

Model L Neck -- Upgrade Plans for Model J Owners

MATERIALS LIST, with Commentary. (Underlined terms are ones referred to later in the instructions.)

1. stair rail, for neck: 4-1/2' (52-1/2" min.) (see Pat 1.)

What I get is supplied by L.J. Smith Stair Parts. Visit their website at <http://www.ljsmith.net/lj-6042.html> . It's available in several different woods but all you need is the cheapest, which is hemlock fir.

If you have the opportunity to look the piece over, what you'd like to find is a section which is clear of splinters and bad blemishes. These stair rails are often made of shorter lengths finger-spliced together. Having a splice within the length of your neck is only an aesthetic drawback, and not all that big a one, but you don't want a splice right where you will be doing some finesse cutting.

2. 1x4" flat stock, for bottom and rear brackets: approx 1'

Pine is fine, but others can be used, e.g. a scrap of cherry or walnut from a hardwood supplier's scrap bin. I like poplar because it's nice to work with and matches the color of the fir neck.

3. 1/2 x 3/4" pine parting stop, for tripod legs and crossarm: 5'

4. 3/4 x 1/2 x 3/16" piece of polyethylene for nut

Could use almost anything here, so long as it's workable with a file, but poly or hard rubber helps dampen some of the high frequency over- tones the open E especially seems to generate. For these materials, you'll also need 2 small nails or brads for pinning nut to neck.

5. 3/4 size bass A string.

A "real" bass string is smoother to plunk than aircraft cable, gives a slightly better sound, and is bowable. (Aircraft cable can't be bowed.)

A low-end string like Red Label or Corelli will do fine (available from <http://www.swstrings.com>.) A "composition" (steel/fiber) string will sound a bit more mellow, but the price is ridiculous. Check with your instrument repair shop for take-offs.

The original motive for redesigning the Model J neck was to allow a better position for bowing the string. The resulting Model L neck has other merits, but if you're not interested in bowing you could stick with aircraft cable and save \$15 or so.

6. 1/4"-20 x 3" large eye bolt (for model J-style tuning bolt) plus wingnut and hex nut for same.

7. #10-24 1-1/2" x 5/8" j-bolt (3/16" dia. shaft) plus wingnut and washer (#10) for same.

This is the same as is used to hold tub to back ring in the Model J. Loop diameter (5/8") is not critical; smaller would actually be better.

8. hanger bolt for rear leg: #8-32 x 1-1/4" plus wingnut, washer (#8), and hex nut for same.

9. screws

- a) (5) #6 x 1-1/4" sheet metal screws
- b) (2) #6 x 2" Phillips flathead wood screws
- c) (4) #8 x 1" truss-head sheet metal screws.

(I have specified truss-head here because they look nice with their built-in washers, but ordinary #8 screws would do, with or without washers.)

10. cable stop for 1/8" wire (a single-barrel aluminum cylinder)
11. stranded picture wire, 20-lb test: approx 24"
12. coupler: #8-32 internally threaded cylinder 3/4" long
your hardware store may call this a threaded spacer
13. eye screw: 1-1/4" length, eye 3/8" or so diameter
14. small eye-bolt: #8-32 x 1-1/2"
15. grommet: (for 5/16" hole in 1/16" sheetmetal)
16. felt pad: 3/4" disk as used on knick-knack feet
17. plastic washer (3/4" dia. , cut from milk bottle.)

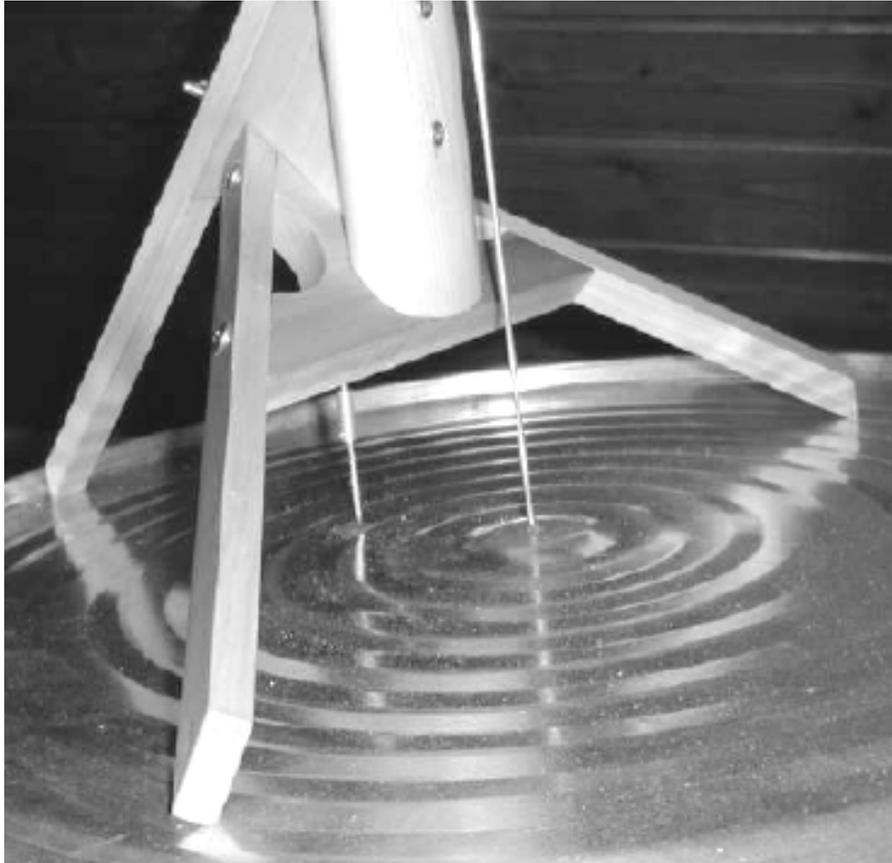
Note 1: The construction process described here pertains to a tripod for a #3 (Behrens 3gs or other 15-gallon) tub. The main difference for a #2 tripod is the length of the long side of the bottom bracket (see Pattern 2.) It should be 6-3/4 inches as opposed to the 7-1/2 inches for the #3 tripod (shown.) The #3 pattern can be modified for a #2 by measuring in 3/8" from each corner and drawing a diagonal line from the ends of the short side to these new points. (The resulting new angle is 49 degrees, where the #3 had 45.) The second difference is that the front legs will be shorter on a #2. You can start with an 11-3/4" initial length for the front legs, and probably trim them down to 11-5/8" as you adjust for action and angle. The rear leg will also be shorter when trimmed to produce the optimal angle for the neck-- where the string stands completely perpendicular to the head. (The optimal action is a more subjective matter; 1-1/2" is about average. One advantage of the cable neck pressure adjustment is that you can easily vary the action just by relocating the neck.)

Note 2: Pat (Pattern) numbers refer to the Patterns on Page 14. Pic numbers refer to the photos embedded in the text.

BUILDING THE NECK TRIPOD

Transfer the patterns for the bottom bracket and the rear bracket (Pats 2, 3) to your 1x material. Note that the corner angles of the rear bracket are not all 45's. Also note that line B is not parallel to line A, and line C is perpendicular to B but not to A. Cut out these two pieces and drill $7/64$ " guide holes at marks w-z.

Pic 1



Cut front legs 11" long, bevel top ends at 45 degrees as shown in Pat 4 but leave bottoms unbeveled. Drill $7/64$ " guide holes at $7/8$ " and $4-3/8$ " from top end.

Cut rear leg 1-5/8" in length with a 7/64" guide hole 3-3/8" from top end. The top end could simply be beveled, or ground away with a 3/4" sanding drum for the cove effect shown in Pat 5. You can leave the bottom end square for now and trim it when adjusting the neck.

Drill a 1/8" guide hole on the long (A) edge of the rear bracket, spaced evenly side-to-side at the centerline shown. Start the hex nut onto the hanger bolt, followed by the wingnut, and tighten the two together. Use this double-nut handle to turn the hanger bolt into the guidehole to the mid-point. Remove nut and wingnut. Align small end of bottom bracket into square notch in rear bracket, extend guide hole w into rear bracket. Enlarge guide hole w in bottom bracket to 9/64" and attach bottom bracket to rear bracket with a #6 1-1/4" screw.

Measuring very carefully, mark the center line of the top curved surface of the stair rail. Cut bottom end of rail to a 45 degree angle back from the curved surface (see Pic 1.) Mark the center line at points 2-1/2" and 4-1/4" up from the tip of the neck. Using a drill press or drill guide, drill 7/64" guide holes perpendicular to the rail (now called the neck.)

Position bracket assembly on the neck, with the rear bracket aligned up the back of the neck and the angled end of the neck centered on the bottom bracket. Holding the pieces snugly into position, extend guideholes x y and z into neck. Enlarge holes y and z in the bottom bracket to 9/64" and x to 1/8". Attach bracket assembly to bottom of neck with #6 1-1/4" screws through holes y and z. Screw eyescrew into hole x as far as it will go (see Pic 2.)

Pic 2



Check alignment of rear bracket against back of neck. Extend guideholes through neck into rear bracket, then enlarge them in the neck to $9/64$ ". Countersink these holes and attach neck to rear bracket with 2 #6 2" phillips flat-head wood screws.

Place the upper end of a front leg firmly into the corner between the bottom and rear brackets and extend its guideholes into the bottom bracket. Enlarge guideholes in leg to $5/32$ ". Repeat procedure for the other leg.

Place each leg into its position on the bottom bracket and note how the bottom end of the leg would have to be cut to make the tip point down as opposed to horizontally. Cut each accordingly, at 45 degrees (see Pic 1 and Pat 4.) Attach legs to bottom bracket using #8 1" truss-head screws.

Enlarge guidehole in rear leg to $5/32$ ", place it over the hanger bolt in the rear bracket and attach with washer and wingnut.

COMPLETING THE NECK

Stand the neck on its tripod atop the tub with the rear leg at the back flange and the two front legs in the second largest valley of the corrugations. Mark the centerline at 51-1/2" from the tub top for the position of the tuning bolt, at 50-3/4" for height of j-bolt string restrainer, and at 50" for the bottom edge of the nut.

Whatever you use for the nut, it needs to be about 3/4" wide, 3/8" tall, and 3/16" thick. If it's not flexible, file or sand it to fit the curve of the neck. File a groove across the top (3/8") face that slants from a depth of about 1/2 the string diameter at the lower edge to full string diameter at the upper. Fasten it to the neck so the lower edge is 50" above the tub head. If you can't glue it, pin it with small nails.

The purpose of the j-bolt is to pull the string down snug against the nut. Saw off the tip of the hook just at the 180-degree point. Drill a 3/16" hole perpendicular to the neck about 1/4" above the nut and offset so that the hook straddles the centerline. Put the shaft through the hole, install washer and wingnut and tighten it down to where the tip of the hook marks the neck on the opposite side of the centerline. Loosen the wingnut and hook, turn the hook away and drill a short hole for the tip to pull into when you tighten it later (see Pic 3.)

Consult your Model J plans for making and installing the tuning bolt. (The string hole must be enlarged to 7/64", or possibly 1/8".)

Pic 3



PREPARING THE STRING

Check to see that the string will push through the center hole of the tub, from inside. If you've been using aircraft cable on your Model J, you may need to enlarge the hole a bit. Use an awl to do this, rather than drilling, so the flared metal can be pushed back down when the string is in place.

Measure 50-1/2" back from the point where the top thread wrapping starts covering the metal winding, and mark this point on the string with a felt-tip pen.

Slide the cable stop onto the string to where its upper end is at the 50-1/2" mark. Lay the stop on some anvil-like surface and flatten heck out of it so it'll never slip. Bend the tail of the string at right angles to the stop and trim it off close to the stop.

Slide a 3/4" plastic disk (e.g. cut from a milk bottle) down to the stop, followed by a light felt disk. Rethread the string up from inside the tub.

To test the setup at this stage, loosen the j-bolt and run the string over the nut under the hook of the j-bolt and through the hole in the tuning bolt. Reattach the tub to the back ring. Set the neck in position on the tub and pull the string through the tuning-bolt hole to take out the slack. Give the bolt a half-turn and tighten its wingnut. Tighten the j-bolt to where it pulls the string down against the nut, but still would allow it to be tightened or loosed. Tune to E an octave below a guitar's low E. Plunk.

TENSION KIT

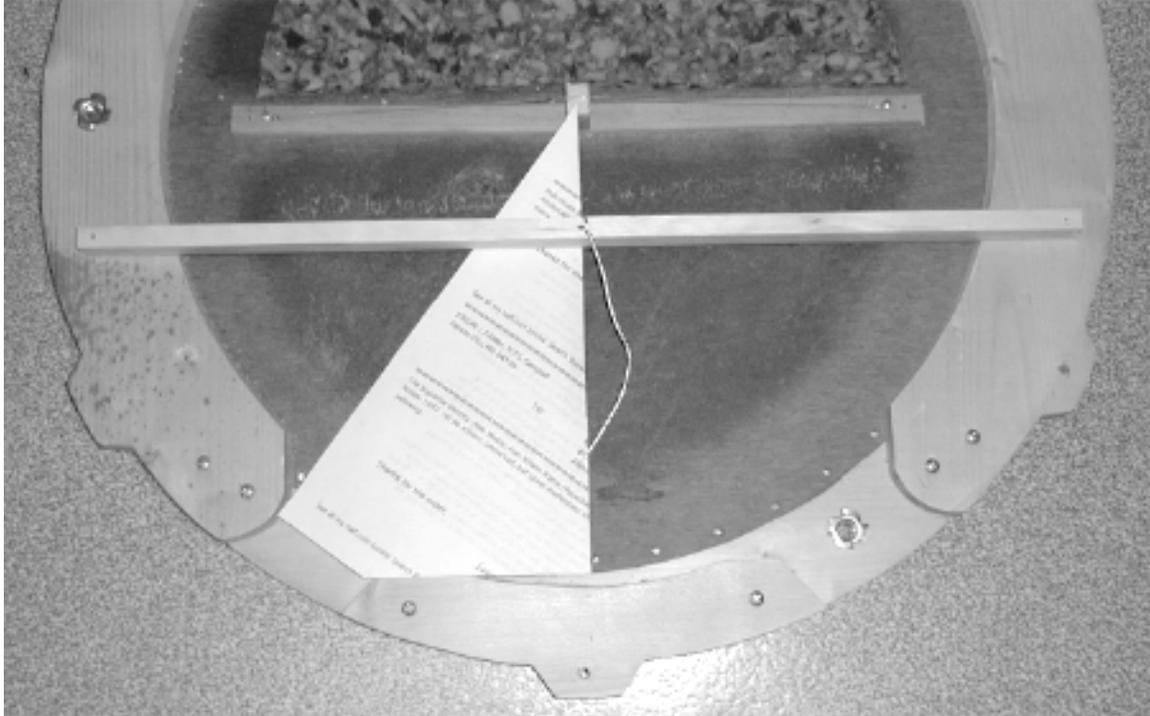
With a hacksaw, cut out about 1/4 of the circumference of the small eye bolt to covert it into a hook bolt. On the flange of the tub head, mark the spot that you normally align the center of the rear leg to (what your J manual calls the Very Back.) Lay a ruler on the radius from the center point of the head to this mark on the flange. 3" out from the center along this radius will put you right in the valley of the 2nd corrugation. Punch a hole here with an awl, and use a progression of bits (e.g. 1/8, 3/16, 1/4, 5/16-- this is to avoid distorting the metal or making a large burr) to enlarge it to 5/16". Clean up the edges of the hole using a rat-tail file and install the grommet.

Put a mark on the back ring directly in line with the mark on the flange. Remove the tub from the back ring and on the inside surface of the back panel, lay a ruler from the center toward the mark on the back ring. Mark a point on this radius 3" from the center (see Pic 4.)

Cut a 20 -1/2" length of 1/2 x 3/4" parting stop for the crossarm, and on the 1/2" dimension of the piece, mark the mid point and points 3/8" in from the ends. Drill 3/32" guideholes at these three points. Lay the crossarm so it spans the back ring with its center hole directly above the 3" mark you made on the radius of the back panel. Extend the end guideholes into the ring pieces, then enlarge

them in the arm to $9/64$ " and attach arm to ring with a $1-1/4$ " #6 screw at each end.

Pic 4



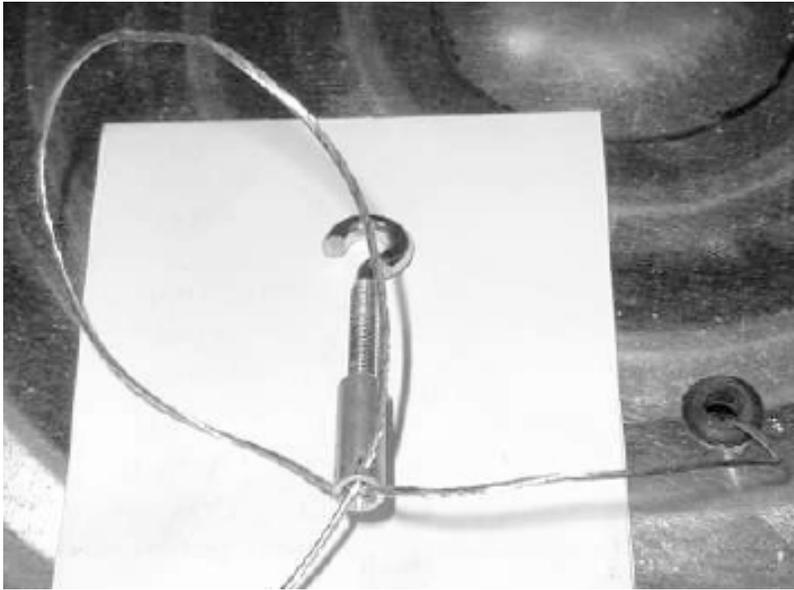
Feed one end of the tension wire through the center hole in the arm, bring it around and wrap it securely to itself. Lead the other end through the hole in the tub, then position tub back on the ring with the rear marks aligned.

On one end of the coupler, file a small flat spot roughly $1/8$ " from one end, make a dimple with a centerpunch (or awl, if it's aluminum) and drill a hole into it and out the other side.

From the inside of the coupler, thread the free end of the tension wire out through one hole, pull up six inches of slack, bring it around the back of the coupler and feed it in through opposite hole. Don't pull it tight just yet-- it's easier to adjust when it's loose (see Pic 5.)

Twist the eyebolt into the coupler three full rounds. Put the neck tripod atop the tub head in its standard position and turn the rear leg to let the tripod drop down to where the hook of the hook bolt engages the eye of the eye screw. Return rear leg to align with rear bracket. Take the slack out of the tension wire by pulling it through the first coupler hole and bend it down to mark the place.

Pic 5



Drop the rear leg again to release the hook, and set the neck off on the floor. Move the coupler another 1/4" down below the bend you made in the tension wire. Pull the end of the wire through the second hole to take up its slack, and wrap the wire a turn or two around itself to secure it.

Reinstall the neck and check the tension on the wire. If it's so tight as to cause difficulty aligning the rear leg, retreat and give back some wire. If it's so slack that aligning the rear leg produces no tension on the wire, retreat and move the coupler down some. Otherwise, tension can be increased by screwing the hook into the coupler.

If it seems satisfactory, wrap a few more turns of the free end around the tension wire-- but leave the excess untrimmed until after playing/adjusting for a while. If you ever need to remove the tub from the back ring again, unscrew the hook and push grommet and cylinder on into the tub. To reassemble, remove grommet, hold cylinder up to hole inside tub and screw hook into it to pull it through with. Slide grommet over cylinder and press its lower lip into hole with a small screwdriver.

Ideally, the neck will lean forward a bit so the string is perpendicular to the tub head. The bottom of the rear leg, which is cut over-long, can be progressively trimmed off, at a 45-degree angle, to adjust this.

Pic 6

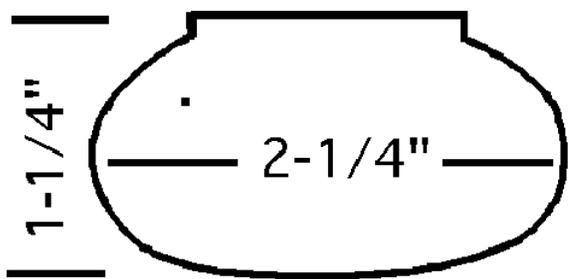


Besides being simpler in design, the Model L neck is better looking and, being sturdier, produces a solider sound than the J neck. With its official bass string, it's got a better tone and is easier to play. Plus, if you want to bow it, now you can.

You'll need an inexpensive bass bow, like the 1/2-size Glasser available from Southwest Strings (<http://www.swstrings.com>) for about \$70, plus a block of Pop's Rosin. Unlike plunked notes, bowed ones will take some practice. Start working with notes up around the octave level—the low notes take more skill to produce. Put plenty of rosin on your bow, and draw squarely across the string 5-7" above the tub head. It's never going to be all that loud, but the tone's not bad, and with practice you could amaze your friends with a rendition of Faded Love!

Plunk in Peace,

Lauren F. Miller



Pat 1

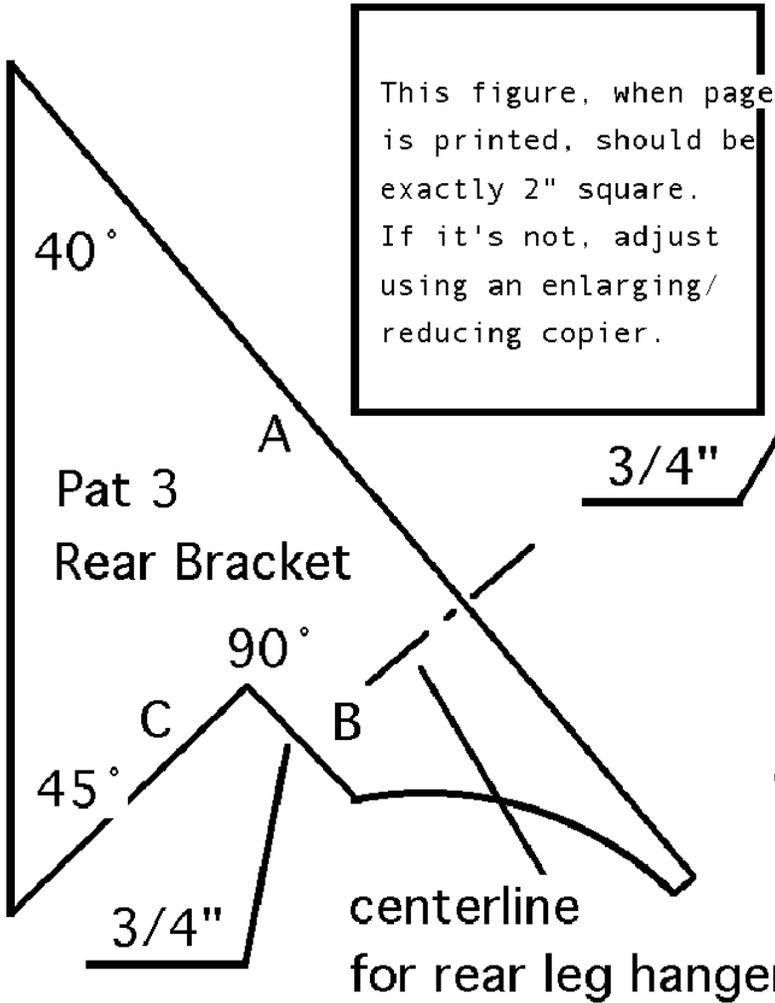
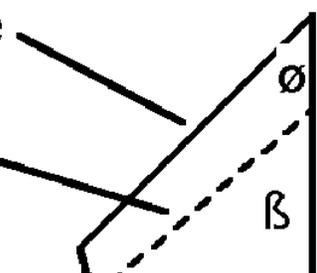
Stair Rail

Cross Section

For #3 tub, use outer line and angle ϕ (45°).

For #2 tub, use inner line and angle β (49°).

Follow cut-out arc for either.



Pat 3

Rear Bracket

Pat 2
Bottom Bracket

3/4"

1-1/4" radius

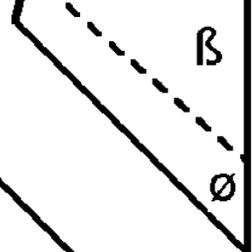
W X

○ y

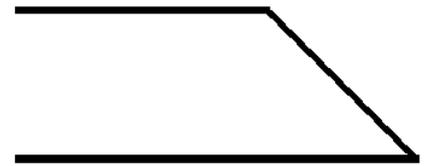
○ z

3/4"

centerline
for rear leg hanger bolt



Pat 4
front leg details



top ends

final bottom ends



Pat 5
rear leg details

