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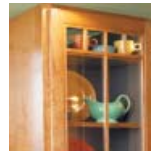
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*Workbench* Tool Test:

July 2003

# Mortising Machines



Benchtop mortising machines are more affordable than ever. But can these mini-sized machines handle the full-size job of cutting mortises? We tested 8 popular models to find out.

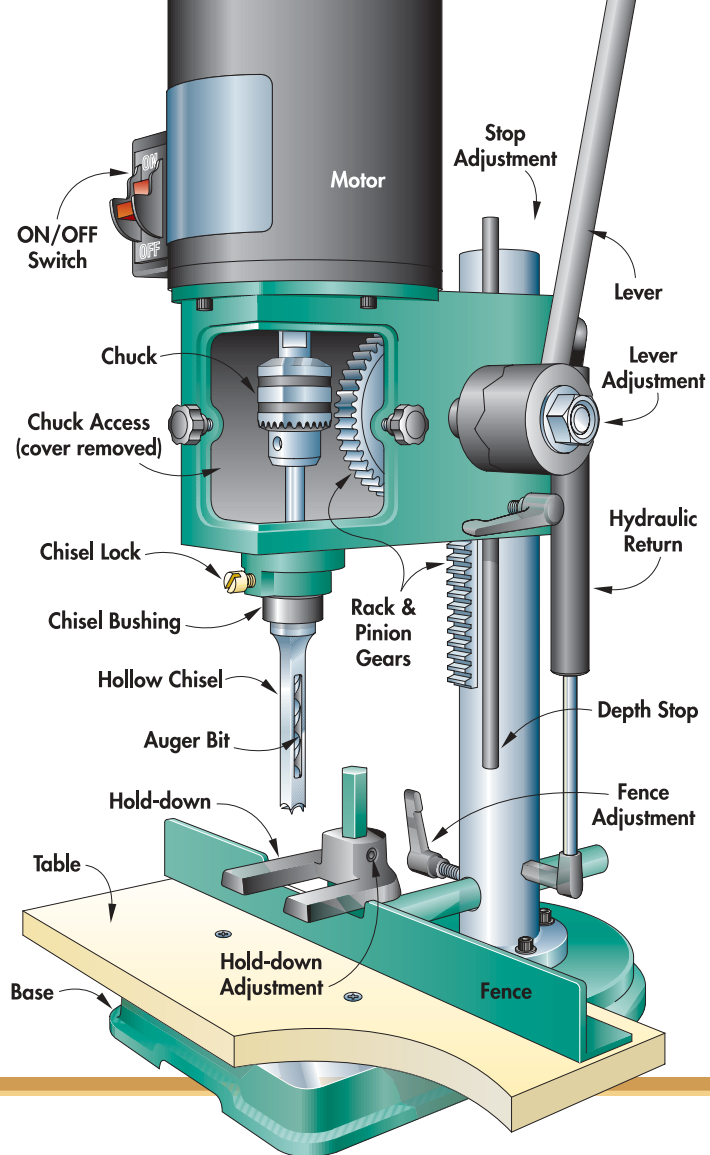
## Eight Popular Models Square Off!

A mortise and tenon joint is one of the more challenging joints a woodworker can aspire to. That's largely due to the formidable task of cutting an accurate mortise. Benchtop mortising machines (illustrated at right) have the singular purpose of performing that task.

The difficulty of that job becomes apparent when you consider the mechanics of machine mortising. A special auger bit nests inside of a four-sided, hollow chisel. The auger bit bores a hole like any other drill bit. But following just behind the point of the auger bit are the four cutting edges of the hollow chisel. Their job is to remove the stock around the hole and render a round hole square. If you imagine making four simultaneous, full-depth cuts with 1/2" chisels, you get a better sense of what these tools are expected to do.

Our testing of these tools revealed some surprising truths. Among them are that horsepower and bit speed are secondary to precise tolerances and smooth operation when it comes to how these tools perform. (See the Sidebar on page 4 for more on this). We also found that many of these tools required a "break-in" period before they realized their full potential.

Our testing procedures are explained in more detail below, and the results of those tests can be seen in the table on page 8 along with our final recommendations. Our impressions of the individual tools and their respective strengths and weaknesses are on the pages in between.



## HOW WE TESTED

For a mortising machine to cut accurately and without the chisel binding in the workpiece, the fence and table must be flat and square to one another. Our first step, then, was to measure each of those factors (see Photos below). Furthermore, the head must travel in a perfectly straight line, which we tested with a dial caliper and a machined steel rod (see Photo on page 1). The acid test, though, was to cut dozens of mortises with each machine to determine how those factors influenced performance and to see how well the machines maintained an exact setup.



▲ Tables and fences were all inspected for flatness using a straightedge and feeler gauge.



▲ The angle between each table and fence was checked with squares and a feeler gauge.

▼ When cutting mortises, accuracy, user effort, ease of setup, and hold-down effectiveness were all considered in each tool's final report card.



# Delta Industrial 14-651



Delta's model 14-651 mortising machine set the standard for this category by delivering both top-notch performance and user-friendly features. So many other tools in this test seemed to require us to compromise on one or the other. (As an aside, it's our considered opinion that performance far outweighs bells and whistles.) It's another huge feather in Delta's cap that this all-inclusive mortiser is also available at a very reasonable price.

On the subject of performance, there was only one other tool in this test that cut as effortlessly as this one (the Woodtek 1-hp machine). Frankly, we were surprised by how much effort many of these tools required — there seemed little benefit to using them at all. And while that did cause some disappointment, it also resulted

in us having a real appreciation for a tool such as this one that indeed made mortising seem like a viable operation.

The excellent performance of this machine can no doubt be attributed entirely to its outstanding construction. The fence and table are both machined dead flat (the cast table is automatically superior to the MDF tables common on other machines). And our head travel test revealed only the most negligible variance.

Besides its superior performance and construction, this tool also boasts the best set-up and convenience features (a few of which are shown in the *Photos* below).

Most notable among those features is a rack-and-pinion, micro-adjustable fence. This is one of only two machines in the test with such a feature (the other being the Fisch) and Delta's design is far more accurate and easier to use.

## At a Glance:

<b>Price:</b>	\$237
<b>Motor:</b>	1/2-hp
<b>Spindle Speed:</b>	1,725
<b>Chuck Capacity:</b>	3/8"
<b>Chisel Capacity:</b>	1/2"
<b>Max. Stroke:</b>	5"
<b>Head Space:</b>	9 3/8"
<b>Throat Space:</b>	3 3/4"
<b>Warranty:</b>	2 years

**Virtues:** Superior performance and outstanding features.

**Vices:** None.

**Verdict:** The undisputed best choice on all accounts.

[www.DeltaWoodworking.com](http://www.DeltaWoodworking.com)  
800-438-2486

Interestingly enough, this is the last tool we tested from this group. That seemed quite appropriate when we recognized that, had we been able to harvest the best characteristics of all the other machines and blend them into one, this is the tool that would've resulted. The real news, though, is that all this can be had for a considerably lower price than you might expect.



▲ Delta's 14-651 has all the best features, including a pinion-type lever that adjusts quickly and without tools.

► Securing the chisel and tightening the chuck are done with the same tool on this mortising machine.



▲ The micro-adjustable fence and tool-free settings make setup fast, accurate, and secure. Installing the riser block gives this machine the largest throat capacity in the bunch.

## At a Glance:

<b>Price:</b>	\$350
<b>Motor:</b>	1-hp
<b>Spindle Speed:</b>	1,725
<b>Chuck Capacity:</b>	1/2"
<b>Chisel Capacity:</b>	1"
<b>Max. Stroke:</b>	5 1/4"
<b>Head Space:</b>	9"
<b>Throat Space:</b>	3 3/4"
<b>Warranty:</b>	1 year

**Virtues:** Top-flight performance and large capacity.

**Vices:** Lacks features.

**Verdict:** A bit pricey, but the performance is there.

[www.Woodworker.com](http://www.Woodworker.com)  
800-645-9292



▲ The two-position, screw-secured lever of the Woodtek lacks the convenience of the pinion-type levers.

# Woodtek 900-881

Woodtek doesn't build a fancy mortising machine, but it certainly came through with a capable one in this 1-hp model. And we'll take capable over fancy any day when it comes to what makes a valuable mortiser.

What impressed us most about the Woodtek is how it made cutting a mortise seem almost effortless. In fact, we found ourselves double-checking subsequent machines to see if the difficulty we were having relative to the Woodtek was due to an improper setup on our part.

Turns out the Woodtek is just that much better than most other machines. Sharp chisels, dull chisels, cheap chisels, expensive chisels — it just didn't seem to matter. This 1-hp behemoth powered through mortises with equal, and remarkable, ease. But the additional horsepower doesn't fully explain the superior performance, especially considering that the only other machine that matched this one in ease of cutting was the 1/2-hp Delta Industrial.

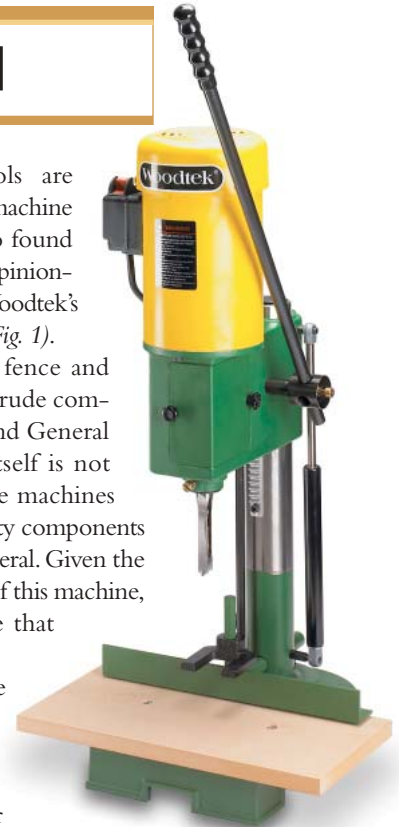
What this tool lacks are the user-friendly features that can be found on many other machines. For instance, every adjustment requires a tool of some sort. In fact, all told,

three different tools are needed to setup this machine from scratch. We also found that we preferred the pinion-adjusting lever over Woodtek's two-position lever (Fig. 1).

Additionally, the fence and table are somewhat crude compared to the Delta and General machines. This in itself is not that bad. Most of the machines lacked the high-quality components of the Delta and General. Given the relatively high price of this machine, however, we did see that as a disadvantage.

But again, we have to defer to this benchtop mortiser's flawless performance and consider it a good choice for any home shop.

The burning question is whether you can justify the higher price of this somewhat plain machine versus the moderate price of the Delta Industrial mortiser. Our answer to that is that the Woodtek's performance is certainly worth the price, but we still can't help but wonder why no bells and whistles.



## RPM & Horsepower



Power and speed, while generally favorable in cutting tools, did not affect mortising machines in the manner we expected.

Horsepower, for instance, had little bearing on how effectively these tools cut. Inadequate horsepower would result in the bit stalling, which we saw only rarely. Also, if horsepower were a deciding factor, we wouldn't expect to see the 1/2-hp Delta match the performance of the 1-hp Woodtek.

As to bit speed, conventional wisdom says that faster is better. The theory is that a faster spinning bit will cut cleaner and clear faster, leaving less work for the hollow chisel. Our experience ran contrary to that. We found that the slower turning machines cut and cleared just fine and were less susceptible to the burning that can scar a workpiece and shorten the bit life.

# General International



General's model 75-050 mortiser is a paragon of user-friendly design, solid construction, and top-rate performance — following a brief “break-in” period, that is.

In fact, this was the first of several machines we saw that became increasingly easier to use with each subsequent mortise. At first, the herculean effort it took to cut a mortise with this machine caused us some concern. But as testing progressed, the machine

became much more fluid and required us to lean into it with much less effort. After about a dozen mortises, we felt like the performance and the required operator effort had caught up to the outstanding construction and worthwhile features of the tool.

An example of the stellar construction is this machine's cast iron, precision-machined bed, which we consider a significant advantage over a bed made from MDF. Testing showed that the bed is dead flat and perfectly square to the beefy cast iron fence. Another noteworthy feature on the bed is a scale that aids with centering the stock under the chisel and bit.

The fence, besides being sturdy and flat, has a couple of other exceptional features. First is the fact that it runs on dual guide rails, which go a long way toward ensuring it's always square and also offers two points for securing the fence once it's positioned. The face of the fence is further enhanced by two deep notches that allow the stock hold-down to be lowered much further than many of the other tools in this test (Fig. 1). That makes it possible to mortise much smaller stock without the need to shim the stock off the table.

Another big plus for this machine is its user-friendliness. This is the only machine in the group that

## At a Glance:

<b>Price:</b>	\$299
<b>Motor:</b>	1/2-hp
<b>Spindle Speed:</b>	1,720
<b>Chuck Capacity:</b>	1/2"
<b>Chisel Capacity:</b>	5/8"
<b>Max. Stroke:</b>	6"
<b>Head Space:</b>	8 1/2"
<b>Throat Space:</b>	3"
<b>Warranty:</b>	2 years

**Virtues:** Loaded with features. Above average performance.

**Vices:** Two-position lever.

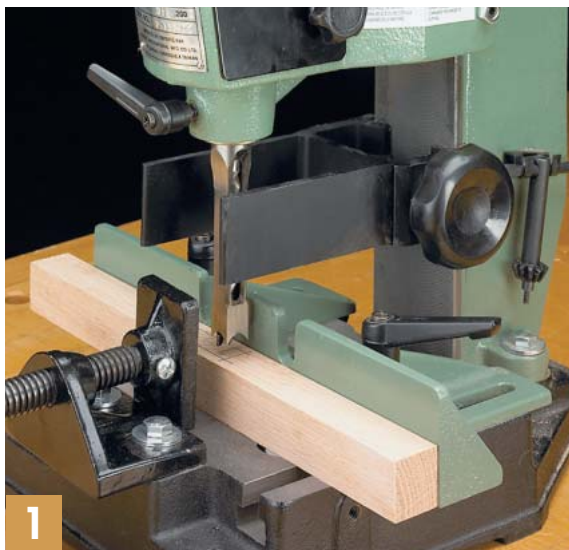
**Verdict:** Break this one in and you'll have a great machine.

[www.General.ca](http://www.General.ca)  
524-326-1161

doesn't require any tools beyond the chuck key to change the setup (Fig. 2). A unique depth stop system limits both the upward and downward travel of the head (Fig. 3). Being able to set the upward travel helps eliminate unnecessarily long pull strokes when mortising thin stock.

Our only complaint, and it's a small one, is the lever adjustment (Fig. 4). We found the pinion style to be more versatile and easier to adjust than this type.

Nonetheless, this became one of our favorite machines in the group. And even with its relatively high price tag and requisite “break-in,” we wouldn't hesitate to recommend using this mortiser in any shop.



▲ A flat table, sturdy fence, a face clamp, and a beefy hold-down offer excellent setup and stock control.



▲ The General is the only machine in the bunch with a tool-free chisel lock.



▲ General's unique stop system allows you to customize the stroke length to the job.



▲ With only two positions to choose from, this lever often isn't set at an optimum position.



## Jet JBM-5

### At a Glance:

<b>Price:</b>	\$199
<b>Motor:</b>	1/2-hp
<b>Spindle Speed:</b>	1,725
<b>Chuck Capacity:</b>	3/8"
<b>Chisel Capacity:</b>	1/2"
<b>Max. Stroke:</b>	4 3/4"
<b>Head Space:</b>	7"
<b>Throat Space:</b>	3 1/2"
<b>Warranty:</b>	2 years

**Virtues:** Solid performance, top-flight features.

**Vices:** Requires some muscle.

**Verdict:** The best mortiser you can buy for under \$200.

[www.JetTools.com](http://www.JetTools.com)  
800-274-6848

► While most stock hold-downs require a wrench to tighten, Jet built a thumb lever into their hold-down.



Although not the most inexpensive tool in this test, we are convinced that Jet's JBM-5 is the best mortising machine to be had for under \$200. Thus, we honor it with our *Top Value* award.

What really differentiates this tool from the similarly-priced and -sized mortising machines in this group are its features.

Securing the chisel requires a screwdriver and the chuck takes the usual key, but every other adjustment on this machine is tool-free (Fig. 1). We found that the fewer tools we had to keep track of in order to

change fence, depth stop, and hold-down settings, the more we enjoyed using a tool. And given the very narrow margins of performance

differences between so many of these mortising machines, it became a significant measure of our satisfaction with a tool.

Convenience notwithstanding, a mortiser is only as good as its mortises. And on that count, this is a very good machine. From the first cut, this impressed us as a solidly-built, smooth-running machine.

Nonetheless, it did require a decent amount of muscle to cut a 1/2" mortise. But like so many other machines, this one benefitted from a short "break-in" and eventually became quite easy to operate.

All in all, Jet's JBM-5 is a complete-package mortising machine with great set-up features and a very competitive price.



### At a Glance:

<b>Price:</b>	\$185
<b>Motor:</b>	3/4-hp
<b>Spindle Speed:</b>	1,725
<b>Chuck Capacity:</b>	1/2"
<b>Chisel Capacity:</b>	1/2"
<b>Max. Stroke:</b>	5"
<b>Head Space:</b>	6 5/8"
<b>Throat Space:</b>	2 3/4"
<b>Warranty:</b>	2 years

**Virtues:** A few nice features.

**Vices:** Requires enormous effort to cut 1/2" mortises.

**Verdict:** Low price, possibly an option for light use.

[www.Fisch-Tools.com](http://www.Fisch-Tools.com)  
724-663-9072

► One nice feature of the Fisch is a micro-adjustable fence. Note also the dual-column design.

At first blush, this machine has a lot of unique and promising features. Among them are a micro-adjustable fence and a twin-column design, which is supposed to give the machine improved stability and accuracy (Fig. 1).

Unfortunately, we found that cutting a 1/2" mortise with this machine demanded gargantuan effort. A thor-



ough inspection of the setup, a different (though same-sized) chisel and bit set, and more than adequate break-in time yielded only negligible improvement.

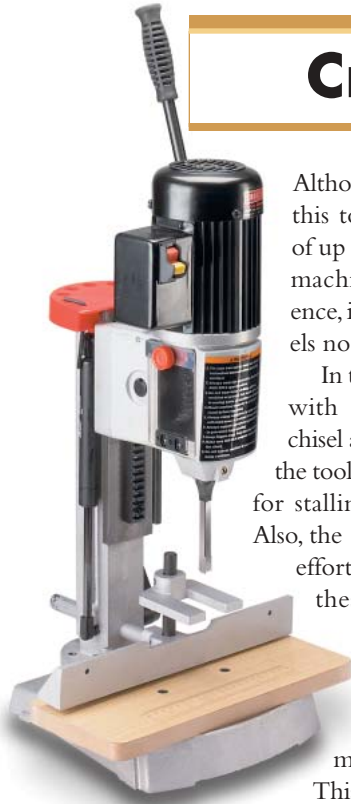
What did make this machine more usable was trading out the 1/2" mortising set for a 3/8" set. Perhaps that is enough.

Given the relatively low price of this machine and the number of agreeable features on this tool, it could make an acceptable choice for smaller mortising applications.

## Fisch BTM-99



## Craftsman 21906



Although Craftsman rates this tool with a capacity of up to  $\frac{3}{4}$ " mortises, this machine, in our experience, is best suited to chisels no larger than  $\frac{3}{8}$ ".

In testing the Craftsman with the standard  $\frac{1}{2}$ " chisel and bit set, we found the tool to have a propensity for stalling under the load. Also, the amount of operator effort necessary to make these cuts was well beyond what we considered acceptable when compared to other machines in this test.

This tool also required a fair amount of fine-tuning to remove slop between the head and the column before we were able to start mortising.

We did notice some improvement following about 10 break-in cuts and were ultimately able to mortise quite effectively with the  $\frac{3}{8}$ " chisel and bit that were included with the machine.

Clearly, we aren't able to give this tool our wholehearted recommendation, but the price is competitive and the machine does have a few worthwhile features. Among them are onboard tool storage and a scale printed on the bed (Fig 1.).



### At a Glance:

<b>Price:</b>	\$199
<b>Motor:</b>	$\frac{1}{2}$ -hp
<b>Spindle Speed:</b>	1,725
<b>Chuck Capacity:</b>	$\frac{3}{8}$ "
<b>Chisel Capacity:</b>	$\frac{3}{4}$ "
<b>Max. Stroke:</b>	$4\frac{1}{8}$ "
<b>Head Space:</b>	$7\frac{1}{4}$ "
<b>Throat Space:</b>	$3\frac{1}{2}$ "
<b>Warranty:</b>	1 year

**Virtues:** Moderate price. A few nice features.

**Vices:** Sub-par performance.

**Verdict:** Limited ability, but not out of the question for light work.

[www.Craftsman.com](http://www.Craftsman.com)  
800-549-4505

◀ Craftsman's MDF table features a printed scale that "zeroes-out" under the bit center. This aids in accurate spacing of the mortises in the workpiece.

## Bridgewood HM-11



Showing up as the last tool in the article probably doesn't look too good for the Bridgewood, which is unfortunate. It's actually not a *bad* machine. In fact, we'd characterize it as a no-frills, no-fuss mortiser that performs as well as many others. Unfortunately, we expected more in light of the price tag attached to this machine.

On the up side, this machine performs satisfactorily once you get accustomed to the higher bit speed, and it does have a couple of the features that we quickly came to

appreciate throughout our testing. First is the pinion style lever. Another is the large, removable panel that allows access to the chuck. This is one of several similarities this machine bears to both Woodtek benchtop mortisers (the 1-hp model on page 4 and the  $\frac{1}{2}$ -hp machine that can be seen on the *Workbench* website). In fact, this is virtually a twin to the smaller Woodtek machine, right down to the instruction manual.

Nonetheless, at just a few dollars less than the Delta Industrial mortiser, this one lacks the ease of operation and the substantive features that make the Delta such a bargain. For that matter, this one doesn't even come with any chisels as part of the purchase price. So factor in another \$45 to \$75 for that expense.

### At a Glance:

<b>Price:</b>	\$229
<b>Motor:</b>	$\frac{1}{2}$ -hp
<b>Spindle Speed:</b>	3,400
<b>Chuck Capacity:</b>	$\frac{3}{8}$ "
<b>Chisel Capacity:</b>	$\frac{5}{8}$ "
<b>Max. Stroke:</b>	$4\frac{3}{4}$ "
<b>Head Space:</b>	$8\frac{3}{4}$ "
<b>Throat Space:</b>	$3\frac{1}{2}$ "
<b>Warranty:</b>	1 year

**Virtues:** Adequate performance and some nice features.

**Vices:** Overpriced.

**Verdict:** Capable but costly. Look for this one on sale.

[www.WilkeMachinery.com](http://www.WilkeMachinery.com)  
717-764-5000

Ultimately, this is a capable machine that's overpriced and under-equipped. But if you should happen to find it at a deeply-discounted sale price, you'd never regret buying it.

# Final Recommendations

## Editor's Choice

### DELTA 14-651

Delta's Industrial mortising machine includes the best features, top-rate performance, and a low price that belies its premium construction. There's just no better, more complete benchtop mortiser to be had.



## Top Value

### JET JBM-5

Getting this much machine for under \$200 almost feels like stealing. But we assure you that the price *and* the performance of this machine are entirely aboveboard.



## MORTISING MACHINE RATINGS

Tool	Table Flatness	Fence Flatness	Table/Fence	Side Deflection	Front Deflection
Delta Industrial 14-651	NV	.002	NV	.002	.002
Woodtek 900-881	NV	.007	.010	.006	.004
General International 75-050 M1	NV	.002	NV	.004	.004
Jet JBM-5	NV	.003	.017	.003	.005
Fisch BTM-99	NV	.004	.014	.002	.004
Craftsman 21906	NV	.005	.019	.012	.003
Bridgewood HM-11	NV	.004	NV	.004	.006
Multico PM16	NV	NV	NV	.004	.002

Numbers indicate greatest variation in inches. NV = no measurable variation. Head travel variation indicated as front/side deflection.

## Multico's Multi-Purpose Mortiser

### At a Glance:

Price:	\$649
Motor:	3/4-hp
Spindle Speed:	3,450
Chuck Capacity:	3/8"
Chisel Capacity:	3/4"
Max. Stroke:	4 <sup>5</sup> / <sub>8</sub> "
Head Space:	6 <sup>3</sup> / <sub>8</sub> "
Throat Space:	4 <sup>1</sup> / <sub>2</sub> "
Warranty:	1 year

**Virtues:** Excellent fit and finish. Top-rate performance.

**Vices:** Very expensive.

**Verdict:** If money is no object, this is a solid investment.

[www.GarretWade.com](http://www.GarretWade.com)  
800-221-2942

In light of the premium price of Multico's PM16, we decided to consider it separately from the more moderately-priced machines in our test. This clearly isn't a tool for the masses, but we did want to offer some insight into just what \$650 could get you in a benchtop mortiser.

For starters, it will get you one of the most compact, lightweight, solidly-built mortisers available. The fit and finish of this machine are immaculate. The components, from the aluminum hold-down to the steel lever, are meticulously machined. Not surprisingly, the performance of this machine is also stellar. Plunging into mortises is fluid and effortless, so much so that the high spindle speed of this machine did not create the burning that plagues most high-speed machines.

Beyond being a superior mortiser, this machine doubles as a passable drill press when you install the drill chuck and arbor assembly that comes with it.

Nonetheless, we are a frugal bunch, so it's difficult for us to recommend a machine this costly. But for the woodworker who has it all, this would be a good choice.

