

NOTE: This catalog has been reformatted without drop shadows on the photos for easier web viewing. The front and back cover are the last two pages.



Don't be intimidated by the large number of accessories we offer. Many are very specialized and will only be needed by a small percentage of our customers. We suggest you buy only what you need, when you have a job where it is needed. We ship orders within 24-48 hours of receipt, so you can always get what you need quickly. It's good to know that no matter what machining job you may decide to tackle in the future, the proper Sherline accessory will be available to make that job easier and more fun.

Table of Contents

<p>2 Why Sherline Tools Are Right For You</p> <p>3 Projects by Sherline Machinists</p> <p>5 Sherline, The Small Solution to Big Problems</p> <p>7 Compare Sherline Quality (Machine feature list)</p> <p style="text-align: center;">Lathes</p> <p>9 • 3.5" x 8" lathe</p> <p>10 • 3.5" x 17" deluxe lathe</p> <p style="text-align: center;">Lathe Accessories</p> <p>10 • Vertical milling column</p> <p>• Multi-direction vertical mill column</p> <p>11 • 1/4"-1/4" 2-position tool post</p> <p>• 5/16"-3/8" 2-position tool post</p> <p>• Rocker tool post</p> <p>• 3/8" Insert holder tool post</p> <p>• Cutoff tool and holder</p> <p>• Steady rest</p> <p>12 • Lathe follower rest</p> <p>• 3-jaw self-centering chucks</p> <p>13 • 4-jaw self-centering chucks</p> <p>• 4-jaw (independent) chucks</p> <p>• Tailstock drill chucks—3/8", 1/4" and 5/32"</p> <p>• Microscope and lathe mount ...NEW!</p> <p>14 • Adjustable "zero" handwheels</p> <p>• Rear mount cutoff tool holder</p> <p>• Cutoff tool rear mount block</p> <p>• Live center</p> <p>15 • Bullnose live center</p> <p>• Thread-cutting attachment</p> <p>• Spindle handwheel</p>	<p>16 • HSS and carbide cutting tools</p> <p>• 35° Carbide insert holders</p> <p>17 • 3/8" IC Boring tool set</p> <p>• Center drill set</p> <p>• Lathe tool height gage</p> <p>• WW collet sets</p> <p>19 • Collet pot chucks</p> <p>• 1" WW collet blank</p> <p>18 Lathe and mill terminology</p> <p>19 • Deluxe WW collet sets</p> <p>• 8 mm and WW collet adapter</p> <p>• Adjustable live center</p> <p>• Adjustable tailstock chuck holders</p> <p>• Adjustable tailstock tool holder</p> <p>• Adjustable tailstock 1" die holder</p> <p>• Quick-change tool post and extra holders</p> <p>20 • Quick-change tool post riser</p> <p>• Crossslide accessory plate</p> <p>• Compound slide</p> <p>21 • Compound riser block</p> <p>• Radius-cutting attachment</p> <p>• Power feed</p> <p>• Morse #0 to 3/4-16 chuck adapter</p> <p>• Vertical milling table</p> <p>• Tailstock spindle extender</p> <p>22 • Headstock riser block kit</p> <p>• Tailstock riser block</p> <p>• Steady rest riser block</p> <p>• Riser cutoff tool and holder</p> <p>• Wood tool rest</p> <p>23 Machine and Accessory Packages</p> <p>25 • Spur driver</p> <p>• Toggle switch dust cover</p> <p>• Knurling tool holder</p> <p>• 55° Negative rake insert holder</p> <p>• Chip guard</p> <p>• Lathe vinyl dust cover</p> <p>26 • Accessories for clockmakers</p> <p>• W.R. Smith watchmaker's T-rest</p> <p>• Lathe digital readout</p> <p>• CNC-ready lathes</p> <p style="text-align: center;">Vertical Milling Machines</p> <p>27 • Vertical mill general description</p> <p>• Saddle lock lever upgrade</p> <p>28 • Vertical mill model descriptions</p> <p>29 • 8-direction column upgrades</p> <p style="text-align: center;">Mill Accessories</p> <p>29 • Drill chucks</p> <p>• Boring head</p> <p>30 • Boring tools</p>	<p>• Rotary column attachment</p> <p>• Tilting angle table</p> <p>31 • Mill digital readout</p> <p>• Mill cutter arbors</p> <p>• 3/8" end mill holders</p> <p>• 3/8" end mill sets</p> <p>32 • Miniature end mill set</p> <p>• Milling collets</p> <p>• 4-jaw hold-down set</p> <p>• Chuck-to-T-slot adapter</p> <p>• Standard hold-down set</p> <p>33 • Step block hold-down set</p> <p>• Slitting saw holder</p> <p>• Sherline 5/32" hex T-driver</p> <p>• Mill XY bases</p> <p>• Mill XYZ bases</p> <p>34 • Index block set</p> <p>• Indexing attachment</p> <p>35 • 4" Rotary table</p> <p>36 • Right angle attachment</p> <p>• Right angle tailstock</p> <p>• CNC rotary table indexer</p> <p>• 10,000 RPM Pulley set ...NEW!</p> <p>37 • Gear tooth cutter</p> <p>• Milling vise</p> <p>• Rotating mill vise base</p> <p>38 • Horizontal milling conversion</p> <p>• Microscope and mill mount ...NEW!</p> <p>39 • Fly cutter</p> <p>• Carbide inserted tip fly cutter</p> <p>• Mill headstock spacer block</p> <p>• Morse #1 blank</p> <p>40 • Mill tooling plate</p> <p>• 90° angle plate</p> <p>• Sensitive drilling attachment</p> <p>• WW and 8.0 mm collet fixture</p> <p>• Mill vinyl dust cover</p> <p>• Machinist's parallel set</p> <p style="text-align: center;">New Products for Lathe and Mill</p> <p>41 • 18" extended mill table and 15" mill column</p> <p>• 78-Piece boxed metric WW collet set</p> <p>• Ceramic insert tool holder</p> <p>• Mill, Lathe anti-backlash saddle lock upgrades</p> <p>• Thread-on drill chuck holder for mill</p> <p>• Rotary table metric chuck adapters</p> <p>• Super-Lube Teflon grease and spray lube</p> <p>• 54,000 RPM air grinder and grinder tool posts</p> <p>42 Books and Videos (including new lathe video)</p> <p>43 CNC systems and upgrades for Sherline machines</p> <p>45 Frequently asked questions about Sherline tools</p> <p>46 Technical specifications</p>
---	--	--

New Electronic Line Filter makes Sherline tools CE Compliant



New electronic filter cuts electronic emissions to meet CE standards.

As countries around the world have tightened up their import regulations, Sherline has taken the extra step to make available an in-line electronic filter between the DC motor speed control and the incoming AC current in order to meet CE standards. Users outside the USA will only need to supply a wall plug adapter to go from the American style 3-prong plug to the type of plug used in their country. An extra charge applies for machines ordered with this filter installed, but the shipping box will state that the machine complies with CE standards. We highly recommend that customers in countries requiring CE certification order this part in order to avoid possible problems with customs.

CE Filter added to any machine: Part number plus letters -CE, Retrofit filter/cord only: P/N 45500

Sherline's owner, Joe Martin is seen here with the Model 5400 deluxe mill and the Model 4400A lathe. He has spent his life building things—from his youth in the building trades to becoming a self-taught machinist and mold maker. He has also worked in the radio control manufacturing industry and builds and operates his own R/C boats, helicopters and high performance aircraft. He is a founder of the sport of R/C Formula 1 aircraft pylon racing and one of its early champions in competition. His attraction to competition plus his love for building and operating high performance equipment has extended to racing a Formula Ford in SCCA events and a 1974 Spyder IndyCar in vintage racing events.

Joe has put his experience in working with tools and building things that really perform into the design and construction of Sherline tools. They are built to last and offer accurate, repeatable performance at a very reasonable cost.



Why Sherline tools are right for you

At Sherline, our goal has been to produce a high quality line of miniature machine tools at a price that offers the customer a great value. Accuracy and versatility have been prime requirements in the design process. As a result, we have been gratified to find that almost half our sales have been to technicians and industrial customers who adapt our machines to production line use to make a tremendous variety of small parts. This attests to the accuracy, adaptability and dependability of Sherline tools.

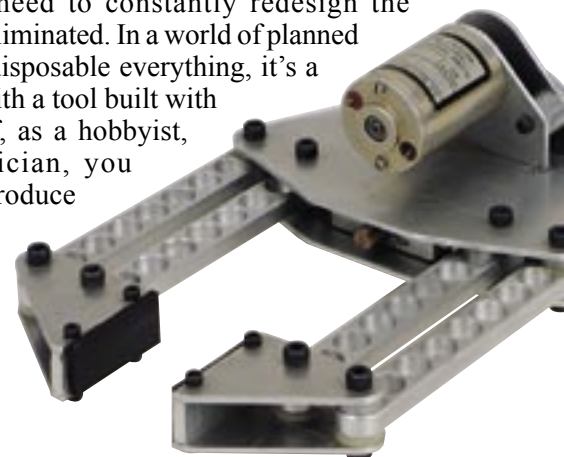
In 1972, the first Sherline lathe, along with several new accessories, were completely produced and marketed in the United States. In 1975, the Sherline vertical milling machine was totally designed and manufactured at our San Marcos facility. Since then, Sherline has devoted itself to providing versatile, quality products by using the latest manufacturing and engineering techniques. State-of-the-art computer-controlled equipment allows us to produce tools that are of higher quality and more accurate, while at the same time allowing us to keep production costs down, making Sherline tools an even better buy for the machinists and technicians who use them. A laser engraving machine now precisely engraves scales, providing greater utility and a higher quality look. It is also an example of one more job done “in-house” to both maximize quality and reduce costs. In fact, over forty major machine tools—an investment of over a million dollars—are used to produce all Sherline’s machined parts.

As Sherline tools enter their third decade of production, we take pride in certain benchmarks of progress. What began as an imported machine is now made entirely in the U.S.A. In addition, Sherline tools are now exported throughout the world. This is the eighth printing of our color catalog, which

has continued to grow as new products are introduced to the line. Attesting to the good basic design of the machine is the fact that accessories work just as well on Sherline tools made twenty years ago or today. Sherline has the most complete line of miniature machine tools and accessories available. We will continue to expand that line with the introduction of new accessories each year.

Another feature that sets Sherline apart is our complete, well-written and illustrated instructions. We are able to pass on this valuable knowledge to our customers because the people who design and build Sherline tools use them themselves and understand your needs. Sherline’s engineering staff has an extensive background not only as machinists, but also as modelers. The owner, Joe Martin, is both an experienced toolmaker and has also been involved for many years in competitive radio-controlled aircraft modeling.

With the sophistication of manufacturing techniques plus the sound design principles of the equipment manufactured by Sherline, the need to constantly redesign the products has been eliminated. In a world of planned obsolescence and disposable everything, it’s a pleasure to work with a tool built with quality in mind. If, as a hobbyist, jeweler or technician, you want or need to produce your own accurate, small, machined parts, Sherline tools are right for you!

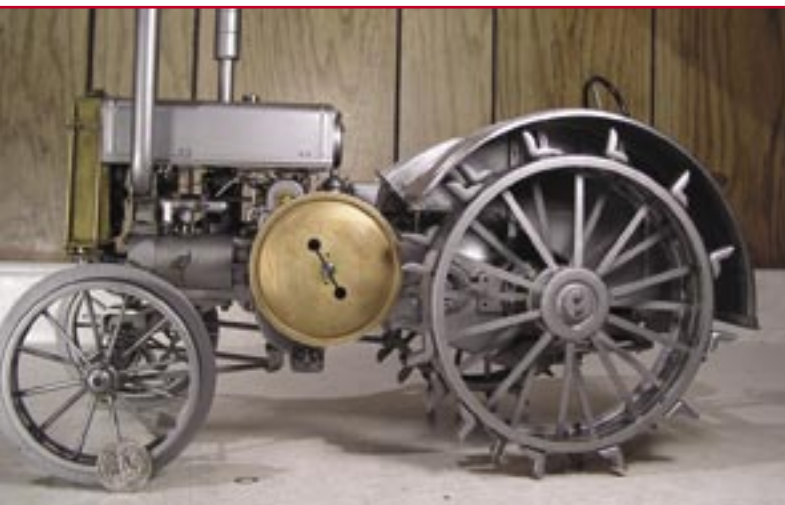


Projects built by Sherline machinists...



CO₂ powered race car • Scotty Hewitt, Van Nuys, CA

This brightly colored 5.5" long 1930's style racer won first place in the 1997 Sherline Machinist's Challenge in Detroit.



Miniature masterpieces show what can be done when you have the right tools

Throughout this catalog we talk about the accuracy, capability and versatility of Sherline tools. While those things are important, we added these pages to the catalog so you could see some of the projects that people have built using Sherline equipment. This, after all, is the ultimate test of the value of any machine...the results it can produce. On these pages and spread throughout the catalog are some fine examples of the type of precision work that can be accomplished when you have the right tools and the skill to use them properly.

We invite you to send in photos of your Sherline projects for our showroom scrapbook and for future catalog issues. These projects speak more eloquently about what you can accomplish with Sherline tools than any list of technical specifications could ever do. The people who made them are, for the most part, not professional machinists. They have all kinds of jobs and all kinds of interests. What they share is a creative spirit, a willingness to take the time to do the job right and Sherline tools.

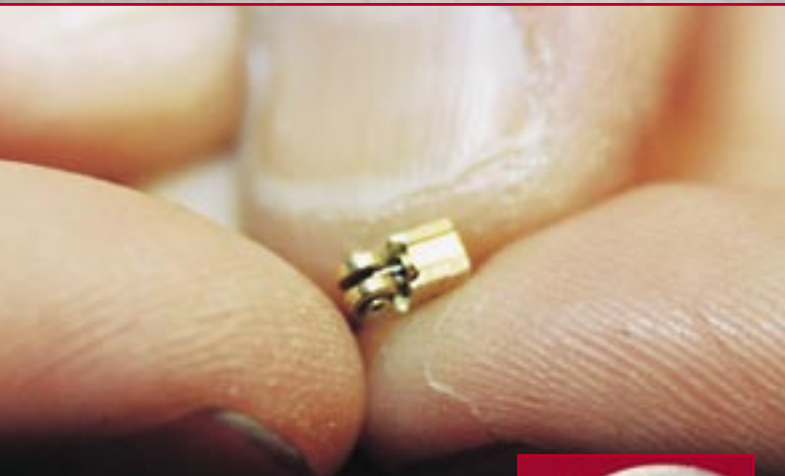
Although we have chosen to show projects built by hobbyists, it is a fact that a sizable proportion of our customers use their tools for industrial jobs. The projects we have shown are colorful and fun to look at, but remember that Sherline tools are also making parts in the industrial world day in and day out.

1/8 Scale John Deere Tractor • Jerry Kieffer, DeForest, WI

Shown prior to painting, this fully functional tractor fires up with a twist of the flywheel and is built to scale to the smallest part.

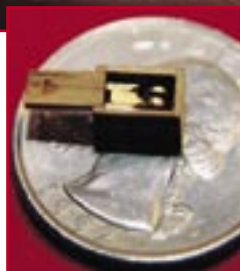
1/12 scale Ferrari Formula 1 engine • Bob Breslauer, Coral Gables, FL

Models like this V-12 engine took Bob's hobby and turned it into a career. He went on to become a professional modelmaker for a museum. The non-running engine contains about 1500 parts.



**Dual-flywheel, oscillating steam engine
Jerry Kieffer, DeForest, WI**

*This engine weighs just 3.5 grains.
Bore: .029", Stroke: .032". Jerry also
made the finger-jointed wood box.*





Model marine exhaust, drive and rudder • Don Martin, Sacramento, CA
These model drag boat parts are both functional and good looking.

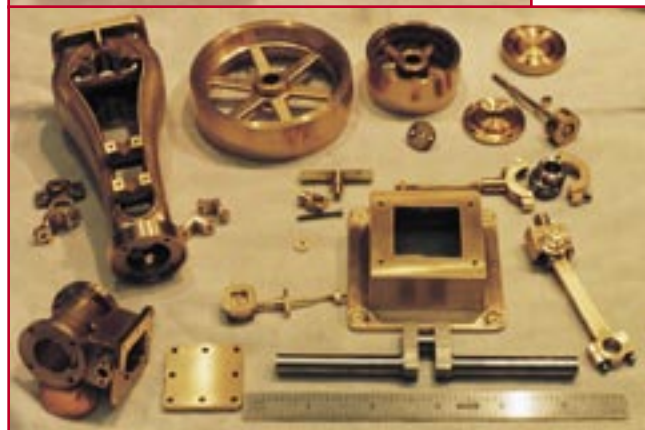
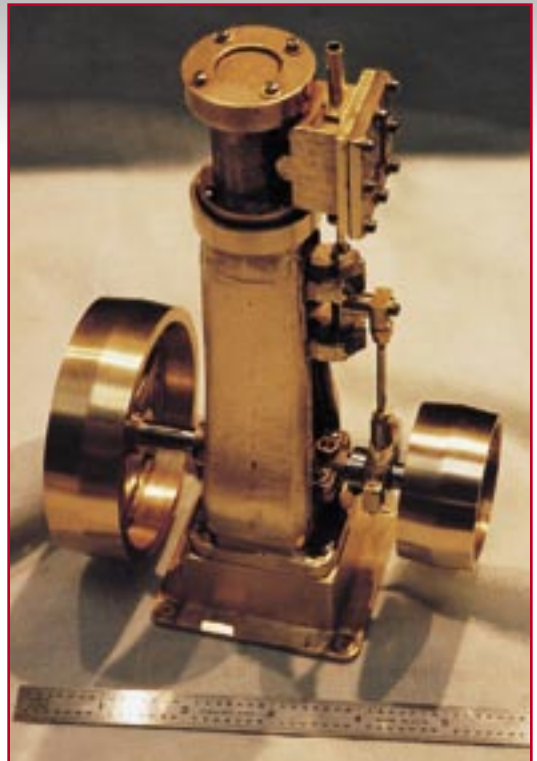


**1/6 Harley cylinders
 Jerry Kieffer, WI**
Harley Davidson owners will recognize these as cylinders for a model of a 1947 "knucklehead" motorcycle engine. The engine now runs and Jerry is making an even smaller one in 1/8 scale.



NOTE: The American quarter-dollar coin used for size reference in some photos is .95" or 24.1mm in diameter.

**Railroad crane car
 Greg Conrad, WI**
Plenty of detail made this model train car a first place contest winner.



**"Coke bottle" steam engine
 Chuck Sherwood, Naperville, IL**
Chuck took on quite a challenge to build this steam engine from a bronze casting kit as his first machining project. The top photo shows the completed engine, and the second photo shows the unassembled individual components. A ruler is used for size reference.



Custom brass wheel • Bob Breslauer
Bob designed a clever double rotary table fixture to machine these curved spokes.

1/32 American LaFrance hotrod fire truck • Mike Foti, Hillsboro, OR
Mike's entry in the hotrod division of the 1999 Salt Lake City national model contest is made entirely from formed and soldered brass. Items like the wheels, gas tank, lights, bell and rail stanchions are turned on the lathe.



SHERLINE

The Small Solution to Big Problems

Machine Demo Videos

See videos of Sherline machines cutting materials from Delrin to stainless steel and titanium at www.sherline.com/testcuts.htm.

Sherline tools are used throughout the world in industry, schools, labs and by the hobbyist...wherever there is a need for small, precision-machined parts. They are operated by engineers, scientists, technicians and model makers to produce prototype parts in metal, plastic and wood. Craftsmen should have no problem operating Sherline miniature machine tools, for they are designed to be operated by people with a "common sense" knowledge of mechanics. The skills of an experienced machinist are not required.

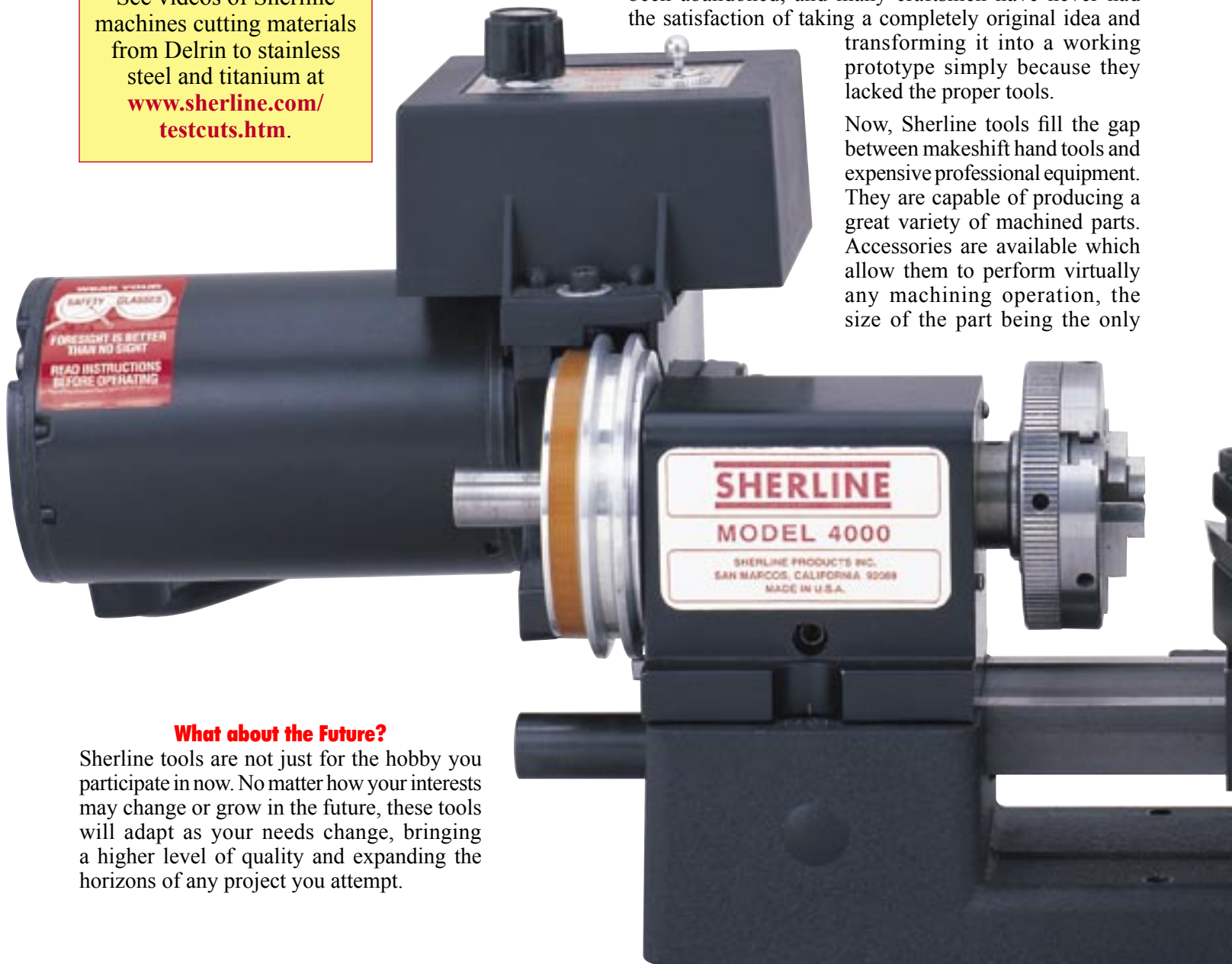
The Craftsman's Alternatives

Eventually every technician and hobbyist will find they need a part that cannot be purchased or built with ordinary hand or power tools. The choice has been either struggling with a hand drill and file or spending thousands of dollars on standard machine shop equipment. Projects have been abandoned, and many craftsmen have never had the satisfaction of taking a completely original idea and transforming it into a working prototype simply because they lacked the proper tools.

Now, Sherline tools fill the gap between makeshift hand tools and expensive professional equipment. They are capable of producing a great variety of machined parts. Accessories are available which allow them to perform virtually any machining operation, the size of the part being the only

What about the Future?

Sherline tools are not just for the hobby you participate in now. No matter how your interests may change or grow in the future, these tools will adapt as your needs change, bringing a higher level of quality and expanding the horizons of any project you attempt.



limitation. Sherline's commitment to quality extends to our service department. Should the need arise, repair parts and/or service are top priority. You will experience a maximum of a two working day (in-house) turnaround time rather than weeks of waiting.

QUALITY...designed by a machinist and built from top quality material

Sherline equipment and accessories incorporate many features found only in the best production machines. For example, the lathe spindle and the milling machine spindle both utilize lifetime lubricated bearings with adjustable preload for minimum end play. With the exception of the electronic speed control's plastic housing and protective belt guards, all parts are metal, precision machined with instrument quality finishes on all working parts.

Both the lathe and milling machine feature fully dovetailed machine slides with adjustable gibs to give precise adjustment and maximum rigidity. Machining accuracy of one thousandth of an inch or better can be easily obtained. In fact, the handwheels are precisely laser engraved in graduations of .001 inch or .01mm on metric machines. The bases of both the lathe and the milling machine are made with mounting holes so that they can be permanently attached to a board or workbench for even more rigidity and vibration-free operation.

VERSATILITY... a small solution to big problems

Sherline machines have a tremendous capacity to turn out parts for all kinds of uses. Aluminum, steel, brass, plastic, or wood parts can be easily machined on the lathe, yet the entire lathe can be stored on a closet shelf. Together, the lathe and milling machine with their many available accessories are capable of performing all the standard

machining operations. Now, there is almost no small machining job that can hold up your project. If a part isn't available, just design and machine your own!

For those who prefer to work in metric increments, the Sherline lathe and milling machine are available calibrated in millimeters rather than inch equivalents, or if you're currently thinking in inches, buy a machine that is calibrated in inches. In other words, buy a machine that is calibrated in the same increments as the tools you are currently using to eliminate the aggravation of converting dimensions. Later, should you decide to convert an inch machine to a metric machine, all the parts are available. There's no need to buy a new machine. Additionally, the DC motor and speed control supplied with the machines will run domestically or outside of the United States without any change in motor or controller, and no transformer is required.

ECONOMY...it doesn't cost much to produce valuable custom made parts

The value of any tool is the relationship between its cost and the results it produces. For most of the small machining jobs encountered by the average user, Sherline machines will produce results equal to machines costing many times more. Unless money is no object, why pay more?

A good tool never becomes obsolete. The operations done on a lathe or mill have remained the same since the dawn of the machine age. A good 50-year old lathe still produces good parts. Sherline machines are designed and built to last for generations.

Economy, versatility and quality—Sherline machines embody all three in an unbeatable combination.

That's VALUE!



Compare Sherline Quality

No other miniature machine tools offer all these features...

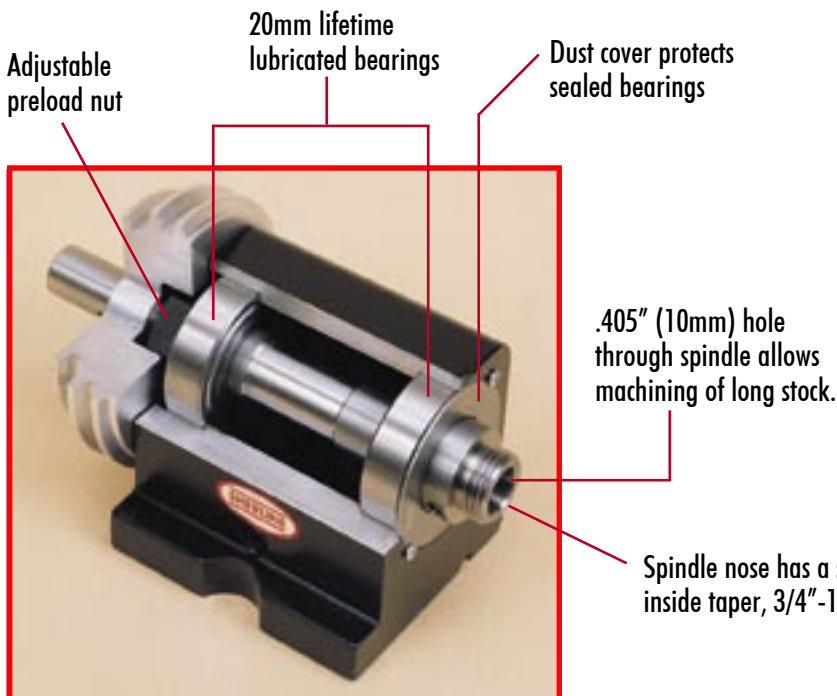
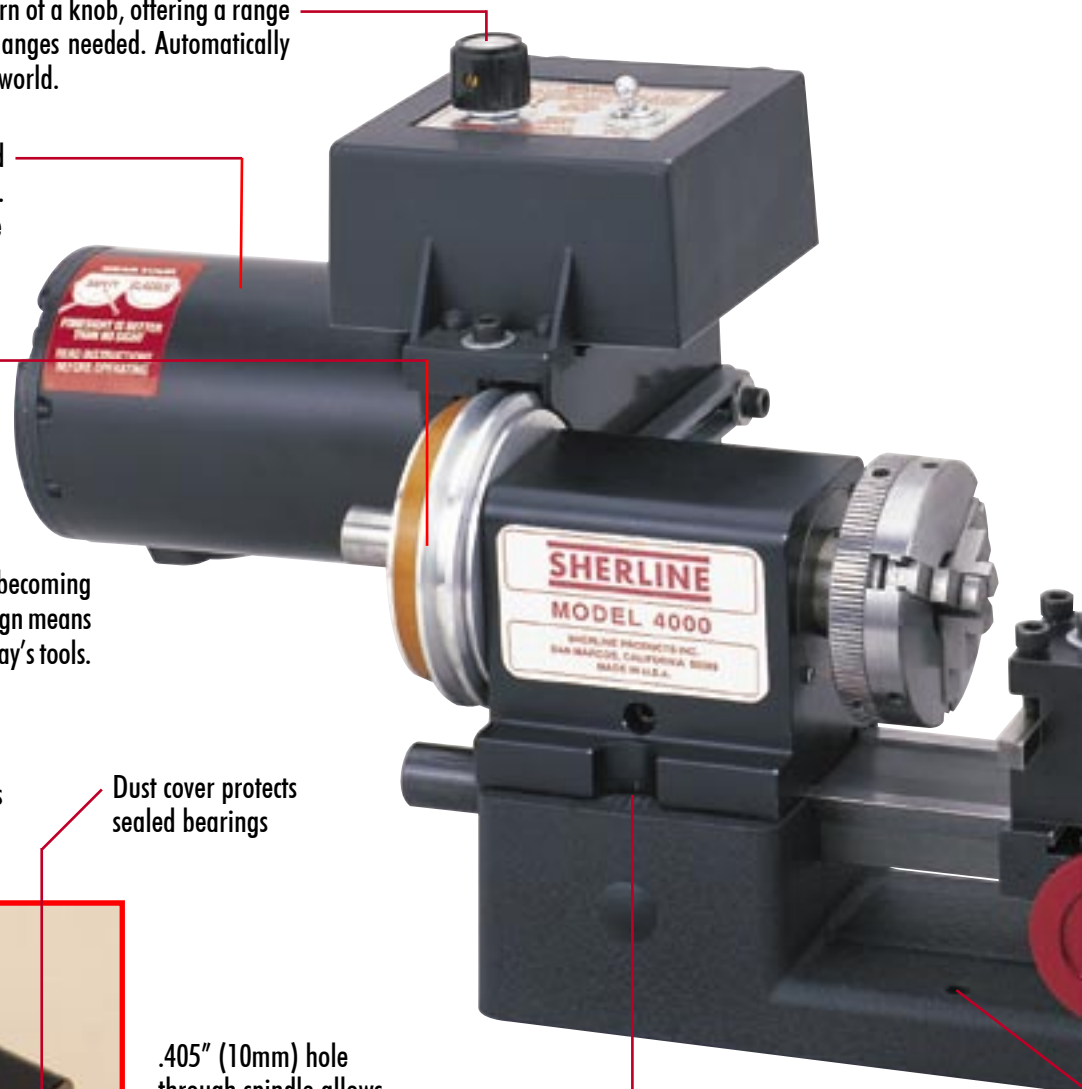
Headstock and motor assembly are easily relocated when switching to vertical milling column attachment. It takes less than one minute!

Speed is electronically controlled with the turn of a knob, offering a range of 70 to 2800 RPM with no gear or belt changes needed. Automatically adjusts to any current used throughout the world.

Motor is located out of the way on lathe and mill. Stays clear of chips and cutting oil. Motors now feature externally replaceable brushes for easy maintenance. (Not shown)

Two-speed "V" belt drive increases electronic speed control power range by offering lower ratio for more torque at lower speeds when turning larger parts.

- No need to worry about your investment becoming outdated. The soundness of the basic tool design means accessories made twenty years ago still fit today's tools. New accessories every year add to value.



Taper turning is accomplished simply by removing the alignment key and rotating the headstock to the proper angle.

Spindle nose has a standard #1 Morse inside taper, 3/4"-16 external threads.

CUTAWAY VIEW OF HEADSTOCK

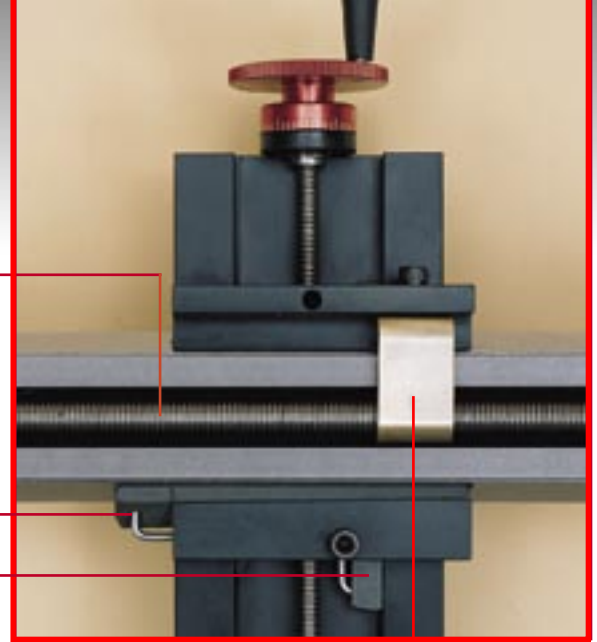
Extra long slide travel and large 6" x 2-3/4" table

Saddle and crossslide are precision machined with tough anodized finish.

Ground steel bed features dovetailed machine slides with tapered gibs that handle stress well in both lathe and mill configurations. This is the way most large, high-quality machine tools are built.

Leadscrew is underneath bed, protected from grit and flying chips.

Tapered adjustable gibs



BOTTOM VIEW

Saddle is connected to leadscrew with a brass part that is easily replaceable. An inexpensive way to correct backlash wear.

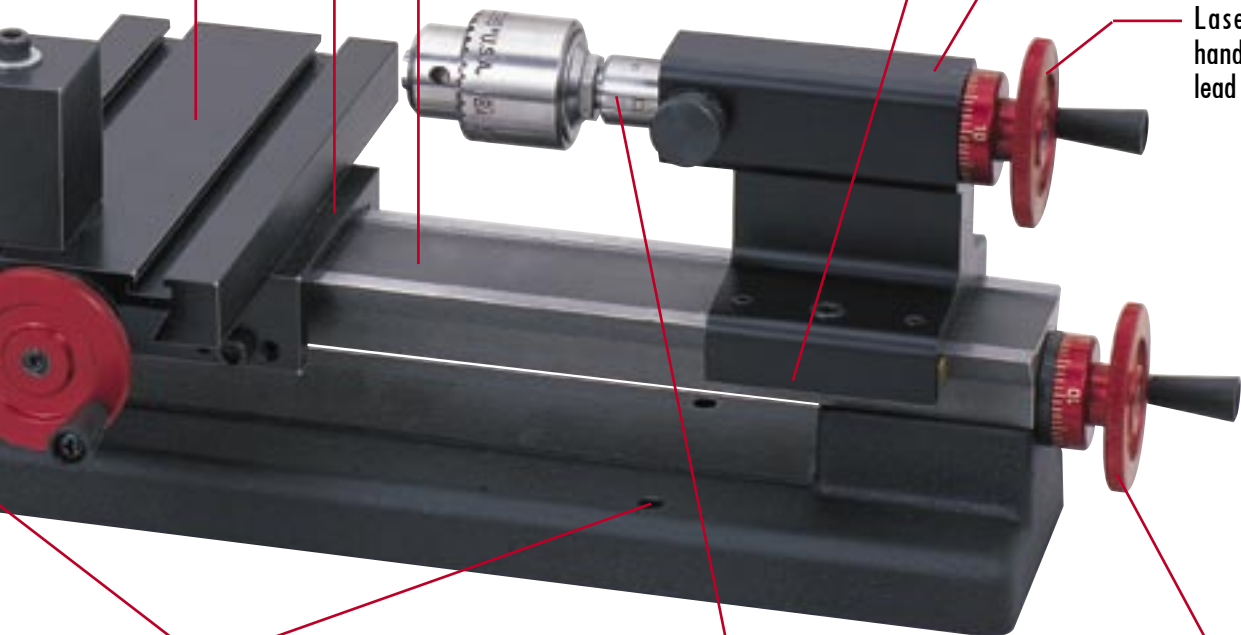
- Optional thread-cutting attachment cuts over 50 different pitches, metric or inch, left or right hand threads.
- Sherline offers not only a vertical milling attachment for the lathe, but also makes several complete vertical milling machines. (See pages 27-29.)
- Huge list of available accessories makes Sherline the most versatile tool line in the world. Virtually any conceivable machining operation is possible in miniature.

Brass gib on tailstock is adjustable for wear. Also makes it easy to remove tailstock without removing handwheels when adding riser block.

Black anodized finish on aluminum parts gives a professional appearance, plus it is tough and easy to care for.

Laser engraved aluminum handwheels with inch or metric lead screws and graduations.

- Optional resettable "zero" handwheels are available that can be unlocked and reset to "zero" (or any number) at any time. This makes dialing in a precalculated amount of feed much easier. (See page 14.)



Holes are predrilled into cast metal base for secure mounting to board or benchtop.

Tailstock spindle has a standard #0 Morse inside taper.

All handwheels are red anodized aluminum to increase the readability of the laser engraved scales.

Sherline Lathes

When the Sherline lathe first came on the market over thirty years ago, its use of rigid, extruded components meant miniature machine tools were no longer just toys for producing simple hobby projects. They could now be considered serious machine tools built specially to produce accurate, small parts. Since then, we have not only added a vertical milling machine and extensive accessory line, we have also found ways to improve the accuracy and utility of the tools themselves. The introduction of CNC machines into our production facility has greatly improved the accuracy of Sherline tools. In 1999, we improved the lathe by changing the way the tailstock is tightened on the bed with the addition of a brass gib. The mill column lock was also replaced with a locking lever that tightens against the saddle nut for easier operation and a more secure lock. These improvements are typical of Sherline's commitment to continually upgrade the quality and functionality of our products. The Sherline tools in this catalog offer the best dollar-for-dollar value of any we have ever made.

Model 4000 3.5" x 8" Lathe (Inch) Model 4100 (Metric)

When used with its various accessories, Sherline lathes will perform a host of tasks. They will turn, face, bore, drill, ream, polish, cut tapers, and cut both inch and metric threads. When used with its vertical milling column attachment it can be used for milling, fly cutting, drilling, and boring operations.

Sherline now offers several lathes to fit every budget and need, and they are available with either inch or millimeter calibrations. A high-torque DC motor with variable speed control is standard on each machine. This speed control is internally equipped with a converter that automatically adjusts to incoming AC current from 100 to 240 volts, 50 or 60 cycles/sec without loss of torque.

Model 4500 (Inch) Deluxe 3.5" x 8" Lathe with Adjustable Zero Handwheels—Model 4530 (Metric)

The 4500-series lathes offer the same equipment as the 4000-series lathes, but with the addition of two 2" (51 mm) resettable "zero" handwheels on the leadscrew and crossslide feed. (For additional information on the adjustable handwheels P/N 3420, see Figure 5, page 14.)

Standard Equipment Offered with Every Lathe

Every Sherline lathe includes the DC motor and speed control, a 2.75" (70 mm) x 6.0" (152 mm) crossslide with two T-slots, pulleys, drive belt, faceplate, lathe dog, two dead centers, hexagonal adjustment keys, tool post, sharpened high-speed steel cutting tool, eight-foot, three-wire power cord and a 48-page color *Assembly and Instruction Guide*. The 4000-series lathes come with standard 1-5/8" (41 mm)



Sherline 3.5" (89 mm) Lathe Model 4000/4100 with 15" (381 mm) bed

The 4000-series lathes offer an accurate, compact and versatile machine at entry-level prices. 4500-series are the same but with the addition of handwheels that can be reset to zero or any other reading at any time.

laser engraved aluminum handwheels, while the 4400 and 4500-series lathes come with deluxe adjustable zero handwheels. The 4400-series lathes also include a rocker tool post in place of the standard tool post.

Ordering lathe and accessory packages

All lathes and mills can be ordered plain or packaged with selections of accessories. Ordering a machine and accessory package saves you money compared to purchasing the same items separately, and the packages include the items most people buy first. See pages 23 and 24 for a description of the "A," "B" and "C" package options. Full shop packages with lathe, mill and an array of accessories are also available.

Order any machine with Digital Readouts or CNC

In addition to accessory packages, any lathe or mill can be ordered with factory installed digital readouts (DRO). To purchase a machine with digital readouts simply add the letters "-DRO" to the part number. See pages 26 and 31 for more on digital readouts.

Any machine can also be ordered with motor mounts ready for the installation of your own CNC stepper motors and computer controls. We call this "CNC-ready." To purchase a CNC-ready machine, simply add the letters "-CNC" after the part number. Buy a driver box and stepper motors to complete the package using your own computer.

Complete, ready-to-run CNC systems with stepper motors, driver box, cables, computer and software are also available. See page 43 for details.

Examples: **4000A**—An inch shortbed lathe with the "A" accessory package. **4410C-DRO**: A metric longbed lathe with "C" accessory package and factory installed digital readouts.

Retrofitting DRO or CNC later

Any Sherline machine can be retrofitted with digital readouts or CNC later if not ordered that way initially.

Using Sherline Accessories on Older Machines

Thinking of buying a new lathe or mill? All your old Sherline accessories will still work with it. Have an older machine? All our new accessories will work with it too.



Sherline 3.5" (89 mm) Lathe Model 4400/4410 with 24" (610 mm) bed

The 4400-series "A" package includes a larger 3.1" 3-jaw chuck and 3/8" tailstock chuck.

Model 4400 3.5 x 17" Lathe (Inch) Model 4410 (Metric)

If you are interested in a lathe with more distance between centers, the model 4400-series lathe is available. Standard equipment is the same as on the model 4000; however, the 4400-series lathes have a 24" (610 mm) bed that has 17" (431 mm) between centers, a 2.5" (63 mm) resettable "zero"

The 4400-series lathes offer a great value with over twice the center-to-center distance and many luxury features.

handwheel on the leadscrew, two 2" (51 mm) resettable "zero" handwheels on the crossslide and feed screw and a rocker tool post substituted for the standard tool post. This is Sherline's best selling lathe.

Lathe Accessories

Vertical Milling Column, P/N 3050 (3053 Metric)

Deluxe Vertical Milling Column, P/N 3480 (3485 Metric)

(See Figure 1.) With this attachment the Sherline lathe can be quickly and easily converted into a small milling machine. The attachment consists of a steel dovetailed vertical column with a solid aluminum base that attaches to the bed of the lathe in place of the headstock. The headstock then mounts to a dovetailed saddle on the vertical



Figure 1—The model 4000 lathe is set up with the vertical milling column attachment. Conversion from lathe to milling or back to a lathe takes less than one minute!

column. The saddle is raised and lowered to control the depth of cut by turning a handwheel. Calibrations on the handwheel enable depth control to .001" (.01 mm). Parts to be machined are mounted on the crossslide. On the deluxe version, a 2-1/2" adjustable "zero" handwheel replaces the standard handwheel.

This is the most economical way to get into milling. Most standard vertical milling operations can be performed with this attachment, with part size being the basic limitation. Conversion from the lathe to milling takes less than one minute. Most Sherline milling accessories can be used with this setup, although larger accessories like the tilting angle table and rotary table may require a longer table. At a later date, should you wish to upgrade to a complete vertical milling machine, the column will fit the Sherline XY bases (See pages 33 and 34.). This offers a cost savings compared to purchasing a complete vertical milling machine, because you save the cost of a second headstock, motor and speed control.

NOTE: Columns made prior to January, 1996 will need to be modified to fit the XY table. Call Sherline for details.

Multi-Direction Vertical Milling Column, P/N 3580 (3585 Metric)

(See Figure 2, next page.) The multi-direction vertical milling column provides all the movements of the model 2000-series 8-direction mill. (See page 28.) The entire Z-axis column can be swung, rotated, tilted or moved in and out for machining or drilling from just about any angle. At any time, you can purchase the new P/N 5600/5610 deluxe XY base, which has been designed to accept this special



Figure 2—The new multi-direction vertical milling column opens up many new machining possibilities on the lathe by turning it into an 8-direction mill.

column. In doing so you have duplicated a 2000-series mill while enjoying the cost savings of not purchasing a second headstock and motor unit. This incremental approach allows you to start machining now and add to your shop as your projects become more demanding or your budget allows.

TOOL POSTS



Two-Position Tool Posts, P/N 3003—1/4"–1/4" and P/N 3008—5/16"–3/8"

It is not unusual to have to stop and change lathe tools several times while turning a part on the lathe. The change may be to switch from a left-hand tool to a right-hand tool, from a sharp-nosed tool to a radiused tool, or from a roughing tool to a finishing tool. Whatever the reason, each change requires a little setup time. This time can be reduced by using a two-position tool post. Each Sherline two-position tool post mounts two lathe tools. By having one or more of these tool posts with your favorite lathe tools pre-mounted in them, you can simplify your work and reduce the time required to change tools.

P/N 3003 holds two 1/4" square tool bits. P/N 3008 is similar but is designed to hold a 5/16" (8 mm) square tool

"I am a professional model builder of thirty years. I specialize in building working models of miniature oil field equipment. I have used my Sherline lathe and milling machine for four years and find it to be fine equipment, well designed and built for what it is intended. My Sherline equipment has assisted me in manufacturing miniature pump heads, pump shafts and cam work for my oil rig equipment. I highly recommend American-made Sherline equipment."

John White, Professional Modeler
California

bit on one side, and a 3/8" (10 mm) square tool bit on the other side.

1/4" Rocker Tool Post, P/N 3057—The cutting edge of a lathe tool should be set right on or just slightly below the centerline of the part being machined. With new lathe tools this is not a problem, because Sherline tool posts are made to hold them at the correct height. Older tools that have been sharpened numerous times may require shimming to bring them up to the correct height. The Sherline rocker tool post is designed to eliminate the need for shimming. The height of the cutting edge can be changed by simply adjusting the two clamping screws. This inexpensive accessory reduces setup time and also extends the life and the usefulness of your old lathe tools.



3/8" Insert Holder Tool Post, P/N 7600—Your present Sherline tool post may be modified to accept these special tool holders, but an easier solution is Sherline's special tool post. It is designed to fit the larger 3/8" square and 3/8" round tool holders commonly used for carbide, ceramic or diamond inserted tips. It will also hold Sherline's own right- and left-hand 35° inserted tip tool holders (P/N 2258). Purchase of this tool post will allow you to keep your standard tool post available for use with 1/4" high-speed steel tools for jobs where they are sufficient and/or a specially ground and shaped tip is required.



NOTE: Carbide inserts and inserted tip tools are available through Sherline. Call for a complete listing or see our web site.



Cutoff Tool and Holder, P/N 3002—After completing a part in the lathe it is frequently necessary to separate the part from the excess material used for chucking. This operation is best accomplished with the use of a cutoff tool or "parting tool" as it is sometimes called. The Sherline cutoff tool and holder consists of a very slender high-speed tool steel cutting blade mounted in a special holder. The thinness of the blade (.040" or 1 mm) enables it to feed into the part quite easily, and, at the same time, minimizes the amount of waste material. The turning speed for parting should be approximately one-half the normal turning speed for any given material. One word of caution; never use a parting tool on a part mounted between centers. The part can bind on the cutter and result in a scrapped part or a broken tool. A small amount of cutting oil is a must. Parting off free machining material over a 1.00" (25 mm) diameter will always be a problem on a machine of this size. The 3002 cutoff tool can be used on the "back" side of the tool post with the addition of the P/N 3016 rear mount riser. See page 14.

Steady Rest P/N 1074

(See Figure 3.) All materials have a tendency to deflect away from the cutting tool when you are turning them in a lathe. This tendency is especially noticeable on long, slender parts and long pieces of bar stock, which makes

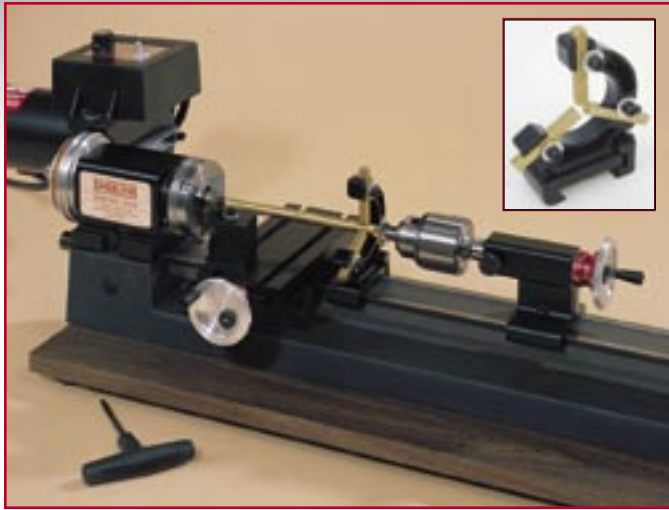


Figure 3—To drill a hole in the end of a long shaft, the lathe is set up with a center drill in the drill chuck, which is mounted in the tailstock. The steady rest keeps the shaft from wobbling and assures that the hole will be concentric with the outside diameter of the stock.

it quite difficult to hold close tolerances. The best way to support a long part is with a center mounted in the tailstock. However, for one reason or another this is not always possible. As an example, it may be a piece of stock that you want to center drill so that you can mount it between centers, or it may be a part where a center drill hole would ruin the looks of the part. Whatever the reason, a steady rest provide a means of supporting the part while it turns. The Sherline steady rest has three adjustable brass blades mounted in a holder that mounts on the bed of the lathe. These blades can be adjusted to the diameter of the part to provide necessary support. Another advantage of the steady rest that is often overlooked is the fact that work held in position by the rest turns concentrically with its outside diameter. This means that concentricity is assured when working near the steady rest, because, at that point, it **must** be running perfectly true despite imperfections in how it is chucked or centered at either end. The Sherline steady rest will accommodate any size part up to 1.75" (44mm) in diameter.

Lathe Follower Rest, P/N 1090

(See Figure 4.) The purpose of the follower rest is to keep long or small diameter work from deflecting when a cutting tool is applied to it. It is attached to the lathe saddle and moves as the saddle moves, keeping the point of support directly behind the cutting tool. This helps you maintain accuracy on long cuts and on small diameter stock.

The follower rest is mounted to the lathe saddle with one 10-32 set screw. It is not necessary to drill any mounting

“I own a small machine shop doing contract work for a major corporation. We use the Sherline lathe in a winding capacity in conjunction with a much larger machine. This system has been successful using Sherline equipment to the point where a multitude of machines have been purchased over the years.”

Larry Rubido, The Machine Shop

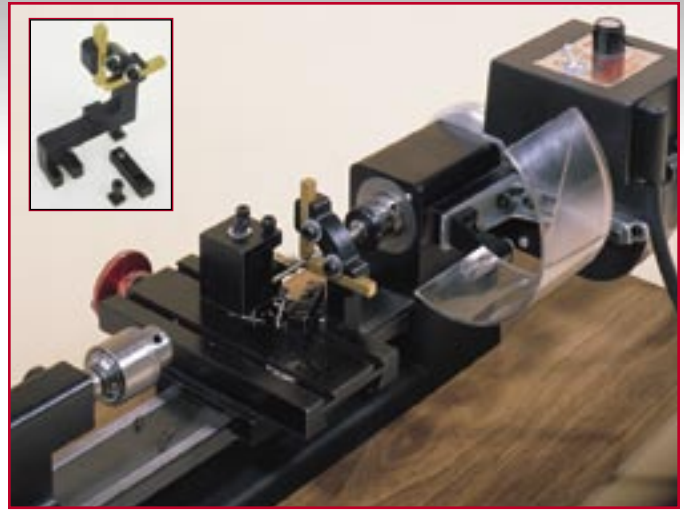


Figure 4—A follower rest in use supporting thin stock.

holes, and full instructions are provided for use. A support bar is attached to the table using a T-nut in the table slot. The support and T-nut are also provided. A small set screw adjustment at the end of the support presses down on the follower base to keep it from rising. It slides along the top of the follower base, allowing the tool post and tool to be moved in and out while still keeping downward pressure on the follower rest.

CHUCKS

Chucks are by far the most popular lathe accessories. The following types and sizes are available for your Sherline lathe. All Sherline 3-jaw and 4-jaw chucks have reversible jaws for holding larger stock.

3-Jaw Self-Centering Chucks, P/N 1040 (3.125") and P/N 1041 (2.5")



Three-jaw chucks are designed so that all three jaws move together and automatically center round or hexagonal parts or stock to within a few thousandths of an inch. These chucks provide the quickest and easiest way of holding work in the lathe. For this reason, they are the most popular of the Sherline accessories. The 2.5" (63 mm) 3-jaw chuck is included when the 4000-series lathes when the "A" package is ordered. The 3.1" (79 mm) 3-jaw chuck is included when the 4400-series lathe "A" package.

The Sherline 3-jaw chucks are designed so that they can be used to clamp externally on bar stock or internally on tube stock. The 2.5" 3-jaw chuck is designed to grip from 3/32" (2 mm) up to 1-3/16" (30 mm) diameter stock with the jaws in the normal position. For larger diameter work, the jaws must be reversed. The reversible jaws can grip up to 2-1/4" (56 mm).

The 3.1" (79 mm) 3-jaw chuck is designed to grip from 3/32" (2 mm) up to 1-1/2" (38 mm) diameter stock with the jaws in the normal position. For larger diameter work, the jaws must be reversed, and can grip up to 2.75" (70 mm). Both 3-jaw chucks have a .687" (17 mm) diameter through hole with a 3/4-16 thread. (The 2.5" chuck is also available with 1/2-20, 12 mm x 1 mm and 14 mm x 1 mm spindle threads to fit other brand machines.)



4-Jaw Self-Centering Chucks, P/N 1075 (2.5") and P/N 1076 (3.125")

These chucks combine the ease-of-use advantages of the 3-jaw chuck with some of the advantages of a 4-jaw chuck. They will automatically center square or round stock. (The stock must be accurately shaped for all four jaws to grip.) They will also grip thin wall tubing in four places rather than three, spreading out the load to allow more grip without crushing the tubing.

4-Jaw (Independent) Chucks, P/N 1030 (3.125") and P/N 1044 (2.5")

These chucks have four advantages over 3-jaw chucks. 1) They can be used to hold irregularly shaped parts. 2) With the use of a dial indicator, they can be used to center parts with a great deal of accuracy. 3) 4-jaw chucks can be used to deliberately hold a part off-center. 4) They can clamp stock tighter. This is a valuable asset when machining cams, crankshafts, and similar parts. The main disadvantage of the 4-jaw independent chuck is that the jaws must be individually set, adding considerable time to setups.

Like the Sherline 3-jaw chucks, the 4-jaw chucks can be used to clamp either externally or internally. The 2.5" (63 mm) 4-jaw chuck is designed to grip from 3/32" (2 mm) up to 1-3/16" (30 mm) diameter stock with the jaws in the normal position. For larger diameters, the jaws must be reversed and can grip up to 2-1/4" (56 mm).

The 3.1" (79 mm) 4-jaw chuck is designed to grip from 3/32" (2 mm) up to 1-1/2" (38 mm) diameter stock with the jaws in the normal position. The reversed jaws can grip up to 2.75" (70 mm). Both 4-jaw chucks have a .687" (17 mm) through hole with a 3/4-16 thread. (The 2.5" chuck is also available with 1/2-20, 12 mm x 1 mm and 14 mm x 1 mm spindle threads to fit other brand machines.)

Although we recommend the 3-jaw chuck for standard lathe projects, the 4-jaw chuck is considered the accessory that could add the most versatility to your machine. If you have definite projects in mind and feel the 4-jaw chuck would be more useful, and you have no need for the 3-jaw chuck, any lathe "A" package can be ordered with the 4-jaw chuck substituted for the 3-jaw upon request.

Jacobs Drill Chucks, P/N 1069—3/8" capacity and P/N 1072—1/4" capacity



A drill chuck will enable you to accurately centerline drill, ream or tap any part mounted on the lathe. The part to be machined is mounted in the headstock using a chuck or collet. The tool is mounted in the tailstock chuck and fed into the part using the tailstock ram feed. Parts that are going to be mounted between centers can be center drilled this way. Other parts requiring a hole accurately drilled down the center can also be done this way.

These drill chucks can also be mounted in the headstock of the lathe or used in the mill. The Sherline 1/4" Jacobs chuck has a holding range of from 1/32" (.8 mm) to 1/4"



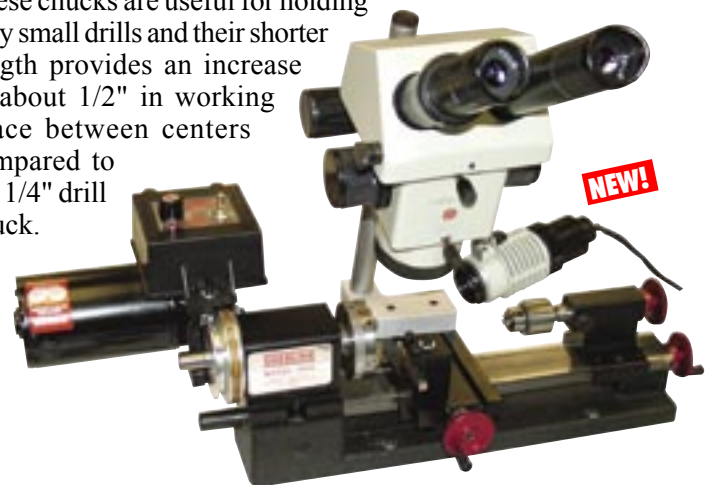
Model builders at the San Diego Aerospace Museum model shop scratch build custom parts for a new display using a Sherline lathe.

(6.4 mm). It comes complete with key, drawbolt and two arbors. The 3/8" chuck has a holding range of 1/32" to 3/8" (9.5 mm) and also comes with a key, drawbolt and two arbors. A #0 Morse arbor fits the tailstock and a #1 Morse arbor fits the headstock. The 1/4" chuck is included with the 4000-series "A" package. The 3/8" tailstock chuck is included with the 4400-series "A" package.



OJT 5/32" Jacobs Drill Chuck with #1 Morse Arbor—P/N 1010 (for Headstock) or #0 Morse Arbor—P/N 1015 (for Tailstock)

The 5/32" chucks hold very small drills from 5/32" (4 mm) down to #80 (.0135" or .34 mm). They are designated "OJT" which stands for "Zero Jacobs Taper," because they come with a #0 Jacobs tapered hole in the back. Into that we have pressed a special arbor that provides either a #1 Morse taper to fit into the Sherline headstock or a #0 Morse taper to fit the tailstock. A drawbolt and washer are included with P/N 1010 to secure the chuck in position. These chucks are useful for holding very small drills and their shorter length provides an increase of about 1/2" in working space between centers compared to the 1/4" drill chuck.



**Stereo Microscope and Lathe Mount, P/N 2125
Lathe Microscope Mount Only, P/N 2126**

Working on extremely small parts puts a strain on even the best of vision. A high quality microscope focused on your work makes small jobs a lot easier. This is especially important if you are working on high value parts where

mistakes are not an option. This rock solid Russian-made microscope offers a great combination of top quality optics, many handy features and an affordable price. In addition to use on the specially designed lathe mount, the microscope can also be used by itself as a stand-alone inspection scope. It offers magnification from 5 to 100 power and a positionable light to brighten up the stage area. The scope swings easily out of the way for setups. A separate mount for the mill is also available, so the scope can be transferred from one machine to the other. (See page38.)

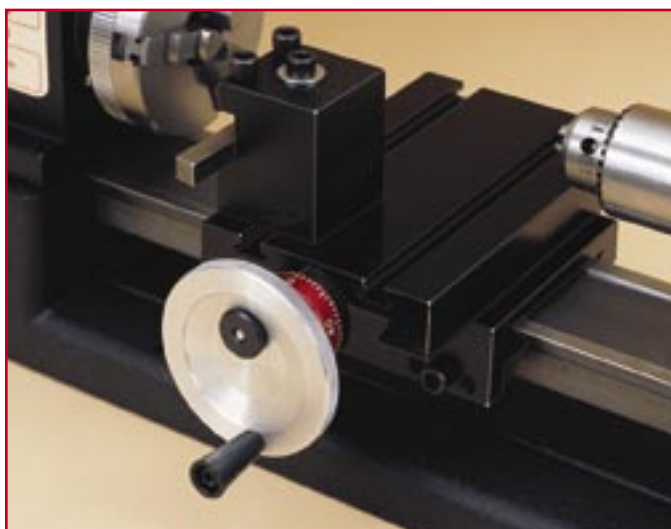


Figure 5— Adjustable “zero” handwheels can be reset to zero (or any number) at any time to make it easier to dial in precise amounts of feed without having to calculate your stopping point.

2" and 2-1/2" Adjustable “Zero” Handwheels

(Standard equipment on Sherline deluxe machines.

Call for part numbers to upgrade your present machine.)

(See Figure 5.) Most expensive full-size machine tools allow the machinist to reset the handwheel to “zero” (or any desired setting) at any time during the machining operation. Now that option is available on Sherline’s miniature machine tools as well. They install easily in place of the standard handwheels by simply releasing one set screw. Operation is simple as well. Just release the locking nut while holding the handwheel. Then reset the handwheel collar to “zero” and retighten the locking nut. Now you can dial in the amount of feed you want starting from zero without having to calculate your stopping point. It’s a great timesaver and also reduces the chance of errors.

All standard handwheels can be replaced with 2" adjustable handwheels. For the Z-axis of the mill or vertical milling column and the long leadscrew of the lathe a 2-1/2" diameter handwheel is available. Z-axis handwheels can be purchased with a ball thrust bearing set to relieve the stress caused by the lifting action of the vertical Z-axis that is not present on the other horizontal axes. Older machines can be upgraded to use the new ball bearing set when getting the resettable handwheel. Call with your model number and we will help you select the proper handwheel upgrade.

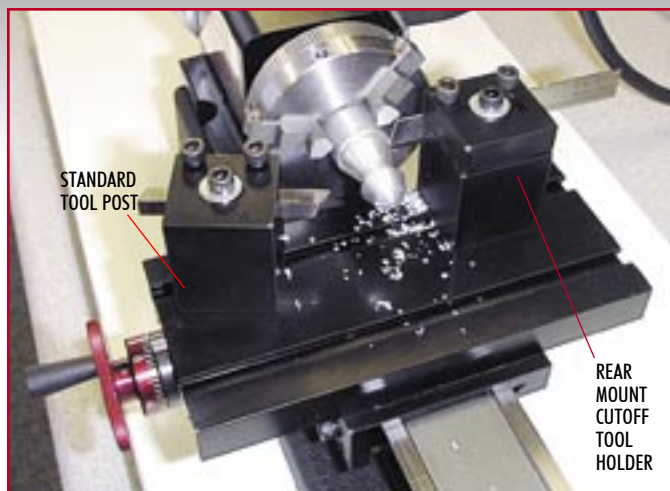


Figure 6—The rear mount cutoff tool holder can remain mounted to the lathe table. It is out of the way on the “back” side until needed for a cutoff operation.

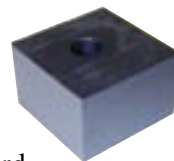
Rear Mount Cutoff Tool and Holder, P/N 3018

(Figure 6 shows the rear mount cutoff tool in use.) This timesaving cutoff or parting tool holder is designed to hold the cutoff blade upside down for use on the “back” side of the part. This allows the holder to remain mounted to the crossslide where it is out of the way while the regular tool holder stays mounted on the front of the crossslide. A parting tool blade is included.



Cutoff Tool Rear Mounting Block, P/N 3016

For those who already own a standard P/N 3002 cutoff tool holder, this spacer block will lift the cutoff tool holder the height of the blade, allowing the blade to be mounted upside down and used on the back side of the crossslide. With the standard P/N 3002 holder and this adapter, you have a choice of mounting the cutoff tool on either the front or rear side of the table.

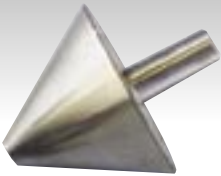


Live Center, P/N 1191



The Sherline lathe comes equipped with two dead centers that fit the headstock and tailstock. These centers are used for holding parts that are mounted “between centers.” This system of mounting work in a lathe has been in use for many years. However, since the tailstock center is held stationary and does not turn with the part, it is a point of friction and requires frequent oiling and attention. Also, because of thermal expansion caused by friction generated heat, the pressure of the tailstock center must be checked frequently. This is especially important for parts made from thermal plastic materials which have a tendency to soften and even melt as a result of the heat.

The Sherline live center is designed to eliminate these problems. The center is ball bearing mounted so that it can rotate with the part. This reduces wear and heat and makes machining much more pleasant. The sealed bearings are permanently lubricated and require no maintenance.



Bullnose Live Center, P/N 1182

A live center is the best way to support the end of a long piece held between centers in a lathe, but sometimes the piece may have a hole in the end that is too large in which to index a standard live center. The bullnose live center will support parts or tubing with an open end as large as 1-5/8" diameter. Its solid steel bullnose center turns on two preloaded ball bearings. It is fitted with a #0 Morse taper to fit the tailstock spindle. Rather than turn a sleeve to size down a hole, this special live center can be fitted up in seconds when needed.

Thread Cutting Attachment, P/N 3100

(See Figure 7 below.) One of the big advantages of having a lathe is being able to machine threads. Many threads can be cut using taps and dies, but having a tap and die set that will enable you to cut all the non-standard thread sizes would be quite expensive. Sherline offers a unique and versatile thread-cutting attachment for its lathe. This low cost attachment enables you to machine thirty-six different unified thread pitches (Pitch range from 80 to 5 threads per inch) and twenty-eight different metric thread pitches (Pitch range from .25 to 2.0 mm). It also allows you to cut them as either left-hand or right-hand threads. A 60° carbide cutting tool is included, but a standard high speed steel lathe tool can be ground to cut various thread forms on any pitch diameter you desire. This versatility enables you to machine any inside or outside, standard or

non-standard thread you might desire as long as it is within the size limitations of the lathe.

The attachment consists of 15 aluminum gears, mounting brackets, engagement mechanism, and 4.00" (102 mm) handwheel. Threads are generated on the Sherline lathe by gearing the spindle to the leadscrew. As the spindle is rotated with the handwheel mounted on the headstock spindle, the tool will advance an amount determined by the ratio of the gears. When the tool has completed its movement, you simply stop cranking, back up the tool and turn the spindle in the opposite direction until the tool is past its starting point. Then reset the tool and you're ready for the next pass. It's as simple as tapping! By using a 127-tooth gear (supplied), true metric threads can be cut on an inch (model 4000, 4500, or 4400) or true inch threads on a metric (model 4100, 4530, or 4410) lathe.

Spindle Handwheel, P/N 2049

This 2.5" steel handwheel mounts on the end of the spindle shaft and looks and works much like a sewing machine handwheel. It allows the operator to quickly and safely stop a rotating spindle by hand. It also makes it easy to hand index the spindle when working on a part. A black

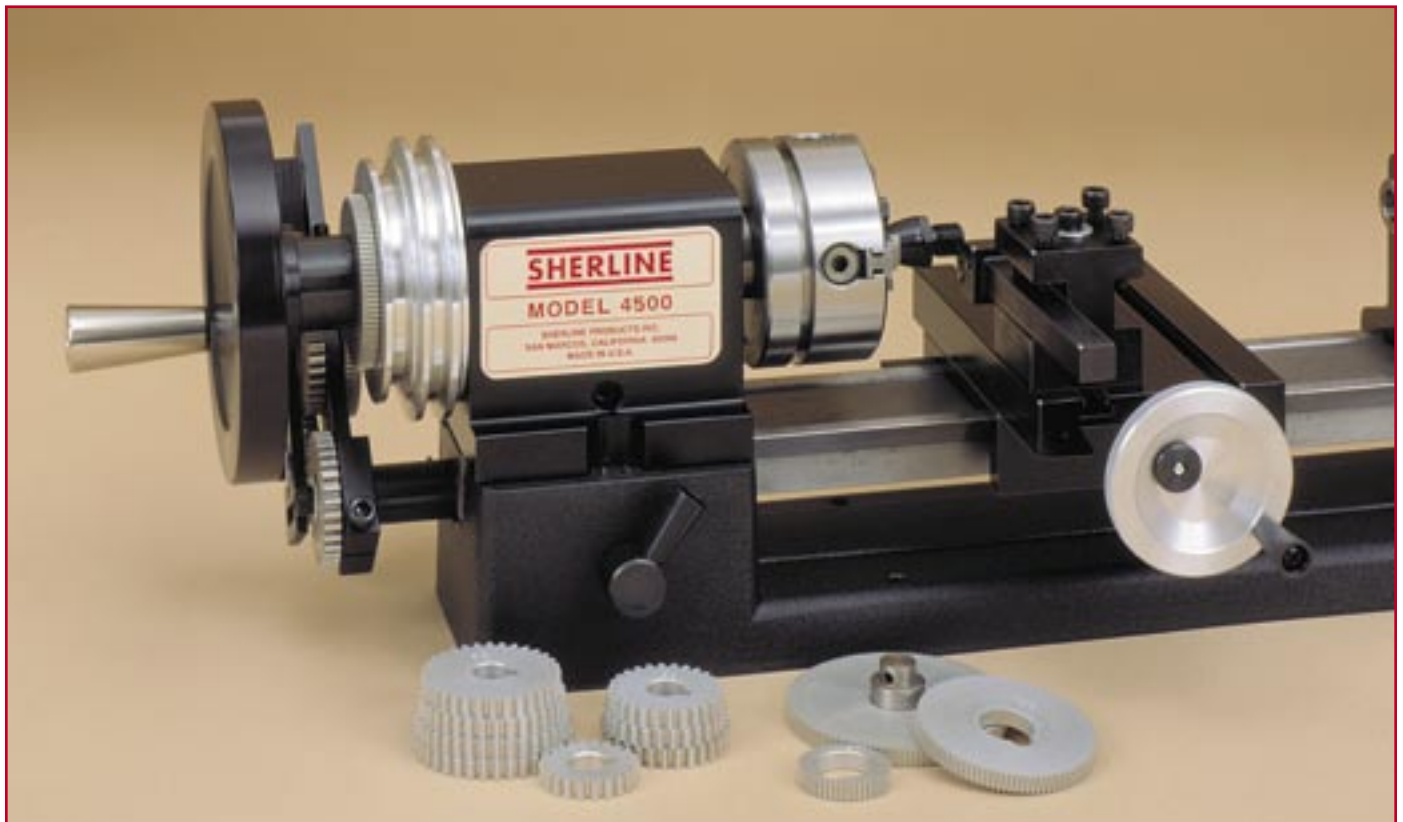


Figure 7—When the lathe is set up with the thread cutting attachment, the motor is removed and the spindle is turned by a large handwheel. A thread is being cut in a part held in a 4-jaw chuck. In the foreground are some of the change gears used for cutting different size threads.

oxide finish was not used, because the smooth, machined surface offers a better feel on your hand.

Lathe Cutting Tools

Lathe tools, or tool bits as they are sometimes called, are the cutting tools that are used for turning and facing work on the lathe. The most popular lathe tools are those made of high-speed tool steel (HSS). They can be used for machining most materials including wood, plastic, aluminum, brass and free-machining steel. These tools will retain their hardness at temperatures up to 1000° Fahrenheit (588° C.). For this reason, depth of cut, cutting speed and feed rates are important. The big advantage of high-speed steel tools is the ease with which they can be sharpened. A standard aluminum oxide grinding wheel can be used. Once shaped and sharpened, they will retain their cutting edge for a long time.



Pre-sharpened 1/4" high-speed steel (HSS) and carbide cutting tool sets and tool blank you sharpen yourself.

Carbide lathe tools usually have a tungsten carbide cutting tip brazed or bonded to a softer steel shank. These tools are recommended for cutting hard or abrasive materials. Carbide tools can retain their hardness at temperatures up to approximately 1700°. This permits a higher cutting speed and faster feed rates.

Carbide tools are typically harder to sharpen than their high-speed counterparts. A silicon carbide or diamond grinding wheel must be used. The shape of carbide tools is also more critical than the shape of high-speed tool steel cutters, but their cutting ability makes them very popular.

Grinding Your Own Lathe Tools

A sharp cutting tool is essential for producing good, clean parts, and our four-page illustrated guide makes it easy. It comes free with each set of HSS cutting tools from Sherline. It is also available on our Internet site at www.sherline.com/grinding.htm.

"I initially bought my Sherline tools to do rough work... to rough in a piece and then put it in a jeweler's lathe to finish it up, but since I bought the Sherline, I hardly ever touch the jeweler's lathes. Now I can do what I did on the jeweler's lathe just as accurately, faster, and the Sherline is easier to clean up."

Jerry Kieffer, Retired Utility Co. Field Rep.
Wisconsin

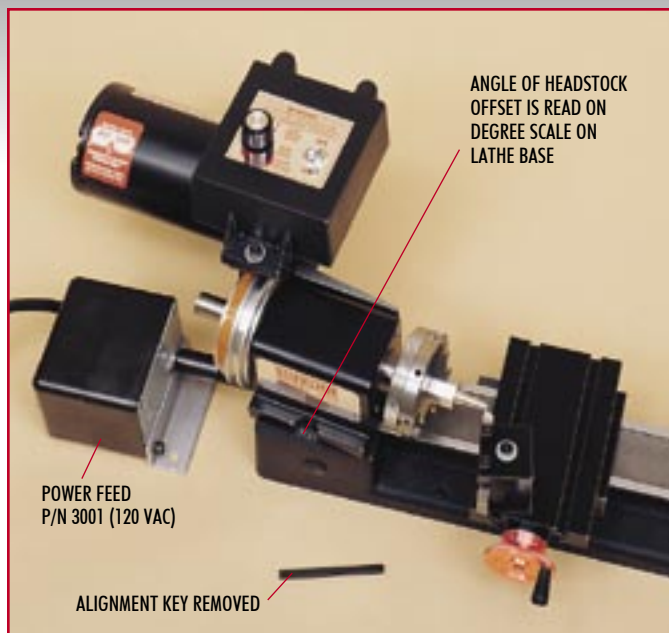
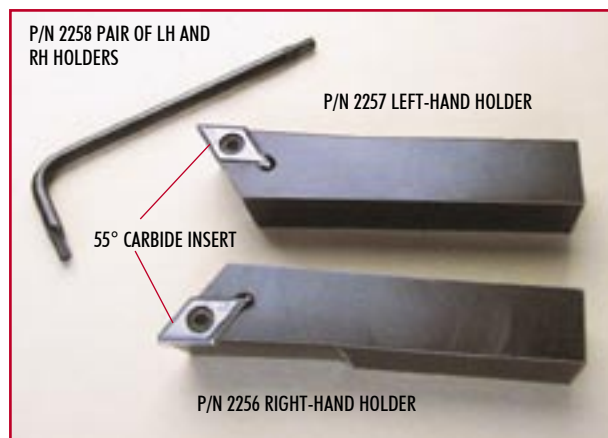


Figure 8—One advantage of the Sherline lathe design is the ability to turn tapers without a special attachment. Here, a three-jaw chuck holds a piece of hex stock. The alignment key (foreground) has been removed so the headstock can be rotated to a slight angle so a taper can be turned. A P/N 3001 power feed accessory is also shown installed to provide a smooth, even finish on the part. (See page 21 for more on the power feed.)

35° RH and LH Carbide Insert Tool Holders, P/N 2258

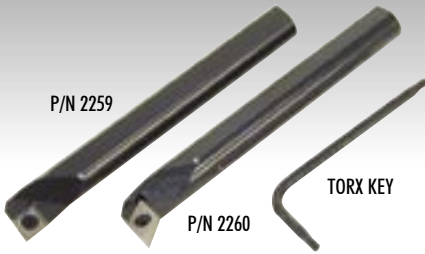
Sherline now manufactures its own inserted tip carbide tool holders. They are available individually as a right-hand holder (P/N 2256) or a left-hand holder (P/N 2257). The pair of RH and LH is P/N 2258. Each comes with a P/N 7605 55° carbide insert, hold-down screw and special Torx key. The 3/8" square shank is held in a P/N 7600 tool post (See page 11) or the 2282 quick-change tool holder (See page 20). The 35° offset angle of the tip makes it easier to accomplish certain cuts. For example, by using the tool holder square with the crossslide, you can turn an O.D. up to a shoulder and then finish the shoulder by backing the tool out while still maintaining the proper tool clearance. The holders are made from case hardened steel with a black oxide finish.



35° carbide insert holders and Torx wrench. The 3/8" shank fits tool post P/N 7600 or quick-change holder P/N 2282.

New Ceramic Insert Holder, P/N 2267

See New Products on Page 41



**Inserted Tip Carbide
3/8" Boring Bars, P/N
2261**

These boring bars are available individually as an 80° holder (P/N 2259) or a 55° holder (P/N 2260). The pair of both holders is P/N 2261. Each comes with a carbide insert, hold-down screw and special Torx key. The 3/8" round shank is held in a P/N 7600 tool post or P/N 2250 quick-change tool post. The 2260 holder accepts a 55° insert and requires a minimum hole size of 3/4". The 2259 holder accepts an 80° holder and fits into a minimum hole size of 1/2". In addition to fitting into a smaller hole, the 80° insert offers a little more strength, while the 55° insert will cut into a sharper corner. The holders are made from case hardened steel with a black oxide finish. A flat is ground on one side so the two hold-down screws of the 7600 tool post can tighten against it to keep the tool from rotating. Overall length of the holder is 3-1/4", and with both hold-down screws engaged it can be extended to bore a hole a little over 2" deep.

Center Drill Set, P/N 3021



Center drills are used with the lathe to drill a hole in the end of stock for mounting between centers in the lathe. They are designed to drill a small diameter pilot hole followed by a 60° countersink that provides a bearing surface for the 60° point of the lathe center. Center drills are also used extensively with the milling machine to accurately start holes. The large diameter shank on the center drill holds the drill point right on center and keeps it from "walking" as the hole is started. Once the hole is started, the center drill is replaced with a drill of the desired diameter and the hole is finished.

The center drill set includes a #1, #2 and #3 double-ended high-speed steel drill. The #1 drill has a 1/8" shank, the #2 drill has a 3/16" shank, and the #3 drill has a 1/4" shank. These and other smaller sizes are available individually.

Tool Height Gage, P/N 3009



This steel gage offers a simple way to assure the tip of your cutting tool is set to the centerline height of the lathe. The lower lip is for tools in the standard tool post, while the upper lip is used with the riser tool post. Just set the gage on the lathe table and position it in front of the tool tip to check height. It is much quicker and easier than checking height against a center in the headstock or tailstock.

WW Collet Set, P/N 1160 (Metric P/N 1178)

Collets provide a quick, easy method of mounting cylindrical parts or bar stock in the lathe with a great deal of centering accuracy. Each collet is actually a small, precision 3-jaw chuck that fits into a special tapered adapter in the headstock. A drawbar that passes through the headstock and threads into the back side of the collet is used to

draw the collet up into the tapered adapter. The adapter causes the jaws of the collet to close down, gripping the part to be machined. Typically, collets provide a very accurate part mounting system, but each size collet can accommodate only a small range of diameters of approximately ±.001-.002" (.02 mm).



The WW collet set includes an adapter, drawbar, knockout bar and five collets.

WW collets differ from milling collets (P/N 3060) in that WW collets have a hole all the way through the collet and drawbar. The maximum diameter stock that can pass entirely through the collet is 3/16" or 4.5 mm. The WW collets that are larger than this diameter are sometimes referred to as "pot" chucks. (See Figure 24.)

The Sherline WW collet set includes a WW style collet taper adapter, a drawbar, and a set of five WW collets with .275-40 thread, sizes 1/16", 1/8", 3/16", 1/4", and 5/16". A metric (P/N 1178) WW collet set is also available and includes sizes 2.0 mm, 3.0 mm, 4.0 mm, 5.0 mm, and 6.0 mm. These collets are manufactured by Sherline and are built to standard WW specifications; however, we have come across collets that are called WW and will not fit our drawbar and adapter. Be sure to check WW collets made by other manufacturers to be sure they fit our adapter before you purchase them. Sherline manufactures a slightly larger .315" (8.0 mm) adapter and drawbar set (P/N 1163) that will accommodate some of these other brands.



Collet pot chucks, 2100, 2101 and 2102

**Collet Pot Chucks—3/4", 1", and 1-1/4",
P/N 2100, P/N 2101 and P/N 2102**

These collets can be easily machined and are especially designed to hold larger and odd shaped parts. A 1/8" dowel pin is included with the collet to close on while the face is being machined. They require the WW collet adapter and drawbar, P/N 1161, which is purchased separately.

NOTE: Collet pot chucks are designed to hold material only on the face end, not through the collet. Maximum gripping depth is 3/16" (4.8 mm).

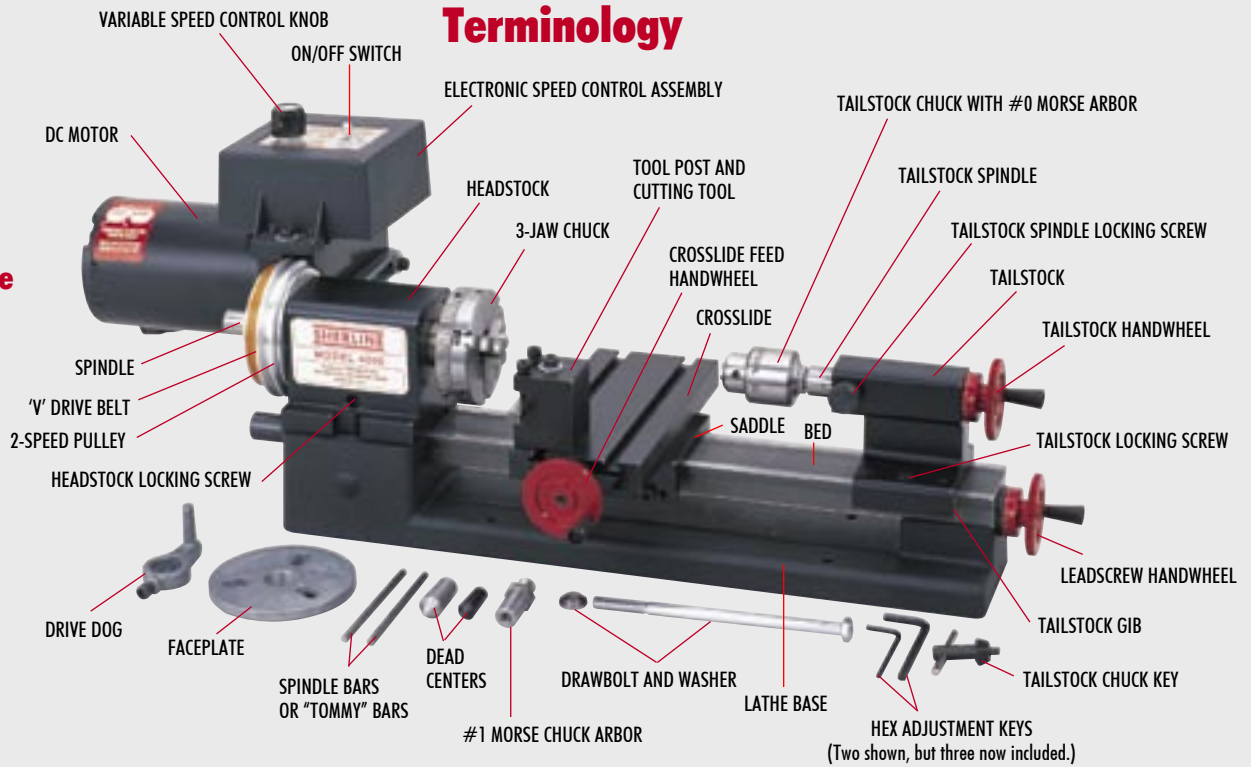
1" WW Collet Blank, P/N 2083

To make it easy for you to make your own custom tool holder, we now provide a 1" (25.4 mm) diameter blank collet without hole or slots. It is made from free machining steel so you can drill and machine it to whatever shape you need. The shaft is pre-machined and threaded to accept your WW collet holder.



Terminology

Lathe



Vertical Mill

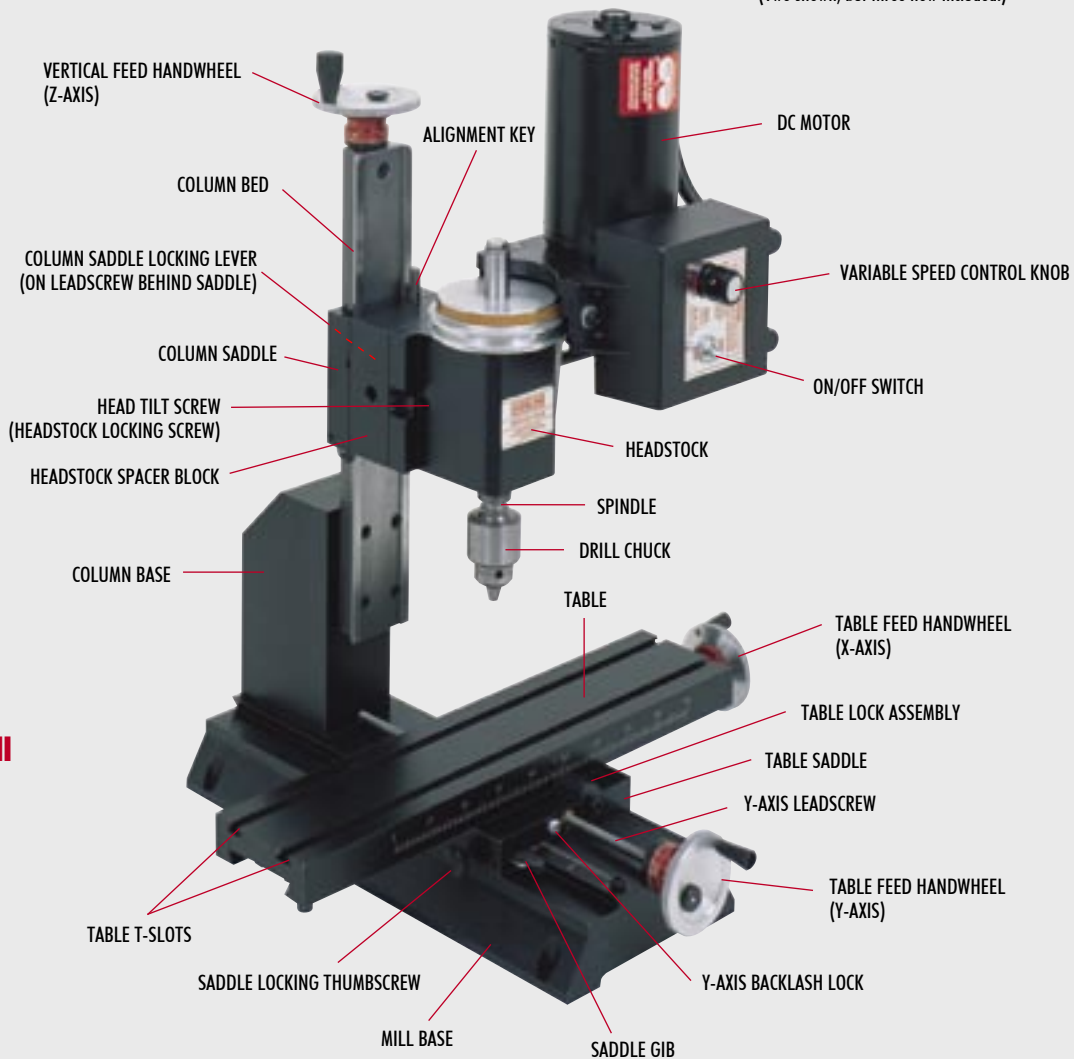


Figure 9—Parts terminology for the lathe and vertical milling machine. Some optional items are shown.

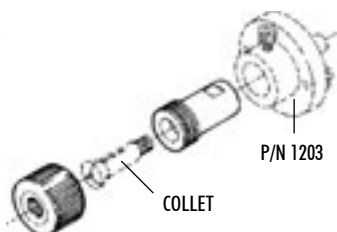


Deluxe WW Collet Set, P/N 1162 (Metric P/N 1179)

This set contains a complete selection of 17 (14 for the metric set) Sherline WW collets, including a blank, 3/4" and 1" pot chucks with 1/8" dowel pin, an adapter, drawbar and a knockout bar. It is packaged in an attractive wood box with a brass latch and hinges. A machined wood insert locates each part, plus a drawing in the lid reminds you where each part goes to keep things organized. Extra holes are provided should you want to add additional collets to suit your particular needs. (See the "New Products" section on page 41 for the complete 78-collet metric set.)

"Sherline has proven to me to be a great company in so many ways. Not only are your machines excellent to work with, but your commitment to furthering the model engineering hobby has been outstanding. Very few companies are interested in anything more than turning a profit, and it is refreshing to find one that does so much more."

Ron Colonna
Pennsylvania



Sherline WW Collet Adapter, P/N 2085 and 8 mm Collet Adapter, P/N 2086

Held in the adjustable tailstock tool holder, P/N 1203 (Not included), the collet adapter allows the use of WW collets in the lathe tailstock. This means you can hold extremely small drills accurately on center. Drills of only a few thousandths of an inch are easily broken if not perfectly centered. Complete instructions are provided with the adapter to help you precisely align the headstock and tailstock of your Sherline lathe. When you consider the alternative is to spend thousands of dollars for a jeweler's lathe that is far less versatile, the time is well spent.

Adjustable Live Center, P/N 1201

(See Figure 10.) A live center is held in the tailstock of a lathe and supports the unchucked end of the work while



FIGURE 10—Adjustable tailstock tools make it possible to achieve "perfect" alignment between the headstock and the tool held in the tailstock. From left to right are the adjustable live center, adjustable drill chuck holder, adjustable custom tool holder and adjustable 1" die holder. The 1204 holder is similar to the 1202 but with a 0 Jacobs male taper to accept the 5/32" Jacobs chuck.

allowing it to rotate easily on a bearing, as opposed to a standard "dead" center that does not rotate. If the point of the center is not in perfect alignment with the shaft, or if the center mark on the part is not dead-on, the part will "run out" (wobble), making precise machining impossible.

An adjustable live center allows you to precisely position the center point. The center is attached to one plate, while the shaft is part of another. Two slightly oversize holes in one side allow adjustment screws to be loosened, the center located and then locked down where you want it. In this manner, highly accurate centering can be achieved. If the ultimate in accuracy is your goal, the adjustable live center will help you achieve it.

Adjustable Tailstock Chuck Holders, P/N 1202, 1204

(See Figure 10.) Much like the adjustable live center, holding a tailstock chuck in perfect alignment without some method of adjusting it can be difficult or impossible. The adjustment screws and split design allow perfect centering for the chuck, should the quality of your work demand it. P/N 1202 accepts 1/4" and 3/8" Chucks. P/N 1204 accepts a 5/32" 0JT Jacobs chuck. (Chucks not included.)

Adjustable Tailstock Custom Tool Holder, P/N 1203

(See Figure 10.) By making your own custom split collet with a 5/8" outside diameter, this part can hold almost any tool you wish to adapt to it. A set screw tightens on the split collet to hold the tool in place. It is also used to hold the collet adapter, P/N 2085/2086. The split face design with adjusting screws allows perfect centering of the tool's tip. Like the previous tools, it is designed for the machinist seeking every advantage in the quest for total accuracy.

Adjustable Tailstock 1" Die Holder, P/N 1206

(See Figure 10.) The 1" die holder utilizes the same split design to achieve centering accuracy. A 1" button die is held in the face plate, and shafts held in a chuck or collet in the lathe headstock spindle can be threaded. The tailstock is not tightened to the bed, so the die is free to feed itself onto the part as the part is rotated by hand with the spindle using the large handwheel from the thread-cutting attachment or the P/N 2049 spindle handwheel. Included is a 13/16" bushing that allows smaller dies of that size to be held as well.

Quick-Change Tool Post and Three Holders, P/N 2250

(See Figure 11 on next page.) This accessory brings to your Sherline lathe the ability to change tools quickly and easily.

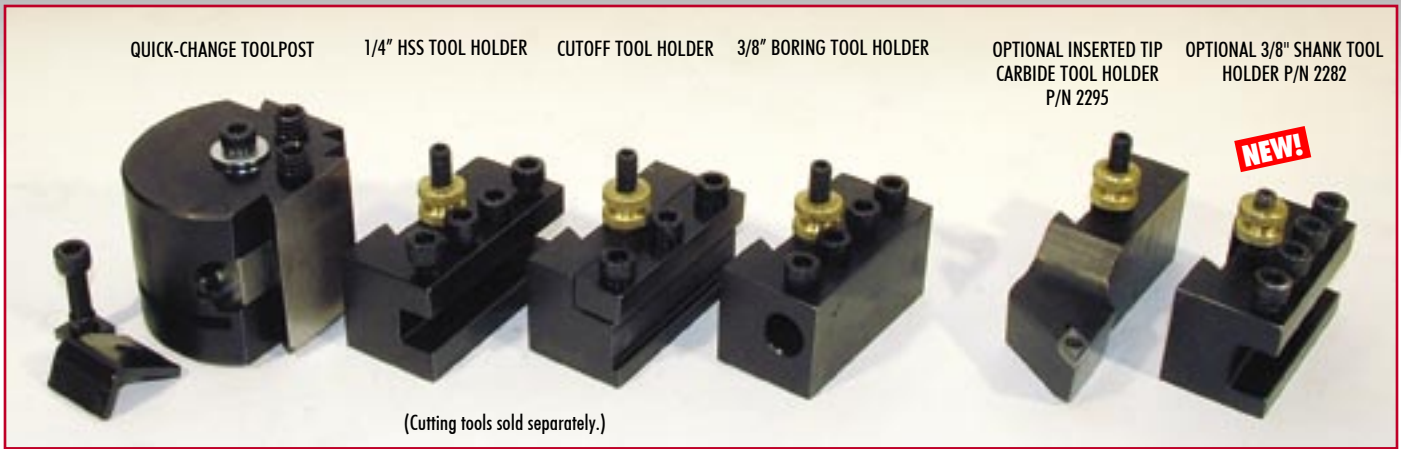


Figure 11—The tool post at the left has two machined dovetails to accept the various holders. The three holders to the right of the tool post come with the P/N 2250 set. They hold (L to R) a 1/4" HSS cutting tool, a cut-off blade and a 3/8" round boring bar. A clamp and T-nut are included. To the right of the photo are two optional holders. P/N 2295 comes with a 55° carbide insert and P/N 2282 holds 3/8" square shank tools like the 2256, 2257, 2265 and 2267. The post and holders are all machined from steel and have a black oxide finish. Knurled brass knobs adjust tool height.

It uses a dovetail design to locate removeable holders in a fashion similar to that used in production machine shops. Included with the case hardened steel tool post are three interchangeable steel holders designed to hold a 1/4" cutting tool, a 3/8" diameter boring tool and a Sherline cutoff tool. (Tools sold separately.) An optional holder for inserted carbide tips is also available as P/N 2295. Each holder has a knurled brass knob that allows you to easily adjust the height of the tool tip. Changing tools is simply a matter of releasing the locking screw, sliding out one tool holder, sliding in another and re-locking. If you find your jobs require a lot of tool changes, this timesaving accessory will make your projects that much more of a pleasure.

Quick-Change Tool Post Riser, P/N 2251

Now your Sherline quick-change tool post system can be used with the riser blocks in place when turning larger diameter parts. This 1.25" riser base brings the cutting tool up to the proper height when the headstock riser block is used on the lathe. It is made from solid steel with a black oxide finish to complement the high quality of the quick-change tool holder components.

Crossslide Accessory Plate, P/N 3017

The table on the mill is thicker than the table on the lathe because of the greater forces transferred to the table in milling and the requirement for stiffer setups. When using the vertical milling column on the lathe, the table can be "beefed up" with the addition of this plate, which adds 1/2" of thickness to the table. It also serves as a tooling plate that protects the surface of your lathe table from damage. The plate attaches to the table by means of four recessed cap screws and T-nuts. It must be removed for lathe turning to maximize the diameter of part that can be turned and so that the standard tool post can be used.

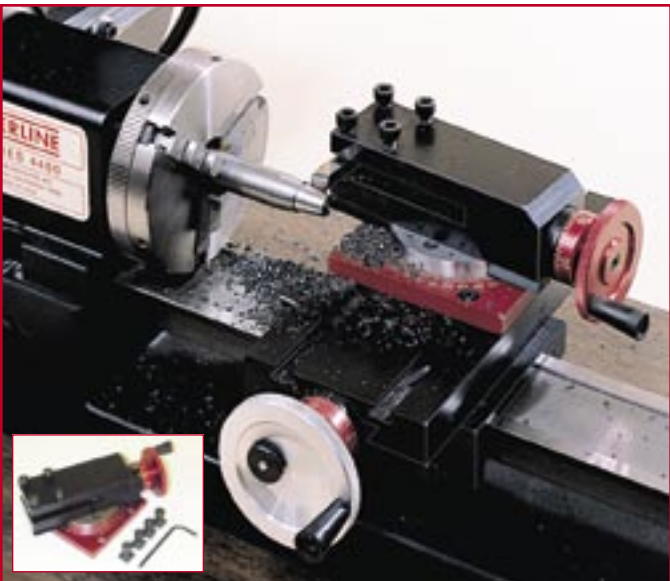


Figure 12—The compound slide offers another way to cut tapers. The slide is used on the "back" side of the table with the tool upside down. An inset shows the slide by itself.

Compound Slide, P/N 1270 (Inch) or P/N 1280 (Metric)

(See Figure 12.) The compound slide offers a way to turn tapers and cut angles on a lathe without rotating the headstock. Four mounting holes are provided in the base for solid positioning on the crossslide. The base has a red anodized finish with laser engraved angle scales to make setting an angle easy. It utilizes a highly efficient locking ring design to lock it in position without having to overtighten the locking screws. A 1/4" cutting tool can be mounted across the front or on either side of the head.

Unlike compounds used on full-size, conventional lathes, this one was designed to be used from the "back" side of the table. This allows it to be designed in a more compact size and used without interference from the crossslide handwheel. The lathe tool is inserted in the holder "upside down" so the cutting tip faces downward. Because of the small size of the miniature lathe, operating the crossslide handwheel in this position is just as convenient.

Looking for metal in small quantities for your projects?
Find a list of suppliers at www.sherline.com/online.htm.

Compound Riser, P/N 1272

This riser block is about 1" thick and allows the compound slide to be used when riser blocks are in place on the lathe. When mounted to the riser block, the compound slide is used on the "front" portion of the crossslide rather than in back, and the cutting tool is returned to the normal upright position.

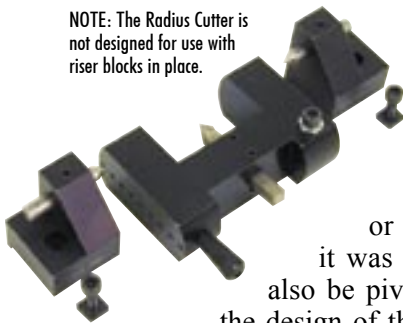


Figure 13—The radius cutting attachment can cut a convex or concave radius. Unlike most lathe operations, the tool is moved up and down rather than horizontally.

Radius Cutting Attachment, P/N 2200

(See Figure 13.) The radius cutting attachment swings a tool through an arc to put a radius on the end of a part. The pivot points and tool position are adjustable, so it is capable of cutting either a concave or convex shape.

NOTE: The Radius Cutter is not designed for use with riser blocks in place.



It came about as a result of studying the method used to shape grinding wheels. Conventional thinking says that lathe tools should move parallel to the tool's longitudinal axis or horizontally across it. Once

it was realized that the tool could also be pivoted vertically on this axis, the design of this tool became much easier to conceive. Believe it or not, a technician with a need to cut an accurate radius to make prosthetic eyeballs got us started on putting this tool into production. Now anyone with a need to put a nice looking radius on the end of a part can benefit from the way this accessory makes it easy. It may not be something that a lot of people need, but it is typical of our commitment to serve *all* of our customers. If you need to (or just think it would be fun to) put a radius onto or into the end of a part, there is no easier way to do it than with this accessory. It can also cut a complete ball in a two-step operation covered in the instructions.

120V Power Feed, P/N 3001

(See Figure 8 on Page 16 for power feed in use.) Reducing the diameter of a long shaft or a long part can be a tedious task.



Obtaining a good finish on such a part requires very steady movement of the cutting tool; something hard to achieve when feeding the tool by hand. For this reason, Sherline has developed a simple power feed attachment for the lathe. It consists of a constant speed gear motor complete with "ON" and "OFF" switch, a simple, easy-to-install mounting bracket and an engagement mechanism that permits quick disengagement of the motor so that you can hand-feed the cutter whenever you desire. The power feed is from right to left at a constant (non-adjustable) speed of approximately .9" (23 mm) per minute. It is not designed for use with the thread-cutting attachment. A 240 Volt version is no longer available.

#0 Morse to 3/4-16 Chuck Adapter, P/N 1230



This adapter fits into the #0 Morse taper of the tailstock to allow Sherline chucks with a 3/4-16 spindle thread to be mounted to the tailstock for holding tools or work. This is a simple and inexpensive way to increase the versatility of your lathe.

Vertical Milling Table, P/N 1185 (Metric P/N 1184)

The vertical milling table is another method of milling on the Sherline lathe instead of using the vertical milling column. For general milling we recommend the vertical milling column, but for specific setups you may find this accessory useful. Many older books written for the hobbyist show this type of setup on larger lathes.

The Sherline vertical milling table is mounted on the lathe crossslide. Vertical table travel is 2.25" (57 mm). This allows work to be moved up or down on the vertical milling table, back and forth with the crossslide, and in and out with the leadscrew, which covers all the axes needed for milling. This accessory takes two minutes or less to mount on a Sherline lathe. Many of our customers have also found uses for the vertical milling table on special machines that require a reasonably priced, small precision slide.



Tailstock Spindle Extender, P/N 1220



Certain setups on lathes with the old style tailstock (made prior to July, 1996) are made possible by the use of the tailstock spindle extender, because it adds 1-1/2" to the reach of the tailstock spindle. Although the new cutout tailstock design usually eliminates the need for this part, some setups can still make use of this accessory to get extra reach over the table without over-extending the tailstock spindle.

Headstock Riser Block Set, P/N 1291

(See also Figure 14.) A 3.5" (88.8 mm) diameter part is the largest part that can be accommodated in the basic Sherline lathe. However, occasionally it may be necessary to work on something larger. The Sherline riser block set increases the maximum working diameter of the lathe to 6" (152 mm). P/N 1291 includes a 1-1/4" (31.7 mm) riser block to fit under the lathe headstock and a riser rocker tool post that raises the cutting tool by a corresponding amount.

This useful accessory greatly expands the capability of the lathe. (If you are using the P/N 2250 quick-change tool post, a riser for that tool post is available separately as P/N 1289.)

Tailstock Riser Block, P/N 1292

For those customers interested in turning larger diameters between centers, the tailstock riser block will raise the tailstock to correspond with the 1291 riser block kit above, allowing you an additional 1-1/4" (31.7 mm) of clearance. The tailstock riser block has a two-part dovetailed base to allow for easy installation and secure locking to the bed.



Steady Rest Riser Block, P/N 1290

The steady rest can be used with the riser blocks in place by using the steady rest riser block to bring it up to the same height as the headstock and tailstock. An example of where it might be used would be in turning a large diameter part that has a long shaft that needs to be steadied to keep it from wobbling or for those who leave their riser blocks in place all the time yet still need to center drill small stock.



Riser Cutoff Tool and Holder, P/N 1296

This accessory is not meant to imply that you can part off large stock, but many people leave their riser blocks in place when doing operations on small diameter stock, and this accessory allows you to use the cutoff tool without removing the riser blocks. It is used on the "back" side of the



PROJECT: 9-cylinder radial model engine. It is very small (note size of dime in center) yet it is beautifully crafted. It is typical of the type of projects that can be produced with high quality miniature machine tools.

Built by Charles Herman, Jr.

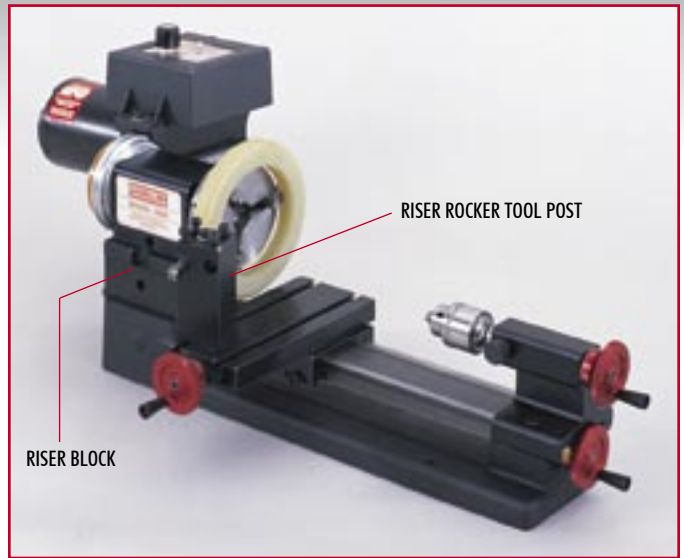


Figure 14—Larger parts up to 6" (152 mm) in diameter can be turned on the lathe using the riser block kit shown above. Parts over 4" (102 mm) in diameter can be turned between centers over the table.

part with the blade upside down to reduce "chatter". The extra wide base adds to stability. (Cutoff tool and holder P/N 3002 are shown but sold separately. See page 11.)

Think big, build small, have fun!

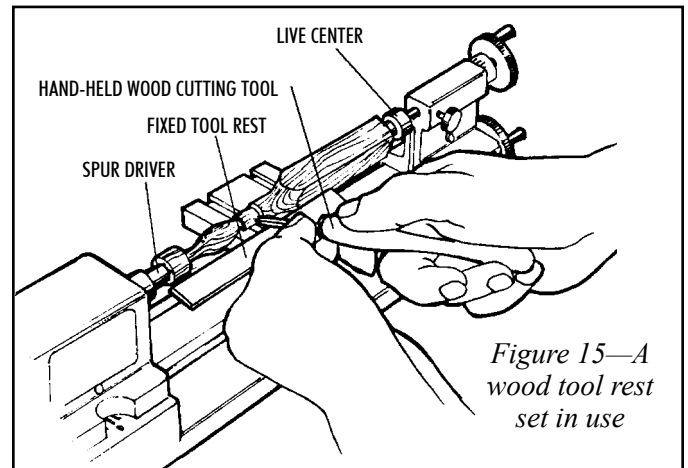
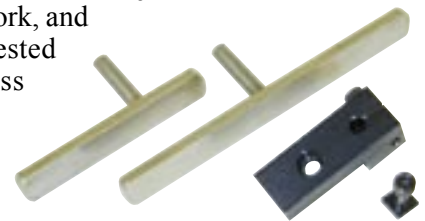


Figure 15—A wood tool rest set in use

Wood Tool Rest, P/N 3038 and P/N 3047

(See Figure 15.) The Sherline lathe is used by many hobbyists to turn wooden parts. In wood turning, the chisel-like tool is held by hand rather than in a tool holder as is used to cut metal. These adjustable 3" and 5" rests are placed near the work, and the cutting tool is rested on and moved across their surface to cut wood. The design of the tool rest support system allows great flexibility in adjustment for position. Socket head screw and T-nut fasteners are included for mounting the base to the crossslide. (Continued on page 25.)



Sherline Machine and Accessory Packages

Save money when you buy as a package deal!



Sherline's Ultimate Machine Shop Package...Set up a complete machine shop with just one purchase!

Buying tools as a package offers two advantages. First, we have made it easier by helping you with the selection of the most important items when setting up a shop. In addition, we have reduced the price of each package to save you some money compared to buying all the items individually. (Accessories are prepackaged for shipment, so we cannot make substitutions at the discounted price. Additional accessories may be purchase separately.)

The opposite page shows some of the lathe and mill packages available. The Ultimate Machine Shop package shown above includes a long bed lathe and deluxe mill plus all of the most important accessories most people choose when setting up a shop. The package can be purchased with either the 5400-series or 8-direction model 2000 mill. It can also be ordered with digital readouts or stepper motor mounts installed. Here is what you get in the package:

Machine Tools

- P/N 4400/4410 3.5" x 17" deluxe long bed lathe (See page 10)
- P/N 5400/5410 deluxe mill (Pg. 27) or P/N 2000/2010 8-direction mill (Pg. 28)

Lathe Accessories

- 1040 3.1" 3-Jaw self-centering chuck
- 1069 3/8" Jacobs drill chuck, key, #0 and #1 Morse arbors and drawbolt
- 1074 Steady rest
- 1191 Live center
- 3002 Cutoff tool and holder
- 3007 3-piece 1/4" HSS cutting tool set (RH, LH, Boring)

Mill Accessories

- 1297 Headstock spacer block (with 5400/5410 mill only)
- 3013 Step block hold-down set
- 3052 Fly cutter with 1/4" brazed-tip carbide cutting tool

- 3054 Boring head, inch (P/N 3049 metric boring head with metric orders)
- 3060 3-piece mill collet set w/ drawbolt
- 3063 Boring tool (5/16" min. hole, 1" max. depth)
- 3072 1/4" Jacobs drill chuck and key w/ #1 Morse arbor and drawbolt
- 3079 3/8" End mill holder
- 3551 Milling vise
- 3700 4" Manual rotary table (P/N 8730 4th axis CNC rotary table with stepper motor included with 8600/8601 and 8220/8621 CNC shop packages)
- 3750 Tilting angle table
- 7400 6-piece 3/8" shank double-ended, 2-flute end mill set

Other Accessories

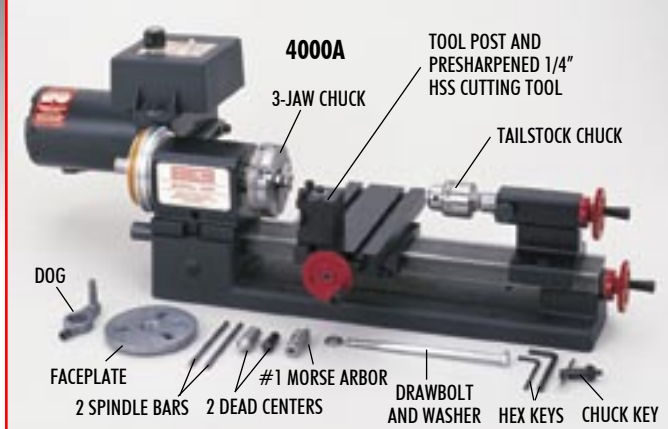
- 3020 Sherline 5/32" hex T-driver
- 3021 3-piece center drill set
- 5327 **Sherline Accessories Shop Guide** instruction book
- 5330 Safety glasses

P/N 6000 (inch) or P/N 6010 (metric)—Ultimate Machine Shop Package with P/N 5400-series mill

P/N 6200/6210—as above but with P/N 2000-series mill

P/N 8600/8601—Ultimate CNC Machine Shop Package with 5400-series mill, steppers, 4-axis driver, computer and software

P/N 8620 /8621—As above but with 2000-series mill



Sherline Lathe and Mill Accessory Packages

Unless you are replacing an existing Sherline machine, most new machinists need certain accessories right away in order to get started. Chucks, holding fixtures and cutting tools are the most often purchased and are, therefore, included in these popular, money-saving packages. Lathe packages include your choice of Model 4000 or 4500-series 3.5" x 8" lathe or deluxe model 4400-series 3.5" x 17" lathe and the following accessories:

Lathe "A", "B" and "C" Packages...

"A" Packages Include Lathe PLUS:

- 3-Jaw chuck (2.5" with 4000-series lathes, 3.1" with 4400-series lathes)
- Tailstock drill chuck (1/4" with 4000-series lathes, 3/8" with 4400-series lathes)

"B" Packages Include "A" package chucks PLUS:

- 1074 Steady rest
- 1191 Live center
- 3002 Cutoff tool and holder
- 3007 3-piece 1/4" HSS cutting tool set (LH,RH, Boring)
- 3020 5/32" Sherline hex T-driver
- 3021 3-piece center drill set
- 5327 *Sherline Accessories Shop Guide* book (224 pages, B/W)

4000B/4100B (3.5" x 8" lathe) Save \$65.00

4400B/4410B (3.5" x 17" lathe) Save \$75.00

"C" Package includes all "A" and "B" package items PLUS:

- 1270 Compound slide
- 3100 Thread cutting attachment

4000C/4100C (3.5" x 8" lathe) Save \$75.00

4400C/4410C (3.5" x 17" lathe) Save \$85.00



Milling Machine "A" Packages...

Mill "A" packages include your choice of 5000-series, 5400-series or 2000-series mill and the following accessories:

"A" Packages Include:

- 1072 1/4" drill chuck with key, arbor, drawbolt
- 3013 Step block hold-down set
- 3020 5/32" Sherline hex T-driver
- 3021 3-piece center drill set
- 3052 Fly cutter with 1/4" carbide cutting tool
- 3060 3-piece mill collet set with drawbolt
- 3079 3/8" end mill holder
- 3551 Milling vise
- 5327 *Sherline Accessories Shop Guide* book (224 pages, B/W)
- 7400 6-piece, 3/8" shank, double-ended, 2-flute end mill set

5000A/5100A (Standard mill with 10" base) Save \$45.00

5400A/5410A (Deluxe mill with 12" base) Save \$50.00

2000A/2010A (8-direction mill with 14" base) Save \$50.00

• For digital readouts, add "—DRO" to part number

• For CNC-ready machines, add "—CNC" to part number

• Accessory packages also available with full CNC machines.

By special request from a number of our wood turning customers, we offer a set of wood tool rests with extended bases (P/N 3047). These are designed to accommodate the additional height needed when using riser blocks (P/N 1291 and 1292) to work on larger diameter parts.



Spur Driver, P/N 3035

The spur driver is used in the headstock to drive wood when turning between centers rather than using the 3-jaw chuck. It has a point and four sharp blades that grip a wood part from the end to drive it. (See Fig. 15, page 22.)

Toggle Switch Dust Cover, P/N 3015

Working with brass or wood often generates a very fine dust that can work its way into the toggle switch, eventually causing your machine to work erratically or even short out. This special nut with a built-in seal replaces the standard mounting nut on the speed control on/off switch. The soft silicon collar slips over the head and shaft of the toggle switch and seals out fine dust to keep the inside of the switch as clean as new for years of reliable operation. This is an easy and inexpensive way to avoid possible headaches later on.



“Presently, I own a Sherline lathe and vertical milling machine. They are very versatile in every machining aspect and small enough to be kept in cupboards. Thank you, my hunt for a good compact lathe/mill machine is over.”

S. Wan
Singapore

Knurling Tool Holder, P/N 3004



Sherline’s knurling system can add that “professional” look to your parts. Knurls are embossed into the surface of a part rather than cut. Straight knurls are often used on the end of a shaft that is to be pressed into another part. Straight or diamond knurl

patterns are used to provide better grip on handwheels and thumbscrews.

The holder consists of a right and left side that evenly tighten down on your part, creating a knurled pattern. The holder is supplied with one set of spiral knurls that creates a diamond pattern. Other size knurls for diamond or straight patterns are also available as options. The tool will handle diameters up to 1" (25 mm).

NOTE: The knurling tool was not designed for use with riser blocks.

55° Negative Rake Insert Tool Holder, P/N 7610

If you have trouble grinding good tools or if you choose to work with difficult materials such as stainless

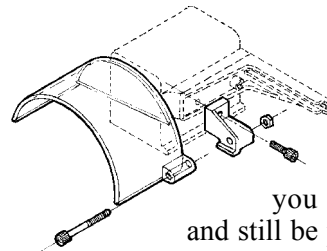
steel, this tool holder will bring a great deal more enjoyment to your machining. Manufacturing it from 7075 aluminum, which is approximately twice as hard as regular T6 aluminum, insures a long life for the holder. The carbide insert is designed in such a way that it cuts like a positive rake cutter. Positive rake cutters don’t require as much rigidity as negative rake cutters. This type of design allows the advantages of a negative rake cutter (four cutting edges per insert) without requiring the rigidity that can’t usually be found in smaller, bench-type lathes.



Carbide cutters give good finishes on hard-to-machine materials such as cold rolled steel. (They will also work on aluminum, brass or leaded steels, and will last practically forever; however, the best finishes on those materials are still achieved with a good, sharp high-speed steel tool.) The holder comes with one four-sided carbide insert. Replacement cutters are available from Sherline (P/N 7612) as well as from other sources. Though not inexpensive, when you consider you are getting four cutting tools in one and are saving a lot of time in tool sharpening, it really is a pretty good deal.

NOTE: The insert tool holder was not designed for use with riser blocks.

Chip Guard, P/N 4360



The chip guard mounts to the headstock and swings down over the faceplate or chuck. It is made of a tough, clear polycarbonate material, so

you can see what you are doing and still be protected from flying chips. It swings easily out of the way for setups. It is not recommended as a replacement for safety glasses, but rather as an additional safety feature. It also helps keep your work area cleaner by containing chips in a smaller area. It was designed to meet the compliance requirements of countries that require a chip guard.

Lathe Vinyl Dust Cover, P/N 4150 (for 4000 and 4500-series lathes) and P/N 4151 (for 4400-series lathes)

(See Figure 16 on next page.) Fitted 6-mil vinyl dust covers are available for the two different size lathes. They extend the life of your machine and keep it looking like new by keeping it clean and dust-free when not in use. The clear

A Contest for Miniature Machining Projects

Each April Sherline sponsors a contest called the “Sherline Machinist’s Challenge.” Entry is free and up to \$2500 is awarded. Special awards are available for novices (less than 2 years experience) and entrants under age 20. Call or visit our web site at www.sherline.com/challen.htm for rules and an entry form.



Figure 16—Once your machine is cleaned up, a fitted vinyl cover will help keep it that way until the next use.

covers have a red Sherline logo printed on them. Add a professional touch to your workshop with these fitted covers.



Figure 17— Sherline offers arbors and adapters to add versatility to existing jeweler's lathes that take 8.0 mm and 10.0 mm "D" collets.

Attention Watch and Clock Makers...

(See Figure 17.) Sherline makes a number of accessories to make your job easier. Shown above are some of the chuck arbors, gear-cutting arbors and 10.0 mm collet pot chucks. In addition, we offer a selection of WW collets, a tailstock WW collet adapter (See page 19) as well as adapters that allow you to use our 3- and 4-jaw chucks on your jeweler's or watchmaker's lathe. Take advantage of the versatility of the Sherline system of tools and accessories. If you're looking for a new lathe or ways to make your old lathe more versatile, check out all that Sherline has to offer.

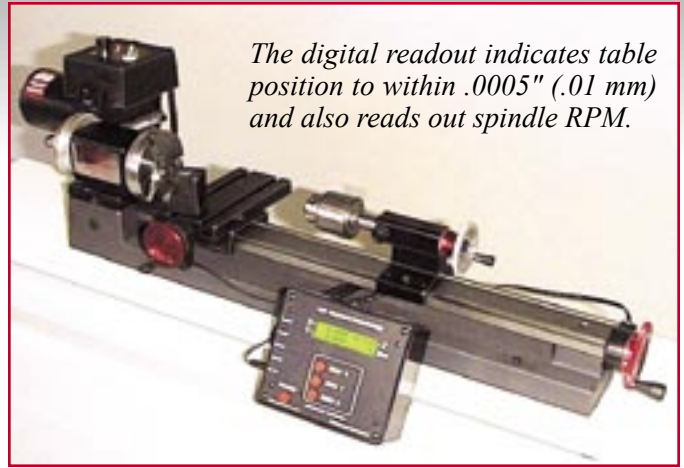
NOW AVAILABLE: 8.0 mm and 10.0 mm collet-to-live center adapters for your watchmaker's lathe. 8.0 mm—P/N 2106, 10.0 mm—P/N 2107.

W.R. Smith T-Rest, P/N 2110



The W.R. Smith T-rest turns your Sherline lathe into a first class clockmaker's lathe. The T-rest supports a handheld "graver", the traditional metal turning tool of watch- and clockmakers.

A T-rest is used by watchmakers to support a handheld cutting tool called a "graver". World-renowned watch- and clockmaker, William R. Smith has designed a T-rest especially for the Sherline lathe. It is of solid steel



The digital readout indicates table position to within .0005" (.01 mm) and also reads out spindle RPM.

construction and clamps to the lathe's bed in seconds. If you are interested in watch or clock repair or construction but wanted a tool system more versatile and less expensive than a jeweler's lathe, this T-rest makes a Sherline lathe a most attractive choice.

Lathe Digital Readout with RPM Gage, P/N 8200

(See photo above.) A digital readout is available to read the position of the two lathe axes while also providing continuous RPM readout. It allows you to read the position of the leadscrew and crossslide to three and one-half decimal places (.0005") and either axis can be reset to a zero reading at any time with the push of a button. Now you can dial in dimensions larger than .050" (1 mm) without having to keep track of the number of handwheel rotations. If you use your lathe as a mill with the vertical milling column attachment, you can purchase a 3-axis DRO kit. If you add a 2-axis DRO to your lathe now and later purchase a vertical milling column, you can purchase a kit to add the third DRO handwheel and sensor at that time. New lathes can be ordered with the DRO already installed. See page 31 for more details on the similar DRO for the mill.

As a cost-saving measure, accommodation has also been made for owners of both a lathe and mill to use a single electronic display box for both machines. The input cables from the lathe can be unplugged and the readout box transferred from the lathe to the mill and vice versa. Depending on which machine you already have fitted with a DRO, ask for the upgrade for the other machine that allows you to use your existing box.

CNC-Ready and full CNC Machines

Any existing Sherline lathe can be retrofitted to accept stepper motors. They can also be ordered with just stepper motor mounts in place or as complete CNC systems with mounts, motors, drivers, software and a computer. See the CNC section on pages 43 and 44 for more details.

"Once again I must tell you how happy I am with the lathe and accessories, and my friends and family are too, as I make toys and things for them."

Kieth Yundt
Canada

Sherline Vertical Milling Machines

Model 5400 deluxe mill



The main difference between a lathe and a mill is that on a lathe, the work turns and the cutting tool is stationary, while on a mill, the tool turns and the work is stationary. Because of the tremendous number of operations that can be performed on a vertical mill, it is commonly regarded as the most important tool in the modern machine shop...the workhorse of the industry.

At first glance, a vertical mill looks similar to a drill press, but there are some important differences; such as, a spindle that can take side loads as well as end loads and an accurate method of moving the work in relation to the spindle on all three axes. Sherline milling machines can perform all of the tasks and operations that a large commercial machine can perform. Operations such as fly cutting, precision drilling and boring are all routine tasks for the Sherline mill. Because the tool turns rather than the work, much larger parts can be worked on in a mill, and these parts need not be round. The work is securely held, thus extremely accurate hole patterns can be drilled or bored. The longer X-axis table (side-to-side) throw also increases the machine's versatility over that of the lathe with the vertical milling column attachment. It is an extremely rigid, accurate tool that accomplishes tough machining jobs with ease.

In addition to the basic three axes of movement, known as the "X" (left/right), "Y" (in/out) and "Z" spindle (up/down) axes, Sherline mills also offer a headstock that can be tilted to either side to mill angled surfaces. The Model 2000 mill offers four additional directions of adjustment for those who wish the ultimate in flexibility. (See next page.)

Sherline milling machines are offered in four models and can be purchased in either inch or metric versions. The inch models have their feeds calibrated in .001" increments, while the metric model is calibrated in .01mm increments. The machines are equipped with a high-torque DC motor with variable speed control.

This speed control is internally equipped with a converter that automatically adjusts between inputs of 100 VAC to 240 VAC, 50-60 Hz, without loss of torque.

The saddle locking lever is typical of Sherline's policy of constantly striving to improve the accuracy, functionality and value of our machines. (See Figure 18.) This lock is standard on all new mills and vertical milling columns. In keeping with our goal to make all accessories and improvements compatible with existing machines, any older Sherline mill can be upgraded to add the new saddle lock by purchasing upgrade kit P/N 4017U, which includes the locking lever and a new saddle nut.

The differences between the various models of the standard, deluxe and multi-direction mills are described in the following pages.

Visit www.sherline.com/new.htm for new accessories added since this catalog was printed.



Figure 18—The saddle locking lever provides a positive lock for the Z-axis and is standard on all Sherline manual mills. CNC mills have a lock that also controls backlash.



Model 5000 mill

**Model 5000 Vertical Mill (Inch),
Model 5100 (Metric)**

The 5000-series mills feature a solid 10" (254 mm) aluminum base, precision machined dovetailed slides with adjustable gibs, permanently lubricated spindle bearings, adjustable preload anti-backlash feed screws on the X- and Y-axes, two 1-5/8" (41 mm) laser engraved aluminum handwheels, one 2-1/2" (63 mm) laser engraved

handwheel with thrust bearings, Z-axis locking lever and many other features found only on the best commercial machines. This milling machine, along with a Sherline

All Sherline mills are available "CNC-ready" with stepper motor mounts. Mills can also be ordered with Digital Readouts factory installed. See page 31 for details.

lathe, will enable you to complete almost any appropriately sized job in your own machine shop.

**Model 5500 Vertical Mill (Inch)
Model 5510 (Metric)**

The model 5500/5510 comes equipped with the same features and standard equipment as the model 5000/5100 but with the addition of upgraded adjustable "zero" handwheels. A 2" (51 mm) adjustable "zero" handwheel is provided on the X- and Y-axes, while a 2-1/2" (63 mm) adjustable "zero" handwheel with ball bearings is featured on the Z-axis column.

**Model 5400 Deluxe Vertical Mill (Inch)
Model 5410 (Metric)**

(See page 27.) The deluxe 5400-series mills come equipped with all of Sherline's standard features upgraded to include a laser engraved 12" (305 mm) solid aluminum base for 2" of additional Y-axis travel, laser engraved scales on the table and base, 2-1/2" (63 mm) adjustable "zero" handwheel on the Z-axis and 2" (51 mm) adjustable "zero" handwheels on the X- and Y-axes, a mill headstock spacer to provide more throat distance and a 1/4" drill chuck and drawbolt.

**Model 2000 8-Direction Vertical Mill (Inch)
Model 2010 (Metric)**

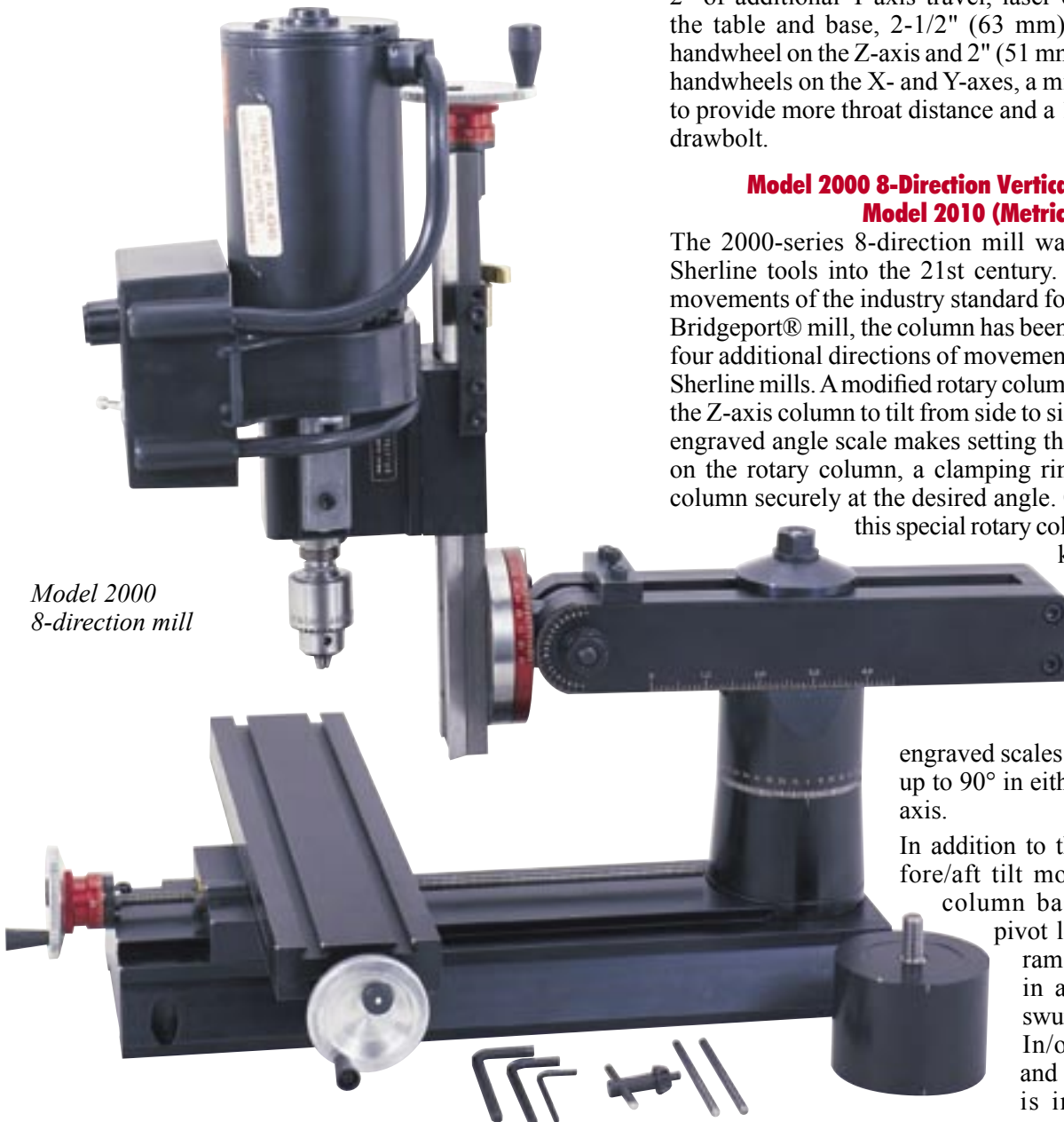
The 2000-series 8-direction mill was designed to take Sherline tools into the 21st century. Patterned after the movements of the industry standard for full-size mills, the Bridgeport® mill, the column has been redesigned to offer four additional directions of movement compared to other Sherline mills. A modified rotary column attachment allows the Z-axis column to tilt from side to side up to 90°. A laser engraved angle scale makes setting the tilt angle easy. As on the rotary column, a clamping ring design locks the column securely at the desired angle. On the back side of this special rotary column attachment is a

knuckle that allows the top of the Z-axis column to be tilted either toward or away from the operator. Laser

engraved scales indicate movement up to 90° in either direction on this axis.

In addition to the side-to-side and fore/aft tilt movements, the new column base offers a center pivot lock that allows the

ram to be moved both in and out as well as swung from side to side. In/out travel is 5.50" and side-to-side motion is indicated by laser



*Model 2000
8-direction mill*

engraved scales showing up to 90° of movement either way. These four movements are in addition to the standard mill's X-, Y-, Z-axis travel and headstock rotation movement, giving a total of eight directions of movement or tilt. This much versatility puts the Sherline model 2000 mill in a class by itself in this size range. It is a fully functional shop mill that fits on a tabletop and stores on a closet shelf. When used with accessories like the tilting angle table and rotary table, the machining possibilities of the mill are limited only by part size and the extent of your imagination.

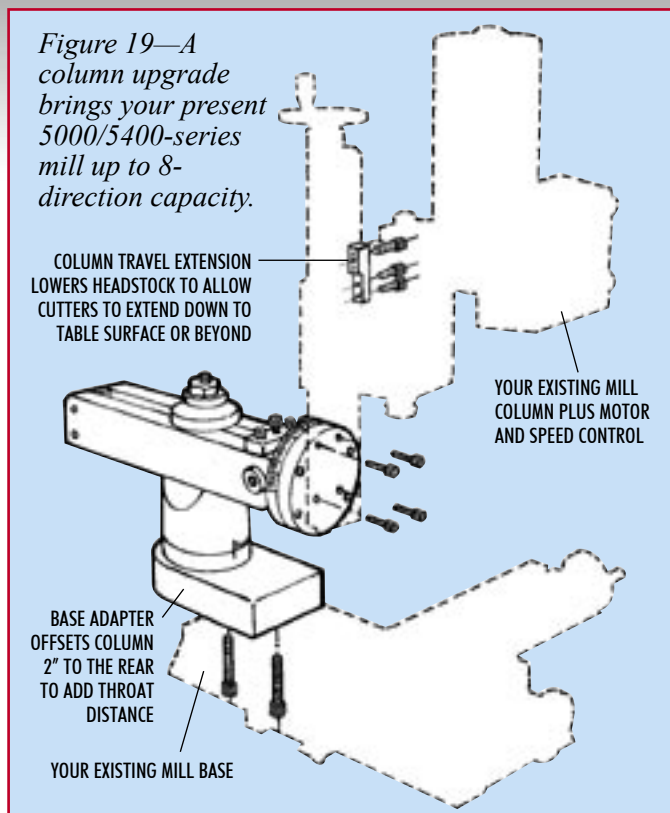
The 2000-series mill base has been extended an additional 2" over the Model 5400, extending the Y-axis travel to 7.0" (178 mm). This was done to accommodate the pivoting mechanisms and to take advantage of the increased arm movements. Like the deluxe Model 5400 mills, all handwheels are resettable to zero at any time.

The 8-direction mill includes the same laser engraved scales on the base and table as the 5400-series deluxe mill package. Also included is a 1/4" Jacobs drill chuck. (The headstock spacer block is not included on the 2000-series mill, as the ram travel makes it unnecessary.)

8-Direction Upgrade for 5000-Series Mills, P/N 5650 (Inch), P/N 5660 (Metric)

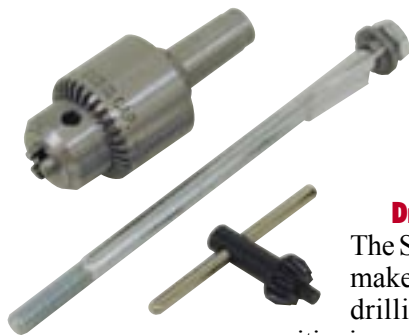
(See Figure 19.) If you already own a 5000-series Sherline mill, or if you purchase one now with the thought of upgrading later, an upgrade package is available to convert your mill to an 8-direction mill when you feel its additional

Figure 19—A column upgrade brings your present 5000/5400-series mill up to 8-direction capacity.



capabilities would be useful for your projects. Included is an adapter base and all necessary attachment screws. Also included is the column travel extension that allows the headstock to be brought down closer to the table. (See also Figure 33, page 39.)

Milling Accessories



1/4" Jacobs drill chuck, drawbolt and key

(Included with 5400-series and 2000-series mills)

Drill Chuck, P/N 3072

The Sherline milling machine makes an excellent precision drilling machine. Accurate positioning on both the X- and Y-axes provides a simple way to locate holes, and, although the standard Sherline mill does not have a quill feed, the Z-axis feed screw does give you micrometer accuracy for depth control. The drill chuck is similar to the tailstock chuck used with the lathe in that it holds drill bits from 1/32" (.79 mm) to 1/4" (6.4 mm). It is mounted on a #1 Morse arbor that has been drilled and tapped for a drawbolt. This prevents the arbor from working loose during use. The Sherline drill chuck comes complete with key, #1 Morse arbor, drawbolt and thrust washer.

A 5/32" Jacobs drill chuck is also available for use in the mill. P/N 1010 has a #1 Morse adapter pressed in and includes a drawbolt and washer. It is capable of holding drills as small as #80. The P/N 3073 3/8" Jacobs chuck can also be used on the mill. (See chucks on page 13.)

NOTE: These chucks are NOT designed for lateral loads and should not be used for holding end mill cutters. End mills should be held in a collet or end mill holder.

Boring Head, P/N 3054 (Inch), P/N 3049 (Metric)

It is hard to say what is the most important accessory for a milling machine. It really depends on the type of work you want to do, but certainly the boring head must rank highly in importance for any shop. What makes it so important

is that it provides a means of accurately machining almost any size hole. It

would be very impractical to own drills and reamers

for all the possible hole sizes up to 1.75" (44 mm) in diameter. Another

point to consider is the fact that larger diameter drills and reamers could

not be adapted to fit on a miniature size machine tool. They are unnecessary too, because the boring head is infinitely adjustable so it can machine all of these holes to a high level of accuracy. It is also capable of machining stepped holes for seating bearings and internal grooves for lock rings. Boring tools cut like lathe boring tools with the difference being the tool moves rather than the work.



The Sherline boring head comes complete with drawbolt, thrust washer and a hex key for making adjustments. The cutting tool is not included. The boring head is designed for use with standard 3/8" (10 mm) diameter shank boring tools. For best results, the length of the tools should be kept to a minimum. You will find that a short tool gives you less chatter and it will be easier to hold tolerances.

Boring Tools, P/N 3061, 3063 and 3064

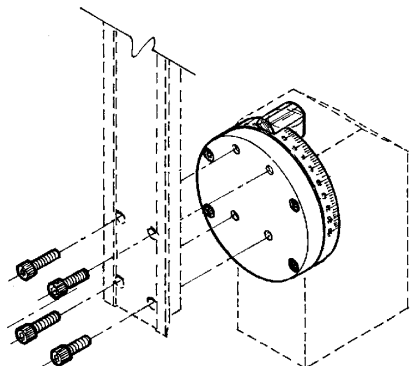
These high-speed steel cutting tools are designed for use with the Sherline boring head. They have a 3/8" (9.5 mm) diameter shank. The cutting end of P/N 3061 is designed



to work in a 1/4" (6.4 mm) minimum hole with a maximum depth of .600" (15.2 mm). P/N 3063 is designed to work in a 5/16" (7.9 mm) minimum hole

with a maximum depth of 1.00" (25 mm). P/N 3064 also requires a 5/16" minimum but has a longer 1.5" (38 mm) reach. If desired, they can easily be ground down to work in a smaller hole. These tools can also be used in the round hole of the P/N 7600 tool post on a lathe for boring.

Rotary Column Attachment, P/N 3500



The rotary column attachment allows angled drilling to be done on a 5000/5400 series mill.

The headstock on the Sherline mill can be rotated so that milling cutters can be used at an angle. However, once the spindle is pivoted, it no longer aligns with the movement of the Z-axis, and the handwheel can not be used to

advance the spindle for drilling. Parts to be drilled at an angle must be mounted to the table on a tilting table. For some larger parts this may not be possible. The rotary column attachment goes between the mill column and base to allow the entire column to be rotated to any angle up to 90° in either direction. Now the Z-axis handwheel advances the spindle along its axis, allowing angle drilling to be accomplished on parts mounted square to the table. A laser engraved collar and magnifying scribe lens make it easy to set angles accurately. No additional holes are required for retrofit. (Not required on 2000-series mills or multi-direction vertical milling columns, as this function is already designed into those columns.)

Tilting Angle Table, P/N 3750

(See Figures 20 and 21.) This accessory offers a variety of setup options and an alternative to rotating the column. With the base mounted square to the mill table, parts mounted to the tilted table can be machined or drilled at precise angles. It can be set at any angle from 0° to 90°. The hole pattern



Figure 20—The tilting angle table allows you to hold a part on an angle so it can be drilled or milled without taking your column out of alignment.

in the table accepts Sherline's mill vise or rotary table. A threaded chuck mount is also included, which means parts from the lathe can have machining operations done on them without removing them from the chuck. They can then be returned to the lathe for further operations without re-centering. With the rotary table mounted to the tilting table, many additional machining possibilities are opened up. (See Figure 28, page 36.) The pre-drilled and tapped hole pattern is laid out so that when the rotary table is in the 90° position, its center is the same height as the rotary table tailstock. This eliminates the need for the P/N 3701 right angle attachment.



Figure 21—Chamfers can be milled using the tilting angle table on a mill.



A Sherline mill or lathe fitted with a digital readout makes keeping track of cut and feed calculations much easier. It reads out to .0005" (.01mm) and also provides a continuous spindle RPM display.

Mill Digital Readout with RPM Gage, P/N 8100 (Inch), P/N 8160 (Metric)

Most full-size shop mills are available with a digital readout, and now that option is available on Sherline mills too. They are popular because they make your life as a machinist easier. Readouts on the X- Y- and Z-axes can be reset to zero at any time with the push of a button. From there, as you move the handwheels, you can read the table position to three and a half decimal places (.0005") on the digital readout. (Metric versions read to .01 mm.) You no longer need to count handwheel revolutions or make difficult calculations when cranking in a negative number.

While we were designing the electronics, we went the extra step to include an RPM readout, adding an additional function to the package. The sensors are easy to install and require no modification of your Sherline mill. A two-axis DRO package is also available for the lathe as P/N 8200. (See page 26.) A three-axis package for using the lathe with the vertical milling column can be purchased, or a third axis can be added later if you add the vertical milling column to your lathe. For those with both a lathe and a mill, the electronic readout box can be shared between both machines to offer a cost savings if you buy just the additional handwheels and cables for the second machine. At present, the DRO is only available with a 120 VAC power supply. Those operating on 240 volt current will need to provide a converter.

Mill Cutter Arbors, P/N 3230, 3231, 3235, 3236

(See Figure 22.) If you need to hold 7/8" or 1" I.D. round cutters for milling or gear cutting, these arbors are designed to hold them on your Sherline mill. They are steel arbors turned with a #1 Morse taper and provided with a drawbolt and washer for use in the Sherline headstock spindle. Each

is available in a choice of standoff lengths of 3/4" (short) or 1-3/4" (long). You can see one in use holding a gear cutter in Figure 28 on page 36.

- Part numbers:
- 3230-7/8" (short)
- 3231-7/8" (long)
- 3235-1" (short)
- 3236-1" (long)

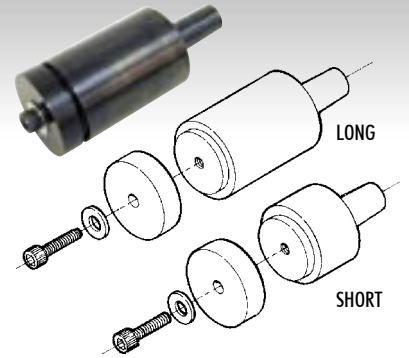
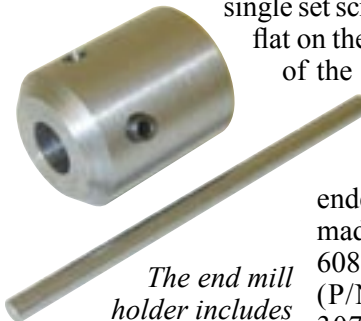


Figure 22—Mill arbor cutters hold 7/8" or 1" I.D. round milling cutters.

3/8" End Mill Holder, P/N 3079

(Other sizes available also)

This easy-to-use end mill holder screws onto the threaded end of the mill spindle. End mills are held in place with a single set screw that tightens against the flat on the side of the cutter. Because of the ease of use of this type of



The end mill holder includes a Tommy bar for tightening.

cutter holder and the fact that it allows the use of longer or double-ended end mills, we have also made it available for 1/8" (P/N 6081), 3/16" (P/N 6080), 1/4" (P/N 6079) and 5/16" (P/N 3075) diameter cutters. For metric tools, we offer the most commonly used 10 mm end

mill holder (P/N 3078) as well as 6.0 mm (P/N 3076) and 8 mm (P/N 3077) sizes.

In addition to end mills, special purpose cutters such as those designed for cutting key slots, dovetails and corner radii usually have 3/8" diameter shanks. The Sherline end mill holder will increase the versatility of your milling machine by enabling you to hold these popular cutters.

CAUTION! Always consider power and size limitations of your equipment when using larger cutters. You may want to reduce cutter speed.

"Your lathe has made it possible for us to complete the assembly and fabrication of many intricate parts that are critical to the function of the special machinery that we design and produce. In fact, the machine was used so much that we practically wore it out! Anyway, we are definitely satisfied with your company and its service to us. We probably will be buying the new series this year to accommodate and enhance our 'small tool' room."

Richard Proud, Engineering Company President
Illinois

3/8" End Mill Sets, P/N 7400 and P/N 7401

(See Figure 23.) Of all the end mills available to machinists, by far the most popular are those with a 3/8" shank. Because they are made and sold in great quantities, they are an



Figure 23—Double-ended 3/8" end mills fit in the P/N 3079 end mill holder. They are available in a large variety of sizes and shapes. For strength and maximum rigidity, use the largest diameter cutter your job will allow.

economical alternative to the smaller but less often used miniature series end mills. They also offer the advantage of being double-ended, so you get twice the cutter for your money. Each has a flat on the side against which the set screw of the end mill holder is tightened to hold it in place.

Sherline offers two sets of six double-ended cutters. Both sets include sizes 1/8", 5/32", 3/16", 1/4", 5/16" and 3/8". (Remember, when cutting in a pocket, the corner radius left by your cutter will be half the cutter diameter.) P/N 7400 is made up of 2-flute cutters, while P/N 7401 offers 4-flute cutters. The 2-flute cutters are recommended for softer materials like aluminum where they are less likely to become clogged. For cutting tougher metals like steel, 4-flute cutters are a good choice. Each set comes with a plastic case or wooden block to protect and store your cutters.

CAUTION: Unlike a drill bit that looks similar, end mills are sharpened on the edges as well as the tip. These sharp edges demand a lot of respect when being handled and used! Also, to keep them sharp, store them in the block provided or individually protected in your toolbox.

Miniature End Mill Set, P/N 3080

These small, single-ended end mills can be held in a mill collet or a 1/4" end mill holder. Their small size makes them useful where space is limited. The set is made up of the highest quality general purpose 3-flute cutters manufactured in the miniature series. Sizes are 1/8", 3/16" and 1/4" diameter, all with 1/4" shanks. A plastic storage block is included.



End mills must run true in order to cut properly. Small end mills or miniature size end mills are very expensive and can be

easily damaged if milling is attempted using a drill chuck to hold the end mill. Milling collets or an end mill holder are a must for proper operation of your mill!

NOTE: It is always a good idea to use cutting oil when working with end mills.



Milling Collets, P/N 3060 (Inch), P/N 3090 (Metric)

Sherline milling collets are designed to be used with the Morse #1 internal taper that is standard on both the Sherline lathe and vertical mill. Because of the shallow angle of the Morse #1 taper when the drawbolt is tightened, greater clamping force can be applied when compared to the clamping pressure of WW collets. Therefore, we recommend the use of these milling collets for holding miniature size end mills (3/16" or 1/4" shank), #1 and smaller center drills or Dremel® bits (1/8" shank) and assorted other cutters. The Sherline milling collet set consists of a 1/8", 3/16" and 1/4" mill collets, a drawbolt and a thrust washer. (Metric sets include 3 mm, 4 mm and 6 mm sizes.) Other size collets in inch and metric sizes are also available through Sherline.

Cutting tools held by these collets must have a shank size within .001" of the manufactured size. Because of the shallow taper angle, these collets will not loosen from the spindle without backing the drawbolt off a couple of revolutions and tapping the drawbolt to free the collet.

4-Jaw Chuck Hold-Down Set, P/N 3058

This set consists of two clamps complete with screws and T-nuts and can be used to clamp the 4-jaw chuck to the milling table or lathe crossslide. The set provides a little more versatility than the chuck-to-T-slot adapter (P/N 1187) in that the chuck can be located almost anywhere on the table, and the part can be properly aligned with the axis of the machine. The clamps fit in a groove machined around the circumference of the 4-jaw chuck. They are the same as those furnished with the Sherline milling vise and rotary tables, so they are not needed if you already own one of these accessories.



Chuck-To-T-Slot Adapter, P/N 1187

This simple adapter can be used with either the 3- or 4-jaw chuck and fastens the chuck securely to the milling table or lathe crossslide T-slots. It slides into the T-slot and the chuck is simply screwed down onto it until it tightens against the table.



Standard Hold-Down Set, P/N 3012

Sherline now offers two types of hold-down sets; standard and step block. The standard set offers a simple and versatile method of clamping work to the mill table.



This simple hold-down set consists of two strap clamps complete with bolts, T-nuts, washers and a variety

Toll Free Order Line: 1-800-541-0735
Technical Assistance: 1-760-727-5857
On-line Orders: www.SherlineDirect.com

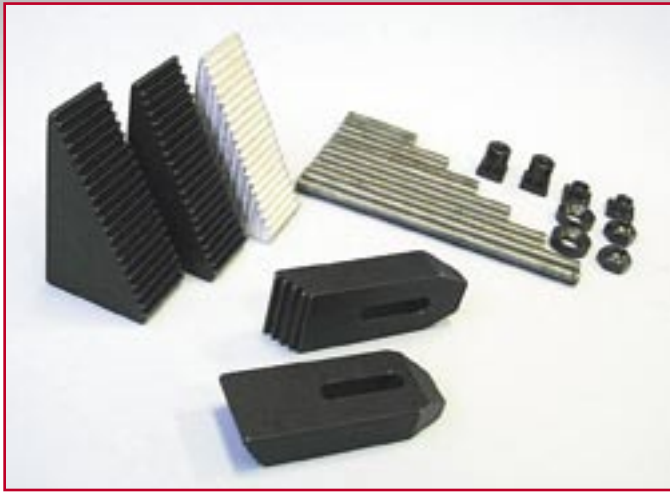


Figure 24—A step block set offers a quick and versatile way to clamp parts to the mill table.

of lengths of socket head cap screws. The round heads of the carriage bolts rest upside-down on washers on the table surface and are screwed up or down to support the strap clamp at the same height as the part being held.

Step Block Hold-Down Set, P/N 3013

(See Figure 24.) This style clamp set has long been popular on full-size milling machines, and we now produce a nice set suitable for miniature machine tools. The step blocks are notched as are the back of the clamps to make it quick and easy to set your clamps to the proper height. A selection of threaded studs from 1" to 3-1/2" is provided to allow a variety of heights to be selected quickly. The nut and washer design is a nice touch too. The bottom of the nut is convex while the top of the washer has a matching concave surface. Even if the clamp isn't level, the washer will seat flat on top of it while applying even pressure. Also provided is a spare, unanodized third step block that you can cut down to make smaller size step blocks for low setups.

Though slightly more expensive than the standard set, this type of clamp is easier on the surface of your mill table and also quickly adjusts to a larger range of heights. At least one set of hold-down clamps should be considered a necessity for every milling machine owner.

Slitting Saw Holder, P/N 3065

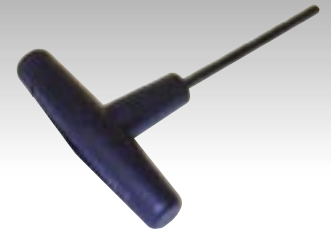
Jeweler's slitting saws are small, circular, metal cutting saw blades that are used for machining thin slots. The Sherline slitting saw holder is designed to mount jeweler's slitting saw blades with 1/2" diameter mounting holes.



Sawblades are available through a large network of industrial suppliers. (See our "cutting tools price list" for sizes offered by Sherline.) The slitting saw holder has a #1 Morse taper and mounts directly into the spindle. A drawbolt and thrust washer are also included.

NOTE: As with almost all metal cutting operations, a small amount of cutting fluid is helpful when using a slitting saw.

Sherline Hex T-Driver, P/N 3020

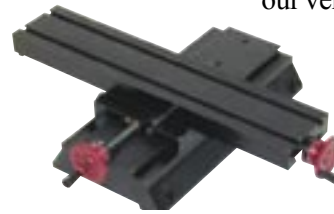


This tool is used in place of the standard 5/32" hex key that is furnished with your lathe or milling machine. The majority of adjustments on Sherline tools and accessories are made with this size hex key. Its large black plastic handle is more comfortable and provides better leverage than the shorter standard key. Also, because of its larger size, it is easier to spot on your workbench when you want to use it. This T-driver will quickly become your most often-used tool.

The handy Sherline 5/32" hex T-driver is easy to find on your bench.

Mill XY Base (See part numbers below)

If you already own a vertical milling column (P/N 3050/3053, 3480/3485 or 3580/3585) for use with your lathe, but feel a sturdier base with a larger work area would be to your advantage, you may purchase the base of any of our vertical mills as an XY base. Your



older vertical milling column made before 1995 can be returned to the factory to be remachined and used with an XY base rather than purchasing the entire vertical milling machine.

(Call for price.) Vertical milling columns made after 1995 do not need to be modified. This combination saves you the amount of money included in the cost of the vertical mill for the column, but gives you the same machine less headstock and motor/speed control. XY bases have also found their way into the industrial market and are used in various manufacturing setups. Part numbers for the various XY bases are as follows:

P/N 5200 (Inch) or 5210 (Metric)—10" XY base from 5000-series mill. Travel: X=8.65" (220 mm), Y=3.0" (76 mm)

P/N 5220 (Inch) or 5225 (Metric)—10" XY base with adjustable "zero" handwheels from 5500-series mill. (Same travels as 5200/5210 above.)

P/N 5401 (Inch) or 5411 (Metric)—12" deluxe XY base with adjustable "zero" handwheels and laser engraved table and base from model 5400/5410 deluxe mill. X=8.65" (200 mm), Y=5.0" (127 mm)

P/N 5600 (Inch) or 5610 (Metric)—14" deluxe base w/adjust. "zero" handwheels and laser engraved table and base from the 2000-series 8-direction mill. (Takes P/N 3580/3585 column.) Travel: X=8.65" (220 mm), Y=7.0" (178 mm)

Mill XY Base (See following part numbers)

The Sherline vertical mill can be purchased without the headstock and motor/speed control. This



allows lathe owners to swap the headstock and motor/speed control from their lathe to the mill in approximately 60 seconds. This package offers a savings of about 30% when compared to the price of our standard mill, and 10% compared to the cost of a vertical milling column and XY base. Part numbers of the various XYZ bases are as follows:

P/N 5201 (Inch) or 5211 (Metric)—Standard 10" XYZ base from 5000-series mill. Travel: X=8.65" (220 mm), Y= 3.0" (76 mm), Z=6.25" (159 mm)

P/N 5230 (Inch) or 5235 (Metric)—10" XYZ base with adjustable “zero” handwheels from the 5500-series mill. (Same travels as 5201/5211 above.)

P/N 5420 (Inch) or 5430 (Metric)—12" deluxe XYZ base with adjustable “zero” handwheels and laser engraved table and base from 5400-series deluxe mill. Travel: X=8.65" (220mm), Y= 5.0" (127 mm), Z=6.25" (159 mm)

P/N 5625 (Inch) or 5630 (Metric)—14" XYZ base with 8-direction capability from the 2000-series 8-direction mill. Travel: X=8.65" (220 mm), Y=7.0" (178 mm), Z=5.38" (137 mm)



Index Block Set, P/N 2045

For simple indexing jobs, we now offer a set of two blocks. An indexing set offers an easy way to index simple hole patterns or do milling on 2, 3, 4, 6 or 8 sides. Something similar to this has been around in machine shops for years utilizing 5C

collets, but we adapted this set to take all the tools and accessories that will fit the spindle of your Sherline tools. A hexagonal block allows indexing to three or six sides, and an octagonal block allows indexing to two, four or eight sides. By mounting your part on the block with a collet or chuck, the block is held in a mill vise on the table. Once located, the first operation is completed. Then the vise is loosened, the block is indexed to the next side, the vise is retightened and the next operation is completed. It is quite simple, but very effective for the most common patterns you will probably do repeatedly, such as the six flats on a hex nut. A drawbolt is available (P/N 11681) to hold WW collets in the #1 Morse taper. A 3/4-16 thread accepts Sherline chucks. Now you can do simple patterns without math and without even moving the mill table!

Indexing Attachment, P/N 3200

(See Figure 25.) Many times a machinist is required to machine features into a part that are located in a radial rather than linear manner. Examples of such features are the flats on a nut, the teeth on a gear or the splines on a shaft. The Sherline indexing attachment is a unique design that provides an economical means of accurately rotating a part so that these kinds of features can be machined.

The attachment consists of an indexing head and a tailstock mounted on a 12" long dovetailed bed. Also included is a

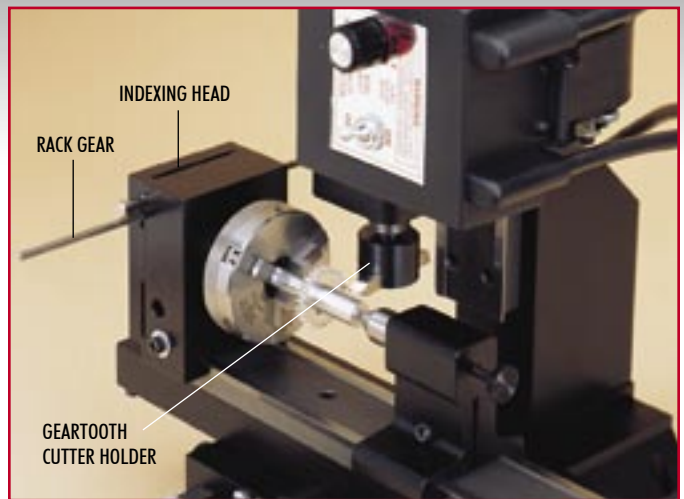


Figure 25—A toothed gear sprocket is being cut using the indexing attachment. The blank is being held in a 3-jaw chuck and supported at the other end by the tailstock. A P/N 3217 geartooth cutter holder (included with the indexing attachment), holds a standard 1/4" tool blank which has been custom ground to the shape required.

rack gear that is used to measure radial movement, a gear tooth cutter holder and a high speed steel tool blank. The indexing head utilizes a spindle with a #1 Morse taper and a 3/4-16 make thread identical to the spindles on the Sherline lathe and milling machines. This enables the use of all the Sherline accessories such as the faceplate, 3- and 4-jaw chucks, Jacobs drill chuck and the dead or live centers with the indexer. A built-in mechanism detents the spindle every 5°, and there is also a red laser engraved collar that indicates rotation in 1° increments. The rack gear mentioned previously provides a means of accurately positioning the spindle where positioning in other than 5° increments is required. The gear inserts into the indexing head and engages an index gear. This transfers the rotary motion of the spindle into linear motion that can be measured with the depth rod of a Vernier caliper. Simple calculations then permit accurate indexing to an infinite number of positions.

The indexing attachment can be attached directly to the table of the Sherline milling machine as in Figure 25, or the indexing head can be used by itself in a horizontal position similar to a rotary table. The indexing attachment is not recommended for use on the Sherline lathe with the vertical milling column; however, with the use of shims to elevate the unit high enough to clear the crossslide handwheel, it can be done.

“My steam engines are machined from castings to a tolerance of .0005". They are not toys, but precise machines... it requires a precision tool to do this— Sherline does it best— for far less than the \$2000 to \$5000 industrial machines. Sherline is compact and portable as well. An added bonus is the accessory line available for special jobs.”

James Horvath, M.D.
Ohio

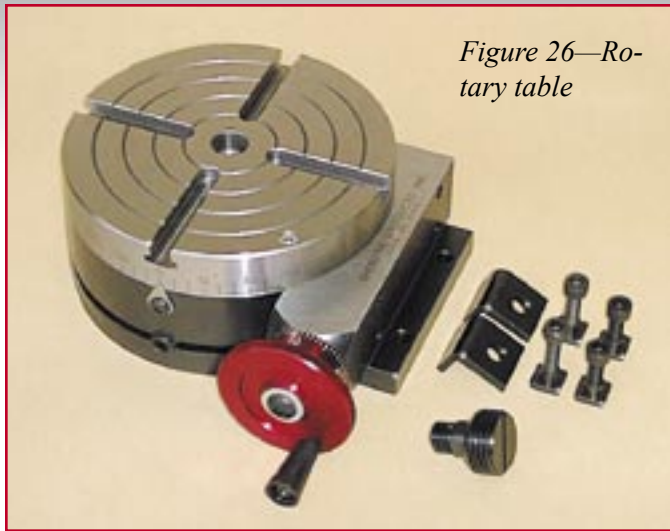


Figure 26—Rotary table

Rotary Table, P/N 3700

(See Figures 26, 27 and 28.) A rotary table used in conjunction with a mill allows a machinist to produce virtually any part he can design. The only limits are size, not complexity.

Sherline's rotary table is a precision piece of equipment that has been designed to work with Sherline's vertical milling machines; however, it can be used on any mill whenever the compact 4-inch size would be an advantage.

The table is 2" (51 mm) high and 4" (102 mm) in diameter. The main components have been machined from solid bar stock steel, and the complete unit weighs seven pounds. The table has been engraved with a laser, giving sharp and precise lines every 5°, numbered every 15°. These lines are calibrated with the 72-tooth worm gear that is driven by the handwheel. The handwheel is divided into 50 parts, making each line on the handwheel 1/10°. This allows a circle to be divided into 3600 increments without interpolation. Seventy-two revolutions of the handwheel rotate the table one revolution.



More details on Roger's work can be found at www.CraftsmanshipMuseum.com/Ronnie.htm.

Project: 1/2 size pistol. Gun engraver Roger Ronnie of Rapid City, SD was commissioned to restore and re-engage this rare 1896 Bergmann 6.5 mm pistol. While he had it apart, he recreated each part in 1/2 scale to make a complete, working model. He even duplicated the silver inlays and engraving at 1/2 size. Small parts for rare full size guns can also be made on tabletop machine tools. The model is shown below the full-size original.

The table T-slots are identical to those used on the Sherline mill and lathe, making the vast line of Sherline tooling available for use with this product. Two hold-down clamps and T-nuts are provided with the table. Also included is an adapter that allows Sherline's 3- and 4-jaw chucks to be mounted directly to the rotary table. An optional right angle attachment is available (P/N 3701) to mount the table in the vertical position to further increase its versatility. (See Figure 27.) With the table mounted vertically, an optional adjustable right angle tailstock (P/N 3702) can be mounted to the mill table. It is used to support and stabilize the other end of long work held in a chuck or otherwise attached to the rotary table. (See also Figure 27.) A tilting angle table P/N 3750 can be used in place of the 3701 right angle fixture as it also aligns with the 3702 tailstock in the vertical position.

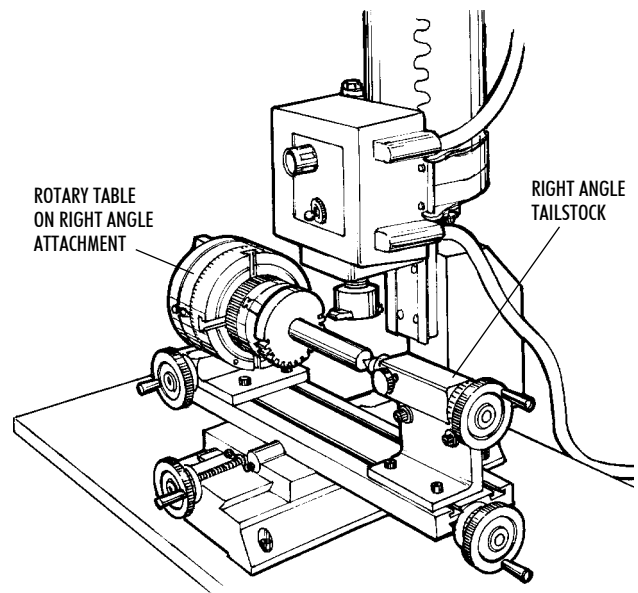
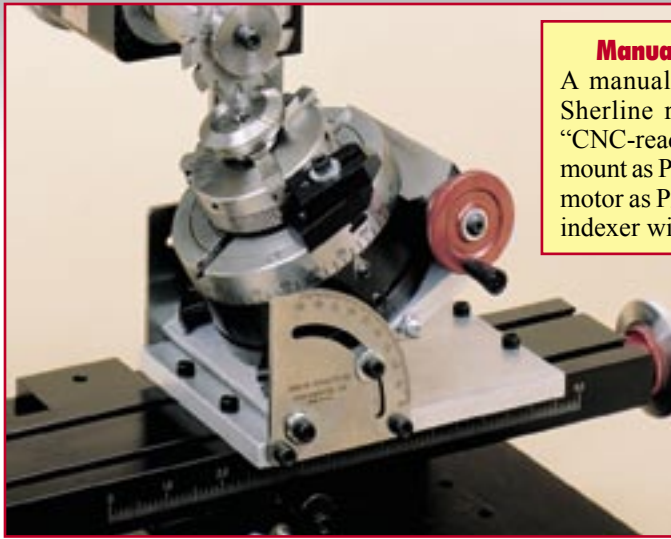


Figure 27—Here is a sample setup to cut a gear using the rotary table mounted to the right angle attachment. An adjustable right angle tailstock steadies the other end of the long shaft. The teeth are being cut using a P/N 3217 gear tooth cutter holder.

The rotary table has a unique table locking mechanism that is positive and does not move the table as it is locked. To maintain accuracy and frictionless movements a ball bearing is used. Worm gears are factory greased and the drives sealed to keep out chips and dirt. An oiler is easily accessible to facilitate lubrication of the table. The appearance is instrument quality with a black oxide base, precision ground finishes and laser engraved markings.

As with all Sherline tools, the illustrated instructions are very useful. The 6-page manual covers the basics of rotary table use and takes the user through a typical project.

Machinists who want to take their capabilities to the ultimate levels should consider purchasing and learning to use a rotary table. The Sherline rotary table is an extremely precise and well-built piece of equipment that is sized to fit with our product line. It can also be useful on larger equipment when its compact size is called for.



Manual and CNC-ready versions

A manual version is shown here, but Sherline rotary tables can be ordered "CNC-ready" with just a stepper motor mount as P/N 3700-CNC, with mount and motor as P/N 8730 or as a complete CNC indexer with controller as P/N 8700.

If an error is made, previous positions can be accurately recalled by hitting another key. Basic resolution is 28,800 steps per revolution, or $\pm 0.006^\circ$ per step. This allows the accurate

machining of items like gears with odd numbers of teeth. Computations are made internally to many decimal places as on an electronic calculator to avoid cumulative errors.

The CNC rotary indexer is a stand-alone unit. You get everything you need to make complex indexing jobs easy. In addition, the unit can be connected to an existing CNC control to act in conjunction with that system. An input signal triggers the programmed function. When it is complete, it signals back to continue the program. The unit can also be "daisy chained" with other units to trigger sequential actions. As with all Sherline accessories, complete instructions are included.

Rotary Indexer Specifications

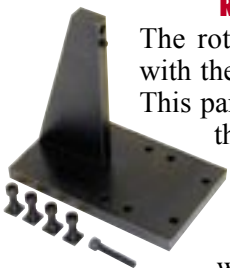
Rotation speed— $1^\circ/\text{sec}$ to $50^\circ/\text{sec}$ maximum (programmable)
 Resolution—28,800 steps per revolution ($\pm 0.006^\circ$ per step)
 Backlash compensation—Programmable
 Stepper motor—120 oz-in, 400 steps per revolution
 Power supply—Input: 115 VAC 50/60 Hz, Output: 24V, 1 Watt

Figure 28—A rotary table is held at an angle on a tilting angle table (P/N 3750) to cut a bevel gear. The gear blank is held in a chuck which is clamped to the rotary table. A mill arbor in the spindle holds the specially shaped cutter. The headstock is rotated to the horizontal position using the horizontal milling attachment (P/N 6100). This setup demonstrates how accessories can be combined to produce sophisticated cuts on miniature machine tools.

Right Angle Attachment, P/N 3701

The rotary table is made even more versatile with the addition of the right angle attachment. This part has been designed to accurately align the rotary table in a vertical position while still maintaining rigidity.

(Note: The P/N 3750 tilting angle table can be used in place of this accessory when tilted to the 90° position.)



Right Angle Tailstock, P/N 3702

The adjustable right angle tailstock supports the end of long stock held in the rotary table when it is in the vertical position. This allows you to accurately turn a part between centers.

See also Figure 27 for a typical example of how it can be used.



Programmable CNC Rotary Table Indexer, P/N 8700

(See Figure 29.) Sherline has taken their accurate and reliable 4" rotary table into the 21st century with the addition of Computer Numeric Control (CNC). Clockmakers or anyone with a need to cut gears, splines or radial hole patterns will find this accessory takes all the headaches out of repetitive indexing operations.

You get everything you need including the 4" Sherline rotary table with installed stepper motor, microprocessor unit with numeric input keypad, 115 VAC power source and all necessary connecting cables. Operation is very simple. After entering the number of divisions per revolution or the number of degrees per step on a simple numeric keypad, the table advances quickly and precisely to the next position at the touch of a single advance key.



Figure 29—For complex indexing jobs Sherline's 4" rotary table is the perfect platform for the application of CNC controls. Included is a programmable input unit that contains its own microprocessor, keypad and power supply.

10,000 RPM Spindle Pulley Set, P/N 4335

The standard Sherline pulley set is geared to turn the spindle at a maximum speed of 2800 RPM. This offers a speed range sufficient for most lathe and mill operations



while taking maximum advantage of the motor's torque. However, we often get requests for higher turning speeds from people running small diameter cutters for jobs like engraving. For this purpose we have developed a pulley

set that is capable of turning the spindle at speeds up to 10,000 RPM. Naturally, when geared to turn such a high speed, power is somewhat reduced, but this is not normally a problem with small cutters or when turning small shafts. In the second belt position, maximum speed is 2200 RPM, which is about the same as the normal pulley set when you need more torque. Installation takes about 10 minutes.

“Having worked with a manual 10" lathe for a few years now, I didn't see how such a small machine could work with the 2" diameter material I was hoping to work with. After using it for a week and a half it has surpassed my wildest dreams of usability. It is more powerful than I ever would have suspected, it leaves a beautiful finish and is highly accurate. The machine has worked so well that I am not only using it for prototypes but for a small production run as well!”

Jordan Blessing, President
ScopeTronix Astronomy Products, Florida

Gear Tooth Cutter, P/N 3217

The gear tooth cutter is included with the purchase of the indexing attachment and can also be purchased separately.

It looks much like a small fly cutter and includes a 1/4" high speed steel tool blank that you can custom grind to the particular gear tooth shape you need. Figures 25 and 27 show the cutter in use in conjunction with the indexing attachment and rotary table.

The #1 Morse taper on the shaft is held in the spindle with a drawbolt and thrust washer. This is an economical alternative to round commercial gear cutters.

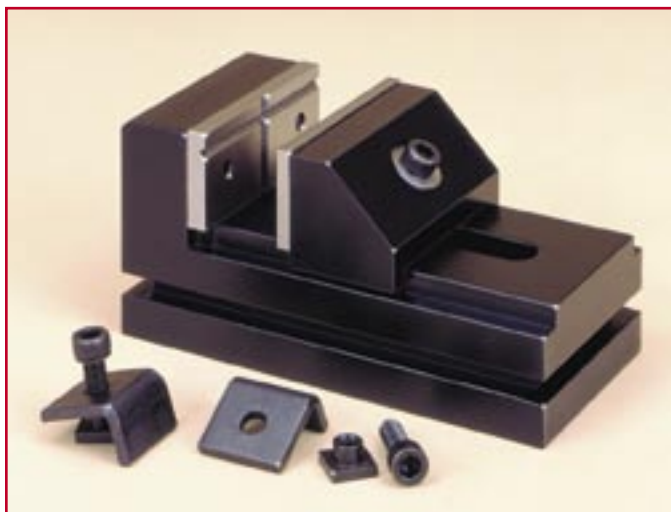
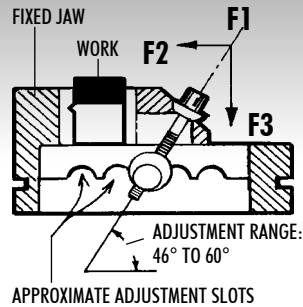


Figure 30—The Sherline mill vise and hold-downs.

Milling Vise, P/N 3551

(See Figures 30 and 31.) The most convenient way to hold small parts for milling is with the milling vise. Milling vises are different from other machine vises in that they are



APPROXIMATE ADJUSTMENT SLOTS
Figure 31—Vise pull-down feature. Tightening in direction F1 produces forces to both hold the part (F2) and keep the jaw from lifting (F3).

designed to hold the movable jaw down while clamping, eliminating any chance for the jaw to lift. A cheap drill press vise is almost useless on a milling machine, because it can't be accurately aligned with the machine.

The Sherline milling vise is sized just right to be the perfect working companion to the Sherline milling machine. The jaws are 2.00" (50.8 mm) wide by 1.00" (25.4 mm) deep and open a full 2.00" (50.8 mm). The fixed jaw has both a horizontal and vertical “V” groove to facilitate holding round bar stock. The vise includes two clamps for use in attaching it to the milling machine. These clamps are the same as the 4-jaw hold-down set (P/N 3058).



The rotating vise base provides a way to pivot the vise on an arc or in a circle for drilling hole patterns or milling flats.

Rotating Mill Vise Base, P/N 3570

When mounting the mill vise to the table, this base will allow the vise to be rotated to any angle. The red anodized base is laser engraved with angle measurements in 1° increments all the way around. A witness mark is engraved on the side of the rotating collar that holds the vise. The locking washers can be loosened, which allows the vise to slide forward and back in the fixture for further adjustment. A locking ring underneath pulls the collar down onto the base to lock it securely when the two hold-down screws are tightened. The low profile tooling plate base only raises the height of the vise 1/2". Four T-nuts and hold-down bolts are included.

The rotating vise base eliminates clamping and unclamping the vise to produce angles. Once mounted square to the table, the vise can be positioned using the laser engraved protractor scale as a guide for setting the angle. Properly positioned, the rotating base can even be used as a simple rotary table to drill small radial hole patterns or to machine repetitive flats.

If you do not already have a vise and are considering purchasing both a vise and a rotating base, they can be purchased together at a price that offers a savings compared to buying the two individually. The part number for the vise and base together is P/N 3575.

Horizontal Milling Conversion, P/N 6100

(See Figure 32.) An easy way to increase the size of work that can be machined on your Sherline 5000- or 5400-series mill is the addition of the horizontal milling conversion. By allowing the vertical column to be mounted in various positions in relation to the table, and with the headstock and spindle rotated 90° into the horizontal position, a tremendous variety of machining possibilities are opened up. Plus, the mill can remain mounted to the conversion base and still operate in its conventional vertical mode as well, providing a very sturdy and vibration-free base.

With the work mounted perpendicular to the table, position "A" (Figure 32) allows an area of up to 9" by 6" to be machined without moving the work—a very large work area for a machine of this size! (The 90° angle plate, P/N 3559 can be very useful for this purpose.) A second set of holes allows the spindle to be moved further back so longer tools such as drills or a boring tool can be used. In position "B", the table is reversed and the column rotated 90° to the table to take advantage of the long X-axis travel (which becomes the Y-axis in this configuration). This position could offer an advantage when drilling a deep hole, for example.

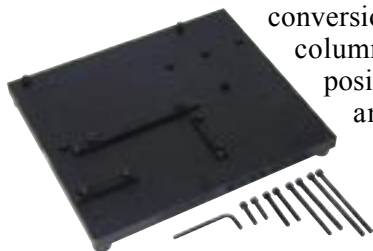


Figure 32—The horizontal milling conversion allows the mill column to be repositioned in two different ways on a sturdy base plate in order to provide greater versatility in set-up and increase the machinable area of the parts being worked on. To the left of the mill is the base of the Z-axis column, which has been cut off to allow a lower positioning of the headstock in relation to the table.

The base is 3/4" thick aluminum 10.5" by 12.5" and is machined and drilled to accept the base on your mill's vertical column. The headstock is rotated 90°, and the unit is remounted to predrilled holes in various positions on the conversion plate. The mill's vertical column base should be modified by cutting off 2" from its height to lower the spindle in relation to the table. (Machines made prior to 1993 will also require a 90° keyway on the Saddle.) This allows the spindle center to go below the top of the table, meaning you can machine the edge of material overhanging the table. The cutoff piece from the column is machined flat and re-tapped to be used as a spacer block to return the mill to its normal height.

Alignment bars are provided with the conversion so that once the base and column are mounted and squared up, they can be quickly and accurately remounted in the future. Alignment bars, a hex wrench and all necessary fasteners are provided to set up the mill in all of the possible configurations. The plate is mounted on four rubber feet for quiet operation. Complete instructions are provided.

NOTE: The horizontal milling conversion was not designed to be used with the 2000-series 8-direction mills. The additional flexibility and versatility of that mill makes this attachment unnecessary.

Stereo Microscope and Mount for the Mill, P/N 2127 Mill Microscope Mount Only, P/N 2128

Your ability to accurately machine tiny parts can be limited by your ability to see what you are doing. Magnifying the interface between cutter and part can solve this problem. The mill mount allows a stereo microscope to be swung around to view the operation from the front, side or in between. The Russian-made microscope itself features high quality optics with edge-to-edge sharpness and very little vignetting. You can purchase the scope and mount together or buy the mount separately if you already have the scope and lathe mount. Purchasing the scope and mount along with a mill offers an additional price savings on the package. See page 13 for the lathe microscope mount.

The microscope features a magnification range of from 5 to 100 power. It rivals the quality of European scopes costing many times more and is perfectly suited in size and focal range for use in machining. It comes with its own base for use as a separate inspection scope with a glass or solid stage and includes a protective lens filter, light and power supply.





Figure 33—Fly cutting is an excellent way of producing a flat surface quickly. This Model 5400 mill has been converted to 8-direction capacity with a P/N 5650 column upgrade. The adapter base can be seen in the background.

Fly Cutter, P/N 3052

(See Figure 33.)

Fly cutters are used primarily for machining large, flat surface areas.

The fly cutter is a single-point cutting tool similar to a lathe tool mounted in a special holder. The cutter can be adjusted to cut up to a 2.00" (51 mm) diameter and is easily capable of taking a .010" (.25 mm) deep cut in aluminum at this diameter.

The Sherline fly cutter comes complete with the holder, a drawbolt, thrust washer and a left-hand brazed 1/4" carbide cutting tool. It is a worthwhile addition to any shop.

REMINDER—As with all other machine operations, safety glasses are a must when fly cutting. The parts being machined must be held very securely.



Carbide Inserted Tip Fly Cutter, P/N 7620

This fly cutter offers several advantages over the standard high-speed steel fly cutter. Inserted carbide tips will last much longer without sharpening, plus they provide an excellent finish on hard-to-machine materials like cold-rolled and stainless steel. The cutter path is 1-1/8" (28.6 mm) wide. The cutter shape allows it to cut a straight shoulder on a part— something that cannot

be done with the standard fly cutter. Once you use this tool, you will understand why 80% or more of the metal removed in modern machine shops is removed with carbide insert tools.

The cutter comes with one 2-edged carbide insert, a Torx attachment screw, a drawbolt and washer plus a T-15 Torx wrench. Additional inserts are available through Sherline as P/N 7622.

Mill Headstock Spacer Block, P/N 1297

On the mill, having the option to extend the headstock further out can sometimes allow surfaces to be machined



that could not otherwise be reached without breaking down the setup and re-clamping the part. The spacer moves the spindle out an additional 1-1/4"

(31.8 mm). In many cases, it is much easier to increase your machinable surface area by using this spacer than to re-clamp the part. Precisely machined keyways keep the headstock accurately aligned.

Morse #1 Blank, P/N 3055



The Morse #1 blank is made from free-machining 12L14 steel and is available so that

you can make your own custom tool holders. The proper #1 Morse taper is already machined onto the tapered end. You need only turn, drill, tap or slot the blank to fit your special tooling needs. Included with the blank is an instruction sheet showing some common uses with dimensions for making a fly cutter, a slitting saw holder or an end mill holder.



The late Augie Hiscano of Miami, Florida won the 1999 Salt Lake City national model car contest "Best Hot Rod" and "Best of Show" trophies with this model. Aside from a few highly modified plastic kit body parts, the 1/25 scale Ford hot rod is almost entirely scratch-built from metal.



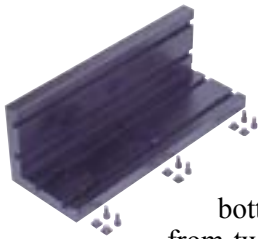
**Mill Tooling Plate,
P/N 3560**

Like those used on our large production machines, the mill tooling plate solves two problems.

It not only protects your mill's table from damage, but it also provides an inexpensive, modifiable surface for clamping work that is as flat as the machine's original table. The best way to hold a part more securely is to add more clamping points rather than over-tightening the points you already have. The mill tooling plate allows you to easily do this.

Like a lathe faceplate, the mill tooling plate should be looked at as somewhat disposable. It has a hole pattern predrilled to make it easy to clamp down the Sherline mill vise or the rotary table, but you should feel free to drill whatever additional holes are needed to meet your particular needs. The plate is made from cast aluminum, which is milled to 1/2" thick. Though not quite as strong as extruded grades, it is very stable and free from internal stresses so it will not warp when you drill additional holes. The surface is not anodized, as it is intended to be drilled and machined to suit your unique part holding needs.

The tooling plate comes with six 10-32 socket head screws and six T-nuts for mounting. The mounting screw holes are countersunk to keep the working surface free of obstructions. All other holes are drilled and tapped for 10-32 screws.



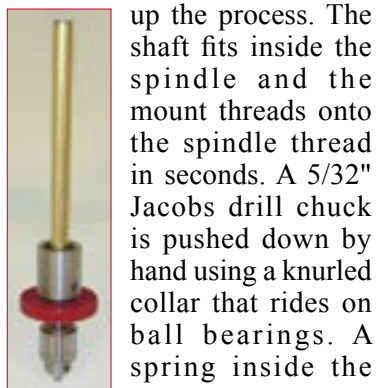
90° Angle Plate, P/N 3559

This angle plate is a very useful work-holding fixture for milling. It can be used to hold parts on either surface which means you can hold a part perpendicular to the table, even if the bottom is not flat. Parts can also be held

from two directions at once. It has large 3" x 3" x 10" machined mounting surfaces with two T-slots running full length on each. It is made from extruded aluminum with a black anodized finish. Provided with the plate are six 10-32 mounting screws and T-nuts.

Sensitive Drilling Attachment, P/N 1012

(See Figure 34.) Tiny drill bits are expensive and easily broken. This attachment gives you the proper "feel" for hand feeding when drilling small holes while also speeding



up the process. The shaft fits inside the spindle and the mount threads onto the spindle thread in seconds. A 5/32" Jacobs drill chuck is pushed down by hand using a knurled collar that rides on ball bearings. A spring inside the



Figure 34

shaft returns the chuck to the retracted position when pressure is released. You get precise control of the feed with plenty of feel for the cut when the precision of the Z-axis handwheel is not needed for depth control.

**WW and 8.0 mm Collet Fixtures,
P/N 1164 and P/N 1165**

The collet fixture was designed to be mounted either on the surface of the rotary table or on the mill table. A knurled ring allows WW collets to be tightened without the use of a drawbolt from the back. This is particularly



useful for clockmakers for gearcutting on a gear blank that has a pinion shaft attached that can be held in a collet. A bushing is provided that fits into the

center hole of the rotary table and helps locate the fixture on center. T-nuts and attaching screws are also provided for clamping the fixture in place in the rotary table or mill table T-slots.

WW collets vary somewhat in size depending on manufacturer. This adapter holds those collets made by Sherline with a .312-.313" body size and .275-40 thread, which we refer to as WW collets. Other common "WW" collets have a body size of .314-.315" which we refer to as 8.0 mm collets. A fixture for these collets is also available as P/N 1165. It looks identical except that it is identified by a groove machined around the body. If you are using a brand of collets other than Sherline, measure the body diameter with a micrometer before deciding which collet fixture to order.

**Vinyl Dust Covers for Vertical Mills,
P/N 5150 and P/N 5151**

A fitted 6-mil vinyl dust cover is available for your Sherline milling machine. Keeping dust off your machine when it is not in use will not only extend its life, but will also keep it looking like new while adding a professional touch to your workshop. P/N 5150 fits the 5000- and 5400-series mills. P/N 5151 is sized for the 2000-series mill. (Does not completely cover X and Y stepper motors on CNC mills.)

**Machinist's Parallels,
P/N 7505**



(Scale not included.)

Parallels are pairs of accurately ground steel spacers of different heights. They can be used in many ways, but are typically used to raise a part a known distance while keeping it parallel to the table surface during machining. The pieces in this set are 2-1/2" long and 1/16" thick. The set includes five pairs of precision ground steel bars in heights of 1/4", 3/8", 1/2", 5/8" and 3/4".

For the most up-to-date listing of new products, see our web site at www.sherline.com/new.htm.

New Products

Extended 18" Mill Table P/N 54182 and 15" Tall Mill Column Bed P/N 45260

Due to requests for more travel, mainly from CNC users, Sherline has introduced an 18" mill table that is 5" longer than the standard 13" table and a 15" mill column bed that is 4" taller than the standard 11" column.



Appropriate leadscrews are also available in inch or metric, manual or CNC versions for each. It is also possible to order new machines with these extended travel items already installed. Because of the number of combinations and part numbers, it is best to call Sherline for prices and options.

Metric WW Collet Set, 78 Collets in Oak Box, P/N 1180

Sherline offers a set of WW watchmaker's collets that run from 0.03 mm to 8.0 mm by 0.01 mm increments. Also included is a collet blank. The oak box has brass hardware and an insert with 96 holes, leaving room for additional metric or inch size WW collets.



Ceramic Insert Holder, P/N 2265

Ceramic inserts are used to cut hardened tool steel and other materials that might otherwise have to be ground. The triangular insert has 6 cutting surfaces. The holder has a 3/8" shank for use in the P/N 7600 tool post. Extra inserts are available as P/N 2266. Hex key included.



Mill Z-axis Saddle Lock Upgrade P/N 4017Z (Inch), 4117Z (Metric)

On CNC mills, excess backlash is a particular problem on the Z-axis for certain 3D modeling and engraving applications requiring very subtle movements of the Z-axis. This modification to the Z-axis locking lever allows adjustable control over the Z-axis backlash, making it possible to reduce it down to as little as .001". It is now included as standard equipment on all CNC and CNC-ready Sherline Machines and can also be easily installed on existing manual or CNC machines, requiring no new holes. Once the lever is positioned to the desired location removing as much backlash as is desired, the thumbscrew is tightened, holding the locking lever in place.



Lathe Anti-backlash Saddle Lock Upgrade P/N 4417Z (Inch), 4417ZM (Metric)

Based on the mill locking lever design, this kit adds a locking lever to the saddle

nut under the long axis of your lathe. This allows you to control backlash to as little as .001" on this axis. Designed for CNC use, it can also be added to manual lathes.



Drill Chuck Holder, P/N 3074

This chuck holder was designed to help CNC users change tools quickly on the mill. End mill holders with a preset diameter and length tool can be entered into the tools table. Settings are retained when the tool is returned to the spindle. This works the same way for a drill chuck with a drill bit mounted in it. The 3/8-24 thread accepts a 1/4" or 3/8" Jacobs chuck.



Chuck Adapters for Rotary Table, 37091 (12 x 1 mm), 37092 (14 x 1 mm), 37093 (1/2-20) and 37094 (3/8-24)

Now you can attach a 1/4" or 3/8" Jacobs drill chuck, an older Unimat chuck with 12 x 1 mm or 14 x 1 mm threads or a 1/2-20 Sears chuck to your Sherline rotary table. The adapter screws into the 3/8-16 threaded center hole of the table.



Super Lube Grease P/N 7550 and Dri-Film Spray Lubricant P/N 7555

This Teflon-based lubricant is what comes on your machine from the factory. It works great on handwheels and slides and can be used on other applications around the house and shop. It is available in a 3-ounce tube or an 11-ounce aerosol can of Dri-Film. This is a clear, non-staining lubricant that makes an excellent choice for machine tool applications.



54,000 RPM Pneumatic Engraving Head, P/N 8900

The advent of CNC has increased the demand for the ability to engrave type and fine patterns. This air grinder comes with its own headstock that replaces the standard mill DC motor headstock. It is driven by your 1.5 HP compressor and needs only 90 PSI of line pressure. Included in the kit are 3 carbide engraving tips, air lines, lubricating oil and several grinding tips.



Grinder Tool Posts P/N 8976 and Riser Grinder Tool Post P/N 8987

Use the 8900 on your lathe for polishing or fine grinding jobs. The P/N 8976 tool post holds the grinder body on center with your lathe. The P/N 8987 riser tool post is used when the lathe riser blocks are in place.



More new products elsewhere in the catalog...

- Page 13—P/N 2125 Lathe microscope mount
- Page 20—P/N 2282 Quick-change 3/8" tool holder
- Page 36—P/N 4335 10,000 RPM pulley set
- Page 38—P/N 2127 Mill microscope mount
- Page 42—P/N 5335 Lathe instruction video

Books and Videos

Tabletop Machining by Joe Martin, P/N 5301



Sherline's owner, Joe Martin, has written a book that gives you not just the "hows", but also the "whys" of machining practices. Being a hobbyist himself as well as a manufacturer, Joe is familiar with the needs of both the home shop machinist and the commercial production facility. His insights offer a unique and practical perspective on the equipment and processes of machining at both extremes... from intricate miniature machining projects to full size shop production tools and practices.

Joe's book details "real world" practices in machining and gives a good insight into the challenges faced by machinists. Too often, good craftsmen cannot progress because the only information available shows the technically perfect way to do things rather than the simple, practical methods everyone really uses. This book should be required reading for all newly graduated engineers. For those wishing to design and build their first metal parts, it is a perfect starting point. Naturally, Sherline tools are featured throughout in the examples, but the rules of machining apply to equipment and projects of all sizes.

Information is given on selecting materials; using a lathe and a mill; measuring tools; cutting tools; using accessories for threading, indexing and gear-cutting; tool sharpening, knurling, coolants, using files and hand tools, setting up a home shop, CNC in the home shop and more. Several simple projects are provided for beginning machinists. A photo gallery of superb miniature projects will inspire you and show what these small but mighty machines can really do. A history of Sherline tools is written from the point of view of giving you some guidance if you've ever thought of taking a product of your own to market. This is a high quality book that will be equally at home on your coffee table or shop workbench. The book has received many positive reviews from magazine editors and home shop machinists alike. It is now in its fourth printing.

· 8-1/2 x 11", softbound with "lay-flat" binding, full color, 352 pages, 400+ color photos, 200+ illustrations

The Home Shop Machinist's Handbook by Doug Briney, P/N 5300



Doug Briney's book is a complete guide for the amateur machinist. It is especially valuable to the Sherline tool owner because it not only covers all aspects of machine shop work, it features the Sherline lathe and milling machine in its illustrations and text. Included are plans for several simple projects and tools you can use in your shop after you make them.

· 7-3/4 x 9-1/4", softbound, B&W, 285 pages, many black and white photos

Sherline Accessories Shop Guide, P/N 5327

Instruction sheets for all Sherline accessories are reproduced in one handy book. Learn about how an accessory works before you decide to order it. The illustrated, information packed instruction sheets contain a wealth of useful machining knowledge. Learn about boring, thread cutting, knurling, the indexing attachment, using a rotary table and much more.

· 8-1/2 x 11", softbound, Illustrated, B&W, 224 pages



Machine Shop Essentials-Questions and Answers by Frank Marlow, P/N 5305

An excellent introduction to shop practices featuring small and full-size shop tools with over 500 line art illustrations.

· 7 x 10, softbound, B&W, 585 pages



Machine Shop Trade Secrets by James A. Harvey, P/N 5306

The real world of shop practices by a mold maker and machinist with 30 years of shop experience. Many clear, helpful photos. A very informative reference.

· 8.5 x 11", softbound, B&W, 312 pages

Building a Small Steam Engine, Video and Plans by Rudy Kouhoup, P/N 5328-VHS* or P/N 5328-DVD

Expert machinist and engine designer Rudy Kouhoup, long-time editor at *The Home Shop Machinist* Magazine, produced complete video instructions that take you from start to finish in building a small steam engine using Sherline tools. Follow Rudy through the setups and cuts as you gain a wealth of information on machining. 3 hours and 38 minutes—Includes printed plans and material list, 2 VHS tapes or 2 DVD's.



Shop Secrets-Measuring Tools, Video by Mike Rehmus, P/N 5329-VHS* or P/N 5329-DVD

Editor of *Model Engine Builder* magazine, Mike Rehmus is both an expert videographer and an experienced machinist. This 2-hour video shows and tells you what you need to know about using machine shop measuring tools to make accurate parts. VHS or DVD.



Using the Sherline Lathe, Video by Mike Rehmus, P/N 5335

This professionally produced video covers the setup, alignment and use of a Sherline lathe. Also covered is the use of a number of the most popular accessories. If you are just getting started or if it's been a while since you've used a lathe, this is the fastest way to go from opening the box to making parts. DVD version only.



*While they last. VHS versions will eventually be discontinued.

CNC for Sherline Machines



SHOWN: Model 8540
CNC mill with stepper
motors, computer, drivers,
software and cables.

For years Sherline lathes and mills have been available in "CNC-ready" configuration as they still are for the application of controls made by others; however, many customers expressed a desire to be able to buy a complete, turnkey system from one reliable supplier. Now Sherline offers just such a system, and at a great price too. Each CNC system includes a lathe or mill with stepper motors mounted on each leadscrew axis, a new computer with keyboard, mouse and 4-axis driver box, connecting cables that plug into each stepper motor and pre-installed Linux operating system and EMC control program. All you need to supply is a monitor. Any Sherline machine or shop package can be purchased this way.

Your CNC Options

Sherline offers machines in various states of completeness depending on your budget and/or knowledge of putting together a working CNC system. Here are your options:

Retrofit kits—Any existing Sherline machine can have stepper motor mounts added in place of the handwheels. Complete retrofits with computer and motors are available as well.

CNC-Ready—You can order any new Sherline machine with stepper motor mounts installed. You add the stepper motors, controls, software, computer and other components to turn it into a complete CNC system.

Complete CNC—Like the system shown above, you can now buy a complete turnkey system with everything you need to get started. All our standard accessory packages can also be ordered. For example, you could order a CNC mill with the "A" accessory package, or you could order a complete shop package including lathe, mill and rotary

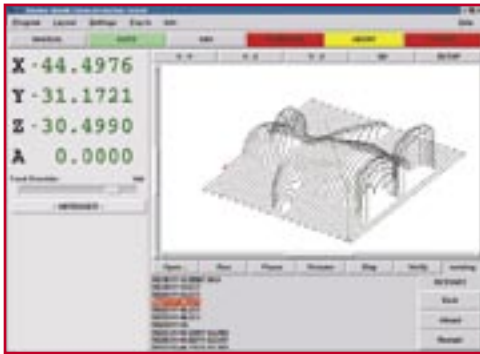


Figure 35

The P/N 8760 Driver Box runs up to four stepper motors and plugs into the parallel port of your own computer. It includes cables, power supply and Linux/EMC software.



SAMPLE SCREENS:
Coordinate systems offset screen also shows jog controls at bottom. (X-axis is highlighted)



Back plotter and auto mode screen. Tool paths are shown graphically and the G-code is displayed at the bottom with the current line highlighted in red.

Figure 36—The simple, straightforward EMC visual interface is customized to the capabilities of Sherline machines.

table all fitted with stepper motor mounts, stepper motors, computer, drivers and all the tooling and accessories.

About Linux and the EMC software we use

Operating System (OS)—Linux is an operating system just like Windows®, except it offers some advantages: 1) It is open source, which means we don't have to charge you any extra for it, so it keeps our system cost down, 2) It operates in "real time" and does not multi-task, so the information stream to your stepper motors is uninterrupted and glitch-free and 3) It is graphically almost identical to Windows, so most operators familiar with Windows will not have any trouble adapting to a new environment.

EMC Control Software— According to the official definition, "The Enhanced Machine Controller (EMC)

Figure 37—The 8730 rotary table connects to the A-axis cable from the driver box to become your 4th axis.

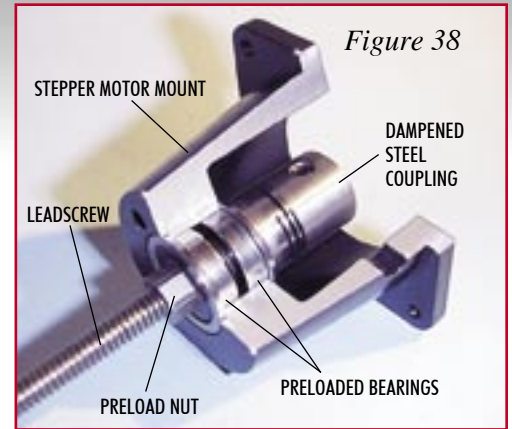
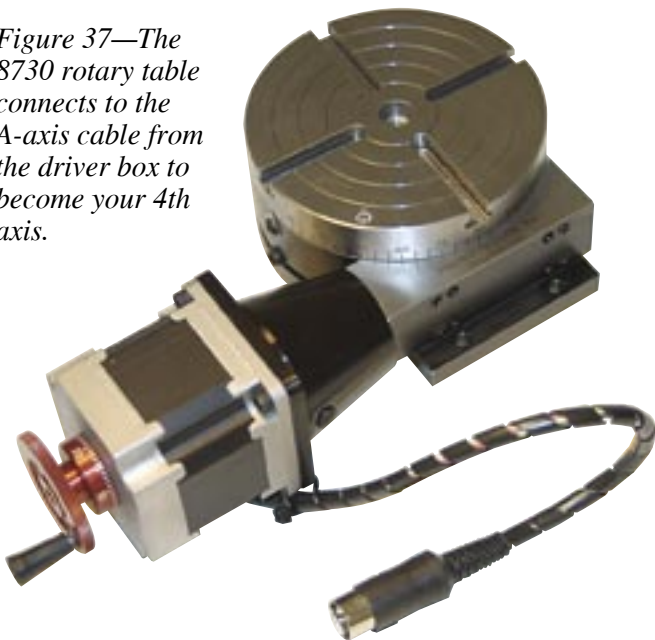


Figure 38

Sherline's stepper motor mounts feature dual preloaded ball bearings to eliminate end play and a dampened coupler to protect the motor.

program is a National Institute of Standards and Technology (NIST) effort to develop, standardize and validate a specification for interfaces to open architecture controllers." In simpler terms, EMC is a free but highly capable open source CNC control program. Because this sophisticated program is available at no charge, we are able to pass the savings on to your by eliminating one of the biggest sources of expense in most CNC systems...the operating system and software.

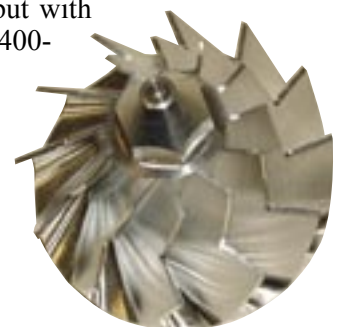
Features:

- Utilizes industry standard g- and m-codes that you write yourself or generate from a CAD/CAM program (not included) that generates G-code.
- Features powerful NEMA 23 size, 120 oz-in, dual shaft stepper motors
- Capable of accuracy to 0.001" (0.01 mm) or better
- Tool offsets—Enter the tool diameter in the "tools" table and the computer calculates how far to offset the tool path so the side of the tool cuts the desired path.
- Accepts inch or metric dimensions
- Instructions by Joe Martin—the most practical, concise and down-to-earth you will find on the subject of CNC.
- Priced for the hobbyist but suitable for running small prototype or limited production work.
- One year warranty for home (non-production) use

Part Numbers for CNC systems

- 8400/8410**—4000-series lathe with computer (2 axes)
- 8440/8441**—4400-series lathe with computer (2 axes)
- 8540/8541**—5400-series mill with computer (3 axes)
- 8020/8021**—2000-series mill with computer (3 axes)
- 8600/8601**—Complete CNC shop package with 4400-series lathe, 5400-series mill, 4th axis rotary table and accessories with computer (2 axes—lathe, 4 axes—mill)
- 8620/8621**—Same as above but with 2000-series mill instead of 5400-series mill.

Project: Supercharger turbine for Honda 50 minibike made with CNC by Robert Rosenfield, Henderson, NV





Frequently Asked Questions About Sherline Tools

By Joe Martin, President and owner, Sherline Products Inc.

Joe Martin turns a complex experimental shape using a combination of accessories on the Sherline mill. Mr. Martin is an experienced toolmaker as well as an expert modeler. As owner of Sherline Products, he works daily with both the large industrial machines that make Sherline tools as well as the miniature machine tools themselves.

Q: How accurate are Sherline tools?

A: I can easily turn a diameter close to the chuck on the lathe within .0002" (two ten-thousandths of an inch). Does this mean the machine is built to that tolerance? No, but it does mean that the leadscrews are accurate, the cutting tool is proper and the diameter I am cutting is large enough not to deflect.

Most problems associated with making very tight tolerance parts are not caused by the machines but rather are the result of the level of craftsmanship of the operator. As your technique improves, you'll find your machine keeps making better and better parts. It is not uncommon for a good craftsman to be able to make parts accurate to within a thousandth of an inch or less on our tools. Headstock/tailstock alignment is within .003" when it leaves the factory. Adjustable tailstock tool holders are available to align the headstock and tailstock "dead on" if you need it.

The tools we make are as accurate as you can build them without expensive grinding and heat treating. We have over a million dollars invested in state-of-the-art CNC machine tools and tooling to mass-produce accurate parts. To increase the accuracy less than 1% would increase the cost by a factor of ten. This simply wouldn't be cost effective for our average customer. To go from our under \$600 lathe to a lathe of similar size costing over \$5000 yields a machine that is only slightly more accurate.

Q: What is backlash and how much do the leadscrews have?

A: Backlash is the play in the engagement of the leadscrew threads that allows a few thousandths of an inch to be turned on the handwheel before the leadscrew starts to turn when changing directions. This is not a fault with the machine but simply a fact of life on any threaded screw and is accounted for by always making your cuts in the same direction and keeping track of which way you turned the handwheel last. On axes that have an adjustment, we recommend backlash be set to about .003 to .005" (.08 mm to .12 mm).

Q: What kind of materials can I machine?

A: There are almost no limits to the kind of materials you can machine. Anything from wood or plastic to exotic materials like stainless steel or titanium can be cut as long as the part is appropriately sized, can be safely and firmly held and the proper cutting tool and speed are used. (See www.sherline.com/testcuts.htm.)

Q: How big a part can I work on?

A: The Lathe is capable of turning a 3.5" (90 mm) part over the bed or 1.88" (45 mm) over the crossslide. A 1.25" riser block kit increases that to 6" (152 mm) over the bed or 4" (102 mm) over the crossslide. A .405" (10 mm) diameter hole through the headstock allows long material of up to that size to be fed through and worked on. The 4000 lathe has 8" (200 mm) between centers and the 4400 lathe has 17" (430 mm) between centers.

That gives you the physical limitations of the machine, but what does the hardness of the material you are working with do to those numbers in the real world? If the materials you plan to work with are free-machining (aluminum, brass and free-

machining steel), you will be pleased with a Sherline lathe if the average part you make is approximately 1" in diameter. For hard materials like stainless, your average part size should be around 3/4" in diameter or less. Wood and plastic are so easy to machine that only the physical size limitations of the machine need be considered. That doesn't mean you can't machine a 3" flywheel, but if you are planning to consistently make parts of that size, you will probably be happier with a larger machine and more horsepower. Removing large amounts of metal on a small machine takes time. If you have plenty of time, the size of the part is less critical. Users of any machine are happier with its performance when they are not consistently pushing the limits of its capabilities.

The vertical milling machine is capable of holding much larger parts than the lathe, because the part is held and only the tool turns. It also has a much longer table throw (X-axis). A deluxe version is available which offers an additional 2" of travel on the Y-axis compared to the standard mill. With the addition of the horizontal milling conversion, surfaces up to 6" x 9" can be machined without moving the part. This is a very large machinable area for a tool of this compact size. The 2000-series 8-direction mills open up even more machining possibilities.

Q: What is the power of the motor and the speed range?

A: The 90-Volt DC motor offers far more torque than the 1/2 HP AC/DC motors we used to use. (It is also much smoother and quieter.) The electronic speed control adjusts automatically for any voltage worldwide from 100 to 240 VAC, 50 or 60 Hz. An electronic circuit in the speed control unit compensates for load, keeping the RPM constant during cuts. The electronically controlled speed range of 70 to 2800 RPM requires no changes of gears or belts to achieve. For even higher torque at low speeds when turning large parts, a second drive belt position is available on the motor drive and headstock pulleys. (By the way, to buy just a DC motor and speed control of this quality elsewhere could cost more than the entire model 4000 lathe!)

Q: How heavy a cut can I make on the Lathe?

A: This depends mostly on the diameter and type of material you are attempting to cut. It is also dependent on the sharpness of your cutter and the firmness of your setup. For aluminum, you should expect to be able to take cuts of up to .060" (1.5 mm) on 3/4" diameter stock, while stainless steel of the same size would require taking no more than .015" (.4 mm) with each pass. On free-machining steel you could take that same .015" cut on a 3" (76 mm) diameter piece. Heavy cuts at high RPM or feeding the tool too slowly will cause the tool to "chatter". Rule #1 in any machining operation is: **"If the tool chatters, reduce speed (RPM), reduce depth of cut and increase the rate of feed."**

Q: Do I have to be an expert machinist to use Sherline tools?

A: No. In fact, a good craftsman who has never cut metal before will often do better than a professional machinist on small tools. Machinists who normally work on big, expensive machines often tend to push a smaller machine too hard. Sherline tools were designed to be operated by people with a "common sense" knowledge of mechanics. We also provide the most complete instructions in the industry. With our tools, accessories and instructions, plus a willingness to take the time to make good parts, you have everything you need to enjoy the world of miniature machining.

Want to learn more? There is a more extensive FAQ on our web site at www.sherline.com/faq.htm and another just on CNC at www.sherline.com/CNCfaq.htm.

Technical Specifications



Model 4000/4100 short bed lathe (rear)
Model 4400/4410 long bed lathe (front)



Model 5000/5100 vertical mill



Model 5400/5410 deluxe vertical mill



(Left) Model 2000/2010 8-direction deluxe vertical mill

Lathes

	4000 (4100)	4400 (4410)
Swing over bed	3.50" (90 mm)	3.50" (90 mm)
Swing over carriage	1.75" (44.5 mm)	1.75" (44.5 mm)
Distance between centers	8.00" (200 mm)	17.00" (430 mm)
Hole through spindle	.405" (10 mm)	.405" (10 mm)
Spindle nose thread	3/4-16 T.P.I.	3/4-16 T.P.I.
Spindle nose taper	#1 Morse	#1 Morse
Travel of crosslide	4.25" (110 mm)	4.25" (110 mm)
Tailstock spindle taper	#0 Morse	#0 Morse
Tailstock spindle travel	1.75" (44.5 mm)	1.75" (44.5 mm)
Protractor graduations	0° to 45° by 5°	0° to 45° by 5°
Handwheel graduations	.001" (.01 mm)	.001" (.01 mm)
Electronically controlled spindle speed range	70 to 2800 RPM	70 to 2800 RPM
Length overall*	23" (584 mm)	32.5" (826 mm)
Width overall*	10.25" (260 mm)	10.55" (267 mm)
Height overall*	8" (203 mm)	8.5" (216 mm)
Shipping weight	24 lb. (10.9 kg)	30 lb. (13.6 kg)

Vertical Mills

	5000 (5100)	5400 (5410)	2000 (2010)
Max. clearance, table to spindle	8.00" (203 mm)	8.00" (203 mm)	9.00" (229 mm)
Throat (no spacer)	2.25" (50 mm)	2.25" (50 mm)	(Adjustable)
(w/ headstock spacer)	(optional)	3.50" (90 mm)	(Adjustable)
Travel, X-axis (with stop)	8.65" (220 mm)	8.65" (220 mm)	8.65" (220 mm)
Travel, Y-axis	3.00" (76 mm)	5.00" (127 mm)	7.00" (178 mm)
Travel, Z-axis	6.25" (159 mm)	6.25" (159 mm)	5.38" (137 mm)
Hole through spindle	.405" (10 mm)	.405" (10 mm)	.405" (10 mm)
Spindle nose thread	3/4-16 T.P.I.	3/4-16 T.P.I.	3/4-16 T.P.I.
Spindle nose taper	#1 Morse	#1 Morse	#1 Morse
Handwheel graduations	.001" (.01 mm)	.001" (.01 mm)	.001" (.01 mm)
Electronically controlled spindle speed range	70 to 2800 RPM	70 to 2800 RPM	70 to 2800 RPM
Width overall*	14.75" (375 mm)	15.00" (381 mm)	15.00" (381 mm)
Depth overall*	11.75" (298 mm)	14.00" (356 mm)	22.25" (565 mm)
Height overall (Max.)*	20.75" (527 mm)	20.75" (527 mm)	23.38" (568 mm)
Table size	2.75" x 13.00" (70 mm x 330 mm)	2.75" x 13.00" (70 mm x 330 mm)	2.75" x 13.00" (70 mm x 330 mm)
Hold-down provision	2 T-slots	2 T-slots	2 T-slots
Shipping weight	33 lb (15.0 kg)	36 lb (16.3 kg)	38 lb (17.2 kg)
Movements in addition to X-, Y- and Z-axes	Headstock rotation (90° L/R)	Headstock rotation (90° L/R)	Headstock rotation (90° L/R), Column rotation (90° L/R), Column pivot (90° Fwd/Bk), Column swing (90° L/R), Column travel (In/Out) 5.5" (140 mm)

Motor Specifications

Input voltage—100 to 240 VAC, 50 or 60 Hz
Output to motor—90 VDC
Current draw—.5 to 15 amps depending on load
No-load output shaft speed—6000 RPM (no pulley)

NOTE: DC motors and headstock/motor units are available separately. Part numbers are as follows:
P/N 33050—DC Motor and Speed Control only
P/N 3306—Std. Headstock/Motor/Speed Control Unit
P/N 3307—10,000 RPM Headstock/Motor/SC unit

*All overall dimensions include motor and speed control.

Spindle Specifications

End play (factory adjustment of preload):
—.0002" (.005 mm) or less, normal pulleys
—.0003" (.008 mm) or less, 10,000 RPM pulleys
Runout at nose—.0005" (0.013 mm) or less
Bearings—Two 20 mm lifetime lubricated ball bearings with adjustable preload

**SHERLINE...
High Quality
Machine Tools
and
Accessories
Made in the USA
Since 1974**



The Sherline shop floor, showing just a few of the CNC production tools used to manufacture the Sherline tool line.



Sherline's modern 66,000 square foot manufacturing facility is located in Vista, California. If you would like to see how we produce our high quality tools at such a reasonable price, we invite you to visit our factory. You will see state-of-the-art equipment, including computer-controlled machining centers and laser engravers producing the extremely accurate parts that make up our lathes, mills and accessories.

Vista is located approximately 35 miles North of San Diego. Our showroom display includes examples of all our tools and accessories. Manual and CNC lathes and mills are available for demonstration. We are open Monday-Friday, 8 AM to 5 PM and closed holidays.



The Internet Craftsmanship Museum

Visit the on-line museum that features some of the world's finest miniature craftsmanship. Sponsored by the Joe Martin Foundation for Exceptional Craftsmanship, it is open twenty-four hours a day and admission is free. There is also a physical museum located at the Sherline factory facility in Vista, CA that is open during business hours. It includes a shop and houses our vintage machine tool collection as well.

www.CraftsmanshipMuseum.com



Your Sherline dealer is:

Secure on-line ordering is now available 24 hours a day on Sherline's e-commerce web site:
www.sherlinedirect.com

Visit Sherline's information-packed Worldwide Web site:
www.sherline.com

© 2007, Sherline Products Inc.
Printed in USA by Village Press, Inc., Traverse City, MI

**SHERLINE
PRODUCTS**
INCORPORATED 1974

3235 Executive Ridge, Vista, CA 92081-8527
Technical Assistance or International: 1-760-727-5857
Fax: 760-727-7857
E-mail: sherline@sherline.com
Internet: www.sherline.com or www.sherlinedirect.com

Toll Free Order Line: **1-800-541-0735**
USA and Canada

Miniature Machine Tools and Accessories Catalog

Featuring lathes, vertical milling machines and over one hundred and thirty accessories for your miniature machine shop.

These are perfect tools for the hobbyist, modelmaker, jeweler, clockmaker, gunsmith, prototyper, inventor, design engineer or any craftsman needing small, accurate parts in metal, wood or plastic.

SHERLINE PRODUCTS

www.sherline.com



Lathes—Page 9



Milling Machines—Page 27



CNC Systems—Page 43



Machine Packages—Page 23



Accessories



New Products—Page 41

New Products!
Lathe microscope mount, page 13
Mill microscope mount, page 38
Eleven more new products, page 41

See the Books and Videos section on page 42 for a new DVD video on how to set up and use a Sherline lathe.