SMARTWOOD HARP KIT

Musicmaker's Kits, Inc.
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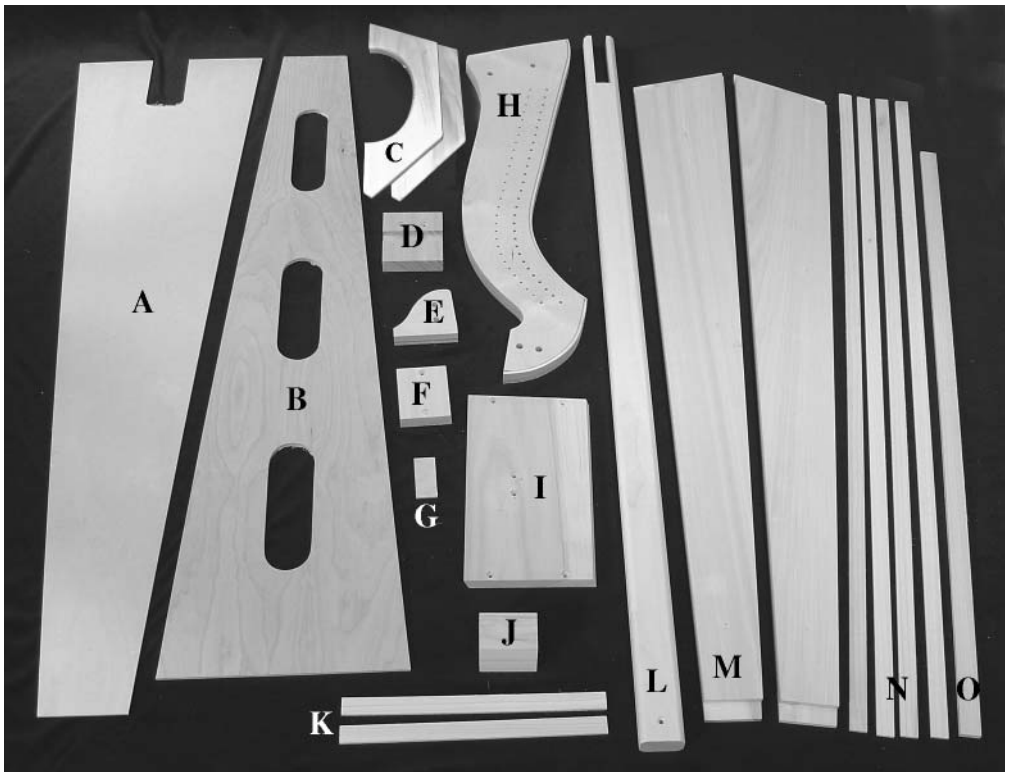
Smartwood Harp Kit

Pre-cut Wood Parts:

A - Soundboard
B - Back
C - Feet (2)
D - Cap
E - Neck Block
F - Top
G - Scrap for notch
H - Neck
I - Base
J - Base Block
K - Bottom Trim (2)
L - Pillar
M - Sides (2)
N - Side Trim (4)
O - Reinforcement Bar



Hardware Parts:

24 Zither Pins
5 Zither Pins w/enlarged holes
29 Bridge Pins
1 Allen Wrench, 5/64”
3 Large Eyelets
2 Sets Long Barrel Screws
2 Sets Short Barrel Screws
1 Wood Screw, 2”
1 Set of 29 Harp Strings
1 Tuning Wrench
8” Strip, Adhesive Brown Felt
1 Spacing Guide

1 Oz. Small Nails
10 Wood Screws, 1-5/8”
4 Wood Screws, 2-1/2”
26 Medium Eyelets
1 Drill Bit, 1/8”
1 Drill Bit, #24
1 Set Assembly Instructions

If you have any questions about the assembly of your kit - please visit our online Builder’s Forum
www.harpkit.com/forum

CUSTOMIZING OPTIONS

If you are an enterprising woodworker who wants to make this project special with some sort of decorations, here are a few ideas for you to think about. You may want to order decorative materials now so you have them when you need them.

2 Large Wood Rosettes for the Sides
3 strips of Inlay Banding for framing the Front
Decals for the Soundboard

A NOTE ABOUT GLUE

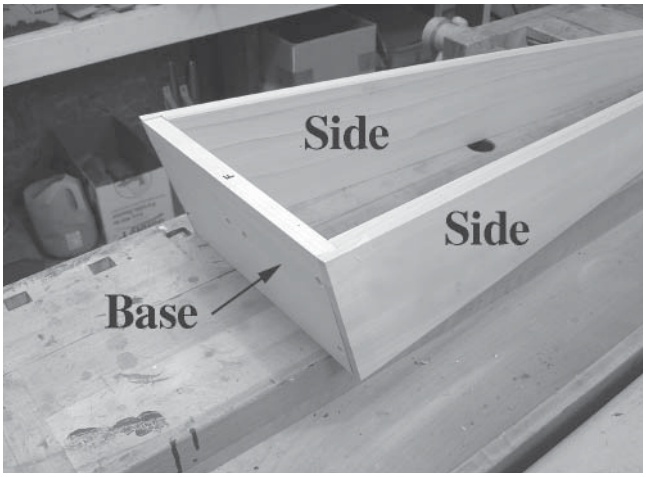
We recommend assembling this kit with standard woodworker’s glue (such as Elmer’s Carpenters Glue or Titebond Wood Glue). Don’t use Hotmelt glue, Superglue, 5-minute Epoxy, or the plain white School Glue -- they are not suitable for this type of project. There is no need to look for any specialty adhesive. Every time you use glue on this project, it is wise to have a damp rag handy for cleaning up afterwards. It is always best to scrub away any excess glue that squeezes out of the joints, especially on the outside of the harp. Keep your hands and workbench as clean as possible too.

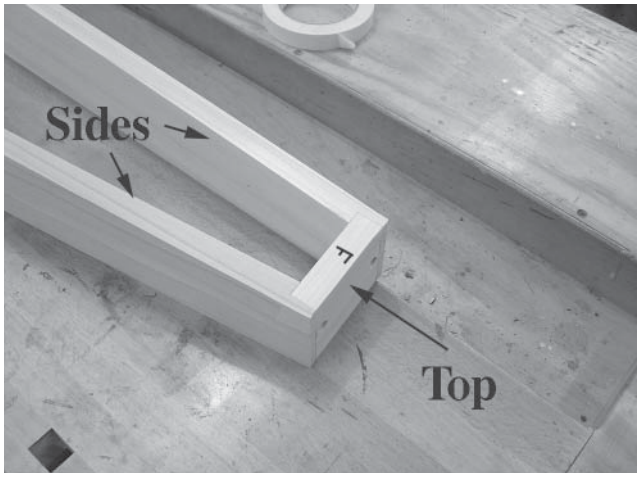
ASSEMBLY INSTRUCTIONS

_____**1.** Please check over your kit parts to make sure you have everything. Contact us right away if you are missing parts so we can rectify the problem without causing too much delay for you.

ASSEMBLING THE FRAME

_____**2.** Begin by assembling the four frame pieces: **TOP**, **BASE**, and two **SIDES**. These parts all have to be oriented correctly to fit well. We have marked the front of some parts with the letter **"F"** to help you. The longer edge of the **SIDE** piece is the front edge. Use masking tape to hold these parts together temporarily.

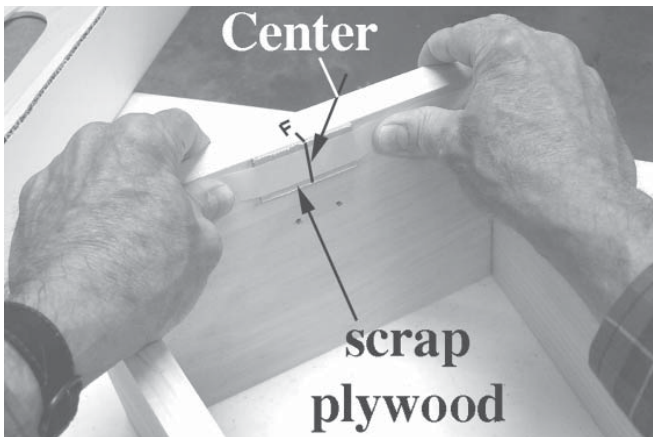


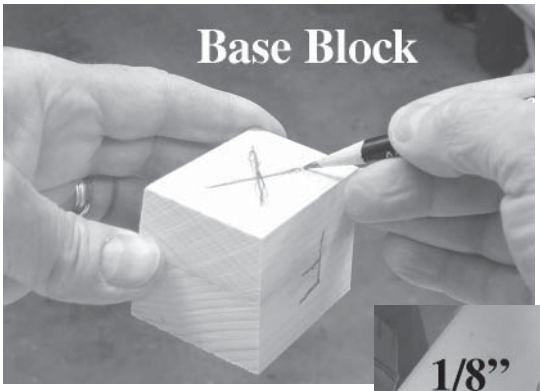


_____**3.** When the parts are properly aligned and held firmly with tape, use the smaller (1/8") drill bit provided in the kit to drill pilot holes into the **SIDES** for the screws. Aim your drill through the pre-drilled holes in the **TOP** and **BASE**. The holes you drill will guide the screws and make it much easier to screw them in without splitting the wood.

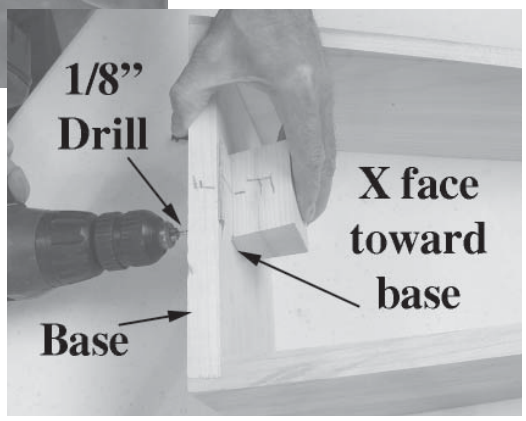
_____**4.** When the pilot holes are all drilled, remove the tape and put glue in the joints before installing 1-5/8" screws to draw the parts together permanently. Glue and screw both the **TOP** (2 screws) and **BASE** (4 screws) pieces to the sides. The screws should pull the parts together fully so that some glue squeezes out of the joints.

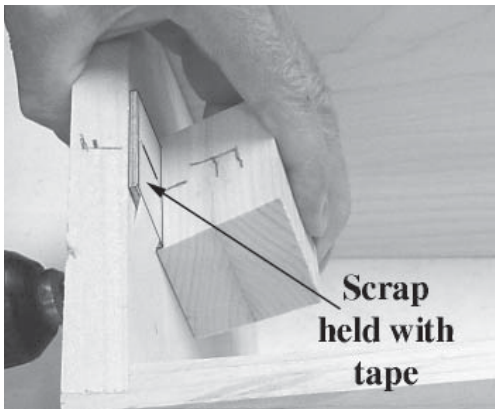
_____**5.** Now that the frame is firmly assembled, find the little scrap of thin plywood and use that as a spacer inside the **BASE**, as shown. Be sure to center it on the **BASE**, flush with the top edge. Use masking tape to hold it temporarily in place.





_____**6.** Find the **BASE BLOCK** and mark the smallest surface with an "X" and the angled surface with the letter **"F"**, as shown here. Hold the block with the "X" against the **BASE**, next to (under) the scrap of wood you taped down as a guide, and center it on your centerline. You can use a long piece of masking tape to help you hold it position if you like.



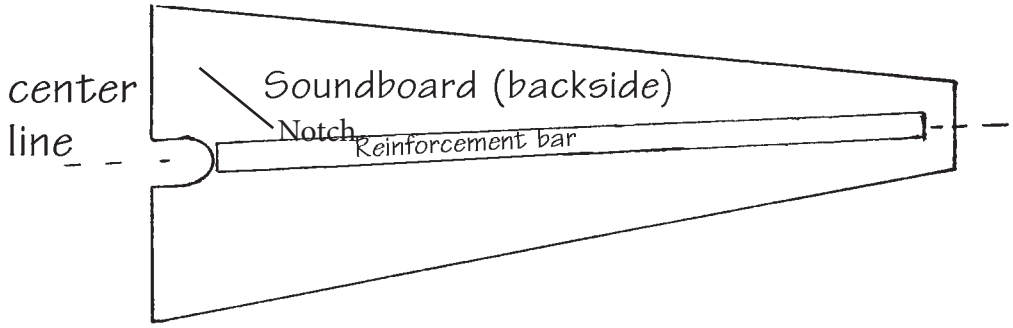


_____**7.** Use the 1/8" drill bit to put two pilot holes into the **BASE BLOCK** through the pre-drilled holes in the **BASE**, as shown. Be sure to hold the **BLOCK** firmly while drilling so it does not move out of position.

Once the pilot holes are drilled, you can apply glue and use two 1-5/8" screws to fasten the **BLOCK** permanently.

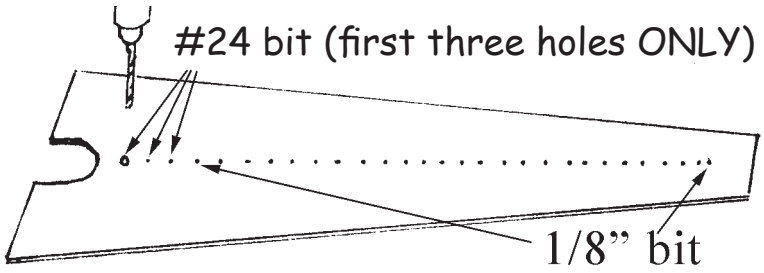
INSTALLING THE SOUNDBOARD AND BACK

_____**8.** The **REINFORCEMENT BAR** is a 1/4" thick strip of hardwood a little shorter (37") than the four trim strips in your kit. This bar will be glued to the inside face of the **SOUNDBOARD**. **CAUTION: DO NOT COVER THE PUNCH-MARKS ON THE FRONT (OUTSIDE FACE) OF THE SOUNDBOARD!**
Make sure to center this strip on the back of the **SOUNDBOARD**, and start it flush with the top of the notch, as shown.

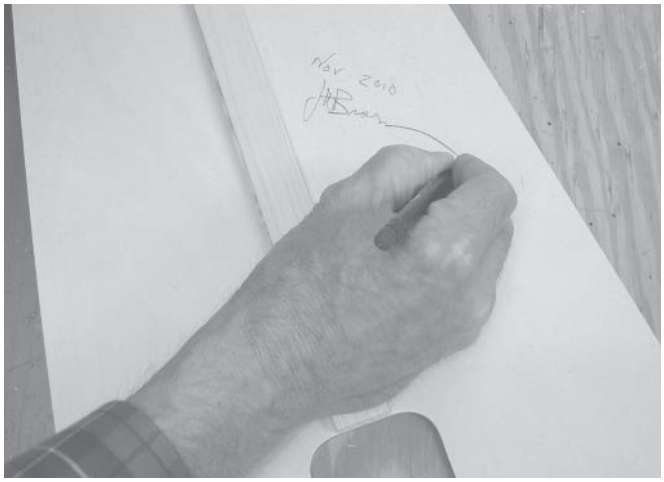


Use heavy weights to hold the **REINFORCEMENT BAR** in place when gluing, and try to keep it from slipping off-center.

_____**9.** When the **REINFORCEMENT BAR** is dry, turn the soundboard over and count the pin-pricks in the front face -- there should be 29 of them. If some of them are faint, use a hammer and nail to deepen the punches. Otherwise you might mistake a bit of sawdust for a punch-mark and put your drill in the wrong place!

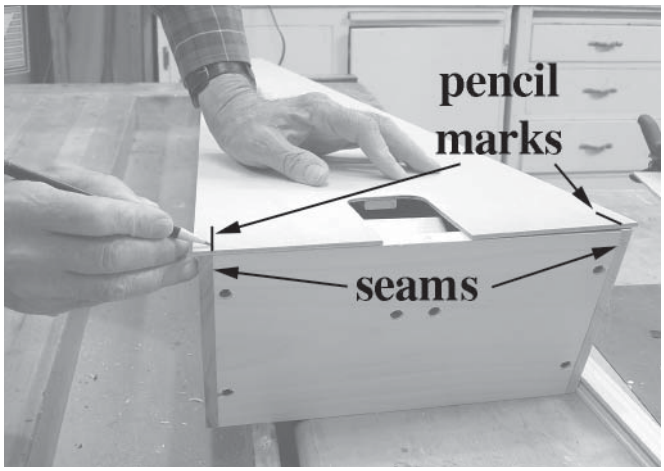


Use the #24 drill bit to drill just the first 3 holes (nearest the notch) through the **SOUNDBOARD**. This is the larger bit in your kit. Drill all the way through the **REINFORCEMENT BAR** too. Then switch to the smaller 1/8" bit to drill the remaining 26 holes.



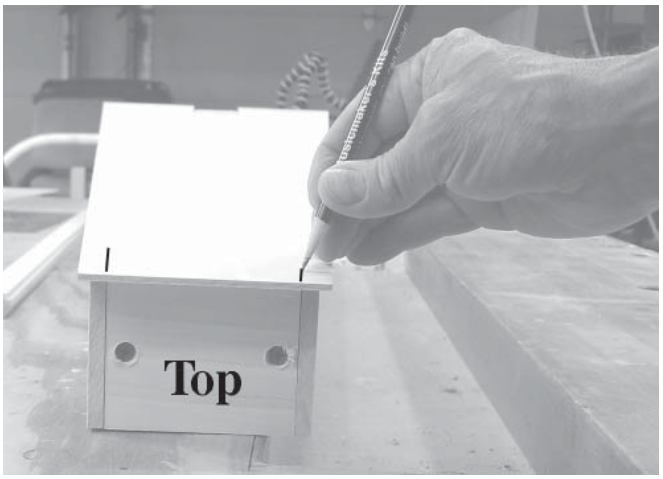
_____**10.** Now is a good time to sign and date the inside of the **SOUNDBOARD**. Some people add a dedication or message to commemorate a gift occasion. People will appreciate knowing the origin of the harp in years to come.

_____**11.** Check over the corners of your harp frame to see if they need any sanding or levelling. Sometimes there are globs of glue that need to be removed before you can fasten the front and back panels to the frame. Use 100 grit sanding block for this process.



_____**12.** When the frame is ready, test the fit of the soundboard on the front (longer) side of the box. **NOTE:** The panel is slightly oversize. Center it so you have equal overhang on both sides. Align the bottom of the **SOUNDBOARD** with the bottom of the frame, and let the excess length hang over the **TOP** (that makes for less trimming later).

Use masking tape to hold it temporarily while you make some pencil marks aligned with the seams at the **TOP** and **BASE** of the box, as shown.

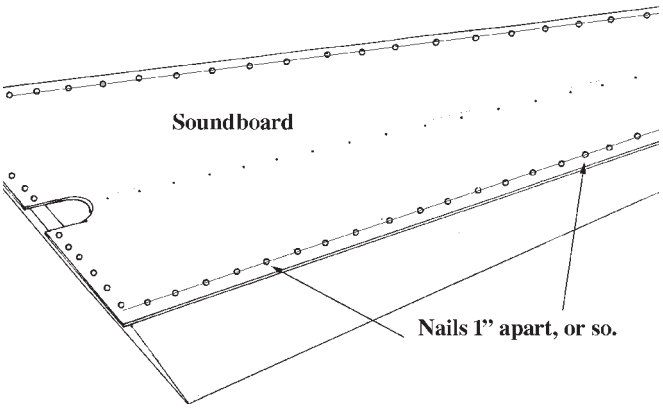


_____**13.** Then use a straight-edge (or straight piece of wood trim from your kit) as a guide to draw lines connecting these marks along both sides of the **SOUNDBOARD**. These will be the lines that guide your nailing. We don't want any nails to poke out of the wood!

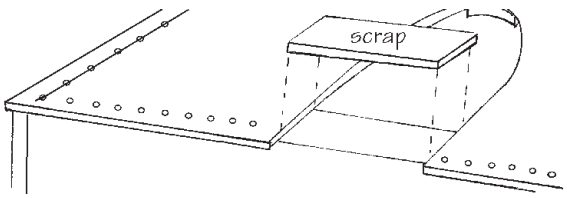
_____**14.** When ready, lift off the **SOUNDBOARD**, put glue along the front edge of the frame, and carefully center the board back in position. Use the small nails supplied with the kit to fasten the **SOUNDBOARD BACK** in place.

Don't nail across the top of the soundboard though. You'll be covering the nails along the sides and bottom with wood trim later, but there is no trim piece for the top end.

Place your nails about 1" apart on the front.

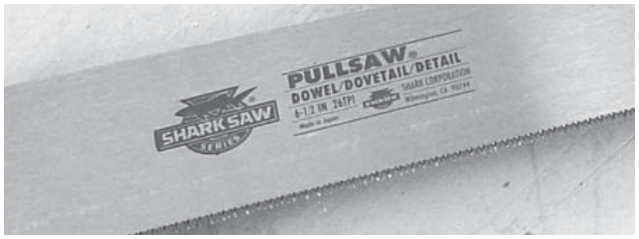


Fit the little plywood scrap in the gap of the notch too, using a couple of nails to fasten it down.



_____**14.** The **BACK** panel is next. Choose which side you want facing out, and draw lines down each side to guide your nailing, just as you did for the **SOUNDBOARD**.

When ready, spread glue around the back of the harp box and position the **BACK** in place. You don't need as many nails holding the **BACK** as you put in the **FRONT.** We usually space them about 2" apart.



TRIMMING THE BOX

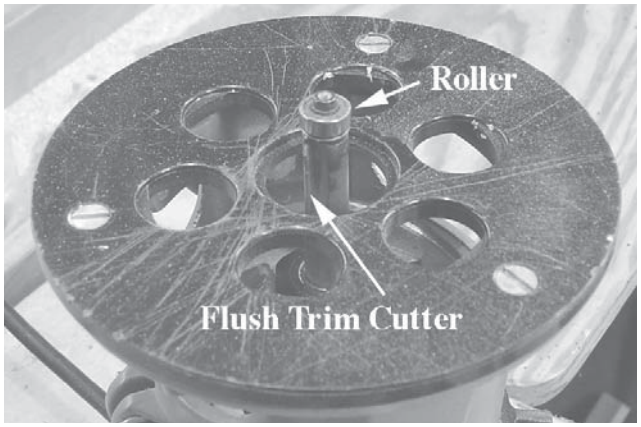
_____**15.** When the front and back are securely fastened, you need to trim them flush with the box, all the way around. Here are some options for that:

Large overhangs can be removed with a small saw, like the ***Japanese pull saw*** shown here. We found it at **ACE Hardware**, and it cuts very quickly.

Lesser overhangs can simply be sanded flush using coarse (60 or 80 grit) sandpaper on a wood block, plus a few hours of hard work. If you have a power sander, however, you'll reduce the job to 30 minutes or less. A random orbital palm sander is a very useful tool for this project. We like the ***Porter Cable*** model with 5" round sanding discs.

The fastest tool for this process, however, is a router. If you are looking for an excuse to add this tool to your shop, this would be a good time to do so. You'll use a flush-trim bit for cutting off the overhanging front and back panels, and a 3/8" or 1/2" round-over bit for rounding over the sharp corners of the box later in the project. Yes, you can do the job with the power sander, but it takes only 3 minutes with a router.

So have at it: Cut off the overhanging plywood flush to the sides of the box.



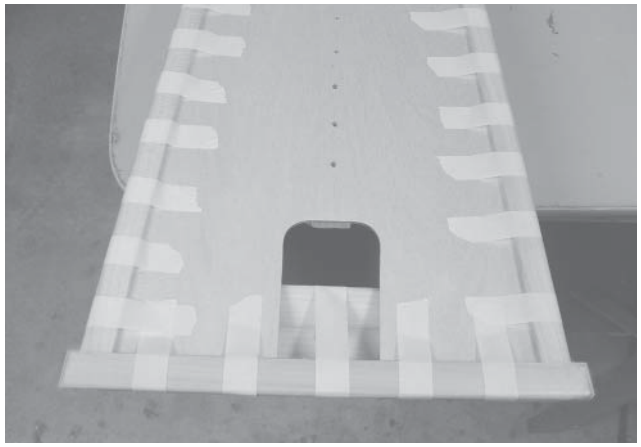
_____**16.** Before installing the **TRIM** pieces on your harp, be certain the nail heads are all tapped flush (or below) the surface of the wood on both the front and back of the box. Otherwise the nails will prevent the trim pieces from lying flat. Use a nail-set, or sand the point off a large nail, to tap the small nails fully into the wood.

_____**17.** Start at the bottom of the harp to install the **BOTTOM TRIM** flush with the bottom of the box. Put glue on one face of the **TRIM** piece and use tape to hold it in place on the bottom of the **SOUNDBOARD**. Make sure the **TRIM** is flush with the bottom of the box. No need to cut the **TRIM** to exact length first -- it will be easier to cut after the glue is dry.

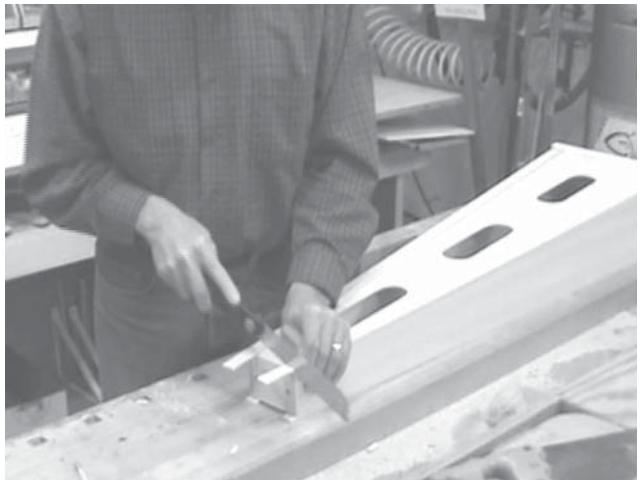
_____**18.** Look carefully at the long **SIDE TRIM** pieces. One end of each piece has been cut at a slight angle. This allows you to butt the angled end up against the **BOTTOM TRIM** and have it fit nicely.

Glue each trim piece to the **SOUNDBOARD**, flush to the edge of the box, and use masking tape to hold it in place until the glue dries.

HINT: Use just the right amount of glue on the **TRIM** so you don't end up with a lot of excess squeezing out and making a mess on the outside of your harp.



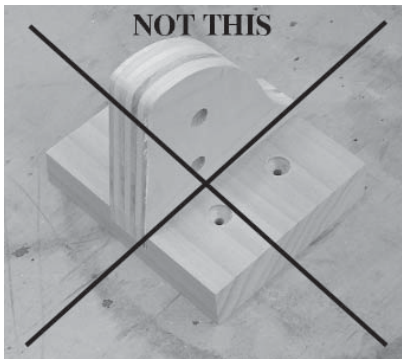
_____**19.** When the trim pieces are dry, remove the tape and cut off the excess length where the ends hang over the edge of the box.



_____**20.** Find the two parts that make up the **TOP CAP** and glue them together as shown in the left photo. It wouldn't be a big deal it you goofed on this step, but when you get it right, the mounting screws will be hidden by the **NECK**, and that just looks nicer.

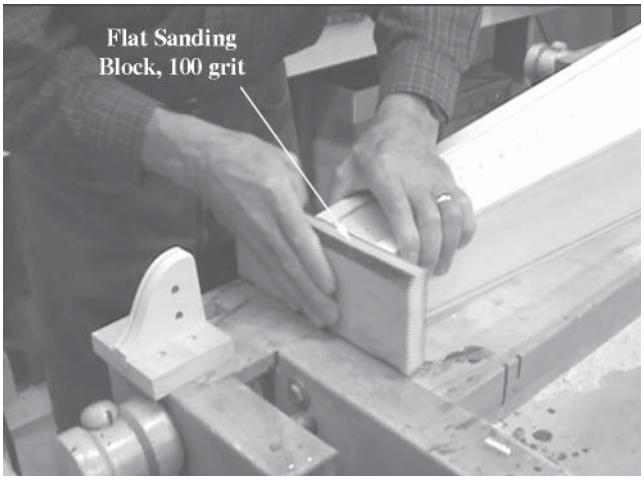
Just put glue in the groove and press the parts together fully. Allow at least 30 minutes for drying.

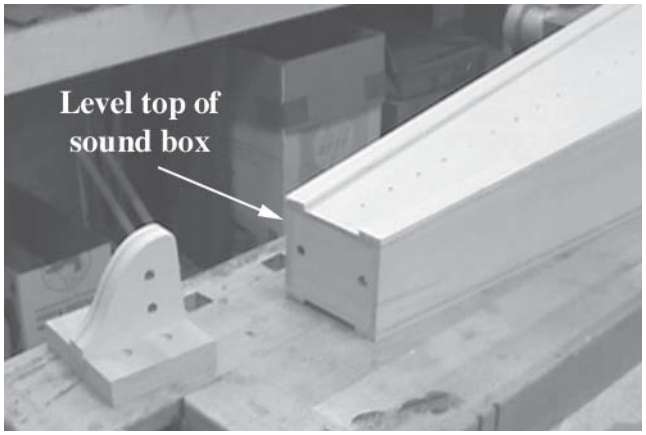
TOP CAP & NECK BLOCK



_____**21**. Now you need to fit the **TOP CAP** to the top of the harp body. To prepare the box for a good fit, you will need to sand the top nice and flat. The goal is to get the **FRONT**, **BACK,** and all the **TRIM** pieces flush with the two **SIDES.** It is not necessary to sand all the way down to meet the **TOP** piece -- it's easier to allow that to be slightly recessed.

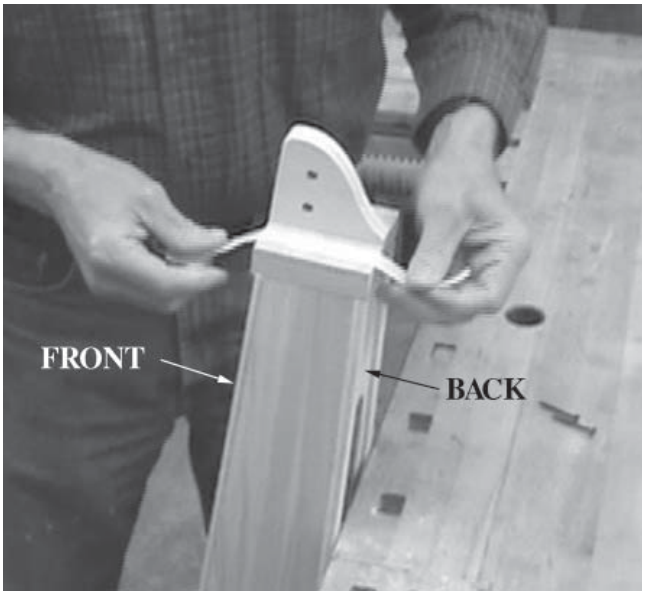
Use 100 grit sandpaper glued to a flat sanding block to achieve a good flat end on the harp box.

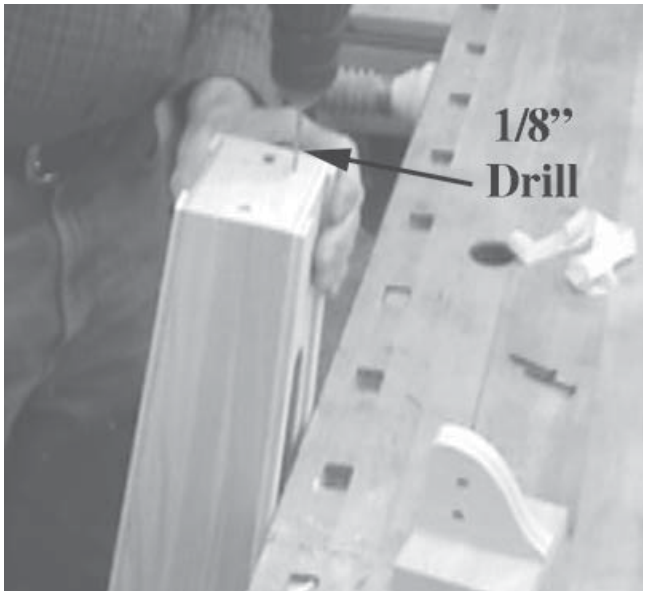




_____**22.** When satisfied with the fit, tape the **TOP CAP** in place, carefully noting the front and back orientation shown here. This **CAP** is slightly oversize, so just leave about equal overhang all the way around.

Use an awl or a long nail to punch-mark the location of the two mounting screw holes. then use the 1/8" drill bit provided in the kit to drill these two pilot holes in the top of the harp, as shown.





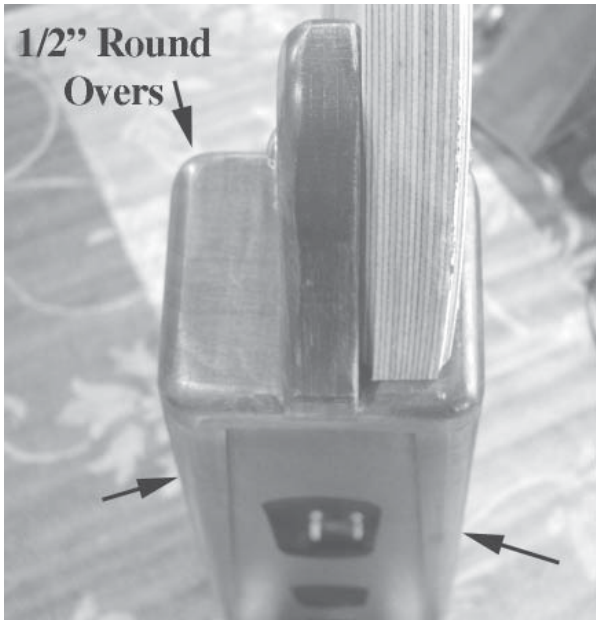
_____**23.** Put glue on the top of the harp and use two of the 1-5/8" wood screws to screw the **TOP CAP** in place on the harp body. Be sure to clean up any glue that squeezes out. It will show prominently on the outside of the harp if you leave it.

_____**24.** Sand the edges of the **TOP CAP** flush with the harp all the way around. Here again, the orbital sander works best with a 60 grit sanding disc, unless you happen to have a belt sander.

_____**25.** Your harp will look much nicer and feel better to hold and play if you round all the corners of the body significantly. Novice woodworkers don't realize how much rounding they should do, so we have pictured the top view of a finished Smartwood Harp here to illustrate the point. This harp was rounded with a 1/2" radius router bit, which seems aggressive, but really looks and feels good.

You do not need a router to do a nice job of smoothing and rounding your harp though. A hand-held orbital sander will do the job very well with an hour's time or so. Be sure to wear a dust mask when sanding this much, as you will create quite a cloud of fine powder in the room.

We suggest starting with about 60 or 80 grit abrasive on your sander for rounding all the corners. Follow after that with about 120 grit paper to remove all the scratches left by the coarse grit.

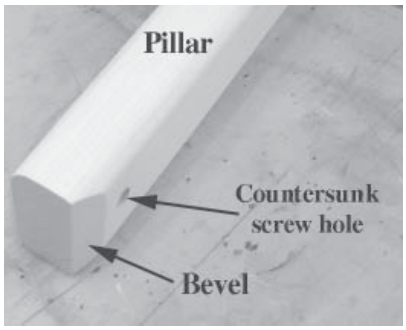


OPTIONAL ROUTER

Yes, you will be removing quite a bit of material from the front and back trim along the sides. This is good -- there's plenty of solid wood in these corners.

FINAL FITTING

_____**26.** Once the body of the harp is nicely rounded, you can try fitting the **PILLAR** to the bottom of the box to see how it fits in the notch at the bottom of the harp. You may need to bevel the front of the pillar a little to get it to fit fully down into the "pocket".



Just sand a bevel at the bottom of the **PILLAR,** as necessary. You want the pillar to make full contact with the base of the box.

Retrofitting Parts From Older Smart Harp

NOTE: If you are retrofitting a neck and pillar from an older foamcore Smart Harp to this new wooden body, you'll need to tune down the strings and un-hook them from the tuning pins in order to remove the neck and pillar from the old box. Just leave the pins and levers on the neck, and the strings hanging in the old box for now. You'll re-use the strings, but it is best to keep them organized in the old harp body until you need them.

_____**27.** Now you can test fit both the **NECK** and **PILLAR** to the harp body. Begin by assembling the **PILLAR** and **NECK** using the barrel nuts and longer bolts provided. ***Don't tighten the bolts too firmly -- just hand-tighten them for now.***

Be sure the front of the **PILLAR** is facing forward. The front is distinguished by the countersunk hole for the screw near the bottom (and your little bevel).

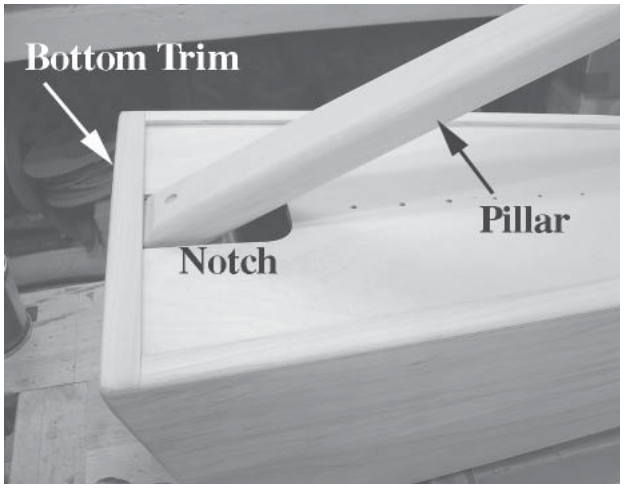
Hold the **NECK/PILLAR** assembly up to the harp body and check the fit. Install the two shorter bolts and barrel nuts at the back of the **NECK**. See note below if your **NECK BLOCK** has no holes.

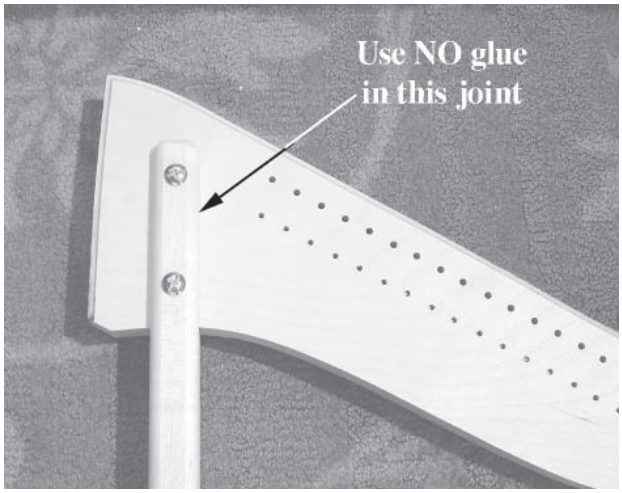
Retrofitting Parts From Older Smart Harp

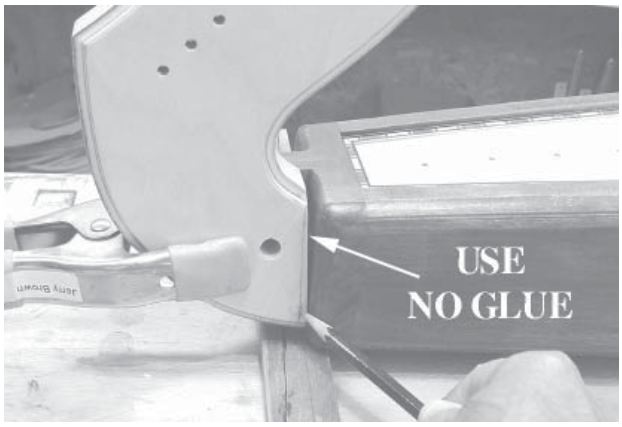
NOTE: You may need to alter the back of the neck slightly to match the angle of this new body. Draw a pencil line on the side of the neck parallel to the Top Cap to guide you in shaving some wood off the neck so it rests flat atop the harp box.

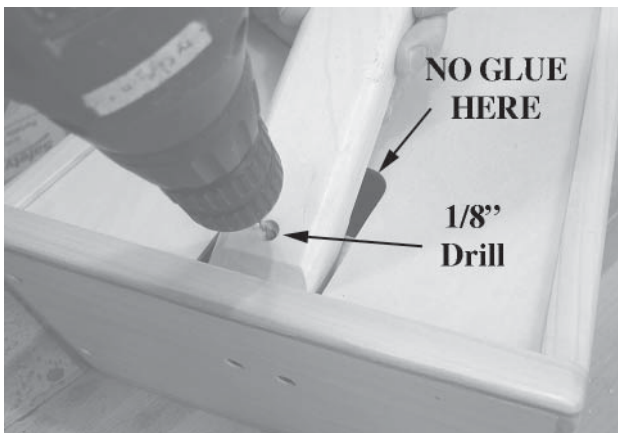
Test the fit again and drill 5/16" holes for the barrel nuts to match the holes in the neck. (5/16" is the minimum size -- these holes can be larger if necessary). We provided an undrilled Neck Block just so you could drill these holes to match your Neck.

_____**28.** Drill a 1/8" pilot hole into the **BASE BLOCK** for the screw that will hold the **PILLAR** into that pocket. Then use the 2" long screw provided to fasten the **PILLAR** firmly to the **BASE BLOCK**. ***Do not use glue at this joint*** -- you'll want to be able to remove the **NECK** and **PILLAR** from the harp in the future.









FINAL SANDING & FINISHING

_____**29.** When you are satisfied with the fit of all these parts, unscrew the bolts and screw so you can remove the **NECK** and **PILLAR** for final sanding and finishing.

Sand the entire harp with 180 grit sandpaper to smooth out all machine marks and remove any glue spots or smudges on the outside surface. Use a sanding block where it is helpful, but just fold the sandpaper in your hand for curved areas and inside corners. This is an important step, so take your time to inspect the entire surface carefully. Feel the wood surface with your bare hands to make sure it is smooth to the touch.

Don't forget to sand the two* FEET *also!

HINT: It is helpful to pad your work table with an old towel when you do your sanding. This will prevent adding scratches and smudges from the table surface as you work.

Now you are ready to apply the finish. Here are some recommendations:

STAIN -- STAINS are coloring agents and should only be used if you dislike the natural color of the wood. We often like to stain this light-colored wood, but it is certainly not necessary. If you decide to color the wood, it is easiest to color all the parts the same. It is more difficult to mask off the soundboard, for instance, and just stain the sides and back of the harp body because the stain tends to "bleed" under the masking tape. If you are a novice at finishing, or facing a deadline for completion, we recommend skipping the stain altogether.

OIL -- An oil finish (such as Watco Danish Oil) will give your wood a low luster appearance, bringing out the natural color of the grain, but it tends soak into the wood and appear dry and "thirsty" after awhile. 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, if that is important to you.

VARNISH -- Any regular varnish will work fine on this project, but we recommend the wipe-on Gel Topcoat polyurethane from General Finishes. This is what we supply in our Finishing Kit. The advantages of this finish are its simple application (no drips or runs), durability, and deep, soft luster.

LACQUER -- Many professional instrument makers still use nitro-cellulose 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 may smear some painted decorations or blister some types of decorative decals. If you plan to add such ornamentation to your instrument, it would be better to finish with polyurethane varnish instead of lacquer.

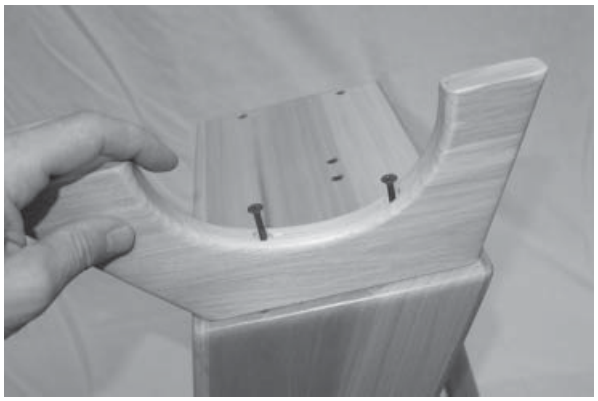
_____**30.** So choose your weapon and proceed with finishing all the wood parts. ***Don't forget the Feet!*** Plan on applying at least three coats of finish unless you are using Danish Oil. Be sure to follow the directions on the can.

_____**31.** Once the finish is dry and you like the results, you are ready to install the **FEET** on the bottom of the body and bolt the **NECK** and **PILLAR** back in place.

Install the 2 1/2" wood screws in the pre-drilled holes in the feet so that just the tip is protruding from the **BOTTOM**. Line the **FEET** up along the seam between the base of the harp and the edge as shown in the picture.

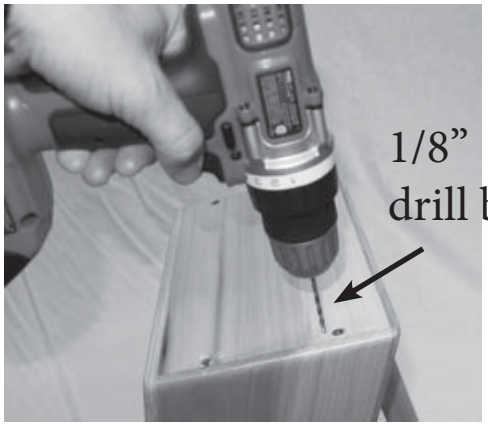
There are 2 surfaces on each foot that will make contact with the ground. Orient the foot so that the larger contact surface is coming out the back of the harp.

When the foot is properly aligned - press down firmly enough for the protruding screws to make punch marks in the **BASE**.



_____**32.** Using the punch marks as a guide - drill pilot holes into the **BASE** using the 1/8" drill bit.

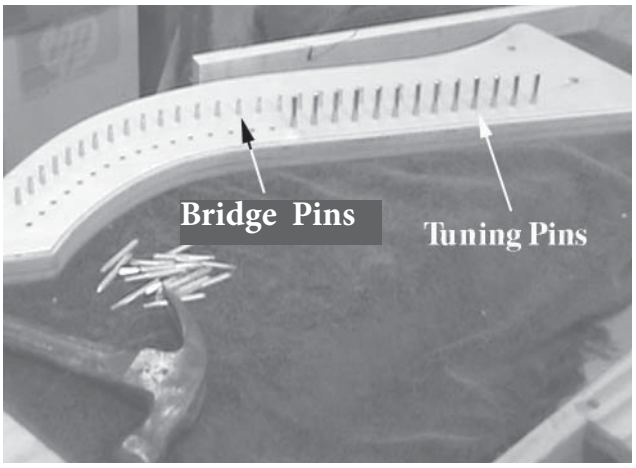
Repeat this for the second foot, and then screw the feet in place with the 2 1/2" screws provided. **USE NO GLUE** on the feet. It won't stick to the finished surfaces anyway, but you'll want to be able to remove the feet easily in the future in case you need to repair or replace them.



_____**33.** Cut the adhesive backed felt and stick to the bottom of the feet as shown to prevent scratching the floor, and to reduce the noise when you slide your harp into playing position. The pads should be positioned at each end for greatest stability.

INSTALLING HARDWARE

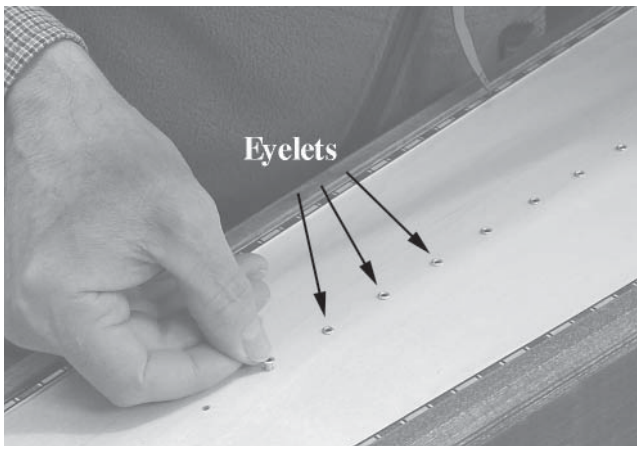
_____**34.** Notice that the brass-colored **BRIDGE PINS** are threaded to allow adjustments to their depth after the strings are installed. It is important to wax these threads before installing the pins. Just scrape the threads across an old candle. Then use a hammer to pound them into the holes so they stand about 5/8" above the wood surface. We like to cut a scrap of wood to that dimension and use it as a depth gauge. Use the 5/8" **SPACING GUIDE** to double-check the pin height.



_____**35. DO NOT WAX** the nickel-plated **ZITHER PINS.** They need to be tight in the wood to keep the strings in tune. Pound the pins into the larger holes, threaded end first, so they stand about 1" above the surface of the wood.

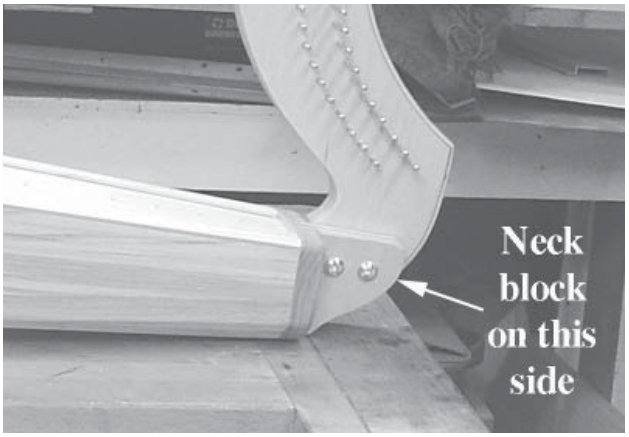
Install the 5 ENLARGED HOLE ZITHER pins in the holes for the bottom (longest) 5 strings.

_____**36.** Push the brass **EYELETS** into the holes in the front of the harp. Note the three larger ones for the bottom three holes. The **EYELETS** should be tight enough in the holes to prevent them from falling out easily, but if you have any that seem loose in the hole, you may add a little droplet of glue to the outside of the brass shaft to fill the gap. Just be careful not to plug the hole with glue. The strings need to pass through these eyelets.



_____**37.** Assemble the harp back together, using the bolts and screws provided. This time you'll want to tighten the bolts firmly to withstand the string tension.

NOTE: The **NECK** must be placed on the proper side of the **NECK BLOCK**, as shown. Otherwise the strings will be angled too sharply from the **SOUNDBOARD** to the **TUNING PINS**.



INSTALLING STRINGS

Gather the following tools and supplies for stringing:

1- set of harp strings from the kit package
1- tube of Superglue or Krazy glue
1- pair of scissors
1- tuning wrench from the kit package

Stringing a harp is somewhat of an art. We recommend that you read through these last pages of directions completely before beginning, so you know what to expect. It is not uncommon for people to call us to ask why their harp won't stay in tune. Careful installation will do much to stabilize the strings.

Retrofitting Strings From Older Smart Harp

NOTE: Remove one string at a time from the old harp and install it in the new harp, starting at the bottom. You might break a string or two in the process, but most strings should survive this transfer.

_____**38.** Start at the bass (widest) end of the harp with string #29. Push the end of the string through the lowest hole in the **SOUNDBOARD** from back to front.

Then pull the knot tightly against the inside of the soundboard.

NOTE: PULL STRAIGHT THROUGH THE HOLE, NOT AT AN ANGLE, TO AVOID SCRATCHING THE NYLON AGAINST THE BRASS EYELET.

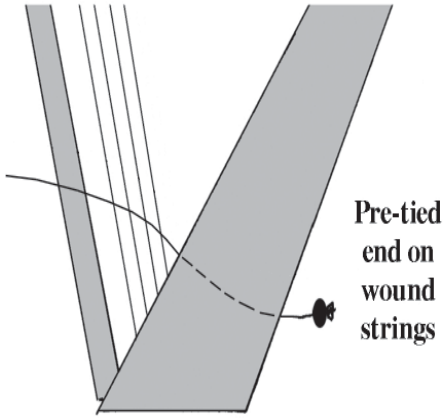
Thread the other end of the string through the last tuning pin at the point of the **NECK**. Pull it through the **PIN** until there is some slack below the **PIN**.

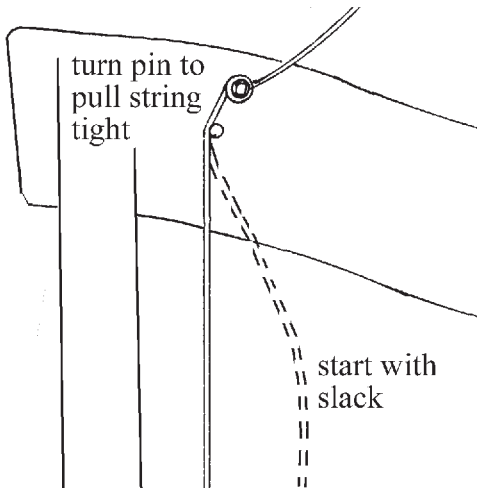
Turn the **PIN** clockwise with the tuning wrench and guide the windings of the string downward toward the wood. As the string begins to tighten, place it in the groove of the **BRIDGE PIN**.

HINT: Do not accumulate a lot of windings of string around the tuning pins, especially in the bass. They become bulky and cumbersome. If you find yourself with that problem, turn the tuning pin backwards to unwind the string, then pull more slack through the hole before tightening again.

The strings are numbered from 1 (for the shortest) to 29 (for the longest), and they are color-coded to help guide you as you play. "C" strings are always red, and "F" strings are always blue.

Note that the bottom bass strings are compound (wound) strings that are already tied with a leather washer at one end. The core of the string extends beyond the wound part on purpose.

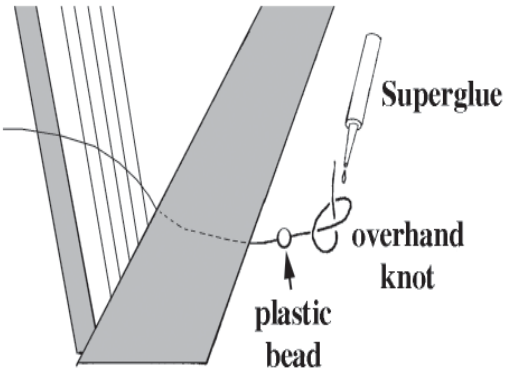




When you come to the first plain nylon string (.050" diameter), push it through from the front of the harp and pull the end partway out the back of the harp, so you can thread a plastic bead onto the string and tie a simple overhand knot, as shown.

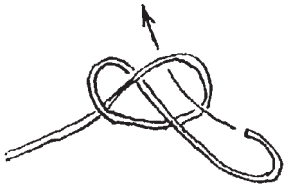
NOTE: We supply plastic beads for you to use as "washers" on each plain nylon string, so your knots won't pull through the holes in the soundboard. Use a bead on each string .040" diameter and smaller!

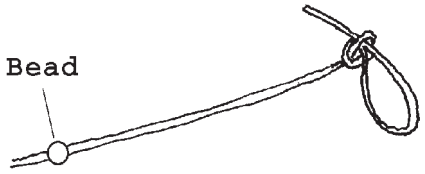
You'd think this would be enough of a knot to secure the string, but nylon is very slippery, so we always pull the knot tightly against the inside of the harp and then retrieve it from inside the harp so we can put a drop of ***Superglue*** on top of the knot. This prevents the nylon from slowly untying itself under tension.



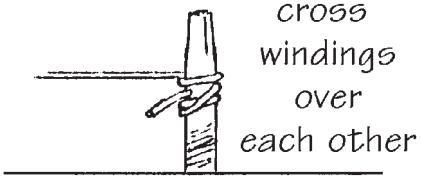
Install all three .050" diameter strings in proper order (a clear, a blue, and a clear). Notice that we pack a spare clear one in case you have difficulty. Save the spare of each diameter for emergency replacements, just in case of breakage.

When you get to the next size (.040" diameter), you'll need to alter the knot slightly. Start with the same overhand knot, but before you pull it completely tight, push the loose end part way back into the knot, just to add one more thickness of string to the knot, as shown. This will ensure that the knot cannot be pulled through the plastic bead when you tune the harp up to pitch. Be sure to add a drop of ***Superglue***.



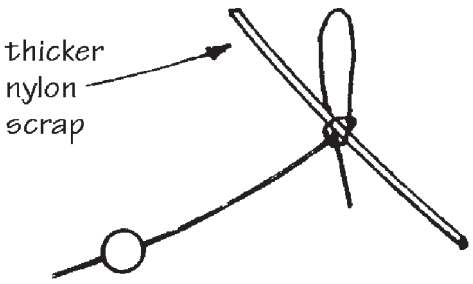


We also like to anchor the tops of these lighter strings securely to the tuning pins as follows: Make one or two windings of string around the **TUNING PIN**, then cross the next winding over the others so the string cinches itself tightly around the **PIN**. Otherwise you may experience string slippage and breakage, especially in the upper half of the instrument. This also helps keep the string at about the same level as the groove in the **BRIDGE PIN.**



CAUTION: Nylon strings are somewhat fragile, especially in the upper octaves. Try to avoid scratching them as you install them. Most string breakage occurs at the **TUNING PIN**, when the string is pulled forcefully around the sharp corner of the small hole in the metal. You can minimize the problem by installing the string carefully and by crossing the windings before applying too much tension to the strings, so the nylon does not begin to slip back through the hole under tension and become damaged.

When you come to the lightest strings (.025" diameter), you will need to add a short piece of heavier string into the knot in order to make the knot bulky enough to keep from pulling through the hole in the plastic bead. Just use some scraps of excess nylon from the .050" bottom strings. ***Don't forget the Superglue....***



When all the strings are installed, you can tune them up to pitch and allow the instrument to adjust itself to the tension (over 600 pounds). The strings should all be tuned to the C major scale (white keys on the piano). All the red strings are C notes and the blue strings are F notes. Middle C is the second red string from the bottom.

Many people are not certain if they are tuning their harp strings to the correct octave. Tuning the strings an octave too low will result in flabby harp strings that don't produce clear sounds. Tuning the strings too high will cause strings to break. To make sure you are tuning your harp strings to the correct octave, you can double-check the pitch on our website with our "online tuner": www.harpkit.com/freetuner

NOTE: It will take 20-30 tunings for the harp to stabilize. ***Be patient!*** Nylon strings take awhile to stretch out, and the soundboard will bow up slightly as you continue to tighten the strings. Tune the harp a few times each day to hasten the process.

CONGRATULATIONS! We hope you have enjoyed building this harp and that you enjoy many years of musical pleasure from playing it. We stock a good number of teaching materials and accessories to help you get started playing. Just call us, or check our web site, for more information or for placing an order.

ADDING SHARPING LEVERS

Sharping levers are used on folk harps to facilitate key changes. Installing a lever at a string allows you to raise the pitch of that string one-half step by lifting the handle. Thus an F-string can be raised to F# by a simple flick of the lever. Similarly, a B-string may be tuned to Bb so that the lever will raise it to B-natural and release it back to B-flat, as needed.

Most folk harp players set the key signature (sharps or flats) on the harp before starting each piece of music. For the key of G, you would engage the levers on all the F strings to produce the F# notes needed for that key (making sure all other notes on the harp are natural). If the following piece were then to be played in the key of F, you would then release the levers on all the F strings to produce F-natural, and also release all the B-string levers to produce Bb.

You may install a lever at every string on the harp, or, if you think you won't use all of them, it would be more cost-effective to select which keys you think you are most likely to use, and then install only the levers necessary for those keys.

Sharping Levers come with installation instructions. Check on-line at www.harpkit.com for details.

KEY OF E:	**requires F# and C# and G# and D#**
KEY OF A:	**requires F# and C# and G#**
KEY OF D:	**requires F# and C#**
KEY OF G:	**requires F#**
KEY OF C:	**requires no sharps or flats**
KEY OF F:	**requires Bb**
KEY OF Bb:	**requires Bb and Eb**
KEY OF Eb:	**requires Bb and Eb and Ab**

ACCESSORIES FOR YOUR HARP

SMARTBAG	Nylon Gig Bag for Smart Harp (with shoulder strap)
CA- 30	Chromatic Electronic Tuner
TUNERCORD	External pickup & cord for tuner
SMARTSTRG	spare set of 29 strings

plus many books, CDs, and DVDs on playing the harp

See Website for Current Pricing

SMART HARP (G2 to G6)

SMARTSTRG **FULL SET OF 29 STRINGS**

STRING	NOTE	GAUGE	CODE	COLOR	LOVELAND SHARPING LEVER	VIBRATING LENGTH
1	G6	.025	NYL025	clear	00	4-1/2”
2	F6	.025	NYL025	blue	00	5-3/8”
3	E6	.025	NYL025	clear	00	6-1/8”
4	D6	.025	NYL025	clear	0	7”
5	C6	.032	NYL032	red	0	7-7/8”
6	B5	.032	NYL032	clear	0	8-3/4”
7	A5	.032	NYL032	clear	0	9-3/4”
8	G5	.032	NYL032	clear	0	10-3/4”
9	F5	.032	NYL032	blue	0	11-7/8”
10	E5	.032	NYL032	clear	2	13
11	D5	.032	NYL032	clear	2	14-1/8
12	C5	.036	NYL036	red	4	15-1/2
13	B4	.036	NYL036	clear	4	16-3/4
14	A4	.036	NYL036	clear	4	18-1/8
15	G4	.036	NYL036	clear	4	19-1/2
16	F4	.036	NYL036	blue	4	21
17	E4	.040	NYL040	clear	5	22-3/8
18	D4	.040	NYL040	clear	5	23-3/4
19	Middle C4	.040	NYL040	red	5	25-1/4
20	B3	.040	NYL040	clear	5	26-3/4
21	A3	.040	NYL040	clear	5	28-1/4
22	G3	.050	NYL050	clear	7	29-3/4
23	F3	.050	NYL050	blue	7	31-1/8
24	E3	.050	NYL050	clear	7	32-1/2
25	D3	.045/.008	SMART25D	clear	7	33-3/4
26	C3	.045/.010	SMART26C	red	9	35-3/8
27	B2	.045/.013	SMART27B	clear	9	37
28	A2	.050/.015	SMART28A	clear	9	38-1/2
29	G2	.050/.018	SMART29G	clear	9	40

(Full set includes one spare clear string of each monofilament nylon size)
24 String beads are included for preventing strings from pulling through soundboard holes.

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