

Ten+ CHEAP and USEFUL Things for the Mill

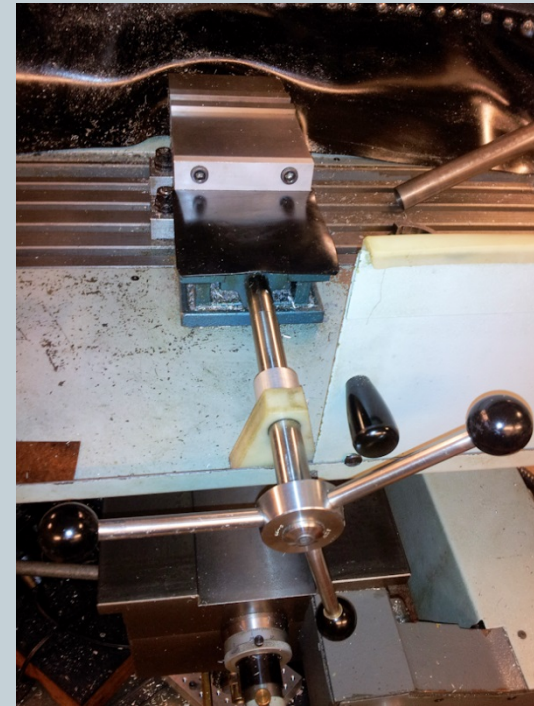


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HMSC JUNE 14, 2014

Vise Speed Handle



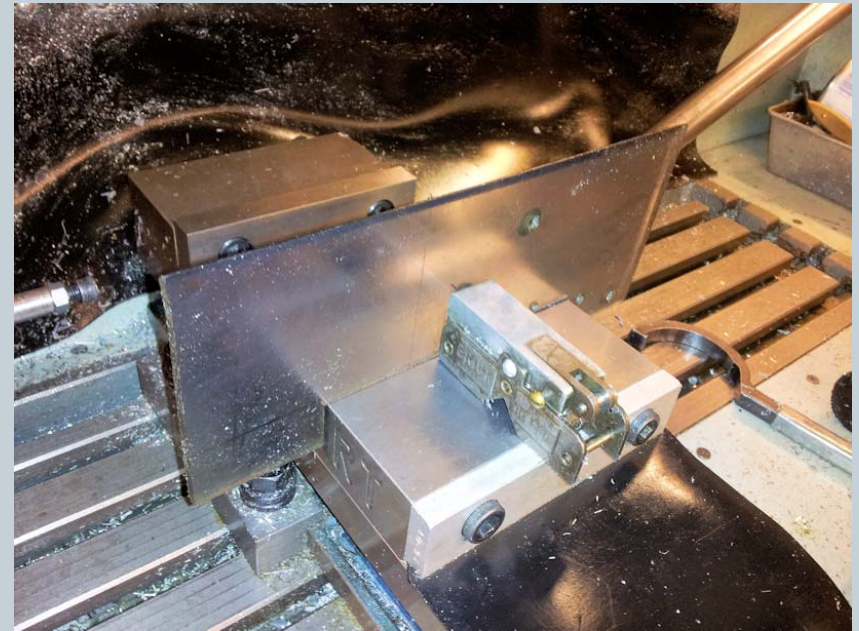
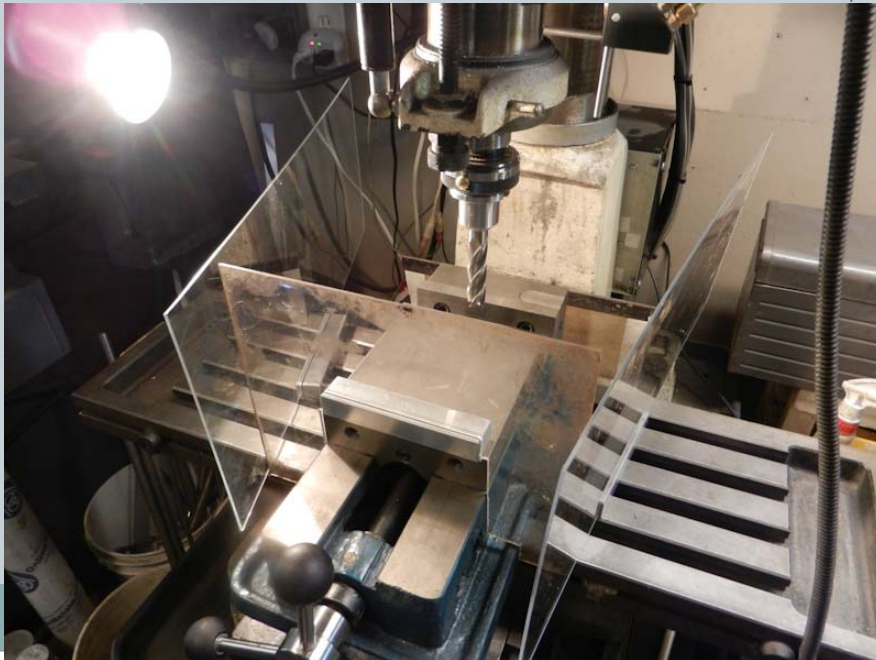
- Replaces vise handle
- Quickly stroke vise



- Use deep 6 point socket
- Angle handles out - 15°
- Support bearing

Plexiglass Chip Guard

- Made of plexiglass
- Stops chips and coolant
- Magnetic base
- Especially good for fly cutting and aluminum



Adjustable Vise Stop

- Allows stock to be placed in exactly the same spot
- Great for repetitive operations or removal for measurement
- Many designs available



- Make base from steel
- Fine adjustment on end

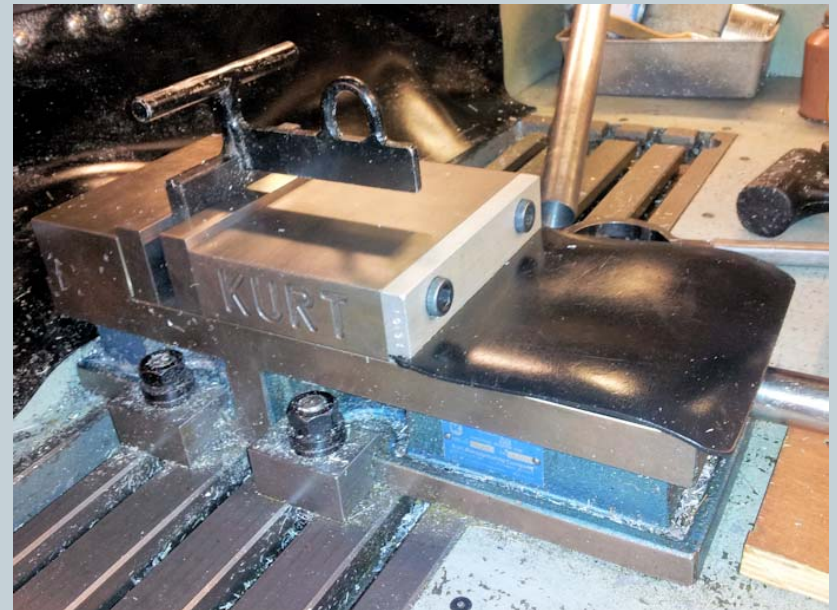
Long Stock Vise Support

- Supports long pieces of stock
- Bolted to end of mill table
- Adjustable height
 - Work parallel with bottom of vise
 - Or can be used for small angles
- Great for repetitive operations



Vise Lifting Handle

- Clamp in vise for easy handling
- T handle to lift by hand
- Lift eye at balance point for crane or hoist lift
- Saves fingers and back



Parallels

- Provide accurate stock support aligned with vise
- Set of different heights
 - Especially one set slightly shorter than top of vise
- Can be bought or made
- Many types
 - Long
 - Wavy
 - Thin
 - Adjustable
 - High speed tool bits or dowels
- Can be stuck to vise jaws with way oil
- Tap work down with dead blow hammer until both parallels are tight



Checklist



- Review before milling
- Helps avoid typical problems
- Concept similar to checklist pilots use
- Consider making air or dry run for CNC

CHECKLIST

Head bolts tight

Correct mill size

Set X0, Y0, Z0

Quill maximum stroke

Conventional vs climb

Power on

CNC

Rotational speed

Tool feed rate

Rewind / Correct program

Overrides off

Tool Holder Rack

- Made from wood drilled to size of holders
- Keeps tool holders safe, organized and handy
- Alternate is to keep inside of a drawer



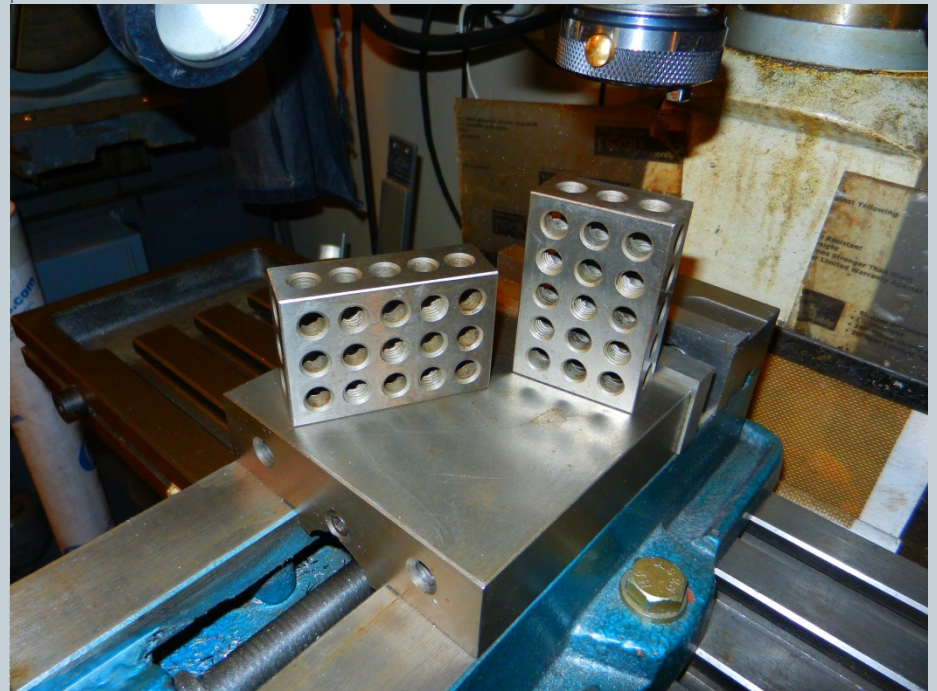
Way Covers

- Prevent chips from fouling mechanism
- Uses
 - Mill Y ways
 - Vise
- Can make from rubber or teflon cooking sheets
- Oil sliding surfaces occasionally



1-2-3 Blocks

- Handy for supporting work when stock is bolted directly to mill table
- Can be used with angle plate to make support fixture to cut at angle
- Can be used to assure part is square with table or vise
- 2-4-6 blocks available



Machinist's Jack

- Handy to support overhanging stock
- Easy to make project



Rear Chip Shield



- Removable rubber shield and support



Riser Plates

- Used for dividing head and tailstock
- Made of 1" aluminum plate
- Provide hand clearance for dividing head crank
- Keyways and keys added to assure parallel mount



**** Bonus ****

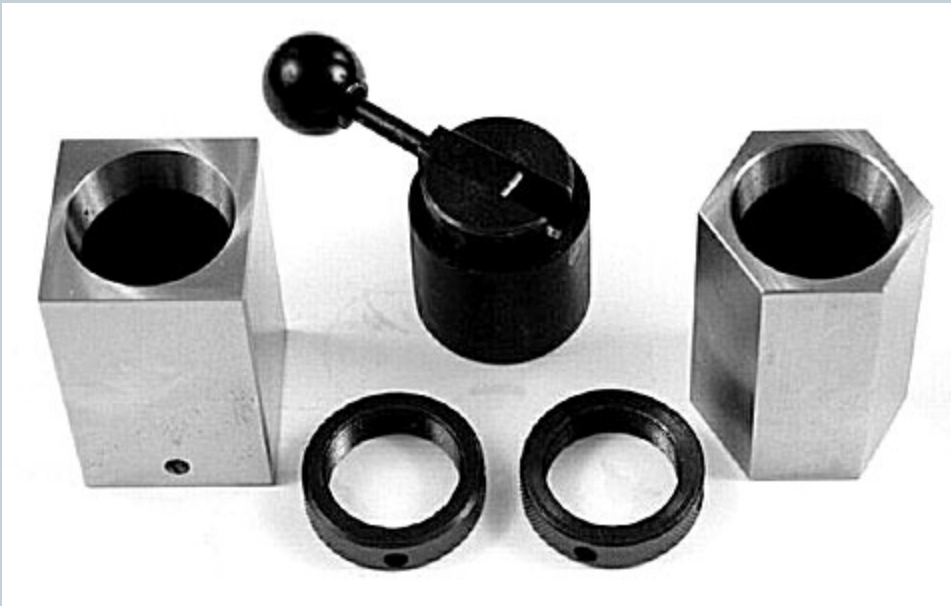
Not so cheap things for the MILL



5C Collet Holder



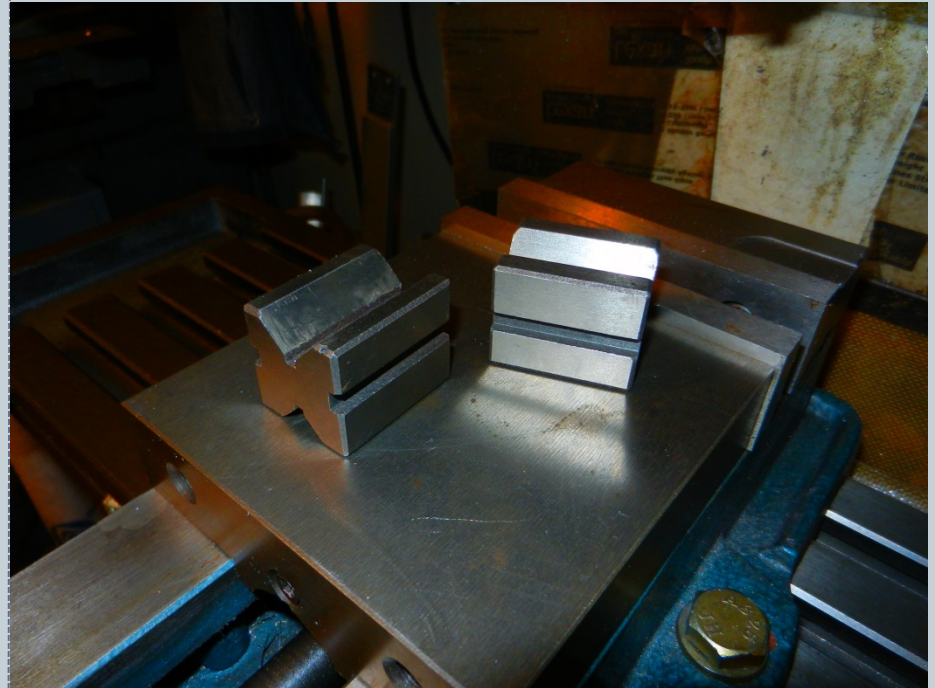
- Used for small round parts
- Precise 90° or 60° rotation



- Horizontal / Vertical for table mount

V-Blocks

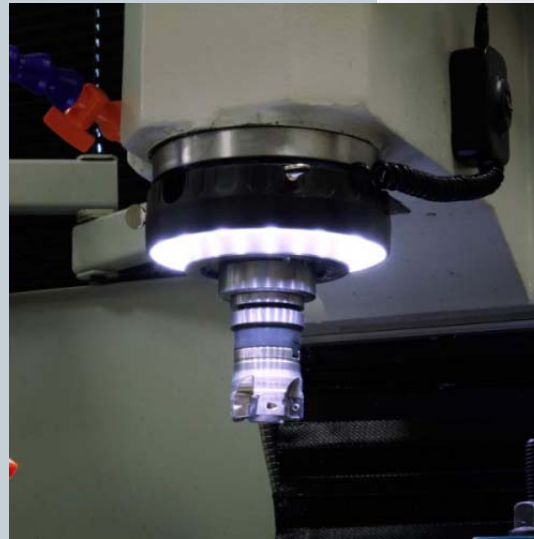
- Much more secure way of holding round stock in vise
- Horizontal or vertical
- Come with clamps for small diameter stock
- Matched pairs to support stock at same elevation
- Can be stored clamped to dowel pin to keep together



Work Light



- **Many options**
 - Incandescent
 - 12V or 24V Halogen
 - ✦ Low cost bulb (12V)
 - ✦ Computer power supply
 - LED
 - ✦ “Angel Eye” car lights
 - ✦ Install around quill



Power Knee Drive



- Built with small gear head 3 phase motor
- Powered with VFD
- Chain drive to existing sprocket
- Safety latch on crank to disengage



Jib Crane



- Utilizes ball bearings in pivots
- Uni-strut for trolley track
- Trolley made from two pairs of ball bearings
- 1/2 ton chain block
- Useful to move heavy parts like dividing head, vise, or large stock



Coolant System

- Coolant spray system
- Aspirated or pressurized water and air
- Sprays droplets, not mist
- Can be controlled manually or by CNC system



Control Panel Arm



- Articulated arm to hold CNC control panel
- Moves side to side as well as in and out

