

Midsized Plunge Routers

A hands-on review
of eight routers
in the 2-hp class

BY TOM BEGNAL

Some woodworkers run a router every day, using bits nearly as big as a fist and hogging out enough material in a morning to cover a shop floor in thick sawdust. Others rarely use a router, perhaps once a month or less, and use it only to do light-duty work. Then there are those many woodworkers, me included, whose needs fall somewhere between those extremes.

We middle-of-the-road woodworkers are likely to use a router once or twice a week. Our routers are used for a little of everything—from shaping profiles to cutting joinery. So choosing from among the many machines on the market can be daunting.

A router on the low end of the horsepower scale isn't an answer, because it's going to struggle when called on to make occasional heavy cuts. Granted, you can solve that by making a series of lighter cuts, but that can quickly become a nuisance, especially when there's a lot of machining to do.

NOISE, RUNOUT, VIBRATION

On the other hand, one of the big 3½-hp routers can handle almost any task. But those wide-bodies are a bit awkward to use when you're simply cutting a ⅜-in.-radius roundover on a small tabletop. Plus, your wallet usually has to open a lot wider when it comes time to buy one.

That's why midsized plunge routers, those in the 2-hp class, appeal to me. They have enough muscle to tackle most tasks, yet they're relatively easy to handle. Unlike a fixed-base router, a plunge router lets you lower the spinning bit straight down into a workpiece. That makes it a good choice for those who cut a lot of stopped grooves, dados and mortises.

So with that in mind, I gathered all eight of the midsized plunge routers currently available: the Black & Decker RP400, Bosch 1613AEVS, DeWalt DW621, Festool (formerly Festo) OF 2000 E-Plus, Makita RP1101, Porter-Cable 7529, Craftsman 27510 and Skil 1845-02. And with the routers side by side in the *Fine Woodworking* shop, I was able to give each one a close look and a test drive.

Several of these routers are new in one form or another. For example, the Makita is new to the plunge-router market. Another, the Bosch 1613AEVS, is just now replacing an earlier model, the 1613EVS (it has several new features, including a larger base opening and an upgraded depth adjuster). And Festool, a longtime German tool manufacturer, has recently started to market its plunge router, along with a number of other products, to the U.S. market.

By the way, I had some doubts about including the Festool. With an 1,800-watt motor, it has 15 amps and about 2½ hp, putting it in a class by itself. And there's nothing midrange about the \$636 price tag. But because the router is new to the U.S. market, I thought this was a good opportunity to check it out.

One other point. Plunge routers sometimes are used in router tables. They work in a table but rarely better than a fixed-base router. A plunge router is designed to plunge down into a workpiece, not up into one. So because a plunge router isn't the best choice for a router table, I didn't use any of the routers in one.

Taking a test drive

I gave each router a thorough going-over, checking to see how fussy it was to turn the machine on and off, to change router bits and to set the plunge depth. I looked at how much finger contortion it took to set the switch locks and the plunge-lock mechanisms. I also wanted to see how well the multiple-stop systems worked. I checked the handles for comfort, then measured each router for noise, vibration and collet runout. And after all of that, I tested each router by running it through a sheet of plywood.

It's important to note, though, that a number of the evaluations are purely subjective. What feels right to me, based on the size, shape and flexibility of my hands, might not seem quite as good to you. So before going out and buying one of these routers, it makes sense to get your own hands on it and try the various controls.

Turning on the router shouldn't be a turn-off

Most routers in this group are turned on simply by squeezing a trigger switch built into one of the handles. The trigger switches are easy to work. But as a precaution, the DeWalt and Porter-Cable tools require you to first depress a safety switch before the trigger can be squeezed. Releasing the trigger shuts off the machine.

A safety switch makes sense, but it should be easy to use. On the DeWalt, the safety switch is pressed with the thumb, then the trig-



Noise test. To record the sound level of each router, a decibel meter was placed in a tripod and placed in about the same height your ears would be if you were using the router.



Runout check. A dial indicator measured runout on each of the routers.



Good vibrations. With the router running, a dial indicator was used to measure the vibration at the handles.

SWITCH LOCKS

A finger-friendly switch lock. The Black & Decker switch lock has a big button that the thumb easily finds.



No pain, no gain. It takes a mighty push from the end of a forefinger to engage the switch lock on the Craftsman router.



ger must be squeezed to fire up the router, I found the procedure slightly awkward. To start the Porter-Cable, you must push down the safety switch with your forefinger, then squeeze the trigger. Perhaps my hands are clumsy, but I found the action annoying.

The two machines that don't employ a trigger switch are the Makita, which has a top-mounted toggle switch, and the Festool, which has a switch that is turned on and off with a flick of the thumb. When it came to turning the Makita on or off, I was not enthusiastic about having to remove one hand from the router to reach the switch on the top. Granted, this is less of concern with a plunge router, because the bit should be above the workpiece at

both the beginning and end of the cut, but I always feel more comfortable with both of my hands on a router when it's running.

A switch lock is handy—When making a lengthy cut, I like to lock the on/off switch in the on position. Because the Makita and Festool have toggle switches, they stay on until you shut them off. But the other routers all have some means to lock the spring-loaded switch in the on position.

The Black & Decker, Bosch and Skil use the same system. To lock on these routers, squeeze the trigger and press your thumb against a button on the inside of the handle. The Black & Decker



BLACK & DECKER RP400

(800) 544-6986

This machine features comfortable handles, a lock-on switch that's effortless and a bargain-basement price. But it accepts only ¼-in.-shank bits and has no micro-adjust or multiple-stop systems. Consider it if you run a router only occasionally.

Street price	\$99
Amperage	10
Horsepower	2
Collet size	¼ in.
Dust port	Yes
Size of opening in base (min.)	2½ in.
Maximum plunge depth	2¼ in.
Runout	0.0030 in.
No-load noise level	92 dB
Vibration rating at handles	Good

BOSCH 1613AEVS

(877) 267-2499

The Bosch has an easy-to-activate on/off switch, a switch lock that's almost effortless, a nice micro-adjustment knob and a simple multiple-stop system. Optional collets are available for ⅜-in.- and 8mm-shank bits. The machine did relatively well in the noise and vibration tests.

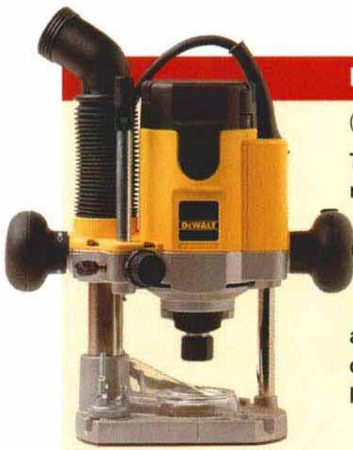


Street price	\$199.99
Amperage	12
Horsepower	2
Collet size	¼ in., ½ in. (⅜ in. and 8mm optional)
Dust port	Yes
Size of opening in base (min.)	2 in.
Maximum plunge depth	2¾ in.
Runout	0.0022 in.
No-load noise level	90 dB
Vibration rating at handles	Very good

DEWALT DW621

(800) 433-9258

The DeWalt has a plunge lock that releases with a simple turn of the wrist. The machine's depth-of-cut adjustment is better than that on most of the other routers. The micro-adjustment knob works well, and the router had the least amount of collet runout. However, the switch lock is awkward to use.

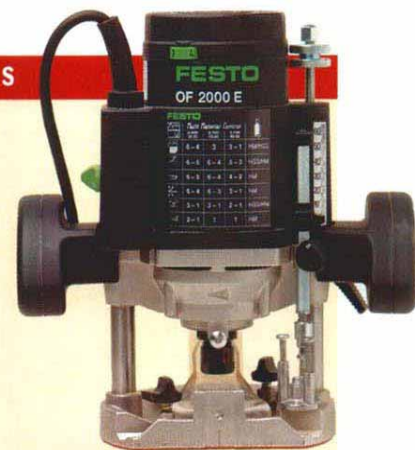


Street price	\$199.99
Amperage	10
Horsepower	2
Collet size	¼ in., ½ in.
Dust port	Yes
Size of opening in base (min.)	2⅞ in.
Maximum plunge depth	2⅞ in.
Runout	0.0014 in.
No-load noise level	95 dB
Vibration rating at handles	Very good

FESTOOL OF 2000 E-PLUS

(888) 463-3786

The Festool (formerly Festo) has the biggest horsepower motor among the bunch and the best depth gauge. It has a hefty feel, with lots of metal, but it's noisy. The router comes with a three-year warranty and a hefty price tag. It is available in 220 volt only.



Street price	\$636
Amperage	15
Horsepower	2.41
Collet size	8mm, ¼ in., ½ in. (10mm and 12mm optional)
Dust port	Yes
Size of opening in base (min.)	2⅞ in.
Maximum plunge depth	2¼ in.
Runout	0.0035 in.
No-load noise level	98 dB
Vibration rating at handles	Good

switch lock engaged almost effortlessly, and the Bosch worked almost as easily. But to push the recessed button on the Skil, my thumb had to do some uncomfortable gymnastics.

The Craftsman also was a challenge to lock. You're supposed to squeeze the trigger and then depress the locking button on the front of the handle. But it was a chore to push the locking button all the way—and downright painful on my forefinger.

The DeWalt and Porter-Cable switch locks worked okay, although it took some practice and concentration on my part to get the locking procedure down pat.

Bit changes made easy

The Black & Decker, Bosch, DeWalt, Festool, Porter-Cable and Skil all use a spring-loaded spindle-lock system to change bits. One hand engages the spindle lock, and the other hand turns the collet nut with a wrench. The spindle lock immediately disengages when your hand is removed from the lock. All of the routers using this system worked just fine.

But I liked the Craftsman system a bit more. Pushing a button on the housing locks the spindle, allowing you to use both hands: one to hold the router securely and one to turn the wrench.

The Makita employs a two-wrench system: One anchors the spindle, and the other turns the collet. Over the years I've changed a lot of bits using this method, and I've never found it user-friendly. So I was pleased to discover that the Makita worked rather well because there's plenty of access room on the side of the housing.

Setting the depth of cut shouldn't be a chore

Each of these routers can be set to a predetermined cutting depth. Mounted to the router, behind a sliding shaft, is a scale with graduations in inches or millimeters, or both. Using the scale as a guide, the shaft is adjusted to establish the depth of cut, then the shaft is locked in place. The end of the shaft butts against a stop in

SPINDLE LOCKS



Lock and load. Most of the routers use a spring-loaded spindle lock, which makes bit-changing a one-wrench job.



Two hands are better than one. With the Craftsman machine, pushing a button on the housing locks the collet in place. That way, one hand can hold the router while the other turns the collet with a wrench.

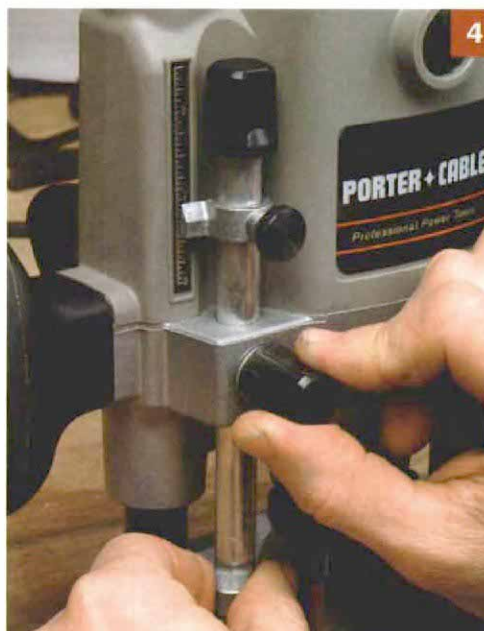
FOUR STEPS TO SETTING THE DEPTH OF CUT

Introduce the bit to the workpiece.
With the bit installed in the router, lower the housing until the bit just touches the workpiece. Secure the housing with the plunge lock.



Lower the shaft.
Slide down the shaft until it butts against the lowest stop on the turret, then tighten the knob to lock the shaft.

Zero-out the tab.
The shaft includes a tab that can slide up and down. After sliding the tab to the zero mark on the scale, turn the knob to secure the tab.



Set the depth of cut.
Loosen the shaft knob and raise the shaft until the tab aligns with the desired depth of cut on the scale. Tighten the shaft in place. Now release the plunge lock, start the router and lower the housing to start cutting. When the shaft butts against the stop, you'll be at the exact depth you want.

the base of the router, preventing the housing from lowering beyond the set depth.

To make it easier to set the depth of cut, the Black & Decker, Bosch, Festool, Makita, Porter-Cable (see above) and Craftsman routers are equipped with a tab that slides up and down on the shaft to "zero out" the shaft. The DeWalt employs a knob to do the same thing. The Skil has no such component.

None of these adjustment systems can be mistaken for precision instruments, but the Festool is an improvement over the others, with machined parts that fit together with a minimum of play. One caveat, though: The Festool scale reads in millimeters only.

Except for the Black & Decker, each of these routers has a micro-adjustment feature. This system complements the depth adjustments, allowing you to fine-tune the setting. Of the bunch, the

Bosch micro-adjust worked most effectively, with the Festool and DeWalt also featuring friendly systems. They're the only routers that immediately provide micro-adjustment once the housing has been plunged. The others required a lot of knob-turning before any fine adjustment could begin.

Plunge lock should be easy to use and within reach—Except for the DeWalt and Craftsman machines, the routers have a spring-loaded lever that locks the plunge mechanism. Press the lever with your thumb, then plunge the router into the work. Remove your thumb, and the lever snaps back into position to relock the housing. To fully lock the housing, the back of the lever needs an extra push with your thumb.

Among the routers with a locking lever, I favored the Makita. It



MAKITA RP1101

(800) 462-5482

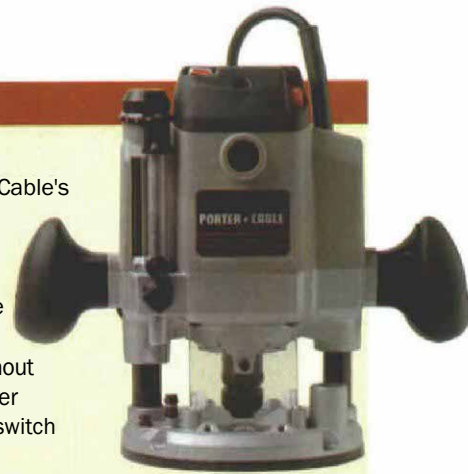
The Makita has an easy-to-release plunge lock, the lowest noise level (tied with Porter-Cable) and lots of metal. However, it has a small opening in the base (a base with a larger opening is optional), no dust port, and the depth gauge is difficult to read.

Street price	\$259 (estimate at press time)
Amperage	11
Horsepower	2¾
Collet size	¼ in., ½ in.
Dust port	No
Size of opening in base (min.)	1¼ in., 2½ in. (optional)
Maximum plunge depth	2¾ in.
Runout	0.0015 in.
No-load noise level	91 dB
Vibration rating at handles	Good

PORTER-CABLE 7529

(800) 368-1487

A large opening in the Porter-Cable's base makes for easier bit changes. It has a second on/off switch on top of the housing, low vibration and the lowest noise level (tied with Makita). On the downside, runout is higher than most of the other routers used, and the on/off switch takes some getting used to.



Street price	\$205
Amperage	12
Horsepower	2
Collet size	¼ in., ⅜ in. (optional) and ½ in.
Dust port	Yes
Size of opening in base (min.)	3½ in.
Maximum plunge depth	2½ in.
Runout	0.0050 in.
No-load noise level	91 dB
Vibration rating at handles	Very good

was easy to keep my hands in position on the handles while reaching with my thumb to activate the lever. Close behind was the Bosch, which was almost as easy to use. The Porter-Cable worked okay, but I had to reposition my hand slightly to reach the lever.

The DeWalt system gives your thumbs a rest because the lock is built into one of the handles. Twist the handle about one-eighth turn one way, and it unlocks; twist the other way, and it locks.

The Craftsman takes an opposite approach. The plunge mechanism is normally in the unlocked position. After plunging the router, squeeze a trigger on one of the handles to lock the housing. Push a button on the same handle with your thumb, and the lock is released. It's the simplest to use, and it works very well.

All in all, I'd rate the DeWalt plunge lock as a slight favorite, with the Makita and Craftsman locks close behind. The other locking mechanisms worked without any big problems; they just required more reach to get them to work.

By the way, some plunge routers just won't plunge smoothly. The housing tends to stick during the plunge. Each of these routers had some stickiness but not enough to be a problem.

A multiple-stop system can be a time-saver

When making a deep plunge cut, it's often necessary to make the cut in several intermediate steps. With the exception of the Black & Decker and the Skil, these routers have a multiple-stop device that simplifies the process.

The stop systems on the DeWalt, Festool, Makita and Craftsman incorporate a rotating turret. The turret has either three or four steps, depending on the router, and the height of the steps is adjustable. The Bosch also has a turret, but with eight fixed steps, arranged like a circular staircase, with each step providing a ⅛ in. change in the depth of cut.

The Porter-Cable, using a somewhat different approach, has

PLUNGE LOCKS



It takes little effort to reach the plunge lock on the Makita. That means your hand doesn't have to shift position or leave the handle, so you always have maximum control of the router.



Plunge lock with a twist. The DeWalt lets you tighten or release the plunge mechanism simply by twisting the handle a fraction of a turn.



CRAFTSMAN 27510

(800) 697-3277

The on/off switch and plunge lock score high marks, and a collet lock simplifies bit changes. But the router has uncomfortable handles and a challenging switch lock, no variable speed and no dust port.

Street price	\$199.99
Amperage	12
Horsepower	2
Collet size	¼ in., ½ in.
Dust port	No
Size of opening in base (min.)	2½ in.
Maximum plunge depth	2¼ in.
Runout	0.0053 in.
No-load noise level	95 dB
Vibration rating at handles	Fair



SKIL 1845-02

(877) 754-5999

The Skil has an easy-to-activate on/off switch and a lightweight body. However, it accepts only ¼-in.-shank bits, has no multiple-stop system and is noisy. Consider it only if you run a router occasionally.

Street price	\$129
Amperage	10
Horsepower	2
Collet size	¼ in.
Dust port	No
Size of opening in base (min.)	2¾ in.
Maximum plunge depth	2 in.
Runout	0.0020 in.
No-load noise level	97 dB
Vibration rating at handles	Good

three adjustable steps mounted in the base of the router. The steps don't rotate on a turret; instead, the shaft rotates so that it can butt against each stop. It's a pretty neat way to set multiple stops, because you can use your thumb to turn the shaft while your hand remains on the handle. That way you always keep both hands on the router.

In general, all of these stop systems worked fine, although the Bosch was the simplest to use. With the Bosch, you must be able to live with the stops being in ⅛-in. increments only. But for most jobs that's not likely to be a problem.

Ergonomics and runout: important considerations

Let's face it. All routers vibrate, make a lot of noise and have a certain degree of runout (that's the amount the bit wobbles as it spins). I compared all eight routers to see which were more comfortable to use and which made the most noise. I also compared the runout.

Getting a grip—A comfortable grip on a router often translates into safer and easier cutting. But most routers don't feel all that comfortable in my mitts. So it's always a nice surprise when a router feels just right when I grip the handles.

The most comfortable router to hold was the Black & Decker, with the Skil a close second. Both tools have a han-

dle shape that conforms to my hand. So I could wrap five fingers around each handle, holding the handles comfortably, as I would an automobile steering wheel. The DeWalt, although differently shaped, also felt pretty good.

Checking handle vibration—Vibration at the handle can quickly make a router uncomfortable to use. So we devised a somewhat unconventional method, using a dial indicator, to check the routers for the shakes.

Our rock-solid 8-in. jointer served as the work surface for the test. To allow the router to vibrate easily, a thick foam pad was placed on the jointer and a steel disc was added to the top of the pad.

To run the test, each router was placed on the disc and turned on. The amount of movement was measured with a dial indicator. The test showed that all of the routers ran pretty smoothly, with little vibration at the handles. So I ended up rating them as fair, good and very good (see the specific charts).

Measuring noise levels—Using a decibel (dB) meter, each router was checked for noise at about ear level, a point 24 in. above and 12 in. in front of the machine. The Bosch, Makita and Porter-Cable all fared well here, with the Festool and Skil recording the highest levels. Keep in mind that



Fine-tune the depth of cut by turning a knob or dial. The Bosch, DeWalt and Festool allow micro-adjustments immediately after the housing has been plunged.

the decibel level is logarithmic, so an increase of just 5 decibels represents a doubling of the noise level.

Measuring runout—A dial indicator was used to measure the runout at a point 1 in. above the collet using a test pin. All of the routers did well here, although the DeWalt and Makita stood out, with runouts of only 0.0014 in. and 0.0015 in., respectively.

Making sawdust

To get a sense of how well these routers worked, I used a ½-in.-dia. bit to make ¼-in.-deep plowing cut in fir plywood. On the Black & Decker and Skil tools, I used a ¼-in.-shank bit (the only size they accept). The other routers were equipped with a ½-in.-shank bit. The procedure was simple but well short of scientific, making the results entirely subjective.

With the router butting against a straightedge and the speed setting at its maximum, I plunged the bit into the plywood, then cut about a 3-ft-long groove before raising the bit to complete the cut. I did this three times with each router, doing my best to maintain the same feed rate for all of the cuts.

After all of the dust had settled, I was pleased to find that not one of the routers had bogged down. Granted, this wasn't an extreme test, but it gave me a sense that these midsized machines would handle most of my cutting needs without crying "uncle" right from the start.

Choosing a favorite

All of these routers did well in at least one category. They're tough little machines, and they all did what they were supposed to do, although not always as easily as I'd have liked.

If price is a consideration, and if you need a plunge router for only a few hours of service each month, the Black & Decker or Skil just might serve your needs. Remember, though, they accept only ¼-in.-shank bits. And they don't have multiple-stop systems. Of the two, I'd lean toward the Black & Decker. It doesn't have a micro-adjustment knob. But it has a dust port and better depth-of-cut adjustment. And it ran quieter.

I particularly liked the on/off switch on the Craftsman router. And the plunge lock and collet-lock systems worked well. But compared to most of the other routers, it was uncomfortable to hold, and engaging the switch lock was a big-time pain. Also, the router lacks a dust port and variable-speed feature.

The Festool, Makita and Porter-Cable tested okay. If my choices were limited to these three, I'd go with the Porter-Cable.

The Festool is a rugged-looking tool that leads this group in both amperage and horsepower. And it offers the best warranty—three-year parts and labor if their warranty card is mailed back to them. (One year is the standard among the others.) But for me, it was not an ergonomic all-star. And with a price in the stratosphere, you'd want to be convinced it could pay for itself in the long run.

The Makita is a nicely made machine that ran pretty quietly and had little runout. But the depth-of-cut adjustment was difficult to read with any accuracy. And the opening in the base is too small to accept even a ⅜-in. bearing-guided rabbeting bit, although you can order a bigger base from Makita.

The Porter-Cable is the only router here with an electric brake, a device that automatically brings the motor to a quick stop. And it scored best on the vibration test. The generously sized opening on

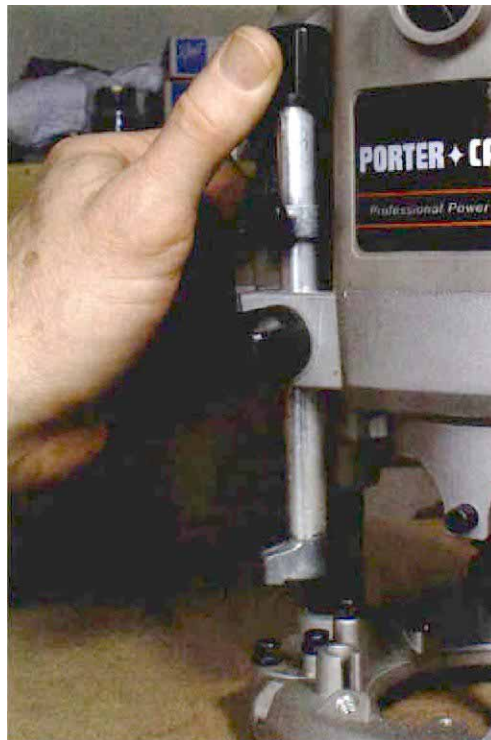
MULTIPLE STOPS



Three-step turret stop. The Festool has a turret stop with three adjustable steps.



Stepped stops. The Bosch turret, with eight equally spaced steps, works with a minimum of fuss.



All thumbs. Instead of a turning a turret to establish a new step, the Porter-Cable lets you change steps by rotating the top of the depth-gauge shaft with your thumb, so your hand stays on the handle.

the base is the biggest of the group. However, after the housing had been plunged, I didn't relish all of the knob-turning that it took to reach the point where the micro-adjustment begins.

The DeWalt is an excellent machine, scoring high in many of the tests, so it's a close second to my top choice. It has one of the better depth-of-cut adjustments, and the plunge lock is, I think, the best of the bunch.

But I'd say the Bosch stands out as the one plunge router that best meets my overall needs. While not at the top in every test, it always scored high. I especially liked the micro-adjustment knob and multiple-stop system. Also, the Bosch was relatively quiet, a big plus for me. It felt right at home in my hands as I made each of the test cuts with little effort. □

Tom Begnal is an associate editor.

ERRATA

Router noise levels—In the review of midsized plunge routers (*FWW*#149, pp. 46-53), a reference was made to the Makita and Porter-Cable machines tying for lowest noise levels. Actually, the Bosch is the least noisy of the routers tested, as indicated in the chart.