

2013 ANNUAL REVIEW: Woodshop Tools & Supplies



**Top Picks
and Hot New
Products!**

The Latest!

- Stationary Tools
- Benchtop Tools
- Handheld Tools
- Accessories



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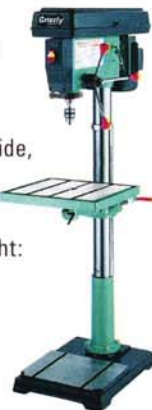
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- Swing: 20"
- Drill chuck: 1/64"-5/8"
- Drilling capacity: 1 $\frac{1}{4}$ " steel
- Spindle taper: MT #4
- Spindle travel: 4 $\frac{3}{4}$ "
- Number of speeds: 12 (210, 310, 400, 440, 630, 670, 1260, 1430, 1650, 2050, 2350, 3300 RPM)
- Collar size: 3.623"
- Precision-ground cast iron table size: 18 $\frac{3}{4}$ " x 16 $\frac{3}{4}$ "
- Table T-slot size: 3/4" wide, 4 $\frac{1}{4}$ " on centers
- Overall height: 70 $\frac{3}{4}$ "
- Approx. shipping weight: 331 lbs.

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- Max. cutting width: 15", height: 8"
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Quality handheld power tools are in rich supply these days. This year, we surveyed the latest technology in drill/drivers and tested an exciting new category of compact plunge routers. If you're in the market for a new quarter-sheet sander, we reviewed them as well. Learn about all of these tools, plus other brand-new products in this section.

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ANNUAL TOOL GUIDE: SPRING 2013

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Stationary & Benchtop Tools

Most woodworkers turn to stationary and benchtop power tools to do the bulk of workpiece fabrication. In 2012, our editors reviewed mid-size and benchtop band saws, plus today's feature-packed benchtop router tables. A variety of exciting new tools came to market, too, and those are featured on pages 8 and 9 of this section.

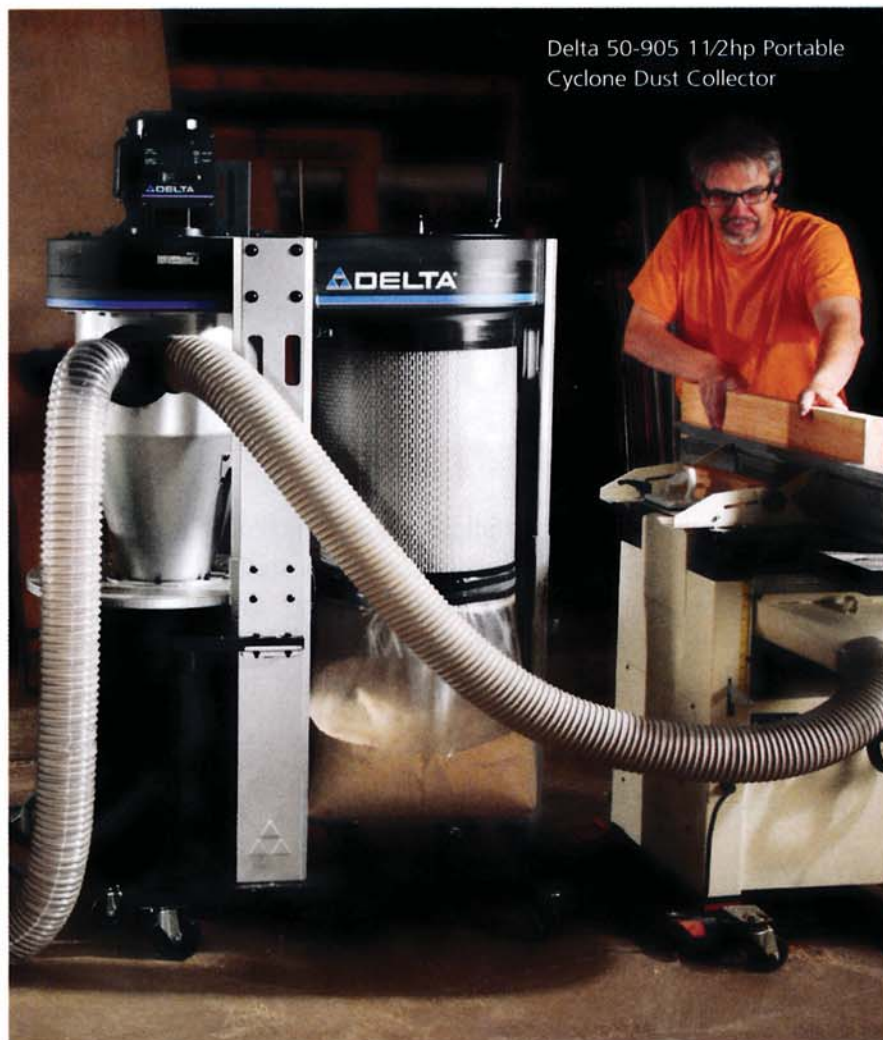
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New Stationary and Benchtop Tools



Delta 50-905 1 1/2hp Portable Cyclone Dust Collector

Dust Collector

The Delta® 50-905 1 1/2hp Portable Cyclone Dust Collector lets you clean the air in your shop even when you're not there to flip a switch: you can set it on a timer for anywhere from 1 to 15 hours, after which point it will turn itself off. Another easy on/easy off feature is the included remote control — which also includes timer programming. Whenever it's running, the cyclone captures large particles into the chip barrel, while the 1-micron canister filter and lower bag catch the small dust particles. As the dust particles build up on the inside of the canister, a top filter cleaner crank rotates to knock them down into the bag, prolonging canister life and efficiency. No tools are required to lift and lock the chip barrel into place; it has a simple lock bar instead. The 1 1/2hp motor of the 50-905 produces 10" static pressure and can filter 810 cubic feet per minute when restricted; 1,638 cfm when unrestricted. The Delta 50-905 1 1/2hp Portable Cyclone Dust Collector's price is listed at \$1,559.99.



EMGLO E810-4V Stacked Compressor

Air Compressor

EMGLO® Compressors' new Heavy-Duty Four-Gallon Stacked Tank Contractor Air Compressor (E810-4V) has a 1.1hp motor that produces 4 standard cubic feet per minute at 90 pounds per square inch. It weighs in at 56 pounds and sports an angled handle for easy maneuvering, while soft-start valves make quick work of cold weather or extension cord starts. The couplers — there are two, in case you'd like to add a second user — are the easy-to-use universal push-to-connect type. The noise rating is 83 dBA, and the suggested retail price is about \$260.



Delta 40-695 Scroll Saw

Scroll saw

Newly released from Delta is the Model 40-695 20" Variable Speed Scroll Saw. Among its features is an upper arm that lifts and locks in the raised position via a pivot lock, keeping it out of

the way while you use both hands to adjust a workpiece or change blades. Single-lever, tool-free tensioning and a tool-free blade clamp are part of the package. The 40-695's unique dual parallel-arm design keeps the blade perpendicular to the work surface during cutting, reducing over- or under-cutting and vibration. The cast-iron table bevels from 0° to 45° left and right. Estimated price is \$499.



Delta 31-483 Heavy-Duty Oscillating Bench Spindle Sander

Spindle Sander

Delta's new Heavy-Duty Oscillating Bench Spindle Sander, Model 31-483, has a 15/16" oscillating action that uses more of the sleeve, to prolong its life, and achieves 20 oscillations per minute. For bevel sanding, the 14 3/4" x 14 3/4" cast-iron table tilts from 0° to 45°, with a positive stop at 90° and a large bevel scale for accuracy and convenience. Twin locking handles provide stability in any bevel position. On the Model 31-483, a heavy-duty worm and gear mechanism drives the oscillations, with the spindle speed reaching 1,725 rpm. The motor is 1/2hp, 115-volt. The Model 31-483 has a suggested price of \$449.99.



General International 80-125L M1 6" Deluxe Jointer

Stationary Jointer

If you find yourself often feeding overly long stock through your jointer, you may be in the market for the new 80-125L M1 6" Deluxe Jointer — with its extra-long table — from General International. The 7 1/4" x 66 1/4" infeed and outfeed tables offer you a maximum cutting width of 6" through a three-knife, 5,000 rpm cutterhead. A jackscrew system allows for quick and easy adjustments of those knives, while the center-mounted cast-iron fence has 45° and 90° positive stops. The 80-125L M1 has a retail price of \$1,299.99.

Benchtop Jointer

Grizzly Industrial®, Inc. has put built-in dust collection into a benchtop jointer with its Model G0725 6" x 28" Benchtop Jointer. The dust collection system has a 2 1/2" dust port, dust collection fan and bag. The jointer itself runs on a 1 1/2hp, 20,000 rpm universal motor with a two-knife cutterhead that can make 20,000 cuts per minute for smooth finishes. The fence and tables are both cast-iron, with the fence measuring 4 5/16" tall and tilting 45° left and right for bevel jointing. The Model G0725 6" x 28" Benchtop Jointer is priced at \$235.



Grizzly G0725 Benchtop Jointer

Band Saw

Grizzly has come out with the new Model G0514XF 19" Extreme-Series® Bandsaw with Foot Brake. What makes this 19" machine extreme? It could be the 18 1/4" of cutting capacity left of the blade, the 12" maximum cutting height or the extra-large (26 3/4" long) tilting table. There's a patent pending on the extruded aluminum resaw fence, and double-row ball bearing blade guides send your wood through the saw for cuts with a 3hp motor. Additional features on the G0514XF include two 4" dust ports, a tracking window and a quick-release blade tension device. It's priced at \$1,325.



Grizzly G0514XF 19" Extreme-Series Bandsaw with Foot Brake



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Benchtop Router Tables Strike a Balance

YESTERDAY'S "STARTER" ROUTER TABLES HAVE EVOLVED INTO CAPABLE, MULTIFUNCTION WORK SYSTEMS. IT'S TIME TO RETHINK TODAY'S COMPACTS.



Bench Dog
ProTop
Contractor

Must-have details on a benchtop router table

- Adjustable fence facings
- T-tracks for featherboards, jigs
- Dust collection
- Convenient plate leveling
- Interchangeable insert rings
- Full-size miter slot

Twenty-some years ago when I got much more serious about woodworking, "real" router tables in my mind were those that stood on the floor and looked like a stationary tool. Benchtop router tables, by comparison, seemed more like toys. While their price tags made them affordable for a new woodworker, and portability was certainly a plus, they tended to

Bosch RA1171

MLCS
Portable

AN EDITOR'S SIX-PACK

While there are many more benchtop models on the market than you see here, our field editor Chris Marshall "cherry-picked" a half dozen top-shelf options equipped with some of the nicest features you'll find in this category. Prices for this grouping range from about \$140 to \$234, so there's a quality table to be found for most shop budgets.



be lean on features and made of thin, rattly metal castings and plastic. Most didn't have insert plates to make router removal easy; their fences were crude, and some came with teeny miter gauges that fit into undersized slots. Who could trust the accuracy of a puny miter gauge? All in all, benchtops seemed like something you bought to make do until you could afford one of their bigger, better brothers.

Well, I'm happy to report that our fervent love of routers and routing over the last two decades has nudged router table manufacturers to step up their game. And they've done just that. Today's premium benchtop router tables come with features you'll find on a floor-standing table, with the added advantage that they're *still* portable —

perfect for the small shop, fit in a car's trunk and useable anywhere. But don't pigeonhole them to just the occasional hobbyist or jobsite user. Take a closer look at their features, and you might discover that a compact router table supports everything you want your router to do. It may be all the router table you require for woodworking.

If you do a web search, there are a lot of benchtop router tables for sale — many more than shown here. Some models have come further than others in terms of feature improvements, so it would be an overstatement to say that all benchtops are equally good. They aren't. Let's see what makes a quality portable router table tick these days and what features you should keep in mind when choosing one for your shop.



Craftsman's Professional Router Table (model 61181) comes with an On/Off switch that powers two receptacles — one for the router and the other for a shop vac.

Convenient Controls

Many full-sized router tables come with an On/Off switch mounted within easy reach during use. That's convenient as well as a safety feature. Just plug the router into the switch, and you never need to grope under the table to power it up or down.



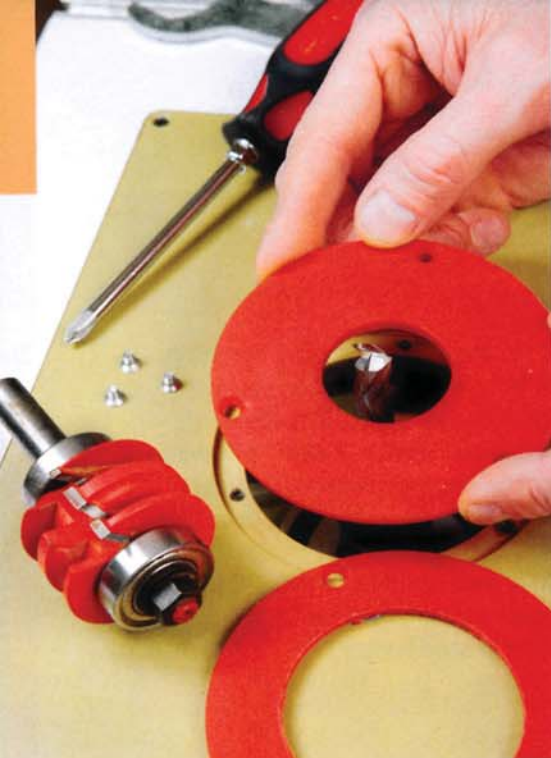
Freud RTP1000



Kreg
PRS2000



Craftsman
Professional
61181



Both the Bosch and Craftsman tables shown here come with a safety switch as well as a second receptacle for plugging in a shop vacuum for dust collection. Flipping the switch activates both the router and the vac. And, both of these control switch examples have a “remove to lock” key to prevent accidents from unauthorized users. An On/Off switch isn’t a make-or-break feature, but it’s a sensible detail to have. I’d like to see more portable tables equipped with a switch.



No Anemic Insert Plates

An insert plate is the aluminum, phenolic or acrylic platform onto which you mount your router in the table. The plate fits into a shallow recess in the tabletop, making it easy to remove the router from the table by lifting the plate up and out. In some instances, you might even leave this plate attached to the router for handheld use to double as a bigger base.

Full-size router tables, almost without exception, have insert plates in their tables. So do all of the benchtop tables shown here. In fact, they use the same size insert plates as their larger cousins do.

Advantages to this crossover feature? I think there are several. Some insert plates on router tables are pre-drilled with one or even several fastener patterns to suit popular routers. You don’t have to fuss around with laying out and boring clearance holes and countersinks for screws. The accurate layout work is already done for you; as long as your router fits, just screw it to the plate and you’re ready to go to work.

My preference for insert plates is that they also have interchangeable rings with various sized holes to fit around the different bit

diameters. These rings help support a workpiece as close as possible to the cutter, which improves accuracy as well as safety. Some insert rings snap in and out, while others are held in place with a turn of a wrench or using tiny screws. I like the type that are secured without screws, because the tiny fasteners are easy to lose in a pile of shavings. That said, I would definitely choose a plate with rings and screws over one without rings.

Another subtle feature to look for in an insert plate is a starter pin; it fits into a hole in the plate and acts like a fulcrum for initiating curved cuts when the fence is removed. Otherwise, a bit can grab and eject the workpiece violently, putting your hands at risk. Most of these tables have a starter pin — and any plate can be fitted with a bolt or dowel to serve the purpose.

An insert plate bears the weight of the router, so it has to be thick enough to remain flat. This new crop of benchtop tables have sturdy plates that range from 1/4" or thicker aluminum to 3/8" phenolic. They’re suitable for any size router you own, up to a 3-hp machine. So, while these units are portable, you can use them for everything from light roundovers and profiling to joinery cuts and full-fledged panel raising. Their small size doesn’t compromise a broad range of routing functions.

Table Manners

Floor-standing router tables do have a leg up on benchtops when it comes to tabletop size. A benchtop table averages about 16" x 24", whereas a standard sized stationary router table is about 8" larger in both dimensions. Still, when using a bench-



Quality insert plates have interchangeable rings to accommodate various bit sizes (top) and starter pins for initiating cuts on curved workpieces (bottom). Some plates are pre-drilled with mounting holes to suit one or many popular router models (center).

Continues on page 16 ...

PRECISION MEETS INTUITIVE DESIGN

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Kreg equips its table with Allen screws for insert plate leveling (top). Craftsman's aluminum table (bottom) is impervious to moisture, for routing indoors and out.

top router table, I've really only wanted more real estate when working with wide panels or large workpieces that want to tip off the front edge. And oftentimes, that work can be done more easily with a handheld router on a workbench anyway. I don't see the smaller table size as a major drawback, but it is a factor when routing larger panels or long boards.

The tables on the models shown here, with the exception of Craftsman's aluminum top, have an MDF core faced with laminate, top and bottom. Thicknesses average 1" to 1½", so they are comparable to full-size tables. That heft provides the rigidity and flatness you need. Bench Dog's table is thinner, at about 9/16", but it's reinforced

with metal braces underneath.

In terms of other table details, Kreg offers a dimpled work surface on its laminate to reduce contact surface and, in turn, extra friction. It's a unique feature I plan to try for a while, to see if the reduction in surface friction is noticeable. Craftsman's aluminum table could be a sensible choice if you need a router table to be weather-resistant as well as portable. The table won't swell like MDF could if you forget it in a truck bed on a rainy day.

I appreciate that all of the tables in this sample group have 3/4" miter slots, so you can use a full-size miter gauge in them. They'll also accept workholding devices like featherboards or other shop-made jigs. Whatever fits in a table saw miter slot will fit here, too. That's handy.

Another point to note in table design is how the insert plate can be made flush to the rest of the tabletop. Router tables typically have a system of screws that allow the plate to be incrementally adjusted up and down until it's even with the table. Sometimes these adjuster screws are accessible from above — as with the Freud, MLCS and Craftsman tables here. Other styles involve manipulating the screws from underneath — Bench Dog and Kreg use this approach. Either method works fine, and you won't need to readjust the plate very often. Some tables have adjusters that are only accessible with the plate removed. Bosch is one example, and it's the least convenient leveling style.

Bosch (top) provides featherboards that attach to the miter slot and fence's T-track. Bench Dog's 3/4" miter slot (bottom) accepts a full-size miter gauge, with Allen screw adjusters that take up any side-to-side play.

Here's a departure unique to the benchtop category: the insert plates lock into their table recesses either with several more screws or, in the case of MLCS's table, rare-earth magnets. In a full-size router table, the plate just sits in its recess, but that's impractical for these compact tables that are designed to be "on the move."

Fence Finesse

A sturdy, flat fence that locks securely to the table is essential to any router table, and the fences provided on these benchtops are first-rate. They all have a pair of moveable facings that slide side to side so you can position them to suit a variety of bit diameters. The closer the facings are to the cutters, the more



support they provide, and dust collection improves as well.

You can also offset the outfeed facing on these fences with shims or other spacers to set it up for edge jointing. It's a useful feature if you don't own a jointer, and a few of these tables even come with the shims to do it. I really like Freud's fence, which has a pair of knurled micro-adjust knobs for fine-tuning the offset — no extra shimming is required.

Freud's would be an even better fence if it also had T-tracks like those provided on the other fences here. T-tracks make featherboards and bit guards easier to install. Featherboards and other work-holding aids are a must for some routing situations, such as slot cutting or when making sliding dovetails, where the bit is buried inside the workpiece and the wood must remain tight against the table and fence. Bosch and Craftsman provide a pair of featherboards with their tables, a very nice addition.

Fence height is one aspect of benchtop units that could still use some improvement, in my opinion. At about 3" to 4" high, I wish they were even taller. MLCS is headed in the right direction with the fence supplied on its Portable model. The facings are 6" tall — nearly double the height of the competition — and that will be very useful when standing panels on edge or end for panel raising. A heavy shaping operation like panel raising may seem unfeasible for a small router table. But if you use a vertical-style panel-raising bit, the job can be done accurately and safely even with a mid-sized router. A really tall fence provides better vertical support for

the panel to help keep the cuts consistent. Install a doubled-up featherboard in the miter slot (like the one sold by Rockler shown in the bottom photo), and you've got a compact system for shaping door panels. Then switch to rail and stile bits to make the door frames, too.

One other word of advice about router table fences: buy one with dust collection. A 2½" vacuum port is pretty standard nowadays on most router table fences, and all six of these tables have it. If you already do a lot of table routing, you'll probably agree that "at the source" dust collection in the fence is remarkably efficient. It's the best way to clear the debris when you're routing with the fence in place.

Base Options

You have several options to choose from in benchtop router table bases. Some models, like the Bench Dog and Bosch units shown here, have fully enclosed cabinets. If you're woodworking in a basement shop or early on a Saturday morning, not everyone within earshot will appreciate the noise of a screaming router. Put a router inside one of these plywood or MDF bases, and the decibels definitely decrease. A "cabinet" type base helps contain dust and debris, and the added mass is beneficial for dampening router vibration during use.

Enclosed bases make for a heavier table, however. If you need to move your router table around the shop a lot or transport



Freud adds precision to edge jointing operations, thanks to two micro-adjust controls on the fence's infeed and outfeed facings (top). MLCS's tall fence offers ample support for vertical panel-raising (bottom).

it to where you're working, a metal legset may make more sense. It will shed some pounds. Rubber feet are a plus to keep the table stationary, or clamp the legs to a bench. For the ultimate



Enclosed bases (right) provide dust collection as well as sound and vibration dampening, but a metal leg base (left) sheds pounds and eases portability.

in compact storage, Freud's RTP1000 router table has a metal base that folds up like a TV tray. With the insert plate removed, you could literally hang this one on the shop wall when it's collapsed flat.

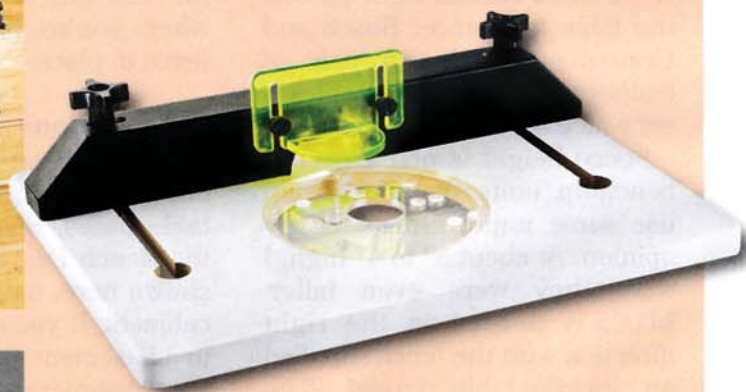
Ready for "Real" Work

I hope you'll find this short overview a great starting point for your own homework about benchtop router table options. Here's a tool category that is reinventing itself to satisfy our serious routing tasks. I'm pleased to see the changes. Today's premium models are still compact and portable, but now they're more capable than ever.

Chris Marshall is a senior editor of Woodworker's Journal.



POCKET-SIZED TABLE ROUTING



Rockler (rockler.com) offers this miniature router table (item #43550) that's designed to fit a trim router. It features a 11½" x 15½" vinyl-wrapped MDF table and a locking fence with bit guard. A round acrylic insert plate comes pre-drilled to suit the screw patterns of many popular trim routers. The table also has a pair of mounting holes for attaching a clamping strip, so it can be secured to a workbench, sawhorse or countertop. Here's a low-cost way to maximize the utility of your pint-sized trimmer.

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Eight Benchtop Band Saws



Despite small differences in cosmetics and features, 9" models by Craftsman, Ryobi and Central Machinery have the same welded steel frames and overall design.

THESE NINE- AND TEN-INCH BENCHTOP MODELS ARE SMALL, AFFORDABLE AND CAPABLE OF TACKLING A WIDE RANGE OF CUTS.

I've never thought much of the small "benchtop" sized band saws I've previously tried. They've proved to be more toy than tool, with poor blade tracking and barely enough power to chew through thin softwood stock. But recently, I noticed that several power tool companies were offering small band saws made with much the same construction and features found on full-sized saws. Had small band saws finally gotten the makeover

they need to transform them into serious benchtop tools capable of doing serious woodwork? Intrigued, I set about to test eight different saws: four 9" models by Craftsman, Central Machinery, Ryobi and Skil; three 10" models by Craftsman, RIKON and JET; and, to round out the field, a 150mm "Micro" band saw made by English power tool manufacturer Proxxon.

My goal was twofold: First, to

determine what kinds of wood-working jobs these diminutive, affordable band saws are capable of. Second, to pick the best of the bunch for this magazine's "Best Bet" designation. I examined each saw's extensive features carefully, and probed its performance by doing a full range of cutting tests to find out how much each benchtop tool could handle. A word before we begin: The great majority of power tools these days are made over-



The 9" Craftsman BAS230 has a couple of features that distinguish it from its rivals, including balanced wheels (left) and a ribbed cast-alloy table (right).

seas by OEM (original equipment manufacturers) factories that build each model to the specifications of the company that's going to put their name on them. This helps explain why three of the four 9" benchtop band saws I tested — the Craftsman, Central Machinery and Ryobi — have virtually the same welded-steel frame, base and overall design. But just because some saws may look similar doesn't mean that they're identical. Besides varying in features and cosmetics, each saw has its own performance personality, and some just flat-out cut better than others.

9-inch Band Saws:

Craftsman BAS230

Of the two benchtop band saws that bear the Craftsman name, the 9" BAS230 has a price on par with the other three 9" saws in this test. There are but a few elements of the Craftsman that distinguish it from the competition. While its welded frame is just like two other saws, its wheels have wider, sturdier looking spokes than the other two. Plus, the

Craftsman's wheels have pressed-on weights, evidence that the wheels have undergone balancing to help them run with less vibration. My cutting tests bore this out, and the BAS230 cut slightly more smoothly than any of the other 9" saws.

The Craftsman has plenty of power to tackle all the basic band saw cutting operations, crosscutting, ripping and even doing light resawing of hardwoods. The 3/8" wide, 6 tpi blade that comes standard on the BAS230 gives a good quality of cut and leaves a relatively clean kerf. The saw's large cast-alloy table offers good support to larger workpieces, and it is the only table in the group with a fully ribbed surface. This is a practical feature, as the ribs can help keep sawdust from hanging up the workpiece.

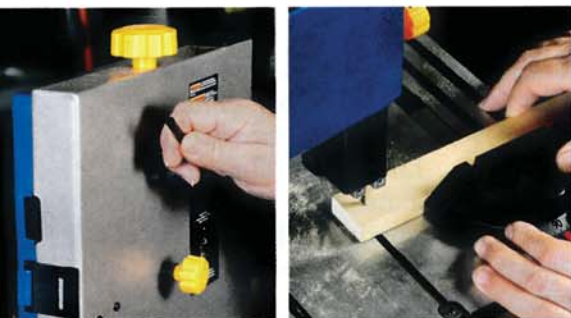
To stabilize its running blade, the Craftsman BAS230 is fitted with the exact same ball-bearing thrust bearings and steel pin friction side guides (both above and below the table) as found on the Central Machinery and Ryobi saws. Although many woodworkers feel that ball bearing side guides are better, to tell you the truth, I didn't really miss them on these small saws. Friction pins are easy to adjust and do a fine job of stabilizing the blade during cutting. Unfortunately, the upper guides on the Craftsman mount to the same molded plastic guide post

assembly found on the other two saws. These posts raise and lower smoothly, via a rack-and-pinion mechanism. But the posts also deflect relatively easily and could possibly break if impacted by a sharp blow.

Ryobi BS903

The bright blue and yellow Ryobi BS903 band saw comes with a very generous three-year warranty. Like the similarly appointed Craftsman and Central Machinery models, the Ryobi sports a blade tension release lever, something more typically found on full-sized band saws. It's a nice feature because routinely loosening tension can prevent a blade from taking a "set" on its wheels, thus helping it to run more smoothly over its lifetime. The BS903 has a small, clear-plastic-covered window on the upper wheel guard (also on the 9" Craftsman, Skil and JET). The window makes it easier to safely adjust the tracking so that the blade rides on the center of the wheel's rim.

Performance-wise, I honestly had trouble distinguishing the Ryobi's cutting abilities from its similarly built competitors. This isn't too surprising, considering the similarity of the blade guides and post, and the fact that all four 9" saws are powered by a 2.5-amp induction motor that drives the lower wheel via a short belt. The BS903 crosscut



Two features the Ryobi BS903 shares with similar-looking 9" models are its blade tension release lever (left) and plastic and aluminum miter gauge (right).



The steel pin friction side guides on the Skil 3386 (top) are slightly larger in diameter than the identical pins found on the Craftsman, Ryobi or Central Machinery (bottom).

well using exactly the same little plastic-headed, aluminum bar miter guide as comes with the Craftsman and Central Machinery saws. The gauge is basic, but adequate for the small cuts you're likely to perform with these small band saws. Even though the Ryobi and two similar competitors don't come with rip fences, I used a clamped board to test their rip and resaw abilities, which were adequate for the scope of work these saws are meant to handle. You can resaw hardwoods as wide as the saw's 3 $\frac{3}{8}$ " cutting depth capacity. Just feed slowly to prevent bogging down the blade.

Dust collection ports, located at the bottom of the lower wheel housing, are built into all of the saws in this test. The Ryobi's is a slightly larger size than found on the other 9" saws, allowing you to connect a standard 2 $\frac{1}{2}$ " hose. Hooked up to a powerful shop vacuum, the Ryobi had very good sawdust capture.

Skil 3386

With its cast frame and curvy design, the Skil 3386 is a standout in this group. It offers a nice blend of features and performance in an attractive package. The Skil's alloy frame and table help keep this saw lighter than any of the other 9" saws. The frame is mounted to heavier cast-iron base.



The 9" Skil 3386's miter gauge features a bar with a T-shaped profile, to keep it from lifting in the slot.

The Skil's overall build quality seems good, and the saw features a guide post made of cast alloy that feels very solid. It adjusts up and down via a concentric pair of knobs, much like the JET. But I found the Skil's controls a bit easier to use. The 3386 uses steel friction-pin side blade guides, like the other 9" saws, but the Skil's guides are larger in diameter: 3mm, as opposed to 2mm, with larger set screws holding them in place. The 3386 lacks a blade tension release lever, but you can always loosen the blade tension knob at the end of your work session.

Much like the Central Machinery and Ryobi saws, the 3386's table tilts for beveled cuts via a geared trunnion. The Skil uses concentric knobs that are easy to set, and its angle scale is a bit easier to read than the other two saws. It's the only 9" saw that comes with a rip fence — a nice addition. Like the fences on the 10" saws, the Skil's locking lever secures the fence at both ends of the table. Plus, the Skil's





The 9" Central Machinery 96980 band saw sports a nice cast-iron table that mounts to the frame via a handy geared trunnion assembly (right). All of the saw's controls and adjustments are very well-labeled (left).



table has scales inlaid at both ends, allowing you to check the parallelism of the fence before locking it. I had an issue with the saw's miter gauge, which has a bar that's T-shaped in profile, designed to keep the bar from lifting out of the table slot. Unfortunately, the Skil's table slot only has two sets of tabs to keep the bar in place. In use, the bar sometimes caught on these tabs, stalling the cut.

Despite this shortcoming, the Skil performed very well in all my cutting tests, and it could even resaw an oak strip as wide as its maximum cutting depth (3 $\frac{5}{8}$ ") without stalling. It ran reasonably smoothly and the blade tracked very well. One feature I really appreciated was the saw's gooseneck-mounted LED light.



RIKON's 10" model 10-305 has a nice, extruded-aluminum guide post that adjusts and locks with hand-friendly controls (right).



Central Machinery 96980

Central Machinery is the Harbor Freight company's house brand. If you like cast-iron machines, you'll like the 96980. Its table is the same size as found on other 9" saws, but it is a smooth-surfaced piece of cast iron. This does add substantially to the weight of the saw: it's 14 pounds heavier than the lightest 9" saw, the Skil. The table attaches to the frame via a nice geared trunnion assembly; the Ryobi and Skil saws have a similar setup. To change the table's tilt angle, simply loosen the table-locking handscrew and rotate a knob to dial in the desired angle. There's also an adjustable stop for quickly setting the table square to the blade — the position it's bound to stay in most of the time. One quibble I have with this table is its location: It extends only 4 $\frac{1}{2}$ " ahead of the blade, whereas the other saws offer 5 $\frac{1}{4}$ " of support. This doesn't seem like much, but I did notice the reduction of support, especially when I cut longer workpieces.

Switched on, the Central Machinery band saw has good overall power and runs smoothly, with an acceptable quality of cut. A small thing I appreciated was the

Central Machinery's clear labeling of all controls: blade tension and tracking, guide post raising/lowering and lock controls, etc. Despite the saw's good features and performance, one reservation I'd have in choosing this over the other models is that it only carries a 90-day warranty, compared to the one- to five-year warranties of the other saws here.

10-inch Band Saws:

RIKON 10-305

Just about every description you could give of the Craftsman 21400 is true for the RIKON 10-305. Aside from different colored paint and name plaques, the two saws are virtually identical, including all their adjustment knobs. But, despite appearances, there are a few significant differences. The first noteworthy difference is that the RIKON sells for about \$65 more than the Craftsman. The only thing I could figure was worth the extra cost is the RIKON's whopping five-year warranty — the longest in this group of benchtop band saws. In contrast, the Craftsman's warranty is one year long; the JET, three.

Performance-wise, the RIKON proved to be significantly less



powerful than its competition. During my cutting trials, the 10-305 handled all the usual crosscuts and curved cuts on 4/4 stock without noticeably straining. But when I resawed the same piece of 4 $\frac{5}{8}$ "-wide red oak I had cut with the 21400, the RIKON slowed to the point of stalling. I could nurse the cut along but could only feed the work at a snail's pace. I checked the blade tension, as well as the



Most benchtop band saws in this test, including the 10" Craftsman 21400, have an adjustable brush (left) that prevents sawdust buildup on the lower wheel's tire. The 21400 resawed even wide hardwoods with impressive power (right).



tightness of the drive belt, and I even swapped blades with the Craftsman just to make sure that the blade wasn't at fault; nothing seemed to improve the tool's resawing performance.

One more small ding: Although the 10-305 has a trunnion assembly that's virtually the same as used on the other three 10" saws, its locking handle is much smaller. It's simply a pain to tighten and loosen when adjusting the tilt of the table.

Craftsman 21400

Similar to the other two 10" saws in this test, the Craftsman 21400 shares a welded sheet-metal frame, cast-iron table and cast-alloy wheels. The 21400's wheels

are balanced for smoother running, and an adjustable brush on the lower wheel wipes sawdust from the spinning tire, to help keep the blade tracking smoothly. The three saws lack the nice geared trunnion assemblies featured on the 9" saws, but they do sport nice extruded aluminum upper guide posts. The posts are solid, and they adjust smoothly via a rack-and-pinion mechanism. The saws also feature full ball-bearing thrust and side guides both top and bottom. The guides on the Craftsman adjust with an Allen wrench and are easy to fine-tune for smooth operation (ditto the RIKON).

Power-wise, the Craftsman is fitted with a 3.5-amp induction

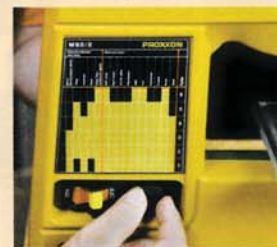
THE PROXXON MBS/E



The Proxxon Micro Saw is by far the smallest, lightest, most easily portable and stowable saw in this bunch. It has only 5 $\frac{1}{2}$ " of throat depth and about 3 $\frac{3}{8}$ " of cutting depth. It's also the only saw with a permanent magnet DC motor (the same kind used on most portable power tools) that's only rated at 85 watts — about .7 amps. By including a variable-speed motor and offering a wide assortment of blade types, the MBS/E can handle wood, plastic, metal and, fitted with the optional water cooling kit, ceramic tile and even stone and glass! The Proxxon's construction

is quite good, with a rigid cast-alloy frame and a polished aluminum table. One small pain is that you have to undo four Allen-head screws each time you want to remove the Proxxon's one-piece wheel guard, making blade changes a bit tedious.

When I ran the MBS/E through its cutting paces, I was generally impressed with the precision of its performance. Both the cross and rip cuts I tried with the saw were clean and square, thanks in part to the saw's smooth-running wheels and tiny ball bearing guides. Fitted with the optional 24-tooth, 13/64"-wide blade, the saw cut on a dime and left an extremely clean kerf.



Using a narrow blade, the Proxxon can cut tight curves in wood. With accessory blades, the variable-speed saw can cut a wide range of materials.



The 10" JET JWBS-100S has several unique features, including (photos from left to right) a pull-out stock support, upper blade guides that adjust tool-less, and a blade tension gauge that shows the correct amount of tension for any blade that the saw accepts.



motor. In terms of cutting performance, that 1-amp upgrade (compared to the 9" saws) seemed to make quite a difference. The 21400 had plenty of power to take thick cuts in hardwoods, and even resaw boards as wide as its 4 $\frac{5}{8}$ " cutting depth. The guides help stabilize the blade very effectively, resulting in kerfs that are straight and true. Even though the Craftsman's blade is the same kind of hook-toothed 6 tpi general purpose blade found on all saws in this test (save the Proxxon), the smoothness of cut suffered considerably with the 21400. Whether crosscutting or ripping, all three 10" saws left more ragged kerfs than produced by their 9" cousins.

JET JWBS-100S

The JET is by far the most extensively equipped band saw in this group, with more bells and whistles than any other model, including its own pressed-sheet-metal stand (you can remove the stand to use it as a benchtop tool). The JWBS-100S frame is very similar to the Craftsman and RIKON, but it is set up to take a slightly shorter blade. The saw's resaw capacity is also slightly less: 4 $\frac{1}{8}$ " versus 4 $\frac{5}{8}$ ". The JET's cast-iron table is much like the other saws, but it includes a pull-out support attached below its outboard

edge: really nice if you're sawing a large panel or crosscutting longer stock.

The JET's ball bearing blade guide assemblies are like those found on the other 10" models, but the upper guides on the JET allow tool-less adjustments. Loosening the plastic-knobbed handscrews used to lock these adjustments allows you to rotate each eccentrically mounted bearing: Turning it brings the bearing either closer to or farther from the blade. Very convenient. In contrast, I didn't care for the JET's controls for adjusting the height of the upper guide post. Most other saws have separate knobs for raising/lowering and locking the post. A pair of concentric knobs does the same job on the JET, but the outer raising/lowering ring often shifted as I tightened the locking knob at its center.

Performance-wise, the JET JWBS-100S runs very well and cuts with good power. How good? I did a little cutting test with the JET, Craftsman and RIKON, resawing a 4 $\frac{1}{8}$ "-wide (the JET's max cutting capacity) red oak board and timed how long it took each saw to get through the cut, pushing as hard as I could without slowing blade speed significantly. The JET could cut at a pace of a foot every 44 seconds, while the Craftsman took 68 seconds and the RIKON

138 seconds per foot. Further inspiring confidence in its cutting abilities, the JET's 3.4-amp motor sports an aluminum housing and heat-dissipating fins, to help keep things cool during longer cutting sessions.

A few other features on the JWBS-100S are worth mentioning: It was the only saw that had a built-in blade tension scale that clearly showed how tight to set the tension knob for any blade that would fit the saw, from 1/8" to 1/2" wide. Even though blade tension doesn't seem to be particularly critical with any of these small band saws, it's very handy to have a way to gauge the actual tension of a blade and set it to the manufacturer's specified tightness. The JET is also the only 10" band saw to have a blade tension release lever.

The JET's rip fence is nicer than on any other band saw in this test, with a large locking lever and a cursor window that makes it easy to set precisely for rip cuts and resawing chores. Like the Skil, there's a goose-neck LED light, but the JET's has a separate On/Off switch which allows you to see what

you're doing before starting up the saw. Like all the other band saws in this article, the JET has a built-in dust port in the lower wheel housing. The JET's port offers the most flexibility, with a concentric port that accepts 4", 2½"- and 2"-dia. hoses.

Conclusions: Best Bet

I've done dozens of tool tests, but few have left me with more head scratching than this one. On the one hand, you have two groups of similar saws; four 9" saws and three 10" saws, and a "Micro" band saw that's different than anything else. Which to choose?

Ultimately, the benchtop band saw that's best for you depends greatly on what your real needs are: If you're a puzzle maker, model builder or hobbyist that often tackles small-scale projects, I have little doubt that the Proxxon will serve you well.

If you often tackle full-size projects, but don't have the space or budget for a full-sized band saw, then the decisions get a bit trickier. The JET has lots of features and is powerful and user-friendly. But its stand-mounted size and relatively high price put it in league with larger, more versatile band saws in the 14" range. The Craftsman's low price tag and good performance make it a bargain, but at 65 lbs., it's not easily portable. Plus, none of the 10" models actually has a 10-inch-deep throat: All three saws have 9½" of throat depth. That really levels the playing field between 9" and 10" models, as the "larger" models only offer a slight amount of additional cutting width and an inch or so of depth capacity.

Considering all this, I think the best benchtop band saw for the average small shop wood-

worker should be compact and portable, capable of decent cutting performance and offer good value for the money. The Skil 3386 has all these qualities, and hence, it gets my vote as the "Best Bet" among these options for a benchtop band saw. The Skil is smaller and, thanks to its alloy frame, lighter and more easily portable than any other saws in this test, save the petite Proxxon. It has nice, solid guides, cuts with good power and lacks only a small amount of the cutting capacities of 10" models. This Skil band saw offers a lot of features considering its low price tag, including a rip fence and a built-in light, which don't come with any other 9" models.



Sandor Nagyszalanczy is a contributing editor to Woodworker's Journal. His books are available at Amazon.com.

Benchtop Band Saw Review Chart

Make/ Model	Craftsman BAS230	Ryobi BS903	Skil 3386	Central Machinery 96980	RIKON 10-305	Craftsman 21400	JET JWBS-100S	Proxxon Micro Saw MBS/E
Actual Throat Depth / Max. Cutting Depth	9" / 3½"	9" / 3½"	9" / 3½"	9" / 3½"	9½" / 4½"	9½" / 4½"	9½" / 4½"	150mm (5⅞") 85mm (3⅓")
Street Price	\$120	\$120	\$129	\$120	\$265	\$200	\$370	\$260
Construction	Welded steel frame and cast alloy table	Welded steel frame and cast alloy table	Cast alloy frame and table	Welded steel frame and cast iron table	Welded steel frame and cast iron table	Welded steel frame and cast iron table	Welded steel frame and cast iron table	Cast alloy frame and table
Motor Type / Amperage / Blade Speed	Induction / 2.5 amp / 2460 fpm	Induction / 2.5 amp / 2500 fpm	Induction / 2.5 amp / 2800 fpm	Induction / 2.5 amp / 2460 fpm	Induction / 3.5 amp / 2780 fpm	Induction / 3.5 amp / 2780 fpm	Induction / 3.4 amp / 2750 fpm	Permanent magnet DC motor / .7 amps / 395-820 fpm*
Table Size	11¾" x 11¾"	11¾" x 11¾"	11¾" x 12"	11¾" x 11¾"	13¾" x 12½"	13¾" x 12½"	13¾" x 13½"****	7⅞" x 7⅞"
Blade Length / Min.-Max. Widths	62" / 1/8" - 3/8"	62" / 1/8" - 3/8"	59½" / 1/8" - 3/8"	62" / 1/8" - 1/2"	70½" / 1/8" - 1/2"	70½" / 1/8" - 1/2"	67½" / 1/8" - 1/2"	42" / 9/64" - 13/64"
Blade Guides	Friction side guides and ball thrust bearing	Friction side guides and ball thrust bearing	Friction side guides and ball thrust bearing	Friction side guides and ball thrust bearing	Ball bearing upper and lower	Ball bearing upper and lower	Ball bearing upper and lower****	Ball bearing upper and slotted post lower
Tension Release Lever / Light	Yes / No	Yes / No	No / Yes	Yes / No	No / No	No / No	Yes / Yes	No / No
Rack & Pinion Table Tilt / Upper Guide	No / Yes	Yes / Yes	Yes / Yes	Yes / Yes	No / Yes	No / Yes	No / Yes	No / No
Warranty	1 year	3 years	1 year	90 days	5 years	1 year	3 years	2 years
Accessories Included / Optional	Miter gauge	Miter gauge	Miter gauge, rip fence	Miter gauge	Rip fence / miter gauge, metal stand	Miter gauge / rip fence	Miter gauge, rip fence, metal stand	Miter gauge / coolant system**
Actual Weight	34 lbs.	37 lbs.	30 lbs.	44 lbs.	64 lbs.	65 lbs.	73 lbs. (with stand)	13 lbs.

* Electronic variable speed control.

** For cutting ceramics, stone and glass.

*** 19" x 13½" with included extension pulled out.

**** Tool-less adjustment of the upper guides.

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Much Safer To Use	✓	
Shorter Clamp Time	✓	
No Foam – Less Mess	✓	
Shorter Open Time	✓	✓
Doesn't Stain Skin	✓	✓
Bonds Most Materials	✓	
Bonds Oily / Exotic Woods	✓	
Lower Cost – Better Value	✓	
Longer Usable Shelf Life	✓	

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A Close Look at Four 18-Inch Band Saws

IF YOU'RE LOOKING FOR A FLAGSHIP BAND SAW FOR YOUR SHOP, ONE OF THESE NEW MID-SIZE, STEEL-FRAMED MODELS MIGHT BE THE IDEAL CHOICE.

A decade or so ago, steel-framed band saws were just beginning to catch on here in the States, and at the time, we still called them “European style.” Nowadays, these welded-frame saws have not only become commonplace in manufacturers’ product lines, but it’s hard to even find a new mid-size band saw that still has that familiar rounded cast-iron frame. This evolution in styling is more than just good looks: a steel frame offers tremendous rigidity for tensioning wide blades, and that’s just what you

need for carrying out heavy-duty tasks like resawing monster boards or slicing logs into turning rounds. New saw models are also sporting premium blade guides, better fences and big motors to deliver top performance for the dollar.

In the ever-widening ocean of band saw options, I think 18-in. machines represent a good balance of capacity versus cost. Smaller 14-in. steel-framed models may offer similar resawing capabilities for less money, but in my experience they often aren’t outfitted with the same rugged components to form a complete heavy-duty package.

In contrast, these larger machines are designed from the ground up to cut wood all day long, every day. Of course, you can buy even larger 20-in.-plus band saws, but the cost skyrockets.

For a home woodworker, these 18-in. saws should be sufficient to check “band saw” off your wish list for good.

Recently, I asked several top manufacturers to provide their latest 18-in. saws for testing. I wanted to look at machines in the 2- to 4hp range, because that seems to be the “sweet spot” for this saw size. A few weeks later, four saws arrived on skids. Grizzly Industrial was also asked to participate, but their preference was to have me look at a 5hp machine you can see on page 34. It’s one of several 18-in. saws with larger motors, but that was more muscle than I felt many woodworkers might need. Shop Fox was also invited to the test but chose to decline the offer this time. Here’s how this group of four sized up for me after testing.

TURNING POPLAR INTO VENEER

There’s no question that saws of this caliber are going to make ordinary rip cuts, crosscuts and curves with ease, and they all did. Finesse is a valuable attribute of a band saw, no matter its size. You won’t have any trouble steering your delicate or run-of-the-mill cuts through these machines. But most users will invest in a big saw for the tougher jobs. So, I asked the manufacturers to send a wide resaw blade, then put each saw to work on some 12-in.-wide, clear 8/4 poplar (left). After cutting 10 sheets of veneer, I had a good idea of each machine’s power, dust collection efficiency and resawing capabilities. Then I looked carefully at essential and extra features that fill in other important details.





General International

90-290M1

Street Price: \$3,089.99

Motor Size: 3hp

Table Size: 24"W x 20"D

Weight: 605 lbs.

Resaw Capacity/Throat Width: 12"/17½"

Blade Length, Width Range:

145½", 1¼" to 1½"

Web: www.general.ca

Phone: 888-949-1161



Heavy, cast-iron flywheels help the saw's motor drive big blades through thick or wide material.

General International 90-290M1

Massive. That's the first word that came to mind when this saw arrived. Compared to the other three models in this test, it is much larger in stature and heftier. After spending time with this burly saw, it is clear that General designed the 90-290M1 with heavy-duty purpose in mind.

For starters, its upper and lower flywheels are made of thicker cast-iron than the other saws. And that added mass helps the motor spin the blade more efficiently through thick, difficult cuts. A foot brake stops the action in seconds. General provides a big, industrial-grade 3hp powerplant; there was no bogging down through the 10 resaw cuts I made in testing. It drove a 3¼" resaw blade right through poplar with ease. Two 4" dust ports kept the flywheel cases very clean.

This saw comes with an oversized table for managing big workpieces, plus large hand wheels for tensioning the blade and raising the upper blade guides. Access windows above for blade tracking and below for reaching the lower bearing guide assembly are good, practical features.

Speaking of blade guides, they're crucial for keeping blades from twisting and to ensure consistent tracking on the wheels. Here, General provides four sets of double bearings beside the blade, on both the upper and lower guide assemblies, plus face-mounted rear thrust bearings, for a total of 10 points of contact on wide blades. While the side guides are easy to unlock and very accessible, their aluminum mounting blocks both adjust and secure with single Allen screws. I



The 90-290M1 has a unique feed arm to help push the tail end of rip cuts through the blade.



An adjustable laser was an unlikely feature, but it can help you zero in on a cutting line.



Roller bearings in the fence clamp enable it to roll almost effortlessly on the front rail for positioning.

find guides that separate fine adjustment from the locking mechanism are a little less fussy to tune up than these.

"Big Green" comes with an Excalibur rip fence that adjusts left and right for blade drift — a tendency that, without adjustment, can lead to wandering when rip cutting. Magnified index cursors and bright yellow scales make setups easy. The fence pops quickly off the rails and stows on the saw. One little gripe: I wish the front rail didn't have to be loosened and slid clear of the table slit for blade changes, then reset again.

You also get a full-size miter gauge, a tall laminated fence facing and a resawing accessory. There's a laser for lining up cuts



An included resaw bar (top) and blade quick release (bottom) are two of JET's useful features.

and a unique pushing arm for feeding the tail ends of boards more safely during ripping. But the arm has enough side-to-side play that I would fear cutting into its foot at some point. The laser/feed arm combo also crowds line of sight to the blade. I'd rather have an LED task light than these extras.

My verdict here: the 90-290M1 is a strong choice for ambitious sawing, and I doubt it would disappoint a demanding user. But its price tag of just over \$3,000 will challenge a modest budget.

JET JWBS-18QT-3

Without question, my favorite feature of JET's 3hp machine is one that doesn't catch your eye at first glance: the blade guides. But if you change blades frequently, I bet you'll appreciate them quickly, too. The doubled-up side bearings have eccentric adjusters. Just twist their knurled knobs to move the bearings away or up close to the blade for final tuning. A wingnut locks their settings without a wrench. The rear thrust bearings are oriented so the blade spine runs against the curved edge — a better design for durability than those where the blade rubs the bearing's face.

Lower blade guides can be hard to reach under the tables of some saws if you have large hands, but JET's are uncluttered, and a hinged guard improves access even further. The machine's white paint also helps to brighten this often shadowy tool area.

The top blade guide post rolls smoothly up and down on a rack-and-pinion gear, and a three-position quick release lever behind the upper housing allows you to engage full or partial tension or release it entirely. It's slick for faster blade setups. Dialing in the recommended blade tension for a range of sizes is also easy with the help of a large hand wheel and two scales: one inside and one outside the flywheel case. JET should switch the tracking control from a small star knob to a larger hand wheel, because you'll reach for it with some frequency. But it does the job. A helpful window on the side of the upper case lets you peek in to check blade position, and the white rubber tire really improves visibility here.

JET has engineered the saw frame with a triangular spine, for purportedly more rigidity. A large "bump" style kill button is mounted to it so that you can activate it without looking. A foot brake, similar to other saws, would add even more safety, but it's absent.

You get a sturdy T-square style rip fence that locks securely to its rail, plus a steel resawing bar and a miter gauge — all sensible features that come standard.

In testing, this saw's single 4" dust port was sufficient to keep the lower flywheel compartment almost free of sawdust, and I'll admit I was surprised, given that the rest of the saws have a second



JET

JWBS-18QT-3

Street Price: \$1,899.99

Motor Size: 3hp

Table Size: 19"W x 19"D

Weight: 381 lbs.

Resaw Capacity/Throat Width: 12"/18"

Blade Length, Width Range:

137", 1/8" to 1 1/2"

Web: www.jettools.com

Phone: 800-274-6848



The author appreciated the precision and ease of JET's eccentric blade guide adjusters.



Laguna LT18 3000 Series

Street Price: \$2,195
Motor Size: 4hp
Table Size: 20"W x 20"D
Weight: 525 lbs.
Resaw Capacity/Throat Width: 15 1/4"/17 1/2"
Blade Length, Width Range:
146", 1/16" to 1 1/4"
Web: www.lagunatools.com
Phone: 800-234-1976



Laguna's ceramic guides provide low-friction, long-wearing contact surfaces for the blade.

4" dust port, too. When resawing, the motor and power train were up to task, although there was some rhythmic vibration that developed. It didn't impact cutting performance or seem annoying. Line-of-sight to the blade was OK, but there's a tab on the bottom of the saw's upper blade guard that makes a tall guy like me have to bend forward to see exactly where I'm cutting.

All in all, I'm pleased with this JET's test drive, and at just shy of \$1,900, I think it's a good bargain for the price.

Laguna LT18 3000 Series

Laguna's line of 3000 Series saws were introduced a couple of years ago as a more affordable alternative to the company's other European-made saws, which they still offer. These new 3000 saws originate from the Pacific Rim, just as the rest of the test group models do.

This newcomer delivered admirable performance in my cutting trials. That, in part, is due to its 4hp Leeson motor, thick cast-iron flywheels for substantial rotational mass and an impressive carbide-tooth 1 1/4" Resaw King blade the company provided. Notice that this saw bests the others for potential resaw capacity at a whopping 15 1/4". The veneer I sliced was of consistent thickness and quite smooth, and the blade cut it like butter. I only recovered a handful of dust from the lower housing after resawing was done — a bit more than others, but still very tidy.

Laguna equips this saw with its signature ceramic blade guides that help to keep the blade running cool during sawing and wear slowly over time. Two ceramic strips support the blade on each side, and a round puck serves as rear support. The guides are



The LT18 came with a wheel kit for mobility (top). A foot brake (bottom) increases the saw's safety.

mounted in aluminum blocks that adjust laterally and tighten with a single thumb screw. The design doesn't provide the same fine-setting control as eccentric adjusters, and the bottom inside left guide's screw was hard to reach. But once they're set, these ceramic guides work really well.

A quick-release lever takes tension off the blade between uses — a helpful and increasingly common feature these days. There's a "tension" scale of sorts inside the flywheel housing, but it's just a swoosh shape with no blade size references on it. A red pointer provides some feedback, but you'll have to experiment on your own to find optimal tension. To change the blade's position on the upper wheel, you twist a small star knob. As with the JET, I wish this control was a bigger hand wheel.

I'm happy the machine has a foot brake to stop cuts quickly when you need to.

The trunnions that support the LT18's cast-iron table are beefy, and a geared knob tips the table for making bevel cuts. It's assisted by a gas-charged shock. Blades load fairly easily from a side table slit.



Variable-speed (top) enables the 10-370 to cut metal and wood. Large hand wheels (bottom) ease setup tasks.

Laguna sent me a mobility kit, which includes an axle, plastic wheels and a "rolling" handle that engages a hitch on the saw base. Of course, you can put an aftermarket rolling base under any band saw, but I like Laguna's integrated approach. I've used this system on my own Laguna band saw for many years.

The LT18 comes with an aluminum rip fence that adjusts for drift and a tubular front rail. You can switch the fence body between an upright orientation for taller support or a "low" position for cutting thin stock. One fussy point about it: you have to loosen the fence body on the clamp with an Allen wrench and slide it back in order to take the fence off the front rail. Lift-off fences are more convenient; you'll want that fence to come off sooner or later to free up more room when cutting large parts.

At the end of the day, this Laguna is a powerful wood cutter with some nice details. There are no extra frills, but it should prove to be a workhorse and a good reflection of Laguna's band saw heritage.

RIKON 10-370

In our August 2012 issue, RIKON reported that they've been selling a lot of band saws lately. So, when I requested an 18" machine, they were temporarily out of stock on their 10-345 model (\$1,499.99), which is intended for woodworking. Instead, they sent me the 10-370. It has a sophisticated variable-frequency drive that activates a motor brake for safety and gives you infinite control over two speed ranges: either 82 to 1,312 or 328 to 3,280 feet per minute (FPM). Variable-speed control allows you to cut metal, plastics and composites as well as wood for maximum versatility.

The saw is well-appointed with good features: double ball-bearing side guides and edge-mounted thrust bearings, large hand wheels for setting blade tension and adjusting tracking, a quick-release blade tension lever in back, and a legible tensioning scale with a viewing window to assist the process. Two dust ports keep the lower compartment free of all but a dusting of debris, and the table has a geared control for tipping it off of 90°.

The hinged upper blade guard and front-mounted table slit gave this saw a leg up for me in terms of easy blade changes. Thanks to bright yellow flywheel tires and a viewing window, you won't have trouble seeing how your blades are tracking, either.

For resawing, the machine comes with a 4¼"-tall rip fence and a resawing bar. Even though this fence doesn't lift free of its tubular front rail, just slide it left and off it comes. Simple enough. If you need to pivot the fence to compensate for blade drift, there are long, threaded posts on the front rail. Readjusting the nuts on those posts will skew the fence to



RIKON

10-370 Wood/Metal Band Saw

Street Price: \$2,499.99

Motor Size: 2½hp

Table Size: 21"W x 19"D

Weight: 400 lbs.

Resaw Capacity/Throat Width: 12"/18½"

Blade Length, Width Range:

142", 1/4" to 1½"

Web: www.rikontools.com

Phone: 877-884-5167



Band saws produce copious fine dust. Double 4" dust ports on RIKON's 10-370 effectively manage it.

some degree by changing the rail's parallelism to the table.

Unfortunately, when I mounted a 3/4" blade and started resawing, it was quickly clear that something was amiss. The motor labored with even light feed pressure. I called RIKON's tech support, who assisted in evaluating and diagnosing the problem. As it turns out, the motor had a wiring issue that prevented it from developing full power, but that presented no danger. I corrected the situation with RIKON's help, and then the motor performed normally.

Resawing, even against firm feed pressure, was steady and sure, with no significant drop in FPM. In fact, I watched the digital readout from time to time to confirm it. RIKON assures me that all of its inventory of 10-370 saws have been re-inspected so that this wiring problem won't happen for you, too.

If you need a saw that's designed for cutting a variety of materials, take a closer look at this offering. Or, try out the 10-345 model for wood; its competitive price could make it a good buy.

Who Wins?

These late-model saws are distinctive but offered fairly consistent cutting performance. So what separates them qualitatively for me are their individual features and price. For my vote, JET's JWBS-18QT-3 has a winning combination: it's moderately priced and yet well-conceived for routine blade setups, user convenience and hard work.

Chris Marshall is a senior editor of Woodworker's Journal.

NEED MORE HORSEPOWER?

Two-and-a-half to 4hp saws in this tool test were up to snuff for a normal range of cutting tasks and up to 15 1/4" resawing. That's about as wide as you'll find most hardwood stock these days. But if you want maximum power from a mid-size machine — and maybe you're lucky enough to have even wider stock in your lumber rack!

— here are three more saw options to consider. Laguna's LT18 Italian-made saw (\$3,350) comes with a 4.5hp Baldor motor and will resaw material up to 18 1/2" wide. Powermatic's PM1800 (\$4,699.99), launched several years ago, packs a 5hp motor and 18" of resawing capacity in its classic — and these days almost "retro" —

806 lb. cast-iron frame. Or, take a closer look at Grizzly's G0636X Ultimate Band Saw (\$2,395). It's a 17" machine with a 5hp powerplant that will resaw 16" stock. The saw accepts blades up to an impressive 1 3/8" wide. Visit lagunatools.com, powermatic.com or grizzly.com for more details.



Laguna's
LT18



Powermatic
PM1800



Grizzly
G0636X

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Handheld Power Tools

Drilling, fastening, routing and smoothing are some of the tasks where handheld power tools are indispensable. We reviewed the latest developments in drill/drivers this year and tested quarter-sheet sanders plus a whole new category of compact plunge routers. Learn more about these tools, as well as other new-to-market products, in this section.

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Quarter-Sheet Palm Sanders42-49

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Lithium-Ion Drill/Drivers56-62

Festool's Domino XL.....64-65

New Handheld Tools



SENCO F-16A Angled Nailer

Cordless Multi-Tool

FEIN's 14.4-volt oscillating tool, the MultiMaster, is now available in a cordless version: the Cordless MultiMaster. Eight double rows of cells in the 14.4-volt lithium-ion battery packs, developed especially for the Cordless MultiMaster, provide a high charge capacity of 3,000 milliamperes, while individual cell monitoring protects the battery cells from overload. The Cordless MultiMaster oscillates at up to 18,000 oscillations per minute, with an amplitude of 2×1.6 degrees — staying constant due to an electronic speed control. Developed and made in Germany, and available in a kit with a charger and two battery packs, the Cordless MultiMaster has a suggested list price of \$625.20.



FEIN Cordless MultiMaster

Pneumatic Nailer

Although the new 16-gauge nailer from SENCO®, the F-16, is part of the Fusion™ lineup with an 18-volt lithium-ion battery, it's truly a pneumatic nailer, with the drive power coming from compressed air. Permanently sealed within the air cylinder are the pneumatic elements of a piston, driver blade and bumper. Air pressure is pre-set at the factory, permanently sealed, and never needs charging: the battery powers the motor for returning the piston to position for the next fastener. Sequential firing or contact activation are options, with the patented Reflex Shot design delivering instant trigger response. The unit can drive up to 500 nails per charge, and it is available in either a straight (F-16S) or 20 degree angled (F-16A) version for \$399.



Earlex HG1200 and HG1500 Heat Guns

Heat Guns

With heat guns, you can age or dry wood, remove paint and varnish, etc. — and Earlex has added the HG1200 and HG1500 to their line. Both weigh in at 2.2 pounds and operate on 120 volts. The HG1200 utilizes 1,200 watts at two heat settings (626° F and

950°F), while the HG1500 utilizes 1,500 watts at heat settings of 660°F and 1,110°F. Included with the HG1200 are a concentrator nozzle and glass protection nozzle, while the HG1500 comes with four nozzles, three shave hook blades, a shave hook handle and a general purpose scraper. Suggested prices are \$24.99 for the HG1200 and \$39.99 for the HG1500.



Metabo STA 18 LTX
Cordless Jig Saw

Cordless Jig Saw

Metabo's new STA 18 LTX Cordless Jig Saw can cut a maximum wood thickness of $5\frac{5}{16}$ " (and both nonferrous and sheet metals). The rubber-coated handle is designed for comfort, and an adjustable blower allows for a debris-free view of the cutting line. An anti-splinter insert helps prevent chipping when you're sawing brittle materials. The STA 18 LTX has a tool-less blade change system and a four-stage adjustable orbital blade stroke. Positive bevel stops are at 15°, 30° and 45°. Variable speeds go up to 2,700 strokes per minute, and the 18-volt tool accepts batteries from Metabo's lithium-ion line. It's priced at \$149.



Torpedo Level

IRWIN® Tools' new 250 Series Magnetic Heavy-Duty Torpedo Level is one of several new levels from the company. The Plumb-Site® feature is a mirror that allows you to get an accurate reading in a tight spot by providing dual-sided, undistorted viewing. The nine-inch tool is equipped with rare-earth magnets for hands-free work around metal and has an integrated 1.5° button for setting up 1/4" per foot drainage. List price is currently set at \$30.66.



Bosch FNS138-23 Pin Nailer

Pin Nailer

Bosch has entered the 23-gauge pin nailer market with its new FNS138-23 Pin Nailer, featuring Zero-Nail™ dry fire lockout, which eliminates blank firing: if the gun doesn't fire, the magazine is empty. For added convenience, a viewing window indicates when a nail clip is close to being depleted, and an auto-length setting ensures the correct nail positioning in the magazine.



The mirror behind the edge's viewfinder on IRWIN's new 250 Series Torpedo Level reflects the bubble below.

Bosch has incorporated a narrow-nose, slim-gun profile and stepped magazine to improve line-of-sight accuracy and maneuverability. The nailer will drive pin nails up to $1\frac{3}{8}$ ". The \$159 unit comes with carry case, no-mar tip, 1/4" air fitting and goggles.



Rockler Silicone
Glue Brush

Glue Brush

Glue no longer stays stuck to your brush with the new Silicone Glue Brush (item 45624) from Rockler: after you've let it dry, it peels and flakes off the flexible silicone bristles. You can reuse the brush for another glue-up, and it won't shed bristles into your glue-ups. The brush is waterproof, so you can immerse it in water for cleaning off glue. One end of the brush has 1/2"-deep silicone bristles; the other is tapered for detailed applications. According to Steve Krohmer, Rockler's vice president of product development, "This is the last glue brush you'll need to buy." It works with standard wood glues and with polyurethane glue, and is priced at \$4.99.



SKIL
MAG77-75
Worm Drive
SKILSAW

Circular Saw

SKIL has introduced a 75th Anniversary Limited Edition of the MAG77-75 7¼-in. Worm Drive SKILSAW®. First introduced in 1937, the SKILSAW portable circular saw remains a popularly used tool today. Features standard to today's MAG77-75 model include a 15-amp motor, anti-sag lower guard for use in making narrow cutoffs, oil indicator level and relief bellows, and a light magnesium housing to reduce user

fatigue. It also comes with a push button spindle lock. The MAG77-75 has a maximum depth of cut of 11½" at 45° and 2¾" at 90°, with a 51° maximum bevel cut. No-load rpm is 4,600. Special features include a commemorative nameplate and a 75th anniversary saw blade, a chrome aluminum foot plate and a black fleck powdercoat finish. The MAG77-75 Worm Drive SKILSAW retails for \$189.

Cordless Combo Kit

The tools in the 18-volt Lithium-Ion Cordless Combo Kit (item 325928) from Kobalt® Tools are compatible with both Kobalt 18-volt lithium-ion and NiCad batteries. One of each type of battery is included in the kit, along with a wall-mountable charger



Kobalt 18-volt Li-Ion
Cordless Combo Kit

that will charge either type. Included tools are a drill/driver with variable speed ranges at 0-450 rpm and 0-1,600 rpm; a reciprocating saw with 0-3,000 strokes per minute and a stroke length of 1½"; a circular saw with 2½" cutting capacity at 90° and 1¾" at 45°; and an articulating LED worklight. Everything fits into an included tool bag. Sold through Lowe's®, this new kit has a suggested price of \$269.

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Testing 1/4-Sheet Palm Sanders

THESE LITTLE “JITTERBUGS” HAVE BEEN AROUND FOR A LONG TIME, AND WITH GOOD REASON: THEY ARE HANDY AND ULTRA-PRACTICAL.



They may not be as feature-packed as other power tools, but 1/4-sheet palm sanders are essential for smoothing wood projects in preparation for and during finishing. Also known as “finish” or “orbital” sanders (not to be confused with random-orbit sanders), palm sanders have a square pad that accepts a quarter sheet of sandpaper. They are small, easy and safe to use, and best of all, most models are very affordable.

I recently set about testing a dozen different palm sanders. Although several models appear to be close cousins, all have distinguishing characteristics. Here are some of the things I looked for in each model and factors that I considered during testing.

Power and Sanding Performance

With most power tools, bigger motors are usually better. But not in a palm sander that is designed to work best when you apply only light pressure to the tool. Smooth operation is also key, to help minimize vibration that leads to hand discomfort.

Ergonomics

The majority of palm sanders employ a twin-grip style body that lets the user hold the tool either by its top or around the waist. This lets you change your grip, either to suit the sanding situation or to avert the hand fatigue due to holding the tool in the same manner for long periods. Rubber overmolds found on most



Quarter-sheet sanders can be gripped from the top or by the barrel. This helps to avoid fatigue.

of the sanders make gripping them more comfortable and ease vibration as well.

Ease of Paper Change

All of these palm sanders except the Festool have clamps designed to take a quarter-sheet of regular sandpaper. This is an economical alternative that lets you use any kind of paper you like in lieu of special pre-cut sanding sheets (also available for most models).



Dust collection is an important feature for any sander — even these smaller machines.



The paper clamping system that Bosch uses is the best of the bunch — terrific, according to our author.



Bosch

1297DK

Street Price: \$48
Motor Amps: 2
Dust Bag: Canister with pleated filter
Hose Connection: 19mm or 1/4" hose adapters
Accessories: Fabric tool bag, vacuum hose adapters, paper punch plate
Weight: 2 lbs. 15.7 oz.

The wire levers on most models allow tool-less paper changes, but some mechanisms are easier to use than others.

Dust Collection

Small as they are, palm sanders produce their share of fine dust. Happily, most new models come with built-in dust collection: A fan pulls dust through holes in the sandpaper that you make using a punch plate that comes with the sander. The fan then blows the dust into a fabric bag, disposable paper sack or a canister with a pleated filter. For more efficient dust collection, the majority of sanders have ports that allow you to connect the sander to a shop vacuum hose.

Bosch 1297DK

The 2-amp Bosch's motor creates a vigorous sanding action, despite the fact that it orbits its pad 12,000 orbits per minute (opm), rather than the 14,000 opm that nearly all other models run. The sanding action transmits only mild amounts of vibration to the user's palm, so it's quite comfortable to use. I liked the 1297DK's body shape and grip, which fit my medium-sized hand very well.

The Bosch sander's best feature is its "SheetLock" paper clamping system. Pressing a large red button at the front of the tool easily opens its front clamp. With one end of paper secured, a bent wire lever opens the rear clamp, which is a round rubber-covered

bar. Pushing the wire lever back into place pulls the paper tight as the bar presses it against a rubbery seat that helps hold the paper firmly. This mechanism is terrific, and it makes paper changes nearly effortless.

For dust collection, the 1297DK has a large rear-mounted canister with a pleated paper filter that's part of Bosch's microfilter system. The filtration worked well, but the canister takes up quite a bit of room behind the sander. An adapter is included for connecting the Bosch to a vacuum hose.

DeWALT D26441K

With its 2.4-amp motor, the DeWALT packs plenty of finish-sanding punch in its yellow-and-black body. It sanded aggressively, although when sanding large panels with coarse-grit papers, it was a little hard to control. Along with the PORTER-CABLE 342K and RIDGID R2501, the D26441K features user-replaceable brushes — a feature that any heavy-duty user will appreciate.

The DeWALT's body has an



The DeWALT D26441K has two different diameter vacuum hose connectors — a very practical feature.

ample rubber overmold, but only the very top of the grip has a rubber insert. The sander's small rocker On/Off switch is covered by a rubber dust shield which keeps fine dust from fouling the switch. But the cover made the switch feel less positive and harder to manipulate. The DeWALT's wire paper clamp levers were easy to operate and

DeWALT

D26441K

Street Price: \$49
Motor Amps: 2.4
Dust Bag: Fabric bag
Hose Connection: 1" or 1/4" hose adapters
Accessories: Fabric tool bag, paper punch plate
Weight: 3 lbs. 2.2 oz.





Festool RTS 400 EQ

Street Price: \$215
Motor Amps: 1.67
Dust Bag: Disposable paper bag
Hose Connection: 27mm
Accessories: Pad for PSA paper,
plastic Systainer case
Weight: 2 lbs. 11.7 oz.



Festool's sander is the only unit in this test to feature a speed control.

held the sandpaper securely.

For dust collection, the DeWALT has a small cylindrical fabric bag that's supported by an internal spring. Remove the bag and you'll find connection flanges for two different diameter vacuum hoses — a handy feature.

Festool RTS 400 EQ

By far the most expensive sander in this test group — more than 10 times the cost of the low-cost Craftsman 11177 — Festool's RTS 400 EQ technically is not a ¼-sheet sander: It accepts only the company's 5¼" x 3⅜" rectangular hook-and-loop sandpaper. The Festool sheets are relatively expensive, but paper changes are a breeze — you don't have to fool with paper clamps, and the sheets come with

dust holes already punched. I found that the slightly narrower and longer shape of the RTS 400 EQ's platen is very practical when you're sanding smaller parts and shaped parts, like moldings.

Despite its low 1.67 motor amperage rating, the Festool sander with decent aggressiveness, no doubt aided by the pad's 5/64" orbit diameter (all the others, save the PORTER-CABLE 330, have 1/16" orbits). The tool produced very little vibration, so it was comfortable to use for long periods of time. The RTS 400 EQ is the only palm sander that features variable-speed control, with a dial that lets you set the speed anywhere between 6,000 and 13,000 orbits per minute. This could be useful if you needed to reduce sanding aggressiveness when sanding a finish or a delicate surface like a marquetry-covered panel.

The Festool's dust collection setup employs a paper dust bag held in a plastic carrier that attaches to the tool's dust port, which also accepts Festool's standard shop vac hose.

Hitachi SV12SG

Hitachi SV12SG has a very distinctive look with a low-

The author found the Hitachi's body shape, although stylish, to be a bit ergonomically wanting.



profile body that's extensively covered in a heavy rubber overmold. Although this provides a very soft, grippy surface, I found the bulbous top a little cumbersome to hold. In use, the SV12SG puts out a moderate amount of vibration, with a sanding performance that was only average.

A pair of heavy bent-wire paper clamps firmly hold a quarter-sheet of sandpaper to the SV12SG's platen. However, the tool's foam rubber pad is relatively thick, so a regular quarter sandpaper sheet is barely long enough to work with the clamps. Interestingly, the Hitachi can be fitted with either a square sanding pad that takes hook-and-loop sandpaper or a 5" round pad, both available as optional accessories.

A polyester fabric dust collector bag mounts on the back of the Hitachi sander via a narrow oval-shaped flange. The bag has a full zipper on the back, which makes it easy to empty. But the mounting flange doesn't allow a vacuum hose connection, and there's no adapter available.

Makita B04556

Compact and not too heavy, Makita's B04556 palm sander has a twin-grip-style body, with ample rubber overmolds that I found comfortable to hold in either position. The Makita's 2-amp motor comes to life somewhat

Continues on page 46 ...



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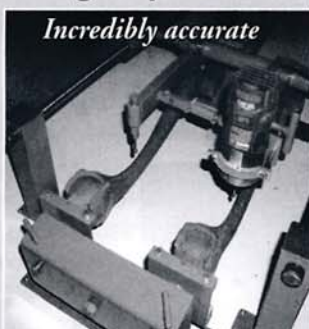
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Makita B04556

Street Price: \$49
Motor Amps: 2
Dust Bag: Fabric bag
Hose Connection: 3/4"
Accessories: Paper punch plate
Weight: 2 lbs. 12.7 oz.



Smooth, low-vibration operation, sufficient power and a nice group of features won this tool our Best Bet.

slowly, but at full speed transmits only light vibration to the user. It's a very smooth running sander that's pleasurable to use for extended periods. Something else I liked: Makita has managed to protect the tool's small rocker-style On/Off switch with a plastic dust cover, while keeping its operation crisp and positive.

Attaching a sanding sheet is a pretty easy job on the B04556. The thick wire clamps provide positive registration of the end of the sandpaper sheet, so it's easy to secure. The Makita's platen features a nice 1/4"-thick neoprene sanding pad; most of the other sanders have thinner pads. I like a thick pad for finish-sanding smaller parts and details, such as moldings and shaped edges; the

heavy foam allows the sandpaper to bend and conform more easily to a curved surface.

The fabric dust bag that comes with the B04556 has a decent capacity, and its port fits Makita's smallish 3/4" shop vacuum hose. You can also fit an optional filter assembly that uses paper bags.

Milwaukee 6020-21

The most powerful and second-heaviest palm sander in the review, the Milwaukee 6020-21 runs on a beefy 3-amp motor. Flip on the Milwaukee's crisply-operating switch and it snaps to life with the kind of start-up torque you'd expect from a small router. But its impressive sanding action does transmit a good deal of vibration to the user's hand. Also, this powerful sander seemed to want to spin, and it took a fair amount of effort to restrain it, even when doing light sanding on a flat surface.

The 6020-21 has a pair of fold-out levers to release the strong springs that secure the paper clamps themselves. The problem is that there isn't enough space to



Milwaukee's 6020-21 holds sandpaper solidly, but the dust bag interferes with operation of the rear clamp.

Milwaukee 6020-21

Street Price: \$50
Motor Amps: 3
Dust Bag: Fabric bag
Hose Connection: 1" or 1 1/4"
Accessories: Plastic case, paper punch plate
Weight: 3 lbs. 1 oz.



PORTER-CABLE 330 SPEED-BLOC

Street Price: \$88
Motor Amps: 1.2
Dust Bag: None
Hose Connection: None
Accessories: Tool for paper clamp
Weight: 3 lbs. 11.3 oz.



The old-school PORTER-CABLE 330 is found in countless workshops around the country.



operate the lever at the back of the sander — the dust bag assembly gets in the way. This makes paper changes a tedious affair.

The 6020-21 has a cylindrical fabric dust bag that, just like several other sanders, has a spring inside to keep the bag extended. This is nice, because the spring allows the bag to deflect if you encounter a vertical obstruction, say, when sanding into a corner.



The PORTER-CABLE 342K is the company's most powerful sander rated at 2.4 amps.

PORTER-CABLE 330 SPEED-BLOC®

The PORTER-CABLE 330 SPEED-BLOC palm sander's distinct black bell-shaped body identifies it as a veteran tool found in countless cabinet and production shops. Although its motor is rated at only half the amperage of its sister model, the 342K, the model 330 still sands with enough gusto to make it a speedy performer for most sanding tasks. (For really heavy sanding jobs, I recommend switching to a random-orbit sander.) The body lacks a rubberized coating, but it still provides a comfortable grip and excellent control of the sander. It also limits the transfer of vibration to your hand.

The 330's paper clamps are heavier and grip paper tighter than on any other palm sander. The sander's stubby clamp levers are stiff and hard to use, so it's best to employ the included metal tool (or a screwdriver) to operate them. The clamps also allow an old production sanding trick: Mount several sandpaper sheets in at once and, as a sheet wears out, tear it off to reveal the



RIDGID's paper punch creates many small holes, allowing for very good dust collection.

PORTER-CABLE

342K

Street Price: \$51
Motor Amps: 2.4
Dust Bag: Fabric bag
Hose Connection: None
Accessories: Paper punch plate
Weight: 2 lbs. 8.5 oz.



fresh sheet under it. Could be handy to try.

Since the SPEED-BLOC lacks any form of built-in dust collection, you need to work atop a downdraft sanding table and/or while wearing a dust mask to protect your lungs whenever you use it. On the up side, there's no need to punch holes in the sandpaper each time you change sheets.

PORTER-CABLE 342K

PORTER-CABLE's 342K is their most powerful model, with a 2.4-amp motor rating that matches the DeWALT and RIDGID sanders. The PORTER-CABLE's performance equaled its rivals, yet it ran a bit smoother and with less vibration. I didn't think the 342K's disc-shaped top grip was as comfortable as the teardrop-shaped grips found on other models. But it did provide excellent control of the tool, especially when sanding edges and narrow or small parts.

The 342K's thin foam rubber-covered platen and bent-wire lever paper clamps are very similar to DeWALT's. The clamps are strong and easy to use,

but the dust bag assembly hangs so low in back that it's hard to see what you're doing when clamping the back edge of a sheet. I liked the sander's dust hole pattern, which is symmetrical both ways, so you don't have to orient the sander in a particular direction when using the punch plate — a small, but nice touch.

The 342K does come with an ample-sized fabric dust bag, but it's mounted to a D-shaped port that has no adapter for connection to a vacuum hose.

RIDGID R2501

The orange and gray RIDGID R2501 sports a twin-grip-style body with soft-feeling rubber overmolds in all the right places. I really liked this sander's lower body grip, which offers a very comfortable holding position. The RIDGID's motor switches on with some authority, but it also sends a fair amount of vibration into the user's hand. Keeping it

RIDGID

R2501

Street Price: \$50
Motor Amps: 2.4
Dust Bag: Fabric bag
Hose Connection: 1/4" or 2/4"
Accessories: Fabric tool bag,
paper punch plate
Weight: 3 lbs. 1.5 oz.





Ryobi S652DK

Street Price: \$30
Motor Amps: 2
Dust Bag: Fabric bag
Hose Connection: 1¼"
Accessories: Fabric tool bag,
paper punch plate
Weight: 3 lbs. 1.7 oz.



A light in Ryobi's teardrop-shaped grip shows that the tool is plugged in.

under control while sanding a flat surface was, at times, a challenge that ultimately tired my hands during long sanding sessions. It took time to get used to the tool's back-and-forth sliding On/Off switch; once in a while I turned it off accidentally when I changed my grip on the tool.

The RIDGID's clamping system

is remarkably similar to the Bosch's, but its front clamp employs a lever that must be lifted to open, so it isn't as easy to use. The paper punch that comes with the sander makes fairly small holes, but there are lots of them, so the RIDGID does a pretty good job of collecting dust. The rest of its dust system is similar to DeWALT's, with a spring-loaded fabric bag and a port that offers the connection for two different-sized vacuum hoses.

Ryobi S652DK

The Ryobi palm sander has a teardrop-shaped rubberized top grip that features a slide-through On/Off switch of the style that's found on the RIDGID. The top grip is pleasant enough to hold, but I found the S652DK's large body a bit too bulky to grip comfortably. There's also an indicator light on top of the S652DK to warn you that the tool is plugged in.

Powered up, the Ryobi put in a middle-of-the-pack sanding performance. Unfortunately, any motor power that wasn't transferred to the sanding pad seemed to end up in my hands. The S652DK vibrated so much that my

palms felt sore even after only 10 minutes of use. I donned a pair of bike gloves with gel-filled palms in order to continue my testing while protecting my hands.

The Ryobi's platen and paper clamps are much like those found on other palm sanders, but its levers have rubberized plastic end caps that make them comfortable to use. The clamps operate smoothly and grip the paper effectively.

Sears Craftsman 11177

With a street price of just under \$20, the Sears Craftsman model 11177 is the least expensive palm sander in this article, and it's also the lightest. The Craftsman has a 2-amp motor that delivered sanding performance on par with the Ryobi. Its top grip is covered with soft rubber which felt good on my bare palm. I also really liked its slide-through-style On/Off switch, which was easy to actuate, yet had enough tension to prevent accidental operation.

The 11177's sanding platen wasn't the best, with a thin aluminum plate covered with a thin, hard foam rubber pad. Its wire

Palm Sander Specifications

Make/Model	Street Price	Motor Amps	Dust Bag	Vacuum Hose Connection	Included Accessories	Weight
Bosch 1297DK	\$48	2	Canister with pleated filter	19mm or 1¼ in. hose with adapters	Fabric tool bag, vacuum hose adapters, paper punch plate	2 lbs. 15.7 oz.
DeWALT D26441K	\$49	2.4	Fabric bag	1 in. or 1¼ in. hose	Fabric tool bag, paper punch plate	3 lbs. 2.2 oz.
Festool RTS 400 EQ	\$215	1.67	Disposable paper bag	27mm hose	Pad for PSA paper, plastic Systainer case	2 lbs. 11.7 oz.
Hitachi SV12SG	\$45	1.7	Fabric bag	None	Paper punch plate	2 lbs. 6.7 oz.
Makita BO4556	\$49	2	Fabric bag*	3/4 in. hose	Paper punch plate	2 lbs. 12.7 oz.
Milwaukee 6020-21	\$50	3	Fabric bag	1 in. or 1¼ in. hose	Plastic case, paper punch plate	3 lbs. 1 oz.
PORTER-CABLE 330 SPEED-BLOC	\$88	1.2	None	None	Tool for paper clamp	3 lbs. 11.3 oz.
PORTER-CABLE 342K	\$51	2.4	Fabric bag	None	Paper punch plate	2 lbs. 8.5 oz.
RIDGID R2501	\$50	2.4	Fabric bag	1¼ in. or 2¼ in. hose	Fabric tool bag, paper punch plate	3 lbs. 1.5 oz.
Ryobi S652DK	\$30	2	Fabric bag	1¼ in. hose	Fabric tool bag, paper punch plate	3 lbs. 1.7 oz.
Sears Craftsman 11177	\$20	2	Fabric bag	1¼ in. hose	Paper punch plate	2 lbs. 3.3 oz.
Skil 7292	\$30	2	Canister with pleated filter	1¼ in. hose	Paper punch plate	2 lbs. 7.5 oz.

*An optional paper filter dust assembly is available



The least expensive sander in the bunch, this Craftsman had a very nice sliding On/Off switch.

Sears Craftsman

11177

Street Price: \$20
Motor Amps: 2
Dust Bag: Fabric bag
Hose Connection: 1¼"
Accessories: Paper punch plate
Weight: 2 lbs. 3.3 oz.



paper clamp levers worked well and have looped ends, which were easier on my fingers than the tightly bent ends on the Hitachi palm sander. However, it was a bit hard to tell how far to insert the sandpaper under one clamp so that there would be enough slack left to clamp the sheet at the other end.

The Craftsman's dust collection setup is much like the Ryobi's, with a dust bag mounted on a round plastic port that also accepts a vacuum hose. The 11177's smallish fabric bag lacks a zipper, but it's easy to empty via a large mounting flange.

Skil 7292

Skil's palm sander has a very generous feature set, considering its low street price. A most unique feature is its "Pressure Control Technology": A series of LEDs that light up in response to how hard the sander is pressed down during operation. One or two green LEDs show that the correct amount of light sanding pressure is used, while yellow and red LED's indicate excessive pressure. Some might consider this feature a gimmick, but I

think some less experienced users will appreciate the feedback that the lights offer.

Overall, the Skil 7292 felt good in my hands, and I was impressed with its overall running smoothness. It didn't sand as aggressively as some models with higher amperage motors, but it didn't feel underpowered either.

The Skil's sandpaper clamps worked well, and it was easy to register the ends of the sandpaper when mounting a new sheet. My only complaint was that the wire clamp levers were somewhat difficult to release from their locked positions.

The 7292's dust collection setup features a plastic canister fitted with a small pleated-paper filter. The sander collected dust fairly effectively, and the clear plastic made it easy to see when it was time to empty the canister.

Picking the Winners

While motor power, easy paper changes and good dust collection are all important aspects of palm sander performance, ultimately, I just HATE having my hands go numb during long sanding sessions. Therefore, I

winnowed down the field by first picking the smoothest running sanders: the Bosch, Festool, Makita, Skil and both PORTER-CABLE models. To further narrow the field, I eliminated the otherwise terrific Festool for simply being too expensive and the PORTER-CABLE 330 for lacking dust collection. When I compared the final four sanders, it was much tougher to pick a clear winner. I really loved the Bosch's amazingly easy paper change mechanism, and I thought the Skil offered a lot of sander for only three sawbucks. But I ultimately gave the Makita my vote as the "Best Bet." This tool feels solid and comfortable, it's powerful enough to use for any finish sanding task, and best of all, it operates so smoothly that you can run it all day without ending up with tingling fingers.

Sandor Nagyszalanczy is a contributing editor to Woodworker's Journal. His books are available at Amazon.com.



LED lights indicate the proper amount of pressure to apply as you use the Skil sander, a nice touch.

Skil

7292

Street Price: \$30
Motor Amps: 2
Dust Bag: Canister with pleated filter
Vac Hose Connection: 1¼" hose
Accessories: Paper punch plate
Weight: 2 lbs. 7.5 oz.





Compact Plunge Router Kits

THESE NEW, TINY PLUNGE ROUTERS SHAVE POUNDS OFF THE WEIGHT OF LARGER MACHINES, BUT THEY STILL PACK A BIG PUNCH FOR WOODWORKING.

Bosch broke new ground for compact handheld routing seven years ago when its Colt Palm Router entered the market, and I wondered then if the “more routing with less router” theme would catch on. It definitely has. In the years

since, Trend, DeWALT/PORTER-CABLE and, most recently, Makita have followed suit with their own versions of 1- to 1½hp compact routers. Now, you can choose from five different models — all with plunge bases that, to me, sacrifice little in the way of

precision or convenience from their larger kin. But, to explore their merits, I’ve run the group through some rigorous routing tasks: full-depth edge profiling with a 1/2" cove bit, shallow free-hand mortising and deep guided mortising in oak and hard maple,



and templated letter carving. In a nutshell, here's what it proved: these versatile, easy-to-handle tools are fully capable wood-working routers. If you think they're just hopped-up laminate trimmers, it just ain't so. Here's how these pint-sized plunge routers tested.

Bosch PR20EVSPK

The Colt Palm Router motor pack and its fixed base are unchanged for this new kit, but what's brand-new is the plunge base. So, I'll cut right to that chase. The ergonomic overmolded handles are modeled after Bosch's MR23 mid-size machine, so they're sturdy and comfortable. Its left-hand plunge lever engages the plunge action when depressed and parks it firmly to depth when released: an intuitive approach. When driving bits down into my test lumber, the action was fluid, and the base's internal springs lifted the bit up and out briskly.

Bosch provides a seven-position depth turret, an easy-to-read depth scale in Imperial or metric readout and a micro-adjustable

stop rod. The clear plastic depth indicator stands off from the scale a bit, which could introduce parallax error unless you look straight on, so use care when setting it.

Bosch fashions the clear round sub-base with an oversized bit opening, and it accepts Bosch's spring-loaded collar to hold notched guide bushings. A steel edge guide comes standard, too.

Once saddled up, the Colt had no trouble tackling oak and maple; it held its depth settings accurately (as did all the test group) and cut the cleanest-walled mortises. The Colt system could really use dust collection, which isn't provided, but overall this was a solid performer for \$199. If you already have a Colt, you can buy the plunge base separately for \$89 to \$99.

DeWALT DWP611PK, PORTER-CABLE 450PK

DeWALT and PORTER-CABLE share the same corporate umbrella these days, so it wasn't surprising when two similar fixed-base/plunge-base kits launched at the same time a couple of years ago.

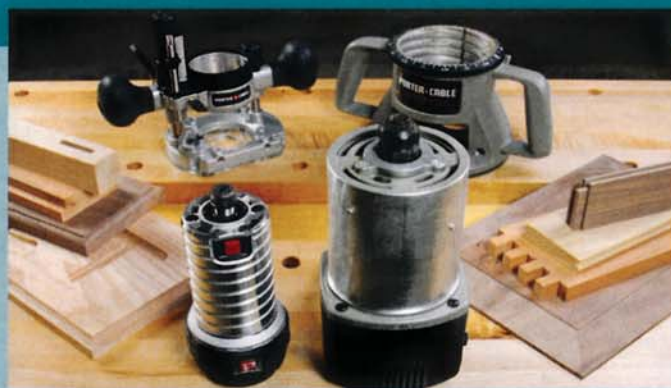
They share many matching strengths to complement their "double-take" looks. The little powerplants muscled easily through hardwood, thanks to feedback circuitry that maintains power under load. DeWALT's iteration comes with electronic variable-speed (EVS); PORTER-CABLE's doesn't. Flat tops, and spindle locks with extra internal detents, made bit changes simple with one wrench. And the motors engage into the plunge bases almost effortlessly: straight down and in, then snap a buckle closed. Good design.

Their plunge action is silky smooth with levers long enough to reach easily by thumb. Stab them, and the bases plunge; let go, and they lock securely. While there was some slight play in the plunge motion, it didn't seem to impact mortising accuracy.

These depth-setting systems are the best of the test group, with cursors that are flat against their bright scales and micro-adjustment on both the depth rod and their five-step turrets. I also appreciated that the sub-bases accept standard 1 $\frac{3}{16}$ " template

TINY BUT TOUGH

About a year ago, we asked readers which routers they'd choose if they could only have two. Twenty percent said two full-size machines. Not me. A big, heavy 3.25hp like my PORTER-CABLE 7518 (shown at right) is perfect in a router table for panel-raising, heavy joinery cuts and making big moldings. But for maximum control when profiling, mortising over a jig or freehand routing, a compact router (at left) is light, accurate and plenty powerful for this work.





Bosch
PR20EVSPK
Street Price: \$199
Peak HP/Amps: 1 / 5.6
Collet Size(s): 1/4"
Speed Range: 16,000-35,000rpm
Plunge Depth: 2"
Weight in Plunge Base: 5.85 lbs.
Web: www.boschtools.com
Phone: 877-267-2499



Two inches of plunge travel will make the Bosch, DeWALT and P-C routers handy for cutting deep mortises.



Bosch's proprietary notched template guides and locking collar fit its new Colt plunge base.



when routing small work or steering the tool around corners. The P-C base is small and round. DeWALT's bit opening in the fixed base is larger than P-C's, which is sized for template guides.

When loading the motors into their fixed bases, a depth collar must first be unbuckled and threaded onto the motor, then the base housing snaps onto it. The collar and an adjustable ring scale beneath it work well for setting depth changes as fine as 1/64".

The circumference of the fixed-base housing is quite large and could feel a bit unwieldy if you have smaller hands.

These two kits come with a collet wrench and duffel bag, but there is no vac attachment or edge guide here (they are available

as accessories). Despite the limited extras, these rugged little routers were a pleasure to test-drive overall.

Trend T4 Plunge Router

It's fun when a tool surprises during a review, and a couple smart features of this T4 dedicated plunge router did just that. First, the router's plastic dust port connector surrounded the bit opening so effectively that everything from mortising to letter carving was virtually debris-free. Wow! On three other machines without a dust fitting, I had a mess to clean up with each test cut. The T4 also has a screw-on adapter ring that outfits it for standard template guides. Very helpful.

This router is a couple inches taller than the competition, but it still feels nicely balanced, and the round plastic handles are comfortably sized.

In terms of plunge styling, the base locks when you depress a rear lever on the right; otherwise, plunge motion is always in effect. It worked well.

The T4's depth stop rod is stamped with a tiny metric scale

guides, because these tools will be handy for moderate template work.

Now, for a few differences. DeWALT outfits the motor with two LED lights that shine down into the bit area while you cut — a helpful enhancement. PORTER-CABLE's 450PK has none. DeWALT outfits its fixed base with a longer square-edged sub-base, which adds stability

PORTER-CABLE
450PK
Street Price: \$189
Peak HP/Amps: 1.25 / 7
Collet Size(s): 1/4"
Speed Range: 27,000 rpm
Plunge Depth: 2"
Weight in Plunge Base: 7.6 lbs.
Web: www.portercable.com
Phone: 888-848-5175



PORTER-CABLE's long lever activates the plunge action, and depth settings lock securely when you release it.



A bright scale and snug-fitting cursor ensure legible, accurate depth setups.



Trend packages the T4 with helpful accessories: an adapter ring that accepts standard template guides (left) and a vac connector (right) that draws debris out of the cutting area effectively.

that's unpainted, and it's harder to read than others. Still, the three-position turret offers micro-adjustment at each step for fine-tuning cuts. There's no feedback circuitry to maintain torque output, but that didn't seem to matter during heavy cutting tasks. It chewed through my cuts on par with the other tools. The motor does have a spindle lock, EVS and access to motor brushes. You can even remove the motor to use it as a grinder.

An edge guide, a 5/8" O.D. template guide and a plastic carry case round out this budget-friendly kit.

Makita RT0700CX3

Makita takes a "shotgun" approach at the compact routing market here, with a kit that offers every imaginable accessory: fixed, plunge, offset and tilt bases, a trimmer roller guide, edge guide, vac attachments for both plunge and fixed bases, even a drill-style side handle and a big padded carry case to stow it all. The extras will appeal to the countertop and cabinetry crowd, but for woodworking, I

think it's more than necessary.

A powerful motor with EVS, soft-start and torque control slips between bases with the flip of a buckle lever, and it was gutsy in testing. The On/Off toggle switch faces left, so you can power up or down without taking your hands off the plunge base's soft rubber handles. Nice! But oddly, the plunge lever is too short to activate by thumb like the other test routers, and that's inconvenient. The depth stop on the plunge base has a red disk pointer; a hairline cursor would be easier to view accurately. The bases accept Makita's steel template guides, not standard sizes.

While the fixed-base vac attachment kept the cutting area really tidy, I can't say the same



Trend

T4 Plunge Router

Street Price: \$99
Peak HP/Amps: 1.1 / 6.6
Collet Size(s): 1/4", 6mm, 8mm
Speed Range: 11,500-32,000rpm
Plunge Depth: 1 3/8"
Weight in Plunge Base: 7.7 lbs.
Web: www.trend-usa.com
Phone: 877-918-7363

for the plunge-base dust port, which struggled for suction; chips clogged up around the cutting area quickly. I eventually removed it to complete my testing.

With a few refinements, Makita's plunge base could be even better, and its overmolded fixed base is comfortable in hand. There's a lot of potential here, but is an extra \$40 or more over the other tools



Makita

RT0700CX3

Street Price: \$239
Peak HP/Amps: 1.25 / 6.5
Collet Size(s): 1/4", 3/8"
Speed Range: 10,000-30,000rpm
Plunge Depth: 1 3/8"
Weight in Plunge Base: 6.1 lbs.
Web: www.makitatools.com
Phone: 800-462-5482



Makita's motor pack slides straight into the bases for quick, easy changeovers. An edge guide comes standard with the RT0700CX3's plethora of base options and extras.





DeWALT's fixed base option for this router (left), has a square see-through plastic baseplate. LED lights (right) illuminate the bit area when routing with either base.

DeWALT DWP611PK

Street Price: \$199
Peak HP/Amps: 1.25 / 7
Collet Size(s): 1/4"
Speed Range: 16,000-27,000
Plunge Depth: 2"
Weight in Plunge Base: 7.7 lbs
Web: www.dewalt.com
Phone: 800-433-9258

worth it for the additional bases? That's a question only you can answer.

Who Takes the Prize?

Here's a tough judgment call, because I'm happy to see so many strong contenders in this new and growing class of routers. Given its low cost and excellent dust control, Trend's T4 seems a great buy. But a fixed base can be handy to have, too. Bosch and

DeWALT, with two bases, run a neck and neck race for pricing and performance. While both tools could really use standard dust collection, I'm going to tip the scales in favor of DeWALT. Those LED lights are a really helpful addition I'd like to see across the board. By a nose, it wins my "Best Bet" pick.

Chris Marshall is a senior editor of Woodworker's Journal.

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Lithium-Ion Drill/Drivers on the March



When it comes to lithium-ion (Li-ion) models, the large majority of new drill/driver offerings are either 12- (aka 10.8-volts) or 18-volts — plenty of power at one end and compact reliability at the other.

IS THERE REALLY A SUBSTANTIAL DIFFERENCE BETWEEN THE DRILLS OF A HALF-DOZEN YEARS AGO AND THE LATEST AND GREATEST OF TODAY?

THE STANLEY YANKEE

This No. 130A Stanley screwdriver from the early 1920s was one of the first "drill/drivers" ... although it was muscle-powered, not battery-powered.





With the crazy fast rate of technological change we've experienced in recent decades, it's little wonder that woodworkers have come to expect a steady stream of newer and better power tools to show up on hardware store shelves. In this article, I'll take a look at some of the latest offerings in the drill/driver world to see if expectations are being met.

Bigger is Better — But so is Smaller

One of the first things I noticed about the latest crop of drill/drivers is that, in contrast to the old NiCad days when a single manufacturer might offer a half-dozen models that are all different voltages: 9.6v, 12v, 14.4v, 15.6v, 18v, 19.2v, 24v, etc., the great majority of the newest Li-ion drill/drivers are either 18-volt or 12-volt models (see inset photo, previous page). Why? Well, 18-volt Li-ion drills seem to hit that "sweet spot" of small size and light weight balanced with enough power to get all but the heaviest jobs done. (Incidentally, DeWALT's new 20V MAX drills are really 18-volt tools; the battery packs output 20 volts right after they're charged.) At the other end of the spectrum, 12-volt compact and subcompact

drills are super handy and still have enough "oomph" to handle smaller jobs around the shop and home.

Another trend that's easy to observe is that many drill manufacturers make two different 18-volt models: a larger, heavier duty drill/driver and a smaller, compact one (see photo above). Bosch was one of the first to embrace this strategy with their Brute-Tough and Compact-Tough drill/drivers, offering different tools to suit demanding pros and everyday users.

New Motors

In the past, all portable power tool motors were two-pole motors, and the big thing was whether or not the motor's brushes were accessible and "user changeable." The current majority of drill/drivers sport four-pole universal motors, and at least one manufacturer, Festool, is putting brushless motors in its line of drill/drivers. Why the big motor switch? As Paul Fry, a marketing director at Milwaukee Electric Tool Corp., told me: "With the advent of more powerful and capable lithium-ion battery packs, the next logical step towards better performance was to use a better motor." Indeed, many

The first trend the author noted is moving away from multiple voltage offerings. The second is the availability, almost across the board, of two units at the 18-volt size — a "heavy-duty" version and a "compact" version.



PORTER-CABLE's new four-pole model (front) delivers over 420 in.-lbs. of torque, while the older two-pole model (back) was rated at 325 in.-lbs.



Festool's brushless motors and Li-ion batteries are a great match. Other manufacturers may soon follow suit — but cost is a big stopper.



Makita's LXFD01, featuring a four-pole motor, also employs a new drive train with larger front-end ball bearings and a redesigned planetary gear system and transmission.



Hybrid drill/drivers that combine both a drilling function and an impact driver function are one of the recent innovations offering more options to woodworkers.



Makita's BTP140 is a real jack-of-all-trades, combining a drill/driver, impact driver and hammer drill all in one tool. The selection switch is handy, but a bit confusing.

drill/driver manufacturers have embraced this advantage and switched to four-pole motors, with impressive results. For example, PORTER-CABLE's PCL180CD model's new motor (see center photo, page 57) delivers over 420 in.-lbs. of maximum torque, while the old two-pole motor in their former model achieved around 325 in.-lbs. — more than a 30% difference. Having a torquier motor also lets manufacturers step up their gearing to deliver faster drilling speeds: up to 1,500 to 2,000rpm. Few drill/drivers made six years ago revved above 1,400rpm.

Festool debuted a brushless motor in its C12 NiCad-powered cordless drills in 2005. But it was recent change to lithium-ion batteries that has unleashed more of this sophisticated motor's full abilities (see bottom photo, page 57). Manufactured by Festool in Stuttgart, Germany, brushless motors offer many advantages over conventional motors: Because they have no commutator or brushes, there are few parts to wear out or require maintenance. Plus, the motors are tremendously efficient — about 30% more effi-

cient than conventional brush motors. "That means you can get more work done with the drill on a single battery charge," says Rick Bush, product manager at Festool USA. Why haven't more tool manufacturers switched to these cutting-edge motors? Cost seems to be the primary limitation at this time.

Use of the four-pole and brushless motors has required other parts of new drill/drivers to change as well. Manufacturers have had to beef up their drill/driver gearboxes and other drive train components. Makita, one of the earliest proponents of 4-pole motors, improved the drivetrain on their new iteration of the LXFD01 with larger front-end ball bearings and a redesigned planetary gear system and transmission that's said to deliver increased durability. Festool also uses planetary gears in their brushless-motor-powered drills, employing a three-stage system to increase strength and durability. The new motors have also required changes in the electronic power management circuitry that regulates power delivery and protects the tool and battery.

Hybrid Models

If basic hole drilling and fastener driving aren't enough to suit your needs, there are a handful of newish multipurpose drill/drivers out there that can handle even more tasks. Heavy-duty drills that offer a hammer function, for drilling holes in brick, concrete, tile, etc., are nothing new. But

**HAVING BOTH DRILLING AND IMPACT
FUNCTIONS IN A SINGLE TOOL IS GREAT FOR
CRAFTSMEN THAT DON'T WANT TO BUY
SEPARATE TOOLS FOR DIFFERENT JOBS.**

for the first time, Milwaukee has integrated hammering into a small drill. Their 12v model 2411 drill/driver has selectable hammer action which is very handy for light masonry drilling jobs, like anchoring a bookshelf unit to a concrete block wall.

If you prefer the wrist-saving drive action of an impact driver for setting big screws but also need to bore the occasional hole, Bosch's 26618 hybrid impact drill/driver will interest you. The tool is not much bigger than a regular cordless impact driver, but it offers more versatility. A top-mounted slide switch lets you change the tool's drive from straight drilling rotation to an impact function that'll drive even the largest screws with torque to spare — up to 1,500 in.-lbs. (in impact mode).

Makita's BTP140 is a real jack-of-all-trades, combining a drill/driver, impact driver and hammer drill all in one tool. A rather complex-looking gear-switching mechanism operated by a single lever atop the tool lets you choose between five settings: drill only in high speed, drill only in low speed, impact driving, hammer drilling and driving using the user-adjustable clutch. Hybrids are even shorter than the shortest regular drill/drivers, making them easy to wield in tight spaces or when working in odd positions. The compactness of these hybrids is due to the fact that they only accept hex shank bits (aftermarket drill chuck adapters are available).

Better Batteries

Not that many years ago, all drill/drivers came with either a NiCad or a Nickel-Metal Hydride battery pack. Milwaukee introduced the first Li-ion powered portable power tools. Others were quick to follow, with some makers offering Li-ion battery packs as an upgrade to their existing tools. Now the field has flipped, and the vast majority of drill/drivers on the market are powered by Li-ion packs. Li-ion offers a big advantage over other power sources: Greater power density, which means more run time in a smaller, lighter battery pack. Lithium cells also hold their charge longer, so if you leave your drill/driver on the shelf, it will still have a useable charge when you need it, even months later.

But lithium hasn't exactly been a slam dunk. Issues of cost, cold-weather performance, temperature degradation, over discharge and battery life have taken a toll on craftsmen who were early to Li-ion powered drills and other tools. As with most other technologies, it's taken several generations of development to make them more dependable performers. One company told me that they'd gone through more than five generations of changes to their Li-ion battery packs just since 2005. There are three main areas in which these batteries have significantly improved in recent years: chemical, physical and electronic.

Battery chemistry continues to be a major topic in Li-ion today.



Li-ion offers a big advantage over other power sources: greater power density, which means more run-time in a smaller, lighter battery pack.



The Red Lithium packs are reputed to operate at temperatures as low as 0° Fahrenheit.



Batteries can be seriously damaged if dropped. Several toolmakers have developed double latches on their batteries to be doubly sure that a pack won't inadvertently fall or get knocked off of the tool.



Battery electronics help regulate the flow of electricity from the pack to the tool and may help regulate the charging process as well. These electronics are advancing with each generation.



"QuickBoost" is another charging innovation that's part of the second generation of Craftsman's NEXTEC line of compact Li-ion tools. It delivers a 25% charge in only three minutes.



Kobalt's KT200A drill/driver takes charging to a new level. An LCD screen shows battery condition and charging status and a minute countdown, indicating time to reach a full charge.

EARLY LI-ION PACKS WERE QUITE LARGE BECAUSE THE CELLS WERE THE DIAMETER OF A ROLL OF QUARTERS. NOW CELLS ARE ABOUT THE SIZE OF AA BATTERIES.

The challenge for tool manufacturers has been to leverage industrial battery developments into batteries that work best for power tools which have high current demands. Drill/drivers and other cordless tool battery packs have a number of cells wired together inside of them. Most tool manufacturers don't make their own battery cells. Their goal is to find a cell with chemistry and electrical characteristics with the right mix of performance, service life and value. When Festool builds its Li-ion battery packs, it carefully tests and selects individual cells to create the best matched sets to enhance cell balancing and prolonging battery life and efficiency. Improved chemistry has created batteries with increased performance and extended pack life. Panasonic, for example, claims that their Li-ion packs have twice the total lifetime performance of their existing Ni-Cad packs.

A most noteworthy achievement in improving lithium battery chemistry has come from one of its foremost pioneers, Milwaukee Electric Tool Corporation. Their Red Lithium batteries, currently produced for the M18 and M12 tool platforms, have made significant strides in improving one of Li-ion's shortcomings: sluggish performance at cold temperatures. The Red Lithium packs are reputed to operate at temperatures as low as 0 degrees Fahrenheit, a temperature at which most Li-ion-powered tools barely run. Milwaukee also

claims the new packs offer 40% more run-time, 20% more power and 50% more recharges than their former Li-ion batteries.

Battery pack construction has been one of the biggest vulnerabilities of cordless tools: A pack fails when its cells, wiring or electronics are damaged by vibration, or if the pack is dropped or otherwise abused. To improve the odds, tool manufacturers have improved the mechanical construction of their packs in recent years. Manufacturers have also improved the latching system that locks a pack onto the tool. Festool, Hitachi, Milwaukee and RIDGID all use double latches on their sled-style battery packs.

Another significant change in the physical characteristics of lithium battery packs is that they're getting smaller. This allows toolmakers to create smaller and lighter packs, such as the slender sled-style packs that come with most compact drill/drivers.

Battery electronics help regulate the flow of electricity from the pack to the tool, and they may help regulate the charging process as well. The sophistication of protective electronics has increased in recent years but varies considerably depending on the make and model of tool.

Faster, Friendlier Chargers

For best performance and pack life, lithium-ion battery packs need to be charged carefully and correctly. To deal with a battery pack that's heated up from heavy use, most chargers check the

battery's temperature. If the pack is too hot, the electronics delay the charging process until the pack cools. Chargers that come with some drill/drivers (Bosch, Festool, Panasonic, Makita, Hitachi, etc.) have a built-in fan that automatically switches on when a hot pack is detected.

The newest "smart" chargers have even more features to enhance battery performance and longevity. For example, the charger that comes with Panasonic's Tough IP cordless line monitors the condition of the battery pack during charging to deliver quicker charges while generating a minimum of heat. Some chargers also have built-in maintenance and cell equalization modes that monitor each cell in the battery for optimum charging and prolonged battery life.

Since nobody wants to wait any longer than necessary for a battery pack to recharge, cordless tool manufacturers continue to find ways to safely speed up the process. Intelligent battery chargers, such as the one that comes with Festool's line of Li-ion drill/drivers, adjust charging rates dynamically. A pack is charged rapidly until it reaches about 3/4 of its capacity. Then it slows down, both to protect the cells and prolong the life of the battery.

"QuickBoost" is another charging innovation that's part of the second generation of Craftsman's NEXTEC line of compact Li-ion tools. If you're stuck with a dead tool battery and want to get back to work quickly, pressing

the QuickBoost button on the NEXTEC charger brings a fully depleted pack up to 25% capacity in only three minutes (that's barely enough time to get a cup of coffee)!

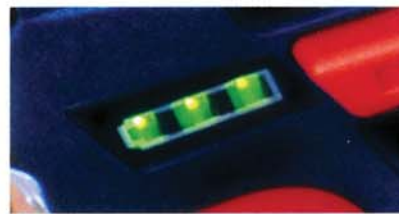
The latest Li-ion battery chargers are not only getting smarter, they're getting more user-friendly with a variety of improved displays regarding the condition of the battery.

Smarter Tool Electronics

In addition to the circuitry found in battery packs and chargers, drill/driver manufacturers are finding other clever ways of using electronics to improve drilling and driving performance. A good example of this are the electronics that Milwaukee puts into its M18 and M12 lines of cordless tools. Connectors on the battery interface with circuitry in the particular tool, so the pack "knows" what tool it's connected to: a drill/driver, a reciprocating saw, jigsaw, etc. A software profile in the tool's electronics then follows a preprogrammed program that controls and regulates battery output for best performance while protecting the pack from temperature or discharge damage.

Cool Features

As significant as all the "under the hood" changes to cordless drills have been (new motors, electronics, etc.) there really haven't been too many significant new operational features to appear on drills in recent years. But there are a few that are worth commenting on:



A recent trend is to move the fuel gauge to the tool itself, thus reducing the need for having one on every individual pack. The disadvantage is that you need to put your battery in the tool to get a readout.



In lieu of having a mechanical clutch as found on virtually every other brand of drill/driver, Festool uses an electronic clutch. It increases battery run-time and reduces stress on the planetary gears.



Black & Decker's "SmartSelect" clutch and gear system is a graphics-based clutch setting system. Aimed at the DIY market, it reduces guesswork for when to use a clutch setting.



Ryobi's 18-volt P815 drill has a handy little "MagTray" to hold steel driver bits or smaller drill bits (left). LED lights are now a standard feature on the majority of drills. Bosch's use of three lights at the tip of the drill/driver is especially effective because it delivers the light exactly where you are working (right).



Festool's interchangeable chuck system now includes five choices: a three-jaw chuck, a quick-change hex bit holder, right-angle chuck, an eccentric drive attachment and a special depth stop fastener driving head.



Using a single tool for multiple tasks requires time to switch between functions. So users often opt for dedicated tools, and manufacturers like DeWALT offer drill/driver and impact driver combo kits.

- Black & Decker's "SmartSelect" clutch and gear system is a graphics-based clutch setting system.
- Ryobi's 18-volt P815 drill has a handy little "MagTray" to hold steel driver bits or smaller drill bits.
- LED lights are now a standard feature on the vast majority of drills.

• While not exactly a brand-new innovation, Festool's interchangeable chuck system for the T- and C-series drills now includes five choices: a regular three-jaw chuck, a quick-change hex bit holder, right-angle attachment, eccentric drive attachment and a special depth stop fastener driving head, which allows you to set the depth to which screw heads will be driven.

MORE Cool Features

Electronic fuel gauges have typically been built into Li-ion packs found on some drill/driver makes and models. But a recent trend is to move this gauge to the tool itself. Some drill/drivers produced by Bosch, Craftsman, Festool and Milwaukee feature such gauges, which light up each time the tool is switched on.

As mentioned earlier in this article, brushless motors require sophisticated electronics simply to run. But that's not where it ends. In lieu of having a mechanical clutch as found on virtually every other brand of drill/driver, Festool uses an electronic clutch. Set a dial at the back of the motor housing to the desired amount of torque, and when the set torque is reached, the drill simply beeps and shuts off. By doing away with the friction of a traditional clutch, the Festool drills save energy for longer battery run-time and reduced stress on the gears.

Should I Buy a New One?

It's likely that reading this article has given you a case of upgrade fever. But drill/drivers aren't like cell phones and MP3 players that change faster than Kim Kardashian changes husbands. If you have a fairly modern drill (Li-ion or NiCad) that you already love and that suits your needs, I don't see a compelling reason to buy a brand-new one. However, if your go-to tool for all your drilling and fastening tasks is a 9.6v or 12v NiCad-powered drill you bought back during the disco craze, it's high time to plunk down for one of the latest 12-, 15-, 18-, 19.2-, or 20-volt Li-ion-powered drill/drivers.

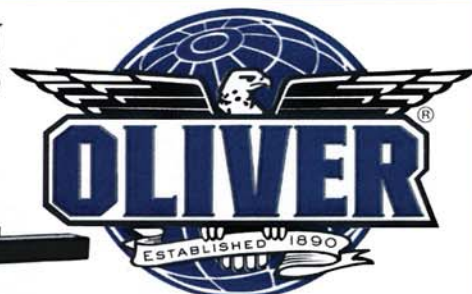
Fortunately, you may not need to buy a whole new tool in order to reap the benefits of the latest technology: It's possible that your current drill can run on a new-and-improved lithium pack.

If you find yourself constantly switching between drilling holes and driving screws, one of the new hybrid drill/drivers might be the answer you need. But remember that using a single tool for multiple jobs requires a certain amount of time to switch between functions. This is why serious drill users usually opt for dedicated tools, and manufacturers, such as DeWALT, offer combo kits that include a drill/driver and impact driver.

Sandor Nagyszalanczy is a contributing editor to Woodworker's Journal. His books are available at Amazon.com.

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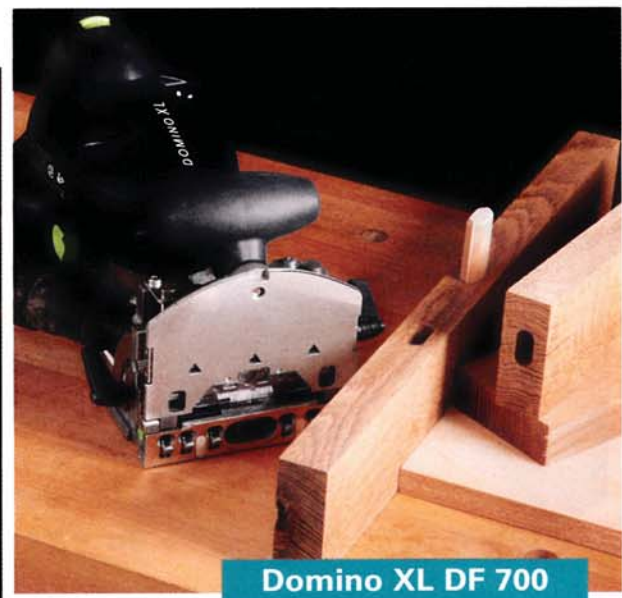
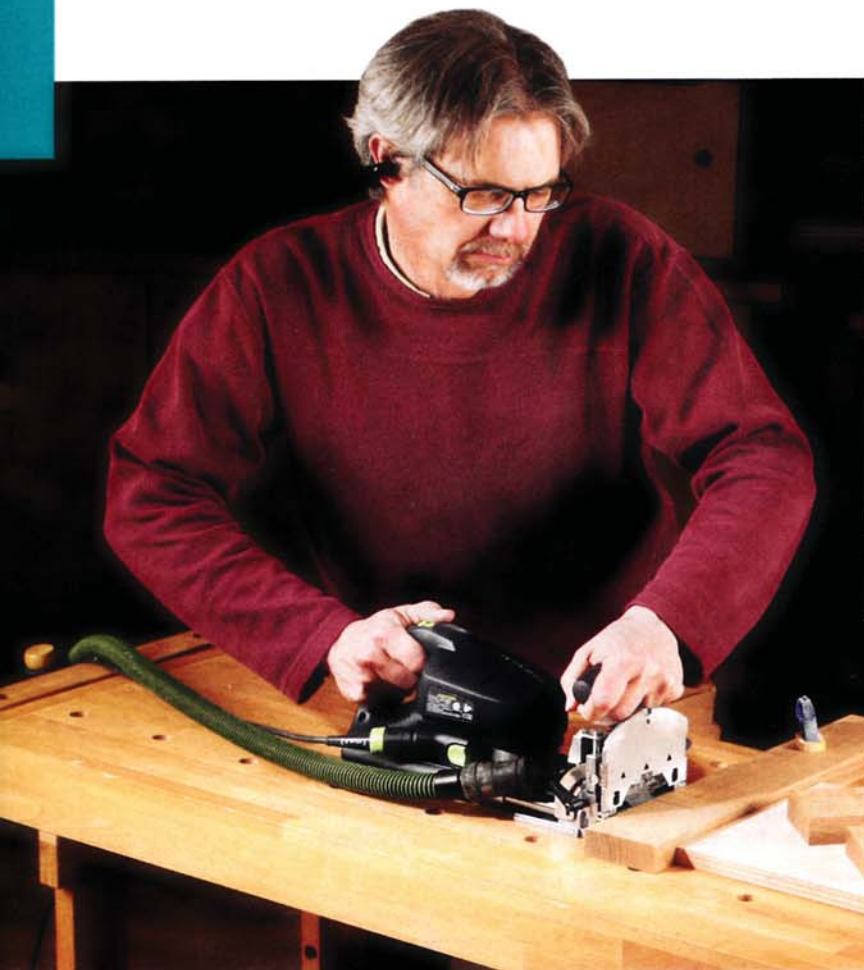
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Domino XL DF 700

Street Price: \$1,200
Watts: 720
Weight: 11.5 lbs.

Festool's Domino XL: A New Game Changer

A LARGER FOLLOWUP TO FESTOOL'S ORIGINAL HANDHELD SLOT CUTTER, THE NEW DOMINO XL IS MADE FOR BIG PROJECTS.



14mm thick by
28mm wide and
140mm long

Shown in relative scale, the large size of the new Dominos designed for the XL becomes readily apparent.



Smallest original Domino



Standard #10 biscuit

SLOT MORTISING :

The idea of a powered slot mortiser has been around since before electric tools. Water mills actually powered belt-driven models starting in the middle 1800s.

Last summer, I spent time assisting master woodworker Ian Kirby as he built projects for our DVD series "The Way to Woodwork." We used Festool's Domino joinery on most of them, and Ian simply could not say enough good things about the Domino system. He identified it as a real "game changer" in terms of small-shop woodworking, adding speed and efficiency to mortise-and-tenon construction. His only mild complaint was that he wished there was a larger version that correlated closer to traditional slot mortisers. Well, perhaps the folks at Festool were listening to Ian, because that's exactly what the new Domino XL promises to be.

The reason why Domino

When shown side by side, the increased heft of the Domino XL (top) is evident compared to the Domino DF 500. The difference in the size of slots they cut is even more impressive. You can find them at rockler.com.

machines are such game changers is both obvious and subtle. First off, Dominos cut mortises with dead-on accuracy in a fraction of the time of other methods. (Saving time means money to the pros and significantly improved productivity for us hobbyists.) That's the obvious part. The subtle part is the quality of the wooden Dominos — the provided loose tenons. Slot mortising has been around a long time, whether it was made by a stationary machine or a handheld tool. But once the mortise is cut, the next step is to make loose tenons, with shaped edges to match the opening.

Festool provides pre-shaped high quality compressed beech loose tenons, which they call

Dominos. They not only speed up the process by removing a step, but because they fit the mortises perfectly when compressed, and then swell from the glue, the joints are also stronger than standard shop-made loose tenons (which have proven to be plenty strong). That means a properly designed stile and rail joint using a Domino will be exceptionally strong.

By increasing the size of the Dominos that can be used, the new XL opens up a host of projects that the smaller Domino would have struggled to support. Chairs, benches and large tables will benefit from the new larger sized Dominos. So will passage doors and other large-sized frame and panel constructions of all sorts.

But all this does come at a cost.



The new Domino XL is being introduced at \$1,200. And a package of the large Dominos shown on the opposite page costs about \$50 for 70 pieces. But because it makes mortise-and-tenon joints so much faster, while keeping them extremely strong, it has to be considered valuable. Whether it will change your game is up to you.

Rob Johnstone is Woodworker's Journal's editor in chief.

WOODWORKING INNOVATIONS FOR OVER 80 YEARS

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Vessel Turning System

Patent Pending



NEW

MultiRest®

Vessel Support System

Patents Pending



Shown with Hollow Roller® Vessel Turning System

Stabilizer®

Small Blade Guide System

Patented



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Supplies & Accessories

Quality supplies and accessories make power tools safer, our shops more productive and woodworking tasks accurate and pleasant. This year, our editors reviewed cutting-edge honing guides, must-have table saw accessories and clever new measuring and marking tools. Read about many other new product developments, too, on pages 68 to 71.

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Innovative Measuring & Layout Tools84-89

New Supplies & Accessories



Kreg Tool
Co. Rip-Cut



Saw Guide

The Rip-Cut™ from Kreg Tool® Company is an accessory for your circular saw that lets you cut large panels down into more manageable workpieces, without a table saw. The Rip-Cut (item number KMA2675) attaches to nearly any circular saw, whether the blade is on the right or the left. The reversible guide arm also lets you use it either right- or left-handed. The solid aluminum guide rail provides support throughout the entire cut. It will cut pieces from 1/8" to 24" wide and does not need to be removed for crosscuts. No measuring, marking or chalk lines are required. The Rip-Cut is priced at \$34.99.

Dado Set

Amana Tool®'s new Prestige™ Super-Fine Adjustable Dado Set for shapers (item 61370) consists of seven laser-cut hardened steel cutters coated in Amana's Electro Blu™ non-stick coating. Designed for use in 3/4" arbor shaper machines, the set accommodates undersized plywood and can be adjusted as needed using the included shim set. Each blade has four tungsten carbide tips for producing smooth edges and flat-bottom cuts both along and across the grain. Amana technical director Frank Misiti says the set can help woodworkers "more easily and safely create deeper tenons and other joints." The set is priced at \$188.95.



Amana Tool Prestige Super-Fine Adjustable Dado Set



Leigh R9 PLUS
Joinery System

Joinery System

The Leigh R9 PLUS Joinery System from Leigh Industries makes three sizes of through dovetails (pin widths of 3/8", 7/16" and 1/2") and three sizes of box joints (3/16", 3/8" and 3/4"), on boards of any width, with no jig adjustments: just "step it over" to the next position along the beam to produce your dovetails or box joints. Board thickness for dovetails can go up to 13/16" and for box joints up to 1". A replaceable backer board

eliminates tearout. The R9 PLUS works on either a router table or bench-mounted with a handheld router and includes the patent-pending Leigh e10 guidebush; it is priced at \$169.



Rockler Steam Bending Kit

Steam Bending System

Sure to heat up your woodworking is the new Steam Bending Kit from Rockler Woodworking and Hardware. Able to work with any steam box — a plan is part of the kit — the Kit's built-in heating element heats water and your steam box's contents to 212° F, making it easy to bend wood for new shapes, designs, oval boxes, moldings and more. For larger projects or bending thicker, denser wood, you can fill and refill the 5.3-quart reservoir to provide continuous steam. A 10'-long steam hose safely directs steam to your box. The Kit sells for \$89.99.



Milwaukee M18 & M12 Multi-Voltage Charger

Multi-Voltage Charger

The M18™ & M12™ Multi-Voltage Charger (item 48-59-1812) from Milwaukee Electric Tool Corp. will charge the lithium-ion batteries for both the company's 12-volt and 18-volt lines, in the same charger. It's a sequential charger, with slots for both sizes of batteries. Put a 12-volt in first, and it will charge that battery to full capacity, then switch to charging the 18-volt; put the 18-volt in first, and the order is reversed. Charge time for compact batteries is 30 minutes; for extended-capacity batteries, it's 60 minutes. The Multi-Voltage Charger is priced at \$59.

Rust-Oleum
Ultimate
Polyurethane



Polyurethane

The new Rust-Oleum® Ultimate Polyurethane finish delivers a warm, amber glow when applied to wood — not, as some woodworkers have been heard to say, the poly effect of “spilling milk on your wood.” The fast dry time (under two hours) of the water-

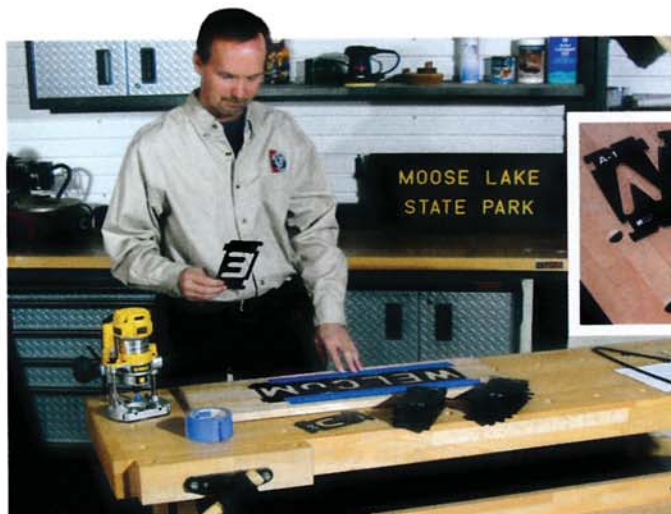
based formula means you can apply more than one coat in one day. Water-based means it has virtually no odor and soap and water cleanup. The formulation also contains a custom blend of hybrid oils which provides 33% more durability than other polyurethanes. The product is available in gloss, semi-gloss and satin finishes in half-pints, quarts and gallons, with a quart priced at \$10.98, as well as in an aerosol spray with finger-fatigue-reducing trigger cap, priced at \$7.97.

Freud
Quadra-Cut
1/4"-shank
router bit



Router Bits

Freud's Quadra-Cut™ router bits, with four cutting edges instead of two, are now available in 1/4" shank sizes. Two of the carbide cutters have an upshear angle to remove most of the stock, while the pair of downshear cutters then makes a final cut to produce a clean edge, with no fuzz, splinters, or need for sanding. The bits are made from TiCo™ Hi-Density Carbide with titanium and feature Perma-SHIELD® non-stick coating to reduce friction and resin adhesion. Copper sandwiched between two layers of silver alloy creates an impact-resistant bond between the carbide and the bit, while multi-axis grinding provides consistent relief angles on the entire cutting edge to reduce burring. Pricing ranges from \$30-\$60.

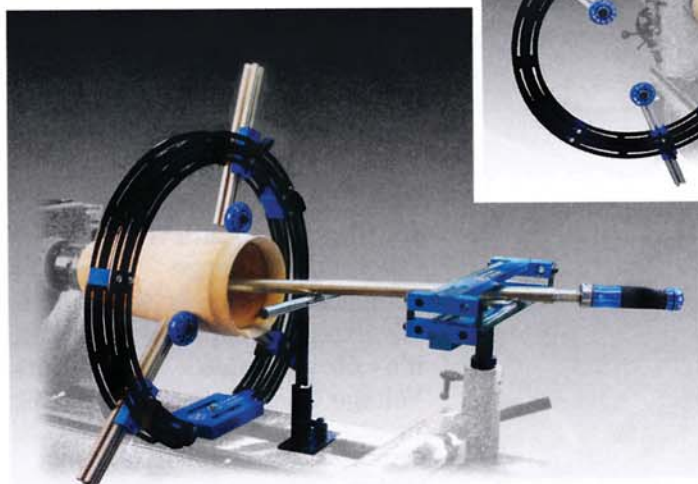


Rockler's new Signmaker's Templates with "State Park" style font.

Sign Templates

Rockler has come out with a new version of its Interlock Signmaker's Templates. The new system eliminates gaps within multiple-curve or -line letters through the use of two-part templates. When routing a "B," for example, you rout a portion of it with the B-1 template, then the second portion with the B-2 template, creating a single letter whose component lines fit together with no gaps. You can also choose to use spacer templates included in the set to create kerning (proper adjustment of spacing between letters) for common two- and three-letter combinations. The new Signmaker's Templates use a "State Park" font for the design of the numbers and letters. Available in 2½" and 3⅜" sizes, each Signmaker's Template kit

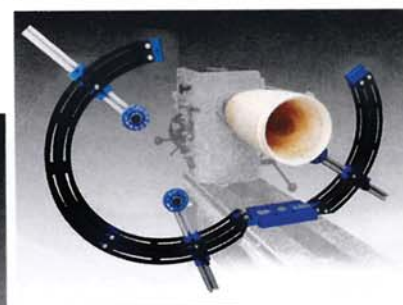
includes 99 pieces (letters, numbers and spacers). Pricing is \$49.99 for the 2½" (item 48356) and \$79.99 for the 3⅜" (item 43820).



Lathe Steady-Rest

The MultiRest™ Workpiece Support System from Carter Products serves as a steady-rest for all sizes of workpieces, on lathes ranging from mini-lathes

up to those with a 20" swing — no additional hardware required. The base attaches to beds with way sizes from 1" to 4½" wide, and adjusts to accommodate different workpiece diameters, at different positions on the lathe bed. The unique two-piece design incorporates a support ring that can be opened without removing the MultiRest from the lathe bed, for mounting, removal or sanding. Removing the large support ring gives you a bowl rest for exterior



Carter Products MultiRest Workpiece Support System

shaping. Engineered and manufactured in the U.S., the patent-pending MultiRest is made from laser-cut steel and aircraft-grade aluminum and is priced at \$359.95.



Stanley 3-in-1 Rolling Workshop



Rolling Workshop

If you're searching for a spot in your shop to stuff your supplies, the new Stanley 3-in-1 Rolling Workshop may be right up your alley. Each of the three storage containers in this system — a traditional toolbox with removable organizer, a large rolling bin, and an organizer — works as a stand-alone piece. You can also easily attach them together for convenient storage and portability. Pricing for the system is about \$38.



Fence System

Ready to be on-the-go with any router is the Micro Fence® Interface Essentials Package. Instead of moving a clamp or tool guide to the position of your cut, you move the Micro Fence System to the desired dimension or position. The Interface Package includes only the measuring portion of the Micro Fence Circle Jig, plus a stabilizer bar and a universal router plate — either with instructions for drilling to fit your router or predrilled for \$25 — and the Clamp Interface Package you choose from the options of All-in-One (single, contractor or ultra), Eureka, Festool, Tru-Grip or Woodline Blue Max. The price is \$199.95.

Micro Fence Interface Essentials Package

out on the top of the tool, which is accurate to within 1 psi. The Inflator/Deflator runs on Ryobi's ONE+ 18-volt battery for cordless operation and has a pressure operating range of 0 to 150 psi. The high volume inflator pressure rate is .33 square cubic feet per minute at 35 psi, with a high volume inflator (HVLP) flow rate at 10 scfm. A switch allows you to change between high and low pressure, and nozzles are included for high volume and high pressure applications. Accessories store onboard. The new unit is priced at \$39.98.

Mixing Mate

Rockler's Mixing Mate™ is a locking mixing lid for quart-sized paint and finish cans that can mix, pour and store. Four cam locks secure to the edges of a can, creating a tight seal to eliminate spills. After locking the lid, you crank the sturdy side handle for 30 seconds to completely mix



Rockler's Mixing Mate

your finishing product. A spring-loaded thumb trigger opens the pour spout. When closed, the locked lid will keep your product stored safely on the shelf. Rockler's vice president of product development, Steve Krohmer, said, "It eliminates the frustration of prying off dented, crusty lids and mixing until your hand is numb with a disposable stir stick. And since the spout pours with pinpoint accuracy and no drips, you can leave your funnel on the shelf!" The Mixing Mate (item number 44360) is reusable; it's priced at \$14.99.



Bench Dog Tools Strap-Loc



Strap Clamp

Bench Dog Tools, Inc. has introduced the Strap-Loc™ strap holding device. The butterfly-shaped body has slots for a strap up to 1" wide and wings to help keep the strap on center while wound around the body. When it's completely wound, an adjustable rubber cord with three tension stops snaps into a built-in hook to secure varying lengths of strap. The Strap-Loc can be used to secure extra lengths of strap during use, or as a handy storage solution. Suggested pricing is \$5.99 for a pair.



Ryobi P731 Inflator/Deflator

Inflator/Deflator

The P731 Inflator/Deflator from Ryobi weighs 2.8 pounds and provides high pressure inflation and high volume inflation/deflation. Separate ports for inflation and deflation increase the tool's durability. You can program the inflator to automatically shut off at any pressure, and see what's happening with the digital read-

Honing Guides: Pros and Cons

A HONING GUIDE CAN HELP YOU PUT RAZOR-SHARP EDGES ON ALL YOUR CHISELS AND PLANE IRONS.

Ah, what a feeling: After running power tools all morning, you switch off that noisy router or table saw and settle back to make some shavings the “old-fashioned” way, with a chisel, spokeshave or hand plane. But all those good feelings can evaporate fast if your edge tools prove too dull to cut even a tender steak. Working with blunt-edged tools isn’t just frustrating, it’s unsafe: It takes more force to drive the tool,

so it’s more likely to slip and cause an accidental cut.

Traditionally, honing dull tools requires using oilstones and employing elbow grease mixed with a good dose of skill to bring edges back up to arm-hair-shearing sharpness. While careful free-hand sharpening can produce excellent results, unpracticed techniques typically yield inconsistent results and tools that aren’t as sharp as they could be.

An alternative to working free-hand is using a honing guide, which can help you attain a wickedly sharp edge without hours of practice. In this article, I’ll show you nine different honing guides and systems that range in price from less than \$20 to nearly \$200. All of these guides are designed to sharpen typical thin, straight-edged tools, like plane irons and chisel blades. Some also handle tools with tapered shanks, like dovetail chisels; short blades, like spokeshave irons; and/or thick-shanked tools. Depending on the style of the guide, honing is done using either a standard whetstone (oil or water), diamond plate, or a honing plate with an abrasive film.

Alisam Sharpening Sled #SS1

Alisam’s blue anodized #SS1 is a wheeled sharpening guide that’s designed and used differently than other wheeled guides. It has a cylindrical body with a central slot through which the blade is inserted. A plastic flanged ring around the outside of the cylinder helps square the blade, while a large-diameter brass screw with a knurled knob locks it in place. The screw has a large foot to put more even pressure against the blade, and there’s a piece of abrasive paper on the bottom of the slot to keep the blade from slipping out of position. The #SS1’s body is straddled by two side supports, each with a pair of wheels on its lower edge. The supports attach to the body via threaded studs on a pair of large plastic knobs that serve as handles. To set the bevel angle, you loosen the handles and select one of 7 detent settings between 15 and 45 degrees. In use, the Alisam guide straddles the bench stone or rides atop a honing plate, working with a back-and-forth action. The sealed roller-bearing wheels at the front of the guide are spring-loaded, allowing the blade to be pressed down onto the stone with just the right amount of pressure. PROS: Large clamping screw and abrasive pad hold tools very securely. Guide’s handles give the user a good grip, so you can apply ample pressure while maintaining excellent control.

CONS: Can’t use the #SS1 with wide bench stones and, unless the





Spring-loaded front wheels on the Alisam (left) let you press the tool down during honing. A series of tiny detents (right) set the exact honing angle. Tightening the side handle locks the setting in place.

stone/plate is narrow, you can't use the full surface of the stone (Alisam also makes the wider #SS3). If subsequent stones vary in thickness, you need to readjust the projection of the blade each time. Only a limited number of honing angle settings are possible.

General 809 Guide

This inexpensive guide is made mostly from cast plastic. There's a pressed sheet metal clamping head which secures the blade to be sharpened with a large plastic knob. Another knob at the guide's midsection sets the angle of the jig and hence, the angle of the blade relative to the sharpening medium. Two plastic rollers at the back end of the 809 guide are made to roll on a stone or sharpening plate and keep the blade at a constant angle during sharpening or honing.

PROS: Inexpensive to buy and works



The knob in the center of the General 809 honing guide is used to set the blade to the desired honing angle.

with virtually any stone or sharpening plate.

CONS: Guide doesn't offer much stability when sharpening narrower blades. Roller doesn't roll all that well, and mine squeaked.

Kell #2 Honing Guide

Precisely built from solid brass and stainless steel, the Kell jig is simple to set up and use. It clamps a plane or chisel blade between two wheels made of Ertalyte TX (a low-friction, wear-resistant plastic) that roll along the top of a stone or plate during honing. A pair of clear plastic washers on the clamping faces cushion the tool and prevent it from slipping. The amount that the blade projects from the jig determines the honing angle. Kell's #2 guide accepts blades up to 2½" wide (their smaller #1 guide handles blades up to 1" wide).

PROS: Because of the jig's low center of gravity, it's especially good for honing short blades as well as thick tools, like mortise chisels. CONS: When honing wide plane blades (2½" or so), the guide's wheels end up so far apart that the guide only works on honing plates or very wide bench stones. Won't work with tapered-shank tools, skew chisels or irons with angled edges.

M-Power PSS

This unique honing guide has an aluminum base with dovetailed ways that engage a weighted sled that slides side-to-side during honing. The sled is two-sided: One side is used to create a 25-degree

primary bevel, then it's reversed on the ways to finish a blade with a 30-degree secondary bevel. A strong magnet on each side holds an interchangeable diamond-grit insert. The Precision Sharpening System (PSS) comes with two DMT-made inserts: coarse and fine. A channel machined in the base keeps the blade square to the sled. You hold the tool against the side of the channel while you slide the sled back and forth to hone the blade's edge.

PROS: System comes complete with diamond hones; no need to buy separate stones or accessories. Diamond hones cut quickly, and the side-to-side honing action subjectively creates a cleaner cutting edge than with front-to-back guides.

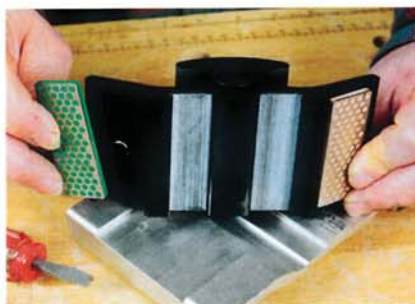
CONS: It takes some time to get used to holding the tool while moving the guide's sliding head back and forth. Only two honing angles



The Kell #2 honing guide's side-gripping design allows it to hold even short chisels and plane irons very solidly.



To use M-Power's Precision Sharpening System (PSS) guide, you hold the tool stationary while you slide the guide's head back and forth, as shown at left. Small diamond hones are held into the M-Power's head with powerful magnets (right).



are available (although they're the two most commonly used angles). You can't use the PSS on tools with tapered shanks or angled edges. Only a narrow band of each stone is used, so they wear more quickly. You'll need separate stones/plates for flattening tool backs.

Pinnacle Honing Guide

This complete system uses a pair of rails to guide the back-and-forth motion of a sliding sled that holds the blade at a fixed angle. A pair of knurled thumbscrews secure a blade into the sled, and a pair of adjustable fences help square it up. A small pair of thumbscrews on the sides of the sled set primary honing angles between 15 and 45 degrees in 5-degree increments or set secondary angles 2 degrees greater than each primary setting. Cross members between the Pinnacle's rails secure a bench stone or honing plate at a fixed distance below the sled. Another pair of cross members limit the travel of the sled along the rails. The sled can also be used without the rails to sharp-

en atop a glass or granite plate fitted with abrasive films. The standard Pinnacle guide comes with 14"-long rails, enough to accommodate stones or honing plates up to 3" wide and 11½" long; optional 20"-long rails let you use longer stones and honing plates. PROS: Complete sharpening kit comes ready to go, with honing plate and abrasive films. Easy to add a secondary bevel to the tool without reclamping it. CONS: Thumbscrews sometimes allowed tools to slip out of position, and they don't properly secure chisels with rounded or un-flat tops (e.g., dovetail chisels). Only a narrow band of the stone/honing plate is used, unless the stone/plate is repositioned or the tool is shifted in the sled. Changing stones or honing films on plates is time-consuming. Rails prevent using the mounted stone/plate to flatten the back of the tool.

Sharp Skate III

Instead of honing with a front-to-back action like other guides (save the M-Power PSS), the anodized

aluminum Sharp Skate III uses hardened wheels that move the guide with a side-to-side honing motion. This guide has a unique blade clamp featuring a large knurled-edged hand screw and a concave V-shaped top jaw. A series of stepped serrations in the jaw help square the blade in the guide and keep it from shifting sideways during honing. The Sharp Skate III comes with a two-sided aluminum angle dock used for setting the honing angle. The dual-sided dock has a series of lines incised at all whole angles between 20 and 45 degrees. With the guide set into the angle dock, you extend or retract the blade until its edge lines up with the desired angle line. The Sharp Skate also handles skewed blades: The clamping plate rotates to any angle between 0 and 45 degrees in either direction, with fixed settings for 15, 20 and 25 degrees.

PROS: The blade clamp's serrations do a very good job of squaring the tool and keeping it from slipping. The side-to-side honing action subjectively creates a sharper cutting edge than with front-to-back guides.

CONS: The most expensive guide in the group. Angle dock won't work with thick chisels or low-angle plane irons. The concave-V-shaped jaw won't hold some types of narrow and thin tools.



With the blade locked in place (left), you move the Pinnacle guide's carriage back and forth over the whetstone during honing. Small thumbscrews (right) on the side of the carriage let you set both primary and secondary honing angles.





Side-Clamping Guide

This style of guide is based on the venerable English "Eclipse" guide. It uses a single threaded screw to operate the clamping jaws that grip the edges of the cutting tool and keep it square to a single roller, which guides the tool back and forth over the honing media. The guide offers two different tool clamping positions: A pair of raised lips atop the guide hold plane blades or chisels up to 3" wide; a lower V-groove holds thin tools from very narrow up to about 1 3/4" wide.

PROS: The guide is very inexpensive and holds a wide variety of tools, including very short palm plane irons and spokeshave blades. Works even atop narrow and short stones and plates. The guide's 7/16"-wide roller allows you to hone both straight cutting edges or, by tipping the guide a bit, slightly curved edges as well (like the violin planes shown in the bottom right photo).

CONS: Narrow wheel doesn't offer much stability to keep narrow blades flat on the stone. Guide won't hold some low-angle block plane irons; tapered edge tools like fishtail chisels; or thick tools, such as mortise chisels. Guide's roller tends to foul with honing grit if not kept clean and well lubricated. The jaws often loosen unless the clamping screw is torqued down heavily.

Veritas Precision Sharpening System

The less expensive of two guides offered by Canada-based Lee



Unlike other wheeled guides that roll back-to-front, the Sharp Skate III hones with side-to-side action.

Valley Tools — the Veritas Precision Sharpening System — consists of two components: a honing guide and an angle-setting jig. To use the system, you first set the angle jig's head to the desired bevel setting: 15, 20, 25, 30 or 35 degrees. Then you slide the honing guide onto the blade and tighten its heavy-duty brass screw to clamp a blade in place (taking care to keep it square to the guide's roller). The guide rolls atop any sharpening stone or using a back-and-forth honing action. Once the primary bevel is done, turning a knurled brass knob resets the guide's eccentric roller to a slightly elevated angle for honing a secondary bevel (aka "micro bevel" — a very useful sharpening technique).

PROS: The angle setting jig accurately sets blade angles with little fuss. The eccentric roller makes it easy to create a secondary bevel without reclamping the tool.

CONS: Narrow chisels or irons can come out of square, especially if the top surface of the tool isn't entirely flat. Accidentally mis-setting the eccentric roller can inadvertently create the wrong honing angle.

Veritas MkII System

The larger and more sophisticated of the Veritas guides, the MkII is a roller-style guide with a clamping bar that accepts blades up to 2 7/8" wide. Its most significant feature is a registration jig that temporarily mounts to the



The angle dock that comes with the Sharp Skate III is used to set the blade to be honed at a precise angle.

front of the blade carrier and accurately squares and aligns the blade or chisel to be sharpened and sets the blade's exact honing angle.

A combination of screw stops on the registration jig, as well as three different user-settable positions for the blade carrier assembly, allow a blade to be set at just about any standard honing angle between 15 and 54 degrees. You can also fine-tune the angle setting (typically, to create a secondary bevel; see the Veritas guide, page 76) by adjusting the MkII's eccentric roller.

To expand its usefulness, the MkII system has a few optional accessories: a special registration jig for accurately clamping skewed blades and chisels (see right photo, page 77); it's a camber roller assembly for creating



Grooves in the side-clamping honing guide are capable of holding even very short blades and narrow chisels.



A knurled wheel on the Veritas Precision honing guide (left) resets its eccentric roller to a higher angle for honing a secondary bevel. An angle-setting jig (right) that comes with the Veritas guide is used to set the blade at 15, 20, 25, 30 or 35 degrees.

rounded corners on large plane blades — so they don't dig in when rough planing stock; and a small-blade holder for sharpening short blades found in palm planes, spokeshaves, etc.

PROS: Very solid guide with good heft. A very complete sharpening system that handles a wide range of tools. Easy to add a secondary bevel to a tool without reclamping.

CONS: Setting up the guide takes a bit of time. Unless the two locking screws are carefully tightened to apply even pressure, the tool tends to slip out of

square. Accidentally mis-setting the eccentric roller can inadvertently change the honing angle.

Picking Favorites

If you've skipped ahead to this section to find out which honing guide is the best one, I may disappoint you. These nine guides are so very different from one another in both how they're used and the range of tools that they'll handle, that I don't think any one could satisfy all possible uses and users. However, over the course of using the guides to sharpen just about every edge tool I own, I did

develop some favorites and have a few recommendations:

As an overall favorite performer, I'd have to choose the Veritas MkII guide. Its clever registration jig and adjustable roller made it a slam-dunk to dial in exact honing angles with great precision and repeatability. This is important, because if you set a blade just 1/2 to 1 degree off in a guide, you'll end up grinding more material off the bevel than necessary. With its optional accessories, the MkII will sharpen just about any edge tool.

Once I got used to its side-to-side honing action, I really liked

Honing Guide Chart

Honing Guide	Guide Type	Street Price	Maximum Capacity	Honing Angle Settings (degrees)	Skewed Blade Honing Possible?	Useable Stones and Honing Places	Optional Accessories
Alisam SS1	Back-and-forth on-stone roller	\$70	2 1/2" wide	15, 20, 25, 30, 35, 40, 45	Yes	Bench stones or honing plates up to 3" wide and 1" thick	Side plates that allow use of thicker bench stones
General 809	Back-and-forth off-stone roller	\$21	2 1/8" wide	None	Yes	Works with just about any bench stone or honing plate	None
Kell Jig	Back-and-forth on-stone roller	\$85	2 3/4" wide *	None	No	Works with just about any bench stone or honing plate	Kell also offers a brass bevel checking gauge
M-Power PPS	Side-to-side sliding guide	\$100	2 1/2" wide	25, 30	Yes	Uses special DMT diamond hones (system includes preparation and finishing hones)	Extra coarse, fine and super-fine diamond hones
Pinnacle Honing System	Back-and-forth sliding carriage w/ railed guide	\$115	3" wide	15, 17, 20, 22, 25, 27, 30, 32, 35, 37, 40, 42	Yes (with user-made angle block)	Bench stones or honing plates up to 4" wide, 12" long **	20" guide rails, honing plates and abrasive films, bevel-angle checking gauge
Sharp Skate III	Side-to-side on-stone roller	\$170	3" wide	All whole angles between 20 and 45 (using the included angle-setting jig)	Yes; stops for 15, 20, 25 degrees	Larger bench stones and honing plates	None
Side-clamping honing guide ***	Back-and-forth on-stone roller	\$14	3" wide (top jaws); X wide (bottom jaws)	None	No	Larger bench stones and honing plates	Guide can be purchased with either coarse or fine glass-plate sharpening systems
Veritas Precision Honing Guide	Back-and-forth on-stone roller	\$47	2 3/4" wide	15, 20, 25, 30, 35 (using the included angle-setting jig) ****	Yes	Larger bench stones and honing plates	None
Veritas MkII Honing Guide	Back-and-forth on-stone roller	\$65	2 1/4" wide	13, 15, 17, 20, 25, 30, 35, 40, 45, 50, 54 (using the included angle-setting jig) ****	Yes, with optional accessory	Larger bench stones and honing plates	Skew registration jig, camber roller assembly, small blade holder

* A 1" capacity version is also available.

** Up to 18" long when jig is fitted with optional 20" rails.

*** This guide, based on the older English "Eclipse," is offered under various brand names.

**** Multiple micro-bevel angles are obtainable by resetting the guide's eccentric roller.



The Veritas MkII guide (left) has a good heft and rolls very smoothly atop any kind of whetstone or honing plate. The registration jig (right) that comes with the MkII can be set to a multitude of honing angles to suit multiple sharpening chores.

the Sharp Skate III and the absolutely scary sharp edges it put on my chisels and plane irons (it didn't form the kind of wire edge burr that back-to-front guides seem to create). Hence, I liked it best for honing the precise secondary bevel that forms the final cutting edges on a tool, and not so much for shaping and restoring its primary bevel.

I liked the Alisam guide best for restoring nicked or otherwise damaged edges. The #SS1's rock-

steady clamping and large handles allow you to apply ample honing pressure and remove material quickly. Using a coarse or extra-coarse diamond plate or stone, it's easy to form a new primary bevel on a tool without the risk of overheating the edge (something all too possible when power grinding).

The Kell #2 jig is simple to set, and it works with a wide range of standard chisels and plane irons. Because of its low center of gravi-

ty and strong clamping action, I found it very easy to use with consistently favorable results.

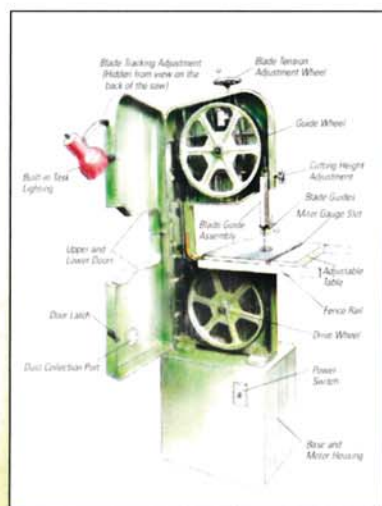
If you're on a tight budget, an inexpensive side-clamping guide is probably the best way to go. It handles most basic chisels and plane irons and is handy to have on hand, even if you decide to upgrade your honing system later.



Sandor Nagyszalanczy is a contributing editor to Woodworker's Journal. His books are available at Amazon.com.



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Top Ten Table Saw Accessories

OUTFIT YOUR SHOP WORKHORSE WITH AFTERMARKET GEAR THAT WILL MAKE IT SAFER, MORE ACCURATE AND EASIER TO USE. OUR AUTHOR PICKS HIS FAVORITES.



I suspect I'll get little argument when I say that the table saw is the workhorse machine in most shops. Indeed, it's a rare shop that doesn't make a table saw the centerpiece, with everything else arranged to support this keystone of productivity.

To get the most from a table saw, we know that it has to be in good repair, properly tuned and outfitted with a clean, sharp blade matched to the tasks required of it. But it's a fact that a table saw doesn't function by itself. That is, to make any kind

of cut at all — rip, crosscut, dado, rabbet, tenon, whatever — you must pair it with an accessory to make it work efficiently, accurately and, above all, safely. For example, to make a simple crosscut it's mandatory to have a guide to push the workpiece at the correct angle through the spinning blade, a job most frequently handled by a miter gauge, and sometimes a sled or sliding table. Likewise, to rip stock you absolutely must have something against which that stock can register for a clean, accurate (and safe!) cut. Hence the supreme utility of a good rip fence.

Those are just two typical accessories, but there are literally hundreds available. Some handle basic tasks, like crosscutting and ripping, while others run the gamut from improving dust control to combating rust.

Few woodworkers have the space or cash to buy them all, but your work can easily be improved with the accessories that suit the way you work.

Absolutely the "Best"?

For this article, I was tasked with coming up with a list of 10 table saw accessories, but it's nearly impossible to rank any collection of such accessories as the "best" out of the hundreds available. Each of you reading this has a very personal idea of what works best for you depending on what you most often use the table saw for.

Instead, I've tried to gather a grouping of accessories that make the biggest impact to the

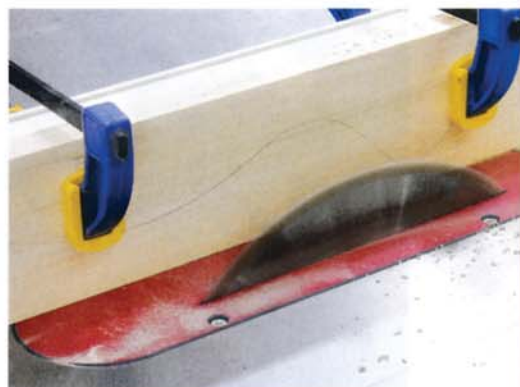
INSTALLING A ZERO-CLEARANCE INSERT



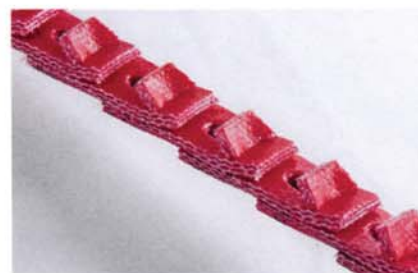
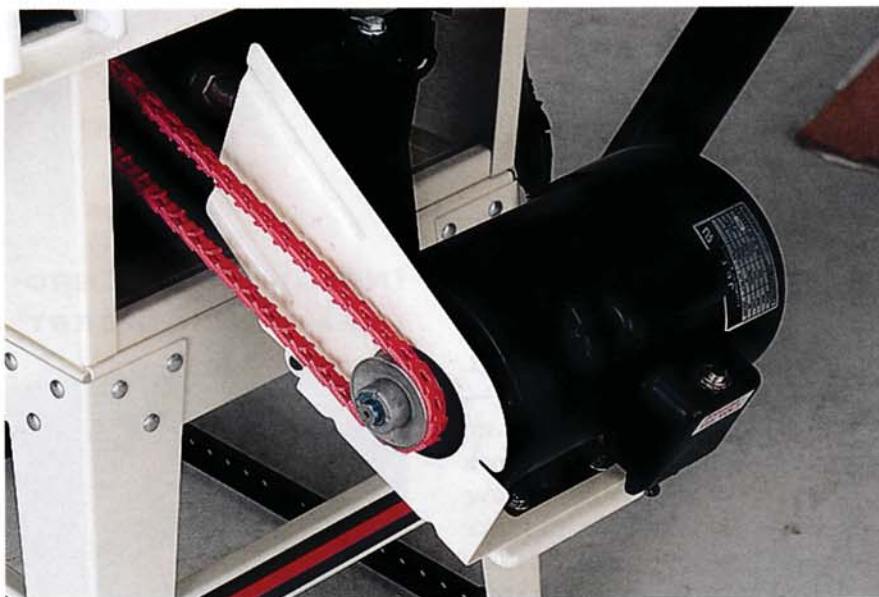
Step 1 — Lower the saw blade completely, put the insert in place, and adjust it until it's perfectly level with the surface of the saw table.



Step 2 — Clamp a piece of scrap to the fence, and adjust it to hold down the insert. Make sure it is clear of where the blade will come through.



Step 3 — Turn on the saw and slowly raise the blade fully through the insert plate to cut the kerf.



A link belt stays flexible to help dampen motor vibration. It retrofits to any saw that takes a conventional drive belt.

typical shop — still a tall order, but more manageable. I opted not to include common accessories that, while commercially available, many woodworkers typically make themselves. Push sticks, absolutely essential safety accessories, are good examples. (You do have several, right?) Also, since the fences included with most saws these days are far superior to those a decade or two ago, I've left aftermarket fences off the list — but a perfect 10 might include one.

Finally, with one exception that I'll explain shortly, I've not ranked these in any order. With that in mind, here are 10

essential accessories you should seriously consider.

Zero-clearance Insert

Now, all that said, let's start with that exception. As an all-around fantastic accessory, every table saw should have what I consider the number one accessory: a zero-clearance insert. Ideally, more than one.

A lot of accessories accomplish only one thing, but zero-clearance inserts do a lot. To begin with, they all but eliminate tearout on the underside of the stock. As the name implies, there's no gap around the blade, so they cut more safely since thin

slivers can't fall into the blade opening and come shooting back out. That lack of a gap helps reduce noise and increases the effectiveness of your dust collection.

When measuring for cuts, you don't have to measure against the blade; the blade is flush with the kerf in the insert, so you can measure directly and more accurately from that. Speaking of measurements, inserts made of brightly colored laminates or other synthetic materials improve visibility and allow you to temporarily mark them with pencil to assist cutting.

You can use a zero-clearance insert to regularly make just about any kind of cut, and it's a good idea to make multiple inserts for the blades you use most, including common dado sizes and even common bevel angles.

Inserts can be as simple as any flat material cut to fit your saw's throat opening, but commercial versions typically include leveling screws to adjust them flush with the table, as well as a relief cut on the underside that accommodates the blade before cutting the kerf. (Some saws don't allow blades to be lowered enough to accept an uncut insert.) Nearly every manufacturer of woodworking supplies and accessories offers these inserts, including the saw makers themselves. Prices vary but are usually from \$15 to \$25.



Add a digital readout to your rip fence for accurate settings to within hundredths of an inch.

Link Belt

Vibration is the enemy of most shop machines. It creates noise, adversely affects efficiency and makes working a lot less pleasant. The typical 1/2" V-belts standard on most tools cause vibration even when new, but as they age they harden and become stretched or oddly shaped, causing even more vibration. Link belts consist of interlocking pieces with a tab-and-hole design that simply slip inside one another to form a continuous belt, but still offer the flexibility of being made of individual links for smooth running. Further, you can add or subtract links as needed to perfectly size a belt to match your table saw (or any other shop machine using a 1/2" belt). Link belts sell for about \$9 per foot.

Digital Fence Readout

While they work well enough, standard equipment on saws requires us to eyeball a scale of some type to set cutting distances when adjusting the rip fence. This is fine if the cut's not critical, but when it is, a digital readout lends the same



Set blade tilts off of a digital angle gauge, then find a multitude of other machine tool uses for this device.

accuracy to fences that a digital angle gauge imparts to bevel angles. Not quite as simple as most saws' original equipment with their tape scales, these units require a bit of installation for a permanently attached gauge. Once mounted, however, they're as fast and easy to operate. Most measure from 0° to 60°, switchable to metric if you prefer. Recalibrate as often as you like (for different sized blades or dado sets) with the push of a button. These readouts usually go for around \$100, including mounting rails and hardware.

Digital Angle Gauge

Do you really trust that scale on the outside of your saw's housing when setting bevel angles? Nah, didn't think so. Measuring a precise angle is possible with a protractor, or a bevel gauge you've set with a reliable protractor, but these digital gauges do it quickly and easily. These gauges calibrate at the touch of a button — just place it on the table surface and press the button to instantly set it to zero degrees. Then stick it to the blade using the magnet in the gauge base and crank in the desired angle. The readout clearly gives you



A featherboard acts like a third hand and keeps yours out of harm's way. Magnetic versions like this can be easily positioned wherever needed.



Sacrificial fences can be installed easily, quickly and unobtrusively, using a pair of specialty clamps that wrap over the fence beam.



A variety of precision miter gauges are available, and some come with extended fences and flip stops.



Miter gauges with sturdy triangulated support are another variation to consider.

the exact angle to a tenth of a degree (some models go to hundredths). You'll never set a bevel on your table saw without one again, and you'll find uses for it elsewhere in the shop, like on band saw and sander tables. Prices vary a lot on these, but most run from \$30 to \$40.

Featherboard

Probably the most efficient way to make a rip cut is to use three hands. But lacking an extra appendage, a featherboard is the next best thing. Like push sticks, woodworkers often make their own, but commercial versions have much to offer. They're available in two basic types: slot-mounted and magnetic.

Slotted featherboards have a spreadable miter bar and drop into a miter slot on the table,

locking down by tightening a thumbscrew that spreads the bar for a tight fit. (Some also work on T-slots for mounting to rip fences.) Magnetic models stick tight anywhere on cast iron. The innovative Magswitch® models are especially easy to use with their switchable rare-earth magnets; one twist locks it rigidly in place, a twist the other way "turns off" the magnet.

Prices range widely here, from as little as \$15 on up to around \$70.

Fence Clamps

Many cuts on the table saw require a sacrificial fence so you can get the blade close to the fence without causing damage to either fence or blade. You can use regular clamps for this, but only for stock low enough that it doesn't hit the clamps. Fence

clamps easily eliminate that problem. To use, drill a pair of holes (usually 3/8") in the top edge of the sacrificial fence. Then, just slip the tips of the fence clamps into the holes, adjust the thumbscrews, and lock it down for an unobstructed fence surface. You'll use these primarily for their intended purpose, but don't be surprised if you find other jobs around the shop for them. Several companies make them, and they sell for about \$12 to \$18 per pair.

Miter Gauge

Although we've seen an improvement in standard-equipment fences, miter gauges included with most machines are — let's be charitable here — less than stellar. You'll do yourself a favor by upgrading to a better one, and you'll find plenty to choose from. Miter gauges come in two styles, protractor and triangle, with each having particular strengths.

Protractor gauges are the kind you're probably most used to, and they consist of a bar that slides in the table's miter slot topped by a semicircular fence you can adjust through a range of angles. Almost all include a longer auxiliary fence that attaches to the front for stock support. These gauges have taken the act of angle measurement to an art form, with many offering exquisitely readable and accurate



The Saw-Jaw rigidly holds blades for easy changing while protecting you from sharp edges and the teeth from possible damage.

scales, as well as presets for common angles. They excel at most tasks but can be difficult to use with very large or heavy stock, as the fence is locked in place at only a single point.

Triangle miter gauges, on the other hand, also offer improved scales with good readability, but they anchor the fence at two points — with a third point near the handle — for extremely rigid support of large stock during crosscut operations.

You might prefer one style over the other depending on what you do most on your saw. I have one of each, and I use the protractor gauge for creating fine miter cuts in smaller stock, while the triangle gauge is my workhorse miter gauge for daily cutting.

Saw-Jaw

Some newer saws are being equipped (finally!) with arbor locks, but until you upgrade to one of those, you probably consider changing blades an onerous task. Handling sharp blades is difficult at best, and the practice of jamming a piece of scrap into the teeth to hold the blade steady while you deal with the arbor nut isn't easy. Some blade manufacturers even recommend against it. The Saw-Jaw™ from G&G Industries handles blades with aplomb. Just slip the plastic paddle-like shroud around the blade and squeeze the handle to lock it in place. Not only does this completely cover the teeth, protecting your hands and arms from cuts, but, locked on the blade, it acts as a wrench to hold the blade rigid while loosening or tightening the arbor nut. And if you happen to fumble the blade while changing it, the Saw-Jaw protects the teeth if they



Aftermarket splitters added to zero-clearance inserts help prevent kickback accidents. The MJ Splitter from Micro Jig shown here includes two splitters that can be reversed or swapped for fine-tuning.

strike anything. You could even buy multiple Jaws and keep extra blades stored in them for extra protection. The Saw-Jaw fits any 10" blade and sells for about \$17.

Splitter

Some accessories can have their own accessories. If you have a zero-clearance insert for your saw, adding a splitter to it makes for an unbeatable one-two punch. Micro Jig's MJ Splitter™ installs easily by drilling three holes into the insert directly behind the blade. (The splitter kit includes both drill bit and drilling guide.) The kit has two splitters with offset posts on the bottom — the splitter you use and the direction you slip it into the holes determines the amount of offset to the blade. Kits are available for both regular and thin-kerf blades and sell for \$18 to \$25 for the standard version, while the enhanced SteelPro (metal splitters with a transparent polycarbonate coating) sell for about \$35.

Extra-Large Power Switch

Manufacturers have gotten better with making machines easier to control, but if you need to get a machine shut down really fast it can still be difficult to find the button. A larger power switch, like the Easy Off Power Control

shown here, wires directly into your saw's switch circuit and gives an enormous off button you don't have to look for; just bang your knee into it for an instant shut-down. Several models of these switches are available from various companies, with many geared to specific amperages. Some versions are plug-compatible, requiring no hardwiring. Plug-in versions go for about \$25 to \$45, while heavy-duty hardwired units sell for around \$175.



A.J. Hamler is a woodworking author and the former editor of Woodshop News.



Large replacement power switches let you turn the saw off quickly by bumping the switch with your knee.

Innovative Measuring and Layout Tools

WHILE BIG POWER TOOLS HAVE THE CACHET, YOU CAN'T DO WOODWORKING WITHOUT A GOOD SET OF MARKING TOOLS. FORTUNATELY, YOU HAVE PLENTY TO CHOOSE FROM!

Tape measure, rule, square, bevel gauge, compass. How far could you get on any project without these basic layout and measuring devices? The most rudimentary forms of these tools have remained nearly unchanged for decades, if not centuries. But time stands still for no man — or tool: A number of tool manufacturers have taken up

the task of reimagining and reinventing measuring and layout tools. Dozens of these innovative tools employ clever designs (many patented) and unique features intended to make the layout process quicker and easier for woodworkers and DIYers alike. In this article, I'll show you more than 50 such tools, all of which are both affordable and available, either at home and hardware stores or through mail order catalogs or via the Internet. I'm sure you'll find at least a tool or two that would make your project-building life a little easier.

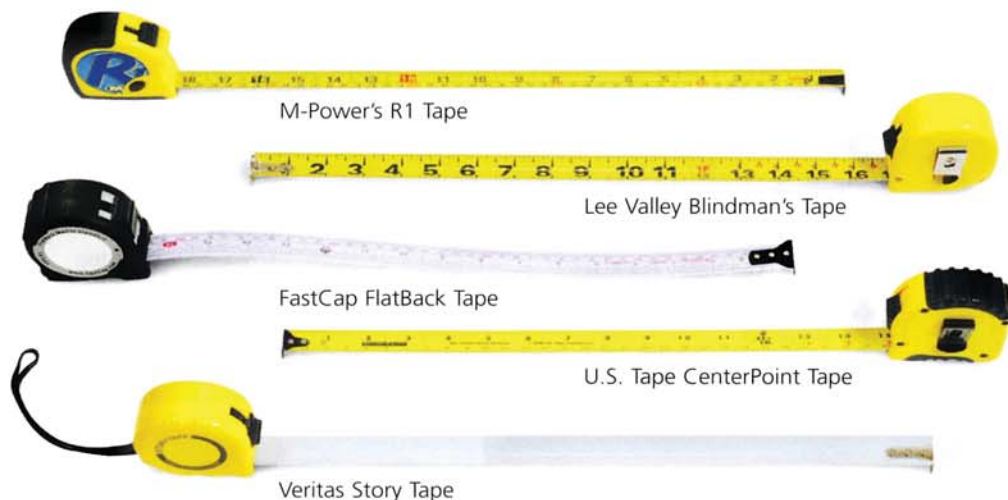
Measuring Tapes

Practically all standard tape measures have the numbers printed so that they read from left to right. That means you have to hold the tape body with your right hand and make pencil marks with your left — not exactly ideal if you're right-handed. But the numbers on M-

Power's R1 Tape read from right to left, allowing you to handle the pencil comfortably with your right hand. If you'd swear that the numbers on your rules and tape measure are getting smaller every year, then it might be time to switch to Lee Valley's Blindman's Tape. The numbers and increment markings on this tape are supersized, so they're much easier to read, even in low light. Another common irritation is that the cupped profile of a standard tape measure — added to allow the tape to be extended without buckling — makes it harder to read and mark measurements on flat surfaces. A FastCap® FlatBack Tape solves this problem by making the tape itself flat. Not only does it lie flush on a board or panel, but it wraps around curved parts easily. Another innovative feature of this tape is an unmarked strip at the edge, which allows you to mark one or a series of part dimensions with a pencil directly on the tape, as shown at far right.

There are a number of other specialized tape measures available that are designed to perform specific tasks, including





M-Power's R1 Tape

Lee Valley Blindman's Tape

FastCap FlatBack Tape

U.S. Tape CenterPoint Tape

Veritas Story Tape



Rockler Square Check

Tape Tip

Utilitas Tool Works
Miter Hook

Square N Tape

the U.S. Tape CenterPoint Tape. This model has a standard imperial scale along its upper edge with a second scale below it. To mark the center point of any length, you find that number on the lower scale, and then use the corresponding increment on the scale directly above it. Another cool specialized tape is the Veritas® Story Tape. It's basically a tape with a completely blank surface that lets you mark out a series of dimensions to use as a story stick. There are also a couple of handy accessories that work with most standard tape measures. The Rockler Square Check secures to the end of your tape with a magnet, and it hooks over the outside corner of any box or chest, allowing you to accurately check the diagonals during assembly to see if they're the same (which means the box is square). The orange plastic Tape Tip also uses magnets, but attaches to your tape's end in different positions, allowing you to take both inside and outside measurements. It also has a V-notch for a pencil and a center hole that allows the tip to be used as a marking gauge or a compass. The Utilitas Tool Works Miter Hook magnetically attaches to a tape measure and allows quick, accurate measurements of mitered parts, tip-to-tip or the more difficult to measure heel-to-heel, as shown at bottom right. The Square N Tape™ is a neat accessory that mounts directly to your standard tape, to provide a 3 1/2" square and marking gauge that's at hand.

Rule Improvements

Think that there isn't much to improve on a standard rule or yardstick? Consider these innovative tools: If you like to use a fine pencil rather than a striking knife for laying out dimensions, INCRA® Precision Tools makes a line of innovative rules with slots and holes precisely placed at 1/64 in. increments. The slots/holes fit a .5mm mechanical pencil lead, for very precise marking. In addition to the standard flat Precision Marking Rule, there's a Pro-T model that features an end stop that squares the rule to the work, and also a Bend Rule, for layout on the edge of a board. Need to precisely measure or mark from the end or edge of a part? An iGaging Hook Rule makes the process easier: An adjustable hook zeroes the rule on the end/edge of the part. With Woodpeckers® Rules, you can add a screw-on Hook Stop. A really handy way to use a standard ruler for laying out joinery, pocket cuts or pilot holes for hardware is to add a rule stop, like the Veritas Ruler Stop or Woodpeckers Rule Stop. Either slides onto a rule and lock at any measurement, so you can use the end of the rule to mark lines at that distance from the edge of the work.

One of the most unusual measuring devices is Lee Valley's Phi Rule, which uses a pair of scales to help you quickly calculate aesthetically pleasing "golden ratio" proportions for furniture and cabinet parts. To use the rule, you simply measure

the known side of the drawer, box, panel, etc., with the upper scale, then use the same numerical increment on the lower scale to mark out the part's other dimension (one scale is 1.618 times longer than the other). One side of the Phi Rule is used to measure the known short dimension, the other the known long dimension of a workpiece. And if your aging eyes are having trouble reading the fine increments



Innovations to the ubiquitous measuring tape, such as a markable edge or an add-on for measuring heel-to-heel miter distances, are a boon to woodworkers.



on this or any rule, consider using a Veritas Rule Magnifier. The tool has a weighted base that also has magnets to hold it to a steel rule. A magnetic friction hinge lets you adjust the 3-power magnifier's lens to any angle for convenience.

Normally, a story stick is a plain piece of wood onto which you mark all the dimensions of a particular project. But the Woodpeckers Story Stick puts a dif-

ferent twist on this concept. This piece of anodized aluminum track is etched with imperial scales on both sides and comes with adjustable tabs and an end stop. By aligning the cursor on each tab with the track's scale and locking it in place, you can save a whole series of layout dimensions, then use the narrow pencil slot on each tab to transfer that dimension to multiple workpieces.

rate measurements from the panel's edge. There are also holes at 1/16" increments, for marking a line parallel to an edge: Insert a .7mm pencil lead in a hole and slide the tool along the edge.

For smaller-scale tasks you often encounter in cabinet and furniture making, like checking stock and part edges for square, a Veritas 6" Precision Square is very handy. Built like a pint-sized carpenter's square, it's easy to carry around in an apron pocket so it's at hand when you need it. Veritas also makes a unique tool they call a Sliding Square, designed to lay out or transfer measurements as well as mark short 90° lines, or to mark parallel to an edge. The tool's 3"-wide blade has scales marked on three sides, allowing you to measure or mark dimensions in two axes at once, thus saving time and trouble. Another way to save time during layout is to mark two surfaces of a part at once, say when marking both the depth and width of a hinge mortise on the face and edge of the work. Veritas wide and narrow Saddle Squares are compact tools made to suit the layout task at hand.

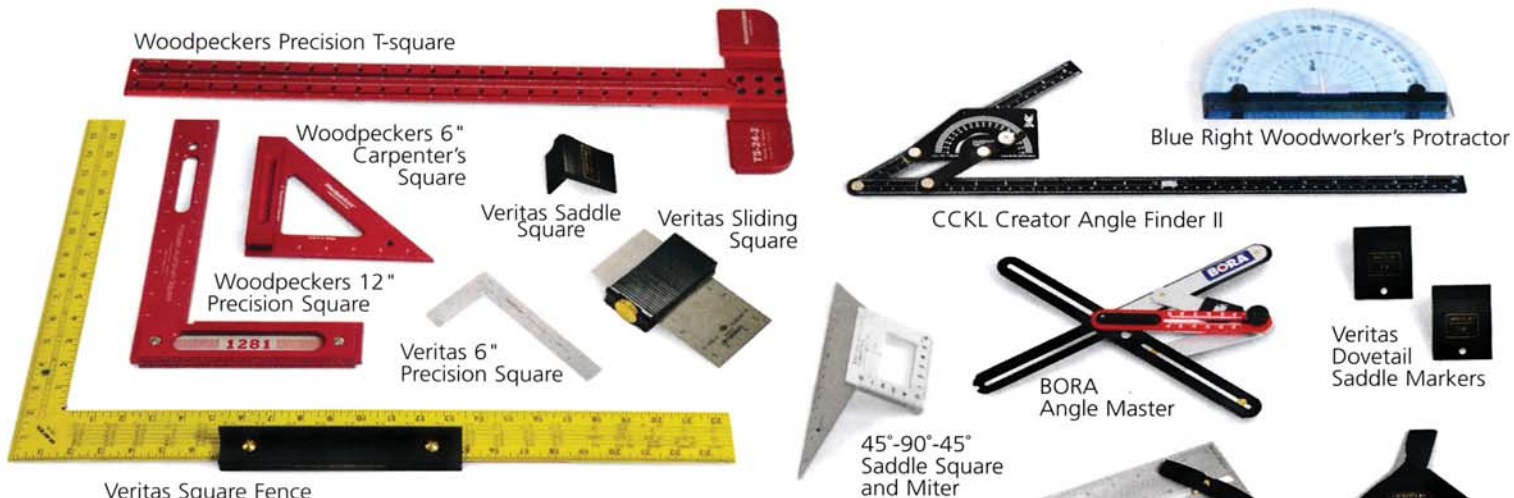
When it's time to mark miter cuts for a picture frame or molding, a Japanese-made 45°-90°-45° Saddle Square and Miter or a Veritas Miter Saddle speeds up the process, as they're preset to a precise 45° angle. There are even specialized saddle tools made just for marking dovetail joints. Veritas offers 1:6°, 1:8° and 14° Dovetail

Squares, Miters, Bevels

A tool that's become standard equipment in carpenter's tool bags, a speed square is basically a 45°-45°-90° triangle with a lip on one of the short edges. Made of anodized aluminum, the Woodpeckers 6" Carpenter's Square quickly aligns to an edge so you can mark lines at 90 or 45°. Unlike a standard try square, Woodpeckers 12" Precision Aluminum Square also features a lip on the inner edge of its stock, so that it stays put on the edge of the stock while you mark lines or measure dimensions. For bigger jobs that require a larger tool, you can add a lip to a standard carpenter's framing square by attaching a Veritas Square Fence to one of the square's legs. For marking square lines across the face of a panel, a draftsman's T-square is a great choice. Woodpeckers Precision T-Squares take this traditional tool one step further by adding a lip to the square's head (to keep it flat and level on the edge of the work) and scales on both edges for accu-



Accurately marking the edge of a square-edged board, laying out a rectangle to the golden ratio or marking multiple dimensions at one time ... there are specialty rules to help do all these tasks.



Saddle Markers, which let you mark both the angled and square edges of a pin or tail with the same tool. For other standard miter angles, the BORA Multi-Angle™ Adjustable Square is like a try square with a pivoting blade that folds open and locks to any one of seven angles — 22.5°, 45°, 67.5°, 90°, 112.5°, 135°, and 157.5° degrees — with great accuracy (BORA claims it's repeatably accurate to $\pm .05^\circ$!). When a project involves laying out other angles, say to build a multi-sided planter box, the Blue Right™ Woodworker's Protractor has a nice, big transparent protractor with a bottom-mounted fence that lets you read and mark angles with great accuracy. The CCKL Creator Angle Finder II has an adjustable protractor attached to a 20"-long arm, allowing you to set and mark an angled line anywhere from 15° to 180° with the same tool. If you prefer to use a conventional sliding bevel for angled layouts, a Veritas Bevel Setter makes setting the tool to a precise known angle a breeze. The plate is marked with lines from 0° to 90° at half-degree increments, plus common dovetail angles and polygon miter angles. A lockable fence lets you use the tool by itself for marking angles. The BORA Angle Master™ is an innovative tool useful for duplicating existing frame angles. After setting the tool against an angled joint, the tool divides in half. You then use this half tool to set your crosscut saw to cut the necessary angle.

Measuring and Marking Gauges

Any time you need to measure the thickness or diameter of a part, width of a slot or rabbet, depth of a hole or mortise, or the length of a dowel or tenon, there's a measuring gauge that's right for the task (see top photo, next page). One of the most useful such tools is a basic machinist's caliper. While a standard dial caliper lets you read inside and outside dimensions, as well as depths on a scale that shows thousandths of an inch, a caliper with a fractional scale is much more useful to woodworkers. Lee Valley's Fractional/Decimal Inch Combination Caliper has markings as fine as 1/64th of an inch — no more converting from thousandths to fractions! When you want to use a caliper for measuring much longer parts, check out the Chestnut Tools Transfer Caliper. This clever device has a pair of plastic caliper heads on an inch-wide tape that rolls up into a compact package. You unroll as much of the tape as you need to accommodate the length of the work (up to 48 inches), then slide the moving head to take either an inside or outside measurement. Another kind of caliper that's often used by woodturners and luthiers (but is useful for many woodworking tasks) is the legged caliper. The Veritas Direct-Reading Caliper is very handy for reading outside dimensions with good accuracy, with a scale that's oriented so it's easy to



Put the BORA Angle Master against an angled joint and then take the tool apart. You then use this half tool to set your crosscut saw to cut the necessary angle — matching it perfectly.



The Veritas Sliding Square is great for marking joints like mortises.



read by a woodturner when measuring the diameter of a spindle. As their name suggests, depth/height gauges are useful when checking the length of short parts and joinery, say the length of a tenon, or to see how deep a hole or mortise is. The INCRA Gauge can be used to mark out joinery or hardware mounting positions at a chosen distance from an edge, thanks to INCRA's unique interlocking rack system that sets precisely at $1/32''$ intervals. The Brumley Tools Trim Gauge™ is a small but very handy gauge for measuring heights or lengths of short parts, joineries and reveals (there's even a pair of built-in levels, for carpentry tasks like setting doorjambs).

Traditional marking gauges

have points that scratch lines into the work's surface. In contrast, gauges with hardened steel cutting wheels cut wood fibers cleanly, rather than tearing them, for more accurate joinery layouts. The Veritas Wheel Marking Gauge comes in a model that features a shaft with Imperial scale graduations and a micro-adjust feature (the scale allows the tool to also serve as a depth gauge). The Veritas Dual Marking Gauge has a pair of independently adjustable marking rods. By locking each to a different setting, you can quickly mark out both sides/edges of mortises, tenons, slots, etc.

Scribing is a special kind of marking that's needed when fitting cabinets to an irregular wall, or wherever parts intersect or need trimming. FastCap's AccuScribe Pro has an adjustable arm that adapts the tool to make a wide variety of scribing tasks easy and accurate. M-Power's Perfect Butt Profile Scriber has a pencil stylus that fits into one of four different diameter wheels that ride along the surface being transferred. The amount of offset between the surface and marked line is determined by the wheel's radius.

Compasses and Dividers

Marking circles and arcs on tabletops or radiuses, for rounded edges on panels or frames, is a job made a lot easier by a good compass. (See top photo, next page.) At the small end of the scale, the Veritas Carpenter's Gauge handles circles up to a $12\frac{1}{2}''$ diameter, yet

stores conveniently in a pocket or pouch. Separate radius and diameter scales make it very easy to set; it also works as a pencil marking gauge. At the other end of the scale (pun intended) is the Brat Manufacturing Rotape, a specialized tape measure with a removable center point. You simply extend the locking tape to the desired radius —up to a whopping 72"! — press the point into the work, and swing the tool's pencil stylus around to mark the arc or circle. Another tack is to transform a standard rule or yardstick into a compass. M-Power's Flat Lying Trammel Set includes a pair of fittings that do just that. One has a carbide steel pivot point, while the other holds either a pencil or a razor knife, allowing you to either mark circles or cut them out of veneers, cardboard and other thin materials. But if you want a compass designed for extremely precise layouts, the Veritas Beam Compass is the ultimate kit for marking or scribing circles and arcs up to 80" in diameter. The set consists of three rods that screw together to suit the desired length, a pencil holder and a pair of brass trammels with steel points. One of the trammels connects to a micro adjuster that allows you to tweak the compass's radius to perfection. The set even includes a brass pivot disc, so the pivot point won't put a hole in your workpiece.

When it's time to divide a length into even segments, the M-Power Point-2-Point™ can divide parts up to $23\frac{1}{2}''$ long into up to seven even



Scribing irregular shapes is made easier with M-Power's Perfect Butt stylus and wheel system (top). Measuring joint heights and offsets is the bailiwick of Brumley's Trim Gauge (bottom).



segments. While this tool is lightning-quick to set and use, it's not meant for high precision layouts, but rather for tasks such as spacing dowels or plate biscuits evenly along an edge. For more precise jobs, like laying out dovetails or finger joints, check out the innovative Veritas Dividing Rule. After slipping the tool over the workpiece (up to 8" wide), simply use a pencil with the series of holes that suits your desired divisions, anywhere from two to 10 even segments. The rule has stops that engage the edges of the work as you slide it along the length of the rectangular board or part while the pencil marks the segment lines.

Layout Multi-tools

Looking for the Swiss Army knife of measuring and layout tools to have on hand for your desert island wood project? There are several multipurpose tools out there that could fit the bill. First off, there's the M-Power Combination-3D, a tool that features a large try square made of heavy cast aluminum with a resettable Sheffield steel 9" blade laser-etched with Imperial and metric scales. There's also a 2"-wide saddle square, a bevel gauge etched with standard miter angles and a removable marking gauge. The latter features an adjustable pencil holder that can be set to any position along the square's blade, allowing you to mark accurate lines parallel to an edge. A much more compact tool, the Kreg Multi-Mark™ has a 6" rule

(Imperial scales on one side, metric on the other) that mounts in three positions, for use either as a try square, a 45° miter square, or a depth gauge. The steel rule can also be used separately. The tool's plastic body has a ledge for setting a 3/16" reveal when mounting moldings and trim, and a built-in level vial makes the Multi-Mark a useful torpedo level. Last, but not least, is a re-creation of the famous Stanley #1 Odd Jobs tool that was originally manufactured from 1888 to the 1930s. The Rockler Odd Job features a solid-brass body and 6" brass-edged maple rule (a 12" rule is optionally available), and Garrett Wade's larger Jumbo Odd Job comes with a 12" rule, with an 18" rule as an available option. Both Odd Jobs pack a lot of function into an attractive tool that looks like a tiny Victorian house: A try square/T-square, an inside square, a miter square, a depth gauge, a marking gauge, a compass and a plumb level (the Jumbo Odd Job has separate plumb and level vials). Plus, the rules can be used separately. Small removable steel styluses serve as scratch awls, scratch points for the marking gauge, and a screwdriver, for extending/retracting the steel compass center point at the peak of each tool's "roof." When used as a compass, a notch in the end of the rule guides the stylus or a pencil when marking a circle or arc.

Sandor Nagyszalanczy is a contributing editor to Woodworker's Journal. His books are available at Amazon.com.



From striking large curves to scribing accurate divided lines, there is a marking tool for the task. The dividing rule by Veritas (bottom) is a shop favorite. Brat Manufacturing's Rotape (upper photo).



Marking tools that do several tasks have a long history in the woodshop. While the Kreg Multi-Mark (upper photo) is new to the scene, the Odd Job tool is a modern-day revival of the Stanley version from the 1880s.



Questions & Answers



To level a shop-made zero-clearance insert made from MDF, simply swap out the set screws from the provided insert.

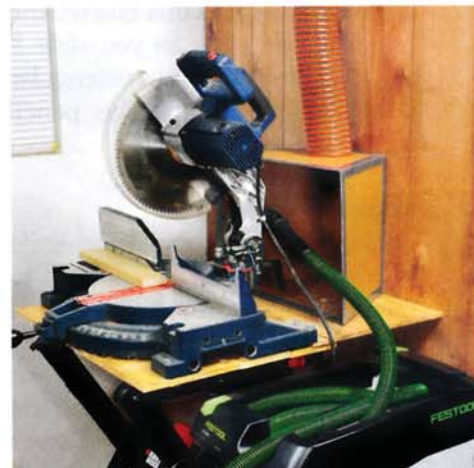
Q Some time ago, in some magazine (not yours, I can assure you), there was a piece about making a zero-clearance insert for a saw. It seems 1/2" MDF is almost the correct size for me to use, and I started out following the instructions very carefully. Then I came to the part about the adjustment screws, and I couldn't believe my eyes when it told me to put the adjustment screws in — but there was no mention of how!

As I said, 1/2" MDF is almost perfect for me, but I can still feel it when the wood goes over the insert. I am hoping that your experts can tell me how to finish the inserts I have made.

Peter Ritchie
Ashland, Virginia

A Peter, we are always willing to get in the game when our competition drops the ball! Shop-made zero-clearance inserts are remarkably useful and easy to make, but as you pointed out, they must be level with the top. The good news is that there is a simple solution to your situation. The inserts that are provided by the manufacturers are usually leveled to the saw top by adjusting set screws. Just take those set screws out, drill holes into your MDF insert blank (use the manufacturer's insert to mark the locations), and drive the set screws into the holes. They will "self thread" as long as you don't bore the holes too small.

— **Rob Johnstone**



Controlling dust spewed from a miter saw is no small task — but it can be done, as demonstrated here.

Q Is there an effective way to remove sawdust from the air as it comes from a large sliding miter saw? I have a 12" Bosch sliding miter saw (model 5412L). It's a wonderful saw, but it throws fine sawdust over a broad area no matter what I try. The least harmful (dusty) method is to have the saw positioned with its back to the wall.

Q&A & Readers' Tricks

Readers often write in with questions about their tools, and our editors provide expert answers. Here's a selection of some of our tool-related questions from 2012. Tool tricks are never in short supply either! For a sampling, see page 96.

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Tricks of the Trade96

I have connected a Dust Right™ 4" hose to it, which is connected to a dust collector. That works, but it only removes a minor part of the sawdust from the air. I have attached a tabletop dust fitting for miter saws. That, too, is connected to a dust collector. It takes away quite a bit of sawdust, but only half or less.

In short, my miter saw is the messiest machine in my wood-working shop and I am stumped. Any ideas?

Paul Fletcher
Indianapolis, Indiana

A It's true that miter saws are awfully good at flinging dust around the shop. But, in my experience, they aren't impossible to tame. You mention that you attached a 4"-dia. hose to your saw's dust port (where the bag normally attaches) and connected that to a dust collector. Your instinct was good, but there's a problem. The dust collector simply isn't moving air fast enough through that hose to capture the chips thrown out by the saw during cutting. I would remove the hose and connect a shop vacuum

to the saw's port. A shop vacuum moves air at a much higher velocity than a typical small-shop collector and, as such, is better suited to capturing fast-moving chips and sucking them away. Once that's done, reconnect your 4" hose to your tabletop dust hood fitting and hook it up to your collector. The hood should capture the finer dust that the vacuum misses.

— **Sandor Nagyszalanczy**

Q I am a beginning woodworker and need advice on what is a good beading bit for the edges of drawers, shelves, etc. I am also looking for a way to join drawer corners without the use of dovetails (I just bought a PORTER-CABLE 4212 dovetail machine and haven't learned to use it yet). I appreciate any help you can give me.

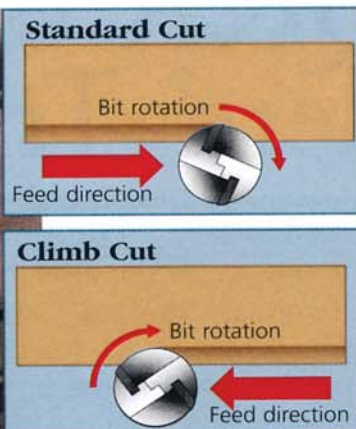
Tony Licata
Eden, North Carolina

A beading bit is one of many profiling options for adding decorative details to your woodworking.

A I like to use a 5/16"-diameter traditional beading bit for the bottom edges of table aprons and shelves. It cuts a semicircle with an adjacent flat shoulder and adds a nice shadow line. But if by "beading" you mean the broader category of profiling bits, then any number of bits can spruce up the edges of drawer faces. Roundovers, chamfers, coves and ogees are just a few of many; buy a starter set of bits and you'll probably get one of each of the standards. Experiment with different styles to see which you prefer — "good" is in the eye of the beholder. Plus, what suits one project may not look as good on the next. As far as dovetails go, instead of shying away from dovetailing your drawers, dive in and learn to use that new P-C dovetailing jig! Go for it ... the end result is worth your effort.

— **Chris Marshall**





Illustrations depict a router and router bits oriented as in the photos above.

Q As a newbie woodworker, I get confused by woodworking terms. Often, the meaning becomes clear from the context it is used in. But other times, I am left in the dark. When reading a recent article, the author talked about using a “climb cut” with his router to avoid tearing out highly figured grain. What is a climb cut, and if it works better than a non-climb cut, why wouldn’t you use it all the time?

Jack Danielson
Blaine, Minnesota

A If you allow your router, spinning a piloted, edge-cutting router bit, to go the direction it wants to, it’ll be making a climb cut. Hold a rabbeting bit at the edge of a board (shank up), and rotate it clockwise. Like a paddle-wheel, the cutting edges will dig into the wood and pull the bit to your left. At the same time, they’ll be pushing the bit away from the wood’s edge. The natural tendency of a bit is to “climb out” of the cut, hence the name.

Chuck that bit in your router and let it guide you through a cut. You’ll find the router takes off to the left, surging along the edge. It can be unnerving. The cut will be clean, but its width will waver. Try again, but this

time push the router to the right. You’ll feel some resistance, but the router will hug the wood’s edge. You’ll feel in control. To be safely in control is why you should avoid climb cuts.

— **Bill Hylton**



Is the UNIFENCE safer to use?
Our editor points out the sliding fence’s advantages.



Fence pulled back (above) for ripping and cutting small parts.



Fence forward for cutting sheet goods.

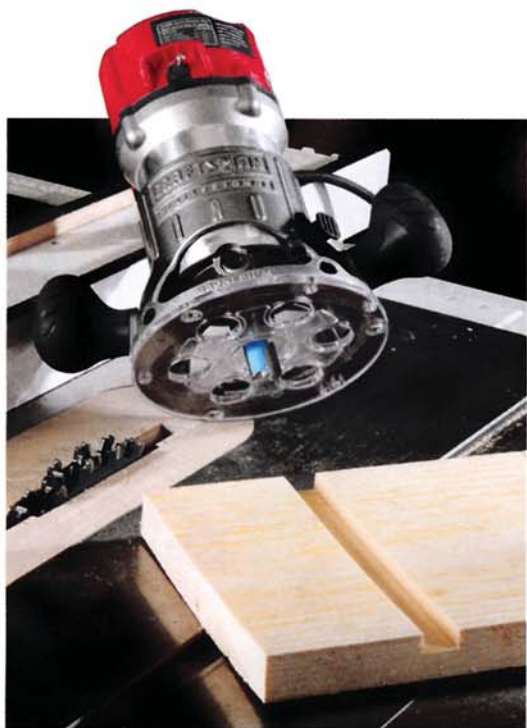
Q In your February 2012 issue, in the Reader’s Survey, you described “the European style with fore-and-aft adjustable fence” as being the safest table saw rip fence. Could you please clarify your description? Do you mean how wide the base along the rail is? What makes this type of rip fence safer than others?

It is important to me because I am considering whether to purchase a table saw with a UNIFENCE.

Jeff Walker
Ann Arbor, Michigan

If you are cutting off small parts on your table saw (using your miter gauge), pulling the fence back keeps the cutoff from binding against the fence as well. So my answer to your question is, yes, this fence is safer to use than those without this feature.

— **Rob Johnstone**



Dado set or router bit ... which is better for making grooves or dados, and why do you need to own both?

Q I am pretty new to woodworking and slowly adding to my tool collection, but I am on a limited income. In every TV show and magazine article I have read, they use a dado blade in a table saw to cut dados. Dado blades are very expensive and look like a big pain to set up. When I read reviews of dado blades, people complain that the bottoms or even sides are not flat, except with high-end blades, I assume. In contrast, router bits are fairly cheap and everyone has a router. Router bit changes are quick and painless, and even a cheap bit makes a perfect flat cut. So I want to know why everyone always uses the table saw to cut dados? What is the advantage of it? Do I need to shell out \$100 for a dado set and then another \$100 because I need to cut dados in plywood? Please explain this for me.

Jason Anderson
Cedar City, Utah

A Jason, the short answer to your question is no — you don't need to invest in a set of dado blades to make dados and rabbets. In the end, it makes no difference how a groove or dado was formed — the only criteria is if it is properly sized and cut in the right place. There are advantages and disadvantages to both systems ... but if you are more comfortable with a router and a straight bit, that's the system for you!

— **Rob Johnstone**

Q I just purchased a #4 hand plane, and it came coated with thick oil as a preservative against rust. The instructions said to remove the oil with mineral spirits. I'd like to hang the plane on my pegboard with my other tools in my basement shop, but I'm concerned that since I've removed all the protective oil, it will rust. What should I use to protect the polished surfaces?

Thomas Belknap
Wenham, Massachusetts

A Iron oxide (aka "rust") is the result of oxygen and water vapor from the air combining with iron. Unlike other metals, rust provides no protection to the sub-surface metal, and corrosion will continue until the iron, oxygen or water vapor is depleted. The drier the environment, the less rusting will occur.

A simple solution to this is a dehumidifier — a great investment in any shop! Anything we do to prevent contact between water vapor and oxygen in the atmosphere and tools will thwart rust. Water-displacing oil is also very effective and the basis of gun oil — a good scheme for storage from a week to years. Our sweat is salty, and salt is a catalyst for the rusting process. After any hard work session, wiping down exposed iron surfaces and oiling is a good idea. Paste wax is also effective, but not a cleaning type automotive wax.

I keep a block of paraffin around to rub frequently on my planes during use because they slide with much less friction. An old shop trick is to cut a block of wood slightly larger than the plane and glue a piece of short carpet (soaked with mineral oil) to it. By storing the plane base-down on the carpet, it's always oiled and ready to go.

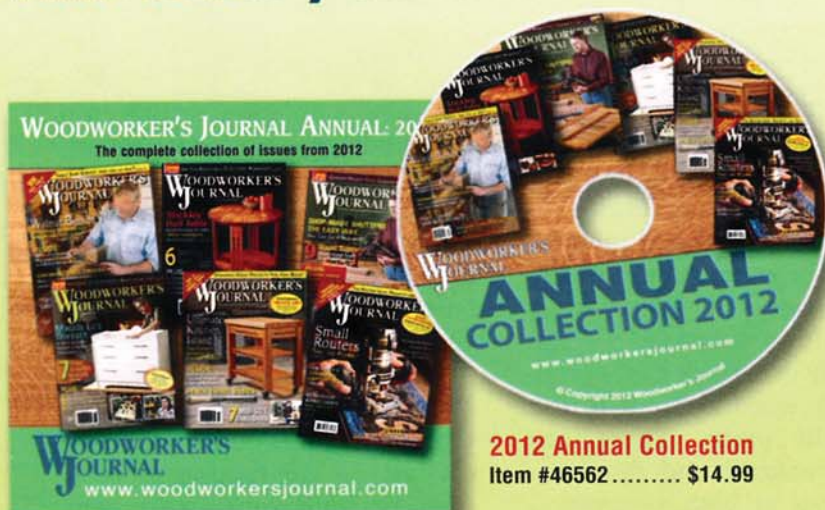
— **Ernie Conover**

A variety of options can keep water vapor and oxygen away from your plane — and rust at bay.



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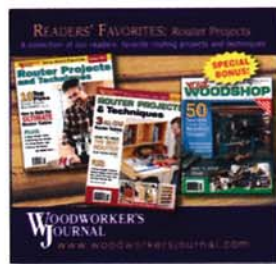
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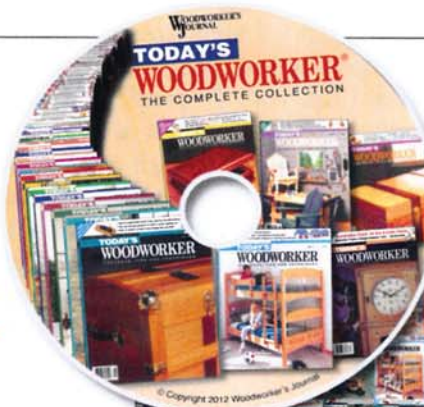
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Tricks of the Trade



An adjustable wrench is a makeshift caliper for matching drill bits to the job.

Adjustable Wrench Takes Quick Measurements

Have you ever had trouble identifying the correct drill bit size for boring holes for dowels, bolts or pipe? If you don't own a caliper, all you really need is an adjustable wrench. Close the jaws of the wrench around a dowel or bolt, then match the bit to the jaw opening. While it's no vernier caliper, the wrench still works quite well.



Save Those Chisel Caps!

Installing or removing mortiser chisels is a clumsy job, and it can lead to poked fingers or damaged points if the bit slips down. There's a cheap solution: protect the sharp points (and your fingers!) with the plastic cap that comes with most new mortiser bits. Install the cap to help push the auger and chisel into place in the tool chuck. Put it back on when you're through mortising to prevent the bit and chisel from falling down as you're removing it from the machine.



Low-tech Laser Accuracy

If you don't have a miter saw with a laser beam, fear not: you can still cut unknown angles just as accurately if you use this easy trick. Lay out your workpiece with the angle you need to cut and set it on the saw's bed. Unplug the saw and hold the guard up to expose the blade. Using a spring clamp, secure a blade guide made out of a piece of thin plywood to the saw blade. Now lower the blade until the scrap rests on the workpiece, and swivel the saw left or right until the scrap lines up with your layout line. Lock the angle. Remember to position the blade on the waste side of the line, remove the clamped guide and you're ready to make the cut.

PVC Wing-nut Wrench

The wing-nuts that secure the blades on some models of scroll saws can be painful to loosen at times, and the lower one beneath the table can be very hard to reach. One reader eliminated the problem by cutting a 3/16"-wide slit into the end of a piece of 3/4" PVC pipe. It fits right onto these nuts to make a handy wrench.

PVC pipe makes blade nuts easier to manipulate.



A screw forms a "handle" for easier wood plug removal.

A Better Way to Pull the Plug

Removing the wood plug jammed inside a hole saw can be challenging, but one of our readers discovered a simple way to remove them effortlessly. Before boring the hole, mark its centerpoint and scribe the circle with a compass. Drive a screw through the waste area about halfway between the centerpoint and the hole's circumference. Choose a screw about an inch longer than the board's thickness. Now bore the hole with the hole saw as usual, unplug the drill and grab the screw with a pliers to pull out the plug. Simple.

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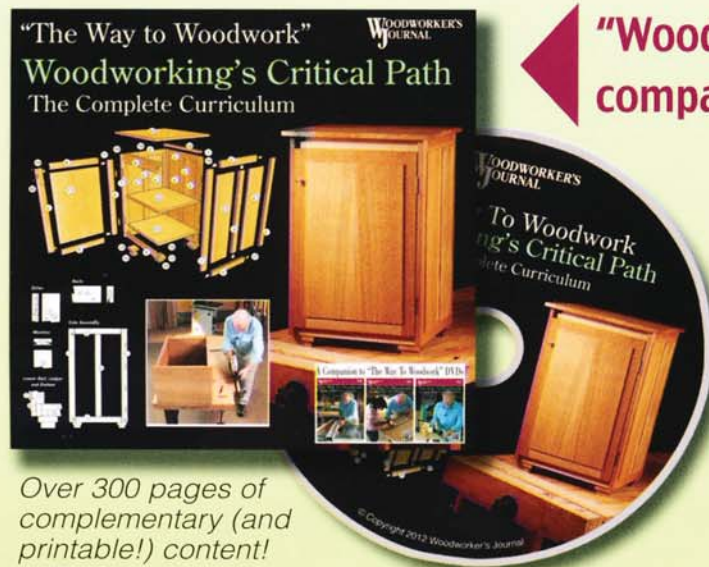
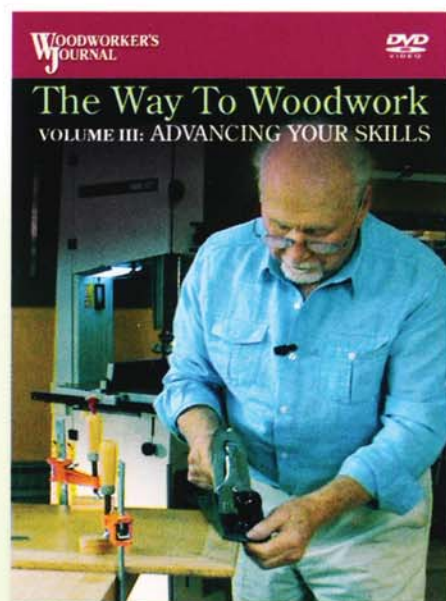
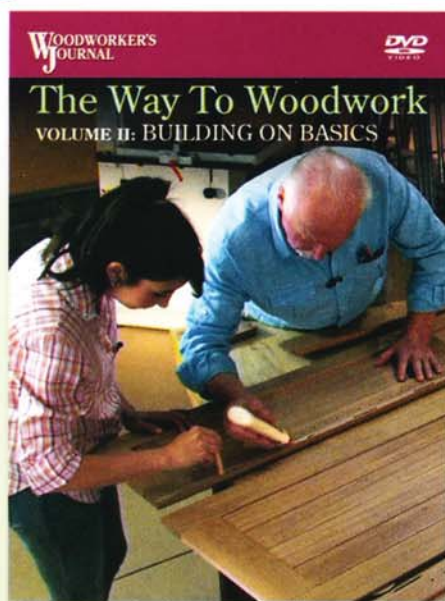
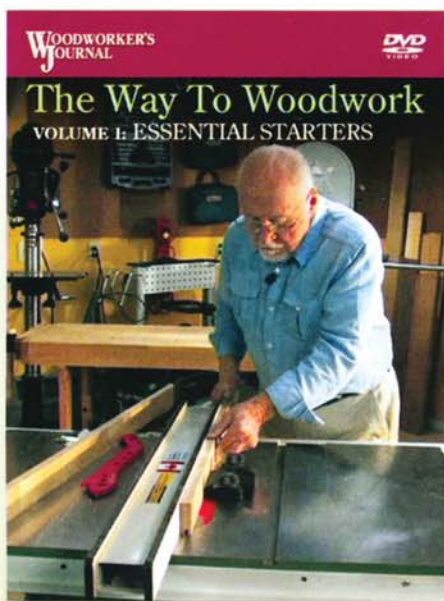
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