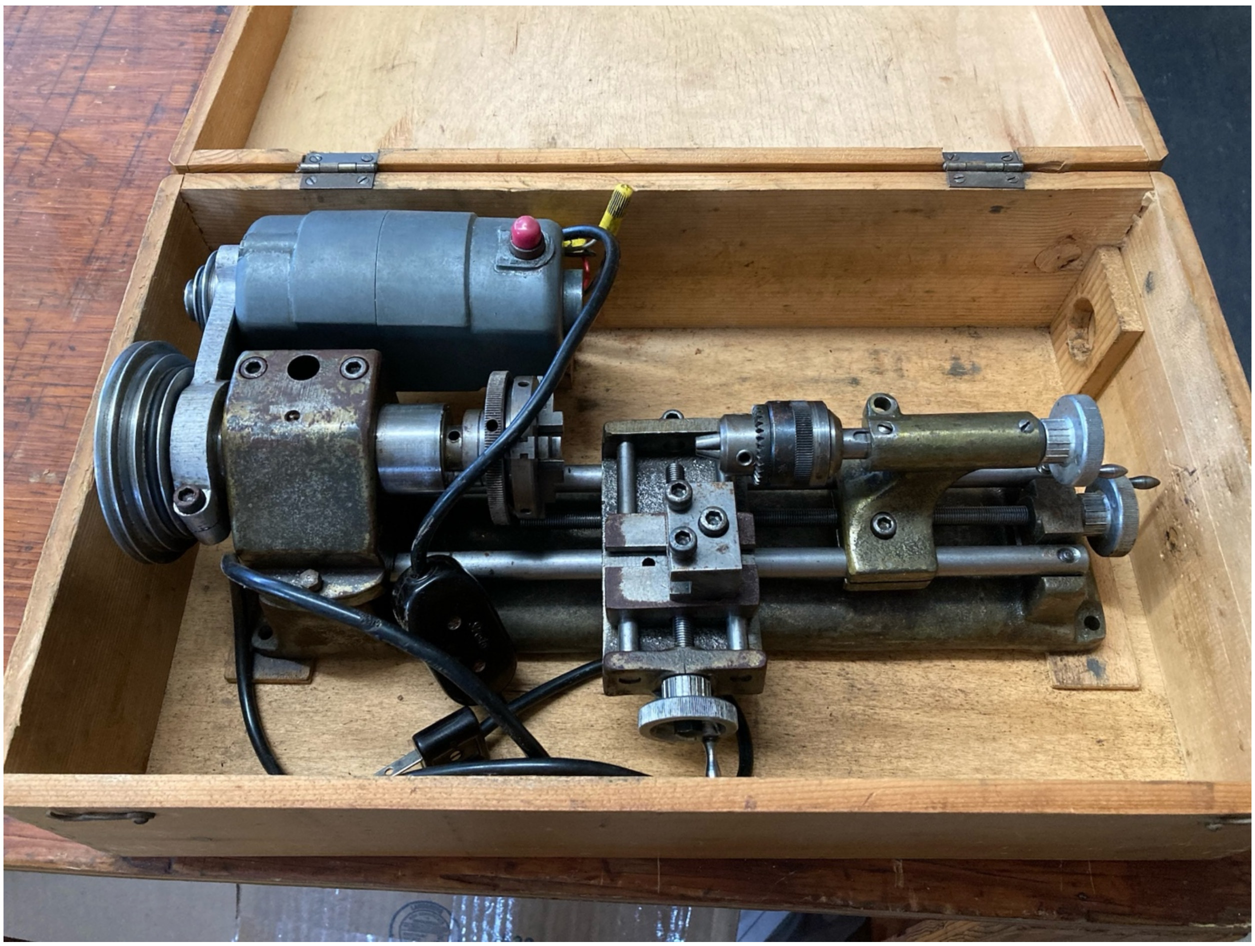
Unimat DB200 Lathe Update Project

Gary Johnson Dec. 2025

By a stroke of luck I received (free!) an older Emco Unimat lathe from a friend who acquires lots of interesting equipment from liquidation sales. I already have a nice South Bend heavy 10, but this little machine has the advantage of higher spindle speeds for the smallest work that I do, mostly in making and restoring Morse keys of various types. Also I can comfortably sit in front of it with my magnifiers on. Having lots of prior lathe experience, I knew the main features needed when updating the Unimat, especially X/Y indicators, variable speed, and a quick-change toolpost. Nearly all the ideas presented here came from the wonderful Unimat online group.

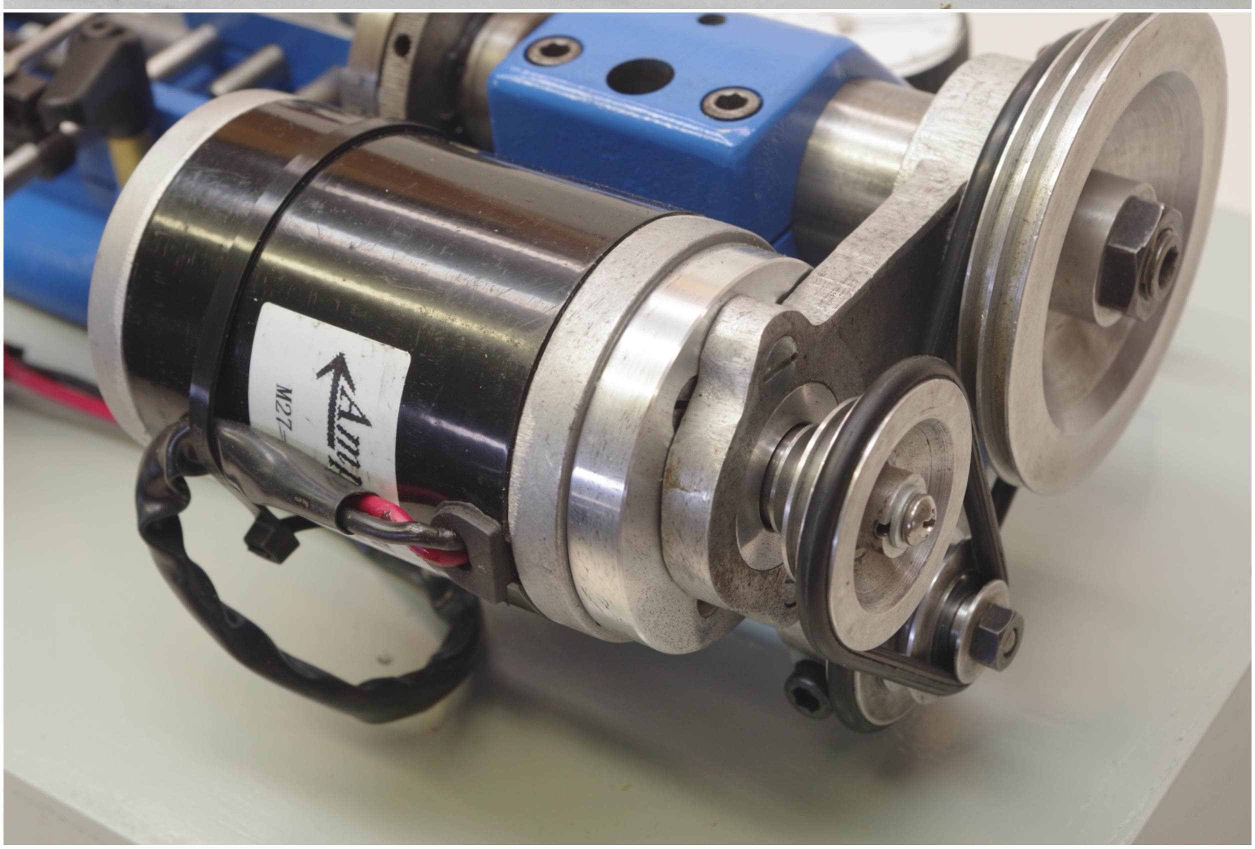


A little research shows that this is a model DB200 circa 1958, entirely made of cast iron. It came with the 3-jaw chuck and a 1/4" Jacobs chuck but no milling attachment which was ok since I have no interest in that. The tailstock casting was broken and unsalvageable so I bought a newer aluminum one on eBay and thankfully it lines up just fine. Everything else I made myself. After full disassembly and cleaning, I gave it a coat of Rust Oleum blue, just like my Kurt vise on the mill. Hey, it's my lathe, I can paint it any way that I like! After all the updates, I built a case for it with a lid like a sewing machine since I need to store it safely out of the way in my tiny shop.

Now lets go through all the customization.

DC Motor Mount

For variable speed and plenty of power, it's hard to beat a DC motor. These are typically rated 150 Watts at 3800 RPM when running on 24 VDC. This one is an Ampflow M27-150. A custom mount is needed and there is a nice design by Keith Angus from the Unimat group. It consists of an adaptor plate and a shaft extension. This fits directly into the standard motor mounting bracket with no modification and the standard pulley is installed in the usual manner. The plate is aluminum, the shaft extension steel.

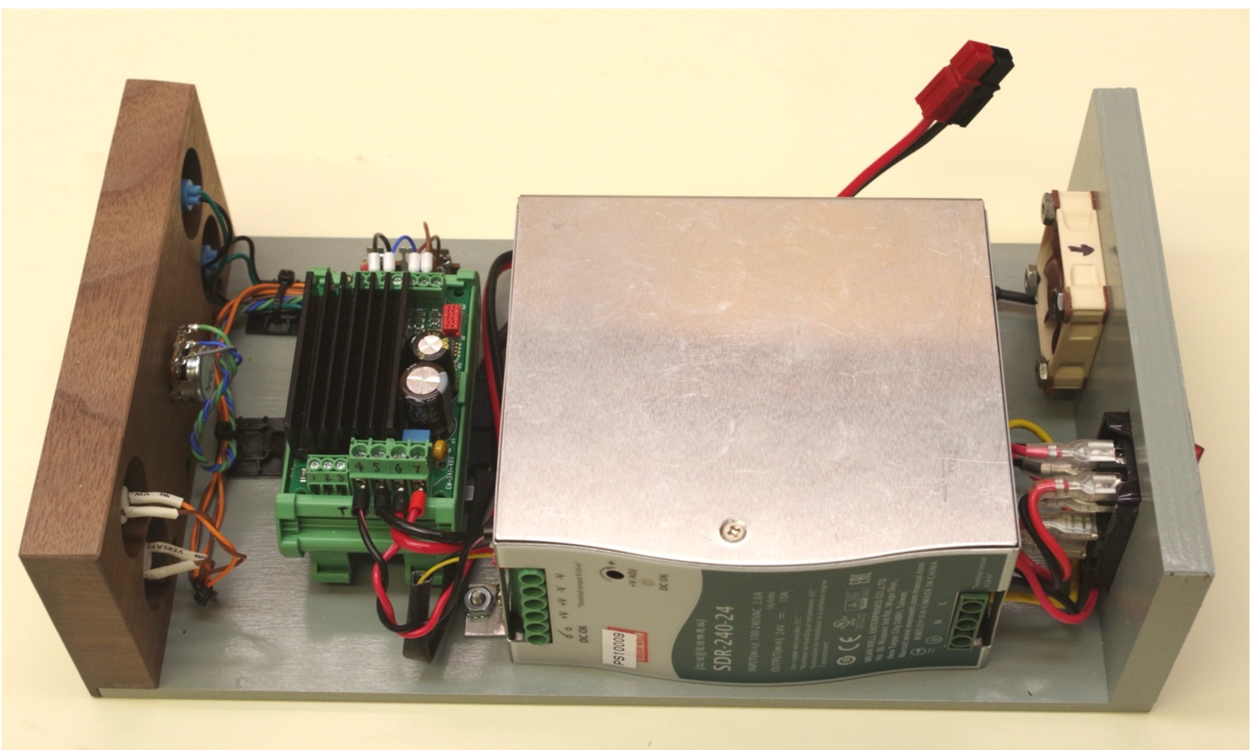


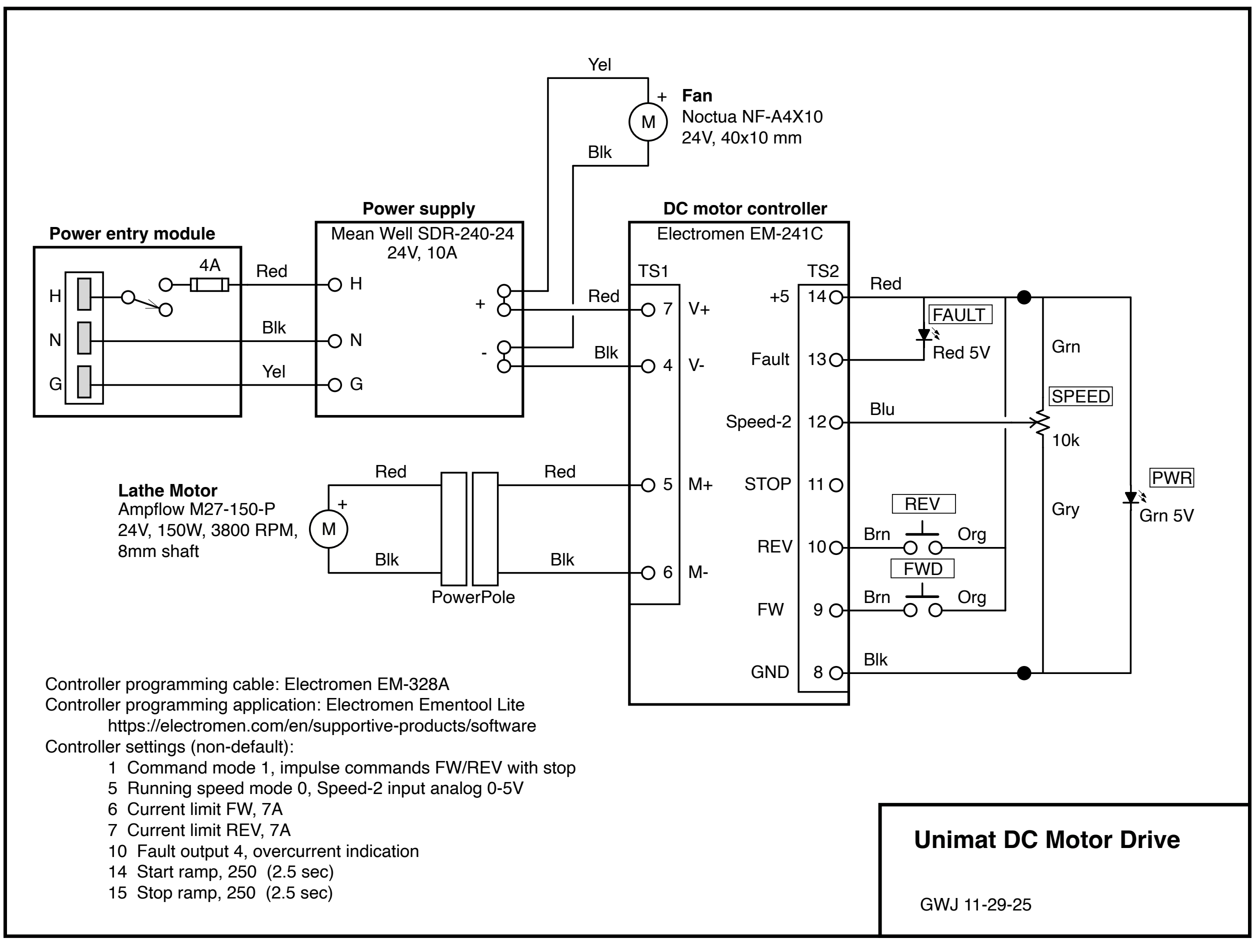
Variable-Speed Drive

DC brush motors are easy to control by simply varying the applied voltage. There are cheap PWM controllers on the market that may be satisfactory but I decided to go with a better motor controller that provides programmable acceleration and deceleration as well as current limiting to prevent motor damage. Raw DC is provided by a commercial regulated power supply. Motor connections use Anderson PowerPoles. Since this was all being installed in an enclosed cabinet, I added a very quiet 24 V fan. A power inlet module with a fuse and switch provides circuit protection and lets me remove the cord for storage. Everything is mounted on a tray the slides out like a drawer.

The controller is a bit obscure. Made in Finland by [Electromen](), it's very small but is fully programmable via a serial port adapter cable and their free Windows application. I configured it with two momentary pushbutton switches for forward and reverse. While running, pressing either switch stops the motor. There are indicator LEDs for DC power and fault. See the schematic for details.

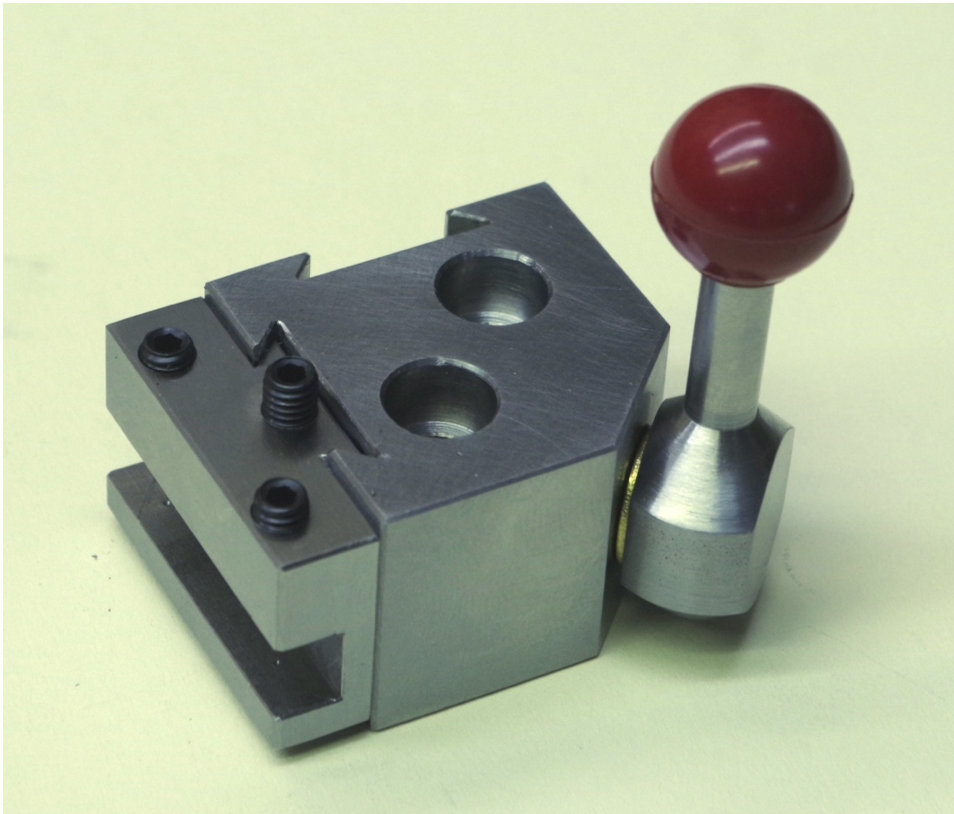
Note that while these motors provide constant torque at any speed, delivered *power* is the product of torque and RPM. So while it may be convenient to dial it way down and start a large-diameter or heavy roughing cut, you may run out of power. That's what the pulleys and belts are for.

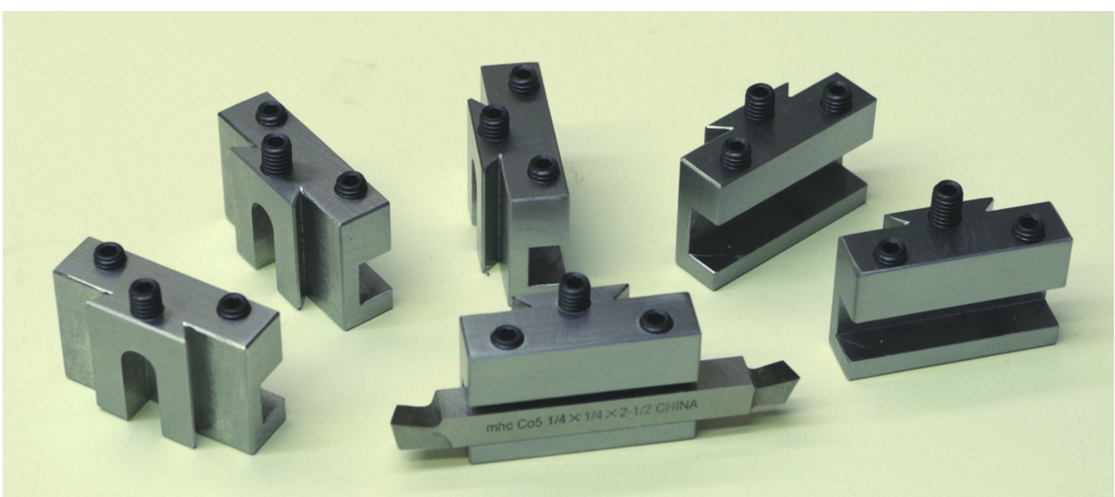




Quick-Change Toolpost

After using a lathe with a QCTP, one is quickly spoiled and it becomes a mandatory accessory. There are a few designs out there for the little Unimat. The one I chose is by Richard Van Beusekom who goes by @OldToolmaker on the Unimat group. The plan set is very nicely drawn, free of errors, and includes helpful written instructions. Everything is made from 4140 tool steel with much of the work done on my Chinese drill-mill. Holding the required tolerances in the dovetails was challenging and right at the limit of this sow's-ear machine but I persevered and the fit is very sweet indeed.

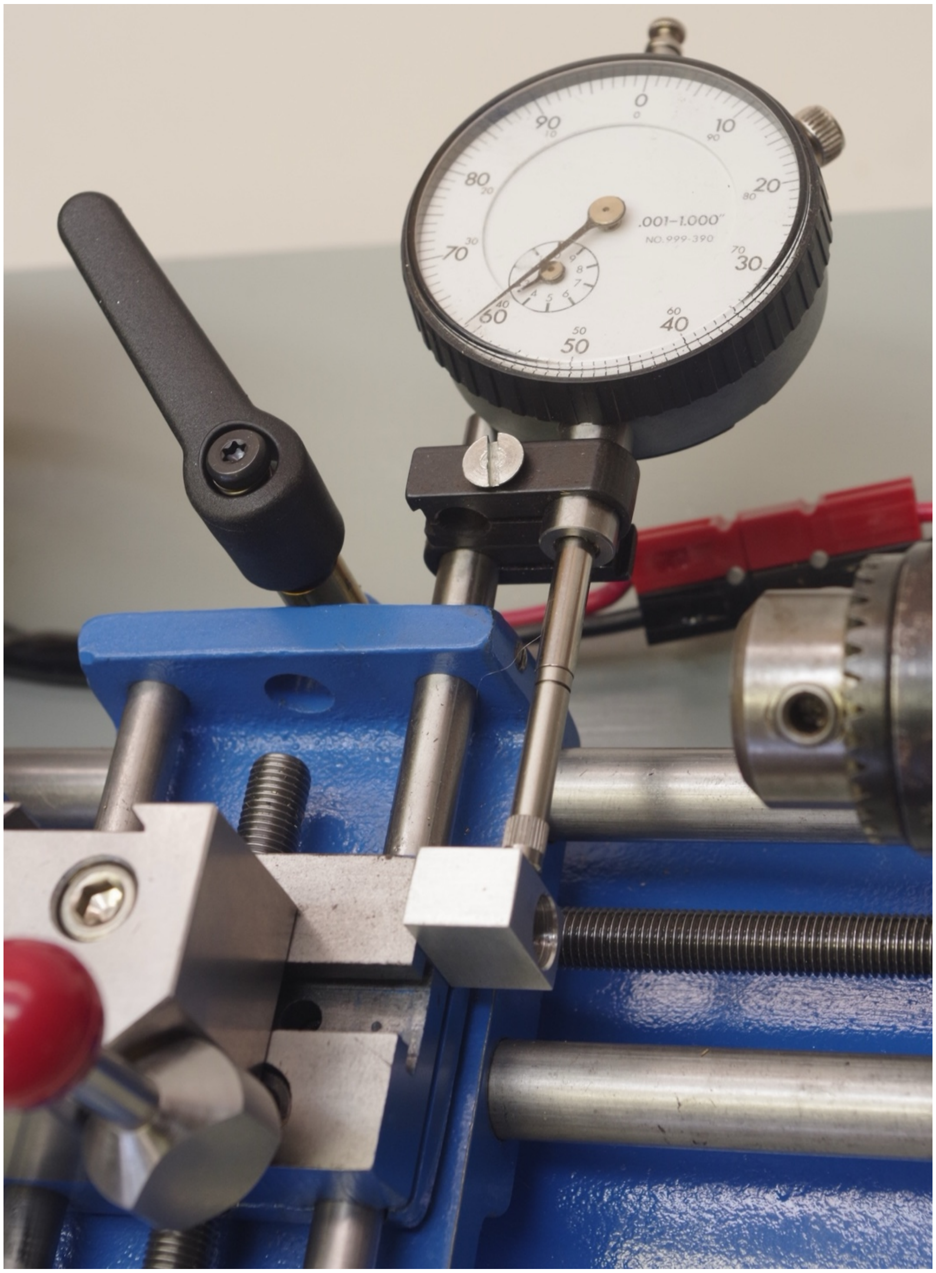




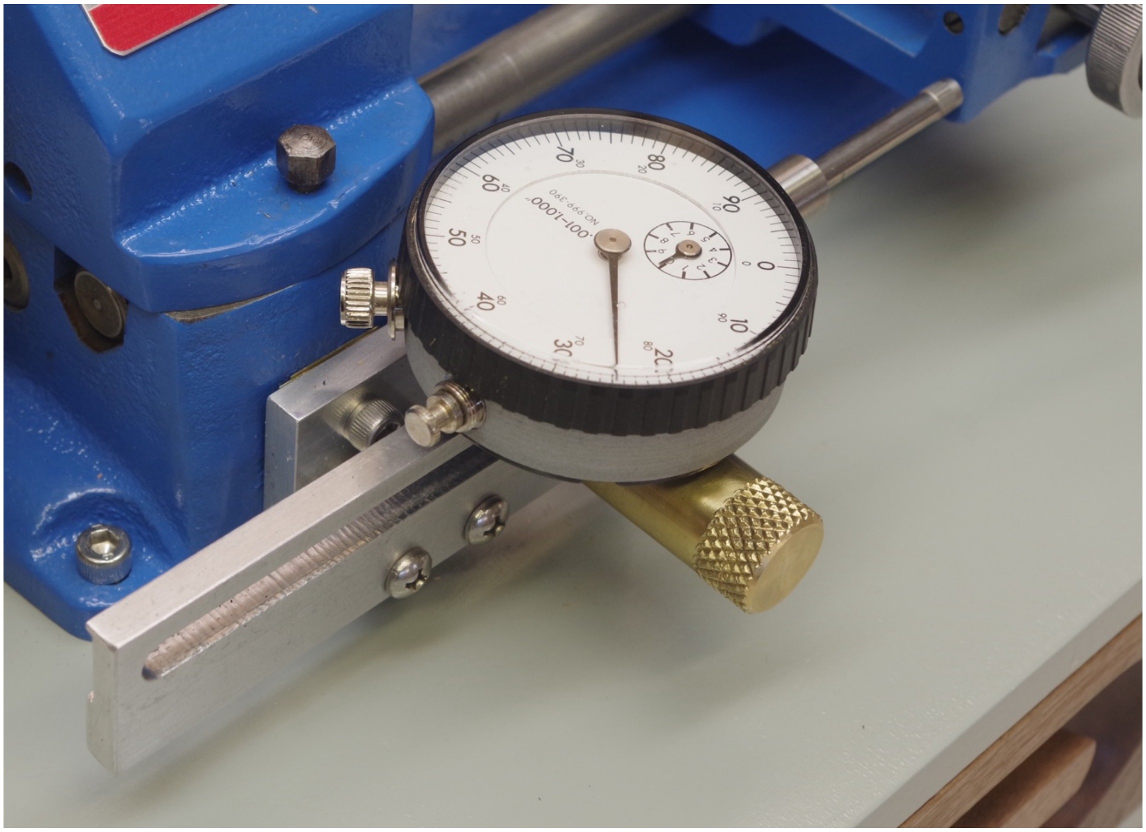
Indicators

Dials on the Unimat are calibrated in mm and of course there is backlash, so adding indicators for the X and Y axes is very helpful for precision work. There are many methods for mounting them and some of the mounts are available for sale. I looked at quite a few and decided on something that is a hybrid of those ideas.

For the crossfeed, I extended one of the 8 mm rails and used a commercial indicator mount that had the right bores for the rail and indicator body. A small block of aluminum is bolted to the side of the cross feed via a tapped hole. I did clean up the sides of all the carriage parts on my mill so everything is square. Indicator extension rods are added when needed.



A travel indicator is installed on a custom mount bolted to the bed. A long slot sets the basic position. I have both 1- and 2-inch travel indicators and either can be installed. Works great!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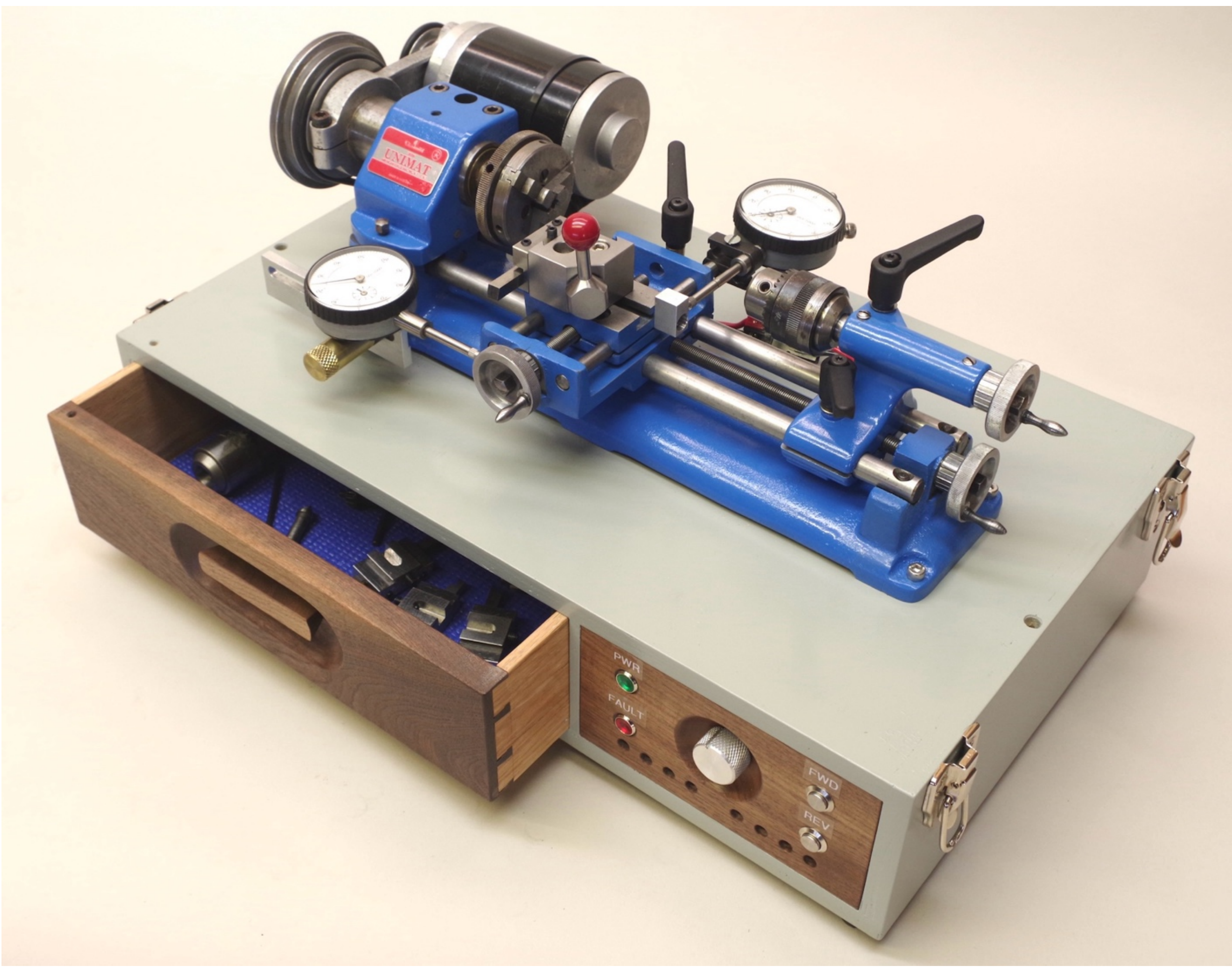
The Case

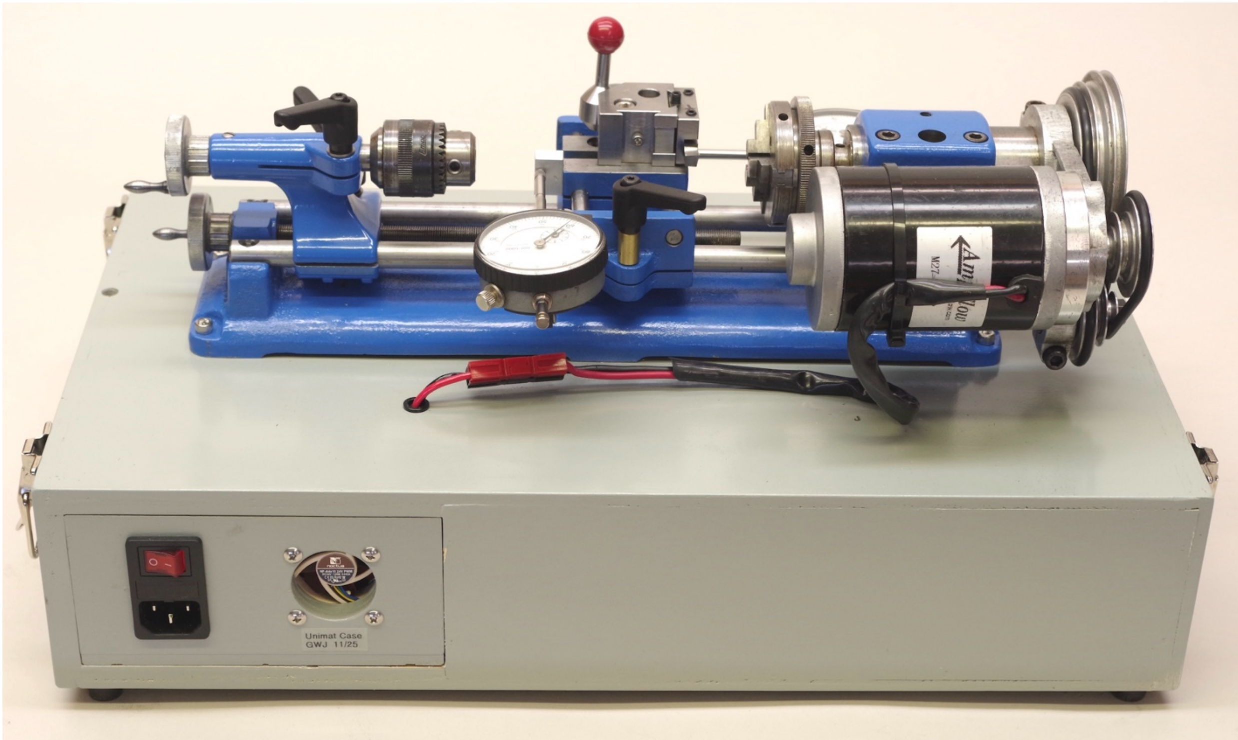
This case is like one for a portable sewing machine with a removable lid and carrying handle. That allows me to quickly deploy the lathe on my benchtop when needed and then store it away. It's made from 12 and 6 mm Baltic birch plywood with walnut faces for the drawer and motor controller. Everything is recessed so nothing gets bumped during storage. A small pin in the lid locks the drawer closed. The drawer is hand-dovetailed (I'm mostly a woodworker...).

My lathe came with no Unimat nameplate. Starting with online photos, I found something that is likely to have been provided in the late 1950s. Using my favorite illustration tools (EazyDraw and Affinity Designer, I created artwork, saved it as EPS, and had my local awards company fabricate the plates. They are printed on thin aluminum. One was made to fit the lathe and the other about twice the size is affixed to the case.



Conclusion

Having only seen a Unimat in magazines when I was a teenager, this was a pretty cool find. I'm getting good finishes when turning and facing and the high spindle speed is just what I needed to augment my big South Bend. Thanks again to all the guys on the Unimat group for the great ideas.


Unimat Case
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UNIMAT
PWR
FAULT
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