

Cumberland Banjo



THE CUMBERLAND GAP

We have designed this banjo with a "Cumberland Gap" in the fretboard. You can fill this gap with either a Fretted Insert or a Fretless Insert, allowing you to play the lower section of the neck with or without frets.

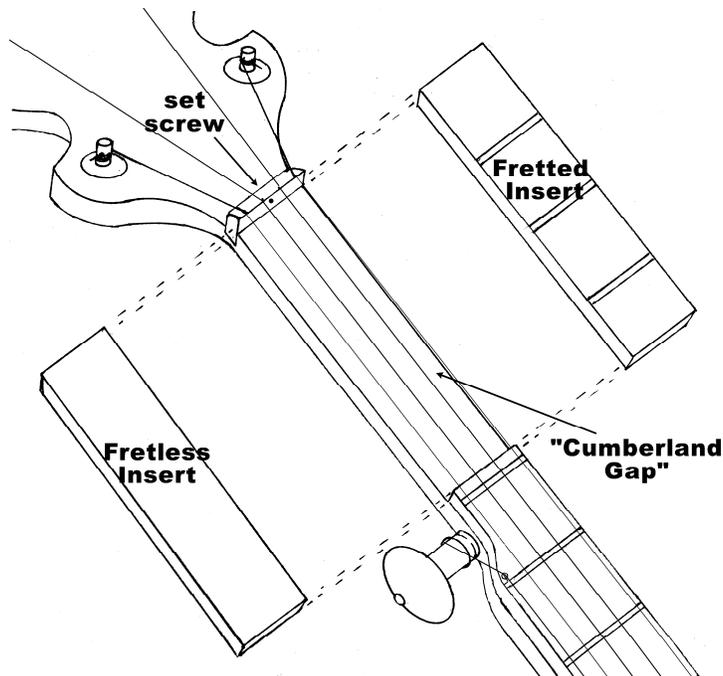
The real Cumberland Gap is a geological formation located where the borders of Tennessee, Kentucky, and Virginia meet. It forms a major break in the Appalachian Mountain chain. First used by large game animals in their migratory journeys, and then by Native Americans, this natural doorway through the mountains was the first and best avenue for the settlement of the interior of America. From 1775 to 1810, the Gap's heyday, an estimated 300,000 pioneer settlers crossed the Gap into Kentucky. It was familiar territory for such great famous woodsmen as Jim Bowie and Davy Crockett.



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INTERCHANGEABLE INSERTS

To change a section of your banjo from Fretless to Fretted, use the ball-end ALLEN DRIVER enclosed to loosen the SET SCREW in the NUT and slide the INSERTS in and out of the "Cumberland Gap" as desired. You can test this feature right away to see how it works.



WHY A FRETLESS INSERT?

You may wonder why we offer this banjo with replaceable short inserts in the fretboard. The reason is that many banjo players like to learn the technique of sliding notes along a fretless surface, especially in the lower range near the Peg Head. You can achieve the old time "mountain" sound of clawhammer banjo style by using the fretless insert. We have devised a system that makes these parts quickly interchangeable so you can switch back and forth between the fretless and the fretted inserts without even loosening the strings.

Playing the fretless neck in this lower range is quite easy and forgiving. You do not need to be perfectly accurate in your finger placement to achieve the proper pitch. As you play up the neck, however, the spaces between notes becomes smaller and smaller, so it is helpful to leave the frets in place to help you with proper finger placement there.

We hope you enjoy this special mechanical feature on your Cumberland Banjo. Use the nylon Pouch in the back of the instrument to hold the spare insert and the Allen Driver. This Pouch might also be a handy place for spare strings and picks.

Some people also like to mute the banjo sound by stuffing a towel inside the back. The Pouch will help hold the towel in place for that special effect.

CUMBERLAND BANJO Kit Inventory List

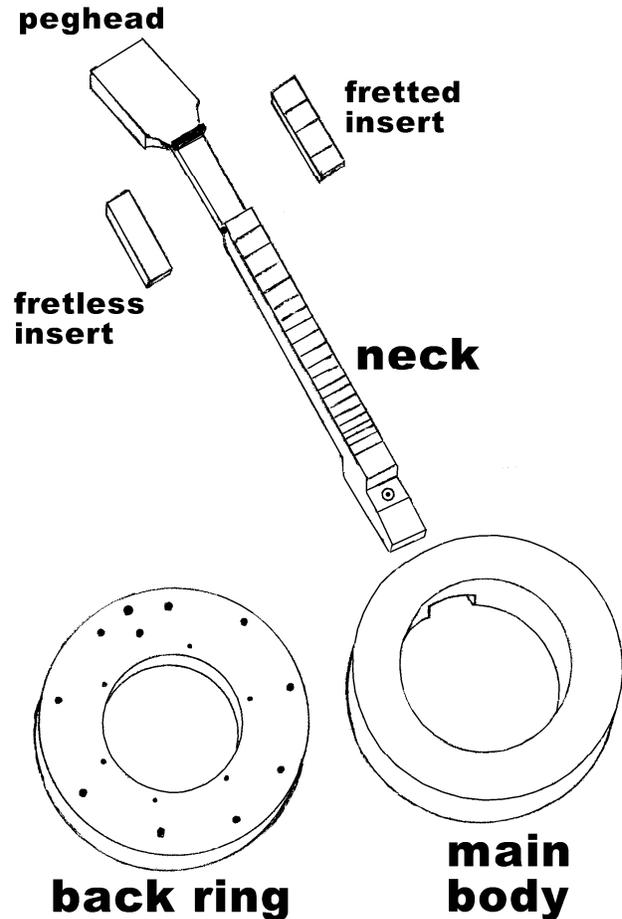
- 1 Set of Assembly Instructions
- 1 Nylon Pouch

WOODEN PARTS

- a) Main Body w/ Back Ring
- b) Neck
- c) Fretless Insert
- d) Fretted Insert

HARDWARE

- Textured Plastic Skin Head
- 1 Plastic Tone Ring
- 1 Set of 5 Banjo Strings
- 5 Mother of Pearl Marking Dots, 1/4"
- 48" fretwire
- 4 Geared Tuners w/screws
- 1 Permatension 5th Peg
- 1 Bridge, 5/8"
- 1 Slotted Screw for 5th String
- 5 Copper Tail Pins (string anchor pins)
- 1 Leather Scrap, 3/4" X 1-1/2"
- 9 Wood Screws, #6 X 1-5/8"
- 7 Hex Drive Cap Screws, #10-24 X 3/4"
- 1 Hex Drive Cap Screw, #10-24 X 1-1/4"
- 1 Washer
- 8 T-Nuts, #10-24 (installed in back ring)
- 1 Ball-end Allen Driver, 3/32"
- 1 Standard Allen Wrench, 5/32"
- 1 Nut w/set screw (installed on neck)
- 1 Brass plate (installed on neck)



BEFORE YOU BEGIN

Please take the time to check over the parts of our 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. We also suggest skimming through the entire directions before beginning, just to get an overview of the project. You may decide that you need to gather more tools or purchase a few optional decorations or accessories to enhance the finished instrument. Now is a good time to decide so you can avoid delays when you reach those steps of construction.

ACCESSORY ITEMS AVAILABLE FOR THE BANJO

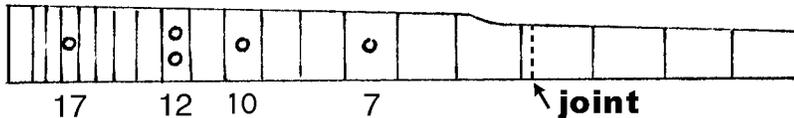
FINISHKIT	Musicmaker's finishing kit with instructions
STRAP-2	Shoulder strap & 2 mounting buttons
BANJBAG	Padded carrying bag for banjo
BANJBKSET	Teach Yourself Banjo (book, CD & DVD)
BANJBKCD02	Clawhammer Banjo for the Complete Ignoramus (book & CD)
BANJBKCD03	Bluegrass Banjo for the Complete Ignoramus (book & CD)

See our website (www.harpkits.com) or current catalog for up-to-date prices.

ASSEMBLY INSTRUCTIONS:

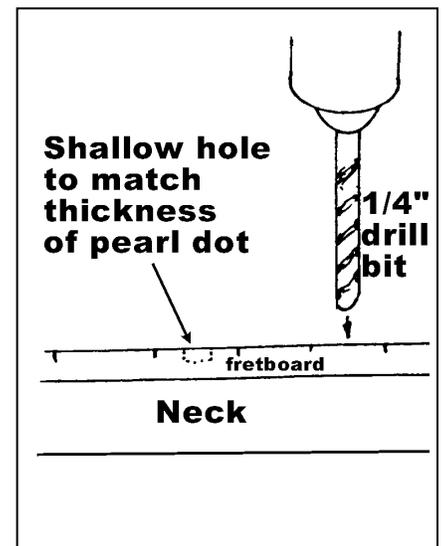
___ 1. There is no gluing required on this kit, unless you wish to add some decorations, fret marking dots or other enhancements. Such work could be accomplished right away, or at least before the final sanding and finishing.

___ 2. (Optional) If you choose to install pearl marking dots on the fretboard, use a sharp (new) 1/4" drill bit to bore shallow holes at certain key locations. We like to mark the center of these spaces: 7, 10, 12, and 17, as shown, with some sort of inlay dots (they'll help guide you when you play).



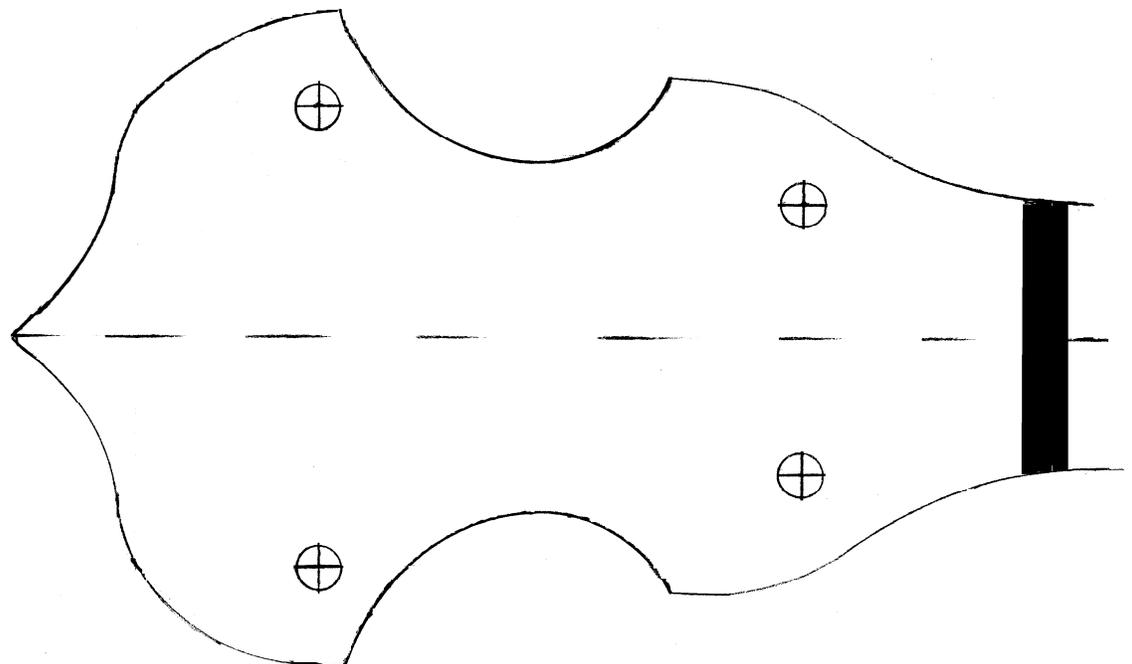
NOTE: Don't fret if your holes are not exactly the proper depth! You can fill an oversize hole with epoxy or superglue to take up extra space, and you can sand the top of the pearl dot if it stands above the wood surface.

___ 3. Use superglue or epoxy to glue the pearl dot inlays into the FRETBOARD. Put enough glue into the hole to nearly fill it, and then tap the pearl dot into place with a hammer. Some glue will squeeze out, so it is good to have a paper towel handy to clean off the excess. Be careful not to push the dot deeper than the surface of the fretboard -- better to have it stand just a little above. When the glue is dry, use medium grit (150) sandpaper wrapped around a block of wood to sand the top surface of the fretboard until all the pearl dots are level and the excess glue residue is cleaned off.



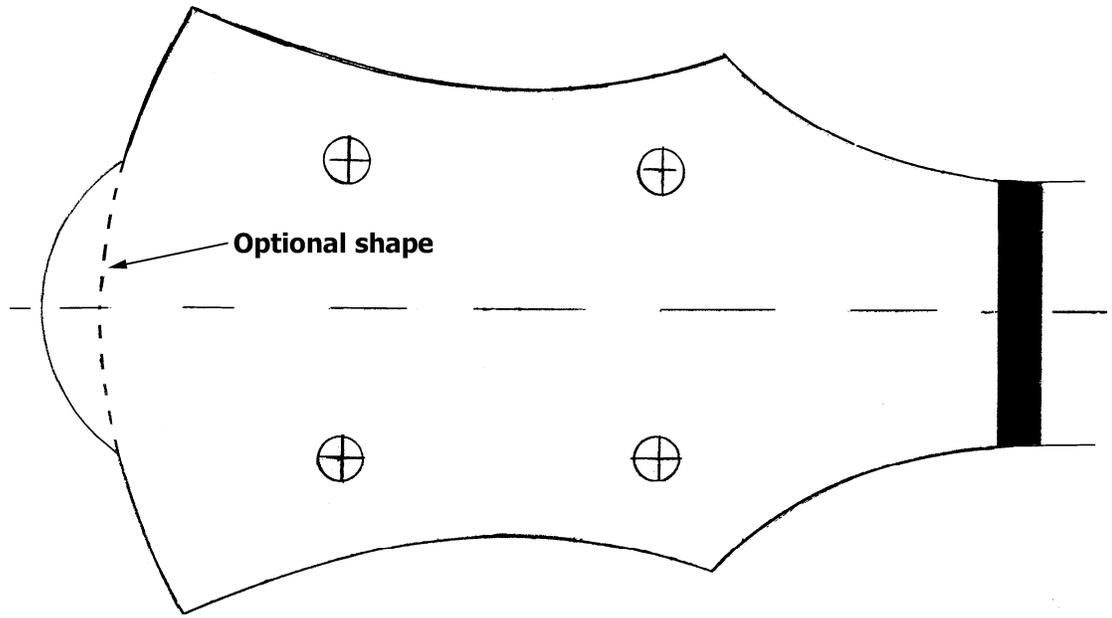
SHAPING THE PEG HEAD

___ 4. The only cutting required on this kit is for shaping of the PEG HEAD. Use one of the patterns shown here, or design your own creative shape for the PEGHEAD, making sure to allow enough room for the GEARED TUNERS to be installed and operated easily.



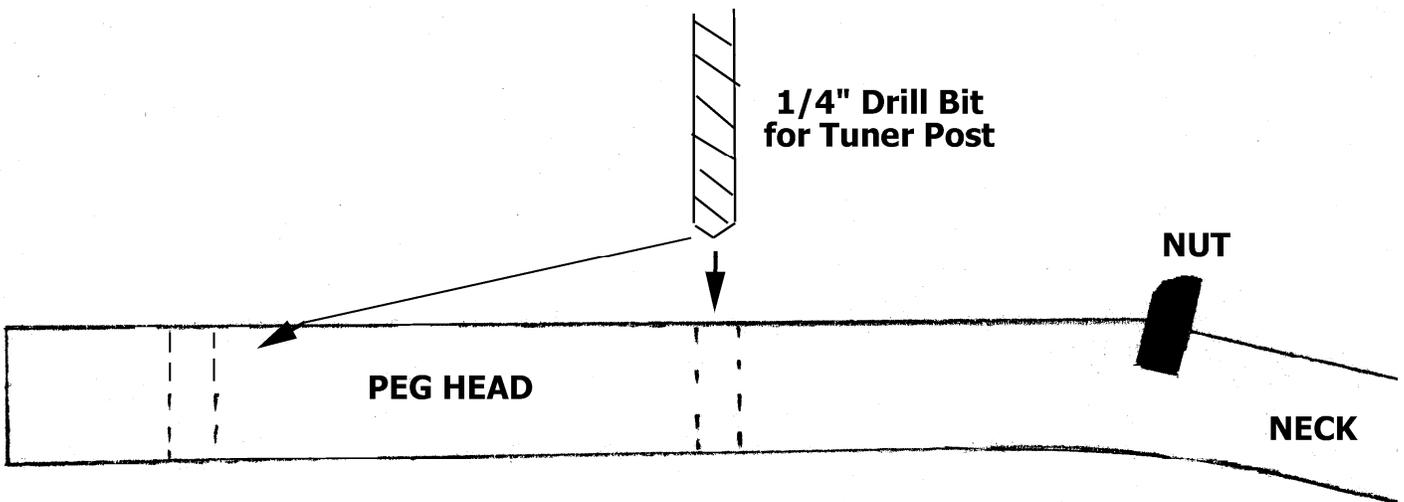
NOTE

If you are in a big hurry or don't have the tools or confidence to shape the PEG HEAD, you may simply leave it in the rectangular shape that it came with, and drill holes for the GEARED TUNERS near the edges.



5. Use a 1/4" bit to drill the four holes for tuning gears according to the positions on PEG HEAD template. Drill straight through the PEG HEAD, holding the drill perpendicular to the surface of the wood.

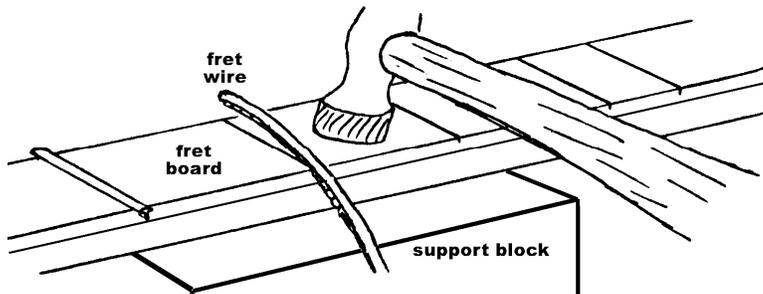
NOTE: If you are designing your own shape for the peghead, take care to plan space to mount the geared tuners. Set the gears on your drawing to make sure the knobs will clear the edge of the wood and the tiny mounting screws will bite into solid wood.



INSTALLING FRETS

6. Now you are ready to install the frets in the NECK. We recommend securing the FRETTED INSERT into the "Cumberland Gap" of the neck for this process. Otherwise you might chip the edge of the wood near the 4th fret (at the joint for the INSERTS).

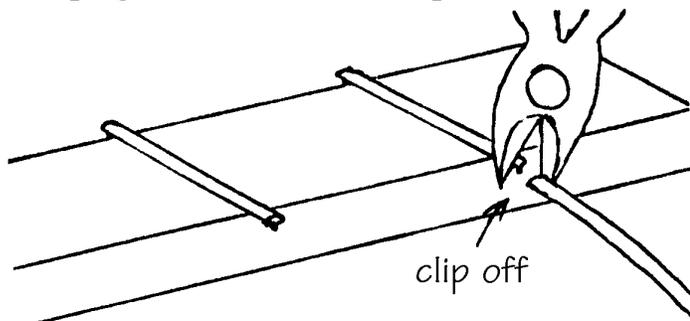
Place the NECK on a solid work surface. If you have only a flimsy table, move this operation to the floor or to a cement block on the ground. Otherwise the NECK will just bounce around as you try to tap the frets into place. Use a block of scrap wood underneath to protect the NECK from scratches and dents.



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.

Position the fretwire so that the "tang" will be driven down into the fret slots, as shown. 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 seat the middle. Be careful not to pound too much in the middle, or you will bend the wire so the ends begin to lift up again. Two or three taps should do the job.



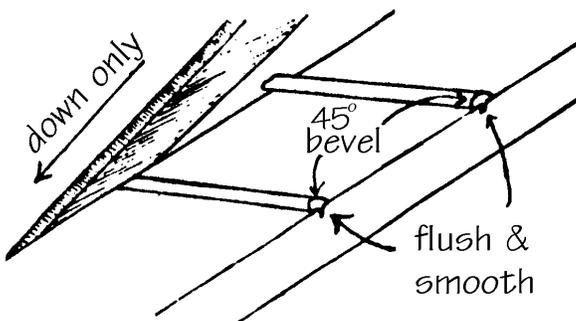
When the fretwire is securely held in the wood, use a wire cutter to clip off the excess, as close to the wood as possible.

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

7. After the frets are installed, look them over very carefully to make sure each one fits all the way down against the wood. If one fret stands higher than its neighbor it may cause the strings to buzz, so it would be good to take care of the problem now.

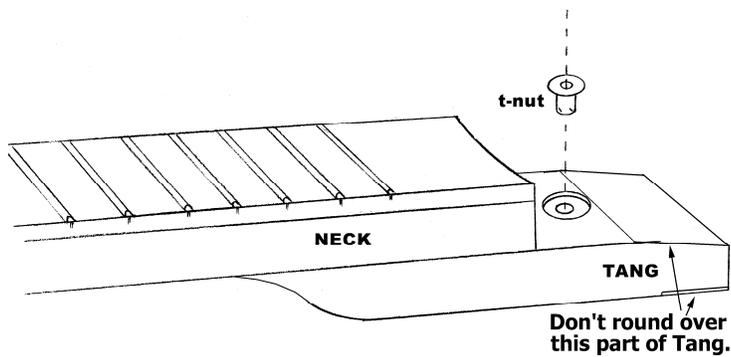
Usually a good tap from the hammer is sufficient to seat any fret that stands too high. Just make sure you are working on a very firm surface. A bouncy table will only make this job impossible.

HINT: If you overwork a fret so that the ends start to curl up, pry it back out of the slot, use a pliers to re-shape it into its original convex (humped) shape, and try it again.



8. File (or sand) the ragged ends of the frets down until they are smooth and flush with the sides of the NECK. If you have access to a belt sander, that will do this job quickly.

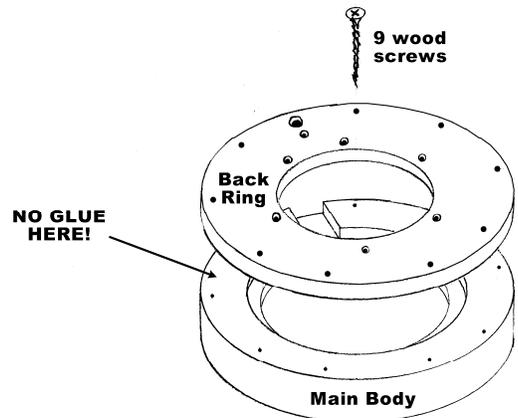
9. File (or sand) a 45 degree bevel at the ends of the frets, as shown, working the file in a downward motion only, to avoid lifting the frets up.



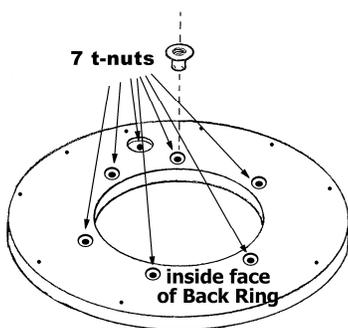
10. We have already put one T-NUT into the tang of the NECK, in the position shown.

11. It is best to accomplish the rough sanding and shaping of the NECK now. Test it frequently to see how it feels to slide your left hand along the length of the NECK, as if you were playing the banjo. Remove all scratches and machining marks from our equipment, and round over all sharp edges, except where the TANG fits into the MAIN BODY of the banjo. Leave that part "as is" so it fits tightly into the banjo.

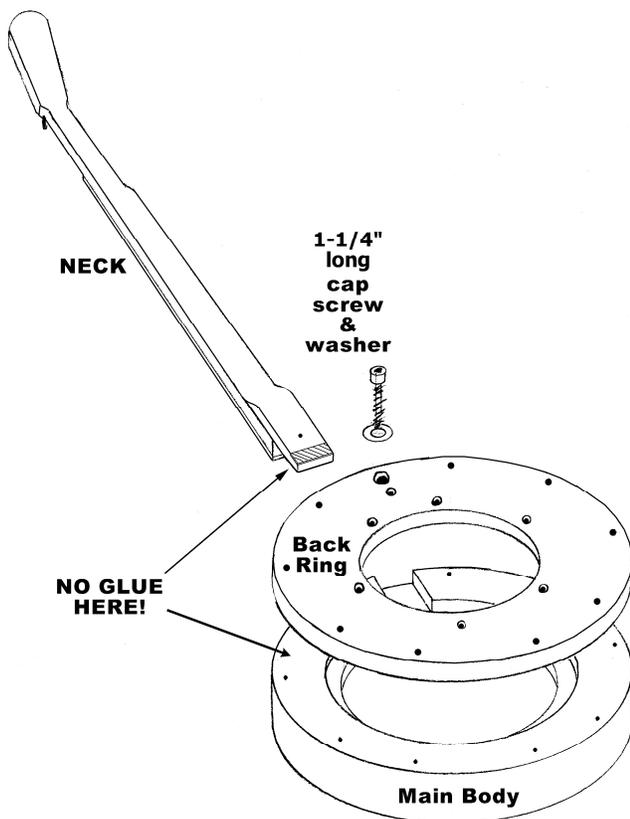
12. We have installed the BACK RING to the MAIN BODY of your banjo at the factory with only four screws, just for truing up the parts. We recommend that you use an electric screwdriver (or drill) to drive the remaining seven WOOD SCREWS in and out of the holes around the outer perimeter of the banjo before taking the BACK RING off the MAIN BODY. This will tap the holes to ensure that the parts will return to proper alignment when you re-assemble them.



13. Remove the BACK RING from the MAIN BODY and double-check the seven (7) T-NUTS that we have pressed into the inside of the BACK RING.



Double-check to make sure you can easily screw one of the cap screws into each t-nut. Sometimes they can be slightly off-center, requiring a little extra effort to get the screw started. You'll want to take care of that before installing the BACK RING in place again.



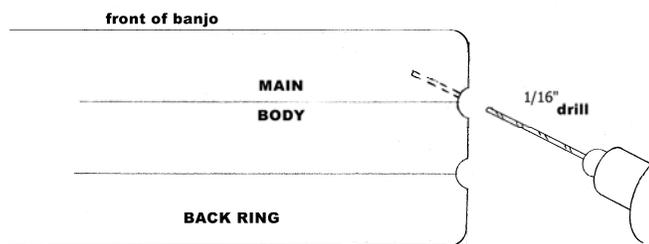
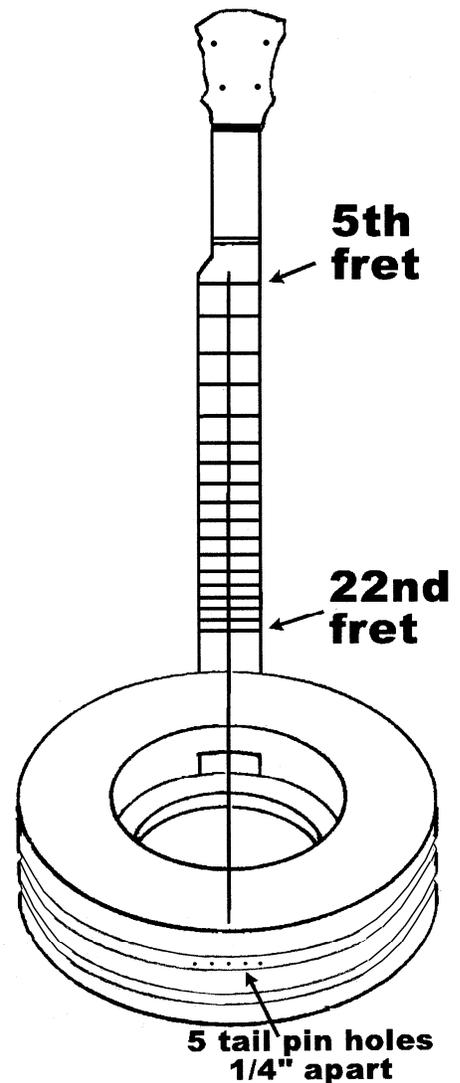
____ 14. Screw the **BACK RING** temporarily onto the **MAIN BODY**, taking care to align the two extra holes over the slot for the **NECK**, as shown. **USE NO GLUE!** Two or three screws should suffice for this step.

____ 15. Place the **NECK** into the **MAIN BODY** of the banjo and use the 1-1/4" long **CAP SCREW & Washer** to hold it in place from the back side. **NO GLUE HERE EITHER!**

____ 16. Put masking tape at two points of the **FRETBOARD**, at the 5th fret and the last (22nd) fret, and carefully mark the center of the **FRETBOARD** at those two points.

Use a straight-edge to extend a center line down to the end of the **MAIN BODY** of the banjo, as shown.

Locate the point where the center-line of the **NECK** crosses the opposite edge of the **MAIN BODY**, as illustrated. The **STRING ANCHOR PINS** must be centered on this point.



____ 17. Mark the center pin position in the groove of the **MAIN BODY** according to the centerline. The center anchor pin will be located at that point, with two on either side of it, spaced 1/4" apart, as shown. Use a 1/16" drill bit to bore pilot holes for each string anchor, drilling only 1/2" deep at a slight angle, as shown.

___18. Sand the entire banjo with medium (120 grit) and then fine (180 grit) sandpaper to prepare for finishing. The goal here is to remove roughness and scratches left by our machines and to round over any sharp corners so the wood feels smooth in your hands. One sign of good woodworking is nicely rounded corners. They look and feel more finished than sharp edges. Try to sand with the grain (except around the edge of the MAIN BODY).

POINT OF INTEREST

The reason for the grooves around the body of the banjo is to minimize the appearance of joints between the layers of wood. The BACK RING will not be glued to the MAIN BODY, so the joint may move slightly over time. This movement will be less noticeable because of these grooves.

APPLYING THE FINISH

___19. Remove the NECK from the MAIN BODY. Now you can apply the finish of your choice. Here are a few hints:

Mask off the top playing surface of the fretboard with masking tape. It is best to avoid putting varnish or lacquer on this playing surface. After finishing the rest of the instrument, you can remove the masking tape and lightly oil the fretboard with linseed oil.

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 and 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. The principal advantage of an oil finish is that it can be applied and wiped dry immediately, so you can proceed with installing hardware (and strings) right away. The disadvantages of oil are that it usually does not give much surface protection or sheen, and it tends to hold dust, although there are some brands that include waxes and/or varnishes to give more surface build-up and luster. We use boiled linseed oil on the playing surface of the fingerboard, but we like a harder finish for the rest of the instrument.

VARNISH -- Any regular varnish will work fine on this project, but we recommend our wipe-on polyurethane called MUSICMAKER'S INSTRUMENT FINISH. Our complete finishing kit includes detailed instructions, sandpaper sheets, tack cloth, foam applicator, and lint-free wiping cloth, along with a pint can of semi-gloss polyurethane varnish. The advantages of this finish are its simple application, durability, and deep, soft luster. Unlike many solvent-based finishes, our wipe-on poly has very little odor, and when you apply thin coats you won't have trouble with drips and sags.

LACQUER -- Many professional instrument makers still use lacquer for their finish. The most readily available lacquer is called Deft Clear Wood Finish. If you choose this product, 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.

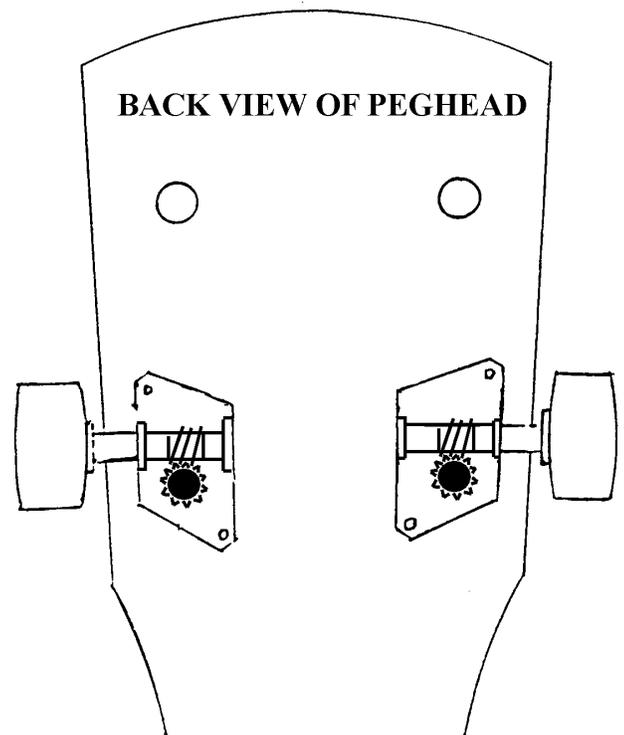
DON'T FORGET TO OIL BOTH FRETBOARD INSERTS TOO!
Once the finish is dry, you're ready to install the hardware!

INSTALLING HARDWARE

____ 20. Notice that there are two left-hand and two right-hand TUNING GEARS. Test how they all fit on the PEG HEAD before permanently installing any of them. Sometimes it is helpful to switch a left-hand one for a right in order to avoid crowding or hanging over the edge of the wood. Watch carefully to see that the knobs are free to turn without bumping each other or the wood.

When you decide the best position for each gear, use an awl or sharp nail to punch marks in the wood for the tiny screws.

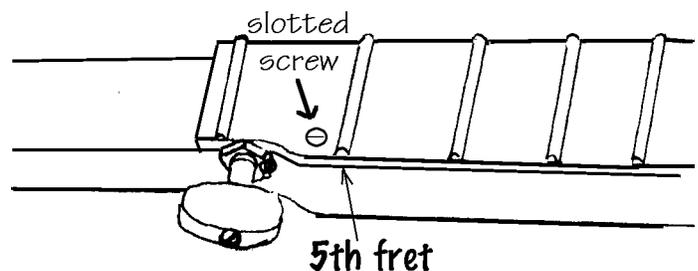
Use a 1/16" drill bit to bore pilot holes in the wood for the tiny screws that hold the TUNING GEARS in place. Then you can install the gears permanently in place.



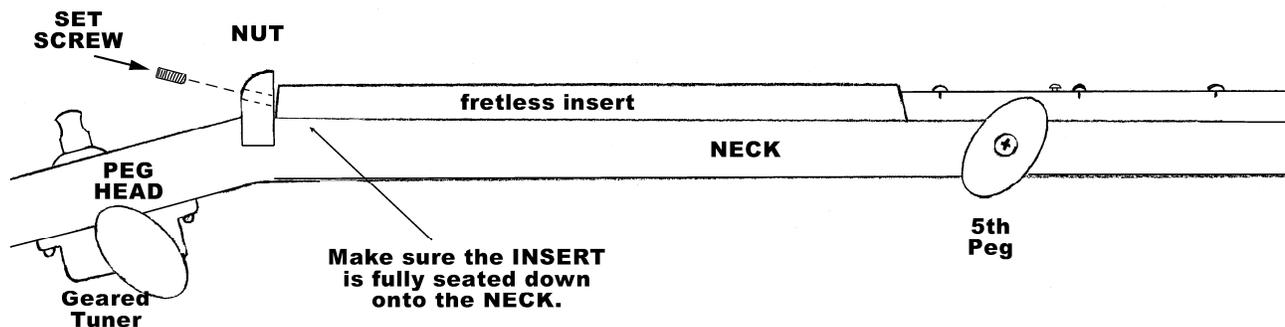
____ 21. The 5th Peg is a taper fit. To insert the 5th peg – gently tap it into the hole in the side of the neck until it is seated flush. Be sure to support the neck directly under the hole while you are tapping in the 5th peg!! There is no need for any glue as the fit is tight enough to hold the peg in place. You can loosen or tighten the tension of the 5th peg by adjusting the screw in the handle.

____ 22. There should be one extra tiny SLOTTED SCREW left in your kit. Use this for the 5th string “nut” to hold the string in position behind the fret, as shown.

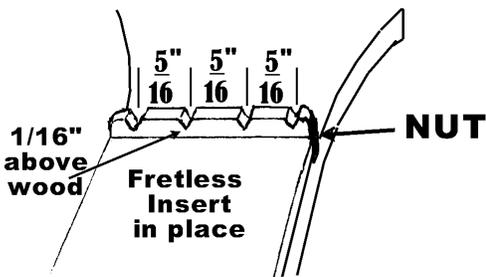
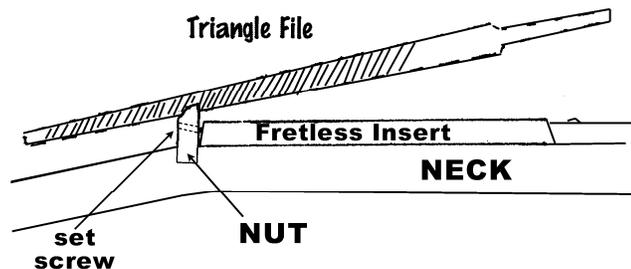
Place this screw about 1/8" from the edge of the FRETBOARD and about 1/8" behind the 5th fret. Use a 1/16" bit to drill a pilot hole for the screw. Then insert the screw all the way down until the head contacts the surface of the wood. That way the string should rest on the 5th fret.



23. Slide the smooth FRETLESS INSERT into the "Cumberland Gap" of the banjo NECK, and gently tighten the SET SCREW to hold it in place. Make sure the INSERT is nicely centered and fully seated down onto the NECK.



24. Use a triangular file to make 4 notches in the NUT to hold the strings at the proper spacing, as shown. The bottom of each notch should be about 1/16" above the surface of the INSERT.



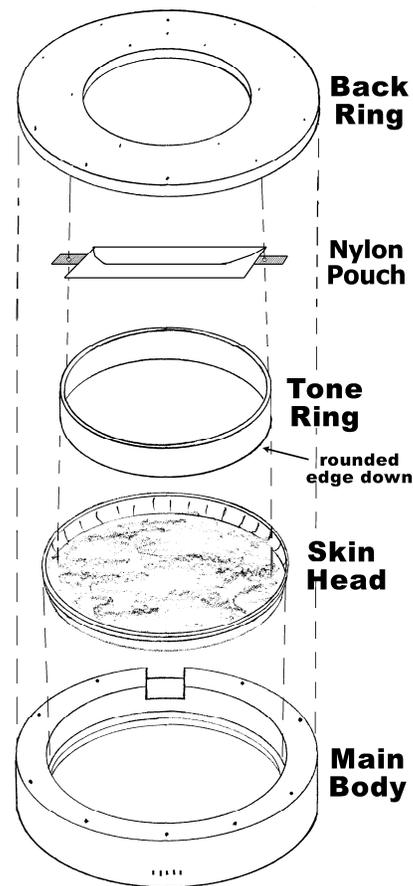
25. Remove the BACK RING and place the 8" SKIN HEAD into the MAIN BODY, and set the TONE RING onto it with the rounded edge contacting the SKIN.

26. Screw the BACK RING onto the MAIN BODY again (still without glue), tightening it permanently in place with all 9 screws.

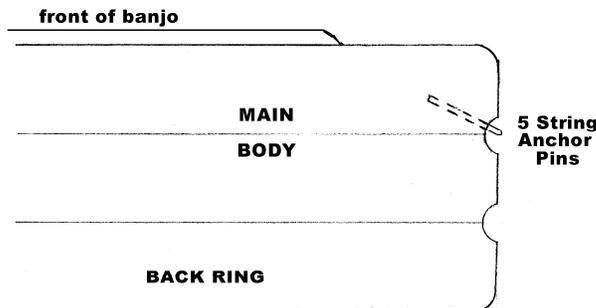
27. Carefully center the plastic TONE RING under the t-nuts in the BACK RING and then use six (6) hex-drive CAP SCREWS to put even pressure against the bottom of the TONE RING.

Before tightening the CAP SCREWS, place the NYLON POUCH under the BACK RING, so two CAP SCREWS pinch the webbing to suspend the POUCH across the opening in the back of the banjo. This will hold your spare fretboard INSERT, Allen wrenches, fingerpicks, spare strings, etc. You'll have one of the few marsupial banjos in your neighborhood!

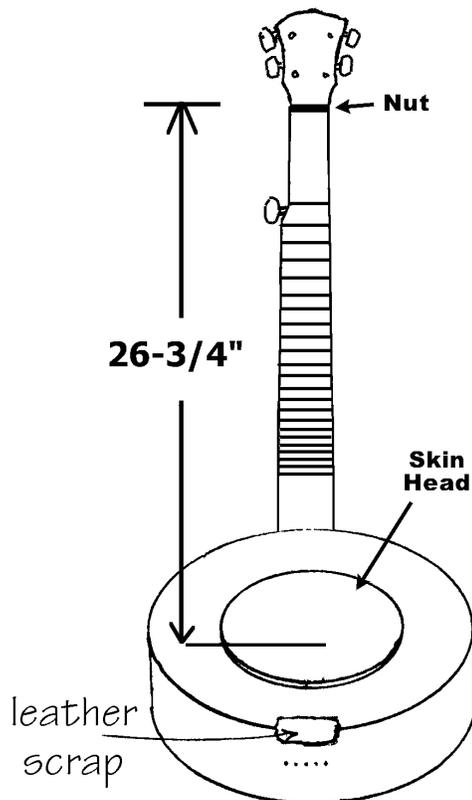
Use the 5/32" Allen Wrench to turn the CAP SCREWS until the SKIN HEAD is evenly stretched and taut on the front of the banjo. It is best to tighten these screws gradually, alternating across the ring from one side to the other so as to keep the tension even all the way around. ALSO, KEEP CHECKING TO MAKE SURE THE RING DOES NOT SLIP SIDWAYS AND "FALL OFF" THE SCREWS.



___ 28. Install the five anchor pins into the WOOD RIM, tapping them with a hammer until about 1/8" remains standing above the surface of the wood.



___ 29. Install the NECK into the MAIN BODY of the banjo again, with the 1-1/4" long CAP SCREW and WASHER, as before (step 15).



___ 30. Draw a light pencil mark on the SKIN HEAD exactly 26-3/4" from the NUT, as shown. This is where the BRIDGE will stand.

___ 31. We like to cut a scrap of leather, rubber, or heavy fabric to place on the edge of the MAIN BODY where the strings would otherwise dig into the corner of the wood. A patch measuring 3/4" by 1-1/2" should work well, although this is optional. It merely prevents the strings from scratching your beautiful finish.

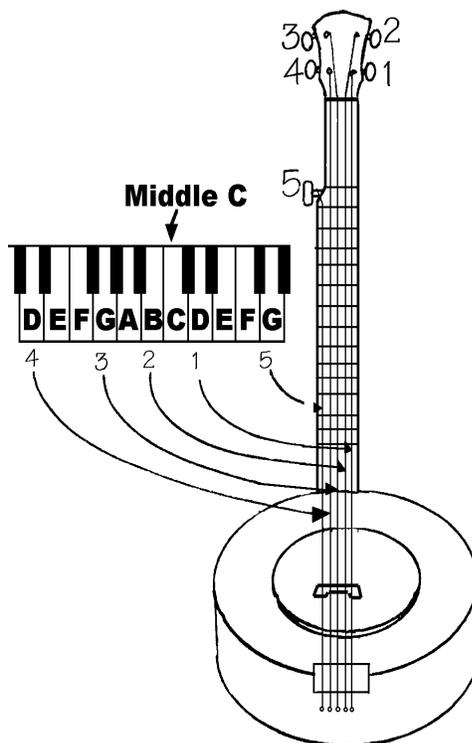
___ 32. Install the strings according to the diagram here. The ends will want to jump off the anchor pins until some tension is applied. We use masking tape to hold them temporarily in place.

The two lightest wires go on either side of the instrument, one to the fifth peg up on the NECK and the other to the first gear on the PEGHEAD. These wires are so fine that you should thread them through the peg holes twice to make sure they don't slip when tightened.

BEFORE TIGHTENING THESE FIRST STRINGS, place the bridge on the SKIN HEAD, at the position marked in pencil, 26-3/4" from the NUT.

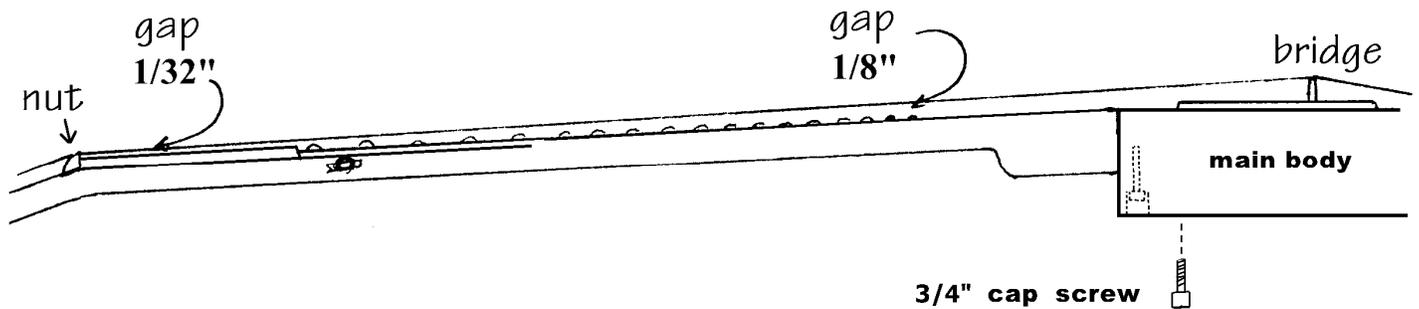
The heaviest wire has a soft metal wrapped around a steel core. This is string #4, tuned to the lowest note.

The remaining two wires may be difficult to tell apart. The lighter one goes to gear #2 and the heavier to #3.

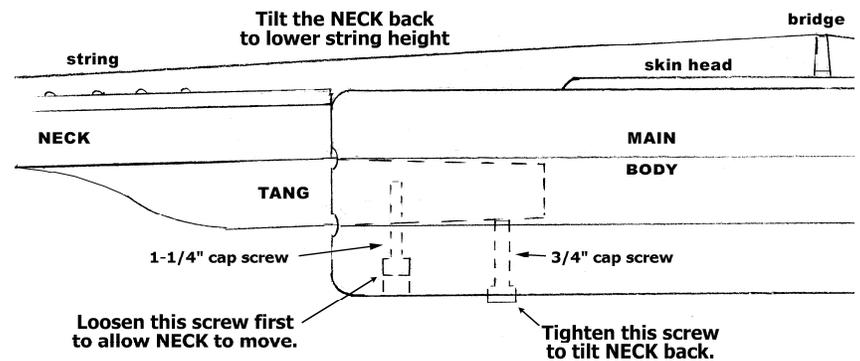


TUNING & ADJUSTING

___ 33. We suggest just tightening the strings a little at first to check how high they hang over the frets. Achieving the proper string height is very important to making your banjo play easily. Insert the last 3/4" CAP SCREW into the last hole in the back of the MAIN BODY. This screw allows you to adjust the tilt of the NECK.



Loosen the long CAP SCREW a little bit to allow the NECK to be tilted. Then watch the string height over the FRETBOARD as you tighten the 3/4" CAP SCREW. The ideal position is for the strings to hang about 1/8" above the last fret near the MAIN BODY.



When you achieve the desired string height, tighten the first CAP SCREW again to hold the NECK firmly in that position. If your banjo ever needs adjustment in the future, these CAP SCREWS will make it simple to do.

POINT OF INTEREST

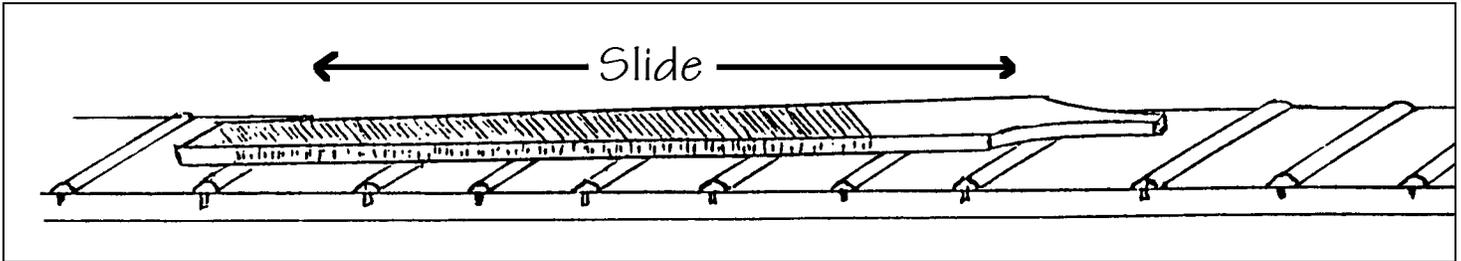
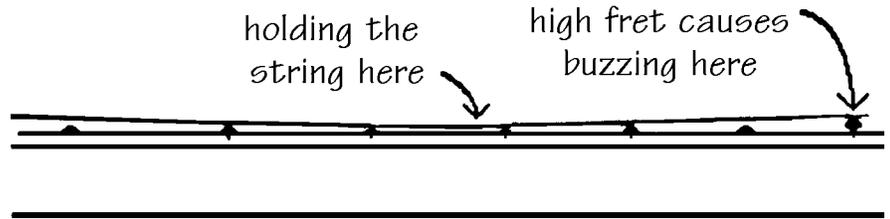
We thank our customer Wayne Norman, of Staten Island, New York, for this idea of tilting the NECK by simply adjusting these two screws. We think your banjo will remain very easy to play throughout its life because of this one feature!

___ 34. You can lower the string height over the FRETLESS INSERT (near the PEG HEAD) by filing the notches in the NUT a little deeper. The ideal height is about 1/32" above the wood surface.

___ 35. Tune up your banjo to the notes shown above (step #33) to see how it plays. If you have any strings that buzz or rattle, look for the following problems:

a. If a string buzzes when plucked in the open position, it may be making slight contact with the first fret (nearest the NUT). You may have to glue a sliver of wood into the notch in the NUT to raise the string a little higher. You might also check to see if the string might be vibrating against the sides of the notch in the NUT. We like to angle the notches down toward the PEG HEAD so the strings make firm contact with the front edge of the NUT.

b. If a string 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 higher than its neighbors. You will either need to tap that fret back down into its proper depth or also use a long flat metal file to level off the tops of the frets.

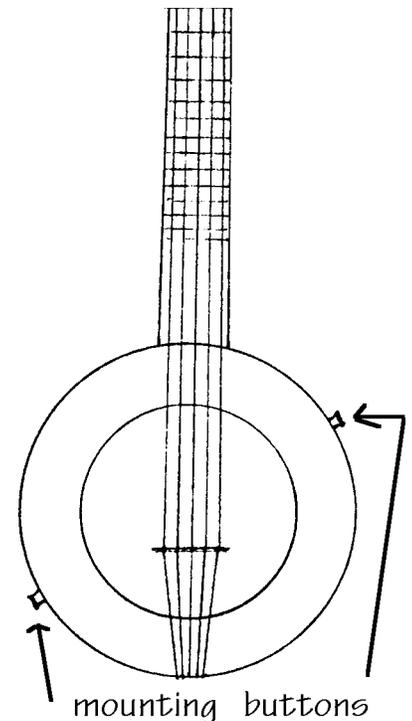


c. If a string rattles or buzzes at several positions (frets) along the NECK, then the NECK should be tilted forward a little more to lift the strings higher. The higher the strings, the less trouble you'll have with buzzing, but the harder it will be to play the banjo.

d. If a string buzzes on the FRETLESS INSERT, you may need to sand the top of this piece to thin it down just a little. The ideal height is level with the tops of the frets on the rest of the fingerboard.

CONGRATULATIONS! You have constructed a beautiful musical instrument. We hope you have enjoyed this project and that you get many years of musical pleasure from playing the finished instrument.

If you wish to add a SHOULDERSTRAP to your banjo, we recommend placing the mounting buttons at approximately the "2 o'clock" and "8 o'clock" positions of the banjo rim, as shown.



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