

LESSONS FROM A PRO

# Spot-On Measuring & Marking

By Alan Turner

If your project parts don't fit during assembly, or your joints lack that clean, tight look, your measuring and marking skills may be suspect. The fact is that errors add up. A mistake early-on can cause untold grief later, even the loss of an expensive piece of stock. At the Philadelphia Furniture Workshop, we teach newcomers the measuring and marking techniques needed for success. Following is a short course, aimed at taking your measuring and marking to the next level. (For selected measuring and marking tools in this story see the **Convenience-Plus Buying Guide**. Other tools can be found at specialty retailers and art supply stores.)

## Tools of the trade, and when to use them

I keep three subsets of marking tools for different applications. When marking rough-cut parts for milling, opt for chalk and a chalk box, both of which make easy-to-see marks that don't stain the wood (**Photo A**). Chalk dust, as shown in the photo above, is also handy for highlighting knife lines on dark wood.

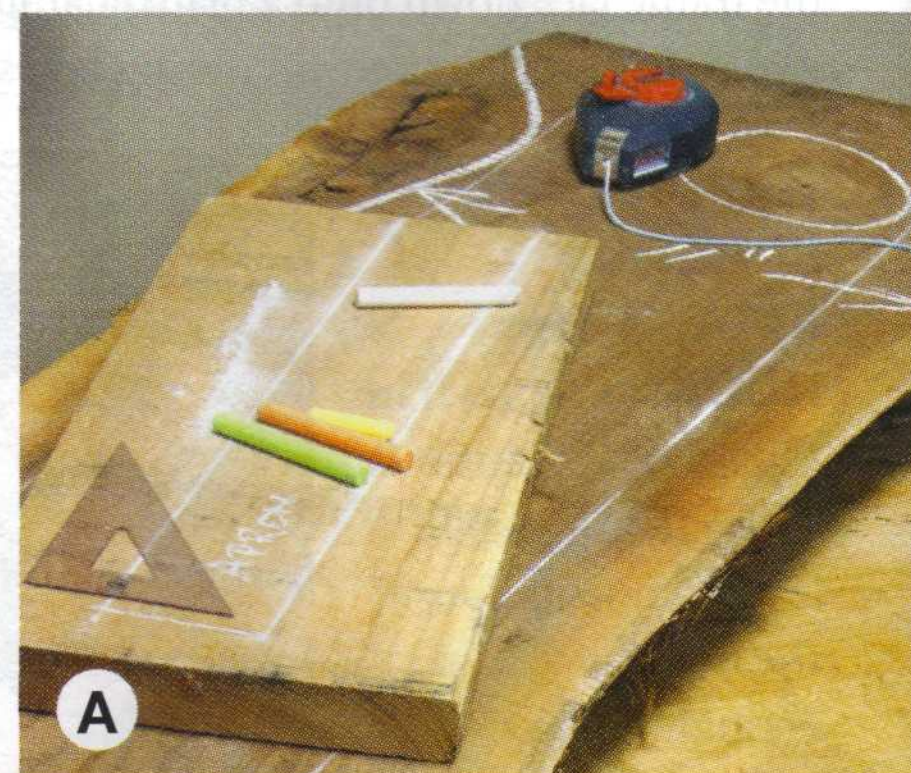
For final dimensioning and joint layout, accurate marks are a must. As shown in **Photo B**, a 1) marking wheel gauge, 2) sharp dividers, 3) eraser, 4) no. 2 pencil, 5) marking pen, 6) sharpener, 7) marking knife, 8) utility knife.



Keep this marking tool set near your bench. Pencil lines are easier to see, but scribed lines cut more cleanly.



Use a marking pen or stamped letters to mark parts in order to avoid confusion during assembly.



Mark rough stock with easy-to-erase chalk and a chalk box.

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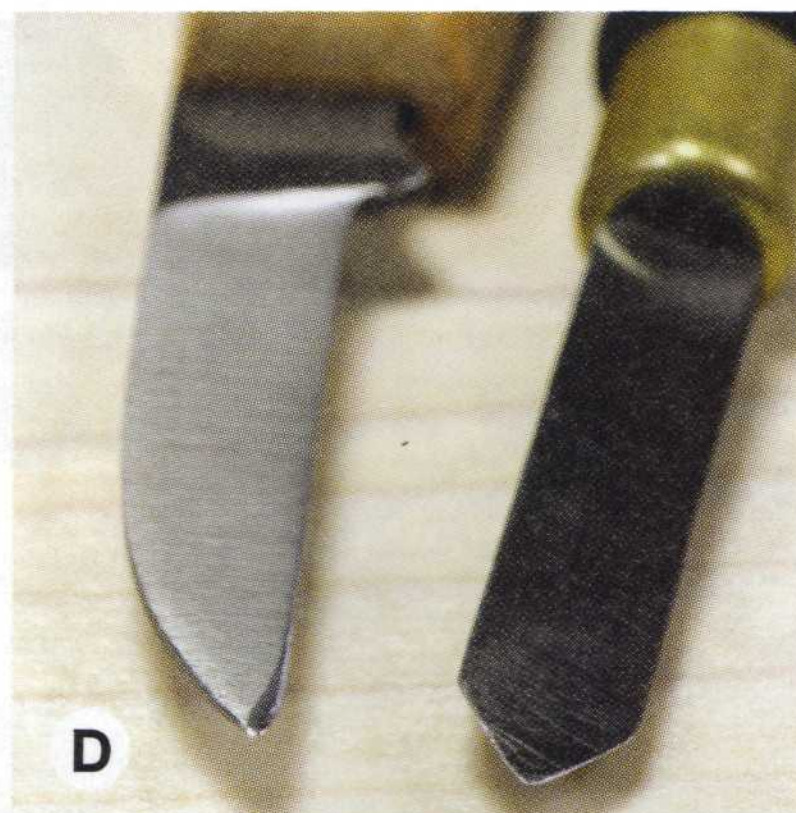
5) white charcoal pencil, 6) .3mm drafting pencil, 7) awl, and 8) marking knives make up the basic kit.

For marking project parts, I use a marking pen on the unseen faces, edges, and ends of stock as shown in **Photo C**. A number or letter punch set lets you identify parts, stamping them where they won't show as with the leg end example, also in **Photo C**. (These are useful when making multiple copies of a piece to keep all parts of each piece together during assembly.)

## On the straight and narrow

The marking knife and steel rule are the perfect pair for creating clean cut lines and marks. With these simple tools, you don't face the variable width of a pencil line. For example, you don't face the variable width of a pencil line when you split a knifed line, you can actually see half of the severed wood fibers in the inset of **Photo D**. Too, a knifed line helps you accurately register a chisel, as when cutting the recess for a mortise hinge; it also registers a knife point for further marking.

We favor two types of marking knives: one, a basic chip-carving knife which makes a deep, fine line; the other, a spear-point knife that lets you cut in opposite directions. To prepare these knives for shop use, we sharpen them well, and back



**D**

A marking knife severs wood fibers, preventing splits and providing a useful registration notch. A slightly rounded tip is less likely to follow the grain.



bevel the edges slightly so that when slid against a hardened steel rule they are less easily dulled. Slightly round the point as shown in **Photo D** so that the knife slices the wood fibers instead of chattering over a cross-grain surface or veering off course when marking with the grain. Take a light pass at first and then deepen if needed with a second pass.

When marking perpendicular to an edge or end, go with a true and reliable square. For unquestioned accuracy, it must be 90°, not a hair more or less. Any deviation will dramatically affect the end result. Choose a high quality tool, such as a Starrett, and take care of it for a lifetime of dependability. We use a 12" combination square and a 4" double square.

Steel rules play an essential role as well, and the longer the better. The 12" rule on a combination square serves a lot of needs. A quality steel rule has etched lines which will register a spear-point marking knife. A hook rule, shown in **Photo E**, permits accurate marking from an edge or end. To employ the rule, set the knife in the desired etch line and make your mark. Next, bring a square to the set knife and incise a fine cut line as shown in **Photo F**. After making the line, darken it with a pencil, as shown in **Photo G**.

### TIP ALERT

For transferring duplicate measurements quickly and accurately, without using numbers, choose dividers. Set the points using your etched rule, or directly off your work.



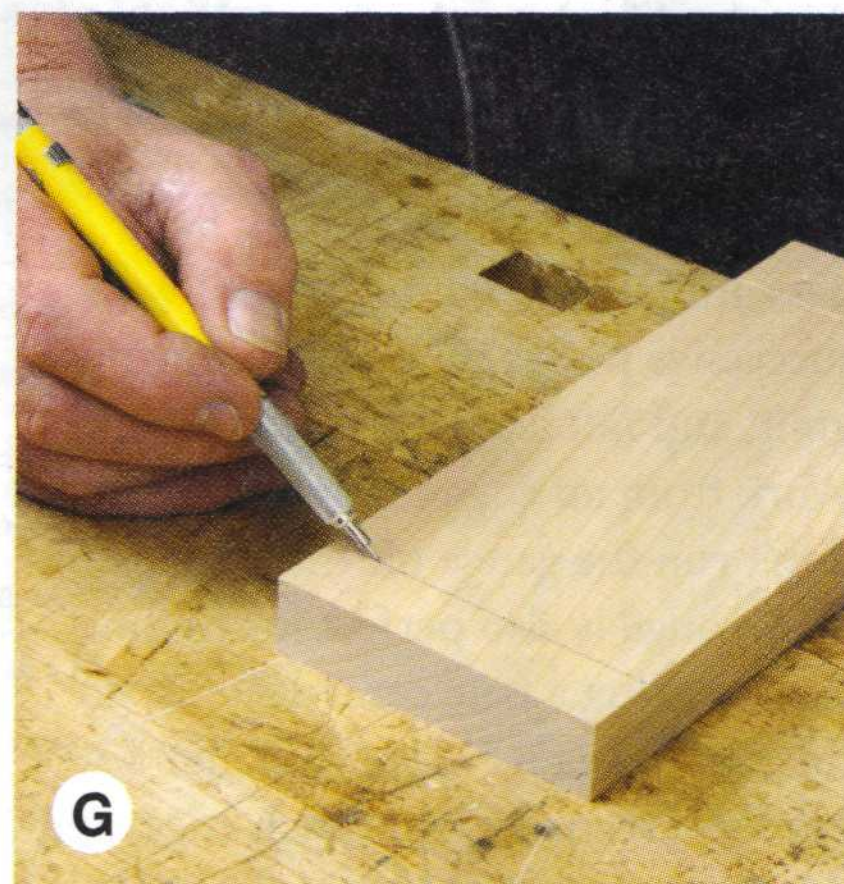
**E**

Make your mark with a hook rule and knife. Set the knife by feeling the point click into the etch line.



**F**

Use combination square to extend lines. Be sure to hold the square tight and flat to the workpiece.



**G**

Drag a .3mm drafting pencil along your knife lines to make the lines easier to see.





**H**

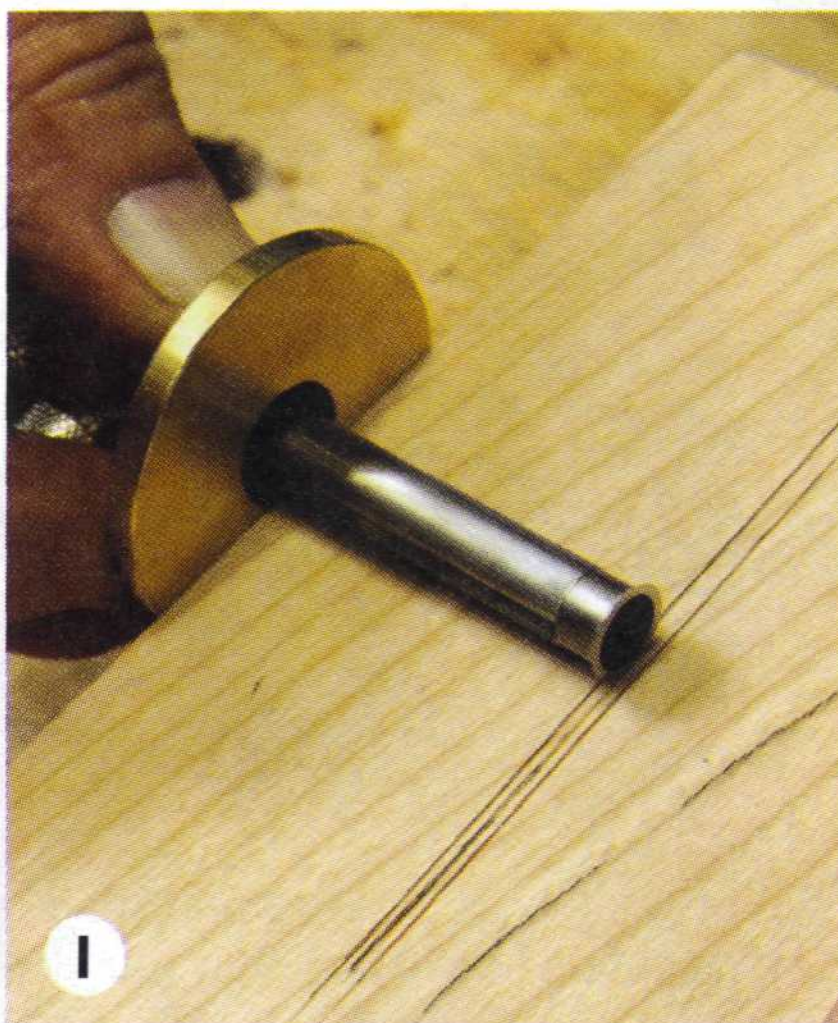
To capture an exact dimension, register the cutting wheel into a steel rule's etch mark.

## Marking gauge magic

A marking gauge is the ideal tool to set in a line parallel to an edge, for mortise and tenons or scribing the baseline for cutting dovetails. Because it's used so frequently, I suggest splurging on a better-quality metal gauge. Compared to old wooden gauges, metal gauges require no tune-up. The wheel comes hardened and sharp, and the head locks tight to the metal rod, guaranteeing clean, accurate cuts.

To use a marking gauge, set the gauge to a fixed distance by registering the wheel in the etch of a steel rule (**Photo H**), or by registering it in an already scribed line or knife mark. As with a marking knife, make a light pass at first, and then deepen it with successive passes or it may follow the grain and not leave a straight line. Work from an edge towards the center; don't run the gauge off the edge.

A gauge is also perfect for finding and marking a true centerline. To do this, set the gauge close to center by eye for test marks from each edge, and then reset, again by eye, to find the center. Test again for accuracy. One or two tries and you'll be spot-on as shown in **Photo I**.



**I**

To find the center, roughly set the gauge then run it against both edges. Reset the gauge between the two lines, and you're spot on.

## Capturing angles

An incorrectly measured angle can pose a significant problem. To get it right, rely on a steel (also known as an engineer's) protractor to set a known angle, holding the tool snug to a board's edge and scribing as shown in **Photo J**. To repeat the angle elsewhere, capture it by setting a sliding bevel to the marked protractor angle and locking it in. When doing so, hold the



**J**

Use a steel protractor to set an angle then mark it on scrap with a fine-point pencil.

## SEE THE MARK WITH STORE-BOUGHT HELP

If your cuts aren't always on the mark, your tools might not be the problem. Sharp eyesight is critical for precise measuring and marking, but seeing knife lines and tick marks can be tough, especially with old eyes. For help, consider using optical aids for close work. Here are a few options. At right is an Optivisor with a clip-on LED light. At left are jeweler's glasses, available at a findings shop. Different focal lengths are available, with the stronger magnification having a shorter focal length.



sliding T-bevel to the fine pencil line made with the protractor as shown in **Photo K**. Leave a small space, about  $\frac{1}{16}$ " between the line and the sliding bevel's edge. One's eye is remarkably accurate at judging parallel lines.



**K**

Set the sliding bevel then slide it  $\frac{1}{16}$ " away from the line. Check for parallel by eye, tighten the bevel, then mark your stock.





Large frames deserve square corners. Use a folding rule to measure the diagonals. When the dimensions are equal, your frame is square.

While the protractor could be used for several identical marks, it generally will not hold a setting securely enough for shop use. The T-bevel works from either face to establish the reverse angle, as when scribing both sides of a dovetail. Use it with a marking knife when incising a line.

## Measuring diagonals

On any rectangular structure, if the diagonals are exactly the same, the construction is a true rectangle with exact 90° corners. For diagonals under 6', we use a traditional carpenter's folding extension rule as shown in

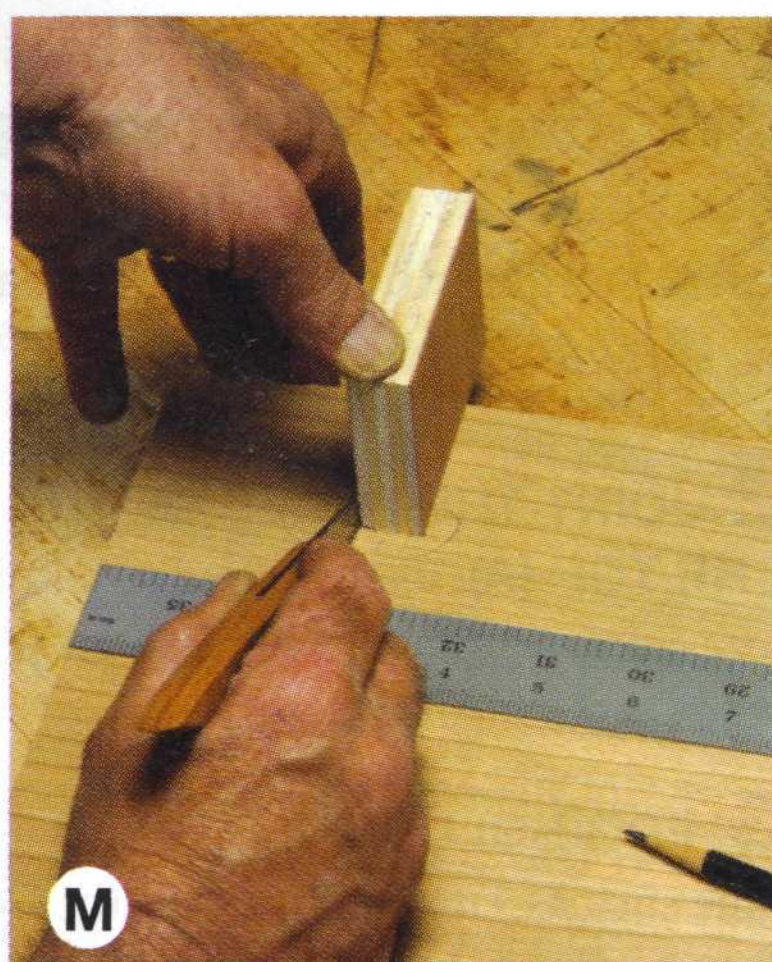
**Photo L.** Unlike a tape measure, it fits neatly into the corners and does not sag.

## Measure off the project, not the page

In the ideal world, your project would perfectly match the dimensions found in the plans and magazines. But in truth, those dimensions start breaking down at the first cut. This is why you should make a

habit of measuring off your project and marking to fit. For example, one would not build the drawers before the chest openings were created. Your best bet: measure the actual openings from the piece itself, in other words, in its as-built condition. Here, rather than use a steel rule or tape, capture the needed dimensions on a storyboard held against the piece, incising it with a marking knife for a perfect fit.

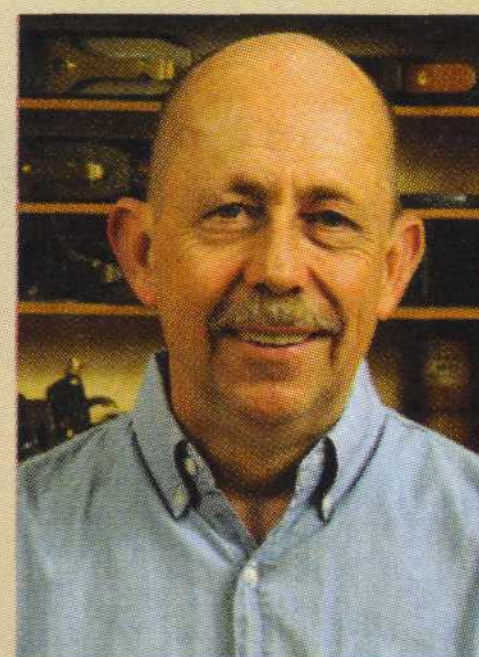
Similarly, when sizing dados in cabinet sides for shelving, set in your first mark on the part face using a steel hook rule. Using a knife,



Marking from parts can be faster, and more accurate than using a rule.

## About the Author

The founder of Philadelphia Furniture Workshop, Alan Turner teaches a



full range of furniture-making skills. Active in commission work, he has been working wood for over 50 years, having first

learned from his father, a fine amateur cabinetmaker. Left to his own devices, he will design in the Queen Anne style, but feels comfortable with most genres. Decorative refinements and fitting joinery using hand tools rank among his favorite ways to spend quiet time. For more about the school, go to [philadelphiafurnitureworkshop.com](http://philadelphiafurnitureworkshop.com).

register in the etch line where needed for the shelf bottom locations. Now, cut a scrap from the shelf material and employ it as gauge and set the second line as shown in **Photo M.** That the plywood is not exactly  $\frac{3}{4}$ " will not matter a bit; you will have a clean, tight joint. 🌲

## Convenience-PLUS BUYING GUIDE

	ITEM	WOODCRAFT #	PRICE
<input type="checkbox"/> 1.	Veritas Wheel Marking Gauge	127929	\$36.99
<input type="checkbox"/> 2.	C.S. Osborne Loose Leg Wing Dividers, 6"	06C21	\$62.99
<input type="checkbox"/> 3.	Rosewood Round Blade Awl	03H22	\$19.50
<input type="checkbox"/> 4.	Pfeil Swiss Made Spear-Point Marking Knife	05Z25	\$14.99
<input type="checkbox"/> 5.	Pfeil Chip-Carving Knife	05Z11	\$13.99
<input type="checkbox"/> 6.	37-IN-1 Stamping Tool Set	129270	\$17.50
<input type="checkbox"/> 7.	Woodcraft Hook Rule, 6"	128292	\$15.99
<input type="checkbox"/> 8.	Starrett 12" Combination Square	06R12	\$74.99
<input type="checkbox"/> 9.	General Square Head Protractor	85O45	\$18.99
<input type="checkbox"/> 10.	6" Stainless Steel Sliding Bevel	147960	\$19.99
<input type="checkbox"/> 11.	Rhino Folding Rule, Fiberglass, 6'	148596	\$19.99
<input type="checkbox"/> 12.	Woodcraft Shop Rule, 24"	129209	\$40.99
<input type="checkbox"/> 13.	Optivisor (without lenses)	09P23	\$24.99
<input type="checkbox"/> 14.	Optivisor 2.0x lens 2.5x lens, 09P16; 3.5x lens 09P18	09P15	\$26.99

Above items are available at Woodcraft stores, [woodcraft.com](http://woodcraft.com) or by calling (800) 225-1153. Prices subject to change without notice.