



RENAISSANCE GUITAR

Musicmaker's Kits Inc.

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RENAISSANCE GUITAR

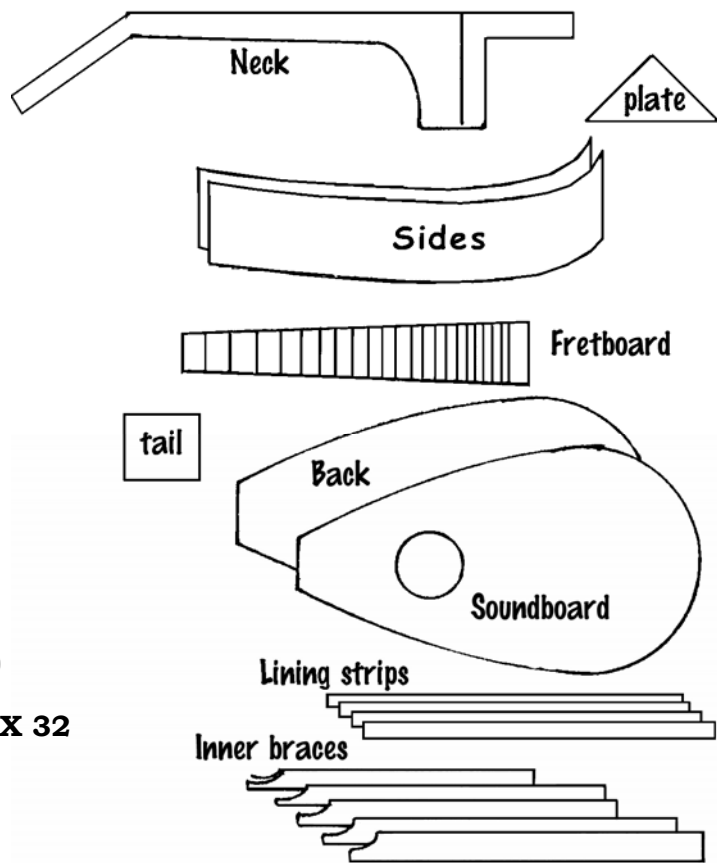
1 - Set of assembly instructions

Wood Parts:

- 1 - Neck
- 2 - Sides, pre-bent
- 1 - Slotted fretboard
- 1 - Soundboard (top)
- 1 - Back
- 1 - Bridge plate, hardwood
- 4 - Lining strips
- 3 - Inner braces for back
- 2 - Inner braces for soundboard
- 1 - Tail block, hardwood

Hardware Parts:

- 6 geared tuners w/tiny screws
- 1 - Set of 6 strings
- 1 - Bridge with saddle & pegs
- 1 - Plastic nut
- 4 - Ft medium fretwire
- 1 - Truss Rod, double action (installed in neck)
- 1 - Allen wrench, 1/8" (for truss rod)
- 2 - Machine screws, nuts and washers, #8 X 32
- 1 - Truss rod cover with 3 screws



BEFORE GETTING STARTED

___1. Please take the time to check over the parts of your kit now, to make sure everything is there. If you discover a problem, call us right away so we can rectify it quickly without causing you much delay in your project.

A NOTE ABOUT GLUE

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

Find some 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 must do the same. We build this instrument with modern woodworking adhesives (such as Elmer's Carpenter's Wood Glue or Titebond) 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.

___2. 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

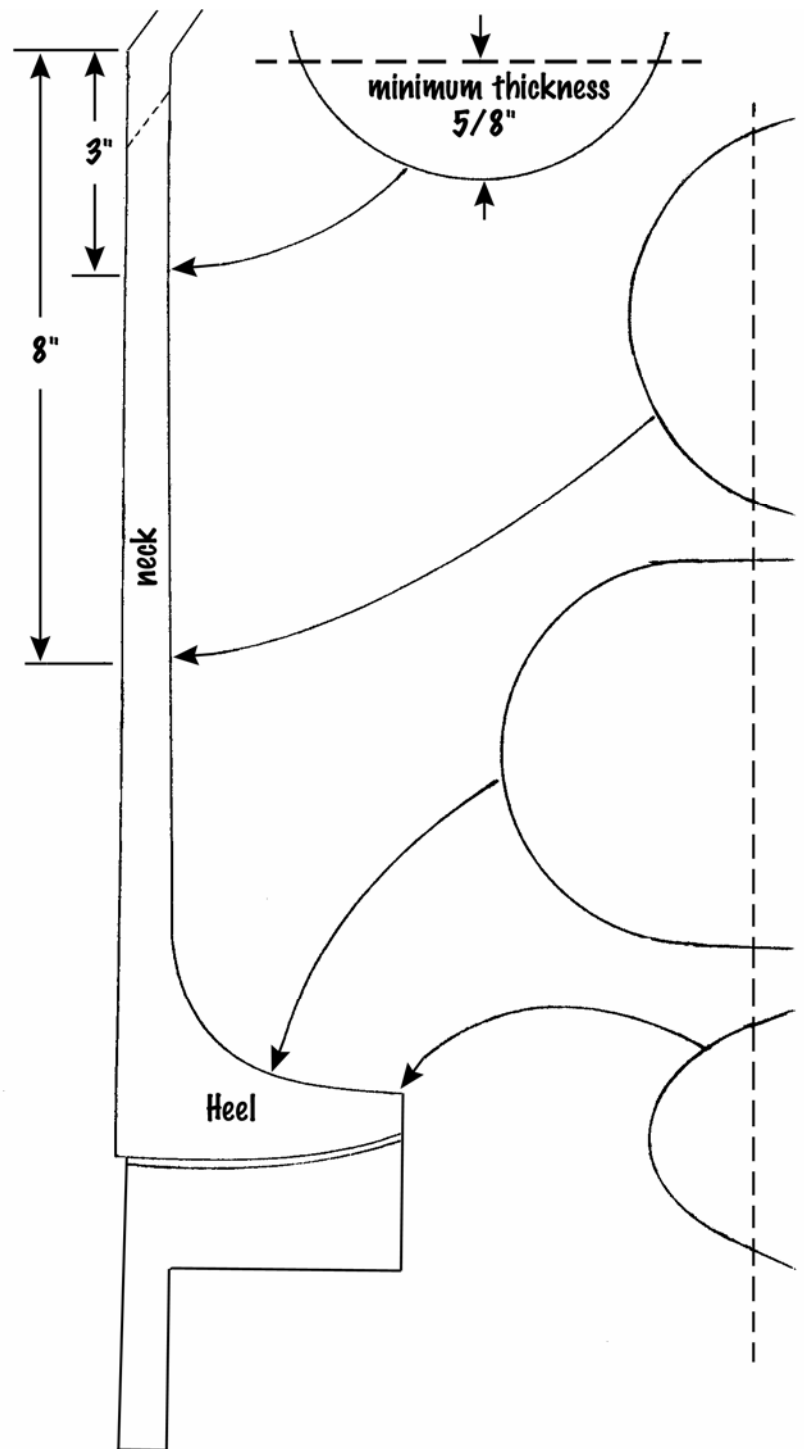
purchase a few optional decorations or accessories to enhance the finished instrument. Now is a good time to make those plans so you can avoid delays later when you reach those steps of construction.

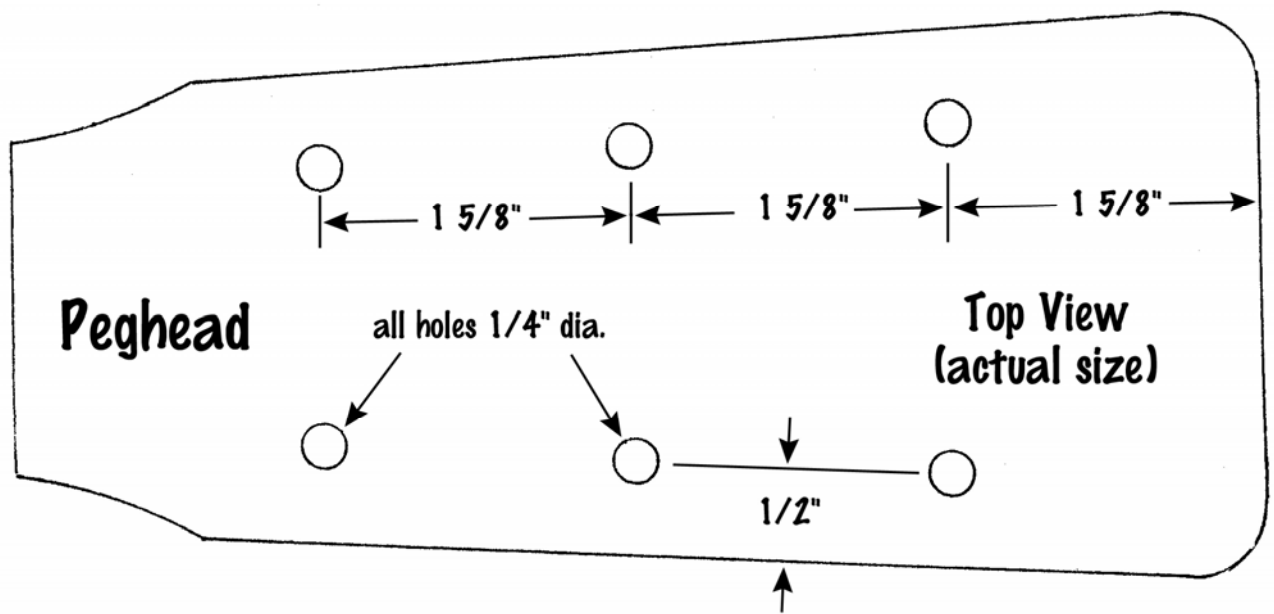
SHAPING THE NECK AND HEEL

4. We have roughed out the shape of the **NECK**, **HEEL**, and **PEGHEAD** on this kit, but they still need more work. If you have another guitar to look at as a pattern, that might be helpful. You may cut out the templates drawn here and use them to guide your shaping, although you may **leave** the **NECK** thicker and/or wider if desired. Note that the finished thickness will be about 1/4" greater after the **FRETBOARD** is glued in place.

Basically, you want to round the entire backside of the **NECK** so it is comfortable in your hand, as you play. Follow the curves around the **HEEL** also, to make a nice looking assembly. An electric sander with coarse (80 grit) paper will make this task quite easy, but you can also do the job by hand with files, rasps and/or sanding blocks. Follow up the rough work with a medium (150 grit) sandpaper to remove the scratches left by the coarse paper.

5. This is also a good time to drill the holes in the **PEGHEAD** for the six geared tuners. Use this drawing as a template for locating those holes, and drill them all with a 1/4" drill bit.

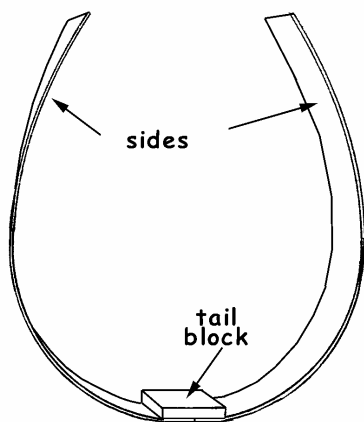




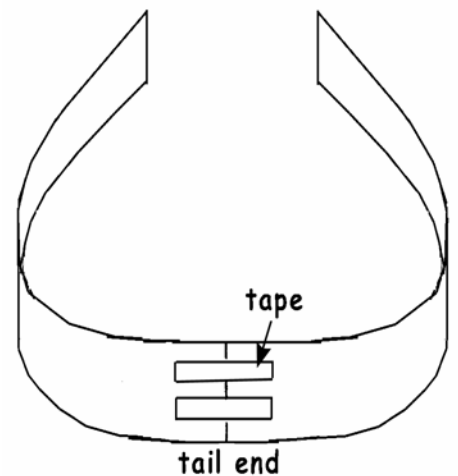
GLUING THE SIDES

___ **6.** We have bent the **SIDES** carefully from two layers of solid walnut. This means there is no paper-thin layer of veneer to worry about sanding through.

Glue the two **SIDES** end-to-end at the heel, as shown. Hold the joint together with masking tape on both sides to achieve a tight seam.



___ **7.** When the seam is dry, carefully remove the tape, and then glue the **TAIL BLOCK** to the inside of this seam, as shown, using clamps or weights to hold till dry. Be Careful! The joint is quite fragile until the **TAIL BLOCK** is glued across the seam.

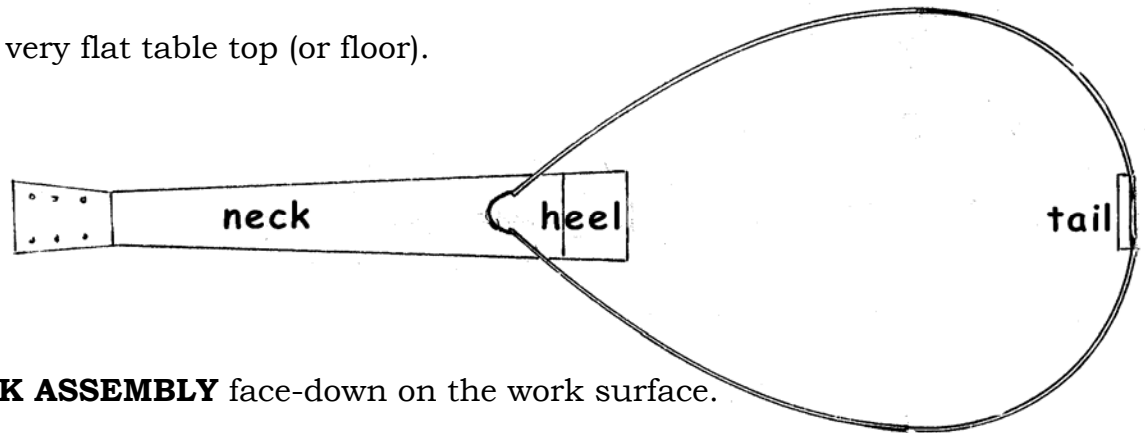


CAUTION: Double check to see that the TAIL BLOCK does not "drift" out of position under the clamps or weights. You want good alignment of this piece in order to glue the SOUNDBOARD and BACK successfully.

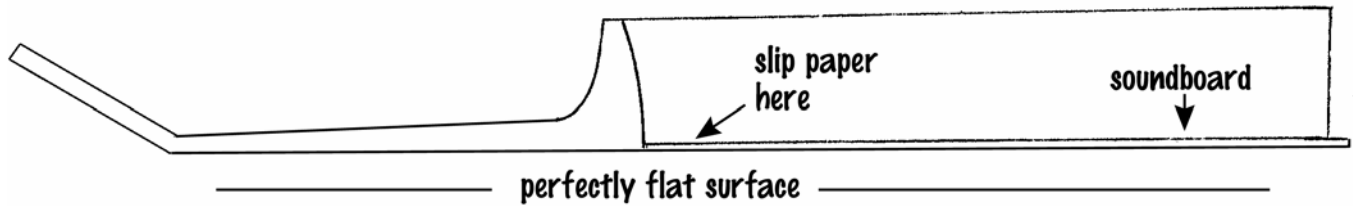
IMPORTANT: MAKE SURE THE SIDES FIT EASILY INTO THE SLOTS OF THE NECK ASSEMBLY. THIS IS A GOOD TIME TO SAND THE INSIDE SURFACES OF THE SIDES (NEAR EACH END), IF NECESSARY.

___ **8.** When satisfied with the fit, glue the **SIDES** into the slots, as follows:

a) Work on a very flat table top (or floor).



b) Place **NECK ASSEMBLY** face-down on the work surface.



c) Slide **SOUNDBOARD** under the end of the **NECK** so it will hold the **SIDES** 1/8" off the work surface. You do not want to glue the **SOUNDBOARD** to anything yet, so you might slip a piece of paper between the **NECK** and the **SOUNDBOARD** to prevent glue from getting on the **SOUNDBOARD**.

d) Test-fit **SIDES** into the slots again. If the **SIDES** fit too loosely, you may want to shim them by gluing some thick paper to the inside face. If they are too tight to slip into the notches easily, then just sand the inside face a little. Once they fit properly, proceed to glue them in place, holding them all the way in with masking tape until dry.

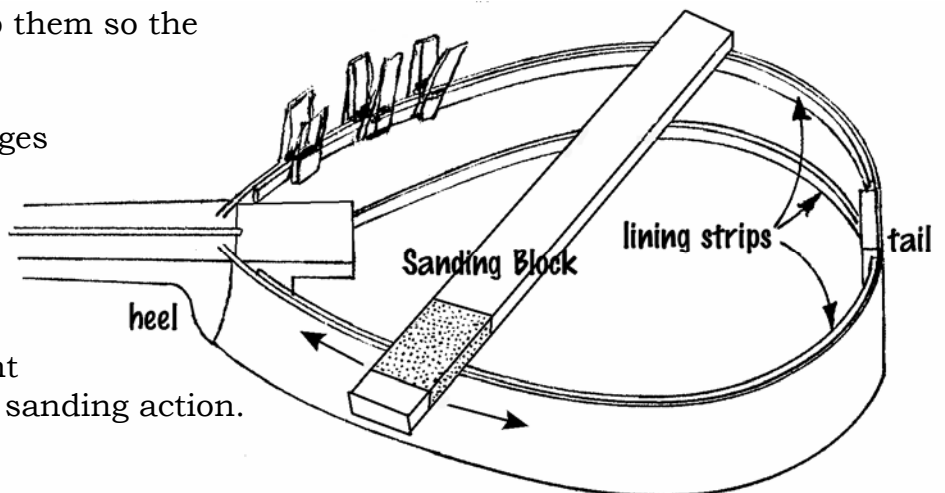
IMPORTANT: Hold all these parts down firmly against your flat work surface while gluing. Otherwise you may have trouble with string adjustments later.

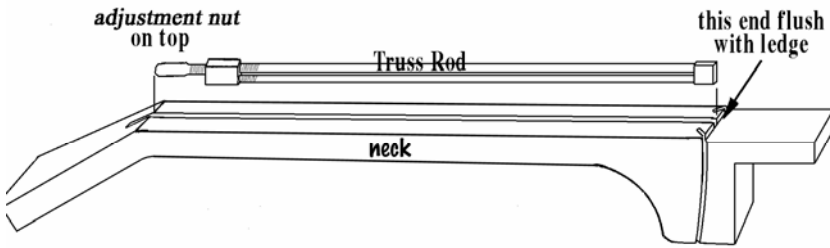
___9. Glue the four **LINING STRIPS** to the inside of the **SIDES**, as follows:

a) Use clothes pins to clamp them so the edges are flush, as shown.

b) Carefully sand all four edges so that they are flat and smooth, ready for gluing the **SOUNDBOARD** and **BACK**.

We like to wrap sandpaper around the end of a long stick, and then rest the stick across the instrument while sanding. This ensures a flat sanding action.





___ **10.** Check the fit of the **TRUSS ROD** before gluing the **SOUNDBOARD** in place. The **TRUSS ROD** should rest in the channel of the **NECK** with the adjustment nut up and facing the **PEG HEAD**, as shown.

THE SOUNDBOARD

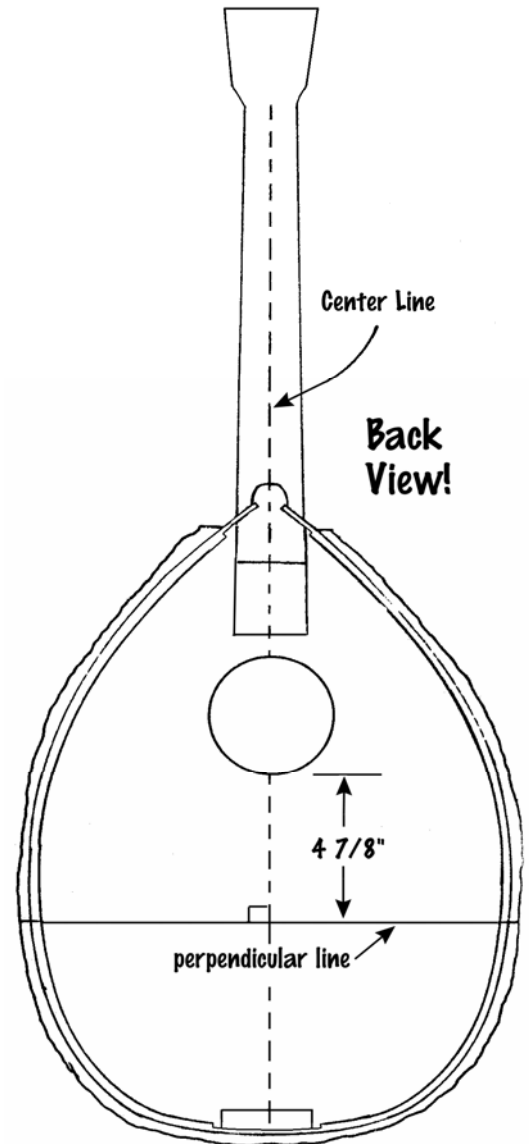
___ **11.** Select which side of the **SOUNDBOARD** you wish to show outward on the guitar. This is a reversible piece so you can choose whichever face you like better for the outside.

___ **12.** Draw a centerline down the length of the inside (the poorer face) of the **SOUNDBOARD**. Then draw a line at right angles to that line, exactly 4-7/8 inches from the large soundhole, as shown. Use a square to test for accuracy.

Hold the frame of the guitar onto the **SOUNDBOARD** again (without glue) on a flat work surface, just as before. Make sure the **SOUNDBOARD** reaches all the way to the end of the ledge cut in the **NECK**.

This time you must line up all the parts carefully so the guitar will be straight and symmetrical. The best way to accomplish this is to mark the center of the **NECK**, the **HEEL**, and the **TAIL BLOCK**. Then use a straight edge to line up all these marks with the centerline on the back of the **SOUNDBOARD**.

CAUTION: IT IS ENTIRELY POSSIBLE TO ASSEMBLE A CROOKED GUITAR! TAKE CARE TO STRAIGHTEN IT OUT AS YOU PREPARE THE PARTS.



You may need to push the **SIDES** one way or the other to center them on the **SOUNDBOARD**. Measure the distance from the centerline to each **SIDE**. Push or pull the **SIDES** into symmetry. When aligned, draw the outline of the **SIDES**, inside and out, on the **SOUNDBOARD**. Now you can work on the **SOUNDBOARD** bracing.

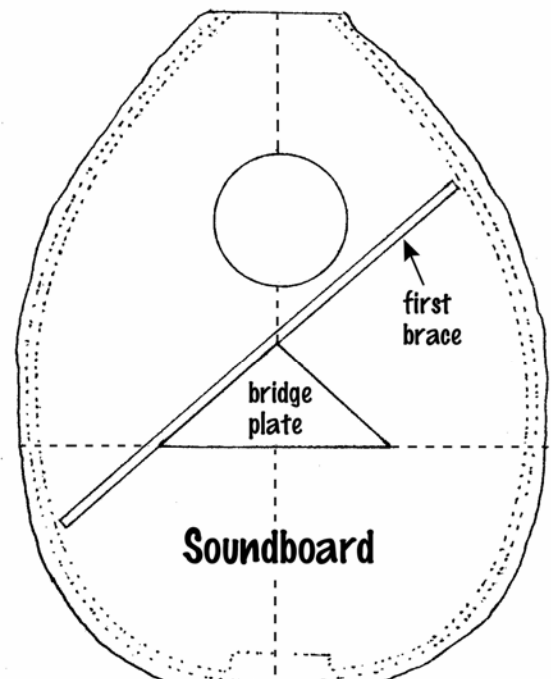
___13. Glue the **BRIDGE PLATE** to the inside of the **SOUNDBOARD**, with the point on the center line and the longest side on the perpendicular line that you drew earlier. Hold it with weights until the glue dries.

___14. The bracing on this guitar is very simple, compared to most guitars.

Begin by test-fitting one of the longer braces to the **SOUNDBOARD**, so it rests against the **BRIDGE PLATE**, as shown.

The brace is only tapered at one end because you must cut it to length before tapering the other end. Cut it so it reaches across the entire inside of the guitar, between the pencil outline you drew in the previous step.

When the brace is cut to length, taper the raw end to match the other (tapered) end.



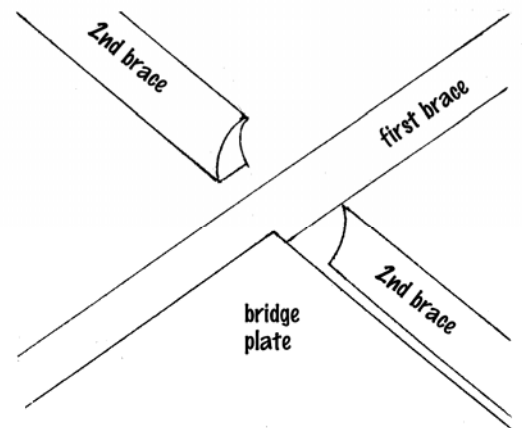
Glue this brace to the inside of the **SOUNDBOARD**, right up against the **BRIDGE PLATE**, and hold it with weights or clamps until dry.

CAUTION: BE SURE TO DO THIS CLAMPING TO A FLAT SURFACE! Otherwise your SOUNDBOARD may end up twisted or bowed.

___15. The next brace must intersect the first one at the point of the **BRIDGE PLATE**. Test-fit it and cut it into two pieces, as shown. Taper only the ends that reach out toward the **SIDES** of the instrument.

Do your best to fit the joint where the braces meet to form an "X". We use the edge of our disk sander to cut a cove in the end of one brace to match the profile of the one it joins. This will increase the strength of your bracing and help prevent buzzing or rattling inside the guitar when you play.

Glue and clamp this two-part brace into place against the other edge of the **BRIDGE PLATE**, gluing all parts that make contact.



___16. Now you may glue the **SOUNDBOARD** to the guitar frame. Do this carefully on a flat surface, making sure to line up all the parts again in symmetry. The inside bracing should not interfere with the **SIDES** of the instrument. Look for glue to squeeze out all around the circumference of the instrument. That will prove good contact.

GLUING THE BACK

___17. Select which face of the **BACK** you prefer to show outward. You will be gluing the bracing to the other (reverse) side.

Place the **BACK** piece on a flat work surface so the inside faces up. Draw a center line from one end to the other, and then position the frame of the guitar over it, aligned to the center marks. There should be some excess **BACK** material extending beyond the **SIDES** all the way around the assembly.

Draw the outline of the guitar on the **BACK**. Then you can set the guitar assembly aside for awhile.

___18. The exact location of the bracing is not critical for the **BACK**. We simply like to space these braces evenly for supporting the thin plywood material.

Draw three lines perpendicular to the centerline in the positions illustrated. Then trim the remaining three braces to fit inside the guitar frame at those positions.

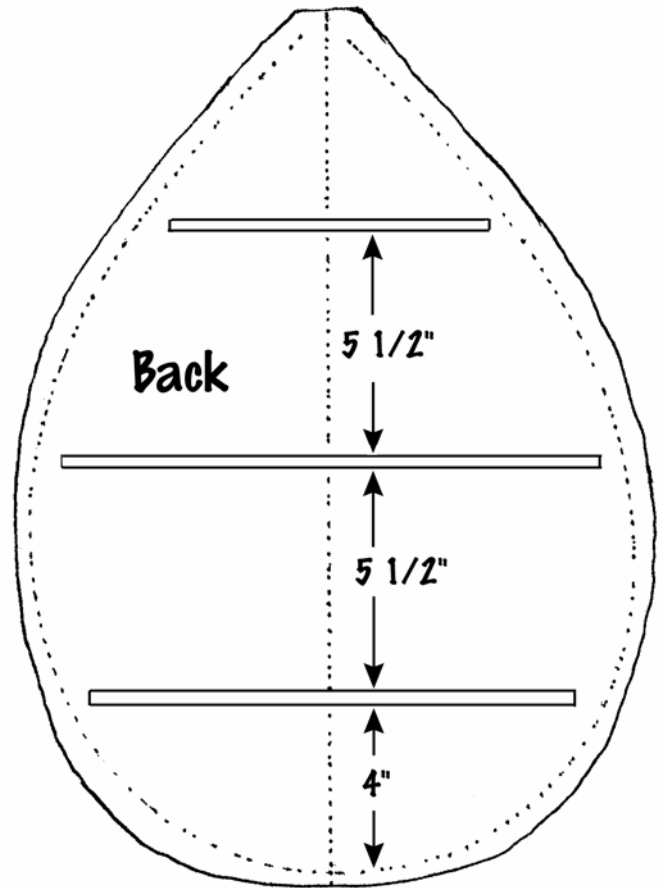
NOTE: You'll need to cut these braces to fit nearly 1/2" inside the penciled outline, to allow for the thickness of the **SIDES** and **LINING STRIPS**.

___19. After trimming these braces to length, taper the raw end to match the finished end, and glue them in place. Use weights or clamps to hold these braces firmly down to the **BACK** on a flat work surface.

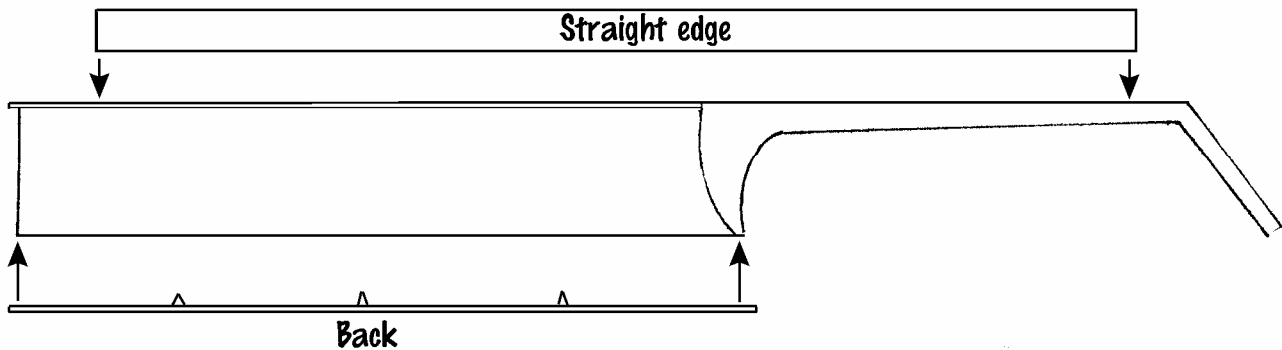
CAUTION: Double check to make sure all three braces are clamped firmly. Some glue should squeeze out all along each brace. It is aggravating to have an internal brace come loose after the guitar has been assembled! If necessary, just glue and clamp one brace at a time.

___20. Sign your name and the date to the inside of the **BACK** before gluing the back in place. Select a place for your signature that will be visible through the soundhole. Check the Musicmaker's catalog for Heat Transfer patterns for fancy signature boxes. You can make your own special "manufacturer's label"!

___21. Test-fit the **BACK** of the guitar again. If any braces interfere with the **SIDES** of the assembly, you can still trim them off with a sharp chisel or knife.



IMPORTANT: It is still possible to glue this instrument out of alignment, although not as likely as it was earlier. Try holding a straight-edge over the **SOUNDBOARD** and down the entire length of the **NECK**. Are these surfaces perfectly flat? If not, you can force the **SIDES** in or out (at the bottom edges) and change the level of that top surface. Try it and see what happens.



___ **22.** When you understand what needs to be done to achieve a level surface at the top, you may glue the **BACK** to the guitar. Force the **SIDES** in or out if necessary and let the clamps or weights hold them in place until dry.

Look for glue to squeeze out all around the circumference of the instrument. That will prove good contact.

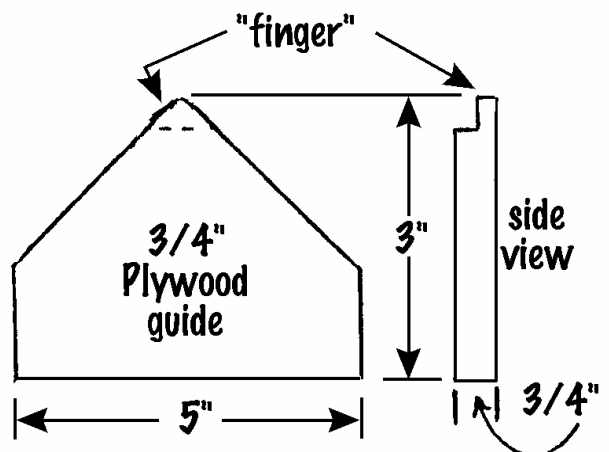
___ **23.** When the guitar body is dry, you can trim off the excess **SOUNDBOARD** and **BACK** material that hangs over the **SIDES**. We use a router with a flush-trimming bit for this job, but you can accomplish the task with a power sander, or by hand with a sanding block. Just be very careful not to sand the surfaces of the **SIDES** or **BACK** too much -- the veneers are quite thin.

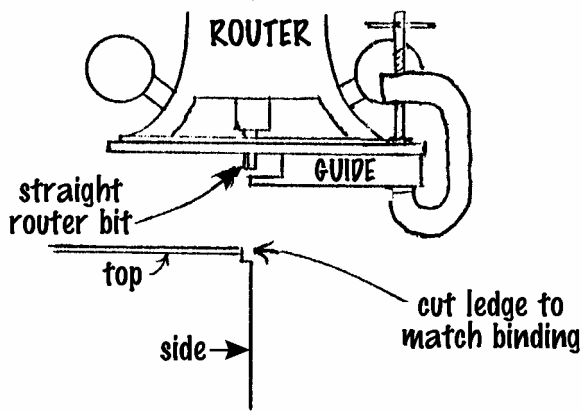
OPTIONAL DECORATIONS:

___ **24. (OPTIONAL)** You may add some decorative inlay banding to the edges of the guitar body, around both the top and back, if you have access to a router. Edge banding adds significantly to the appearance (thus, the value) of the finished instrument. You'll need nearly 60 inches of decoration to reach around the circumference of the instrument once. Double that if you wish to edge both the **SOUNDBOARD** and the **BACK**.

This is not such a difficult step if you have a router and a straight router bit (with carbide tips). You can make a simple jig to clamp right to your router base to guide the bit cleanly around the curves of the guitar.

Make your jig from a scrap of plywood and clamp it to the base of your router so the "**finger**" hangs over the bit, as shown. Set the cutting depth of the bit to match the width of the inlay strip, and adjust the position of the "finger" to allow a cutting depth to match the thickness of the inlay.

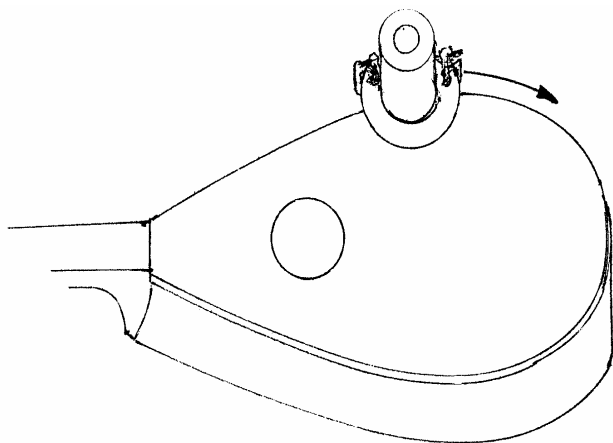




NOTE: You will be cutting with the side of the router bit, not the end. It may take a minute of study for you to see how this will work.

Test your cut on scrap wood first and make adjustments as necessary so the inlay strip fits nicely into the groove.

CAUTION: When you cut the grooves on the guitar, we recommend pushing the router in a clockwise direction around the circumference. This is opposite the normal direction, which would be to move the router against the spin of the bit. By moving the router **with the spin** of the bit, you eliminate any chance of splintering the veneers as you cut. It may sound odd, or even unsafe, but it works beautifully, and does not cause a safety problem with such a small cut.



Go ahead and rout the groove, and then take a good look at it to see if it is cut to full depth and width all the way around. We usually run the router at least twice around the guitar to ensure a complete cut. You need not worry about cutting too deeply -- the guide "finger" prevents that.

NOTE: You'll probably need to use a sharp chisel to finish cutting the ends of these grooves where the

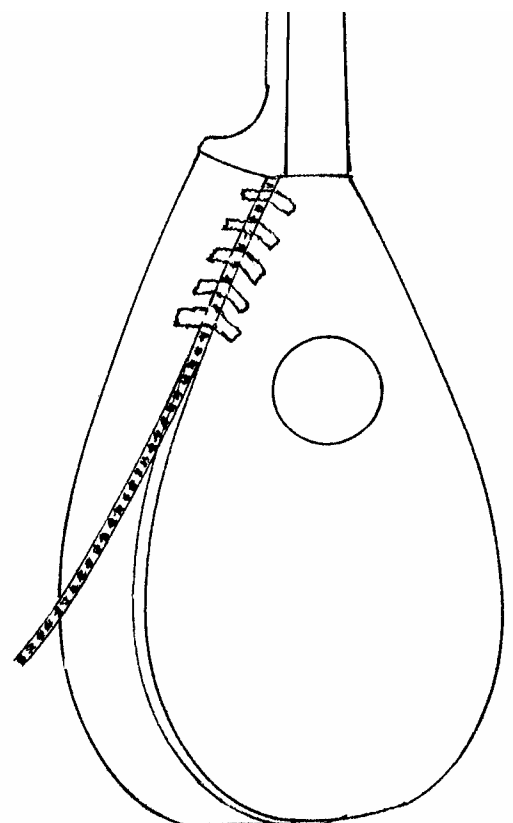
body joins the **NECK** of the guitar.

25. If you are installing wood inlay strips, then Elmer's glue is all you need. If you are installing plastic edge binding, you'll need some model airplane cement to glue the binding into place. We use "Sig" brand, but any other should work fine if it is for plastic and wood. Be sure to have plenty of masking tape on hand for holding the binding in place while the glue is drying.

Squirt a bead of glue along 12" of the groove at a time, beginning at the neck end of the body. Don't apply glue all the way around the guitar at once -- it'll be dry before you get all the banding material wrapped around.

Place the end of banding into the groove and use short pieces of masking tape about one inch apart to hold it securely in place. Work your way around the perimeter, squirting glue into the groove as you go. If you need to make a joint in the banding material, use a razor knife to cut the parts cleanly at a logical part of the pattern where the joint will not be noticeable.

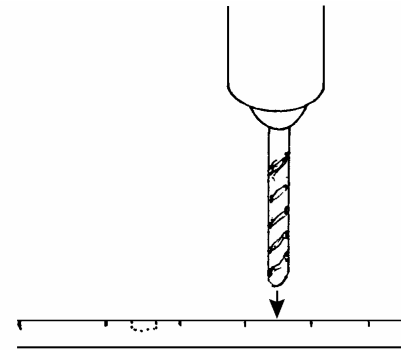
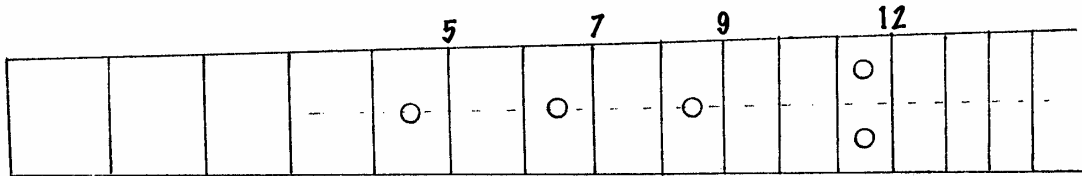
When you get within 8 or 12 inches of the other end of the groove, cut the strip carefully to fit before squirting glue in that



last section. Leave the tape on for at least 12 hours for plastic strips, or one hour for wood inlay banding.

___ **26.** When the glue is dry, remove all the masking tape and sand (or scrape) the edges of the guitar to remove excess glue and to level the inlays with the wood. Just be careful not to sand the surfaces of the **TOP, BACK** or **SIDES** too much -- you may cut through the surface veneer.

___ **27. (OPTIONAL)** Another decorative option is to inlay marking dots at certain positions of the **FRETBOARD**. This is a simple and attractive detail, requiring only an electric drill.



Place scraps of masking tape on the **FRETBOARD** at the positions shown, so you can clearly draw some pencil marks.

Mark the center of each space in pencil, and then use an awl or sharp nail to punch a depression at each point. Drill shallow holes of the size that matches your marking dots (1/4" diameter is normal). The depth of the holes is not too critical, as you will see next.

Mix up some "5-Minute Epoxy" and use a nail to put some into each hole, nearly filling the cavity. Push a marking dot into each hole until it comes nearly flush with the wood surface, but still stands slightly high. The dots may "float" on the epoxy.

When the epoxy is hard, sand the dots flush with the surface of the **FRETBOARD**.

INSTALLING THE FRETS

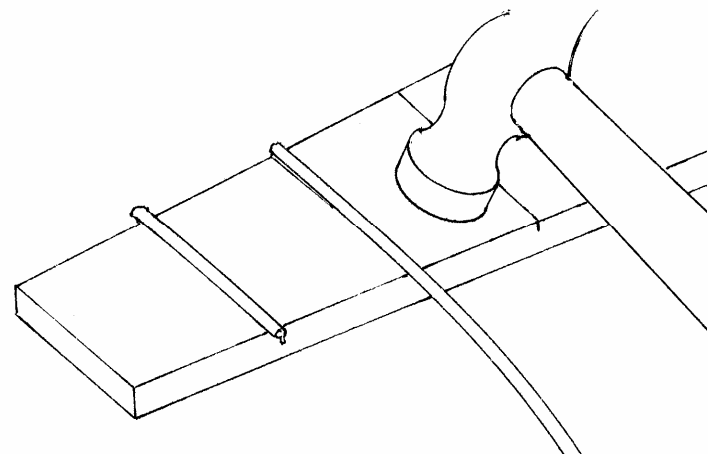
___ **28.** Test-fit the **FRETBOARD** to the **NECK** of the guitar first. The narrow end should begin 1/4" from the sharp angle (to allow room for the **NUT**), and the wide end should come close to the soundhole. **NOTE: If you plan to install a rosette over the soundhole, you must cut a curve at the wider end of the FRETBOARD to accommodate the rosette.**

Check the width of the **NECK** and **FRETBOARD** when they are in proper position. Whichever piece is wider must be sanded to match the narrower one. This is most easily done now, before the frets are installed. Take care to make this shaping smooth and gradual, because this is the "playing" area of the instrument.

NOTE: This is your opportunity to make the **NECK** and **FRETBOARD** narrower, if you prefer. Typically, steel-strung guitars are about 1-3/4" wide at the **NUT**, and nylon-strung ones are about 2" wide. If you own another guitar you may want to match the width of the **FINGERBOARD** to that instrument.

___ **29.** It is best to install the frets into the fretboard **BEFORE** gluing the fretboard onto the instrument.

Place your **FRETBOARD** 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 tap the frets into place.

- a) Begin by placing the long length of fretwire over one of the slots cut in the fretboard, so the end hangs over the edge of the wood just 1/16" or so.
- b) Position the fretwire so that the "tang" will be driven down into the fret slots.
- c) Use a hammer to lightly tap the fretwire into the slot, until the "crown" of the fret contacts the wood surface.

HINT: Tap one end of the wire in first, then the other end, and finally give one or two taps in the middle, checking to see that it is fully seated. Try not to overwork this wire. Too much pounding in the middle may cause the ends to curl up. When you get the hang of it, 3 or 4 taps is all it should take to set each fret.

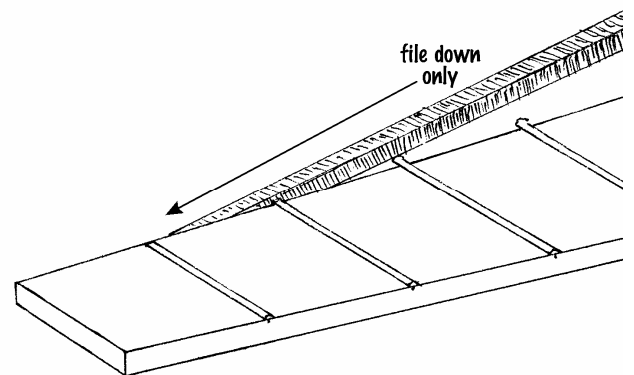
d) When the fretwire is securely held by the wood, use a wire cutter to clip off the excess, as close to the wood as possible.

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

HINT: Some experts prefer to glue the frets in place, using 5-minute epoxy. This can be especially helpful if you have trouble with one or two pieces and end up overworking the wire or enlarging the slot so it no longer holds the wire firmly. Use a c-clamp and a scrap of wood to hold the errant fret in place while the epoxy sets. Then clean off excess adhesive with a sharp knife.

___ **30.** After the frets are all installed, we like to look them over very 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 playing the instrument. Try to tap it down fully into the slot. Do your best to get them all held down firmly. Later, when the **FRETBOARD** is installed, you'll have one more opportunity to level the tops of the frets with a file.

___ **31.** File (or sand) the ragged ends of the frets down until they are smooth and flush with the sides of the **FRETBOARD**. 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 a soft metal that can easily be sanded, and a power sander does the job very quickly.



___ **32.** 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.

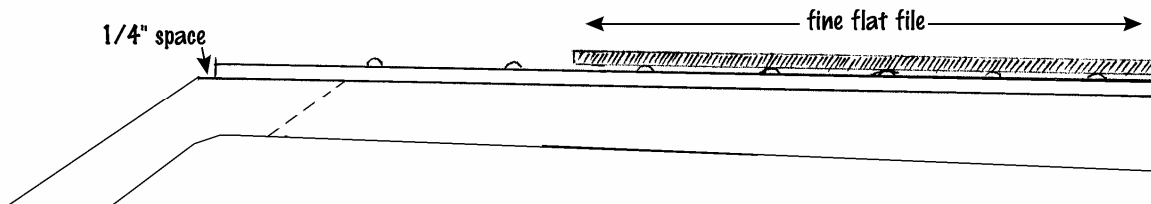
___ **33.** Now you may glue the **FRETBOARD** to the **NECK**, being careful to line up the parts as planned. Clamp it firmly in place so that some glue squeezes out along the seams.

DOUBLE-CHECK TO SEE THAT THE FRETBOARD DOES NOT SLIDE OUT OF PLACE AFTER THE CLAMPS HAVE BEEN APPLIED.

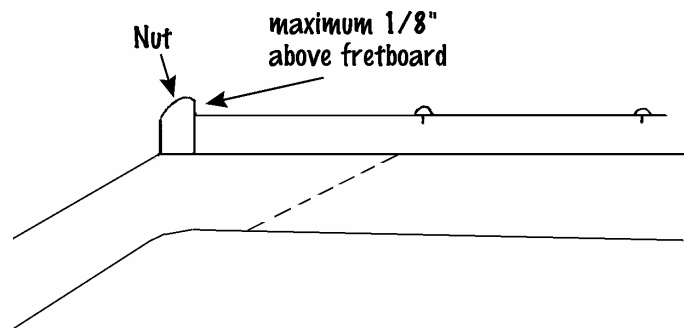
___ **34.** When dry, remove the clamps and sand the edges of the **NECK** and **FRETBOARD** to remove dried glue and to smooth off the playing surface.

Also, clean up any excess glue that shows on the soundboard at either side of the fretboard. We use a sharp chisel or knife for that.

___ **35.** Now is a good time to "level" the tops of all the frets. Use a large flat mill file, resting on the **FRETBOARD**, to wear down any frets that are too high. Check your progress frequently to see which frets are being cut and which ones are not. As soon as each fret has been scratched lightly with the file, you may consider them all level.



___ **36.** Test-fit the plastic **NUT** to the end of the **FRETBOARD**. We use a disk sander or belt sander to trim the length so the ends are flush with the **NECK**. We also like to cut the height and round over one edge of the **NUT**, as shown.



___ **37.** When trimmed to size, the plastic **NUT** can be glued to the end of the **FRETBOARD**. Use Superglue or epoxy for this piece.

INSTALLING THE BRIDGE

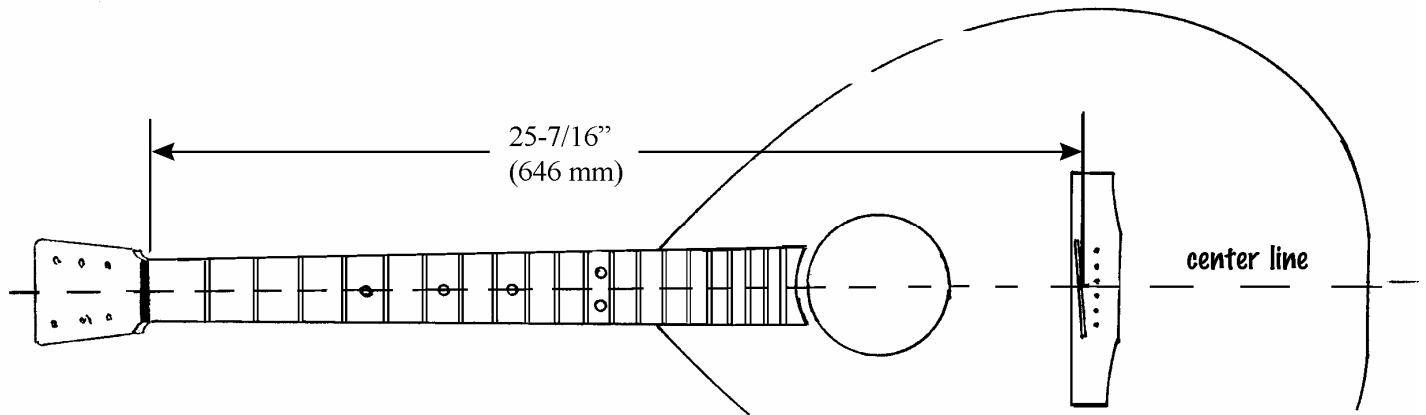
___ **38.** Lightly draw a centerline on the top of the **SOUNDBOARD** in the approximate location of the **BRIDGE**. Mark the center point of the bridge also.

Test fit the **BRIDGE** to the **SOUNDBOARD** of the guitar, making sure that the distance from the inside edge of the nut to the middle of the plastic saddle is precisely **25-7/16\" (646 mm)** at the centerline.

Note that the saddle is not parallel to the edge of the **BRIDGE**. That's **OK**. You are making this measurement at the center of the **BRIDGE**. The slight angle of the saddle is meant to compensate for the differences in the stretch of bass strings versus treble strings as they are pushed down against the frets. Use a square to make sure the front (wood) edge of the **BRIDGE** is perpendicular to the centerline on the **SOUNDBOARD**.

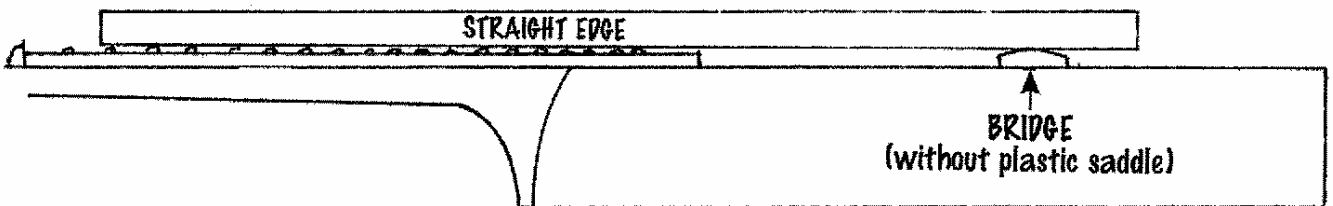
IMPORTANT: CHECK THE ALIGNMENT OF THE BRIDGE WITH THE FRETBOARD ALSO. THIS IS ACTUALLY MORE IMPORTANT THAN CENTERING IT ON THE SOUNDBOARD. Do this by marking the center of the FRETBOARD at each end and then laying a straightedge on those marks to see if the BRIDGE is centered on the same line. If not, MOVE THE BRIDGE! It is better to have the strings follow the

FRETBOARD to an uncentered **BRIDGE** than to have them "fall off" one side of the **FRETBOARD** to a perfectly centered **BRIDGE**....



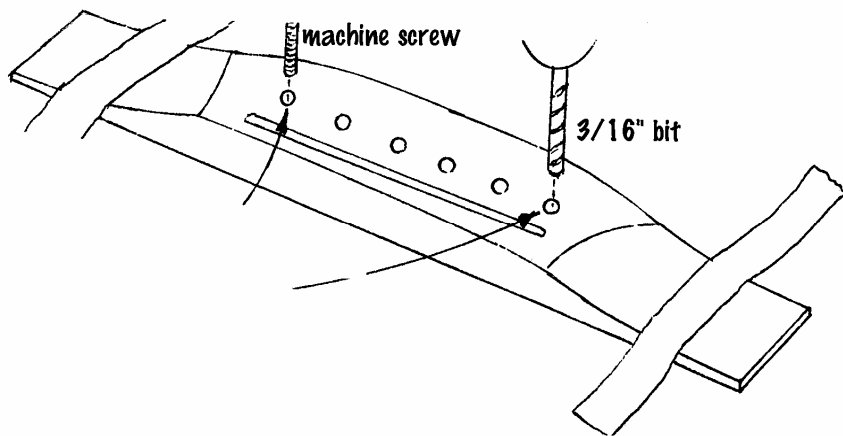
When you have the **BRIDGE** located and squared at the proper distance from the **NUT**, outline it in pencil so you can easily re-position it when you get ready to glue it down.

CAUTION: BEFORE GLUING THE BRIDGE IN PLACE, test the height of the BRIDGE in relation to the FRETBOARD. Lay a straight-edge across the top of the frets and over the BRIDGE, as shown, WITHOUT THE PLASTIC SADDLE. Ideally, the BRIDGE would almost be able to slide under the straight-edge without lifting it off the frets, although a small amount of lift (1/8") is OK. If the BRIDGE is too high, sand it thinner before installing it. You can sand as much as 1/16" off the bottom and another 1/8" off the top of the BRIDGE without hurting anything.



___ **39.** Check the fit of the underside of the **BRIDGE** to the **SOUNDBOARD**. You may need to sand the **BRIDGE** to flatten it to make good contact with the soundboard all the way around.

___ **40.** Use masking tape to hold the **BRIDGE** in its proper location, as outlined on the **SOUNDBOARD**. Double-check your measurement to the **NUT** one more time, just for safety. It should be **25-7/16"** (that is just **1/16"** before the **25-1/2"** mark) to the center of the plastic saddle in the **BRIDGE**. Don't make the mistake we once did of starting the measurement at the 1" mark on the ruler and ending up one inch short! The guitar will not play in tune if this distance is not accurate.



___ **41.** With the **BRIDGE** held steadily in place, use a **3/16"** drill bit to drill through two of the peg holes in the **BRIDGE**, right through the top of the guitar, one hole at each end of the **BRIDGE**. Go ahead and wince as you do this -- we always do!

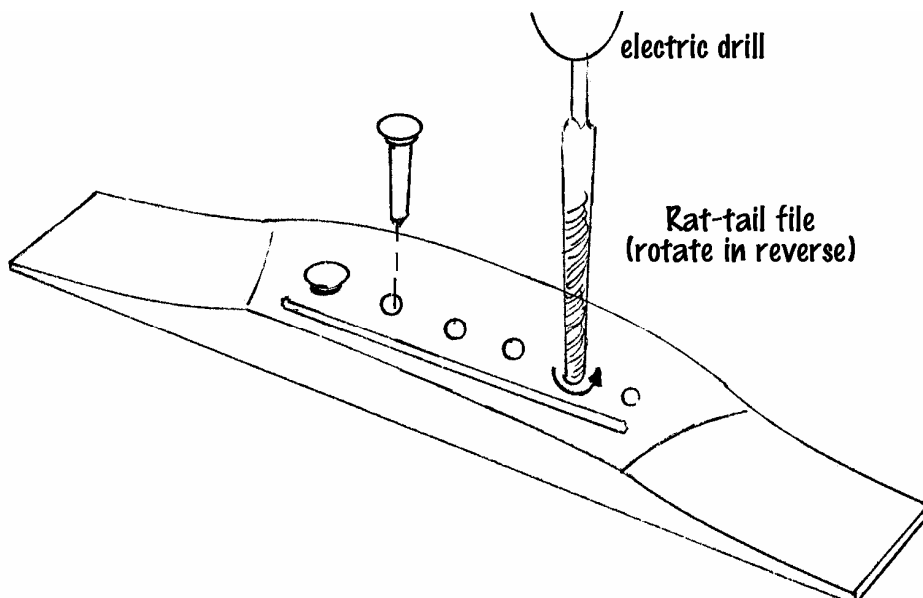
___ **42.** Test-fit the two **3/16"** machine screws with washers and nuts, into the two holes just drilled. These will be used to help clamp the **BRIDGE** to the **SOUNDBOARD** when you glue it in place.

___ **43.** Remove the tape that is holding the **BRIDGE** and check carefully to see if it sits flat on the **SOUNDBOARD**. If you can rock it by pushing alternately on each end, then you still need to sand the underside of the **BRIDGE** to fit the surface of the **SOUNDBOARD**.

___ **44.** When finally satisfied with the fit of the **BRIDGE**, glue it to the **SOUNDBOARD**, using the two machine screws and nuts to clamp it down firmly. Make sure there is enough glue so that a little squeezes out around the **BRIDGE** when clamped. We like to add more clamping pressure to the ends of the **BRIDGE**, using two long (**6-1/2"** reach) Cam Clamps. This will ensure a permanent glue joint. If you don't have clamps that will reach, just place some weights on each end of the **BRIDGE**.

When the glue has begun to set up (after about **30** minutes), use a sharp chisel to remove the excess that squeezed out around the **BRIDGE**.

___ **45.** After the **BRIDGE** is dry, you can drill through the remaining holes for the **BRIDGE PEGS**, using the same **3/16"** drill bit.



___ **46.** The holes in the **BRIDGE** must now be tapered slightly to fit the **BRIDGE PEGS**. We use a small (**6"**) rat-tail file for this task. The simplest method is to chuck the file into your electric hand drill and run it in reverse as you push the file into the holes in the **BRIDGE**. Test the size of the holes frequently by inserting one of the **BRIDGE PEGS** to see if it fits snugly all the way in.

FINAL SANDING AND FINISHING

___**47.** Clean up any glue residue around the entire guitar. Nothing points to an amateur woodworker more than a project with glue blobs and fingerprints on the surface. They are difficult to see now, but will stand out prominently after applying the finish. We recommend wiping the guitar with a clean damp rag to help highlight them.

Use sandpaper, a sharp chisel, knife, or scraper to remove all glue residues.

___**48.** Sand the entire instrument with about a **180-220** grit abrasive to smooth out all surfaces so they feel good in your hands. We like to knock off the sharp edges of the edge banding slightly too.

WA-LA! YOUR GUITAR IS READY FOR THE FINISH. HERE ARE A FEW SUGGESTIONS FOR SELECTING A NICE-LOOKING COAT TO PROTECT YOUR HANDIWORK AND TO ENHANCE THE BEAUTY OF THE WOOD.

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

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

VARNISH -- Any regular varnish will work fine on this project, but we recommend our wipe-on polyurethane called MUSICMAKER'S INSTRUMENT FINISH. Our finishing kit includes detailed instructions, sandpaper sheets, foam applicator, and a half-pint can of satin wipe-on gel urethane varnish. The advantages of this finish are its simple application, durability, and deep, soft luster. It also works well for protecting Heat Transfer decorations.

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

___**49.** Apply your finish to the entire guitar except for the top of the **FRETBOARD** (which can be lightly oiled later). We recommend masking off the **FRETBOARD** before beginning.

We also suggest stuffing some newspaper into the soundhole to catch any drips or spray that might get into the inside of the guitar body. No sense letting this thing look sloppy....

Don't forget to finish the little TRUSS ROD COVER plate too!

Sand between coats with fine (**320-400 grit**) sandpaper or steel wool.

Consult instructions on the can for proper drying time.

If you want to change the sheen of the finish after it dries, you can dull it slightly by rubbing with 0000 steel wool or with a Scotchbright scrubber. We often follow this procedure with a coat or two of paste wax (the same product that you would use on a wood floor) to bring out a nice shine.

___ **50.** Now you can remove the masking tape from the **FRETBOARD** and coat it lightly with some oil. *We use boiled linseed oil or tung oil for this.*

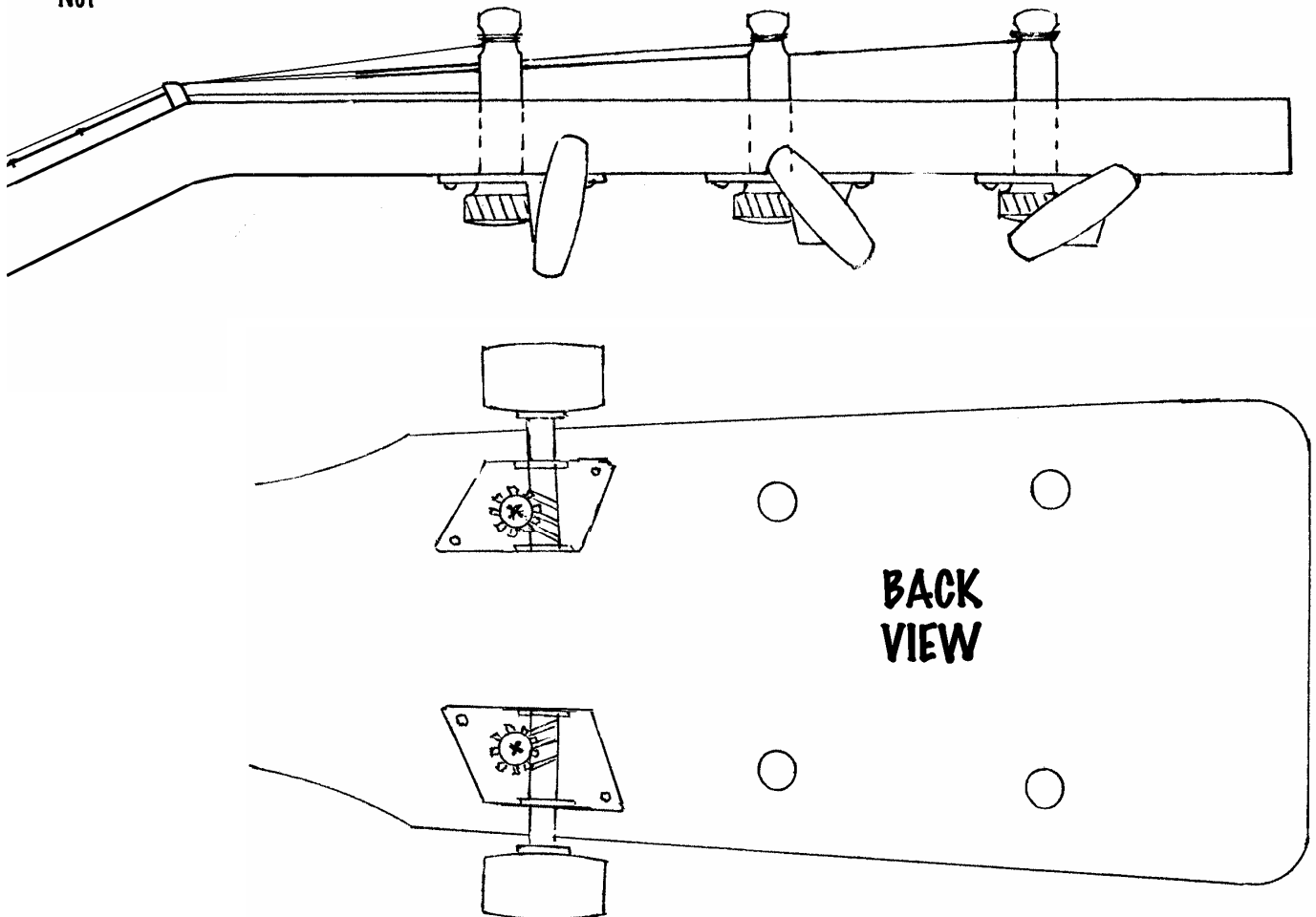
___ **51.** This is also a good time to install the **TRUSS ROD COVER** plate. Use a **1/16"** drill bit to make pilot holes for the three mounting screws.

INSTALLING HARDWARE AND STRINGS

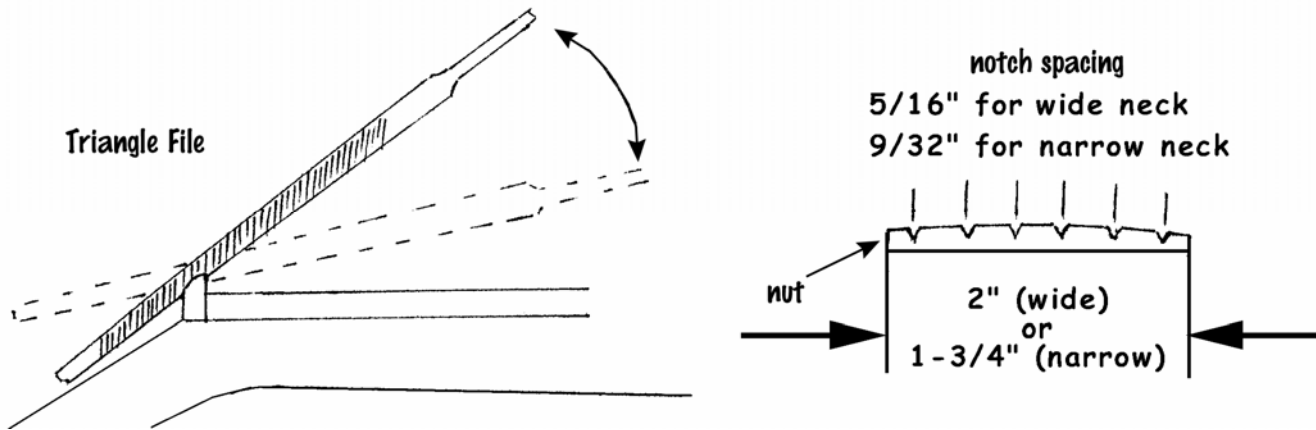
___ **52.** Install the individual **GEARED TUNERS** to the **PEGHEAD**, as shown, taking note that some are meant for the right side and some for the left.

Drill **1/16"** pilot holes for the tiny screws, taking care not to drill all the way through the **PEGHEAD**.

Nut

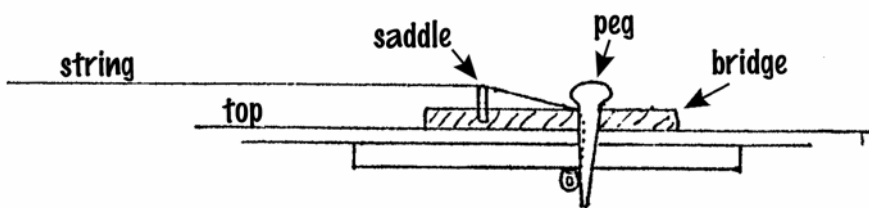


___ **53.** Use a triangle file to cut notches in the **NUT** for the strings, as shown. Note that the notch spacing will depend on the final width of the neck. You may make slight adjustments to the dimensions given here. File these notches in a slight curve so the strings will follow an easy rounded corner from the **PEGHEAD** to the **FRETBOARD**. This will minimize string breakage.



___ **54.** Make sure the plastic saddle is in the **BRIDGE**. We will test its height by installing one string.

___ **55.** Fasten just one string (the heavy "E" - **6th** string) to the bridge as follows:



a) Push the "ball" end down into the hole so the ball is inside the guitar.

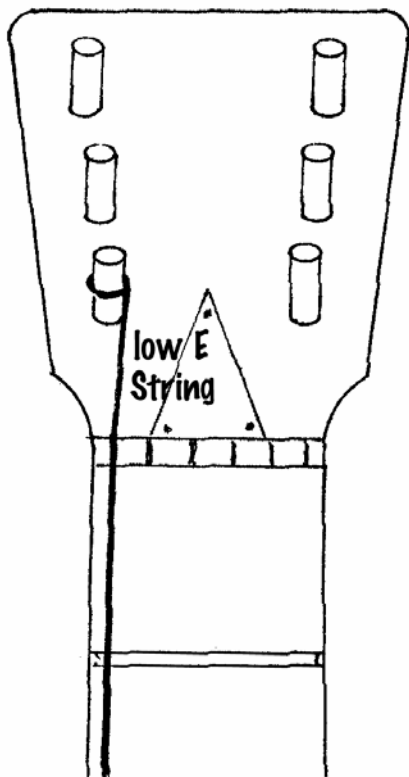
b) Insert one plastic peg, oriented so the groove in the peg shaft lines up with the string.

c) When properly installed, the peg shaft should prevent the ball end from pulling back up through the hole.

d) Thread the other end of the string through the hole in the first geared tuner (closest to the "nut" on the left side) and turn the button to wind the string until it is tight enough to vibrate clearly.

___ **56.** Check the height of this string above the frets. Initially, you should set up the strings so they clear the frets by about **1/16"** at the first fret (near the **PEGHEAD**), and about **3/16"** at the **12th** fret.

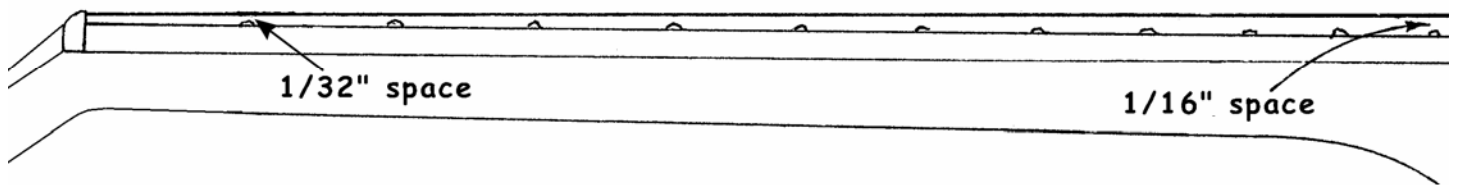
Sight down the **FRETBOARD** to make sure it has no bow to it. You can adjust that by tightening or loosening the **TRUSS ROD**, using the allen wrench provided. Tightening the rod pulls the **PEGHEAD** backward, loosening the rod allows the string tension to pull the



PEGHEAD forward (although it may take some time for the strings to accomplish this).

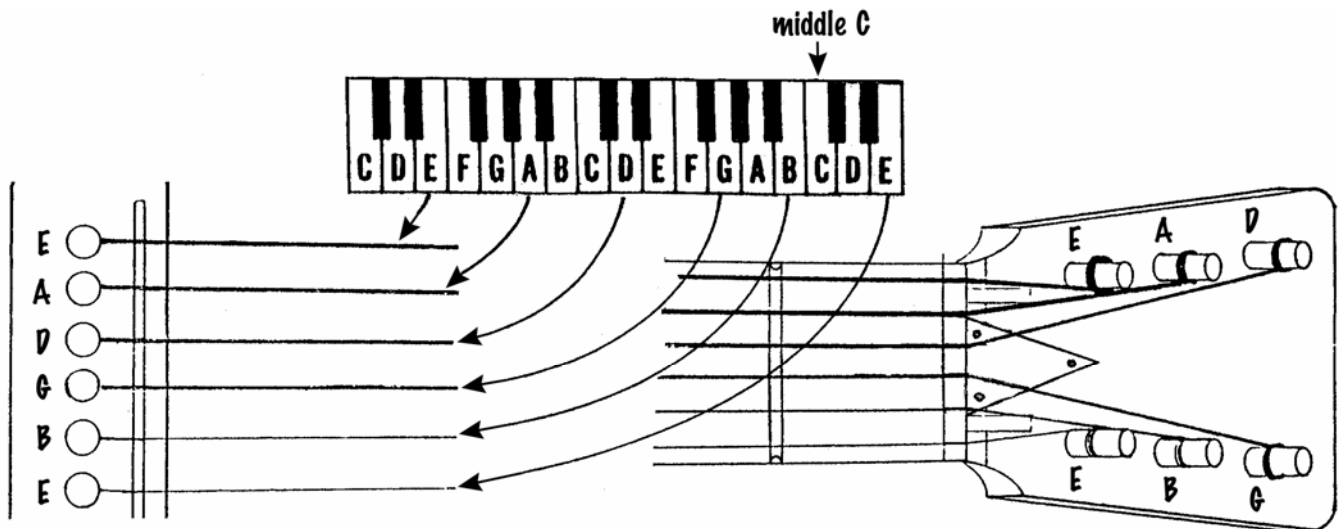
Once the **FRETBOARD** is straight, you can adjust the 1st fret clearance more precisely by filing down the groove in the **NUT** where the string rests, but be careful not to file too far. The only way to raise the string at that position is to remove the nut and glue a shim underneath it.

You can adjust the height of the string over the **12th** fret by raising or lowering the plastic saddle in the **BRIDGE**. Lower it by removing the saddle and sanding the bottom of it, or raise it by placing a thin shim underneath the saddle.



Your style of playing will dictate how low to adjust the string action. Heavy strumming requires rather high action to avoid excessive buzzing or rattling, whereas light finger picking is easier with low action. Most people find the guitar easier to play with low action, so we set the strings to about **1/32"** (thickness of matchbook cover) above the first fret, and about **1/16"** above the **12th** fret.

 57. When you are satisfied with the height of that first string, go ahead and install the other five strings in the same way. Tune them to the pitches shown.



FINE ADJUSTMENTS AND TROUBLESHOOTING

___ **58.** There may still be some fine adjustments needed to make your guitar work its best. Test each string by plucking it with one hand while you press it down at each playing position (fret) along the neck. Here is what to check for:

a). If the string is difficult to push all the way to the fretboard, it is too high. Filing the grooves deeper in the nut will lower the string at the head end, and sanding the saddle in the bridge will lower the strings near the middle of the guitar.

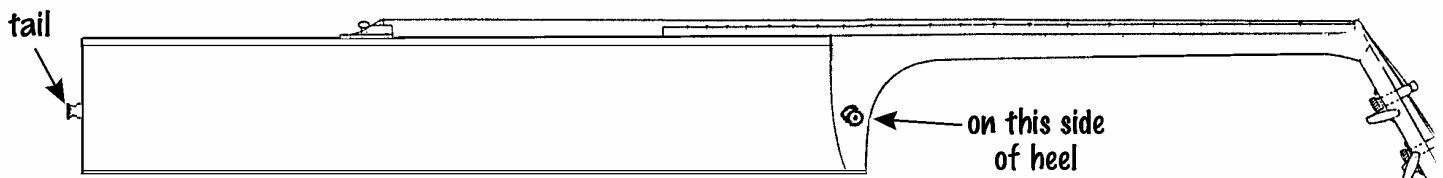
b). If a string buzzes when plucked in the **OPEN POSITION ONLY** (when not held down to a fret), then the notch in the **NUT** is too deep. Raise the entire **NUT** by gluing a shim underneath it.

c). If your strings buzz and rattle in general as you play, sight down the **FRETBOARD** first. Some seasonal changes may cause it to bend backward. Loosen the **TRUSS ROD** to allow the strings to pull the **NECK** forward. You may also shim up the saddle in the **BRIDGE** to raise the strings a little higher, or change to heavier gauge strings to exert greater tension on the **NECK**.

d). If a string rattles or buzzes at just one or two positions (frets), or if you discover that two or three frets all give the same pitch, then look for a fret that stands up higher than its neighbors. You will need to either tap that fret back down into its proper slot in the fretboard or use the long flat file to level the tops of the frets some more. Just loosen the strings, lift them out of the grooves in the nut, and hold them along either side of the fingerboard as you work the file lengthwise along the tops of the frets. You can easily see which frets are the highest, as they are the ones that receive the most filing.

OPTIONAL ACCESSORIES

___ **59.** If you wish to attach a strap to your guitar, you can install mounting buttons in the locations shown here. Use a **7/64"** drill bit for pilot holes for the mounting screws.



___ **60.** You may apply a plastic pick guard to the **SOUNDBOARD** to protect the finish from the scratching action of strumming with a pick. Pick guards come with self-adhesive backing so they stick to the finished instrument.

___ **61.** We also offer a precision cut Wooden Rosette that can be glued over the soundhole to give the instrument a more authentic Renaissance Lute appearance. We like to glue it with only a few dots of "5 Minute Epoxy" on the rim of the soundhole in case you ever want to pop it off again for access to the inside of the instrument.

CONGRATULATIONS! We hope you have enjoyed building this guitar and that you receive many years of musical pleasure from it. Don't hesitate to contact us for any further help that you may need. We also appreciate hearing suggestions and hints that you think might help another kit-builder in the future. Thank you.

ACCESSORIES AVAILABLE FOR GUITAR

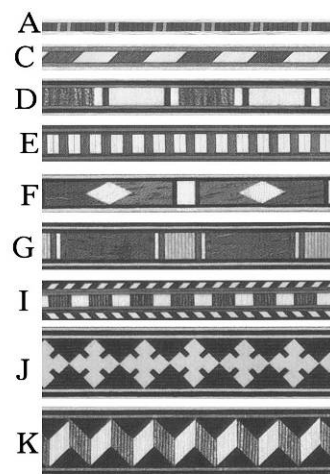
Please see our current catalog or visit www.harokit.com for current pricing.

FINISHKIT	Musicmaker's finishing kit
GUITSTRG	Spare set of 6 steel strings
GUITSTRGNY	Optional set of 6 nylon strings
STRAP-2	Guitar strap with 2 mounting buttons
RENBAG	Padded carrying bag for Renaissance guitar
DOTS14	Pearl marking dots for fretboard
DOILYJ	Wooden Doily Rosette, 4-1/4" dia
GUARD-2	Plastic pick guard, tortoise-shell

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All inlay bands are **36"** long, **1/25"** thick, made of solid wood with colors all the way through the thickness, so you don't need to worry about sanding off the pattern.

CODE	WIDTH
INLAY A	1/8"
INLAY C	3/16"
INLAY D	1/4"
INLAY E	1/4"
INLAY F	1/4"
INLAY G	5/16"
INLAY I	5/16"
INLAY J	1/2"
INLAY K	1/2"



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