

Setting Up Shop

Three pros give advice on outfitting a first shop

What tools do you need to set up a good basic shop to make functional furnishings you can be proud of? That's the question I posed to three accomplished woodworkers—and teachers of woodworking. Independently, each affirmed the importance of both accurate, reliable power tools and high-quality hand tools in the modern woodworking shop. Though sometimes contradictory, the advice they offer is surprisingly consistent. And where it varies it's often because of their different backgrounds and the kinds of work they do.

Peter Korn was a professional furnituremaker for 12 years and taught furniture design at Drexel University for four of those years before becoming director of the woodworking program at Anderson Ranch Arts Center in 1986. He has written numerous magazine articles and newspaper columns on woodworking, and his book, *Working with Wood: The Basics of Craftsmanship*, was published

by The Taunton Press in April. Korn left Anderson Ranch last December to start his own woodworking school, the Center for Furniture Craftsmanship, which is in Hope, Maine. The school offers two-week courses for basic and intermediate woodworkers.

Mario Rodriguez is a cabinetmaker and 18th-century woodworking consultant. He's been making 18th- and 19th-century reproductions for the past 12 years, specializing in Windsor chairs. He has been adjunct assistant professor of woodworking for the Fashion Institute of Technology's antique restoration program for the past five years and has lectured at the Brooklyn Museum, the Cooper-Hewitt Museum, Sotheby's, the Royal Oak Society and for other groups interested in Early American woodworking. He also teaches at Warwick Country Workshops in Warwick, N.Y. Subjects taught have included planemaking and use, dovetailing and veneering.

Mark Duginske, a contributing editor to *Fine Woodworking*, is a fourth-generation woodworker. His books include *The Band Saw Handbook*, *Rand Saw Basics*, *The Band Saw Pattern Book*, *Precision Machinery Techniques* and most recently, *Mastering Woodworking Machines*, which was published by The Taunton Press last year. He has also done two videos, one accompanying his most recent book and the other called *Mastering Your Bandsaw*. His restoration work on the Frank Lloyd Wright home and studio in Oak Park, Ill. has been featured on *This Old House* and PBS's *Frank Lloyd Wright* special.

Although workshops are as individual as their owners, there's a common thread of good sense in the suggestions these three teachers and woodworkers have to offer. If you think we've forgotten something, though, or if you'd just like to comment on the subject of setting up shop, drop me a line. I'd be glad to hear from you. □

Vincent Laurence is associate editor at Fine Woodworking.

It takes time, money and good sense to outfit a complete shop, but the principles involved are simple: Buy the best you can afford, cultivate hand-tool skills and acquire machines to perform those tasks for which they're best suited—the brute work of getting stock square, true and to size.



Peter Korn: Building a foundation for a lifetime of craftsmanship

Every year I teach classes in basic wood-working, and every year the students want to know which tools they should buy to set up their first workshop. The answer, of course, depends upon what they want to make and how. I teach the skills necessary for building fine furniture, emphasizing the use of machinery for milling rough lumber foursquare and hand tools for cutting joinery and smoothing surfaces. Machinery and hand tools are complementary aspects of a contemporary fine furniture workshop.

Whether you're setting up a home workshop or starting a small woodworking business, you should acquire the same basic equipment. In neither case should you stint on quality. Good tools may not ensure good work, but poorly made, undersized or underpowered tools will adversely affect both your results and the pleasure you take in the work. Unlike most consumer items, whose obsolescence is engineered in, good woodworking hand tools and machinery will last a lifetime and beyond; if you buy the best from the start, you'll only have to buy once. In general, I consider Delta and Porter-Cable to be the minimum acceptable standard against which the quality of other power tools should be measured.

Power tools

If I could have only one piece of machinery in my workshop, it would be a bandsaw. This versatile tool can do anything from the brute work of resawing a 6-in. hardwood beam into planks to the delicate work of cutting the curves for a cabriole leg. With a bandsaw, handplanes and a little sweat, rough lumber can be milled perfectly foursquare. A 14-in. bandsaw is the standard size for most home and small professional shops. You should expect to pay around \$700.

The truth is, though, I wouldn't consider getting started without a tablesaw, jointer and thickness planer if I could possibly afford them. Straight, flat, square stock is vital to well-crafted furniture, and these three tools work together to make the milling process easy.

The tablesaw is useful for many other tasks as well, such as making dadoes, tongues, tenons and miters. I recommend buying a good 10-in. tablesaw with a 3-hp motor, such as the Delta Unisaw, which will cost you around \$1,500. If you try to save money by purchasing a smaller saw



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or a weaker motor, you will be itching to upgrade in no time at all.

I started my own shop with a 6-in. jointer, but if I had to do it over again, I would purchase an 8-in. jointer or an even wider one. Those extra inches of cutterhead width significantly reduce the number of boards you will have to flatten with handplanes or saw apart, joint and re-glue because they are too wide for the jointer. A good 8-in. jointer will run you approximately \$1,500.

My first planer was a 12-in. Parks, sold by Sears in 1952. I found it abandoned and in pieces in the corner of someone's shop in 1977. While it's not a huge machine, it's been fine for me as a one-off furniture-maker. If I were buying a planer today, I'd stay away from the myriad of lightweight, portable offerings and get something built to last. I've heard good things about the Makita, Hitachi and Delta DC-33 stationary planers. Expect to pay upward of \$1,300 for a solid 15-in. planer.

I've also heard good reports from students about some of the better jointer/planer combinations, such as the Robland and the Minimax, but I haven't tried them. Combination jointer/planers may be a good idea for woodworkers with little shop space and/or limited budgets, but

separate machines provide an element of convenience I would hate to forego. I am constantly moving back and forth from jointer to planer, so pausing to change one into the other would slow me down considerably. Though I've only used separate machines, I also suspect that they hold their settings more dependably than do the combination machines.

A drill press, for accurate, straight boring of holes, is the final piece of stationary power equipment essential to a woodworking shop. The size of the drill press isn't all that important, and variable speed isn't really necessary either. Any drill press will do as long as its run-out is minimal, it has an adjustable depth stop and the table is square to the quill. A satisfactory drill press can be had for \$300.

Other stationary power tools that are useful but secondary in importance are a lathe, a radial-arm saw or chop saw, a compressor and a belt/disc sander. A vacuum system makes a shop more pleasant to work in, but a dust mask and a broom probably make more fiscal sense—especially when you're just getting started.

Other power tools

Among smaller and portable power tools, I would purchase a grinder, drill and router straight off. A circular saw, jigsaw and biscuit joiner can wait, as can palm, belt and random-orbital sanders.

A grinder is indispensable for keeping chisels and planes sharp. You can get a cheap one for about \$50, but if you can afford to—and they're substantially more expensive—you should buy a grinder that spins at about 1,750 rpm, rather than the standard 3,200 rpm to 3,400 rpm. A slower grinder is less likely to overheat steel and destroy its temper.

A router is perhaps the most versatile tool in the shop. A small router with a 1/4-in. collet is perfectly adequate for a small shop. My first choice would be Elu's 1-hp variable-speed plunge router, which features a soft start. It is a sweet little machine—just a pleasure to use, and at about \$170, it is a very good buy.

My first portable power drill would be a 3/8-in. variable-speed, reversible model. One of its main functions would be to drive drywall screws when building jigs and fixtures in the shop. Milwaukee makes some of the most reliable drills, but they're also among the most expensive—about \$120 for the model I recommend.

Hand tools

While you may not think of it as a hand tool, the workbench is where most of your handwork takes place. It may well be your single most important tool. A good workbench should have a flat top, be sturdy enough to take a pounding and not wobble. The bench should also have both tail vise and shoulder vise or the equivalent. If you can't afford to buy a good European workbench (about \$1,200), building your own bench should be one of the first projects for your new shop. You can find the bench hardware for about \$115.

I've found the following hand tools to be indispensable. I've explained briefly what each is used for as well as what you should expect to pay for a good tool, assuming you shop smart.

Folding rule and a tape measure. My favorite measuring device is a 6-ft. Lufkin Red End carpenter's rule with extension slide. It's durable, handy and accurate. \$18 (for the folding rule) and \$14 (for the tape).

Square. I use several squares regularly: a 4-in. engineer's square, a 6-in. try square and a 10-in. try square. If I had to settle for only one square, it would probably be either a 10-in. or 12-in. try square. \$25 (for a 10-in. try square).

Sliding T-bevel. Indispensable for marking out dovetails and angles. \$14.

Mat knife. For many purposes including marking out joinery. \$4.

Chisels. I recommend buying a set of durable, plastic-handled bench chisels, such as Marples Blue Chip, in sizes 1/4in., 3/16in., 3/8in., 1/2in., 3/4in. and 1 in. \$45.

Shop environment

A good shop environment is as important as which tools you buy. Adequate lighting is essential, and a window can help keep a small shop from feeling like a prison cell. One of my first workshops was a dark, 150-sq.-ft. concrete basement where I had to stoop to duck pipes and beams—it was depressing. My next shop was a one-car garage (200 sq. ft.), then a two-car garage (400 sq. ft.), then a storefront in New York's Little Italy (250 sq. ft.) and, at last, a 1,200-sq.-ft. loft in an old factory. Based on experience, I'd say the smallest comfortable size for a woodshop is 400 sq. ft., although I would choose to make furniture in a smaller space rather than not at all. —P.K.

Handplanes. The first two I'd get are a block plane and a jack plane. The block plane is for planing joints flush, planing across end grain, fairing convex curves, and breaking edges. The jack plane is for flattening wide roughsawn lumber and for smoothing machined surfaces. \$45 (block plane) and \$73 (jack plane).

Marking and mortising gauges (or a combination gauge). For marking mortises, tenons, dovetail shoulders and for marking stock to be resawn. \$34 (for a combination gauge).

Hand scraper. For smoothing surfaces. Sandvik makes the best. \$7.

Hacksaw. For cutting joinery. I use a small, inexpensive saw with a 10 in. by 1 1/8 in. blade. Its 21 tiny teeth per inch leave a very thin kerf. \$13.

Coping saw. For removing waste when cutting dovetails and for sawing interior curves. \$14.

Awl. For marking pilot holes. \$7.

Wooden mallet. For driving chisels. \$14.

Hammer. For a multitude of uses. \$16.

Twist drill bits. From 1/16 in. to 1/2 in., by 64ths. \$48.

Brad-point bits. From 1/4 in. to 1/2 in. by 16ths, plus 5/8 in. and 3/4 in. \$40.

Half-round rasp and wood file. For smoothing curves and shaping edges. \$16 and \$14.

Mill bastard file, 8 in. For scraper preparation and for odd bits of metal filing. \$6.

Water stones, 1,000-grit and 6,000-grit. For sharpening chisels and plane blades. \$47 for the pair.

Clamps. I recommend buying six 2 1/2-in. C-clamps, six 12-in. quick-action clamps, six 24-in. quick-action clamps, and six 4-ft. bar clamps. About \$275.

Although \$6,500 or so (a rough total) may seem like a lot of money now, it is almost a negligible sum when amortized over a lifetime of pleasure, productivity and value. Buying good tools to start with and making sure that they're the right tools for the job, will get you off to a good beginning on your career as a craftsman.

—Peter Korn

Mario Rodriguez: Quality hand tools and a few machines—a good start

When you decide to set up shop, you're immediately faced with decisions about space, equipment and tools. As your skills and experience grow, so will your collection of tools. But, to get you started, here's a good basic kit.

My suggestions are heavy on hand tools because I believe in a strong foundation of hand skills. But a combination of hand tools and machines enables a woodworker to achieve speed *and* practice a high level of craftsmanship.

Stationary power tools

Bandsaw. If I could have only one or the other, I'd choose a bandsaw over a table-

saw. Bandsaws are cheaper, take up less floor space, can resaw and cut curves and are considerably quieter than the tablesaw. With a good, well-tuned machine, the quality of cut is excellent. And while it's true that a bandsaw's rip capacity is limited to its throat size, a resourceful wood-worker can work around that. You can get a good bandsaw (the Delta 14 in., for example) for as little as \$650.

Jointer. Buy the best and largest jointer that you can afford. A jointer is useful for cleaning up edges cut on the bandsaw, straightening and squaring edges for gluing, and for flattening boards. The Delta 6 in. sells for about \$1,100.

Sliding compound miter saw. This saw is invaluable for clean and accurate cross-cuts and miters. The sliding-arm feature lets you crosscut up to 12 in. wide (like a small radial-arm saw). Look for a model that takes a 10-in. blade instead of an 8 1/2-in. blade. Not everyone carries 8 1/2-in. replacement blades. I like Makita's version, which sells for around \$450.

Portable power tools

Router. You can do it all with this tool: dado, rabbet, mortise, joint or shape an edge, or follow a template. Porter-Cable's 7/8-hp router is a good value at \$110.

Drill, 3/8 in. In addition to using it to drill

holes, you can also use it for driving screws, light grinding and polishing. A basic unit can be had for \$50.

Hand tools

Chisels. Buy a good set of wooden-handled bench chisels ($\frac{1}{4}$ in., $\frac{1}{2}$ in., $\frac{3}{4}$ in., 1 in.) and a $\frac{1}{4}$ -in. mortise chisel. Wooden handles are more comfortable and more visually appealing than plastic, and if ever they split or get chipped, you can replace them with little effort. I prefer traditional Western chisels (mine are made by Sorby) as opposed to Japanese chisels, which I think require too much work, especially if you're just getting started in woodworking. If you can afford to, buy a 2-in.-wide bench chisel in addition to the four smaller ones. Its extra-wide blade is ideal for paring tenons. A set of four Sorby chisels costs about \$80, the mortise chisel about \$30 and the 2-in. paring chisel about \$40.

Sharpening stones. I prefer waterstones because they're cleaner than oilstones. I use 800-, 1200-, 4000- and 6000-grit stones.

Combination square, 12 in. This tool will mark out stock at 90° and 45° and can double as a ruler and a marking gauge. Buy the best you can afford: Starrett and Browne & Sharpe are both good brands. You can find the Starrett for about \$50.

Engineer's square, 3 in. This is great for marking out and checking small parts and edges. It's smaller and handier than the combination square and generally more accurate. You can get a 3-in. engineer's square for around \$5.

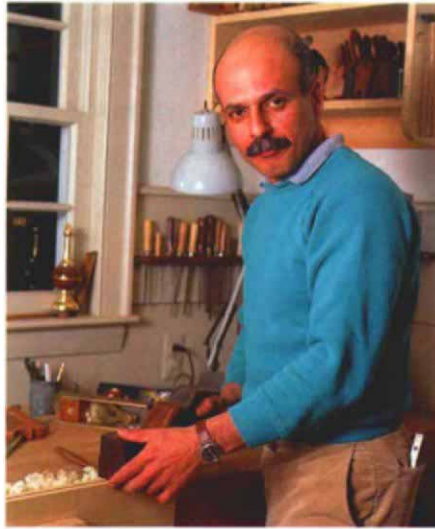
Sliding bevel. This is an essential layout tool used for setting and copying angles. Shinwa makes a compact and inexpensive version (about \$10).

Hammer. A good 13-oz. claw hammer is ideal for general cabinet work and is useful for installation work as well. I use a one-piece, leather-handled Estwing, which costs about \$18.

Carver's mallet. This is useful for driving joints home and for chopping out mortises. I like a medium-sized turned lignum vitae mallet. Expect to pay about \$15.

Marking gauge. I use a compact version made by Reed, which, unfortunately, is no longer in production. It's simple, keeps its setting and has a removable (and replaceable) blade for easy sharpening. Starrett makes a very similar gauge (their #29A) for around \$30.

Marking knife. I use a pointed chip-carving knife for marking joints. Its slim, pointed tip lets me scribe a good line even in very tight spots, and the shape of the blade allows me to apply pressure for a deeper cut when needed. Less than \$10.



"A craftsman's training should be based on a strong foundation of hand skills."

Folding rule, 6ft. I prefer a ruler over tape. I find it more accurate for cabinetwork, particularly when measuring inside cabinets and checking diagonals. Lufkin's Red End is the best and costs about \$18.

Dovetail and tenon saws. For cutting small pieces, I use an 8-in. dovetail saw with a turned handle and 18 teeth per inch (t.p.i.). I use a 10-in. brass-backed dovetail saw with 14 t.p.i. for cutting dovetails and tenons. Japanese saws will also do a great job, but they can require delicate handling, and replacement blades are often expensive. Expect to pay about \$10 for the dovetail saw with the turned handle and about \$40 for the brass-backed model.

Block plane. I recommend the Lie-Nielsen block plane, either the low-angle or the regular. Solid, compact and well-made, it's the best block plane on the market. A block plane is useful for planing small parts, flushing surfaces and planing end grain. It sells for \$75.

Smoothing plane, #3. A smoothing plane is used for final planing of surfaces as well as for shooting edges on short pieces and for fairing joints. I don't care for any of the smoothing planes on the market for under \$100; they're just not made as well as they used to be. I think a reconditioned Stanley, pre-1940, is your best value. I got mine from Tom Witte, an antique tool dealer (P.O. Box 399, Mattawan, Mich. 49071; 616-668-4161). Expect to pay from \$60 to \$85 for a good used #3.

Rabbet plane. There are several planes that fit the bill, but the Stanley #93 is the most versatile because its front half can be removed to convert it to a chisel plane. This plane is used to trim rabbets, plane into corners and trim joints flush. It costs about \$80.

Cabinet scraper. I use Sandvik scrapers. They're inexpensive, work well and last forever (I still use one I bought over 14 years ago). Scrapers are good for smoothing hardwood and veneered surfaces, either before or in lieu of sanding. You can get a Sandvik scraper for about \$6.

These tools are just a beginning. I've tried to keep the list short both to keep your initial outlay of cash from getting out of hand and because it's a good idea to become comfortable and familiar with the basics before adding to your collection. Just remember: Buy the best tools you can afford, take care of them and keep your blades sharp. —Mario Rodriguez



A basic kit of hand tools doesn't have to cost a fortune or take up a lot of space. Here, with some changes and additions, is Mario Rodriguez's basic kit. The chisel handles (and the brass-backed dovetail saw's handle) are all replacements made by Rodriguez.

Mark Duginske: Buy the basics, and know when not to compromise

Setting up shop takes money, but it also takes time, thought and energy: a room full of tools doesn't make a shop. It's important to reach a point of critical mass, though, having all the tools you need to do a job adequately. And while you don't want junk, you're better off with a shop full of inexpensive tools that allow you to get the job done than only one high-quality tool that leaves you stuck. At the same time, I believe, you're better off buying a good tool and buying it once. The trick is to know when a tool is good enough.

Tablesaw

The tablesaw is at the center of more shops, both figuratively and literally, than probably any other machine. This is partially because of the now ubiquitous use of sheet goods, which the tablesaw alone among stationary woodworking equipment is able to cut down to size. But it's also because the tablesaw can rip stock far more cleanly than the bandsaw and more safely than the radial-arm saw.

Your choices for under \$1,000 are the Taiwanese contractor's saws (sold under more names than I can keep up with) and the Delta contractor's saw. The Delta is well-made, easily adjustable and it holds its adjustments well. The problem with the Taiwanese saws is their inconsistency. Some are fine out of the box, but I've also seen one on which it was impossible to align the blade with the miter-gauge slot without disassembling the saw and filing out the trunnion holes. On other Taiwanese tablesaws, I've seen the finish on the inside of the miter-gauge slot as rough as a file. If you take the time to expand your miter bar to fit the slot tightly (either with a prick punch or by peening the bar), the adjustment will wear away very rapidly by the rough side wall. If you're going to buy a Taiwanese saw, buy it from a local dealer, and check it out before any cash changes hands.

Two of the best used tablesaws are the Inca 259 and Delta's old 9-in. contractor's saw. Both are excellent machines; if you see one for a reasonable sum, jump on it. Another excellent used saw is the Delta tilting arbor saw, which had cast-iron wings like the Unisaw, but an open base like the contractor's saw.

Bandsaw

If you can afford only one really good tool, make it the bandsaw, especially if you'd like to do restoration work or any kind of



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work that requires curve cutting. There are only two choices for an affordable first-rate bandsaw: the Inca 340 and the 14-in. Delta. Both are fine pieces of equipment and each has its strengths. The Inca weighs only 60 lbs., which makes it quite portable. Also, with its optional micro-adjuster, it's well-suited for joinery, such as cutting tenons and dovetails. The Delta's strength is its resaw capacity, which, with the optional riser block, is 12 in.

As for used tools, I'd look for a 14-in. Delta or an old Sears with a tilting table.

Saws for crosscutting

If you're doing more carpentry-type construction or you're just doing a lot of crosscutting, particularly of long pieces, then you should consider buying a radial-arm or a sliding-compound miter saw, which has replaced the radial arm for most contractors and for many—if not most—woodworkers. The sliding-compound miter saw has no rip capability, but it can crosscut up to 12 in. on most models and can cut accurate 45° and other miters as well as compound angles. These saws are portable, and their simple design keeps them surprisingly accurate.

Jointers and planers

The Ryobi and some of the other small planers have transformed the small shop

by bringing the price of a planer into the range of most woodworkers' budgets. Along with a 6-in. jointer and a contractor's saw, anyone can afford to dimension his own stock now. Bring a reliable straightedge with you to check the beds when shopping for a jointer. A jointer is a precision-oriented tool, and its beds must be flat and parallel.

A combination jointer/planer is another affordable way to set yourself up to prepare stock. Hitachi, Inca and Robland make very good jointer/planers.

Gadgets and gimmicks: beware

Hand-tool skills and basic power-tool savvy are a woodworker's best foundation. A disturbing trend I've noticed in the past few years, primarily at woodworking shows, is the number of beginning woodworkers buying gadgets and gimmicks rather than investing in solid, basic tools. Granted, the basic power tools represent a more significant investment, but these jigs, fixtures and whatnot that promise to deliver flawless joinery with no effort are only distractions that insulate novice woodworkers from acquiring basic hand skills and mechanical knowledge.

The combination of hand-tool skills, a router and some medium-sized, well-tuned decent equipment will allow you to do just about anything. You may not get it done as quickly as if you had each one of Delta's industrial tools, but you will be able to do a variety of quality work without spending a ton of cash on equipment.

Buying tools is only part of becoming a woodworker. The other ingredient is skill, which is purchased with time and determination. Each tool—whether power or hand—has its own learning curve. The current trend—to learn machine woodworking before developing hand-tool skills—is backward. Compounding this problem, or perhaps causing it, is that we as a culture are so goal-oriented that we have to make things right away rather than playing with a tool and getting to know it. It's possible to develop the same kind of intimacy with power tools as you develop with hand tools, but it doesn't happen when you're in a mad rush to finish a project. Traditionally, knowledge was gained by continuous repetition during an apprenticeship period. Today, experimentation and practice are the best ways to learn. But there are no shortcuts—no matter how much you're willing to pay.

—Mark Duginske