There is no Newsletter for January 2009.

The following slides are from
Bruce Lunde's Presentation on
CNC Routing
given at the HMSC meeting.

Objectives

- Learn about the mechanical design of a CNC machine
- Understand the electronics of the CNC
- Understand the software needed to run a CNC
- Spend as little as possible, but be able to re-use electronics
- Transition to CNC on HF Mill, Lathe

My Background

- Systems Architect
- Hobbyist
  - Woodworking
  - Electronics
  - Mechanic (Own a Harley – have to be to keep it running)
  - Metalworking (novice)

Tools

- Typical Woodworking
  - Table Saw, Band Saw, Compound Miter Saw, lots of hand tools
- HF Mini Lathe
- HF Mini-Mill

Getting Started

- Research, Research, Research
- Ask questions
- Visit Forums
- Find others on a similar journey
- Google, Yahoo Groups, You-tube

My Build

- Rockcliffe Plans
- Keling, Inc Interface, Drivers, Stepper Motors
- MDF for body
- Home Depot for all mechanical components

Rockcliffe Plans

- $20.00
- Delivered via internet
- PDF format
- Blueprint
- Drilling guide
- Assembly guide
- On-line Forums (very helpful)

Electronics

- Took two tries
  - Steppermotor.com, $230.00
    - Fair, came with under-powered steppers ~100 oz. in.
    - Ran very hot, very quickly
    - Single board for breakout and drivers
  - Keling, Inc.
    - Better motors, separate breakout board and drivers, steppers at 270 oz. in.
    - KL4030 drivers $50.00 each, motors 39.00-49.00 each

Software Considerations

- Computer Aided Design Software (CAD)
  - Allows you to draw and layout parts
  - For me, longest learning curve!
- Computer Aided Manufacturing (CAM)
  - Bring in the drawing file (.dxf in my case)
  - Convert to Machine Code for CNC
  - Have to ensure it matches your machine!
- Machine Control
  - Mach3, EMC2,TurboCNC, more

My Software Choices

- Motion Control Software
  - Mach3 (Windows) $175.00 (Purchased)
  - EMC2 (Linux) $0.00
- CAD
  - CadStd $0.00 (to $39.00 for CadStd Pro)
- CAM
  - CamBam (Evaluating) $149.00
  - Vectric PhotoVCarve (Evaluating) $149.00
  - Vectric Cut2D (Evaluating) $149.00

Next Steps

- Replace Dremel with laminate router
  - $30.00 at Harbor Freight
- Change out ¼-20 all thread with Acme rod
- Add Bearings to X Axis
- Replace Wood Clamps with Aluminum
- Add connector to motor and sense wiring so I can use electronics on HF-Mill
- Mount electronics in a case
- Finish Z axis on HF-Mini Mill
- Learn more on Cad & Cam!

Yahoo Groups

- Mach1mach2 Forums
- DIY-CNC
- HF Mini-Mill
- HF Lathe

Web Resources

- http://buildyourcnc.com
- http://instructables.com
- http://cncinformation.com
- http://www.practicalmachinist.com
- http://www.hossmachine.info
- Google “DIY CNC Router”
- You-Tube, search for “CNC, Router”
- Hundreds More!

Web Resources

- http://www.cadstd.com/
- http://www.reprap.org/bin/view/Main/WebHome
- http://cncrouterparts.com/links.html
- http://www.cnczone.com/
- http://www.dumpstercnc.com/
- http://www.homeshopcnc.com/page5.html

Web Resources

- http://www.kelinginc.net/
- http://www.rockcliffmachine.com/
- http://www.cnc4pc.com/
- http://www.practicalmachinist.com
- http://www.pdjinc.com/

Process

- Start with CAD or CAM
- Design