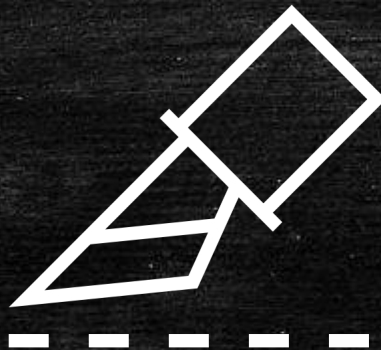


Welcome to L3 CNC Shop

Safety and Shop use Training

What is CNC machining?

- CNC machining is a manufacturing process in which pre-programmed computer software dictates the movement of factory tools and machinery.
- In other words, an automated process by which software informs the machinery on how to operate.



Who Can Use the Shop and Why Use it?

- Students, Faculty, and Staff of The New School (once training has been completed)
- Precise, Robust, Consistent, Repeatable
- Wide range of materials
- Time saver

Shop Use Requirements

- Once training has been completed here are some rules that must always be followed:
 - Always wear eye protection
 - Always use ear protection
 - Always wear close toed shoes
 - Always wear pants
 - Always tie hair back
 - Don't wear loose clothing or jewelry
 - Don't operate machinery while tired or under the influence



What Materials are allowed?

- Hardwoods
- Softwoods
- Plywoods (Shopbot Only)
- Foams
- Plastics
- Waxes (Roland Only)

Machines in the Shop

Vertical Horizontal and Rotary Functionality

Shopbot

PRS ALPHA



- Max Cutting Dimensions
 - 48" width x 96" length x 4" height
 - Max cut depth 4"=FOAM ONLY
 - Max cut depth 2.5"=WOOD

DESKTOP



- Max Cutting Dimensions
 - 18" width x 24" length x 2" height
 - Max cut depth 2"=FOAM ONLY
 - Max cut depth 1.5"=WOOD

Roland

MDX-540



- Max Cutting Dimensions
 - 12" length (max cut length 8") x 5" width
 - Max cut depth 4"= cylinder stock
 - Max cut depth 2.5"= square stock

MDX-40A



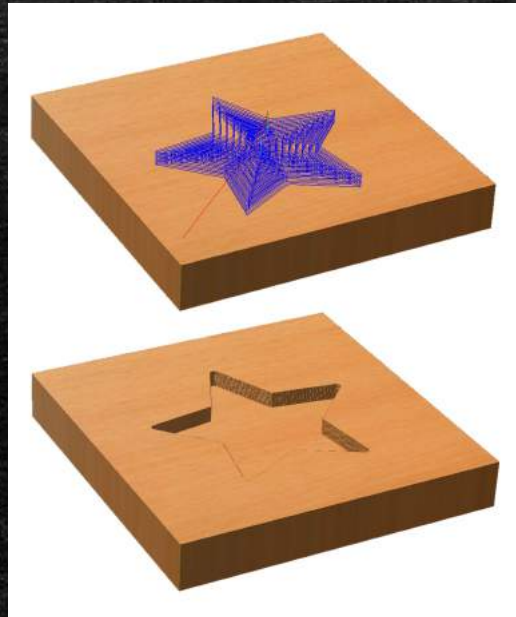
- Max Cutting Dimensions
 - 11" length (max cut length 5.5") x 3.5" width
 - Max cut depth 2"= cylinder stock
 - Max cut depth 1.5"= square stock

Basic CNC Knowledge

Toolpaths and Scale

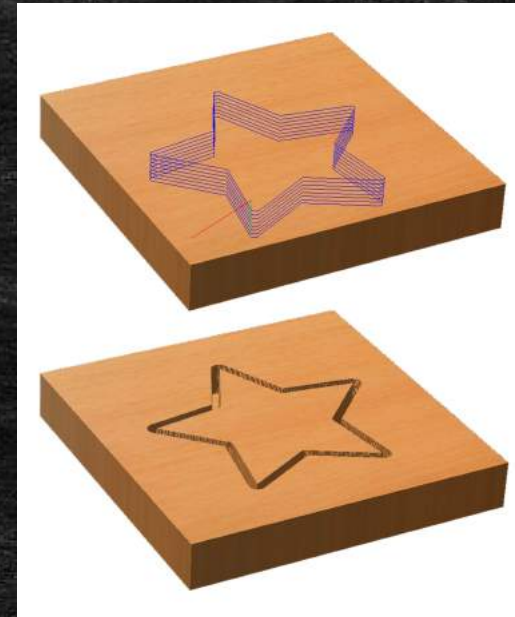
2D Toolpaths

Pocketing



- Removes all material at a FIXED depth **within a specified boundary**.
- If you have knowledge of laser cutting, think of this as a raster fill.

Profiling



- Removes material at a FIXED depth **along a specified path**.
- If you have knowledge of laser cutting, think of this as a vector stroke.

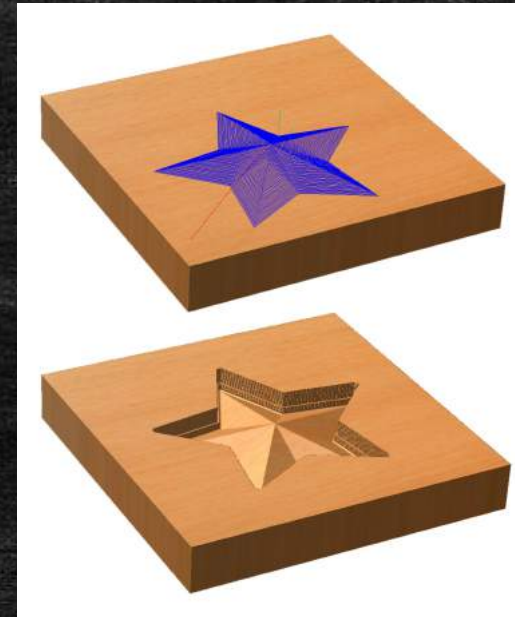
3D Toolpaths

Roughing



- Rapidly removes excess material at a VARYING depth
- **Ragged and rough cuts within a specified boundary and 3D form.**

Finishing



- Gradually removes excess material at a VARYING depth
- **Tight and smooth cuts within a specified boundary and 3D form.**

Additional Facilities

Airbrush Room and Casting Room

Student Access

Both rooms are available to all students. MUST request access from a technician.

Airbrush Room

- Not to be used for aerosol spraying!
- Recommended to wear appropriate personal protection equipment

Casting Room

- Please check L3 CNC Shop resource page/front door casting room for list of approved materials.
- MUST have all required personal protection equipment
 - Goggles
 - Gloves
 - Tyvek suit
 - Respirator (please do thorough research on proper handling and materials usage)

All are available for purchase through the Making Center Store



What Happens Next?

After Training - Consultations and Reservations

Consultations

Let's say you have a design idea and don't know what to do next!

Step 1: Go to E2 CNC Shop for Open Consultation

- Stop by any time the shop is open for an easy sit down with a technician whom can answer any questions or advice you may need for file preparation and/or material choice.
- These consultations are meant only for quick 20 minute QandA.
- After this time please make for sure your 2D and 3D files are corrected.

Step 2: Sign up for an Extended Consultation

- Use Webcheckout Patron Portal for L3 CNC Shop
- During this session you will sit down with a technician whom will write the appropriate CAM file for your design as related to the specific machine being used.
- This may take up to 1.5 hrs to complete. (Please keep that in mind.)

File Preparation

- Do all my files have units in inches?
- Are my vectors closed curves? No overlapping segments? No duplicates?
- Have I saved my vectors as a .ai; .dwg; .dxf?
 - (may choose any one of these options)
- Are my meshes solid?
- Does my model have undercuts?
- If so, acknowledge that those will not be cut
- Have I saved my mesh form as a .stl?
- Have I accurately measured my stock material?
 - (length/width may be measured by ruler/tape measure; thickness must be measured by digital caliper to 0.001" tolerance)

Reservations

So you successfully completed consultations now what?

- At the closing of your scheduled-extended consultation you will be able to schedule a reservation time block.
 - This time is reserved for actual milling and not further file correction.
- This time block will be relative to the estimated mill time per project
 - Range between 30 minutes to 5 hours

Tier 2 Access

- You have completed initial training
- Want to learn more about the CNC process
- Would like to independently work on your own projects

Tier 2 Access may be right for you!

- Essentially E2 CNC Shop has become an exclusive DIY shop.
- Access will be based on completed criteria.
- If interested, speak with a Technician!