a little higher than the proper height at first, you may only need to file the notches in the BRIDGE a little deeper. If you have 1/4" gap at the 8th fret, however, we recommend removing the BRIDGE and sanding the underside to lower the string height. That will be much easier than trying to cut deep notches in the wood. It's OK to reduce the height of the BRIDGE considerably, if needed, to achieve the proper string height. Conversely, it is also fine to glue a shim under the BRIDGE, if necessary, to raise the strings to the proper level.

FIG. 30



FINE TUNING THE BRIDGE PLACEMENT.

___32. Play a string open (without pressing it to any fret) and then play the string fretted at the eighth fret. Check these two notes on your electronic tuner. These two notes should be exactly one octave apart. If the fretted note is sharp - slide the BRIDGE toward the bottom of the instrument a little bit. If the fretted note is flat - slide the BRIDGE toward the neck a little bit. Keep making adjustments until the 2 notes are exactly an octave apart.

INSTALLING A STRAP

___33. If you choose to install the strap with 2 buttons you will need to drill 2 pilot holes (3/32"), one in the middle of the TAILPIECE and one in the heel of the NECK. (fig. 31)

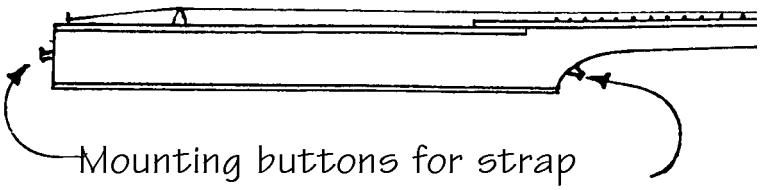


FIG. 31

CARE AND FEEDING

You don't ever need to replace the strings unless they break or get rusty or full of peanut butter and jelly. Strumbly will sound its best, however, if you change the strings about once a year. The strings are just common ball-end acoustic guitar strings. You should be able to find these at any local music shop. The sizes are shown in the tuning chart on the previous page, or you can just take a scrap of the old string with you for comparison.

You can keep Strumbly clean using regular furniture polish. We like a product called Old English because it does not contain silicone or wax. It may be a sad thing when you put that first big nick or scratch in the finish. Go ahead an get it out of the way now so you can stop worrying about it. Remember - the purpose of a musical instrument is to make music. Looking perfect is just a luxury.

Yes, you may take Strumbly hiking, camping, climbing, boating, fishing, and many other places. It may come in handy as a spare tent pole, critter swatter, food tray, or walking cane, but we caution you to use Strumbly as a canoe paddle only as a last resort.

MUSICMAKERS

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