

Tip #29 Table Saw/Joiner

Wood joinery is one of the most rewarding parts of any woodworking project. Ranging from simple, attractive miter and bevel joints to the more complicated lock corner and finger joints, this tip will cover the wood joinery that can be done on the Mark V in the table saw mode.

MITER CUTS

Both miter and bevel cuts are made with the stock held at an angle (other than 90°) to the saw blade. For instance, anytime you change the miter gauge from its normal 90° position, you will be sawing a miter. Some examples of miter cuts used to form four-, six-, and eight-sided figures are illustrated in Figure 3-1. The cut pieces, joined to make forms, are called segments.

It is important to remember that a miter cut angle is always one-half of the joint angle. The joint angle in a four-sided picture frame is 90° , but the cut angle is 45° . Use the following formula to determine the correct miter gauge setting for a project with any number of segments: Divide 360° by the number of sides and then divide the answer by 2. To apply this formula to an octagon, for example, divide 360° by 8; then divide the answer, 45° , by 2. This will yield $22\text{-}1/2^\circ$, which would be the correct setting for the miter gauge.

To make any miter cut, set the miter gauge at the desired angle, and secure the lock knob. **Warning:** Place the miter gauge in one of the slots so that the face of the gauge is angled toward the blade. If you mount the miter gauge so the face is angled away from the blade, the wood may bind and kickback.

Note: Since most miter cuts are made at 45° , the miter gauge has positive stops to help you quickly adjust the gauge to 45° left or 45° right. However, it's wise to check critical setups with a drafting triangle or combination square.

Mark the workpiece where you want to cut it. (It's best to measure from the inside corners of the miter.) Align the workpiece with the saw blade and clamp it securely with the miter gauge safety grip.

From this point on, the procedure is similar to crosscutting. Make a five-point check. All five locks—power plant, carriage, table height, table tilt, and quill—should be secure. Turn the machine on, set the proper speed and let the machine come up to speed. Push the workpiece slowly past the blade (Figure 3-2). When the cut is finished, turn the machine off and let the blade come to a complete stop before re-

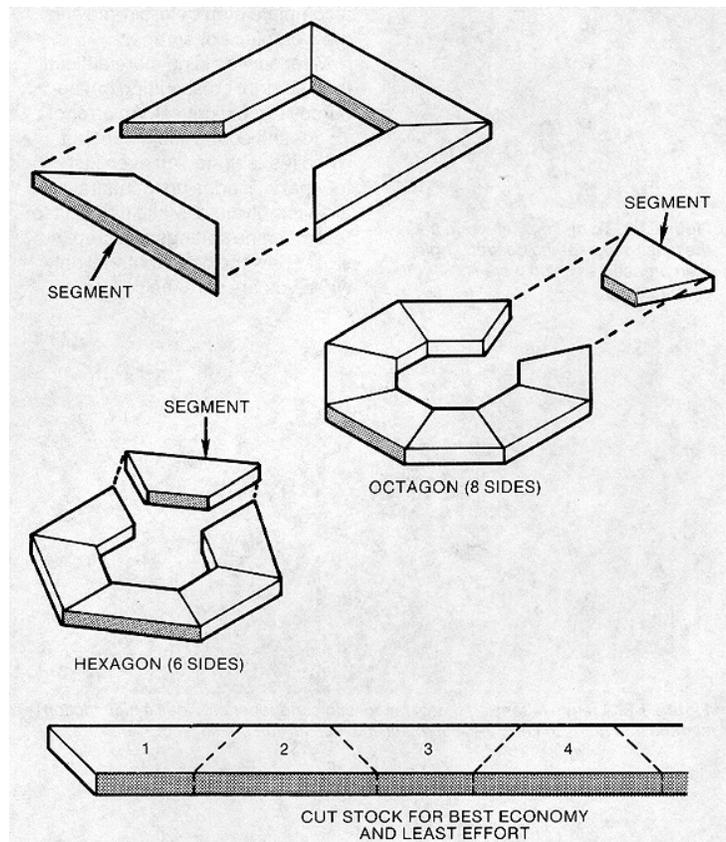


Figure 3-1. Some examples of how miter cuts can be used to form four-, six- and eight-sided projects.

moving the workpiece or scraps.

Miter sawing is no more difficult than straight crosscutting but accuracy is most critical. An error of 10 doesn't sound like much, but when it's repeated on even just four parts, it adds up to frustration at assembly time. Make it a habit to test machine settings on scrap stock. Saw the good material only when you are sure the setting is perfect. Guard against drift which is the tendency of the blade's rotation to pull the workpiece-perhaps just enough to spoil a perfect cut. A fence extension that is faced with sandpaper helps keep the workpiece in place (Figure 3-3). Hold the workpiece securely; use the miter gauge safety grip.

Here are some things that will cause inaccurate miter joints:

- Improper alignment of the machine.
- Dull saw blade or incorrectly set teeth.
- Stock warped or otherwise imperfect to begin with.
- Stock allowed to drift.
- Pass made too fast.

Mitered segments must be perfectly matched in size and shape if they are to join together in a perfect union. Use this formula to determine the segment length:

Frame width - rabbet width x 2 + picture length = frame length

Example for 8" long picture:

$$2" - 3/8" = 1-5/8" \times 2 = 3-1/4" + 8 = 11-1/4"$$

The miter gauge stop rod can be used as shown in Figure 3-4 to gauge the length of the segments.

Square a piece of stock to this length. Set the miter gauge to the angle needed, and miter both ends of the segment. Then use it to set the miter gauge stop rod. **Warning: Never position the miter gauge stop rod so that it crosses in front of the blade.** Other segments are cut from one length of stock by mitering it at one end, then holding the mitered end against the stop rod. Be sure that you turn the stock over for each new pass.

A miter gauge extension with an adjustable stop can be used to cut miters on wide stock (Figure 3-5).

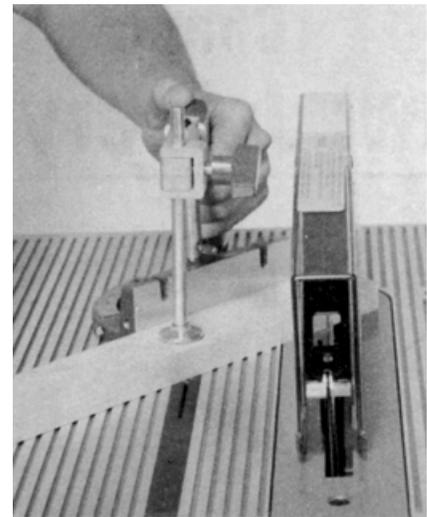


Figure 3-2. To make a miter cut, set the miter gauge at the desired angle, then proceed as if you were crosscutting.

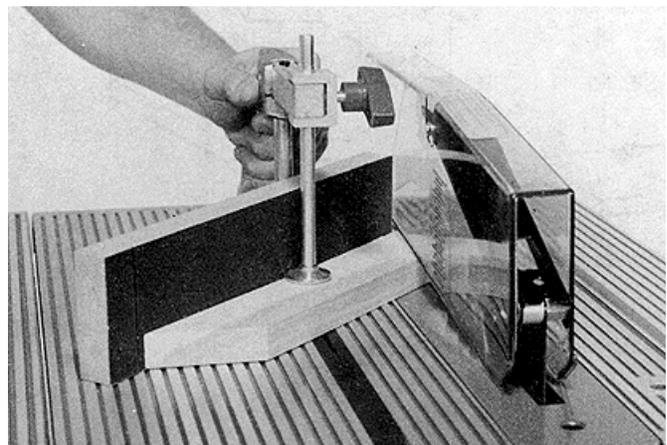


Figure 3-3. A fence extension that is faced with sandpaper provides a high friction surface that helps to keep the workpiece in place as you are sawing.

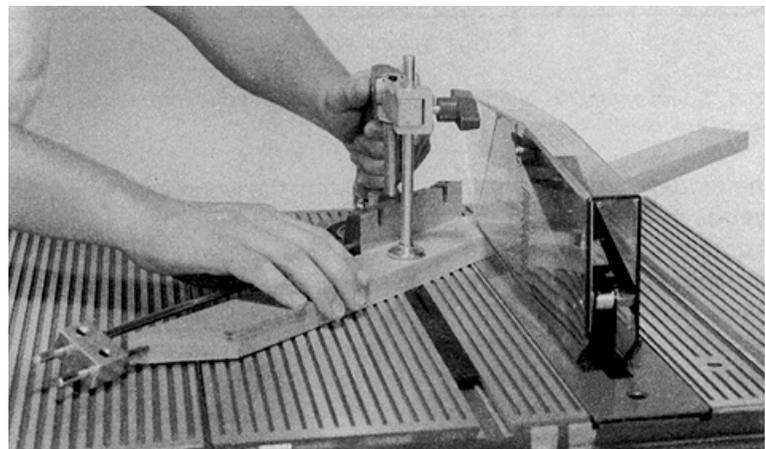
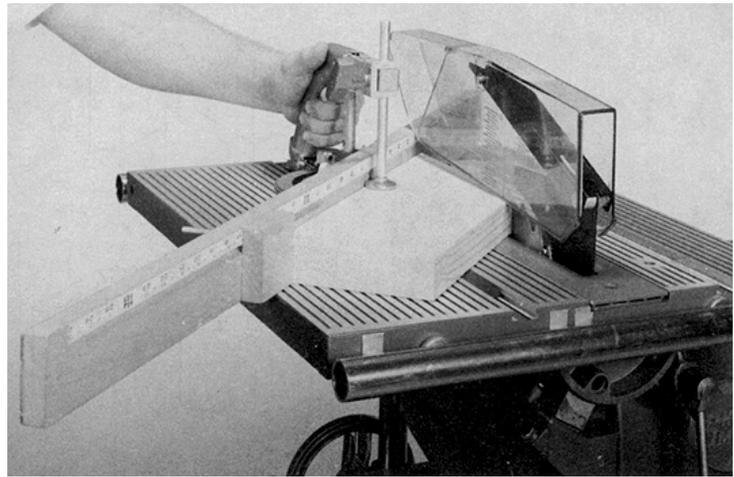


Figure 3-4. The miter gauge stop rod can be used to gauge the length of the segments.

Miter Cuts with a Fixture

Cutting close, tight miters is much easier when you use a sliding table fixture (Figure 3-6). The fixture is easy to make and is well worth your time and effort, because a fixture that is well built and set up accurately will enable you to cut perfect 45° miters every time. The strips that slide in the miter gauge slots are cut to fit from hardwood. Use screws to secure the strips to the base; then cut a 12" long saw kerf into the fixture.



Miter one end of each hardwood fence at 45°. Use glue and screws to secure one of the fences into place at 45° to the saw kerf. Once the glue on this fence has dried, use an accurate square to position the other one; secure it with glue and screws. So that the stock will have less tendency to drift while being cut, attach fine grit sandpaper onto the fixture with rubber cement.

When using this fixture, always cut matching miters. This is done by cutting the first corner of the stock on the right side of the fixture and the second corner on the left side.

Remember that all fixtures, in addition to being carefully made, should be protected so they will maintain accuracy. Carefully sand all parts before assembly. Use glue and screws to join components. After assembly, apply several coats of penetrating sealer with a light sanding between coats and another light sanding when the final coat is dry. Wax and buff those surfaces that make contact with the machine.

BEVEL CUTS

Bevel cuts are made with the worktable positioned at an angle other than 90° to the blade. Slide the carriage and the power plant all the way to the right. This will allow you to move the workpiece freely across the table without interfering with the way tubes. The angle considerations that apply to miters also apply to cross miters and bevels (Figure 3-7). The cut angle is always one-half of the joint angle.

Crosscut Bevels

To make a crosscut bevel, set the worktable at the desired angle and use the miter gauge to guide the workpiece (Figure 3-8). Mount the miter gauge on the downside of the table only. This will provide better support for the workpiece, help eliminate kickbacks, keep the miter gauge from hitting the blade, and keep your hands out of danger.

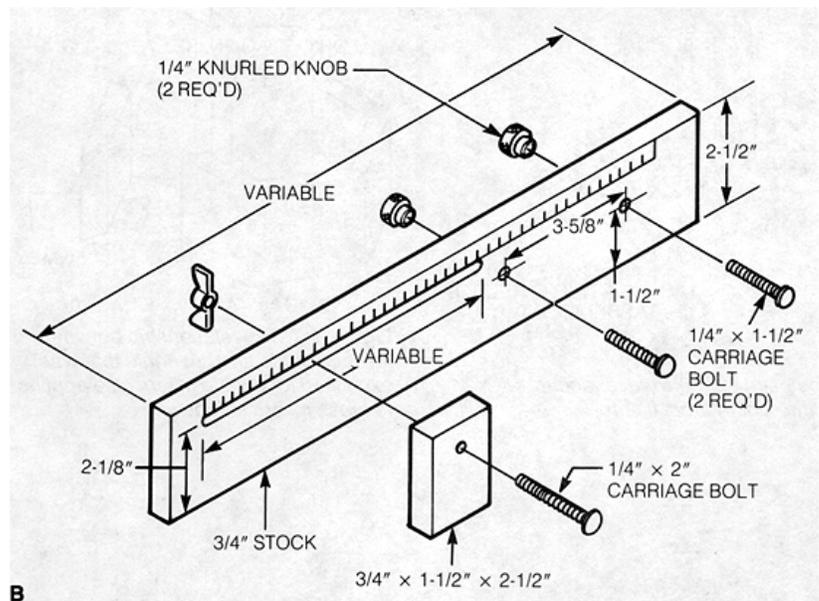


Figure 3-5. (A) A miter gauge extension with an adjustable stop can be used to cut miters on wide stock. (B) Construction details of the miter gauge extension.