

Low-Angle Block Planes

Eight models on the market are more different than they are similar

BY CHRIS GOCHNOUR

Fifteen years ago, when I was first tooling up my shop, there were only two low-angle block planes on the market: a Stanley and a Record. In the years since then, woodworkers have been treated to a resurgence of high-quality hand tools, including a remarkable variety of low-angle block planes. But because of that diversity, making a choice can be more difficult.

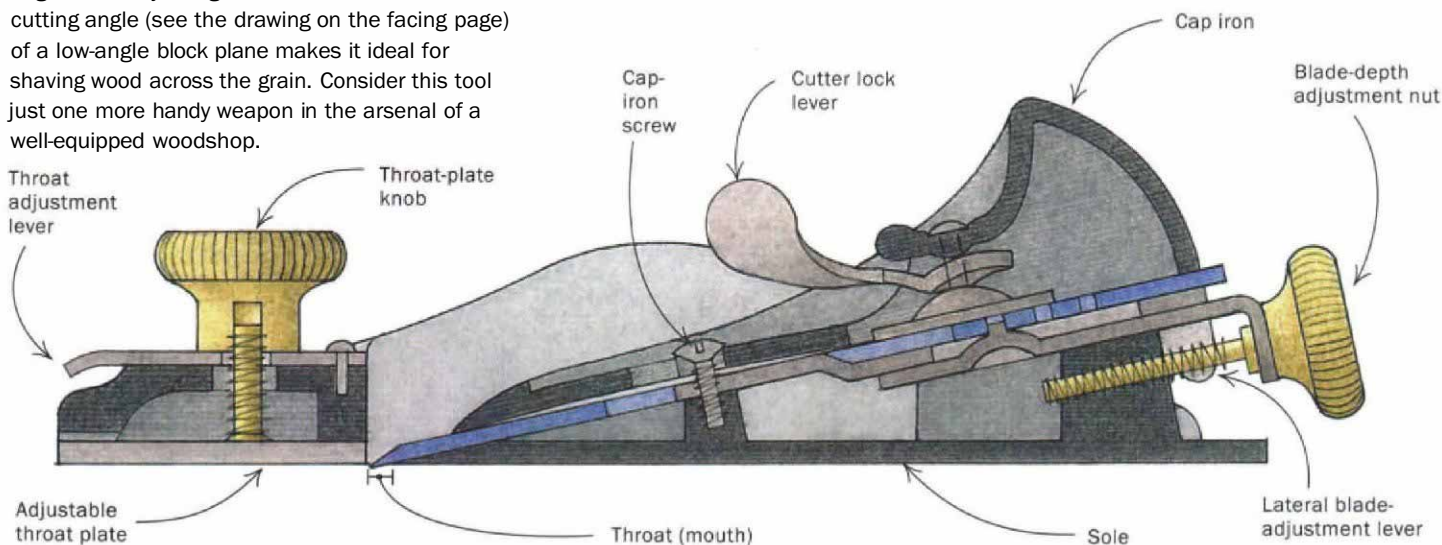
A low-angle block plane is a small, one-handed tool used for trimming and fitting, though more often than not I'm more comfortable using two hands. I often find myself reaching for this handy tool several times a day when I need to plane end grain, cross grain and miters. A block plane excels at trimming excess material from the pins and tails of through-dovetail joints; finetuning miters; perfecting the reveal on cabinet doors; cleaning up

saw marks on the ends of tabletops, shelves and panels; and softening the edges of a board. But even though a block plane performs all of those tasks extremely well, its small size limits its use in smoothing larger panels or accurately truing edges. You may also find that the low angle is problematic when planing some long-grain surfaces because the blade has a tendency to lift and pry the wood fibers, leaving a rougher surface.

A block plane is distinguished by the blade's upward-facing bevel. This contrasts with a bench plane, on which the bevel faces down. To appreciate the difference you must study the geometry of each type of plane. The standard bench plane has the blade bedded at 45°. Because the bevel faces down, changes to the bevel angle of a bench-plane blade have no impact on the cutting an-

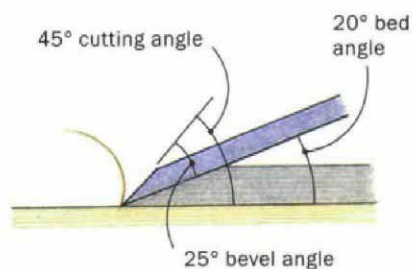
PARTS OF A LOW-ANGLE BLOCK PLANE

Most low-angle block planes are based on the original Stanley design shown below. The reduced cutting angle (see the drawing on the facing page) of a low-angle block plane makes it ideal for shaving wood across the grain. Consider this tool just one more handy weapon in the arsenal of a well-equipped woodshop.



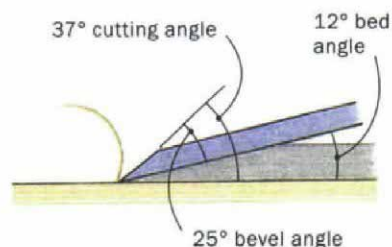
STANDARD VS. LOW-ANGLE: WHICH PLANE DO YOU NEED?

Unlike a bench plane, a block plane has the bevel of the blade facing up. Therefore, when you change the bevel angle on the blade, you change its effective cutting angle in relation to the workpiece. The low-angle block plane is a better choice for trimming end grain and cross grain, as when you true a miter joint or pare down a too-fat tenon. For other tasks that require trimming with the grain, such as chamfers on a tabletop, the low-angle design generally works better on softwoods, and the standard version is suitable for hardwoods.



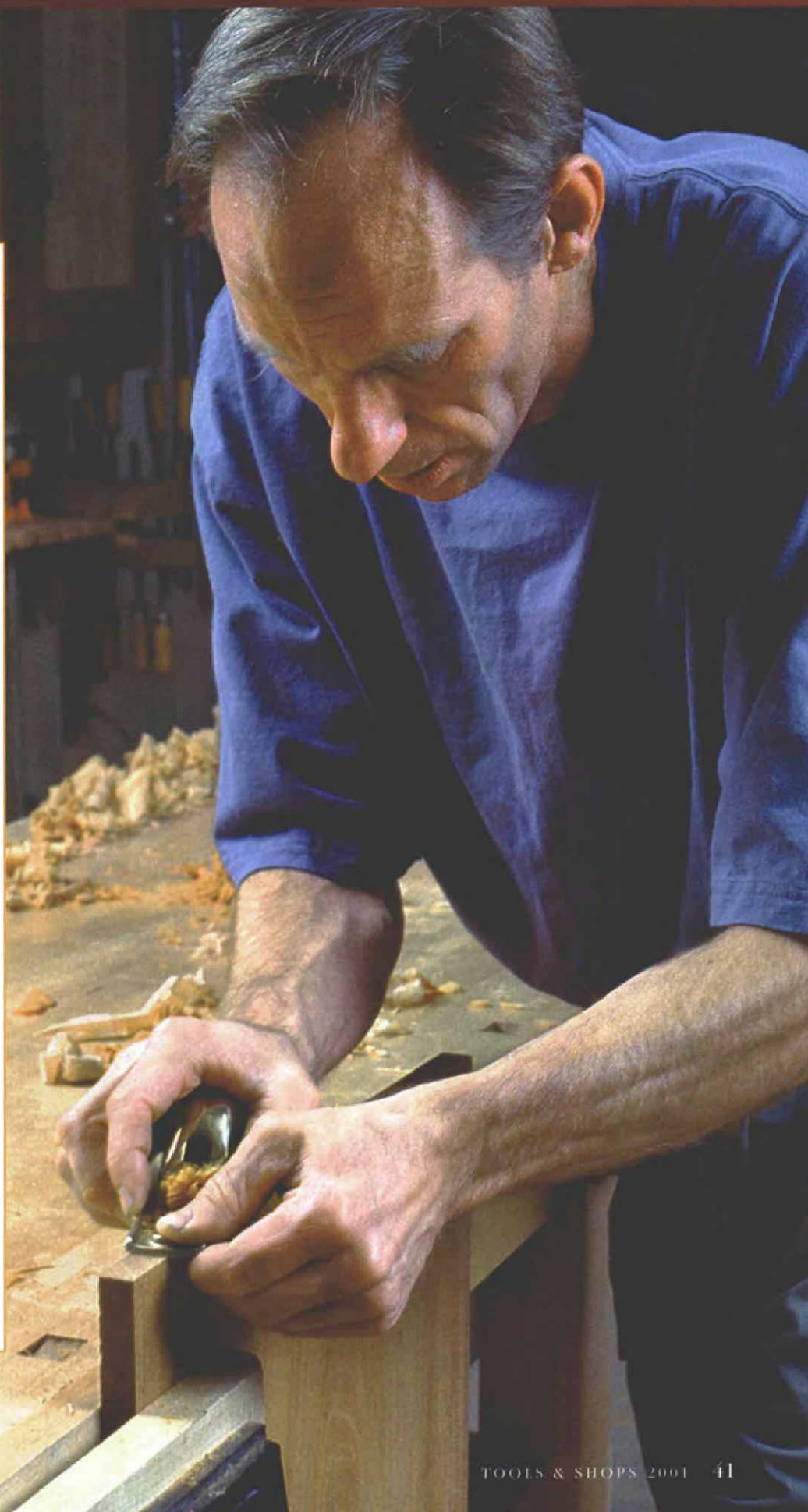
STANDARD BLOCK PLANE

A 20° bed angle and a 25° bevel angle make the effective cutting angle 45°, which is essentially the same as that of a bench plane.



LOW-ANGLE BLOCK PLANE

A 12° bed angle and a 25° bevel angle make the effective cutting angle 37°, which works better on end grain and cross grain. Gochnour recommends adding no more than a 1° microbevel to a low-angle blade.



gle of the tool. Low-angle block planes, on the other hand, have the blade bedded at 12° to 12½° and the bevel angle of the blade at 25° after sharpening (see the drawing on p. 41). The effective angle of the plane is the sum of the bed and bevel angles—37° for the block plane as opposed to 45° for a bench plane.

In addition to the low angle, a block plane has a couple of other features that enable it to work well on challenging tasks such as cutting cross grain and end grain. Because the bevel faces upward, the bed of the plane supports the blade all the way to where it pierces the throat, adding stability to the cut. Also, the angle of the blade is more closely aligned with the force of the cut. These two characteristics make a block plane less prone to chatter.

The evaluation criteria

I look for several details when selecting a low-angle block plane. Among the most important are the ergonomics, or fit and feel of the tool in the hands; the heft, or what some would call the weight or mass; and finally, the ease of setup and adjustment—including the blade depth of cut, throat (also called a mouth) and lateral blade adjustment. I judge a plane's performance and overall value based on how well it rates in all of these areas.

Because it is used frequently under challenging circumstances, such as when you must hold the tool in one hand and reach up high to trim the edge of a cabinet door, a block plane must be comfortable to hold and use. Hand sizes vary, so don't listen only to what others say or write about the tool; try one, if at all possible, before you make a purchase. Heft is also critical. Evaluate a plane to make sure it has a solid bed, a stout flat blade and a secure lever cap. The planes I use most frequently have a solid, weighty feel. The mass of a plane is important because it adds stability and balance when performing a task.

A plane's adjustment features should be convenient to access and to use. When I look at a plane, I want to see a depth adjustment that is handy, and I check for a smooth and precise movement with minimal backlash (play in the mechanism). A throat adjustment and a lateral blade adjustment can also be helpful in achieving peak performance. I open the throat for coarse shavings and close the throat to limit the size of the shavings and to minimize

STANLEY NO. 60½ LOW-ANGLE BLOCK PLANE

This is the latest version of the Stanley No. 60½ design. Features that once were patented, breakthrough advances in plane technology are nowadays often taken for granted. Genuine Stanley innovations include the adjustable throat, which functions smoothly and precisely; the endwise blade-depth adjuster, which functions effectively (even though it has a bit of backlash); and the milled depression in the sides of the body. The lever cap is easy to remove using the pivoting lock-lever.

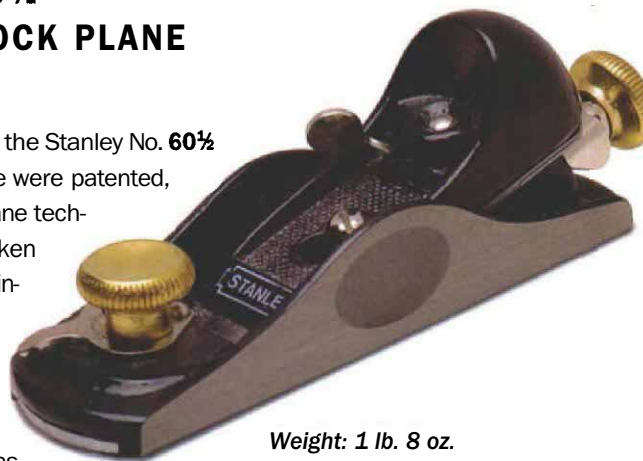
Stanley's relatively thin blade does not receive much support from its small bed. Lateral adjustment is easily accomplished using the patented lever. However, the plane I received from the factory was defective and relied on the lateral adjuster to the extreme. This defect must have occurred at the factory when the body casting was misaligned during the machining of the bed. The result was a slightly angled bed. By moving the adjuster all the way to

the right, the blade could be made parallel with the sole and did work properly. I am confident that most dealers and Stanley would replace a plane with this defect, if asked.

The Stanley required the most attention right out of the box, but in 30 minutes it was ready to go. The sole was out about 0.004 in., toe to heel, and it took 15 minutes to lap it flat. Even if it had been flat, at the factory they coat the cast iron with a rust-preventing varnish finish that I prefer to remove. After tuning the blade, the plane was in service.

With a sharp blade, the plane performed the basics

nicely, but it showed some weaknesses on end grain, miter cuts and dense hardwoods, where it was susceptible to chatter due to its small bed and thin blade. As the least expensive tool reviewed, it is only reasonable to expect some shortcomings. Still, this tool has a lot of great features and appeal for a \$40 price tag. For a trim carpenter working primarily in softwoods or the occasional user who has a limited budget, this may be just the tool.



Weight: 1 lb. 8 oz.

Blade width: 1½ in.

Price: \$42

Source: Various catalogs



The granddaddy of them all. The Stanley No. 60½, with the adjustable throat and the cutter-adjustment functions, is the benchmark design that others copied or improved upon.

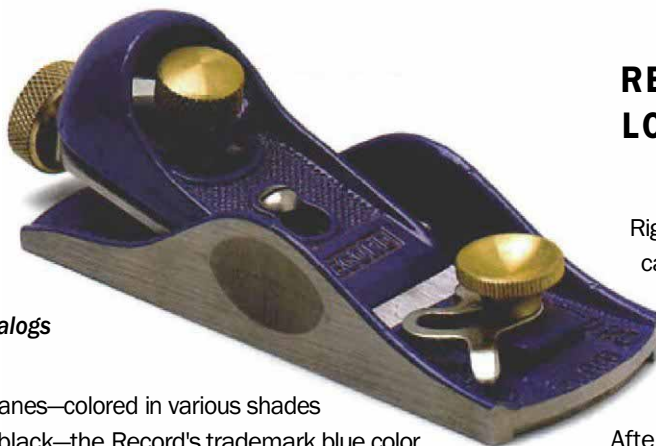
Weight: 1 lb. 8 oz.

Blade width: 1½ in.

Price: \$50

Source: Various catalogs

In a sea of handplanes—colored in various shades of gray, gold and black—the Record's trademark blue color is always easy to spot. The plane has a wide blade and body that can do a lot of work but may tire out the user's hand. The adjustable throat and depth-of-cut adjuster are similar to those on the Stanley. However, the Record had the most backlash of all of the planes reviewed—more than one-and-a-half full turns. The lever cap is tensioned by a knurled knob that is awkward and difficult to grasp because of its location. Like its cousin the Stanley, the Record has a thin blade and a small bed.



RECORD NO. 60½ LOW-ANGLE BLOCK PLANE

Right out of the box (plastic sleeve, in this case), I first noticed how sharp the edges were on the castings and had to file them down. The adjustable throat plate was bowed with a 0.002-in.-high spot in the middle. Lapping corrected the problem. After preparing the blade, I put the tool to work.

The Record performed similarly to the Stanley, under moderate conditions, but balked under the more demanding tests. Adjustments during use were a bit trying due to the excessive backlash and hard-to-get-to lever-cap screw.

I agree with the comments of other woodworkers who reviewed this plane in our trial tests. They called the Record "a good value for an entry-level plane," and said, "its performance and value are consistent with its price." All in all, it's a reasonable tool for the money.

VERITAS LOW-ANGLE BLOCK PLANE

The designers of this tool broke all of the old molds and started from scratch to make a unique, no-nonsense, purely functional tool. The unorthodox grip—three circular depressions milled into each side of the body—fits comfortably in the hand, and the wide body enables the tool to cover a lot of ground.

One of the features unique to this tool is that two setscrews near the plane's throat can be used to center the blade precisely. All lateral adjustment occurs at the rear of the blade. Lateral adjustment and depth of cut are

both produced using one knob, much like vintage Norris planes, and the Veritas had the least amount of backlash of the planes we reviewed. I found the lateral and depth adjustments to be extremely precise, tight and responsive. The adjustable throat functions smoothly. Simply loosen the knurled knob to open and close the throat.

The body is made of ductile cast iron, which makes the tool durable and



Weight: 1 lb. 12 oz.

Blade width: 1½ in.

Price: \$85

Source: (800) 871-8158

Lateral and depth-of-cut adjustments are made with one knob. All adjustments are made at the back of the blade. Setscrews on both sides of the body center the blade at the throat. The large machined bed supports the blade fully, reducing chatter.



stable. The ¾-in.-thick blade is seated securely on a large, accurately machined bed. The blade is made of A2 steel, an alloy that is reputed to take a keen edge and hold it longer. In our tests the blade held up well, but it was not noticeably superior.

The Veritas was nearly ready to use right out of the box. The sole required minimal lapping, and the blade needed to be slightly rehoned for my use. Among my review group, the Veritas was lauded hands-down as the best value, dollar-for-dollar, on the market.

tearout. A plane with a lateral blade adjustment can make up for a blade that has been sharpened out of square, and I'll readily admit to that fallibility.

An organized review process

I have always been skeptical of tool reviews that are entirely dependent on one person's opinion. To broaden the scope of this review, I invited a diverse group of hobbyists, professional cabinetmakers, tool collectors and a violin maker to my shop and asked them to evaluate each plane. Out of the box, I first used feeler gauges and a straightedge to check the flatness of each plane's sole and the squareness of each blade. I also sharpened each blade before we put the planes to work.

I wanted a consistent and thorough review, so I set up four workstations, where we could evaluate each plane's effectiveness under different applications. One workstation was set up for planing white oak and mahogany end grain. Another workstation was used for fine-tuning the mitered border of a tabletop. On the third workstation, we trimmed the top of a cabinet door, where the end grain of the stile meets the long grain of the rail. At the fourth workstation, we planed the long-grained edge of a board.

Each reviewer was given an evaluation sheet and was asked to rate and comment on each plane's fit and feel, heft, ease of setup and adjustment and the relative val-

LIE-NIELSEN LOW-ANGLE BRONZE BLOCK PLANE

This small gem of a plane is another quality product from Lie-Nielsen. It was the smallest plane reviewed, but it had plenty of punch. The plane is made from cast bronze, which apart from looking nice and feeling good in the hand, adds weight to the tool, enhancing its performance.

This plane has a sizable, precisely machined bed that supports a thick blade. The bed mass and blade thickness help eliminate chatter. The blade is further stabilized by a notched lever cap that is secured to the body with a steel cross pin and a tensioning wheel. Setup and adjustment are



Weight: 1 lb.

Blade width: 1¼ in.

Price: \$95

Source: (800) 327-2520

easy, but the plane has no throat adjustment. Except for honing the blade, the tool was ready to go right out of the box.

This plane's solid construction resulted in a solid performance with each application. Depending on the type of work you do, the plane's size can be an advantage or a disadvantage. It fits comfortably into the palm of a hand, making one-handed use a breeze. Two-handed planing is trickier because of the small size and the absence of a front knob. This plane will excel in situations where small, detailed work is required. But for more demanding tasks, some people may prefer a larger tool.



Its diminutive size does not diminish performance. This Lie-Nielsen bronze plane is the smallest of the bunch, but it worked well in a series of tests.

LIE-NIELSEN LOW-ANGLE ADJUSTABLE MOUTH BLOCK PLANE



Weight: 1 lb. 12 oz.

Blade width: 1¾ in.

Price: \$150

Source: (800) 327-2520

The Stanley Rule & Level Co. introduced the No. 60½ low-angle block plane 100 years ago. Through the last century the tool underwent several changes, but five years ago Lie-Nielsen nearly perfected the original design. The first thing you notice about this plane is its beautiful blend of materials—iron, bronze and steel in perfect harmony. A closer examination reveals a body made of ductile cast iron. An extralarge bed is precisely machined, providing rock-solid support

for the ¾-in.-thick, high-carbon tool steel blade.

Setting up and adjusting this plane is easy. Loosening the knurled front knob frees the eccentric lever that precisely moves the throat in and out. The depth of cut is regulated by a steel knob that registers in a single slot at the rear of the blade, providing smooth operation with minimal backlash. Even though the tool has no lateral adjuster per se, users can grasp the blade and move it back and forth within the body, as needed.

LIE-NIELSEN LOW-ANGLE SKEW BLADE RABBETING BLOCK PLANE

This skew block plane is the "multi-tool" of the low-angle block-plane family: It functions as a rabbet plane, a fillister (fenced rabbet plane) or a standard low-angle block plane—an impressive portfolio for the money. A beautiful tool made from manganese bronze, steel and cherry, this plane has great heft and is well balanced. Like the other Lie-Nielsen planes, the skew block has a large solid bed for the blade and similar lateral adjustment and depth-of-cut mechanisms.



The skewed blade sets apart this tool from the others. Removing one side of the body converts it into a rabbet plane (above), and adding an adjustable fence (inset) further transforms it into a fillister plane.



The skew blade sets this tool apart. It does not have an adjustable throat. The blade produces a shearing cut, helpful in planing end and cross grain. I found the setup, sharpening and adjustment a bit tricky due to the skewed nature of the tool.

One distinctive feature is the steel plate on the side of the tool that can be removed to expose the edge of the blade, turning it into a rabbet plane. In this mode, the plane can be used to size tenon cheeks and smooth the bevel on raised-panel doors (after roughing them to shape on a tablesaw). By attaching the fence, you can transform this plane into a fillister plane, cutting rabbets both with and across the grain, but you need to define the rabbet first with a marking gauge.

Using this tool as a shoulder plane is problematic. Trying

Weight: 2 lbs. 4 oz.

Blade width: 1½ in.

Price: \$185

Source: (800) 327-2520

to size tenon cheeks proved a bit challenging because the blade projects on the right side only. I either had to use the plane left-handed or pull it toward me with my right hand.



This plane, as well as the other two Lie-Nielsen planes we reviewed, was nearly ready to go right out of the box. A check with a straightedge confirmed a flat sole. After a few minutes spent tuning up the blade, the tool was in service.

As you might expect, the tool excelled in all of the workstation tests. The polished bronze lever cap felt great in my hand. The solid construction and high-quality materials helped it to handle even the most difficult tasks. The plane was not susceptible to chatter or vibration. Overall, this plane is a great value given the middle-of-the-range price tag of \$150.



One finely made plane. The Lie-Nielsen version is a step up in the evolution of the original Stanley design. All blade and throat adjustments function precisely. The well-machined bed was the largest of all the tools reviewed, providing good support for the blade and eliminating chatter.

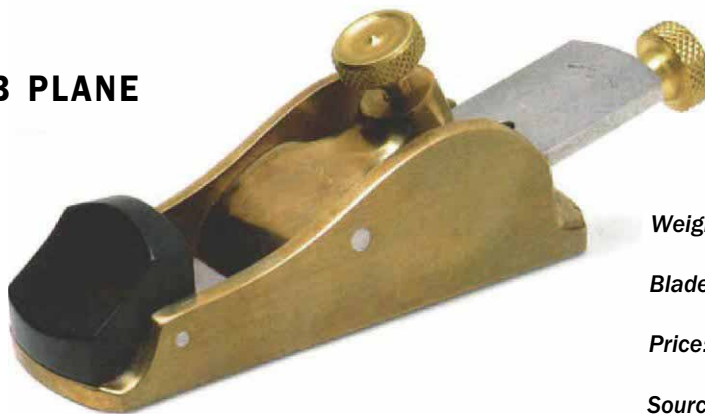
ST. JAMES BAY THUMB PLANE

St. James Bay is a small firm in Mesa, Ariz., that makes handmade, labor-intensive tools at reasonable prices. The company's thumb plane is a beautiful reproduction of a classic British design originally made by Thomas Norris. It is made of silicon bronze with ebony infill. It has a high-carbon tool steel blade. With the exception of some minor honing of the blade, the thumb plane was ready to use right out of the box.

Both the solid lever cap and the extralarge bed filled with ebony are impressive. The solid bed, coupled with the vibration-dampening qualities of ebony, supported the blade well through a series of demanding tests. When other planes had taken their last shavings, the St. James Bay blade held up and kept cutting.

Even though there is no adjustable throat on this tool, the throat is tight enough to produce fine results on end grain, miters and long grain. Users will need to make lateral adjustments to the blade by hand-tweaking it within the casting.

There is a loose shoe that fits under the lever-tensioning screw. This shoe is somewhat difficult and tedious to position, and because it is a small separate part, it would be easy to misplace.



Weight: 1 lb. 9 oz.

Blade width: 1¼ in.

Price: \$225

Source: (800) 574-2589

The feel of the tool was foreign to some of the people in my review group, but it in no way impeded the quality of the results the tool delivered. All in all, the St. James Bay thumb plane was a solid performer with a strong aesthetic appeal.



These shavings were cut from end grain. This St. James Bay thumb plane was one of only three planes reviewed that could make continuous ribbons of end grain. (The other two were the Bridge City and the Lie-Nielsen adjustable-mouth plane.)



A loose shoe is easy to lose. The separate brass shoe serves as a pad to tighten the blade in place. Gochmour says that it would be easy to misplace.

ue. I used their ratings and comments to season my own reviews that appear in the boxed text.

Tips for peak performance

Once you have purchased a low-angle block plane, you will get the most utility and pleasure from your tool if it is well-tuned. Understanding a few fundamental practices will improve your ability to use the tool for tasks that it can do well.

Tune it up first—Even the best of the tools reviewed for this article required a lit-

tle effort to get them into peak form. I am a firm believer in the old adage, "If it isn't broke, don't fix it." Consequently, I am not going to suggest that you lap every plane you buy. I do advise that you check the flatness of the sole by testing it with a straight-edge. If you need to lap it, make sure the blade is in place and secured by the lever cap but drawn up into the body so it will not be damaged by the abrasive.

Why lap it with the blade in place? I'm convinced that the tension of a fully tightened blade can slightly distort the shape of the plane's body. I start lapping with 60-grit

sandpaper glued to a flat stone, followed by 120 grit, and I finish the job with 220 grit. You may choose to polish it with finer grits, but I've found that simply using a plane puts the best polish on the sole that you'll ever need.

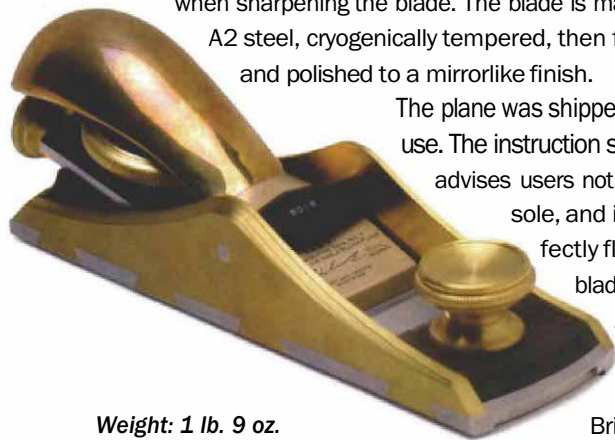
After lapping, blow out the casting with compressed air, and wax the sole to reduce friction. I prepare the blade by lapping it through the same abrasive sequence that I took the sole through, followed by further honing on waterstones.

Make sure you keep your low-angle plane at a low angle. Most of the planes

BRIDGE CITY PRECISION LOW-ANGLE BLOCK PLANE

With this tool Bridge City has taken the art of plane making to a new level—a beautiful blend of materials, design and state-of-the-art technology. The body of the plane was not made from a casting. Instead, Bridge City mills a thick piece of stainless steel into a complex form, including the sole, solid bed, provisions for the blade-depth adjustment, an adjustable throat and a series of dovetails. The brass sides are connected to the sole with a unique, interlocking double-dovetail joint. An ebony infill accents the body and the inside of the blade-adjustment knob. The cast bronze lever cap is polished and secured to the body with a knurled locking wheel and cross pin. All of the knobs are beautifully turned forms that are comfortable to grasp. The depth of cut is controlled with micrometer precision, but the lateral adjustment is minimal, which means great care must be taken when sharpening the blade. The blade is made from A2 steel, cryogenically tempered, then flattened and polished to a mirrorlike finish.

The plane was shipped ready to use. The instruction sheet advises users not to lap the sole, and it was perfectly flat. The blade was razor-sharp and ready to go. Bridge City suggests stropping on canvas or leather to remove the final burr. In a shop, however, preserving the blade's mirrorlike finish could prove tricky, and deburring only on a soft strap would take some practice.



Weight: 1 lb. 9 oz.

Blade width: 1 7/8 in.

Price: \$659

Source: (800) 253-3332



For that price it had better be good. In this plane beauty married brawn, and it was an expensive wedding. Meticulous detailing and fine craftsmanship result in a tool that will appeal to collectors as well as to woodworkers who actually intend to use the tool.

ish could prove tricky, and deburring only on a soft strap would take some practice.

Perhaps this plane was an anomaly, but I had to make a slight modification to get the blade parallel with the sole. The manufacturer assured me that any problems would be corrected by returning the tool. I achieved a temporary fix by rehoning the blade to achieve a parallel alignment.

Put through the paces, the plane performed admirably, and its solid construction translated into solid performance. For those with the means, it would be a source of continual inspiration because of its utility, quality and beauty.

come from the factory with a 25° bevel. A microbevel of 1° or so is helpful because it minimizes the amount of steel to be polished. But a rash decision to hone a 5° microbevel would quickly turn a low-angle block plane into a standard-angle block plane, losing all of the advantages of a low-angle tool.

Cut at a skewed angle—When faced with a difficult planing task, such as planing the sawblade marks off the end of a board, there are a few things you can do to make the job easier. See to it that the blade is ra-

zor sharp; adjust the plane for a light depth of cut and make the cut by turning the plane at a slightly skewed angle to the path of travel across the workpiece. Skewing lowers the effective pitch of the blade by reducing the friction on the blade and the force required to produce a shaving. Skewing can also reduce chatter and prolong blade life between sharpenings.

Moisten end grain—Because sharpening takes time and interrupts the flow of my work, and because many of the tasks of a low-angle block plane are demanding, I

often lightly moisten the end grain of a board before planing it. I generally use water, but water left unchecked in a tool can cause rust. Water and tannic acids in some woods could also react with iron in the tool and stain your wood. I have not had either of these problems, but you can avoid them altogether by using a solvent such as mineral spirits or denatured alcohol to dampen the end grain and make the wood fibers more supple. □

Chris Gochnour designs and builds custom furniture near Salt Lake City, Utah.