

Instructions For Cutting Inlaid Dovetail Joint on the Legacy Maverick CNC

- User assumes all risk in utilizing these instructions.
- Pictures in this document are from a Legacy Maverick CNC. Control software is Mach3, customized for Legacy Machines.
- Read, observe, follow all safety measures for the CNC. Keep fingers back when CNC is in motion.



1. Items used:
 - 1.1. See "Instructions for Programming Inlaid Dovetail Joint..." for programming details to generate required G Code.
 - 1.2. Magnate 2005 – 1/4" Spiral up-cut carbide bit – 4 passes, last pass .0625. (bit measured .245". half the diameter is .1225").
 - 1.3. Magnate 469 – 14 deg 3/4" dovetail bit, full depth pass.
 - 1.4. 3 boards
 - 1.4.1. 1 inlay (white) - .75" thick X 4-1/32" wide X desired length.
 - 1.4.2. 1 lone dovetail (dark) - .75" thick X 4-1/32" wide X desired length.
 - 1.4.3. 1 inlay core (dark) - .75" thick X 4" wide X desired length.

- 1.5. Laser Center
- 1.6. Digital Caliper
- 1.7. 2 Toe Clamps
- 1.8. 1 Bar Clamp

2. Bar Clamp "inlay (white)" board, from step 1.4.1 to vertical fence bar (fig 1).

- 2.1. Toe Clamp board to vertical work surface.
- 2.2. Using digital caliper, measure width of board. Reset and lock caliper to half the distance measured (fig 1 & 2).



Fig 1



Fig 2

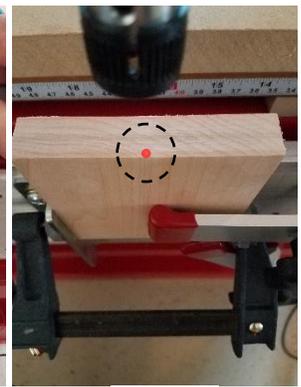


Fig 3

- 2.3. Mark center of board with adjusted caliper. Check both sides to center of board (fig 2).
- 2.4. Using laser center, Mach3, zero "Y" axis on center of board (fig 3).
- 2.5. Mount 1/4" Spiral Bit. Mach3, manually position bit to face of board (fig 4). (paper, "just" trapped between board and bit, is around .003").

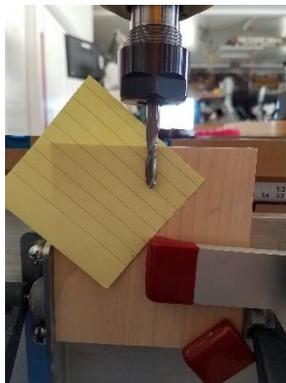


Fig 4

- 2.6. Mach3 "X" axis window; enter half the bit width from step 1.2, plus paper (.1225" + .003" = **-.1255"** **NEGATIVE**)

- 2.7. Raise "Z" axis 3" above board.
- 2.8. Move "X" axis back so Mach3 "X" value window reads +.3750.
- 2.9. Move "Y" axis so value window reads .0000. Bit should be centered over board edge.
- 2.10. Position Smart Tool Pad under bit, laying pad on top of board edge (fig 5).

- 2.10.1. Ensure "Smart Tool" light is green.
- 2.10.2. Complete "Smart Tool Setup" sequence for multiple tools (spiral and dovetail bits).



Fig 5

- 2.10.3. Load/Execute: "2 Cut Inlay.txt"

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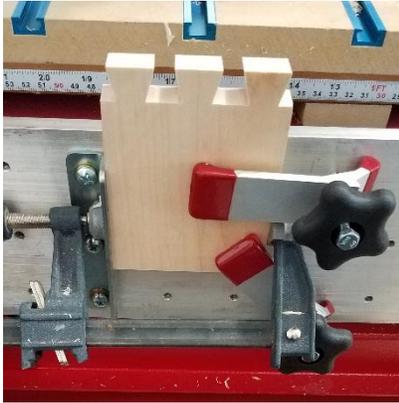


Fig 6

- 2.10.4. CNC machines part (fig 6).
- 2.10.5. Remove "inlay (white)" part. **If running multiple copies, ensure you run "Smart Tool Setup" for each part.
- 2.10.6. Mach3 – close code.

3. Bar Clamp "lone dovetail (dark)" board, from step 1.4.2 to vertical fence bar (fig 7).
 - 3.1. Toe Clamp board to vertical work surface.
 - 3.2. Mach 3 should still be zeroed for "X" and "Y" from above.
 - 3.3. Install 1/4" Spiral bit in spindle.
 - 3.4. Position "Z" axis 3" above board.
 - 3.5. Move "X" axis so Mach3 "X" value window



Fig 7

- reads +.3750.
- 3.6. Move "Y" axis so value window reads .0000. Bit should be centered over board edge.
- 3.7. Position Smart Tool Pad under bit, laying pad on top of board edge.
 - 3.7.1. Ensure "Smart Tool" light is green.
 - 3.7.2. Complete "Smart Tool Setup" sequence for multiple tools (spiral and dovetail bits).
 - 3.7.3. Load/Execute: "3 Lone Dovetails.txt"
 - 3.7.4. CNC machines part (fig 7).
 - 3.7.5. Remove "lone dovetail (dark)" part. **If running multiple copies, ensure you run "Smart Tool Setup" for each part.
 - 3.7.6. Mach3 – close code.

4. Bar Clamp "inlay core (dark)" board, from step 1.4.3 to vertical fence bar (fig 8).

- 4.1. Toe Clamp board to vertical work surface.
- 4.2. Using digital caliper, measure width of board. Reset and lock caliper for half the distance measured.
- 4.3. Mark center of board.
- 4.4. Mach3, using laser center, zero "Y" axis on center of board.
- 4.5. "X" axis should still be zeroed from above (if boards are same thickness).
- 4.6. Mount 1/4" Spiral bit in spindle.
- 4.7. Position "Z" axis 3" above board.
- 4.8. Move "X" axis back so Mach3 "X" value window reads +.3750.
- 4.9. Move "Y" axis so value window reads .0000. Bit should be centered over board edge.
- 4.10. Position Smart Tool Pad under bit, laying pad on top of board edge.
 - 4.10.1. Ensure "Smart Tool" light is green.
 - 4.10.2. Complete "Smart Tool Setup" sequence for single bit (spiral bit).
 - 4.10.3. Load/Execute: "4 Inlay Core.txt"
 - 4.10.4. CNC machines part (fig 8).
- 4.11. Carefully check fit (don't press down too hard as it might change the "Z" reference). Enlarge pocket offset if necessary to get a good fit through Aspire.
- 4.12. Remove "inlay core (dark)" part. **If running multiple copies, ensure you run "Smart Tool Setup" for each part.
- 4.13. Mach3 – close code.



Fig 8

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Fig 9

5. Glue “inlay (white)” from section 2 to “inlay core (dark)” from section 4 (fig 9).

5.1. When dry, cut off white board close to brown board. Sand/cut/flush-route all sides smooth (fig 10).



Fig 10

6. Bar Clamp inlaid built up board, from section 5 to vertical fence bar. **Ensure board is positioned white side to front** (fig 11).

6.1. Toe Clamp board to vertical work surface.

6.2. Using digital caliper, measure width of board at widest white dovetails.

Reset and lock caliper for half the distance measured (fig 11).

6.3. Mark center of white portion with adjusted caliper. Check measurement from both sides to center of middle white dovetail (fig 12).

6.4. Mach3, using laser center, zero “Y” axis on center of middle dovetail.

6.5. Mount 1/4” Spiral bit. In Mach3, manually position bit to face of board (paper, “just” trapped between board and bit, is around .003”).

6.6. Mach3 “X” axis window, enter half the bit width from step 1.2, plus paper. (.1225” + .003” = **-.1255”** **NEGATIVE**).

6.7. Raise “Z” axis 3” above board.

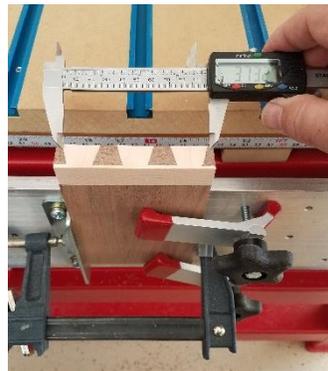


Fig 11



Fig 12

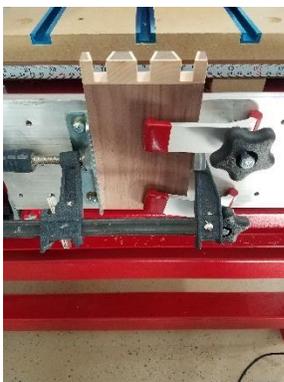


Fig 13

6.8. Move “X” axis back so Mach3 “X” value window reads +.3750.

6.9. Move “Y” axis so value window reads .0000. Bit should be centered over board edge.

6.10. Position Smart Tool Pad under bit, laying pad on top of board edge.

6.10.1. Ensure “Smart Tool” light is green.

6.10.2. Complete “Smart Tool Setup” sequence for single bit (spiral bit).

6.10.3. Load/Execute: “6 Cut Inlay Triangles.txt”

6.10.4. CNC machines part (fig 13).

6.11. Carefully check fit (don’t press down too hard as it might change the “Z” reference). Enlarge pocket offset if necessary to get a good fit through Aspire.

6.12. Remove inlaid part. ****If running multiple copies, ensure you run “Smart Tool Setup” for each part.**

6.13. Mach3 – close code.

7. Glue inlaid part from section 6 to “lone dovetail (dark)” part from section 3.

7.1. When dry, sand/cut/flush-route all sides flush.

7.2. Repeat process for additional edges on project.