The new LMI headstock drilling and slotting jig takes a large evolutionary leap to a new design that supports interchangeable acrylic slot templates which are an exact match to our classical and steel string plans yet can be precisely re-positioned for custom slotting. The new jig also expands the range of tuner hole sizes covering both classical and steel string tuners and incorporates a precise hole centering adjustment method. The addition of four adjustable toggle clamps insures secure mounting of the headstock for both drilling and slotting operations.

What’s included with this tool:
- .005 Blue shim x 2
- .010 Brown shim x 2
- .020 Yellow shim x 2
- .030 Orange shim x 1
- Tuner Hole Alignment Plate x 1
- 3/16 x 1/2 Clevis pins x 2
- 10-32 3-arm knob x 2
- 10-32 Hex head screw x 2
- 8-32 Flat head screw x 4
- Drill Block of your choice x 1
- Acrylic template of your choice x 1

**THE PROCESS**
- Place the headstock face down into the jig
- Align and clamp
- Drill press drill first set of tuner holes
- Cut first slot with plunge router
- Rotate headstock Clockwise 180 degrees
- Align and clamp
- Drill press drill second set of tuner holes
- Cut second slot with plunge router
- Done!

**PREPARATION**
The headstock must be at final thickness and the sides of the headstock at final dimensions. This is important as each side is used as a reference for both drilling and slotting operations. Refer to the reference drawing above for headstock part terminology.

Mark the headstock with the tuner center hole line on each side, left and right, of the headstock.

It is helpful to mark the headstock slot area for each side on the face of the headstock as is suggested to drill a router bit clearance hole (3/8 in or equivalent brad point bit) for each slot centered between the tuner hole lines.

Set the toggle clamps tension for the headstock. The tension should be snug enough for the toggle clamp to lock but not overly tight.
HEADSTOCK DRILLING SETUP

NOTE: Always test the drill on scrap material (unused headstock area or cut offs) to verify the hole center height before committing to a finished neck.

Select the drill block hole size required for the tuner shaft diameter.

Measure headstock thickness with a caliper and then divide the value by 2 to get the hole center height (see Appendix for details and a sample calculation).

Compare the calculated center height to the fixed hole drill block offsets, 0.34 inches or 0.37 inches (these are marked on the side of the drill blocks) and choose the closest offset but under the desired center point as the starting point.

Subtract that block offset from the calculated hole center height to get the shim stack height.

Select the shims – reference the provided thickness vs. color chart – suggest starting slightly lower for first test.

Blue Shim = 0.005 inches/0.13mm
Brown Shim = 0.01 inches/0.26mm
Yellow Shim = 0.02 inches/0.51mm
Orange Shim = 0.03 inches/0.76mm

With the jig turned over, slide the selected shims onto the protruding drill block hold down bolts and flush with the pocket back lip.

Install the drill block align plate using the provided align pins to center.
Verify the drill block orientation to match the selected offset. Slide the drill block onto the hold down bolts, engage into the align plate and then tighten down snug with the provided knobs.

Test drill a hole using scrap material with the same thickness, or an unused portion of the headstock. Measure the hole center height. To adjust the height, loosen the drill block knobs and while lifting the block, add or remove shims. Hint: a piece of tape sticky side down helps with shim removal.
HEADSTOCK SLOTTING SETUP
Select a slotting template. Note: some headstock slots are not symmetrical, left to right, and the LMI slotting templates accurately reproduce this detail. In this case, the slotting templates will be marked with a left and a right hand side. If the slotting template slots are marked, Left, Right, the template will need to be installed with the left side over the jig opening and then rotated 180 degrees to correctly slot the right side.

Place the two 10-32 x 1-1/2 hex head bolts downward into the upright jig drill block clamp slot. Place the slotting template face up on the jig with the selected slot opening over the jig opening.

Align the 4 countersunk template holes with the jig screw slots and attach using the provided 8-32 x ½” flat head screws. If following a plan, place the two align pins in the fixed left and right reference holes and tighten the flat head screws. The screws should be tight enough to hold the template securely but not so tight as to crack the acrylic. Remove the alignment pins to use. If desired, you can replace these with the included nylon dowels. Just make sure they are inserted flush with the template so that router movement is not hindered. Optionally, by placing the alignment pins in the top and bottom holes, the template can be re-positioned to change the slot outside wall thickness to a custom dimension.

SLOTTING ROUTER SETUP
Using a plunge router, install a 3/8 inch diameter guide bushing and a 1/4 inch diameter router bit. Check to see that with a full router plunge, the bit will extend beyond the headstock. For best results we recommend a compression bit for clean top and bottom slot edges.

NOTE: For a cleaner slot, we suggest wrapping tape around the guide bushing diameter to cut a slightly undersize slot. Once the slot is cut, remove the tape and then do a full depth finish pass cleaning up any bit marks.

My Notes:
HEADSTOCK MOUNTING - LEFT SIDE
With the jig bottom facing up and the drill block to the front, slide the face down headstock from the left through the jig leg. Place the left side flush against the drill block and using the center hole marking, position the headstock aligning it to the drill block center mark.

Clamp the headstock in place using the two front fixed toggle clamps. Slide the adjustable clamp bar flush against the opposite side and tighten the bar locking screws. Toggle these clamps to affix.

HEADSTOCK DRILLING - LEFT SIDE
Install the selected drill bit into the drill press and verify the table is 90 degrees to the bit. Stand the jig on its side with the drill block facing up.

Set the drill press table height to clear the jig and set the drill depth stop to hole depth.

Align the drill bit to each hole centerline and drill each tuner hole – peck the drill (to clear chips) to final depth. **DO NOT** remove the headstock once done.

Check out the LMI Headstock Drilling and Slotting Jig instructional video on our website:
LMII.com/ lmi-headstock-drilling-and-slotting-jig
HEADSTOCK MOUNTING - RIGHT SIDE
Turn the jig over, drill block to the front, loosen the adjustable clamp bar, release the clamps and remove the neck/headstock.

While keeping the headstock face down, rotate the neck 180 degrees clockwise and slide the headstock from the right through the jig leg. Place the Right side flush against the drill block and using the center hole marking, position the headstock aligning it to the drill block center mark.

Clamp the headstock in place using the two fixed toggle clamps. Slide the adjustable clamp bar flush against the opposite side and tighten the bar locking screws. Toggle these clamps to affix.

HEADSTOCK SLOTTING - LEFT SIDE
Place the jig/neck combo, slotting template up, across a bench corner (for neck clearance) and clamp from below. Set the plunge router depth stops for approximately 1/2 depth passes. If using a compression bit, make sure the “up” end flutes are deeper than the headstock face. Plunge the bit, 1/2 depth into the clearance hole and slowly follow the template in a clockwise motion. Return to the clearance hole and plunge full depth and again follow the template in a clockwise motion.
HEADSTOCK SLOTTING - RIGHT SIDE
Verify the slotting template is correctly positioned for your headstock.

Place the jig/neck combo, slotting template up, across a bench corner and clamp from below.

Using the same router setup, plunge the bit, 1/2 depth into the clearance hole and slowly follow the template in a **clockwise** motion. Return to the clearance hole and plunge full depth and again follow the template in a **clockwise** motion.

HEADSTOCK DRILLING - RIGHT SIDE
Verify the drill press depth/stop is correct.

Align to each hole centerline and drill each tuner hole – peck the drill (to clear chips) to final depth.

DO NOT remove the headstock once done.

APPENDIX

<table>
<thead>
<tr>
<th>Description</th>
<th>Tuner Shaft</th>
<th>Bushing OD</th>
<th>Drill Block</th>
<th>Drill Bit Size</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuners with 6mm shaft used with either 1 or two bushings per shaft.</td>
<td>6mm</td>
<td>0.31”</td>
<td>SHSDSJ-DB2</td>
<td>N (.302”)</td>
<td>We recommend a hole size slightly smaller than the bushing. Serrated bushings require a slightly smaller hole for a snug fit.</td>
</tr>
<tr>
<td>Tuners with 6mm shaft, no bushings used.</td>
<td>6mm</td>
<td>N/A</td>
<td>SHSDSJ-DB1</td>
<td>D (.246”) and SHSDSJ-DB2 N (.302”)</td>
<td>Even though the shaft is 6mm, there are washers adjacent to the plates that require a larger diameter hole. We suggest you drill a .246” hole and counterbore with a .302” bit.</td>
</tr>
<tr>
<td>Tuners with 1/4” shaft, no bushings used.</td>
<td>1/4”</td>
<td>N/A</td>
<td>SHSDSJ-DB4</td>
<td>1/4” (.250”)</td>
<td>Most manufacturers of tuners with 1/4” shafts recommend a 1/4” drill bit, but if the shafts actually measure 1/4”, this might be a bit tight and require a bit of reaming out.</td>
</tr>
<tr>
<td>Tuners with 10mm rollers.</td>
<td>10mm</td>
<td>N/A</td>
<td>SHSDSJ-DB3</td>
<td>13/32” (.406”)</td>
<td>Tuners with 10mm (.393”) rollers require a slightly larger hole. We recommend a 13/32” (.406”) bit.</td>
</tr>
</tbody>
</table>
EXAMPLE DRILL BLOCK CENTER HEIGHT ESTIMATE

Measured headstock thickness is 0.774 inches
Divide the thickness by 2 to find the hole center height 0.774/2 = 0.387
Select the larger block offset of (0.370 inches) and subtract this from the center height 0.387-0.370 = 0.017 inches
Shims needed to raise drill block to target height = 0.01 Brown and 0.005 Blue
Suggest testing with the 0.01 Brown shim only and adjusting as needed.

Reference:
Drill block offset A = 0.34 inches/8.64mm
Drill block offset B = 0.37 inches/9.40mm
Blue Shim = 0.005 inches/0.13mm
Brown Shim = 0.01 inches/0.26mm
Yellow Shim = 0.02 inches/0.51mm
Orange Shim = 0.03 inches/0.76mm

Drill block/Drill bit requirements for steel string slot-head tuners
Most LMI steel string slot-head tuners have oversized washers on the tuner shafts. These must be taken into consideration when drilling tuner holes - holes must be oversized to accommodate the washers. If you are using bushings, the holes must be appropriately sized for the bushings. Below are 4 different possible configurations when drilling tuner holes. These drill bit sizes are recommended by the tuner manufacturers.