

Introduction:

This tutorial provides basic instructions for the use of the Techno Mill CNC cutter. Typical use of the Techno involves milling plastic blocks into components for larger assemblies. The general Techno procedure can be separated into two sections: file generation and component manufacture

All posted safety guidelines must be followed at all times. The current safety code is posted around N3D and available at <http://engineering.nd.edu/groups/n3d/safety>.

File Generation:

See attached tutorial

Component manufacture:

1. Ensure that the computer and Techno router are turned on. Select the red switch on the router controller box; it will light up when turned on.
2. Double click the Techno CNC Interface logo on the desktop
3. In the interface window, click "Signals Access On"
4. Test the router by clicking the Z+ button
5. Select the "File" button and navigate to the folder that contains your files. Check the "Remember this Folder" box, and then select the first cutting sequence
6. Select the preview button and then click "top" and "zoom fit". Use this to check the origin of your coordinate system.
7. Clamp down the stock material using a backer material, ensuring that neither will move during cutting.
8. Mark zero of coordinate system on material. Check there is enough material in all directions to properly cut desired shape (clamps/fixtures/etc.)
9. Insert tool into router, holding one nut while tightening the other
10. Check that the tool is well above the height of the material and clamps. If not, use the Z+ to raise the tool. Next, using the X+/- and Y+/- buttons, navigate the tool to above the center marked in Step 8.
11. Click "Zero" to zero coordinate system
12. Place the touchoff pad underneath the tool, and then select "Tool" → "Touchoff"
13. Click the "Preprocess" button
14. Press the green button on the control panel to start the cutting sequence
15. After the cutting sequence has finished and the tool has stopped, click the "Resume" button
16. Load and preview the next cutting sequence by repeating Step 5 and Step 6
17. Preprocess the next cutting sequence
18. Click the "Start" button or press the green button on the control panel
19. Repeat Steps 15-18 as necessary
20. Click the Z+ and Y+ buttons to move the tool away from the workpiece
21. Remove part, excess material, and backing material
22. Turn off Techno router
23. Remove the tool from the router

24. Clean up all scraps and excess material using shop vac
25. Close out of the computer program, shut down computer,

Notes:

1. Check that the cutting sequence order makes sense (e.g. perform volume milling first, external profiling sequence last)
2. Check for “Z axis error” as shown on sheets located near machine
3. If necessary, the red button can be used to immediately stop tool

Quiz Questions:

1. What file format is used for Techno parts?
 - a) .NC
 - b) .DWG
 - c) .DXF
 - d) .PDF

2. It is acceptable to clamp cutting material directly to the table. No backing material is necessary.
 - a) True
 - b) False

3. Which of the following must be done prior to the start of cutting?
 - a) Clamp down working material
 - b) Mark coordinate system and check that adequate material exists to cut in all directions
 - c) Zero the coordinate system and touchoff the tool
 - d) All of the above must be done prior to cutting

4. After the first cutting sequence is finished, how is the next sequence prepared?
 - a) Load in next file
 - b) Preview cutting sequence and check that adequate material exists to cut in all directions
 - c) Preprocess next file
 - d) All of the above must be done to prepare the next sequence

5. External profile sequences should be performed _____ internal volume milling:
 - a) Before
 - b) After

6. Which safety rules do not apply when using the Techno mill?
 - a) Safety glasses must be worn at all times.
 - b) At least one other person must be present at all times.
 - c) The equipment and space must be respected by promptly cleaning up after use.
 - d) None of the above: all posted safety guidelines for the machine shop must be followed at all times.