

## TABLE SAW MANUAL

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### **Safety Rules**

1. The buddy system is required for the table saw
2. Wear proper personal protection equipment (safety glasses, hearing protection, respiratory protection)
3. Keep loose clothing, hair, and jewelry away from the spinning blade
4. Do not bypass any safety devices
5. Keep hands clear of the area near the blade
6. Maintain positive control of the stock
7. Use one, and only one, of the following at all times: fence, miter gauge, or sled
8. Let the blade come up to speed before starting the cut
9. Let the blade come to a complete stop before leaving the saw
10. If something is broken or breaks, notify one of the wood shop leads at ([woodshop@sparkmakerspace.org](mailto:woodshop@sparkmakerspace.org)).

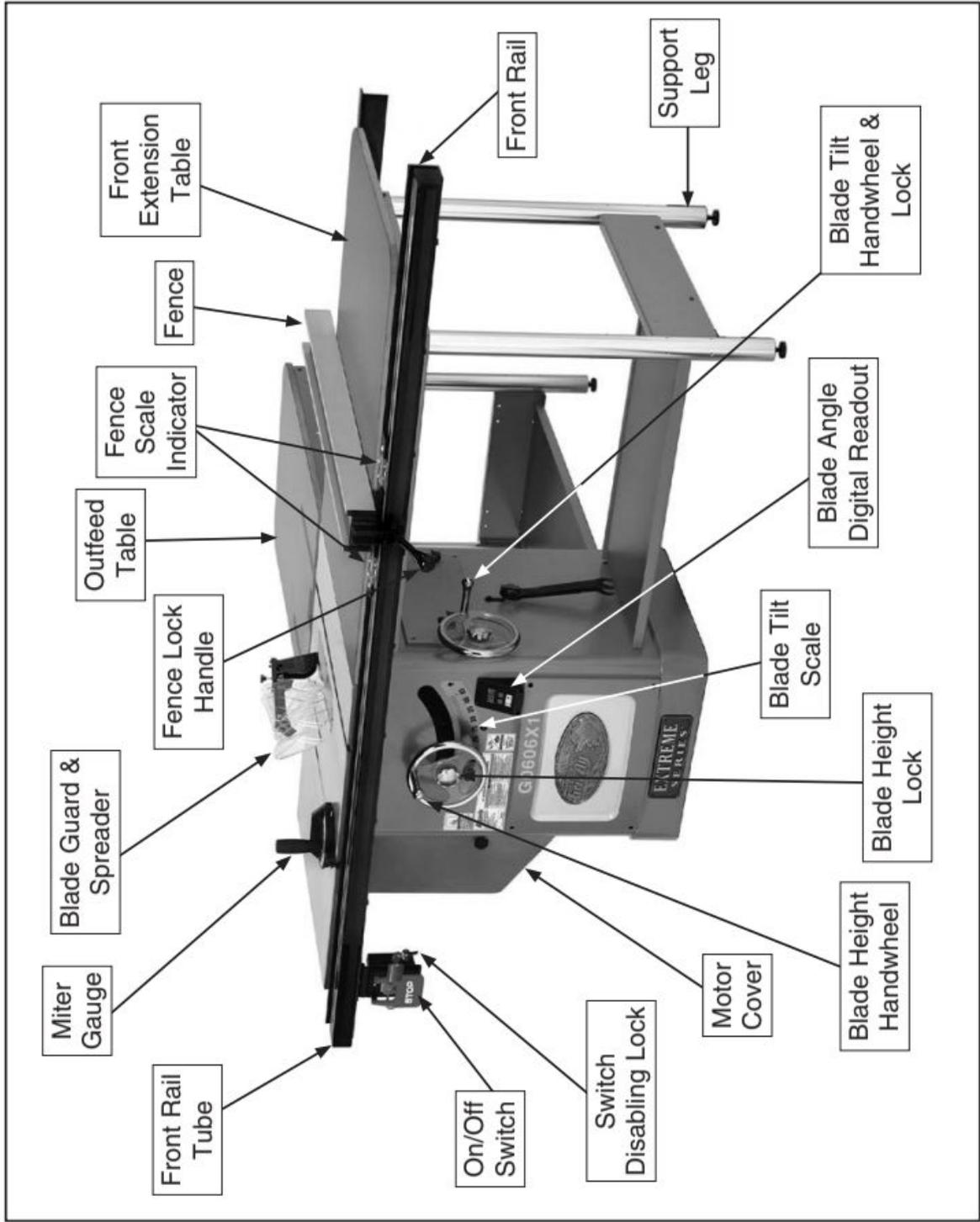


Figure 1. G0606X1 identification.

## **Table Saw Summary**

1. Tool Location in Shop
2. Parts of the saw (refer to diagram)
3. Definitions
4. Uses for Tool
5. Kickback Prevention
6. Before Use
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7. At the Saw
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  - c. Blade angle
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  - e. Line up cut
8. Making the Cut
  - a. Start saw with blade clear of workpiece
  - b. Keep hands clear of blade
  - c. Maintain control of workpiece
    - i. Use push sticks as required
  - d. Use even feed force
  - e. Use assistant or outfeed roller for large stock
  - f. Shut off saw after every cut
9. Cleanup

## Definitions

**Rip cut:** Cuts made in the same direction as the wood grain (usually in the long direction of the lumber)

**Cross cut:** Cuts made perpendicular to the direction of the wood grain (usually in the short direction of the lumber)

**Kerf:** The cut or gap in the workpiece after the saw blade passes through during a cutting operation

**Through Cut:** A cut in which the blade cuts completely through the workpiece (requires blade guard)

**Non-through cut (or partial depth cut):** A cut in which the blade does not cut through the top of the workpiece (requires riving knife)

**Dado:** A groove cut in the workpiece; uses either a specialty blade set or multiple parallel cuts

**Rabbet:** An L-shaped channel along the edge of the workpiece

**Kickback:** An event in which the workpiece is propelled back towards the operator at a high rate of speed

**Blade guard:** Metal or plastic safety device that mounts over the saw blade which prevents the operator from coming into contact with the saw blade

**Riving knife:** Metal plate located behind the blade; it prevents the kerf gap from closing and pinching the blade while performing a cutting operation.

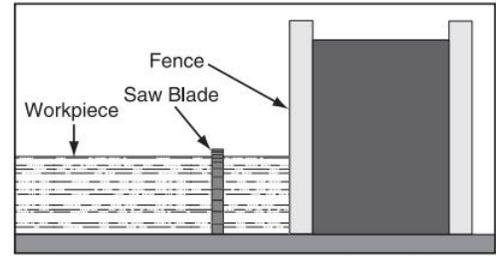


Figure 54. Example of a through cut (blade guard not shown for illustrative clarity).

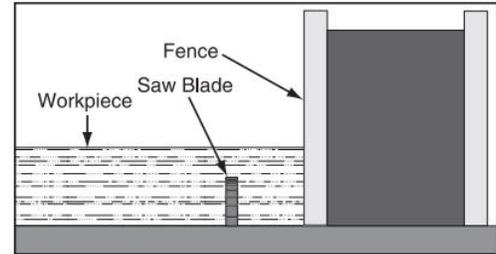


Figure 53. Example of a non-through cut.

## Buddy System

1. Use of the table saw requires a second person must be present in the Woodshop or one of the contiguous Stations (Stained Glass, Small Metals, Art Space).
  - a. The second person must be a Spark member, and must verbally agree to be the “buddy”, to act in case of emergencies. This person must be capable of hearing the tool operator. If the “buddy” leaves the area, use of table saw must cease.

## **Instructions for Use**

### **Uses for Tool:**

1. Good for:
  - a. Reducing width of long boards
  - b. Cutting sheet goods
  - c. Rabbets, grooves, and dados
  - d. Woods
2. OK for:
  - a. Cross cutting stock
  - b. Plastics
3. Bad for:
  - a. Significantly warped boards
  - b. Green (wet, undried) lumber
  - c. Small parts
  - d. Metals
  - e. Ceramics/Glass/Tiles
  - f. Composites (fiberglass or carbon fiber)
  - g. Careless users

### **Kickback Prevention**

1. Kickback occurs when the workpiece is in contact with the saw blade but not restrained or controlled properly. The saw blade can propel the workpiece back towards the operator at dangerous speeds and can force the operators hands into the blade.
2. Kickback is usually caused by:
  - a. Operator failure to maintain positive control of workpiece
  - b. Material being caught between the blade and the fence
  - c. Material pinching the blade during cutting
  - d. Misaligned feeding of the workpiece
  - e. Blade contact with knots or foreign materials in the workpiece
3. Chances of kickback can be greatly reduced by:
  - a. Ensuring at least one smooth, straight edge to the workpiece. This will minimize the chances of twisting the material during the cut and pinching the blade.
  - b. Using the fence, miter gauge, or sled. Do not make freehand cuts on the table saw. This will minimize the chances of misaligned feed pinching the blade.
    - i. Use only one of the guides. Use of the fence in combination with the miter gauge will wedge the workpiece between the fence and the spinning blade which is a dangerous condition.
    - ii. Ensure the fence is parallel to the blade, and clamped properly. Misaligned cuts will increase chances of kickback.
  - c. Use the blade guard or riving knife.

- i. The blade guard has both a spreader, which will prevent the cut from closing up, and a set of pawls, which will dig in to the workpiece to mitigate kickback.
- ii. The riving knife works identically to the spreader, preventing blade pinch on non-through cuts.

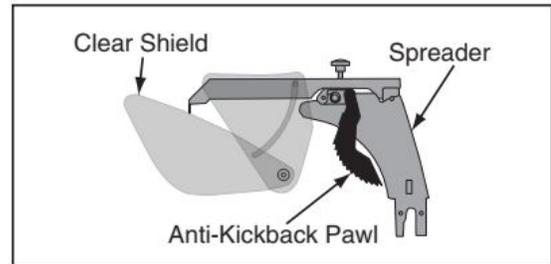


Figure 62. Blade guard assembly components.

- d. Feed all cuts to completion. If a cut must be stop before completion, shut down the saw while maintaining positive control over the material. Let the blade come to a complete stop before backing out of the cut.
- e. For deep cuts, make multiple shallower passes rather than a single deep cut.
- 4. User control of the workpiece is an important aspect of preventing kickback. Users should maintain positive control of the workpiece at all times.
  - a. Operate the saw only from the front side. Do not attempt to pull a piece through the saw from the back, or feed from the sides.
  - b. Hands should never be in a position with the blade between the hand and the body.
  - c. Push sticks should be used to keep hands clear of the blade while maintaining control of the cut.
  - d. Users should stand to one side of the blade while cutting. This prevents the user from being in the path of a workpiece if kickback should occur

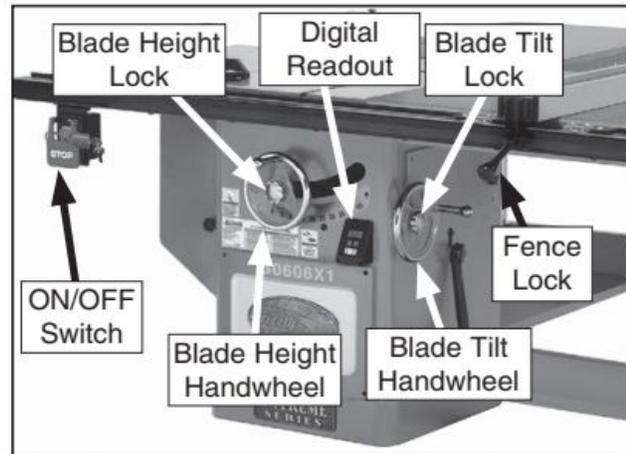
### Before Use

- 1. Wear personal protective equipment.
  - a. Safety glasses
    - i. Face shields may be worn for greater comfort, but safety glasses must be worn underneath.
  - b. Dust mask or respirators are strongly encouraged.
  - c. Gloves shall not be worn while operating the saw.
  - d. Hearing protection is recommended.
  - e. Tie long hair back.
  - f. Roll loose sleeves above elbow.
  - g. Remove all jewelry.
- 2. Inspect the workpiece for suitability
  - a. Materials should be limited to natural wood, engineered wood products, and some forms of plastics.
  - b. Workpiece should be clear of foreign objects such as nails, screws, fasteners, dirt, rocks, sand, debris, or any other non-wood material.
  - c. Loose knots should be removed before being fed through the saw. If loose knots can not be removed, an alternate cut method should be found.

- d. Green, pressure treated, or any other “wet” workpiece should be avoided.
  - e. Minor warping is acceptable, but care should be taken with cut orientation and feeding. Cut must be made in the most stable orientation.
  - f. Significantly warped lumber (cupped, bowed, or twisted) should not be cut with the table saw.
  - g. If required, pass one side of raw lumber through the jointer to create a smooth, straight reference edge. This edge will slide against the fence during cutting.
3. Prepare a cutting plan.
- a. Determine order of cuts, and ensure there is sufficient space around the table saw.
  - b. Safety guard should be used for all through cuts. Non-through cuts require the use of the riving knife and are limited to advanced users.
  - c. When cutting multiple parts out of a single workpiece, be aware of kerf thickness, and its effect on cuts.
4. Choose the saw guide appropriate to your cutting situation. Only one guide should be used at a time to minimize kickback.
- a. Rip cuts: Use the fence.
    - i. Adjust the fence to the appropriate workpiece thickness by lifting the black handle knob at the front of the fence. Slide the fence left and right to adjust, and press down on the handle knob to lock it in position.
    - ii. Precision adjustment of the fence may require measurements to be taken between the fence and the saw blade. Power to the saw should be disconnected before making these measurements.
  - b. Rough cross cuts (including miter cuts): Use the miter gauge (or the compound miter saw)
    - i. The miter gauge is stored under right side of saw against the stand.
    - ii. Move the saw fence clear of the work space.
    - iii. Set the required angle on the miter gauge .
    - iv. Slide the gauge into the T-track in the table surface.
  - c. Precise cross cuts, large numbers of repeated cuts, or smaller workpieces: Use the crosscut sled (requires removal of the blade guard and installation of the riving knife; advanced users only).
    - i. The cross cut sled is stored under the right side of the saw.
    - ii. It has two runners which fit in the T-slots of the table.
    - iii. The sled allows stops, blocks, or other fixturing to be mounted to the sled to hold the workpiece.
    - iv. Use of the crosscut sled decreases kickback risk, but increases blade exposure.

## At The Saw

1. Inspect the circular saw blade for damage. If this is done while power is being provided to the saw, a piece of scrap material should be used to rotate the blade to keep the user clear of the blade.
  - a. If damage is observed, report the condition to a woodshop lead.
  - b. The blade on the saw should be a general-purpose/combination blade of low to medium tooth count. If your application requires a different blade, please contact a Woodshop Lead for help.
2. Adjust the blade tilt, if required, to the correct angle.
  - a. If the saw is unplugged while blade angle adjustments are made, the digital miter gauge on the saw will have to be reset.
  - b. Blade tilt is adjusted using the handwheel on the right side of the saw.
    - i. Loosen the blade tilt lock (central knob) to unlock the blade tilt handwheel.
    - ii. Turn blade tilt handwheel until blade is at desired angle, as shown on blade angle indicator on front of saw.
    - iii. Tighten the blade tilt lock.
3. Adjust blade height
  - a. Blade height should be not more than ¼-inch higher than maximum thickness of the workpiece
  - b. Blade height is adjusted using the handwheel on the front of the saw.
    - i. Loosen the blade height lock (central knob) to unlock the blade height handwheel.
    - ii. Turn blade height handwheel until blade is at desired height
    - iii. Tighten the blade height lock.
4. Ensure that saw workspace is clear.
  - a. Chips and sawdust should be swept from the operators work space
  - b. Outfeed table should be cleared of obstructions
    - i. For large pieces, particularly full sheets of plywood, assistance may be required to support parts of the workpiece during the cut.
    - ii. If using a second person, the assistant should NOT attempt to feed the material, only hold it up.
    - iii. There are several roller supports available
5. If needed, place the “Saw In Use” notification on the back door.



## Making The Cut(s)

1. Establish the buddy system is active.
2. Confirm workpiece is suitable for cutting.
3. Confirm blade angle is correct.
4. Confirm blade height is correct.
5. Confirm guide (fence, miter gauge, or sled) is in correct position.
6. Confirm that the appropriate guard is in place:
  - a. Through cuts: blade guard, kickback paws, and spreader
  - b. Non-through cuts: riving knife
7. Confirm that the saw is plugged in.
8. Start dust collection system.
9. With the workpiece clear of the blade, turn on the saw.

- a. Let blade reach operating speed before feeding workpiece
10. Holding the workpiece firmly against guide, feed workpiece through saw.
    - a. Hands and other body parts should be kept well clear of the saw blade.
    - b. Feed rate should not exceed saw capacity. If the saw looks, sounds, or smells like it is slowing down or bogging, feed rate or cut depth should be reduced.
    - c. When using the fence, push sticks should be used for the final portion of the cut.

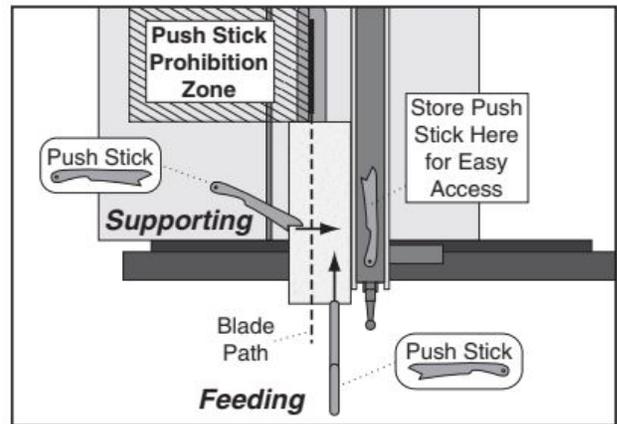


Figure 96. Using push sticks to rip narrow stock.

- i. Feed: The notched end of the push stick should be used against the end of the workpiece and used to move the workpiece past the blade with a steady downward and forward pressure.
  - ii. Guide support: A second push stick can be used to keep the workpiece against the fence. When doing so, only apply pressure before the blade. Pressure applied to the parts of the workpiece which have already been cut will pinch the blade and could induce kickback.
11. Do not attempt to remove small offcuts while the blade is spinning
    - a. If small pieces fall into the space between the table insert and the blade, shut down the saw, and let the blade stop moving before attempting to remove them.
  12. Once the cut is complete, turn off the saw immediately.
  13. Remove all pieces from the table before proceeding with further cuts.

**After Use**

1. Shut down the dust collection system.
2. Remove all offcuts from the table.
3. Return the saw to baseline configuration.
4. Clean up sawdust from around the tool.

**Baseline Configuration Identification**

1. Blade guard, anti-kickback pawls, and spreader installed
2. Combination blade installed
3. Blade tilt at 0° angle
4. Blade set below surface of table
5. Miter gauge and cross cut sled stored under table wing
6. Saw unplugged

## Table Saw Competencies

### **Trained User Competencies**

#### Setup

- Blade type check
- Blade depth set
- Fence position set
- Miter guide set

#### Operation

- Dust Collection System
- Rip cuts
- Cross cuts

#### Changes and Adjustments

- None

#### Maintenance and Care

- Cleanup of saw and surround space

### **Advanced User Competencies**

#### Setup

- Miter angle

#### Operation

- Beveled rips
- Rabbet cuts
- Dado cuts

#### Changes and Adjustments

- Blade replacement
- Riving knife installation
- Miter zeroing

#### Maintenance and Care

- Table clean and wax