

## STRING MAKING

While not truly necessary these days, many archers find it useful to make their own bowstrings.

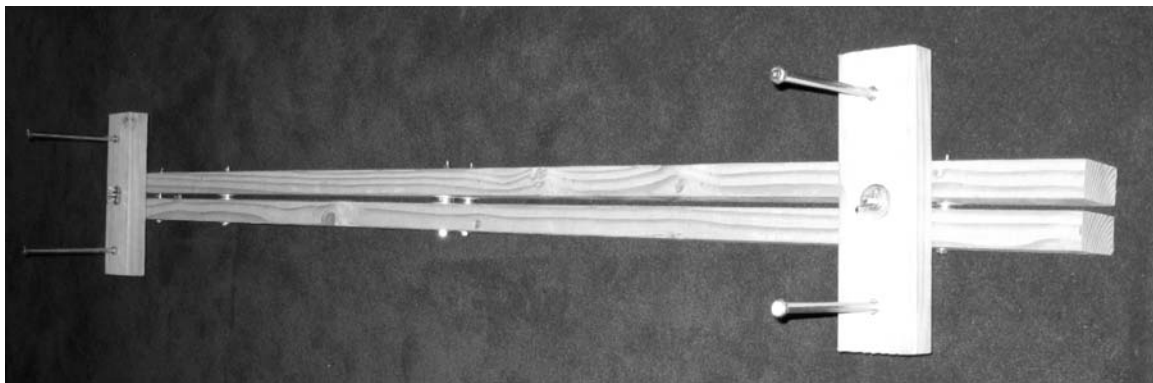
Reasons include:

- A feeling of satisfaction, being able to “do it themselves”
- Just another part of the hobby, making it feel more personal
- Fun (However after several thousand strings, the fun part can wear a little thin.)
- Quality control (more of a problem with commercial strings in years past, than today)
- No waiting time for a new string, except the time it actually takes to make one, usually about a half hour for both Endless Loop and Flemish Splice strings
- Less expensive than factory or custom-made strings, especially if the archer needs to experiment with string lengths, number of strands, loop sizes, serving lengths, materials, etc.

### The Endless Loop string

Fairly simple to make in theory and in practice, the only drawback to making an Endless Loop string is that a fairly large string jig is required. Several styles are available commercially, but a perfectly serviceable jig can be made for a few dollars with hand tools and basic skills.

The following is an example of a simple wooden Endless Loop string jig. If any of these terms or steps seem unfamiliar to you, perhaps purchasing a commercial jig may be a better option. Also note that there are many variations on the materials and methods that can be used to make an Endless Loop string jig. These plans are generic, but the jig can be as elaborate or as simple as your tastes and ability dictate. This one pictured in diag 11-13 was constructed using the following instructions. It's an updated version from the model in previous editions of this book. It's easier to build and considerably more rigid.



11-13 A wooden Endless Loop string jig made by the author using the following directions

### 1. Materials

For this simple wooden jig, you'll need:

2 6' lengths of 2" x 4" lumber

2 1' lengths of 2" x 4" lumber

4 8" 3/8" bolts

8 3/8" nuts

4 3/8" fender washers

2 6" 3/8" bolts

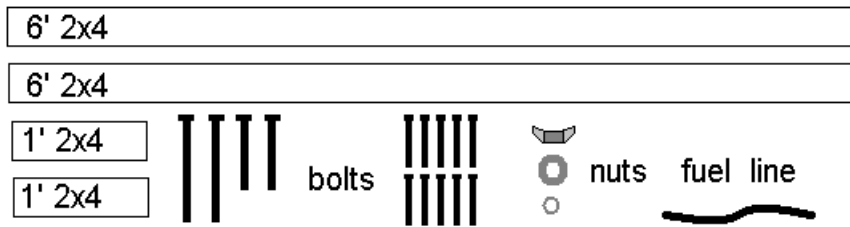
8 1/4" nuts

Box of 1/4" standard washers

8 4" 1/4" bolts

2 3/8" wing nuts

3/8" (inner diameter) rubber fuel line (optional)



11-14 Wooden Endless Loop string jig components

Tools required:

Drill with 3/8", 1/4" twist bits and a 5/8" Forstner (spade) bit.  
9/16" and 7/16" wrenches or ratchet and sockets.

There are different grades of 2" x 4"s. Try to get the best quality you can; yes it's usually a little more expensive. You are looking for straightness, few if any knots, clean edges and no cracks or splits.

2. Preparation:



Take the 6" lengths of 2" x 4" and drill 1/4" holes as shown. You can tape the two 6' lengths together and drill through both at the same time, if your drill bits are long enough. The exact spacing of the holes is not critical, but the two holes on the far left must be at least 1 1/2" away from the next single hole.

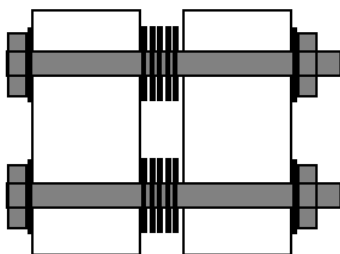


Drill 3 3/8" holes in both 1' lengths. Again, you can tape both 1' lengths together and drill through both at the same time.

Spacing is critical here. The center hole must be dead center on the 2" x 4" and all three holes must be on the 2" x 4"s centerline. The two outboard holes should be approximately 1' from each edge and equidistant from the center hole.

Finally, countersink the two outer holes on each piece with the Forstner bit to a depth of approximately 1". Do not countersink the center hole. Some people find that countersinking the end boltholes is easier to do before the 3/8" through holes are drilled. Either way works.

3. Assembly – base (end – view)



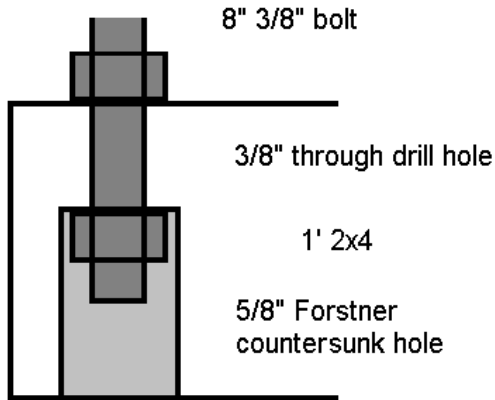
Place a washer on each of the 1/4" bolts and insert the bolts into each of the holes in the 6' length of 2" x 4".

Place 6 – 7 washers on each bolt as shown in the diagram. Then carefully align the other 6' 2" x 4" over the bolts and push through. (This isn't going to be as easy as it sounds, because no matter how hard you tried, all eight holes won't be perfectly aligned. It's normal for it to take a little convincing – that means you may need a hammer.)

Place another washer on the end of the 1/4" bolt and screw on a nut.

**IMPORTANT!!!** After tightening all 8 nuts, make sure there is enough room for the 3/8" bolts to slip through the slot between the two long boards, without too much slop. Yes, you may have to add or remove a washer to get the right fit.

#### 4. Assembly – goal posts (cut-away view)

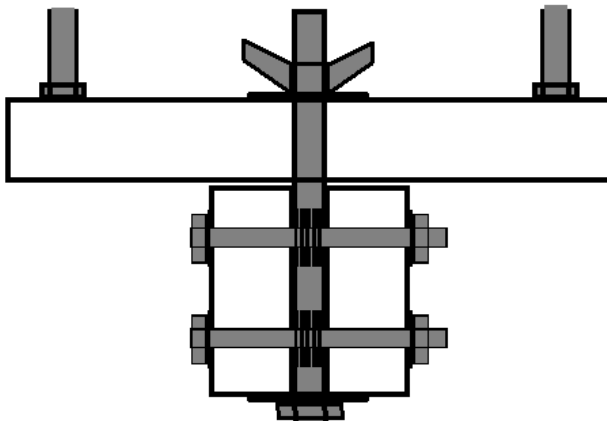


Place a nut on an 8" 3/8" bolt and twist it down until it reaches the shank of the bolt. (A washer here is optional.) Insert the bolt into the end hole on the 1' 2" x 4".

Drop another nut into the countersunk hole and tighten, locking the bolt in place. (Note that after a little use, a retightening may be necessary.)

Repeat for the other side and the other 1' 2" x 4".

#### 5. Final Assembly (end-view)



Slip a 3/8" fender washer on the 6" 3/8" bolts.

On the side of the base with the three holes, slip the 3/8" bolt between the two end 1/4" bolts and the single 1/4" stop bolt.

Slip the goal post assembly over the 3/8" bolt, followed by another fender washer and finally the 3/8" wing nut. (A fender washer between the base and goal post assembly is optional.)

The stop bolt prevents the goal post from sliding forward during string construction.

On the opposite side, just slip the bolt deep to the two end bolts. This goal post needs to slide up and down the channel to adjust string length.

Lastly, while not really necessary, some people prefer a "stop" to keep the string on the goal posts while the string is being made. To do this take the 3/8" inner diameter fuel line and cut four 1" pieces. These could have been slipped down the 8" 3/8" bolts to about 3/4" from the bolt head before assembly. You could also make a slit down each piece and place it on the bolts after assembly, then hold them in place with some electrical tape (that's what I did). A few wraps of electrical or masking tape may serve the same purpose.

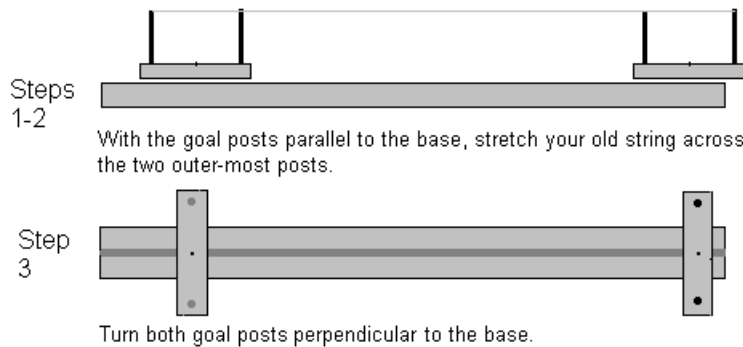
For those who believe that the inherent flex of any wood jig would adversely affect the end product (string), the same type jig can be constructed from 2"x4", 2"x1" or even 1"x1" rectangular metal tubing. The benefits may be more psychological than physical and the price will be at least three times greater. While not necessary, it is an option.

## Making your first 12-strand string

You'll need a spool of string material, a spool of serving material and a serving jig. You'll also need a pair of scissors or knife, either matches or glue (Fletch-tite), and string wax.

You can use an old string you're trying to replace as a template for a new string.

1. Loosen the nuts or wing nuts on the cross arms (goal posts) and turn them parallel to the main board.
2. Put each string loop on the bolts atop the outermost vertical dowels and move the cross arm in the channel out so the string is taut. Slightly tighten the wing nuts.
3. Remove the string, and turn the cross arms so they are both perpendicular to the main board. Tighten the wing nuts.

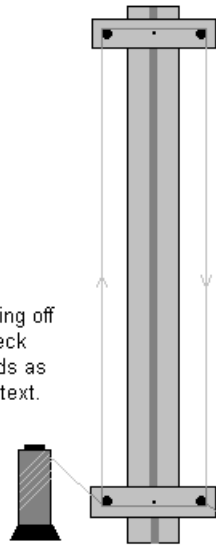


### 11-17 Endless Loop string building – Steps 1 to 3

4. Stand at one end of the jig and take a spool of string material and tie it to the bolt shank atop the right-hand dowel. Take the spool and bring it around the left-hand dowel screw, and then loop it clockwise around the two bolts on the other end.
5. Continue looping the material around each screw until you have six turns around the bolt that the thread was initially tied to. The thread should be fairly taut, but not so much as to bend the jig!
6. When the six loops are done, tie the other end of the thread to the left-hand bolt on the same cross arm on which you started.
7. Make sure there's fairly even tension on all the stands by "strumming" the long sections. If you see a loose strand, it can usually be fixed by pulling on each side a few times to even things out.
8. The serving jig should already be assembled with a spool of serving material. If not, assemble it as described in the instructions, which are usually quite intuitive. The tension on the serving jig should be fairly taut, but still allow the serving thread to unwind freely without binding.

**Steps 5 - 7**

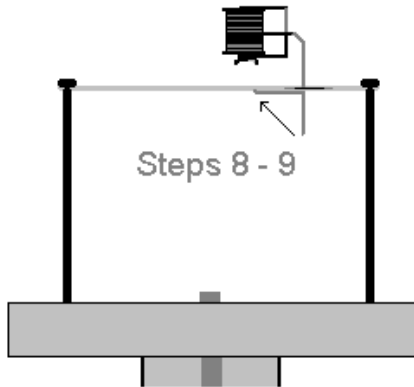
End by tying string off on this post. Check tension on strands as described in the text.



**Step 4**

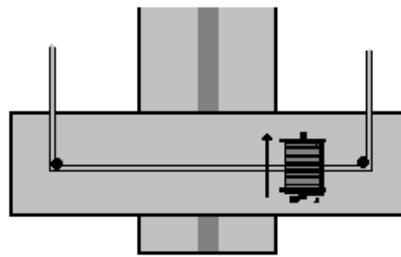
Start by tying string material to this post and loop the string around each post 6 times.

*11-18 Endless Loop string building – Steps 4 to 7*

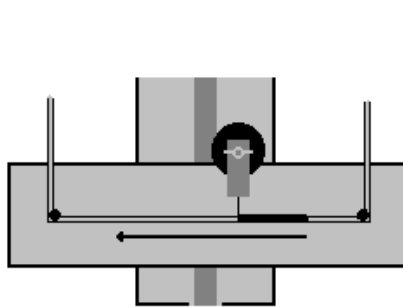


**Steps 8 - 9**

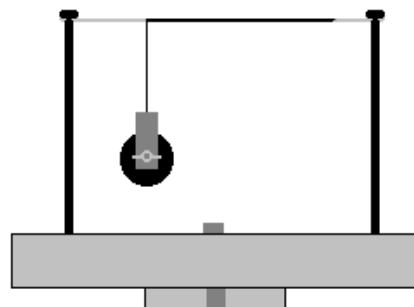
**Steps 8 - 9**  
Top View



**Slip the serving thread through the loops of the string and begin winding the serving jig over the top and AWAY from you.**



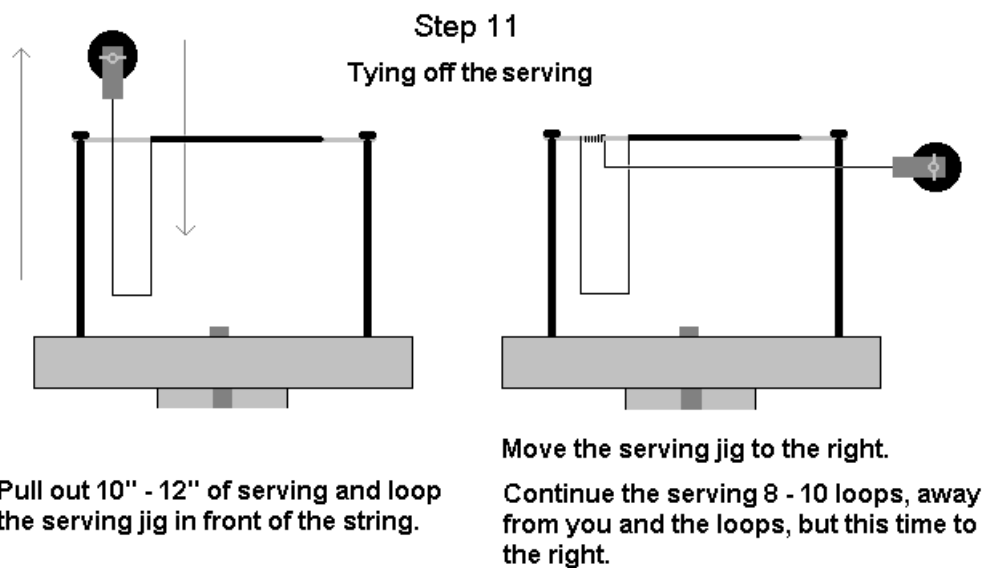
**Step 10**



**Continue the servina for 4" - 5".**

*11-19 Endless Loop string building – Steps 8 to 10*

9. Starting on the end of the string jig where you began and ended the loops, slide about 2" of serving material between the string strands about 2" away from the right dowel. Loop the serving jig away from you and start winding it around the strands. Adjust the tension on the serving jig to keep the serving feeding with some resistance. How much resistance will be learned only from experience. As this is your first string, it's time to start getting some of that experience.
10. Continue the serving for approximately 4" to 5".
11. Tying off the serving. After the approximate length of serving has been reached, pull out about 10" to 12" of serving thread making a very large loop. Begin serving in the same direction (away from you) but toward the previously served section. When you've gotten about ten loops, place the serving jig over the left dowel top and off to the side. Hold the large loop and begin turning it around the string so that it continues the main serving and unwinds the reverse loops. Do this so it overlaps the extended piece of serving thread. When the reverse section is completely unwound, pull the end of the serving (the part attached to the serving jig) taut with your right hand while pushing the far-left end toward the main serving area. Do not cut the serving, but leave the serving jig hanging by several inches. We will continue to the binding serving without interruption. Please refer to the diagrams (11-20 to 11-22); this is actually a lot easier to do than it is to describe.

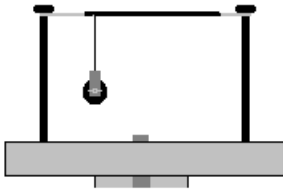


*11-20 and 21 Endless Loop string building: Tying off the serving*

12. Loosen the wing nuts and rotate the arms back to parallel with the main board. Slide the string around the posts so that the ends of the servings are staggered with the end attached to the serving jig about 1/2" shorter than the free end (diag 11-22).

### Step 11

Tying off the serving  
*continued*



Leave the serving jig hanging by several inches of thread.

Cut the string material attached to the bolt near the beginning and end of the serving.

### Step 12



Turn the goal posts parallel to the string jig base and adjust the string so the serving ends are staggered.

 Top view

 Side view

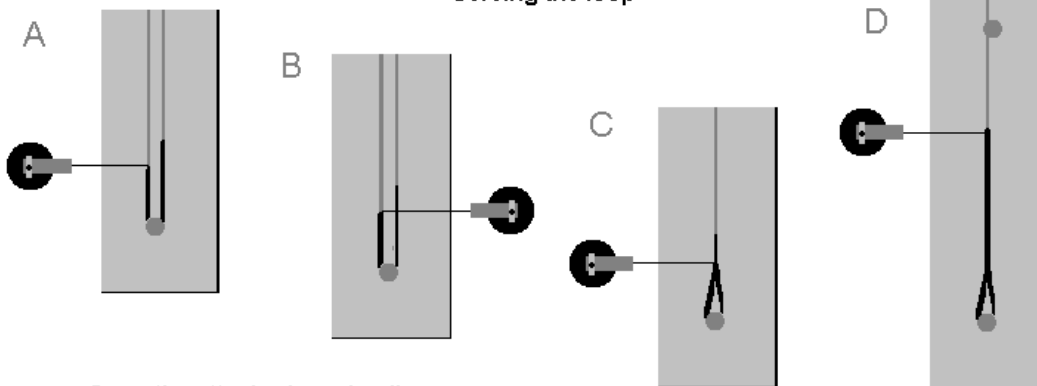
Close-up of the staggered serving ends, with the serving jig attached to the shorter end.

11-22 *Endless Loop string building – Steps 11 (continued) to 12*

- Repeat the serving process to bind the loop together by rotating the serving jig away from you and continuing 5" to 6" long for a recurve and approximately 3" for a longbow (diag 11-23). This will be the upper string loop and remember that the upper string loop is usually larger than the lower. A good rule of thumb is that the upper loop should be approximately 1-1/2" to 1-3/4" in diameter and the lower about 1" to 1-1/4" for recurves and about 75% of that for longbows. The exact size will depend on the limb width of the bow for which you're making the string. Tie off each end as before. This time, cut the serving material leaving a pigtail about 3/8" long.

### Steps 13 - 15

Serving the loop



Carry the attached serving jig over the longer half of the loop serving to bind them together. Continue serving away from you, as before.

Continue serving away from you for approximately 6" and tie off as before.

11-23 *Endless Loop string building – Steps 13 to 15*

- The exposed ends can be burnt or melted down with a match or lighter. A drop of glue can be used for added insurance. Neither the burn/melt down, nor the gluing, is actually necessary, but it can add to the appearance and confidence you have in the finished string. Repeat the process on the opposite side. Since we've already bound one end of the string, we won't be able to adjust the loop serving to stagger the ends as we did on the first loop. Therefore, we'll need to offset the loop serving. If your goalposts are 9" apart, begin the loop serving about 2" from the right goalpost and end it about 3" from the left one. When you turn the goalpost parallel to the base to make the binding serving, the ends will be staggered!



- Loosen the goal posts and remove the string (no, we didn't forget the center serving). String the bow and check to make sure the brace height is where you want it or slightly higher, as the string will stretch. To hasten the stretching, hold the bow with its back against your thighs, and push down on the mid/upper limb sections (diag 11-24). Letting the bow sit for a while, if possible, may also help.

11-24 Helping a newly made string "stretch".

If the string seems dry, a coat of wax can be applied to the string at this time, following the same procedure described earlier in this chapter. Some Endless Loop string makers like to wax their strings during construction, however most modern string materials are pre-waxed, so there really shouldn't be a need unless they seem unusually dry. Remember, do not wax any of the servings! (If waxed, the loop servings just look very messy and the center serving will get wax on your tab or glove.) We'll see in the next section that Flemish Splice strings actually do require waxing during construction.

- The center serving is applied with the string on the bow! Find the approximate point on the string where the nocking point is to be placed. Start the center serving about 1-1/2" to 2" above that and continue until you're slightly past the grip of the bow, or as long as you feel is necessary. Tie off as we did for the other servings. (The reason the standard length for center servings is just below the grip is so the serving protects the string material from arm guard strikes.) We didn't put the center serving on while the string was on the jig, because most Endless Loop string jigs cannot stretch the string as a bow can. Since the center serving is usually the longest serving on the bow, if the string were to stretch under the serving, the serving would start to separate (diag 11-25).

- Apply a nocking point.

## Final steps

Center serving and nocking point



String the bow and stretch the string as described in the text. The center serving is created in the same way as the loop servings. It should be 7 - 8" in length. A nocking point is placed as described in the basic setup section.

### 11-25 Endless Loop string building – Final steps

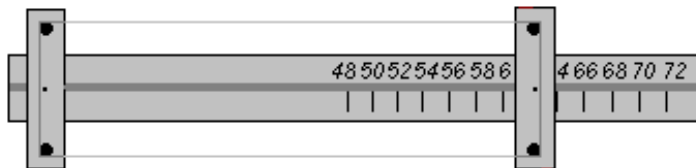
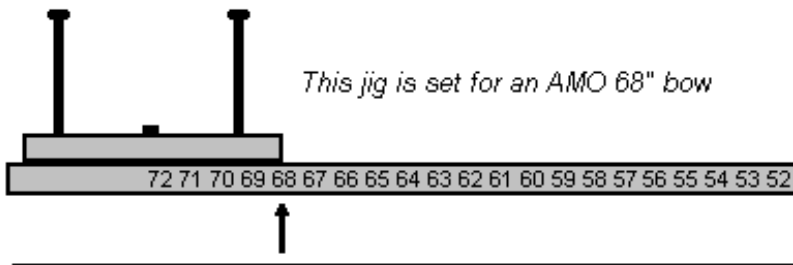
That's how an Endless Loop string is made. Once you're used to it, the entire process should take about half an hour, start to finish. I've tried to make the directions as clear as possible, but as



with most things in archery, actually being able to see the process will greatly shorten the learning curve.

If you don't have a string to use as a template, take the AMO length of the bow, subtract about 4" for a recurve and 3" for a longbow and set the outboard dowels in-line with the baseboard at that distance apart, as a starting point. There will always be some trial and error when making strings. All jigs have some flex to them and what you start with lengthwise may not always be what you end up with. Also, two 66" bows may not like the same length strings. Once you've established the proper string length for a given bow and its corresponding jig settings, it's a good idea to mark the jig so you can go back to the same point the next time you need to make a string for that bow. At the very least, a record should be kept of verified string lengths, on your jig, for each bow you own.

Alternatively, when some archers have a setting for a known length bow, again we'll use our AMO 66" example, they'll mark their jigs at that point and then attach a paper tape measure to the side of the jig (diag 11-26). Then make sure the 66" mark on the tape lines up with the 66" mark on the jig. That way the jig is theoretically calibrated for AMO bows, within reason, of course. Find a method that works for you and stick with it.



*This jig is set for an AMO 64" bow*

*11-26 Tape measure or graduated marks on the side (or top) of an Endless Loop String jig for quick and accurate string length measurement (not drawn to scale).*