

Part III.



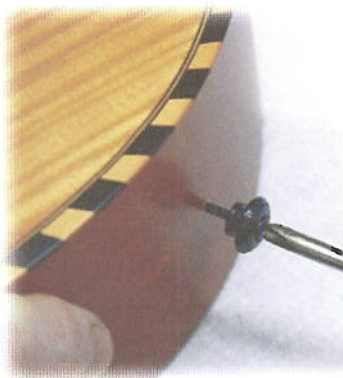
1. Installing Strap Buttons
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3. Installing Tuners
5. Bridge Anchor System
8. Installing String Anchor Pins
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Part III.

Installing Strap Buttons

Preliminary step; check plans and familiarize yourself with the parts.

1. ☐ **Strap button holes** were drilled during the button block installation.
Using a Philips screwdriver, install the 3 buttons as shown.
This will be one of your final steps before tuning.



Installing Wheel Cover & Blocks

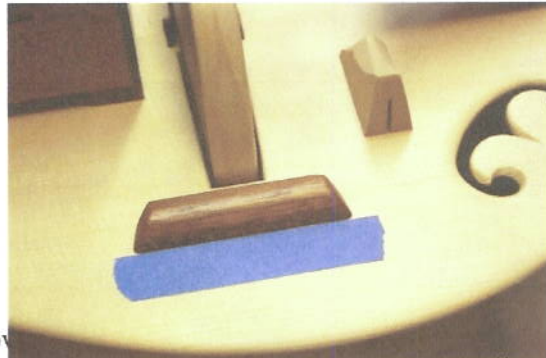
Preliminary step; take out parts. Compare to plan and familiarize yourself with the parts. If these parts were not finished with the rest of your instrument, finish them now.

1. □ Wheel blocks

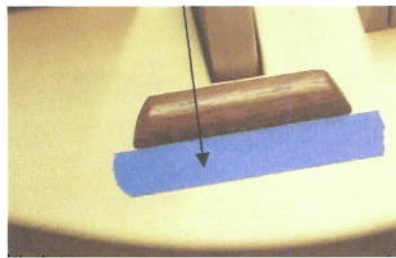
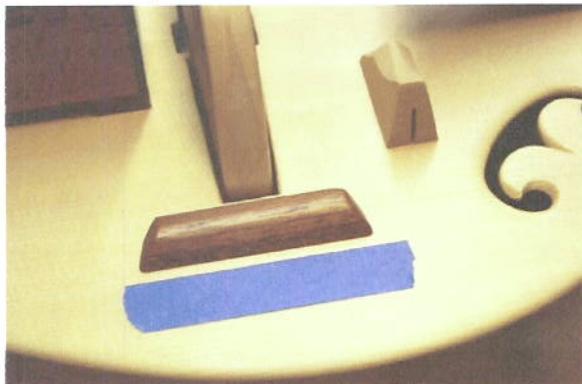
- Measure the location of wheel cover anchor blocks from the plan set
- Place relaxed wheel cover centered over the wheel with the wheel cover so it almost touches the key chest. Place retainer blocks on instrument on either side of wheel cover
- Mark each block's outside position with tape as pictured.



- move tape to new block position



New position



- Tape completely around the blocks and scrape off the finish in preparation for gluing.
- Glue with 12 minute epoxy
- Wipe off excess glue and remove tape before epoxy hardens completely.



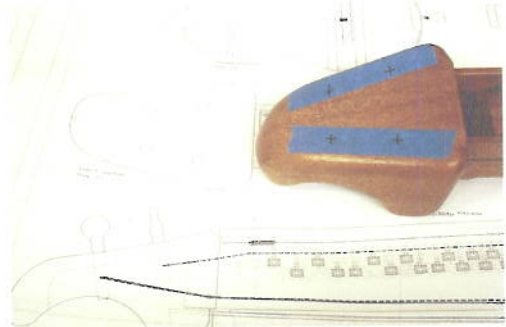
Installing the Tuners

Preliminary step; Read this section of manual. Compare to plan and familiarize yourself with the steps.

1. ☐ Lay out peg head for 4 strings according to plan.
Mark placements on a strip of painters tape

Installing the tuners

1. Using a punch, mark the centers for the holes and remove the tape.
2. Determine what size hole to drill for the tuners you have selected
Bass tuners – $35/64$ " Measure to confirm
Viola pegs – $11/32$ " Measure to confirm
Banjo tuners – $3/8$ " Measure to confirm



With a good clean cutting drill bit, drill the clearance holes for the tuners you have chosen to use.

It is helpful to use a back up board behind the area you are drilling to prevent wood breakout in the area where the drill breaks through.



Bass tuners are installed by removing the nut on the tuner, installing the tuner in the peg head and reinstalling and tightening the nut. Lock the tuner in place by drilling a clearance hole and installing the screw.

Banjo tuners are installed by removing the nut, putting the tuner in the peg head and then reinstalling and tightening the nut. A steel pin prevents the tuner from rotating.

Viola Pegs require a tapered hole to seat properly. A reamer is used by professionals to make the tapered hole but they are very expensive. You can wrap sand paper around a peg and carefully sand the taper.



Six string layout pictured on previous page



Installing the Tuners

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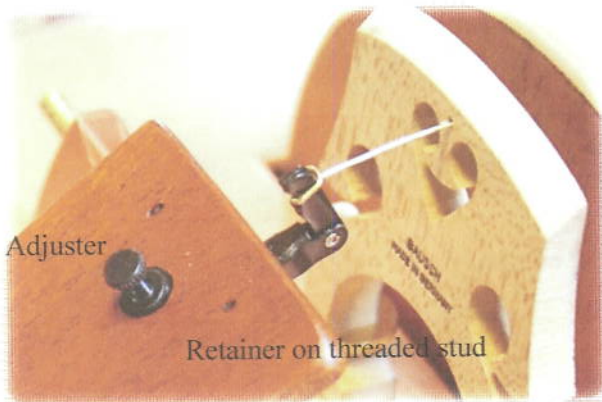
Banjo tuners are installed by removing the nut, putting the tuner in the peg head and then reinstalling and tightening the nut. A steel pin prevents the tuner from rotating.

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Bridge Anchor System Installation

When you have finished the next 3 pages, this is how your tail piece and chanter bridge should look. Now let's get to work.



We need to retain the bridge in position so that the strings do not push it into the wheel and so that we have some adjustment toward and away from the wheel to keep proper scale length when we adjust the bridge up and down or just need to tweak for proper intonation. The violin tuner works great for this. The first two pictures above show the completed system.

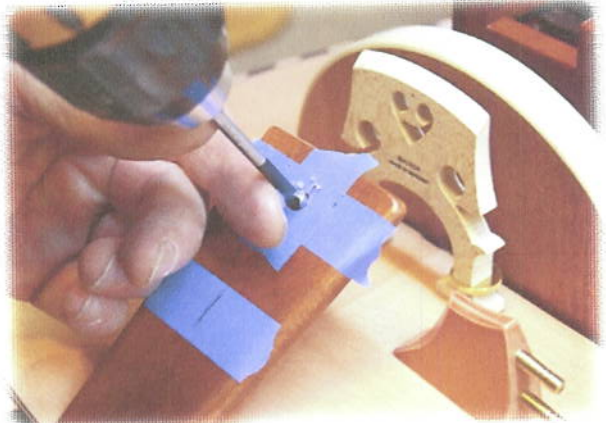
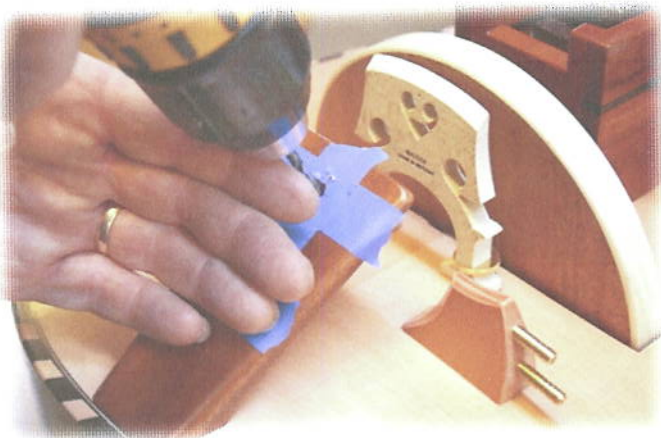


1. **Drill .040" hole in bridge as pictured for the brass wire.** This hole may be chamfered or counter bored on the side near the wheel to help hide the knot that is in the wire. This knot will be tied later. See page 7

2. Marking and drilling tailpiece:

Tape the areas for layout of the four tailpiece holes (violin fine tuner, chanter strings & violin peg) We will drill the hole for the violin tuning peg later.

Mark position of violin fine tuner on tape and drill with 1/4" forstner bit 1/8" deep
perpendicular to lower surface of tailpiece



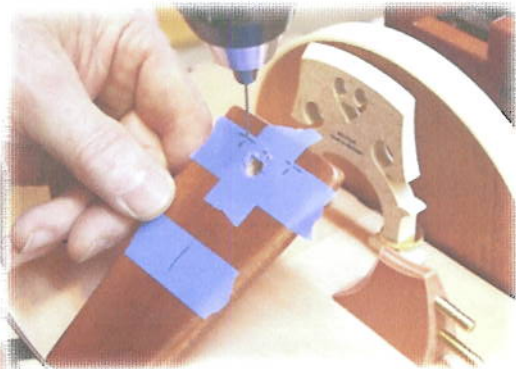
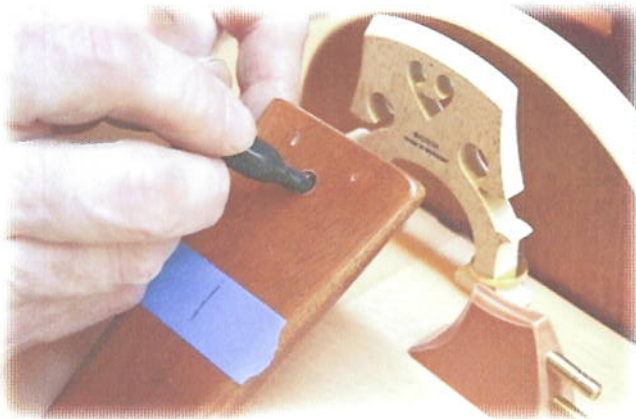
Drill hole the rest of the way through with clearance bit to allow passage of violin tuner's threaded mounting shaft.

Holding a small wood block on the underside of the tailpiece will help prevent splintering when the drill breaks through (watch your fingers when you do this)

Chamfer the hole so you will have access to tighten the thumbscrew.

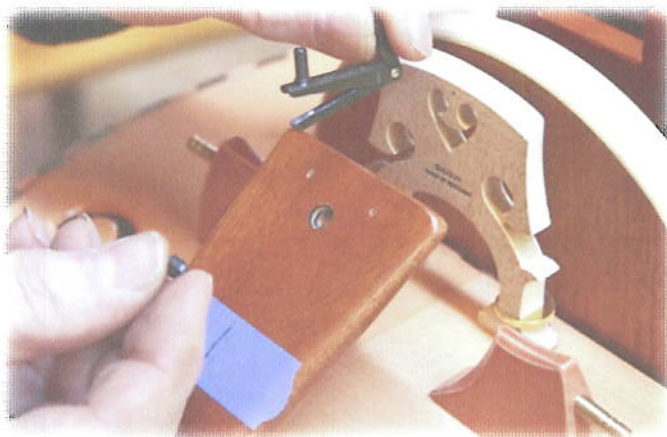


Using a number 60 bit, drill a .040" hole on each side of tail piece according to your markings on tape as done in step 2 above.



We like to use a Sharpe felt tip pen to darken the hole before mounting the violin fine tuner.

Mounting the tuner:



Remove adjuster & retainer

Mount the tuner in its hole and tighten the thumb screw to retain it.

Thread the adjuster into the tuner and turn it in until it has moved the pivoting arm from its bottomed position by a small amount. This will pre-set the adjuster to allow adjustment in both directions.

Knotting & Mounting Brass Wire For Chanter Bridge Anchor

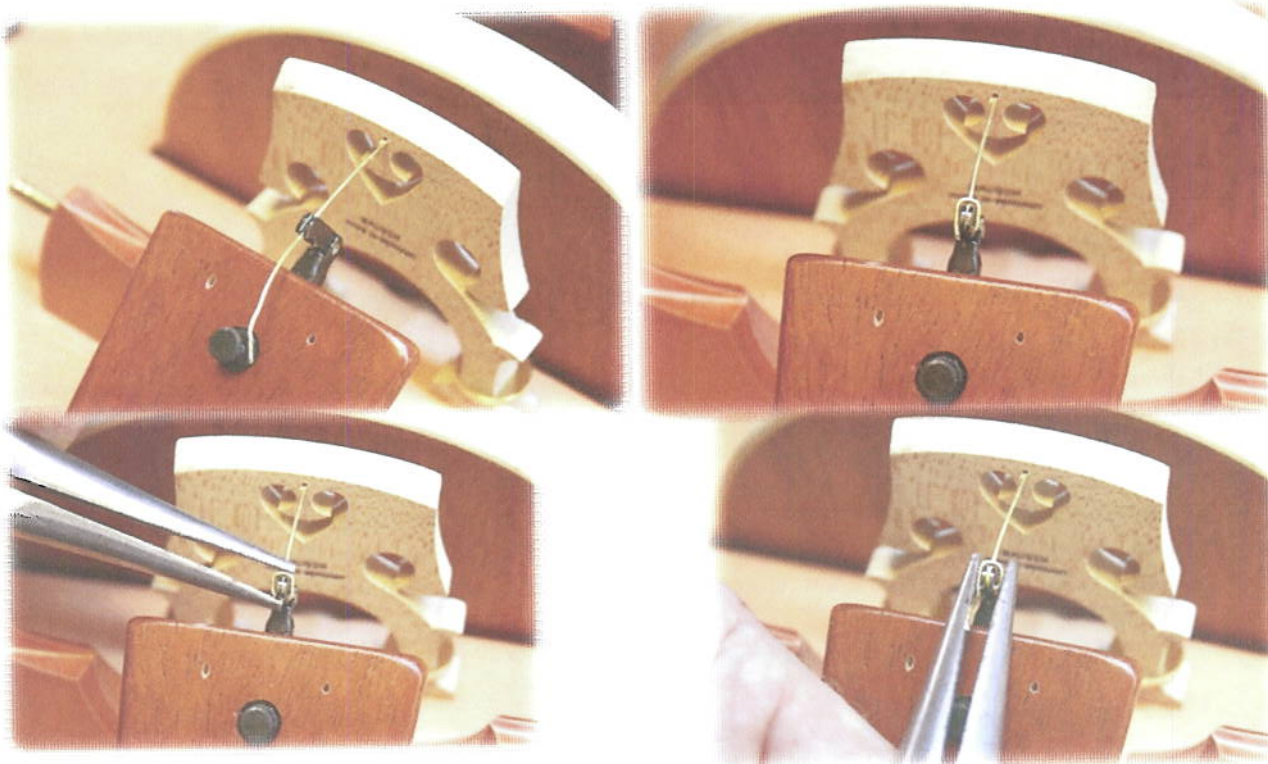
1. Knotting the wire:

You must tie a knot in the end of the brass wire. It not too hard to do this if you use two pair of pliers. Start the knot with large loops by hand and pull the knot tight with the pliers. Cut off the excess and sand or file the sharp end smooth.



2. Attaching chanter bridge wire to tuner

Pass the brass wire through the bridge so it extends out toward the violin fine tuner. Place the wire through the slot in the tuner as pictured. Make sure that front of the bridge is at 90 degrees to the soundboard while you do this. Using needle nosed pliers crimp the wire in place and wrap it around the violin fine tuner post tightening it on the post with the pliers. Cut off the excess wire.



You may now adjust the bridge to 90 degrees by lightly pushing both down and forward on the bridge to tension the wire while you adjust the violin fine tuner.

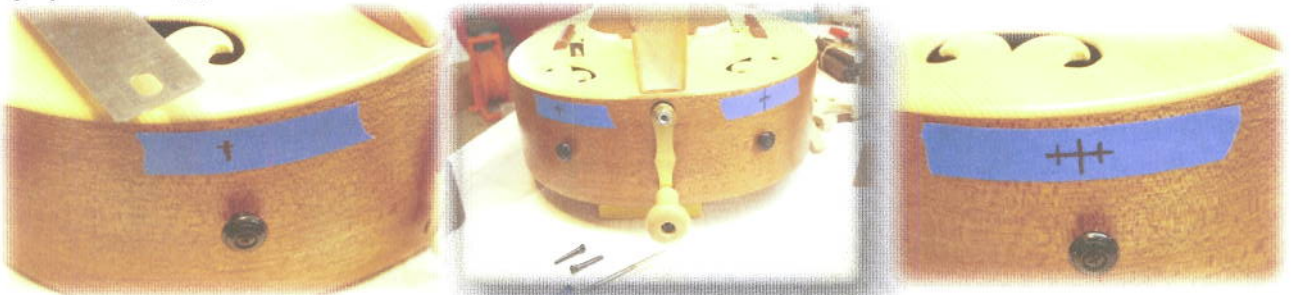
Installing String Anchor Pins

String anchor pins are used to hold the drone strings at the end of the instrument. The pins are tapered and are installed in holes drilled in the side of the Hurdy-gurdy near the crank. They retain the strings by preventing the string knot from slipping out of the hole.

1. Marking and drilling holes

- Place painters tape on the side of the instrument just above the strap anchor holes as pictured on both left and right sides.
- Mark pin position using a straight edge to follow the string path and vertically mark tape for position.
- Mark the horizontal position by measuring down from the top of the instrument 9/16"

Note: if you are installing the six string upgrade you will make two holes $\frac{1}{4}$ " to the left and $\frac{1}{4}$ " to the right of the projected string position.



- Use a punch to dimple these places for drilling with a $\frac{3}{32}$ " bit.
- Drill through the tape and all the way through the side and triangle stock
- Use a 3 degree reamer to make the taper hole if you have one otherwise a small file will work just fine.

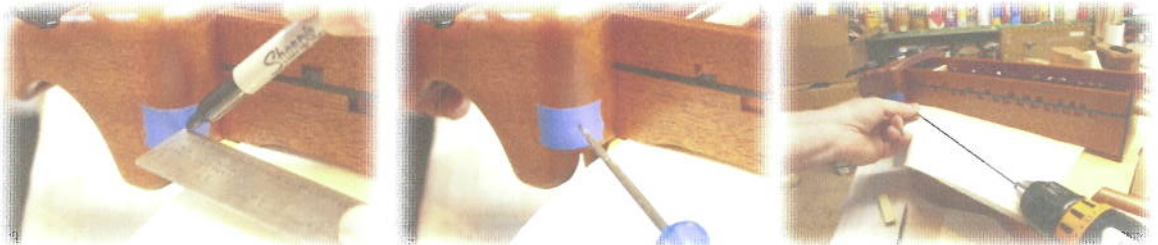


- Test fit the pins to see that they go all the way in with just a little pressure

4. Drilling the string holes in the peg head

- Layout the peg head according to the print using the straight edge along the string path and some tape to mark the string entry points on the left and right sides of the peghead.
- Dimple the string entry points for drilling and leave the tape on
- Use a long $\frac{3}{32}$ " x 12" aircraft type drill bit and point the drill to the exact spot that you want the string to contact the tuner pin. Carefully start and drill the holes through the peg head block into the tuner area. (it is important to hold the bit just behind the flute area to support and guide it)

These are long holes so you should remove the bit once or twice to clear out the chips



⁸
The six string upgrade requires two holes on a side with the trompette and mouche being $\frac{3}{8}$ " & $\frac{3}{4}$ " above the soundboard and the Bourdons also being $\frac{3}{8}$ " and $\frac{3}{4}$ ".

String Lifters



The string lifters provide a simple way of lifting and holding the strings off of the wheel for tuning and playing. The “L” shaped lifters are used in the key chest to hold the chanter strings off the wheel as pictured. The post lifter is used with the trompette string and is near the left wheel cover block as pictured.

Make sure that the end of the adjuster is sanded smooth so that the string may be slid off without damage to the string

- To install the chanter lifters, drill two holes with a #50/ .070” drill in the positions shown in the end block near the wheel.
- The hole needs to be deep enough to allow the lifters to go to their proper depth of about 1/32” above the string.
- Carefully push the adjusters into the holes as shown. If you need the string resting closer to the wheel for tangent contact you may file detents into the lifters as shown. Again make sure that there are no sharp edges to damage the strings.



The Trompette string lifter is positioned at a slight angle toward the string so that the string may vibrate freely and yet keep the top of the grooved end near the string for easy lifting and anchoring of the string. The string will vibrate mainly in the direction of the wheel tangent at the point where the string contacts the wheel so we will only need to keep the lifter about 1/8” away from the string.



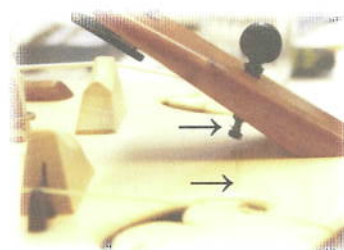
- Drill the hole using a bit the same size as the brass rod that you are using for the lifter. This rod must be mounted into the front bearing brace so that it will hold properly.
- When you have carefully located and drilled the hole insert the string lifter using a dab of epoxy to hold and strengthen it in place.
- The groove in the lifter should be at about the same height as the string is from the top.

Tirent and Dog Installation

The dog or chein may be adjusted to become more responsive to wheel acceleration or simply adjusted completely off so no buzz is made then the trompette string becomes a simple drone.

This adjustment is made by turning the violin tuning peg counter clockwise for more sensitivity or counterclockwise for less sensitivity.

The violin tuning peg pulls a thin string which is tied to the trompette string about halfway between the dog and the anchor point at the edge of the instrument.

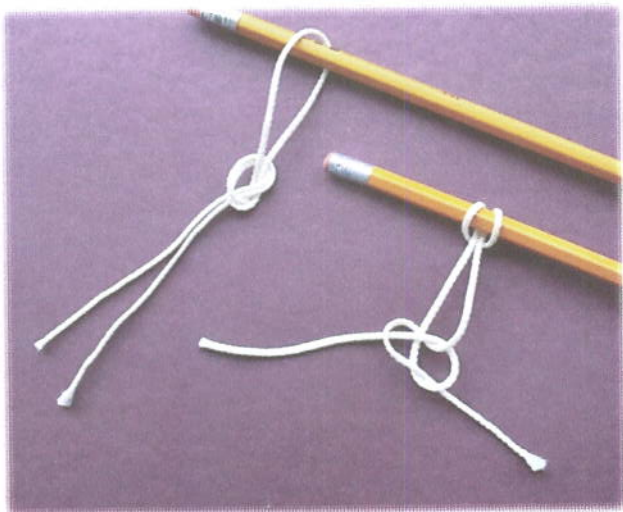


- Drill a 1/4" hole in the tailpiece according to the plan at the same angle shown in the plan.
- You may find it easier to start the hole by drilling perpendicular to the top surface of the tailpiece and then after started increase the drill angle so it is where you want it to be. This requires care and we use a forester bit to do this. Note that a protective board is placed on the soundboard to protect it.



- Fit the peg to the hole by using a 3 degree violin peg reamer.
- Ream only what is needed to get the peg snug while remaining 1/8" from hitting the tailpiece. You may need to trim some of the length off the violin peg to prevent it from hitting the soundboard.
- When properly cut and inserted, the peg will be about 1/8" from the top of the soundboard too.
- Drill a .040" hole in the bottom of the peg to tie the string onto.

The 12 lb fishing string used from the violin peg to the trompette string is tied to the peg in any way you choose but the end that is tied to the string uses a full hitch to allow for adjustment. See examples on next page.



The dog simply slips into the slot in the bridge and moves freely up and down to make the buzz.

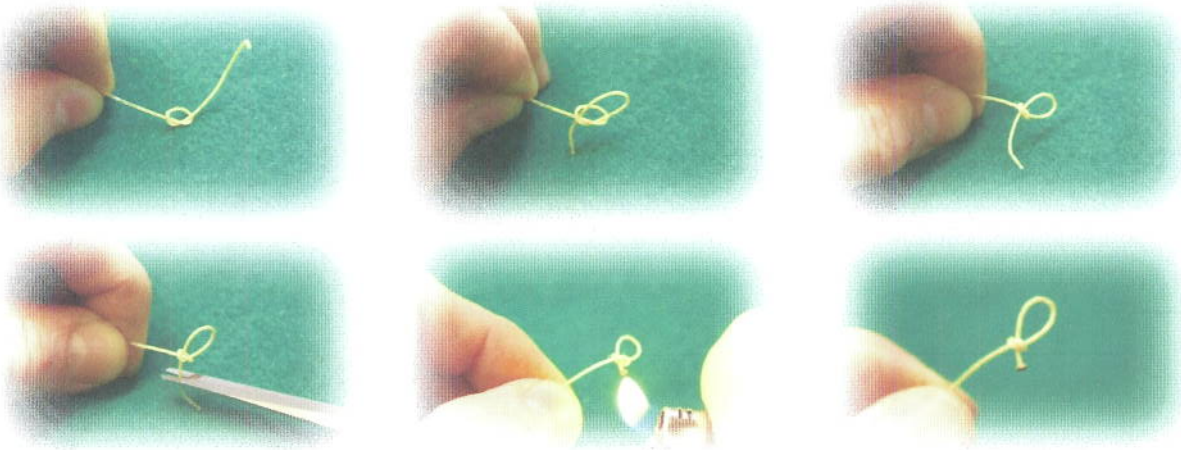
Check the fit of the dog and confirm that it moves without friction up and down ($1/16''$ is more than needed). File or sand the tang until the dog works freely.



Installing the strings

Generally we use all natural gut strings for our instruments except for the high d in D/G tuned instruments which is synthetic for durability. Higher note strings use unwound gut and tend to be thin and lower note strings use wound gut and tend to be thicker.

Strings need to be knotted on one end to be retained by the pins and the tailpiece. The wound strings come with a knot but the plain gut strings will require you to put the knot in them. The knot is easy to make especially if you have hemostats. Here is how to make the knot:



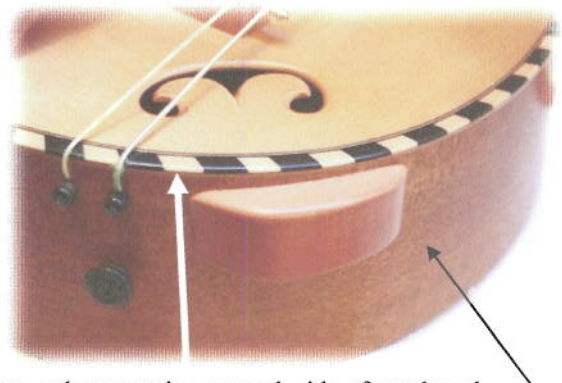
With banjo tuners and viola pegs they need to be set up so that they tighten the string when turned counter clockwise.

Bass tuners can be set up so that the strings all go to the inside of the posts.

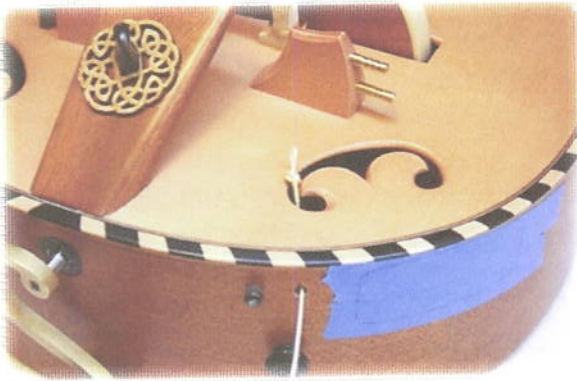
Install the chanter or melody strings first by passing the string through the tailpiece from the underside so that the knot is on the underside of the tailpiece. Run them through the key chest and to the tuners.

Put the string over the nut and into the hole in the tuner with enough slack left in the string to get 3-4 turns on the post with the small diameter strings (large diameter strings may allow fewer turns).

Tighten the string slightly as you check to see that it is routed properly and that it is resting on the bridge. Now install the second melody string in a similar manner and check and tighten only slightly. In the case of D/G tuning the D melody strings are tuned an octave apart (eight notes). The low d string will be about .039" in diameter and the high d is about .027"



¹²
Pictured here is the 6 string optional upgrade. Basic kit will have only one string on each side of crank and no pin blocks.



Sometimes it is easier to insert the string from the inside.

When installing the strings into the side of the instrument a small notch will be cut with a sharp knife at the top of the pin hole so the string does not bend too sharply as it turns to go up the side of the instrument.

Also, a notch for the string at the edge of the soundboard will keep the string in place

The strings must have the cotton on them to properly adjust for good sound and to protect the wheel (especially if they are wound strings). So, cotton the strings now if you haven't already.

Adjustment of the string is required so that they rub on the wheel with enough tension to sound the string.

A general rule of thumb is that you should increase string pressure by $\frac{1}{2}$ the diameter if the string and then go from there.

The bourdons and Mouche are easily adjusted by turning the bridge pins in or out to increase tension or decrease tension respectively.

The Trompette tension is adjusted by filing the notch in the dog so it is correctly resting on the wheel .

Hurdy-Gurdy Crafters Cottoning Tips

Cottoning is critical to having a great sounding instrument.

Long strand English cotton is our favorite at this time but many other materials such as Yak top, Bamboo top etc. are commonly used and sometimes preferred by the individual player. The material used can change the tone of the instrument so it is fun to experiment with other accepted materials.

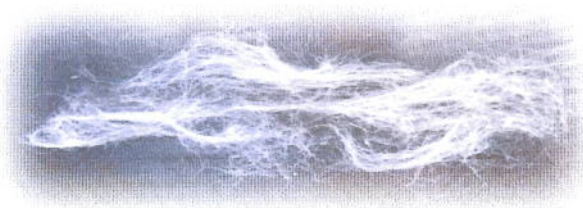
If you use too much cotton the string can go sharp and cause trouble with intonation. If you use too little cotton (especially on the large wire wound strings) the screeching can be unbearable and the wheel may suffer damage.

Cottoning is not easy to understand for the beginner because it is a totally new “one of a kind” skill .

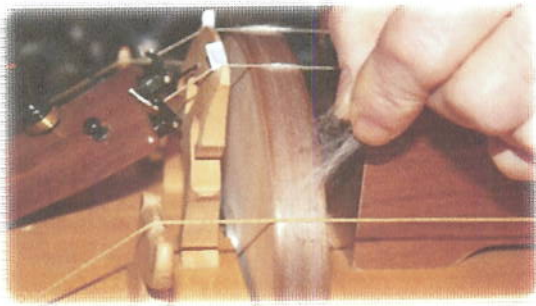
We wish we could do it for you while you watched as it would be very easy to understand then.

Cottoning

- Wash hands with soap and water to remove any finger oil
- Rub the string with the rosin in the area that the cotton will be wound taking care not to hit the wheel with the block of rosin. Some like to use liquid rosin in this application to prevent abrading the string.
- Pull out a little cotton from the package ↓ (This is about 2-3 times as much as you need for a chanterelle)



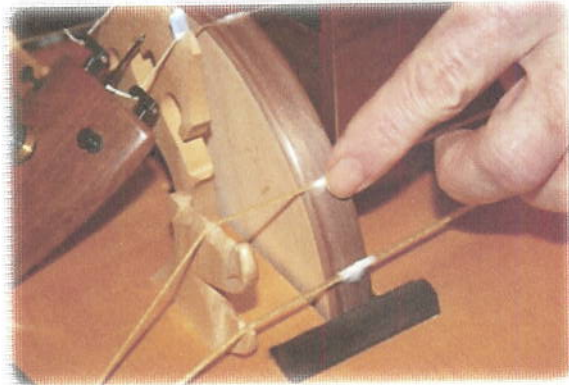
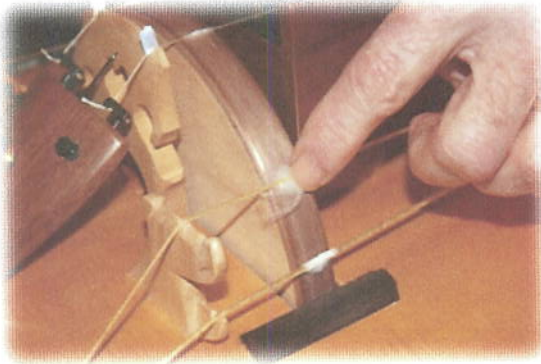
- Pull and spread the fibers and remove any lumps or dark specks
- Lift string and place 1/4 of the cottons length between string and wheel with the fibers generally aligning with the wheel.
- Fold this 1/4 length of cotton back over the string
- Turn wheel while watching the cotton. It should soon begin winding around the string



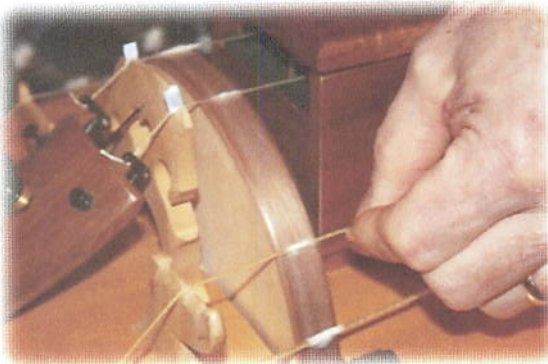
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- Guide cotton while it winds on the string as you continue to crank the wheel
- Use tip of finger to feed any loose fibers onto the string
- Roll cotton tighter onto string



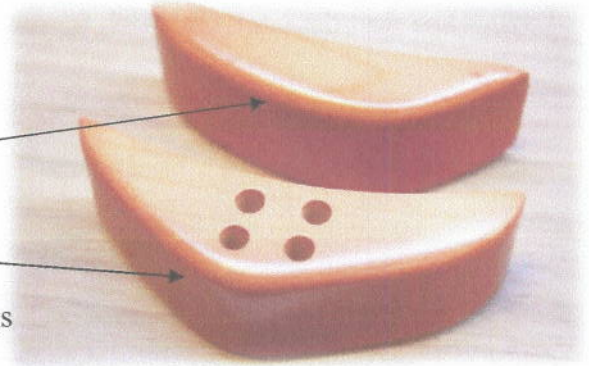
- Grasp string and roll it both ways as the wheel is rotating to tighten the cotton more



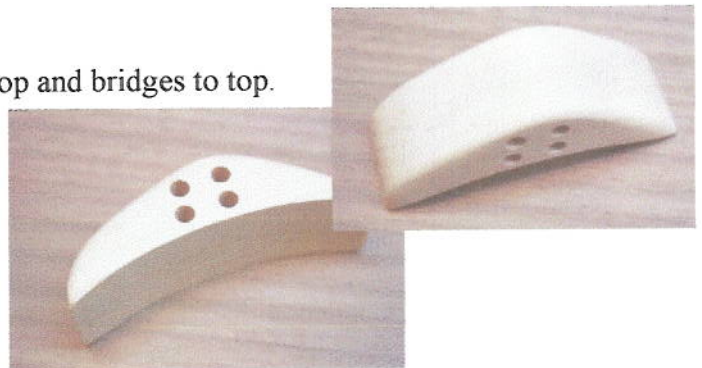
Sympathetic String Installation (optional up grade)

1. Fitting the anchor blocks

- Inspect the anchor blocks and make sure that the tuning pins fit snugly in the four holes of the tuning pin anchor block
Hitch pin block goes at the crank end
Tuning pin anchor block goes at peg head end.
- Lay out the block location on the instrument so that the strings will not interfere with the wheel cover anchor block or overhang the outside of the instrument too much.
- Mark this general position with blue tape temporarily placed on the top of the instrument. Later you will tape the outline of the blocks on the instrument sides but at this point it would interfere with correct sanding.



- Fit both blocks to their proper area by holding sand paper on the side of the instrument in the area where they will be mounted.
- Sand the blocks until they fit tightly to the side contour.
- This is the same procedure you used to fit key chest to top and bridges to top.
- Round the outside corners of the blocks with sandpaper



- Tape the area for mounting the blocks.
- Mark the outline of the blocks on the tape.
- Remove tape from the area where the blocks are to be Epoxied and scrape finish from this area.
- Epoxy the blocks into place with 12-30min epoxy.
- Wipe off excess glue before it hardens
- Remove tape before the epoxy is too hard.

Drilling the hitch pin block

Layout and drill the hitch pin block for the hitch pins with a #26 drill bit to almost the full depth of the block.

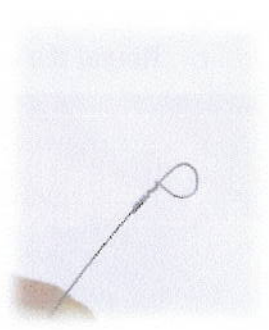
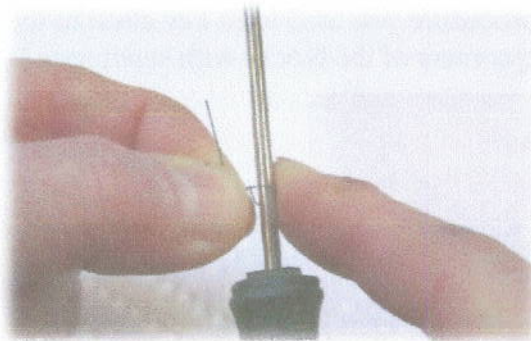
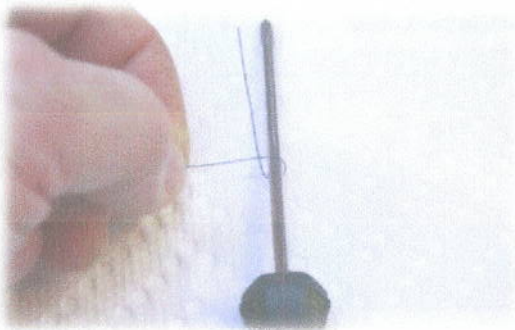


- Tap the hitch pins into the block one at a time while supporting the block underneath so as to not stress the instrument.
- When the pins are properly seated, the grooves will be about 1/16" above the top of the instrument.
- Now screw in the adjuster pins so that the hole is about 1/16" above the instrument top.



2. Installing strings (see pages 14-15 for more details)

Twist a loop into each string end by using a small diameter screwdriver. Loop the string around the screwdriver keeping the loop as tight as possible then grasp the loop tightly at the intersection as shown in picture #2.



Keep the string pulled tight against the screwdriver and turn the screwdriver so that the short end winds tightly around the string as pictured about 7 times.

With a little practice you may be able to make the windings tight and even.



- Notch the bridges for strings with a fine tooth saw or file so that the strings are centered on the bridges and spaced about 1/8" apart.

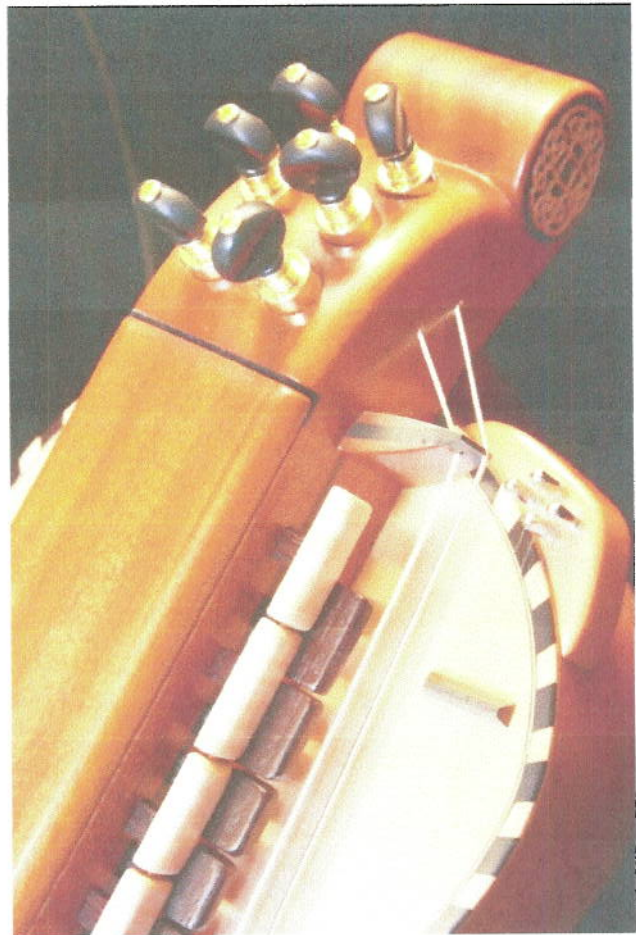
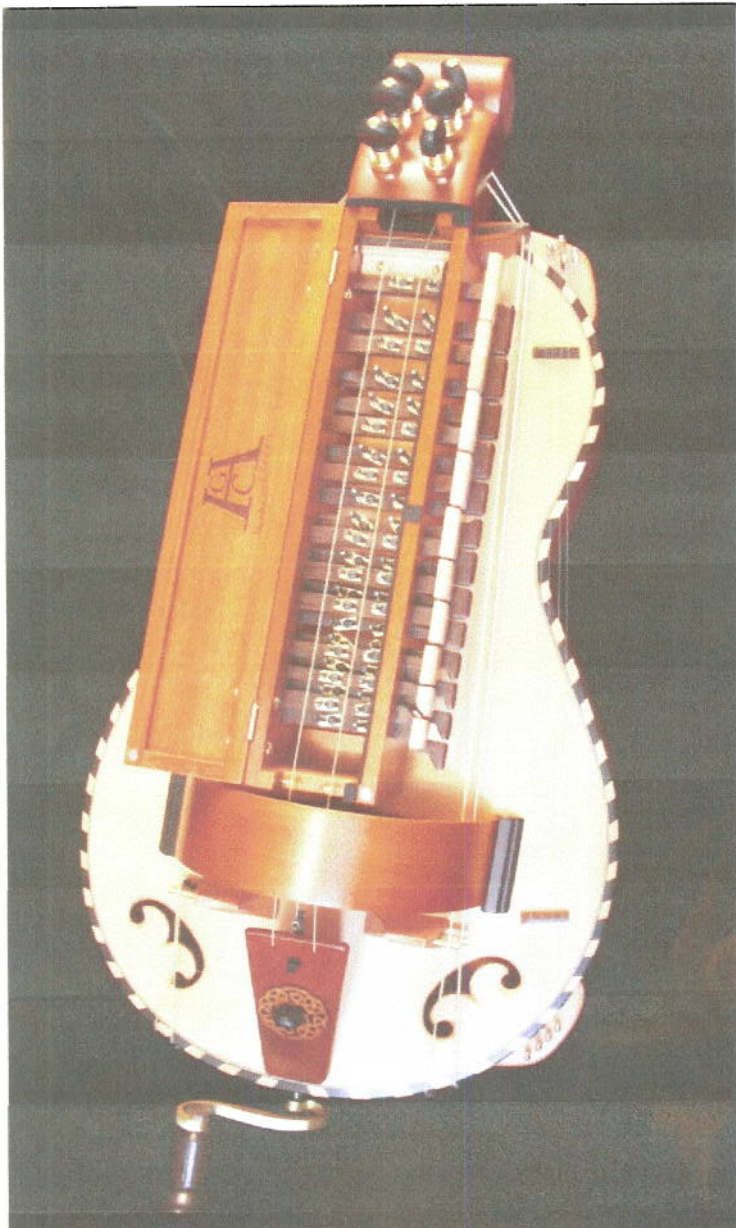
- Fit, and install the two ~~string~~ bridges in the approximate positions shown.

- They just rest on the soundboard and do not require gluing.

- If you have finished your instrument you may go ahead and install the strings now if not finish the instrument first and then install the strings.

- Place the strings through the hole in the tuning pin and wrap the string around the pin counter clockwise about three times.

- Place the loop over the respective hitch pin. Gently snug up the strings with the tuning key so they stay in place and retain the bridges. Tune the strings



Carry and store your Hurdy-Gurdy safely.



Our carry bags are made to custom fit your instrument. They are made of your choice of an outer shell of heavy upholstery fabric or Rip stop Nylon, and a soft fabric lining with a 3/8" closed cell foam padding between. They are perfect for protecting your Gurdy around the house or when traveling by car but do not offer a "checked baggage" quality of protection. Their light weight and a snug fit allows the smaller instruments to be carried on when flying. They are closed with a heavy weight zipper and come with simple hand straps for carrying

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e-mail Mel@hurdygurdycrafters.com



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- Some choice of colors
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- Single removable shoulder strap for additional \$20.
- Adjustable backpack type straps available for \$35.



