

## Are you getting the most from your combo square?

BY PHILIP C. LOWE

Telling new woodworkers about the combination square is a little like being the announcer in those old commercials for the Ronco Veg-O-Matic. No, the square won't slice and it won't dice, but it *will* excel at so many woodworking jobs that it's tempting to say "But wait! There's more!"

A good combination square (Starrett or Brown & Sharpe brands are recommended—see a review in *FWW* #159) can serve as a machinist's square, a straightedge, an adjustable try square, a miter square, a marking gauge, a depth gauge, and a ruler. You'll use it to set up shop machines, to true workpieces, and to lay out and perfect joinery. In short, if you're starting out and looking for a basic tool that will help you improve your woodworking, the

### Machine setup

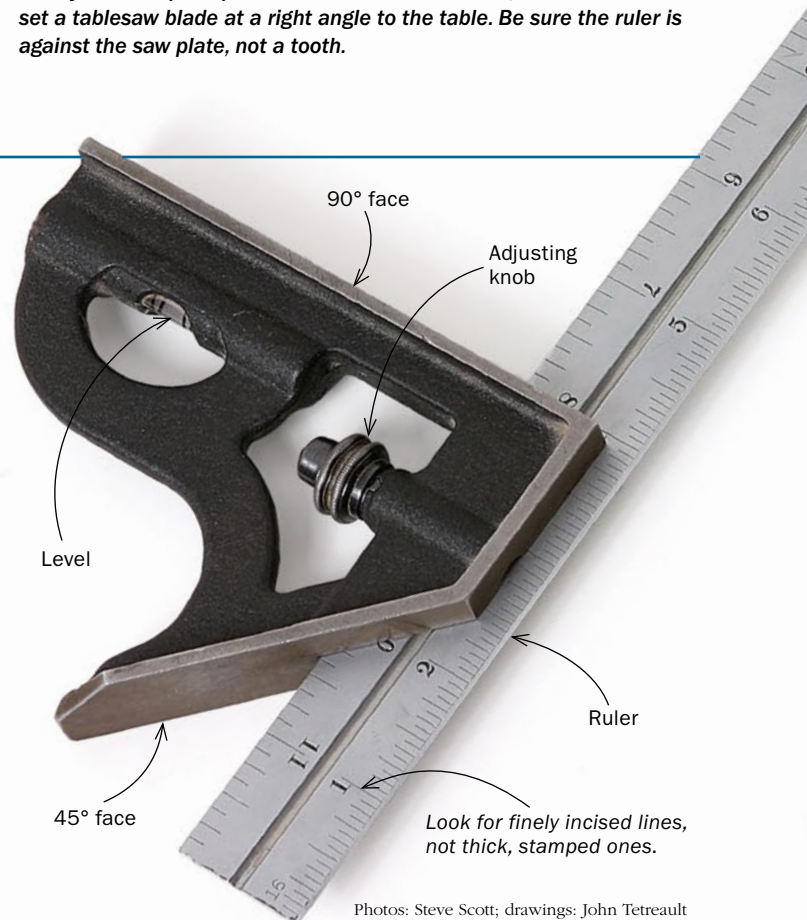


**The right angle.** The combination square can be used in a variety of ways to set up shop machines for 90° cuts. Here, Lowe uses it to set a tablesaw blade at a right angle to the table. Be sure the ruler is against the saw plate, not a tooth.

### DON'T BE AFRAID TO TAKE IT APART



**Some reassembly required.** Because the ruler is graduated differently on each edge, you will sometimes want to remove and reorient it for easier measuring. The mounting post inside the square (left) is machined to fit inside the slot in the ruler. To insert the ruler (above), push on the spring-loaded nut and turn the post until it aligns with the slot. Then slide the ruler into place.







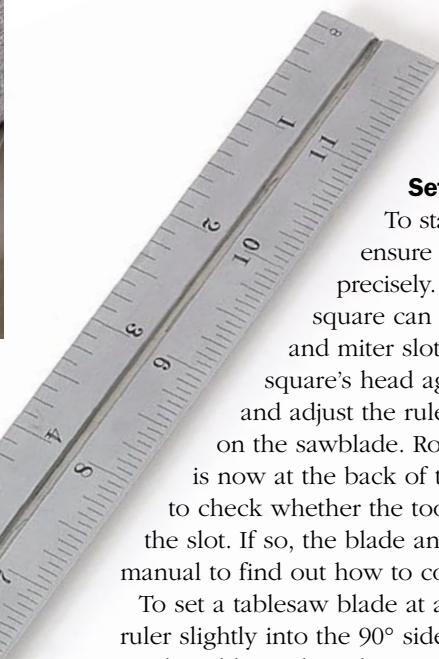
**Check sawblade and miter slot for parallel.** Use the inside edge of the miter slot as a reference surface and adjust the table if necessary.



**Setting up for square crosscuts.** Hold the combination square with its head against the miter gauge. Adjust the gauge until the square's ruler rests flush against the side of the sawblade. This ensures a 90° crosscut.



**Putting the miter in miter gauge.** Use just the head of the combination square to set a miter gauge for an accurate 45° cut.



combination square is what those old ads called an “amazing offer.”

#### Set up machines accurately

To start, a combination square will help ensure that your shop machines are set up precisely. On the tablesaw, for example, the square can be used to check that the sawblade and miter slot are parallel to each other. Set the square's head against the inside edge of the miter slot and adjust the ruler until it touches one of the front teeth on the sawblade. Rotate the sawblade so the same tooth is now at the back of the throat opening, and use the square to check whether the tooth is still at the same distance from the slot. If so, the blade and slot are parallel. If not, check the manual to find out how to correct this problem on your saw.

To set a tablesaw blade at a right angle to the table, recess the ruler slightly into the 90° side of the head. Place the head flat on the table so the ruler is standing vertically beside the sawblade. Now adjust the sawblade until there is no light between it and the ruler's edge. Lock down the blade. This also works to set a jointer fence at 90°.

A miter gauge won't deliver square crosscuts if its fence is not at 90° to the blade. To adjust it accurately, hold the combination square with its head against the fence of the gauge. Adjust the gauge until the square's ruler rests flush against the side of the sawblade.

The square can be used as a height gauge for adjusting the height of sawblades or router bits. Adjust the ruler in the head to the desired dimension. Then hold the end of the ruler against the table or router base and raise the blade or bit until it touches the head without lifting the ruler off the table.

#### The design allows precise layout

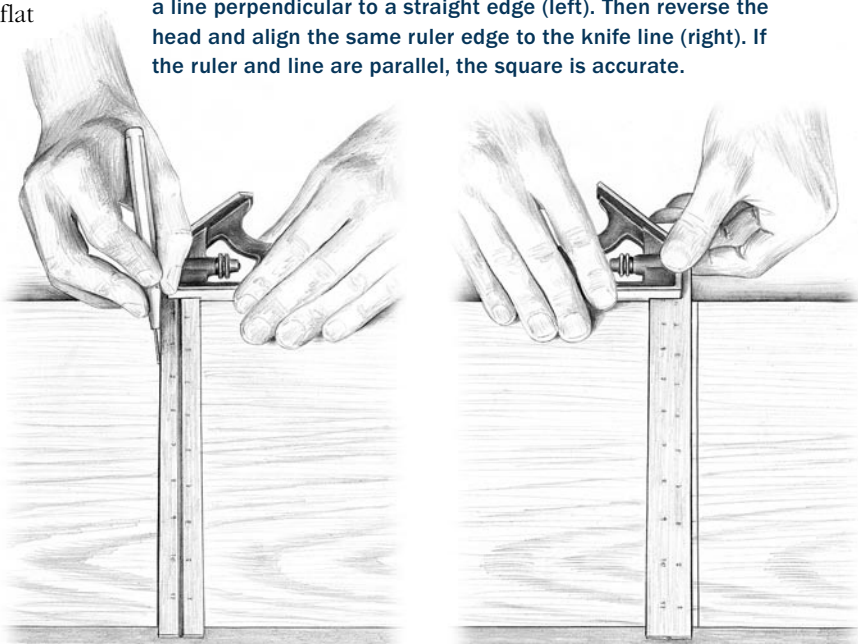
This square is also a highly useful layout tool. The flat edge milled onto a combination square's thick head acts



**An adjustable height gauge.** Set the head at the desired measurement. Hold the end of the ruler flat against the router's base and raise the bit until it touches the head without lifting the ruler.

#### HOW SQUARE IS YOUR SQUARE?

To check a square's accuracy, extend the ruler fully and score a line perpendicular to a straight edge (left). Then reverse the head and align the same ruler edge to the knife line (right). If the ruler and line are parallel, the square is accurate.





## Layout

**An etched ruler enhances accuracy.** The fine lines on a quality square are etched into the ruler, so the tip of a marking knife can be registered inside them.



**Laying out dados.** A square with a long ruler is great for laying out dados across a wide panel.



**Like a marking gauge with a built-in ruler.** The combination square allows marking parallel to an edge at adjustable distances.



**Laying out a miter.** The 45° head makes it simple to lay out for a miter cut. Finger holes help the user hold the square tightly against the stock.

as a fence, holding the ruler perpendicular to any reference surface. To score an accurate line, hold the head tight against the reference surface and use the ruler's edge as a guide for your pencil or marking knife.

If you have the 24-in. and 36-in. rulers, you can mark the locations of dados from the end of a board and transfer the same locations to a mating piece. And because the ruler is adjustable, the square can be used as a marking gauge, striking parallel lines at varying distances from the reference surface. An example is when you need to lay out a mortise in the middle of a board, farther away than a marking gauge will reach.

To do so, adjust the ruler so that its end rests at the correct distance. Now hold a pencil to the work at the ruler's end and slide the square's head along the reference surface, keeping the pencil against the ruler's end as it moves.

A similar technique can be used to transfer a layout from one workpiece to another; for example, marking drawer fronts for hardware locations. Once you've marked the location of the outer post or center for a knob, the square can be adjusted and locked in position and the same position can be marked on each drawer.

### Perfecting workpieces or joinery

One of the square's most important uses is checking that the edges and ends of workpieces are square. When doing so, hold the head of the square firmly against the reference surface and slowly lower the ruler to contact the highest point of the edge being checked.

The square is also useful for checking a workpiece for 45°. Most miters make up 90° corners and a quick check holding the outside of the head of the square can show where material may need to be taken away to form the perfect 90°.

The square's adjustable ruler lets you check a workpiece for consistent thickness. Start at one corner of the piece and hold the



## Joinery



**Checking for square and the trueness of a miter.** First, set the head of the square against the reference surface, then lower it until the ruler touches the highest point (left). Face a light source and look for a gap under the ruler.

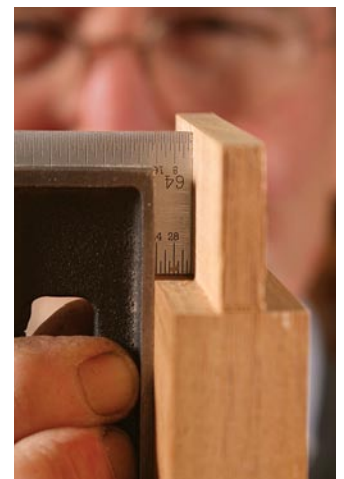


**A thickness gauge.** Adjust the ruler to match the thickness in one corner, then compare at the other three to see if the stock is consistently thick. Your fingertip will feel the slightest difference.

head of the square against a face. Adjust the ruler to match the thickness of the stock. Then use this setting to check the other corners—if the ruler protrudes beyond or is shy of the opposite surface on any of these corners, the thickness is not consistent.

A variation on the technique for gauging stock thickness allows you to check the depth of a mortise. Start by adjusting the ruler to the desired depth. Insert the ruler into the mortise; if the square's head doesn't touch the surface, the mortise is too shallow. The square also can help check the end walls of a mortise for square. Slide the edge of the ruler against the end wall. If there is a void between the ruler and the top edge of the mortise, it indicates the mortise is not square.

Tenon cheeks can be checked to make sure they are parallel with the face of the workpiece by placing the head of the square against the surfaces and extending the ruler to touch the cheek of the tenon. Since the end of the ruler is ground square to the edge, being able to view light under it will indicate how parallel the cheek is to the surface.



**Check mortises and tenons.** Adjust the ruler to the desired depth and set it into the mortise (left); if the head doesn't touch the surface, the mortise is too shallow. A square can also help check whether tenon cheeks are parallel to the face of the workpiece (right).