

## Care and Maintenance of Milling Cutters

- The life of a milling cutter can be greatly prolonged by intelligent use and proper storage.
- Take care to operate the machine at the proper speed for the cutter being used, as excessive speed will cause the cutter to wear rapidly from overheating.
- Take care to prevent the cutter from striking the hard jaws of the vice, chuck, clamping bolts, or nuts.
- Whenever practical, use the proper cutting oil on the cutter and workpiece during operations. Since lubrication prevents overheating and cutter wear.
- Keep cutters sharp. Dull cutters require more power to drive and this power being transformed into heat, softens the cutting edges. Thoroughly clean and lightly coat milling cutters with oil before storing.
- Place cutters in drawers or holders so that their cutting edge will not strike each other.
- Never operate a cutter backwards.

## Check list

### Before entering the work area

- ☐ Put on safety glasses
- ☐ Tie back loose hair and clothing
- ☐ Remove jewelry including rings, bracelets and watches
- ☐ Don't use any piece of equipment until instructor has demonstrated proper operational procedures and individual safety rules
- ☐ Don't use any equipment or tools that are broken and report any broken equipment or tools immediately

Signature: *[Signature]*

Date: 9/20/23

Team Members:

Witness:

Date:



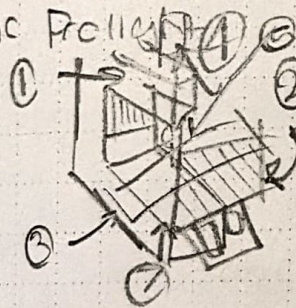
## Before Machining a Part

- ☐ While setting up work, install the cutter last to avoid being cut.
- ☐ When installing or removing milling cutters, always holding them with a rag to prevent cutting your hands.
- ☐ Make sure you have the correct tool.
- ☐ Secure the tool properly.
- ☐ Make sure all tool positions have been properly initialized.
- ☐ Verify the NC program.
- ☐ Remove all loose parts and pieces from the machine.
- ☐ Remove adjusting keys and wrenches from the machine.
- ☐ Close the safety shield.

## While Machining a Part

- ☐ Don't force with it.
- ☐ Press the emergency stop button before re-opening the safety shield.
- ☐ Only open the shield once the machine has halted.
- ☐ Press the emergency stop button whenever changing tools or mounting or removing a work piece.
- ☐ Disengage the emergency stop only once the shield has been reengaged.
- ☐ Keep all unauthorized persons away from the work area.
- ☐ Always leave work area clean and orderly.

## CNC Projects



① 2 axis stepper Drive Motor

② Safety Shield

③ Cross Slide

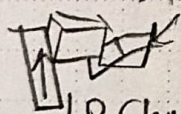
④ Spindle Motor

⑤ Spindle Head

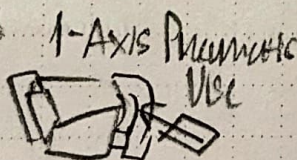
⑥ X axis stepper drive motor

⑦ Y axis stepper drive motor

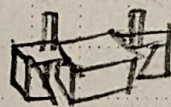
## Other Uses/Hold Downs



LP Clamping kit



1-Axis Pneumatic Vice



Stop blocks and strap clamps

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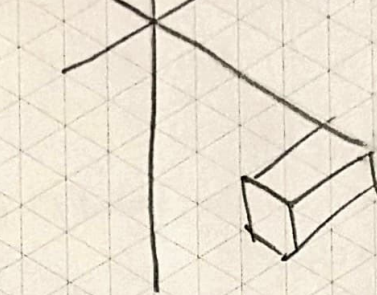


## Milling Tools

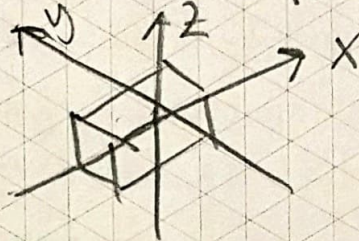
## Specialty tools

- Endgraver
- Long end mill
- Double end bit
- Roughing end mill
- Edge finder in tool holder
- + Common tools

Machine Zero / Home



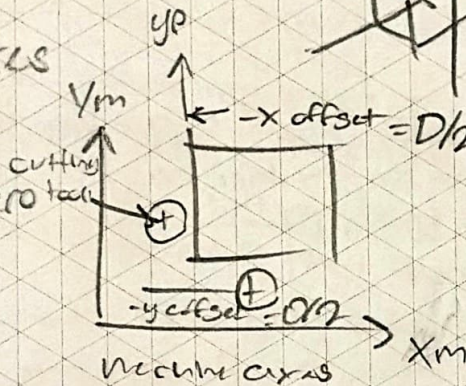
Part Zero



## CNC Machine Axes

## PRZ

- Part reference zero tool
- Origin
- 0,0,0



## Checking PRZ

Send the mill to a point below the X and Y zero to make sure the corner of the cutting tool

## Tool Setup

- Select Setup / Set/Change Home
- Hold the control key and press H
- Right click on Jog control panel and select Set/Change Home

## Tool height offsets

When tool offset is set, the control program calculates its height from using the offset.

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