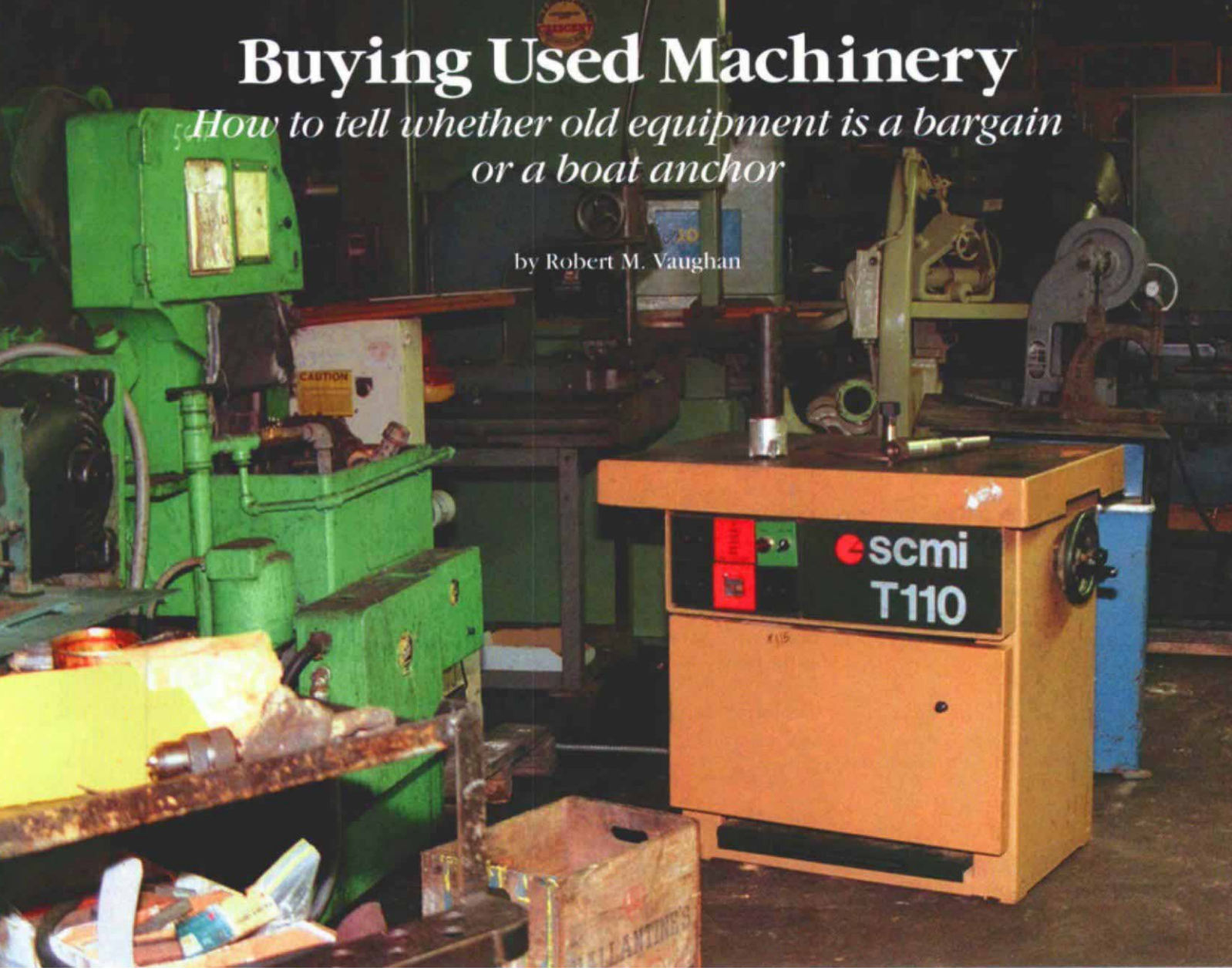
# Buying Used Machinery

## *How to tell whether old equipment is a bargain or a boat anchor*

by Robert M. Vaughan




I've been buying and repairing used woodworking machinery for more than 20 years. Demand for good used equipment is stronger than ever, and woodworkers often ask for advice on what to buy. I always tell them the same thing: The condition the machine is in matters more than the price. You can save money buying a used machine just as you can buying a handyman special when shopping for a house, provided you're handy and you go into it with your eyes open (see the photos on the facing page).

Every woodworker has his own repair tolerance. Some are intimidated by changing a belt, and others have no qualms about making new parts or welding frames. You'll do yourself a favor by being honest about your limits before buying a used machine.


***A good inspection requires some disassembly.*** *Be sure to take along the tools to do it right.*

The price of used equipment depends on its condition and desirability. An essential machine, like a tablesaw, in good condition often sells for close to the brand-new price. A less-desirable machine from a little-known manufacturer may sell for a third of its original price.

Just because a machine is old doesn't necessarily mean it's better than a new one. Some new models have compelling advantages, such as better safety features, easier cutter adjustments or a greater assortment of accessories. But a used professional-grade machine will probably perform better than a new entry-level model. Will a used machine need work? Count on it.

A thorough knowledge of new machine



Photos this page: Aimé Fraser

prices and potential repair costs will help you decide when a used machine is worth the effort to repair it. A big bandsaw with a three-phase motor may need $1,000 in electrical parts alone. If you had planned to buy a $15,000 bandsaw, the investment would be worth every penny. But if a modest 14-in. bandsaw selling for $200 will need $500 in parts, it's clearly no bargain.

## Finding good used machines

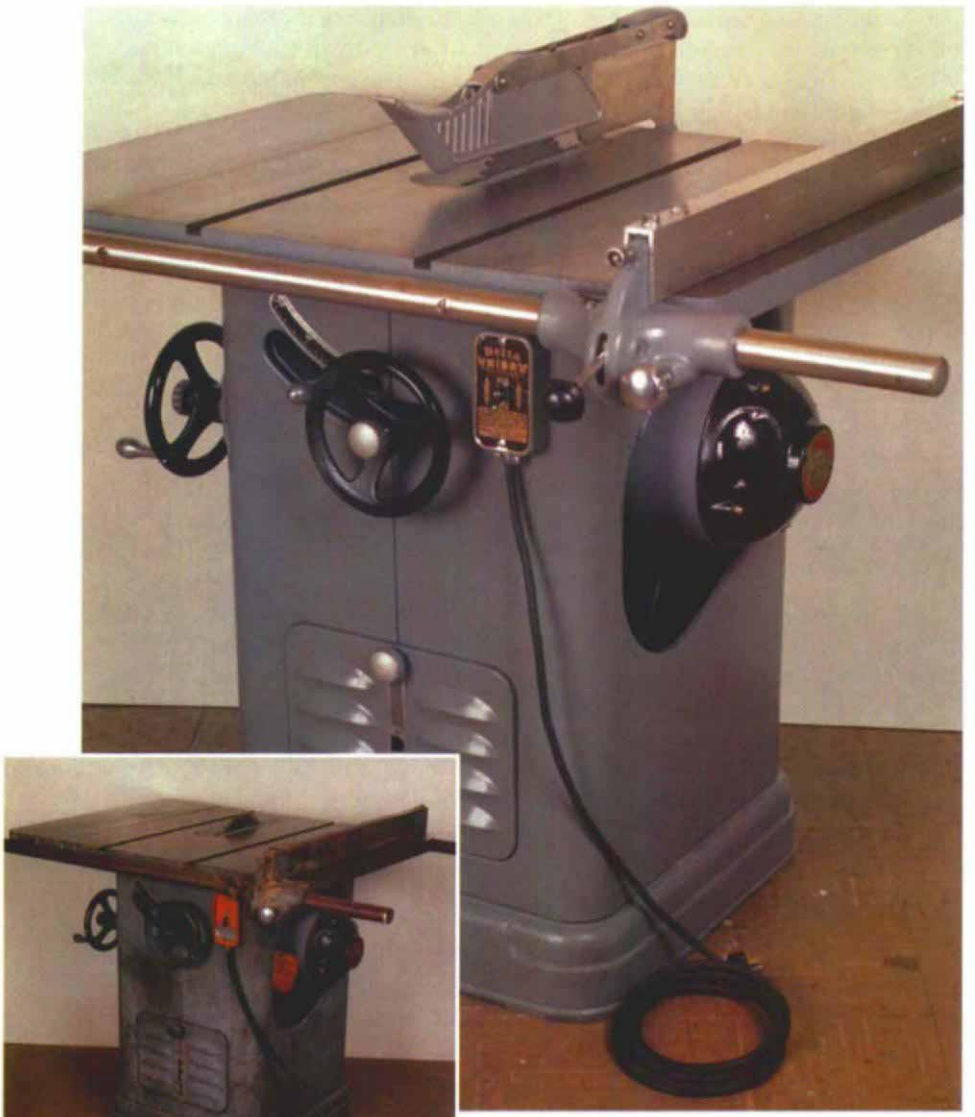
Finding good used equipment is often a matter of waiting. For me, the best deals seem to come from letting plenty of people know what I'm looking for. I sometimes end up with dead-end leads. But I also learn about some great buys before they get into the classifieds.

Auctions are the next best source for machinery, but the bidding can be fiercely competitive if a lot of dealers are present. Bankruptcy auctions are best—the machinery was probably being used until the time of the sale. Government or school auctions are sources of good equipment, but you may have to replace expensive, broken parts. Surplus auctions have the highest risk of bad machinery. Much of what's offered is being unloaded by large companies that have found the machines too expensive to repair.

Reputable machinery dealers are always a good source. They know tools and won't handle worthless junk. The tools are sold as is, which usually means they need some work. But the dealer may be a good source for parts and will have the means for moving or shipping the machine. Most dealers are accustomed to working with buyers from production shops who know exactly what they want. Dealers can be less tolerant with picky small-shop owners. You'll endear yourself to a dealer by doing your homework and acting decisively.

## Take along a buyer's tool kit

I carry a small tool kit when checking out a machine (see the bottom photo on the facing page). I take a flashlight and a mirror to get a good view of obscure areas, and I take a combination square to check surfaces to see if they're square, flat and straight. For removing guards and covers, I carry slotted and Phillips screwdrivers and an adjustable wrench. An old toothbrush, a rag and a can of WD-40 are useful for cleaning away rust and grime. And, of course, using a tape measure is better than guessing whether the machine will fit through the shop door.



***Know your limits for repairs.*** *This 1948 Delta Unisaw cost $450. It took $150 worth of parts and 40 hours to restore this machine to like-new condition.*

It's impossible to memorize parts and price lists for every machine that you intend to check, so take several manufacturers' catalogs with you for reference. These catalogs are available (sometimes at a cost) from hardware stores, machinery dealers or the manufacturer. Good catalogs picture the complete machine and often give the prices of major accessories such as starters, motors and other parts that may need replacement.

## A well-known brand is usually a good buy

An inexpensive, entry-level machine should be carefully scrutinized because it may have been misused. Chances are the owner was a beginner who may have used the machine improperly. However, long defunct brands of small woodworking machines can be good buys. Many machines by Darra James, Duro, J-line, King Seeley (Sears), Red Fox, Shopmaster, Shopmate, Walker-Turner and Wallace are still in service. I would buy a machine made by one of these manufacturers as long as there were no missing parts that couldn't be easily replaced (see the top left photo on p. 63). Off-the-shelf, aftermarket parts like belts, pulleys, motors, fences, miter gauges and blade guides are easy to replace. A missing jointer fence or a lathe tailstock is another matter. These are expensive parts, available only from the manufacturer. Replacing one can cost more than an entire yard-sale machine.

Companies like Oliver, Northfield, New-

Photos except where noted: author

man-Whitney and Tannewitz make large industrial machines that aren't as commonly known as Delta or Powermatic. These heavyweights handle big stock easily, but replacement parts are not cheap. Just a service manual, for example, can cost more than $50.

## Check the adjustments first

Once I've determined the machine has all its parts, I have a close look at all the adjusting mechanisms. I raise and lower the blades and tables, tilt the fences and blades, and run the guides up and down, checking for stiffness or sloppiness that will take time and effort to repair. I make sure tables and fences are square or can be made so (see the bottom left photo on the facing page). I look for damaged screw or bolt heads that may indicate the owner tried to fix the machine and decided to dump it when the repair didn't work.

With this inspection, I get a feel for how the tool was used and maintained. A machine with signs of neglect is probably no bargain (see the top center photo on the facing page). It will probably have many parts that will need to be replaced.

When I see extensive rust, I walk away. It usually means the machine has been in a fire or a flood, and those things mean big problems. The heat of a fire can distort and soften critical parts. The silt in flood waters penetrates every part of a machine, so it will have to be totally disassembled and cleaned. It's likely that every bearing will have to be replaced. Rust can also make disassembly very difficult.

## Check the frame and table for distortion

With a flashlight and a mirror, I carefully inspect the frame and the table for damage. Ideally, they should be in sound condition, but I don't automatically dismiss a machine with a cracked iron casting. Castings can be brazed or welded (see the bottom center photo on the facing page). In my area, a welded repair to an iron casting costs about $30. If I see evidence of a repair, I make sure that it didn't warp or distort the metal and that the parts are in alignment.

I look closely at the trunnions, if the machine has any. Zinc die-cast parts (the very smooth ones with fine seam lines), like those used in some lightweight bandsaw and tablesaw trunnions, are not easily repaired. If these kinds of castings are broken, they should be replaced. If the machine is still in production, that's no problem. But if the manufacturer is out of business, you're stuck—unless you are willing to accept the expense of a custom-made part.

## Make sure the motor suits the shop wiring

Clean off the motor's data plate to see the kind of electrical power the machine requires. Three-phase motors rated at less than 5 hp usually can be swapped for ones that use standard single-phase current. The cost of replacing a motor is about $175 for the first horsepower and $50 for each additional horsepower. That doesn't include the price of a starter, cords and plugs. Single-phase motors larger than 3 hp may require rewiring the shop to handle the heavy amperage load.

Some older machines use direct-drive, three-phase motors that can't be easily replaced (see the bottom right photo on the facing page). In that case, the shop must be outfitted with a phase converter. The cost can run from $100 to $1,000, depending on the size of the motor and the type of phase converter—static or rotary.

I check the end of the motor shaft for mushrooming or peening damage from a hammer or gear puller that would make it difficult to install or remove a pulley. Then I grab the shaft to see if there is any up-and-down play. If so, the shaft, bearings or bearing housing may be worn. If the motor is functional, I remove the drive belt and run it at idle. I listen for the hiss of the internal fan. If there's a high-pitched, gravelly whine when the motor coasts to a stop, the bearings need replacement.

## The power train must run freely

After checking the motor, I look at the power transmission components of the machine. I don't worry about the belts; I just assume they will need to be replaced. I look for pulley wobble, which means either the pulley bore or the shaft is worn. A new pulley isn't a major investment, but a worn shaft can be expensive to replace. Then I work my way through the power train, checking each part for wear.

Heavy-duty antique machines with babbitt bearings are often sold at bargain prices. Babbitt bearings work fine, but they can be difficult to replace and must be oiled before every use. The inevitable oil drips and spills can foul the surface of a board and may be a fire hazard. I tend to stay away from machines with babbitt bearings because newer machines with ball bearings are generally better made. However, with a little care, these machines are a good buy for an amateur millwright with the time and inclination to pour new bearings. Sometimes a machine with babbitt bearings can be modified for modern, standardized ball bearings, but it's no easy job.

I check all the ball bearings in the power train. I'm not concerned if some need replacement. Ball-bearing sizes are standardized, so it's easy to find replacements. However, pressing the bearings on and off the shafts requires some specialized tools. To do the job right, you'll need an arbor press and bearing pullers.

# *Will a used machine need work?*

*Count on it. The trick is knowing when potential repairs will cost more than the machine is worth.*

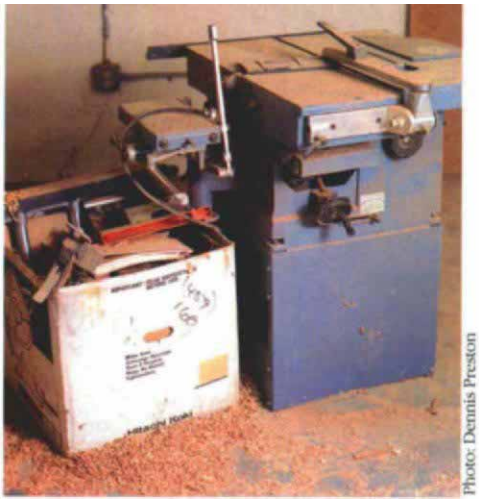
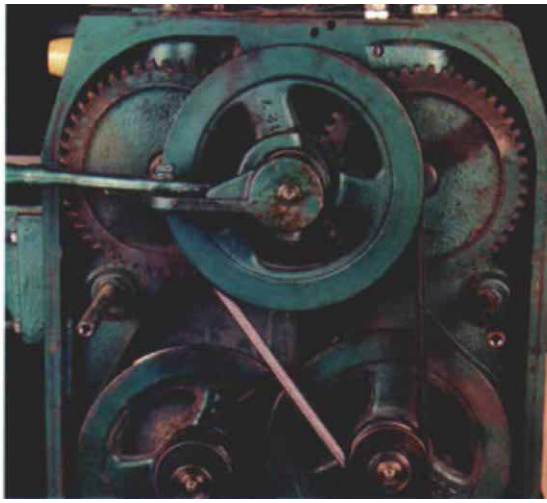


Photo: Dennis Preston

***Make sure all the parts are in the box*** *before continuing your inspection. Finding missing parts for this out-of-production combination machine may be nearly impossible.*

***Badly worn parts may mean poor maintenance.*** *Bandsaw blades are easy to replace, but a thrust bearing like this one indicates the machine was not carefully maintained.*

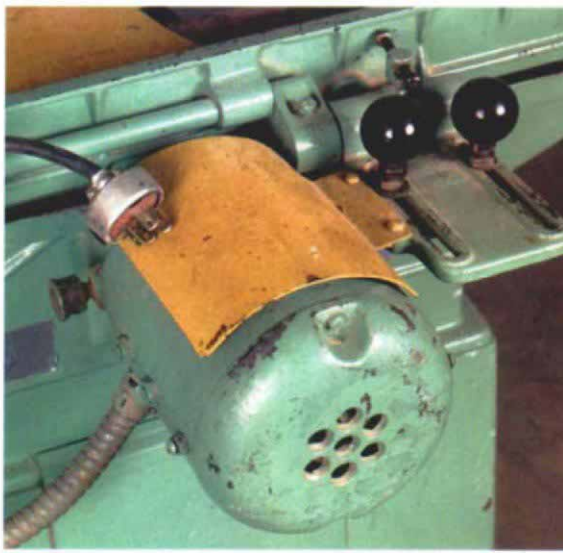


***Remove covers, and inspect power trains.*** *The gears of this planer pass with flying colors—no cracks or broken teeth. If possible, try running the machine under a load to check the power train.*

***Essential adjustments should work properly.*** *Check the fence for squareness, run all the handwheels and raise and lower the tables or blades. The fence shown here is out of square to the table.*

Photo: Dennis Preston

***Cracked or repaired parts aren't necessarily a serious problem.*** *Welding a frame is not difficult or costly. But care must be taken not to distort or misalign the parts.*



***Some motors can't be changed. The*** *three-phase, direct-drive motor on this jointer can't be swapped for a 110v single-phase motor. It will require 220v circuits and a phase converter.*

You can inspect gear-drive systems by simply removing the cover (see the top right photo above). One or two broken teeth can be repaired, but more than that will probably require a new gear. Some gear systems operate in an oil bath in an enclosed housing. In that case, I turn the machine over by hand to look for jerky motion in the visible moving parts and listen for grinding noises.

If possible, I run the machine under load and use it to cut some stock. Doing so can reveal problems, such as planers that don't feed, blades or belts that won't track, or excessive vibration due to damage or wear.

## Moving the machine is not always easy

It can take a significant amount of time and money to move a machine, and I keep that in mind while I'm inspecting it. A small machine like a Delta 14-in. bandsaw that weighs about 150 lbs. can be carried by two people to a van or pickup truck, but an old 36-in. Crescent bandsaw is another matter. Sometimes I've moved large machines by disassembling them. I've also rented panel trucks with lift gates to carry heavy tools (but be warned that most lifts have a 1,000-lb. limit). I don't use lift gates when loading machines like drill presses, handsaws and mortising machines because these tall machines are dangerously unstable as the gate rises.

I've found the easiest way to move heavy machines is to hire a roll-back wrecker. It has unlimited headroom for tall machines and comes with an experienced operator/driver who can make moving a big machine much safer. The cost of moving a machine is about the same as moving a car over the same distance.

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