

# OPERATIONAL PROCEDURES FOR WOOD SHOP EQUIPMENT

## General Principles

Primary considerations:

- 1) the SAFETY of our members and visitors.
- 2) Preventing damage to the equipment.

*Proper use of the equipment serves both these goals*

The most recent safety rules are posted prominently in the shop. They include:

Wear safety glasses with side shields **always** in the machine area and when using tools in the assembly area.

No gloves when working with machines. (There are alternatives for those with allergies.)

Long-sleeved shirts must be skin-tight from elbow to wrist.

No open-toed shoes.

If you've forgotten your safety glasses you can check them out of the tool crib. The tool crib also provides earplugs and dust masks free of charge.

Whenever you are in doubt about how to use a tool or perform an operation, **ASK**.

**Read the Instructions and restrictions posted at each machine.**

Much of the damage done to machines is when users fail to allow the machine to do the work: jamming wood through saws and sanders is pointless and destructive.

A **clean** shop is a matter of safety. No matter how little work you have done, clean up the area after using a machine.

**Be alert** to hoses across the floor, clutter, carts, or other tripping hazards. Keep the area clear around moving equipment. When you are carrying or cutting a long board, for example, make sure you can do so without bumping someone using a nearby machine.

Never walk away from a machine while it is still running; always make sure it is completely stopped before cleaning up.

If something breaks, report it to a monitor immediately so they can put an "out of order" sign on it and fill out a repair form.

Make sure vacuum outlets are open.

## Tool-by Tool Specifics

### Table saws

Each saw is equipped with an organizer for its various accessories. Please return each item to its proper place when you are finished with it.

Before beginning a cut, make sure

- 1) your wood has no loose knots, nails, or screws
- 2) the blade is clear of the wood and the fence
- 3) The fence is locked in position
- 4) the edge of your wood is securely against the rip fence and is smooth and straight. Do not start the cut until the blade is at full speed. Always feed the wood into the blade against the direction of rotation (In our shop, that's from front to back).

**Use guards and feather boards whenever possible. Use push blocks on narrow pieces.**

When making a **straight cut**, the piece you want to keep should be between the fence and the blade, but be aware that the narrower this piece the higher the risk of kickback.

Always use a pusher. There are special pushers for sheet goods, There is also a tool at each saw for making thin, uniform cuts.

#### **Do not:**

- .. stop in the middle of a cut.
- .. back out pieces between the fence and blade until the blade is at a complete stop.
- .. operate cross handed.
- .. walk away from the machine while the blade is still moving.
  
- .. let go of wood between the fence and blade before the blade is stopped.
- .. cut odd sizes or warped pieces on a table saw.
- .. stand behind a table saw in operation.

**Never interrupt a woodworker in the process of making a cut.**

**Never make freehand cuts.** Use the fence, miter gauge or sled, but ...

Never use a miter gauge **with** a fence, as this increases the risk of kickback.

Cross cuts are best done with the sled or on the chop and radial saws. Each table saw is equipped with a sled for making crosscuts on long boards or panels. When finished, turn off the blade and wait for it to stop before moving the sled.

Short, thick, narrow, round, or warped pieces should be cut on a **band saw**.

**Rip and bevel cuts.** Table saw #3 is equipped with a rip blade for cutting with the grain or the wood. This is the best saw for ripping thick boards. The blades on all saws can be tilted to make bevel cuts. The blade should tilt *away* from the fence for safety, to avoid kickback.

**Splitters** should be in place unless you are making a slotted cut (not all the way through the wood, as with a dado). If you remove a splitter, replace it when you are through.

**Replacing blades.** If you replace a blade (#3 saw only), remember that the front edge of the saw's teeth should face the front of the machine.

**Blade height.** The deepest gullet of the blade should be above your wood. Go higher for pieces thinner than ¼". The tool crib has a special blade for making smooth cuts in **plywood or melamine**. Rule of thumb for cutting sheet goods: the thinner the board the higher the blade.

**Lower the blade** and make sure it has stopped spinning before cleaning up.

Turn off the saw at the toggle switch.

### **SAWSTOP SAWS**

Blade changes are to be made by maintenance crew only.

No wet or treated wood or wood containing nails (generally, any recycled wood is Suspect.)

No alternative materials (Corian, Formica etc)

Guards or riving knives are to be used at all times.

Any woodworker who causes the blade to fire through negligence (Inappropriate Materials or misuse) will be fined \$100 per incident

### **Band Saws**

**Re-saws.** The two large band saws with one-inch blades are not to be used for anything but straight cuts. Saw #62 is for cutting milled lumber only: **no logs**. Saw #73 is designated for logs. Use the provided sleds and cradles. Both these saws are equipped with orange brake pedals to help stop the blade. Push down slowly and firmly; don't stomp on them.

**Curved cuts.** The smaller band saws have round pieces of wood showing the smallest diameter cut that should be made on that saw. For example, the radius of the curve cut on a ¼" blade should be no less than 5/8". Each saw is labeled with its blade width.

Some of the tables may be tilted. Always return the table to the horizontal position when you are finished.

The **blade guard** should be lowered to within a quarter inch of the work. This gives you more control and preserves the blade. When you are finished, turn off the saw and lower the blade guard all the way.

Always use a **pusher** when making thin cuts. Avoid putting your hand in line with the blade.

If a small piece gets jammed between the blade and table insert, turn off the machine and wait for it to stop before dislodging the piece. Always wait until the blade has stopped moving before making adjustments or cleaning up.

Try to plan your cuts to avoid "backing out" of a cut or make relief cuts. Always take care to keep from twisting the blade or pulling it into the guard.

### **Miter or Compound Miter Saws**

The sliding compound miter saw locks at frequently used angles. Squeeze trigger, rotate to desired angle, then push the lever down to lock. Return to 90-degree angle when done.

Make sure the wood is firmly in place against the back fence and table before making a cut. Put the straightest edge of the board against the fence. If the board is bowed, put the convex side against the fence to prevent pinching the blade. Pull the blade toward you, lower to cutting position, and then push toward the fence.

Keep your hands at least **six inches** from cutting blade. For close cuts, use clamps.

If you are cutting a small piece that is not held securely by the back fence, use a longer piece of wood to, in effect, extend the fence closer to the blade. Don't raise the blade until it has stopped.

If you're cutting something round, clamp it down securely, or consider using a band saw and a V-block.

There are stops for repetitive cuts, and a V-block jig for cutting dowels. Do not cut dowels by simply holding them in place. Use the V-block.

The **Panel Saw** is for cutting large sheet goods such as plywood.

Place the piece securely in the slot. Start the saw and pull it downward on its rails. It helps to have another person steady large pieces during the cut.

The blade can be rotated 90 degrees to make horizontal cuts. Rotate and lock on the rails at the desired height. The material is then pushed through the saw. Use the spacers (hanging on strings) to keep the blade from being pinched.

**Scroll Saws** are for fine straight or curving cuts. Before using one for the first time, watch the manufacturer's video in the library.

**Jointers** (joiners) are for creating a flat surface or edge on a board.

Observe the designated limits on the size of the board each of our jointers can accommodate. **Use the pushers.**

On the edge jointer, keep the board flat against the fence. You can do chamfer (angle or bevel), but make sure the fence is squared up when you are done.

Make repeated thin cuts (less than 1/16") rather than trying to take it all off at once.

Edging with the grain makes a smoother cut. Do not plane the end grain or wood with loose knots.

For wood that is bowed, cut the concave side first.

**Planers smooth** one face (the top face) of the board.

Do not use on

- Painted or varnished surfaces.

- Plywood, particle board, or MDF.

- Wood with dried glue or loose knots.

- Old wood that may be embedded with stones, dirt, or nails.

Make sure the wood is free of metal (there is a metal detector between the planers.)

Be sure the bottom face is flat. For stock thinner than half an inch, use a shooter board.

Plane with the grain of the wood. Do not plane end or cross grain (as with picture frames).

Keep your fingers away from the bottom of the board; it's easy to get them pinched.

Never, ever, put your hands in the machine to dislodge a board.

Before starting the machine, insert the board into the planer and adjust the height of the table so the board can just be easily inserted and pulled out the **back** of the machine (do not pull it from the front). Remove the wood. Then raise the table one turn. Turn on the power, engage the rollers, and insert the board. Allow the machine to pull it through.

Raise the table as much as one turn after each cut. (Maximum recommended cut is 1/16")

Don't stand directly in front of the machine while it's operating, to avoid kickback injury. If you have several boards, get someone to help offload as you feed from the front.

## Lathes

**Everyone** using a lathe must check out the key from the tool crib.

Always wear a face shield when using a lathe.

Make sure the spindle lock is disconnected before turning the machine on.

Equipment in cases #24 to #29 has been standardized and color-coded. Before and after using the lathe, check to make sure everything is in its place. Report any shortages to the tool crib monitor.

Additional cutting tools, steady rests, etc., can be checked out of the tool crib. Cutting tools are sharpened on a regular basis, but if you find one that is dull, notify the tool crib monitor. Tools belonging to the club should be sharpened only by qualified tool sharpening personnel. You may sharpen your own tools on the club grinder only if you have been checked out on its use by a member of the lathe committee.

Keep the floor around you clear of shavings that might cause you or another member to slip.

Don't use lathes to dry varnish or other finishes.

Don't leave running lathes unattended. When it's turning, you should be there. If you're not sure what speed to use on a project, ask for help.

**Routers** and shapers are for making slots or decorative cuts, such as molding. The tool crib has a selection of bits.

Be sure the **circuit breaker** is off before changing cutters. Blow out the collet before and after use, so the cutter can be positioned firmly.

Tighten the cutter firmly, leaving about an eighth of an inch of the shaft exposed above the collet. Be careful to avoid damaging the cutter by hitting it with the wrench. Make sure the cutter will not hit the fence.

Lock the adjusting wheel of the shaper or locking clamp of router before turning on the machine. Hold the work firmly when cutting; for small pieces and end grain, use a holder (provided). Do not make adjustments to the machine when it is running. Always work **against** the direction of rotation (right to left).

As with just about everything else, it's best to make repeated small cuts (under 1/8").

Use the rear fence as a guide, even when using a cutter with a bearing. For a bit with a bearing, bring the fence up to the bearing; for a bit without a bearing the fence has to be past (forward of) the middle of the bit. Make sure the left and right fences are aligned.

**Never** put the wood between the fence and the cutter (ie. behind the cutter).

If cutting a **dado or cove** in the board, use feather boards; on top to keep the board from rising up, and in front to keep it against the fence.

**Sanders** are among the club's most abused machines. There are hand-held units, spindles, disks, drums, and belts.

Remember, too much pressure not only damages the abrasive, it bums your wood. Light pressure allows the abrasive to do the work. Some woods {cherry, purple heart, etc.) bum easily and require an especially light touch.

Make sure wood surfaces are free of paint, varnish, glue, loose knots, and foreign materials before sanding on the club's abrasives. Glue should have dried at least 24 hours; scrape off excess dried glue. Before sanding, make sure the paper is not torn or burned; report damage to a monitor.

Do not sand MDF, particle board, or Melamine or any item on the "do not cut" list posted on the front wall of the machine room.

Most of the sanders are to be used only for hardwoods (no pine, fir, or cedar). Sanding of pine boards is permitted **only** on horizontal sander#49 and surface sander #14.

On **Spindle Sanders**, work against the direction of rotation. When changing drums. do not over-tighten. Hand tightening is adequate.

On **Disk Sanders**, use the downward (left-hand) side only. The right-hand side will flip your wood.

Hold material firmly in place on **belt sanders** as they can easily catch your material and throw it across the room or jam it (and/or your fingers) into the mechanism.

Clean sander with a (provided) rubber eraser.

**Drum Sanders** work much like planers, in that the material is fed in one side and removed from the other. Sanding is performed with one or two long sanding drums.

These sanders are for removing planer chatter marks, or creating a smooth surface. If you need to take off more than 1/32 inch, use the planer first. Observe the labels giving maximum and minimum plank sizes for each of the sanders. For wood less than ½" thick, use a sled.

**Setting up** Before turning on the drum sander, open the top and observe the roller. Report any damage to a monitor. Measure the thickness of your board and set the machine indicator to slightly larger. Turn on the feed belt only, insert your board, and raise the height of the table until your board just barely causes the drum to move. Then *back off* one notch on the handle. (This is because centrifugal force and heat cause the drum to expand as it works.) If the table is set too high, your work will jam against the drum. Close the cover, turn on the drum, and insert your material.

Run the material through at least twice before raising the table, and then raise it no more than one notch on the crank. When the shop is not too noisy, you can hear when the drums are connecting with your work.

**Drill Presses** are for making holes. The larger the hole (the more material being removed), the slower the drill speed should be. One of the drills (#70) is designated and set for Forstner and other large bits.

After you've inserted the bit and tightened the chuck, spin it around to make sure the bit is seated properly in the chuck.

Use a backup board to prevent blowout of holes and protect the metal base of the stand.

For holes that don't go all the way through the material, use the stop gauge on the side of the drill.

When drilling holes larger than ½" or in small pieces of wood, the wood should be fastened down. (If you're using a vise, make sure it is anchored, because the drill can catch and spin it)

If you change the speed of the drill or tilt the table, return them to their original settings/positions when you are finished.

Make sure you remove the chuck key from the chuck before starting the drill.

**Milling machines** are for precision tooling. The Tree mill requires special instruction. In general, make sure the work is fastened securely on the table and that the metal hold-downs are not in place where they can be struck by the bit.

**Ringmasters** are for making bowls from a flat piece of wood. These machines require some training. There are occasional classes, or an experienced member can help. There are detailed Instructions and accessories In the "Ringmaster Setup Kit" in the tool crib.

**Grinders** for sharpening are to be used only by certified members. The Lathe Committee provides the training.

### **Assembly Room**

No power sanding, routing, biscuit-cutting, or other machines that produce a lot of sawdust or noise.

No spray painting or lacquer.

Please respect others' need for, working space.