TOOL TEST

Radial-Arm Saws

Although the heyday of these machines may be past, there still may be a place for one in your shop

BY WILLIAM DUCKWORTH

Mention the radial-arm saw to any online woodworking discussion in cyberspace or to a real-time gathering of woodworkers, and you're bound to stir up trouble. Some woodworkers argue that this tool is a dinosaur—extinct—and has no place in the shop. Others still sing its praises in no uncertain terms. My intent is not to stoke any flames (hold the letters, please), but I will declare this: The radial-arm saw is not the best all-purpose cutting machine. The tablesaw has usurped that role. But if your budget allows both, you won't regret having the use of both machines.

There can be no doubt that the advent of sliding compound-miter saws, added to the safety concerns of radial-arm saws and the barrage of liability lawsuits manufacturers have had to defend, have all bitten into the market share of radial-arm saws sold. As an example, *Fine Woodworking* last published a review of radial-arm saws about 15 years ago. Three of the machines made and reviewed then are no longer available.

Even though the number of manufacturers making radial-arm saws has decreased, those that remain offer the buyer a wide range of choices. I assembled and tested five machines made by four different manufacturers. Both Delta and the Original Saw Co. offer many larger, more expensive machines. But I chose what I thought would be a fairly representative assortment that readers might be interested in. Three of the machines take a 10-in. blade; the other two take a 12-in. blade.

These are a bunch of apples and oranges

When *Fine Woodworking* publishes tool reviews, we're sometimes criticized for not concluding for the readers precisely which

Photos, except where noted: William Duckworth; this page: Michael Pekovich

RIDGID RS1000	
Price: $629	(800) 474-3443
Blade diameter:	10 in.
Motor specs:	1½ hp, 120 volts
Runout:	0.0005 in.
Maximum depth of cut:	3 in.
Maximum width of cut:	15½ in.
Weight:	150 lbs.

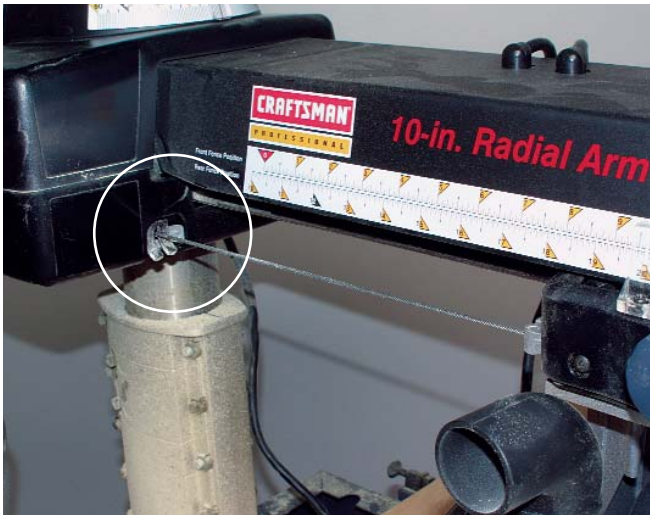
The Ridgid saw, made by the Emerson Electric Co., was the only one that came with a videotape that gives a good overview of putting together and using the machine. Ridgid gets high marks for a clearly worded and printed owner's manual that lays out a step-by-step instruction of assembling the saw and making the myriad adjustments necessary to get it in working order. The instructions more often than not spelled out the *why* as well as the *how* to make a given adjustment.

This saw cut through 8/4 lumber and ¾-in.-thick plywood easily and cleanly with the carbide-tipped blade supplied with the machine. The uniquely designed clear plastic blade guard is activated by a lever attached to the handle on the motor carriage (right), and it takes some getting used to. If you don't pull on the lever, the front of the guard will bind on the back of the fence when you try to pull the saw forward. After I made some crosscuts 90° to the fence, switched the setting to cut some miters and then returned the saw to the original 90° setting, it was cutting about 1/16 in. out of square on an 11-in. width. The automatic brake took an average of five seconds to stop the blade.

This blade guard needs a lift. *The pointed plow on the front of the blade guard must be manually lifted up and over the fence to advance the saw forward into the cut.*

tool they should buy. But for most woodworkers, spending money on tools is very much a budget-driven decision. So the best (and usually the most expensive) model is not an option for everyone. The radial-arm saws I looked at are good examples. With a range in price from $629 to $2,878, it's simply unfair and unrealistic to expect that machines at the top and bottom end of that assortment are going to be even remotely similar in the quality with which they were built and the shop performance you can expect from them over a lifetime.

All of the saws arrived at the *Fine Woodworking* shop via com-



It may be safer, but it's also slower. *Called a "control cut device" by the manufacturer, this feature is unique to the Sears saw. It consists of a steel cable connected to the carriage (above), and it controls the forward movement of the saw. The device is activated by a trigger switch (right), and the choice of three speeds is controlled by a thumb dial.*

SEARS 922038

Price: $650	(800) 377-7414
Blade diameter:	10 in.
Motor specs:	1½ hp, 120 volts
Runout:	0.001 in.
Maximum depth of cut:	3 in.
Maximum width of cut:	15½ in.
Weight:	204 lbs.

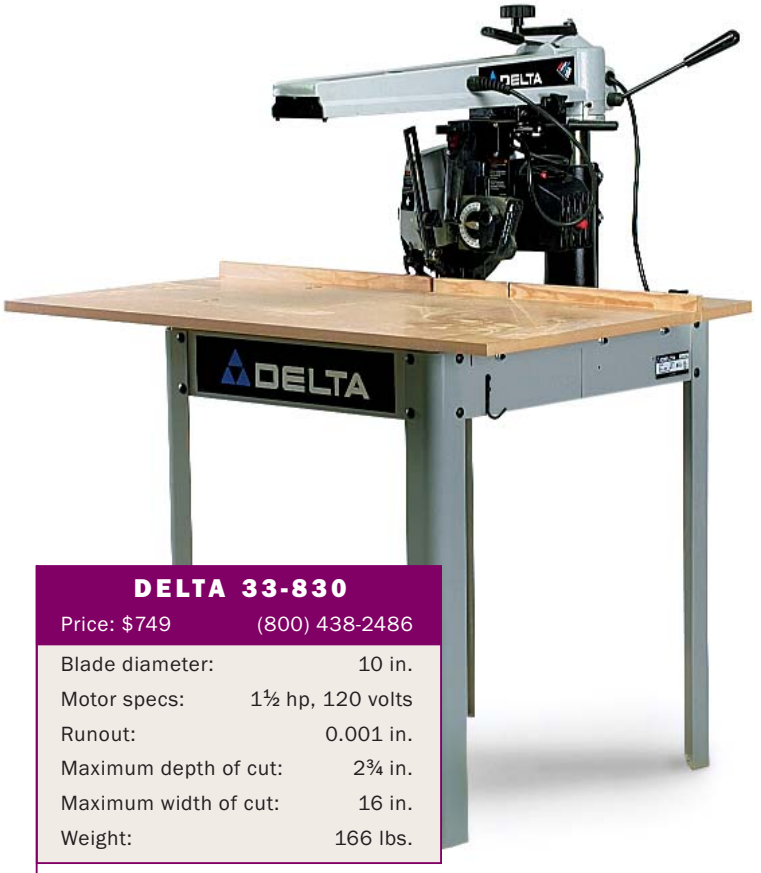
The Sears saw, made by Ryobi Technologies in Mauldin, S.C., is similar in design to that of the Ridgid saw (p. 73), with one notable exception called the "control cut device" (see the photos above). The saw comes with a comprehensive owner's manual, clearly written and illustrated. I ran into trouble at one point trying to remove the blade guard that had been installed at the factory. I called the consumer help line listed and got immediate and competent help to solve the problem.

The Sears saw had no trouble chewing through solid lumber and plywood with the stock carbide-tipped blade. The blade guard is a substantial combination of metal and plastic, and you have to loosen and remove it in stages to change the blade, which can be a less-than-smooth operation. The automatic brake was quick to stop the spinning blade (four seconds) after power was cut off.

The control cut device on this saw is certainly unique and worth mentioning here. The device consists of a steel cable controlled by a separate motor (with its own plug) that limits the forward travel of the saw and keeps a steady tension on the yoke assembly. Whereas you turn the sawblade on and off with a switch at the front of the overhead arm, the control cut device is switched by a trigger on the yoke handle. Speed of travel is regulated with a thumb dial also located on the top of the yoke handle. The dial offers three settings from 6 ft. to 35 ft. per minute. Clearly this device was installed as a safety feature to eliminate the risk of a sawblade jumping toward the operator. However, I've never had any trouble keeping a firm control over radial-arm saw crosscuts, and I found this device too restrictive.

mon carrier sturdily packaged and containing all of the hardware and most of the tools required for assembly. Shipping damage to one of the crates did not result in any harm done to the machine. I assembled each of these machines, one at a time, following to the letter the manufacturer's owner's manual. I took pains in the initial setup to level the tabletops, square up fences and blades, adjust the stop settings and tweak the bearings for a tight and smooth operation. Before putting the machines to work, I used a dial caliper to check all of the arbors for runout. And then I put them through their paces, making crosscuts and miters in 8/4 lumber and ¾-in.-thick plywood, changing the settings and then moving the machines back into place to see how well they returned to their original square settings. Because radial-arm saws are not the best tools for making rip cuts, I didn't test these machines for their ripping abilities.

Runout on all of the motors was remarkably small. Using a dial indicator, I got readings that ranged from a perfect 0.0000 in. to only 0.001 in. But with all of the moving parts and the adjustments that a radial-arm saw requires, runout may be the least of your concerns. These saws live up to their (well-deserved) reputation of be-



DELTA 33-830

Price: $749 (800) 438-2486

Blade diameter:	10 in.
Motor specs:	1½ hp, 120 volts
Runout:	0.001 in.
Maximum depth of cut:	2¾ in.
Maximum width of cut:	16 in.
Weight:	166 lbs.

Of the 17 models of radial-arm saws that Delta Machinery offers, this is the only 10-in. version. This saw is priced to compete with the Ridgid and Sears models, and the construction is of a similar quality, though the cast-iron arm and the heavy-duty sheet steel base make this machine feel more solid. It is fitted with the same motor (made by the Emerson Electric Co.) found on both the Ridgid and Sears saws, and it can be rewired from 120 volts to 240 volts.

This saw cut through 8/4 lumber and ¾-in.-thick plywood easily, but I noticed some marked tearout on the crosscuts through the face veneer of the plywood. Tweaking the bearing settings on the arm improved the quality of cut.

Changing the blade can be a difficult process. The heavy-duty, all-metal blade guard must be mounted on the motor but not fully fastened in place. As with the blade guards on most of the machines I looked at, what you gain in safety you lose in facility, which, I suppose, is a small price to pay. Rather than being mounted out on the front of the arm, the switch is on the top of the yoke carriage, which makes it hard to see, depending on where you're standing. The automatic brake took an average of eight seconds to bring the blade to a full stop.

Hopefully, you won't have to do this often. *Changing sawblades can be an ordeal because you must partially remove the guard to access the arbor nut.*

DELTA 33-891

Price: $1,865 (800) 438-2486

Blade diameter:	12 in.
Motor specs:	2 hp, 230 volts
Runout:	0.001 in.
Maximum depth of cut:	3¾ in.
Maximum width of cut:	14⅜ in.
Weight:	300 lbs.

The steel combination blade that comes with this saw is nothing to write home about (no carbide here), but the machine itself is tuned to perform with accuracy. Switching back and forth from 90° square crosscuts to 45° miters using the built-in indexed settings, all of the cuts were consistently true.

Instead of pivoting from the top of the column, all the way at the back, as other saws do, this machine pivots on a turret located about halfway out on the length of the arm. According to the Delta literature, one benefit of this design is that the saw pivots 360°, which probably makes it easier to set up the saw for unusual and steeply angled cuts. I suspect another big benefit is that there's less stress on the overhead arm because less weight is cantilevered away from the column, which translates into less trouble with the adjustments on the machine.

For safety, a keyed lock is mounted at the top of the arm, near the switch. The mechanical brake took 15 seconds to bring the blade to a full stop.

A unique design. *With a centered pivot point, the weight of the saw is counterbalanced, reducing stress at the column. The indexed 90° and 45° settings on this Delta saw were extremely accurate.*

Photo, this page (bottom right): Michael Pekovich

Two handles find the angle and keep it there. *The lower handle keys into a notched collar, providing factory-set adjustments for square cuts and 45° miters. The handle at the top tightens the overhead arm onto the column.*

ORIGINAL SAW CO. 3512-01, TYPE III

Price: $2,878 (800) 733-4063

Blade diameter:	12 in.
Motor specs:	3 hp, 230 volts
Runout:	0.0000 in.
Maximum depth of cut:	2¼ in.
Maximum width of cut:	24 in.
Weight:	320 lbs.

If you have the money and need a radial-arm saw, you can't buy a better-built machine in this size. The Original Saw Co. in Britt, Iowa, offers this 12-in. saw as the only size in its class—what they call "contractor duty." Looking at this machine up close, with its cast-iron and cast-aluminum construction on a heavy steel frame, it's hard to believe that you can upgrade to "heavy-duty" and "super-duty" series for 14-in. to 20-in. blade sizes with crosscut capacities of up to 52 in.

Except for hard wiring the magnetic starter and installing the blade guard, this machine was ready to go right out of the crate. As the owner's manual says, this machine "was thoroughly tested, inspected, and accurately adjusted before leaving the factory." And what a great job they did. All of the adjustments were spot on target: the factory settings for 90° and 45° cuts in relation to the fence were dead-on, the blade was square to the table, the tabletop was level and parallel with the yoke travel on the overhead arm, and movement of the roller bearings on the arm tracks was smooth.

The first crosscuts were perfectly square, and the 45° miter cuts proved equally accurate. No matter how many times I moved the arm back and forth, once I locked it in place, the saw cut perfectly square every time. Beefy handles at the column adjust and tighten the arm on the column and keep it there. There's a simply designed, small, adjustable clamp stop for the overhead track to limit the distance of the outward travel from the column—a nice little safety feature that's easy to use. A spring-loaded steel cable returns the carriage assembly to the column when you release your grip on the saw. The loosely mounted aluminum blade guards don't entirely cover the blade, but they would certainly provide a shield from any errant lateral movement of hands that get too close. The automatic brake stopped the blade about seven seconds after switching off the power.

ing finicky—some more so than others—and most require fastidious care to get them up and running, and diligent monitoring to keep them cutting square and true. All of them came to us with similar tabletop designs, in which a piece of lumber (some warped) or medium-density fiberboard (MDF) serves as the fence, and you can move it around to different locations in conjunction with other loose tabletop pieces. Adjustable fences make sense if you need to switch from a crosscut to a rip cut, but if you don't intend to use the radial-arm saw for ripping, a better solution might be to replace the factory setup with a more permanent fence—flat and straight and firmly secured to the tabletop.

What appear on pp. 73-76 are summaries of each machine, listed in order of price, starting with the least expensive. Each summary lists other common facts for comparison, such as blade diameter, motor specs, maximum depth of cut, as well as the maximum width of cut when the saw is set up square to the fence. I've also listed the weight of each assembled machine because I believe that you'll often find a correlation between how much a machine weighs and how well it performs. □

William Duckworth, associate editor, gave away an old 12-in. DeWalt radial-arm saw when he moved his shop several years ago, and he still regrets it.

One man's techniques for an indispensable machine

BY JOSEPH BEALS

A radial-arm saw and a tablesaw will do more or less the same things, but the tablesaw is by far the better general-purpose tool. Having said that, why bother with a radial-arm saw at all? Here's why I wouldn't be without one.

THE RADIAL-ARM SAW IS THE PREMIER CUTOFF TOOL

By fastening a stop block against the fence, I can index the stock and cut any number of pieces accurately and safely, including wide or long boards that would be awkward to move on a tablesaw. Simple and compound miters are also easier and safer to accomplish for the same reason. And because the fence is sacrificial, I can move it or install a new one when it's needed to show a clean sawkerf for accurate indexing. Also, I can make a fence of any length, given sufficient shop space.

THE RADIAL-ARM SAW IS A BETTER TOOL FOR CUTTING DADOES

Because the location for the dado cut is clearly visible from above and can be indexed either against the kerf in the wood fence or from a stop block on either end of the workpiece, it's easier to make repetitive dado cuts with a radial-arm saw, risking little chance of a clumsy mistake. And once the setup is completed, angled dadoes are just as convenient to make as straight dadoes. I can quickly make multiple passes for getting a precise fit on really wide dadoes or simply removing a lot of waste for tasks such as making tenons.

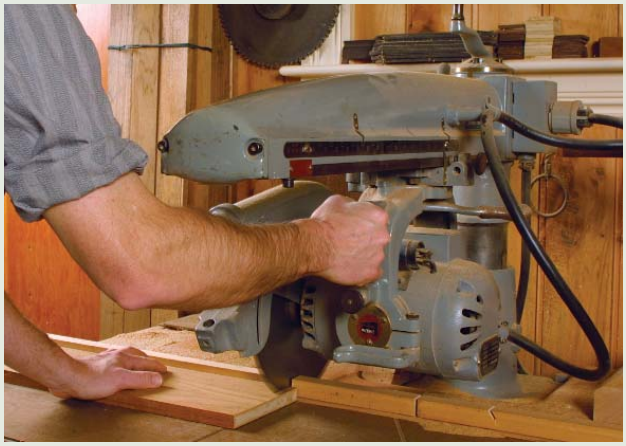
IN DEFENSE OF THE TOOL

Radial-arm saws have an only partially deserved reputation for making sloppy cuts. It is true that these machines must be adjusted carefully, but after that, the quality of the saw will determine its potential for tight, accurate performance.

My radial-arm saw is an old DeWalt GP, which takes a 12-in. blade on a 1-in. arbor. Except for the motor housing and the lower head unit, the entire saw is cast iron. Although the saw is heavy and rigid, it adjusts and operates far more easily than most of the lighter-duty models now sold. These advantages may be a good argument for buying used industrial equipment if you can handle the weight and do your own maintenance. One source for used but reconditioned DeWalt machines is Wolfe Machinery (800-345-6659; www.wolfemachinery.com), or you can often find bargain deals in the classified ads of your local newspaper. □

Joseph Beals is a cabinetmaker and architectural millworker in Marshfield, Mass.

THREE TASKS BEST SUITED FOR A RADIAL-ARM SAW



No equal for crosscuts. *It's easier to make accurate crosscuts with a radial-arm saw than with a tablesaw because the stock stays put: You're not sliding a long, heavy board on a small table surface.*

Making dadoes, straight and angled. *While most dadoes are cut 90° to the edge of a workpiece (above left), some must be cut on an angle. Beals uses an angled scrap of plywood as a jig (above right) to position a window frame for a beveled dado. The jig increases accuracy and saves setup time.*

Cutting tenons. *For cutting tenons that must all be the same length and thickness, a scrap of wood clamped to the fence will size all of the cuts identically.*