# Dividing head with MT 2 spindle

Tony Jeffree (www.jeffree.co.uk) made two dividing heads. The first and simple one used a MT 1 drill-chuck arbor; the more advanced one a Taig Micro-Lathe headstock as the spindle of a dividing head.

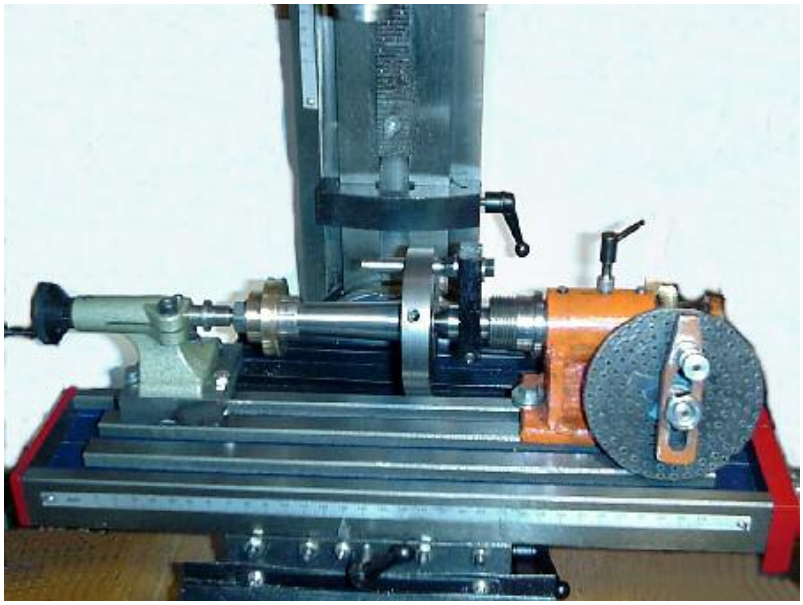
I made a dividing head based on his ideas using an old Emco Unimat spindle (see "Dividing head based on Emco Unimat spindle").

The spindle and spindle-nose of the Unimat is small and will not take heavy cuts, so I decided to make a similar dividing head with a larger and stiffer spindle. I already had the frame I made for the Unimat spindle; all I needed was a new spindle with a MT 2 internal taper. I hoped to get a spare Myford spindle (with MT 2 internal taper) but it was very expensive. Chester UK have a Cobra Mill (Sieg X1?) with a MT 2 spindle. I bought just the spindle (as a replacement), it is about 1/3 the price of a Myford lathe spindle but the spindle-nose has no thread.

## Spindle sleeve

To mount the new spindle I needed a new sleeve with an outer diameter of 35 mm. I had a piece of thick walled steel pipe and turned the outside diameter to 35mm to slide into the old frame.

I mounted the sleeve in the 4-jaw and centred it using a dial indicator so I could turn recesses for two sintered bronze bearings ("Oilite bushes").



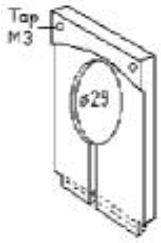
## Worm drive

I also needed a new worm wheel; the old one did not have enough material left so I could open up the hole to approxi-mately 24-mm. I made the wheel the same way as the previous. I had to use another mandrel to mount the wheel blank for final turning and milling.

The picture shows the wheel blank mounted in the old dividing head on the Mini-Mill. After milling the gear teeth, a keyway was milled in the centre hole. I made a key to match the key in the spindle.

## Brake shoe

The new brake shoe was made similar to the old one, except the hole was opened up to 29mm. With the brakeshoe mounted on the brake area of the wormwheel the two 2.5-mm holes were marked and drilled. After tapping the two holes M3 it was time to test the new spindle.

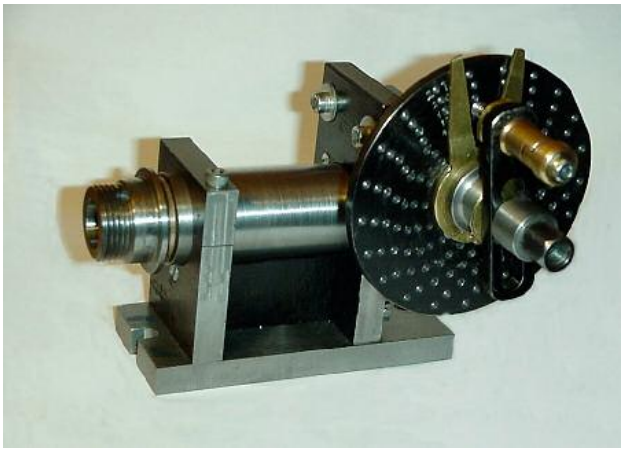



## The spindle

At the rear of the Cobra (MicroMill) spindle there's a keyway and a threaded part. I made two rings with corresponding inner threads so I could adjust the axial play.

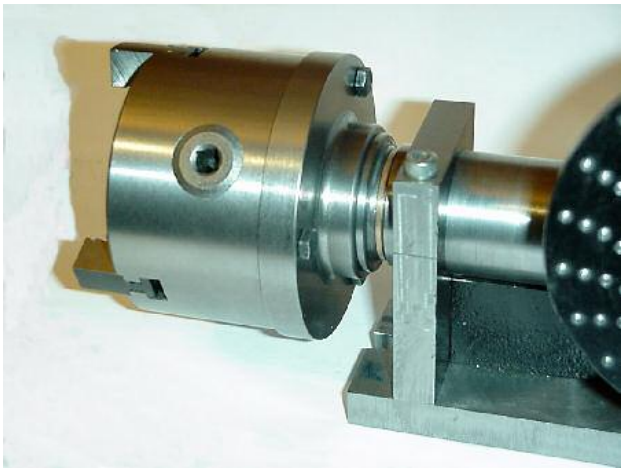
The pictures show the assembled dividing head. The two threaded locking rings have been moved out of the way to show the keyway in the spindle. The spindle extends far behind the frame, so I guess I could shorten it quite a bit. I will thread the spindle-nose 1 1/8-in. x 12 TPI and a register of 1 ¼ in., i.e. like the Myford 7 spindle nose.

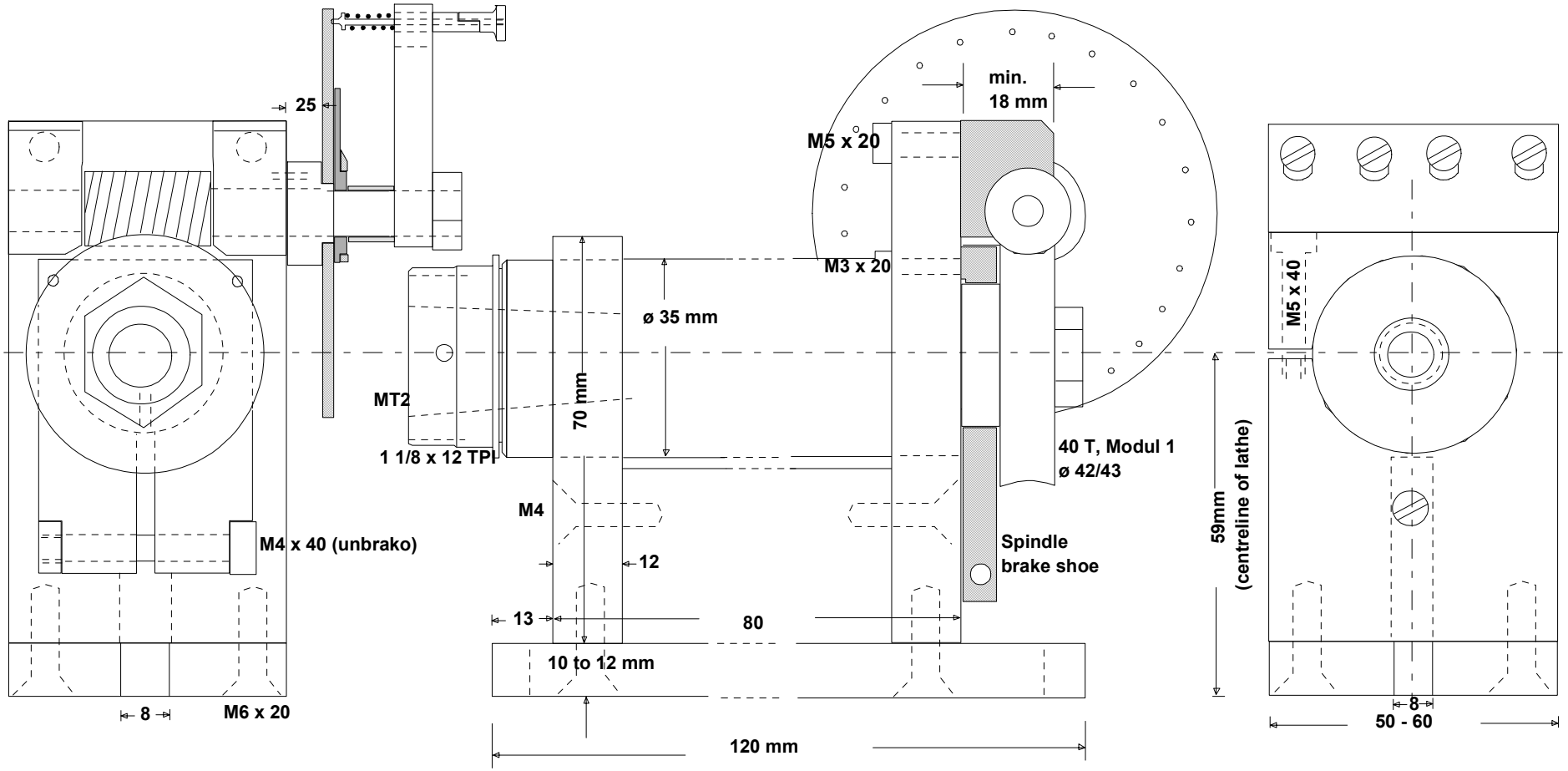
The spindle was case hardened so I used a carbide tipped tool to turn down the spindle nose and cut the thread. After I cut through the hard surface the material machined very well.
I turned the register part slightly oversized (about 0.02 mm). Then I mounted the spindle in the sleeve and while the spindle was rotated slowly I used a small grinding wheel to grind the register to the final dimension. This way the register surface will run as true as I can get it (I measured a T.I.R. of around 0.01 mm).
The picture to the right shows the finished spindle mounted in the dividing head.



I could then use an ordinary Myford "backplate" to mount a small 80 mm 3-jaw chuck. The backplate was turned roughly to shape while mounted in the 4-jaw. The final cuts were taken with the spindle mounted in the sleeve. I used a small multi-flute Dremel end-mill.

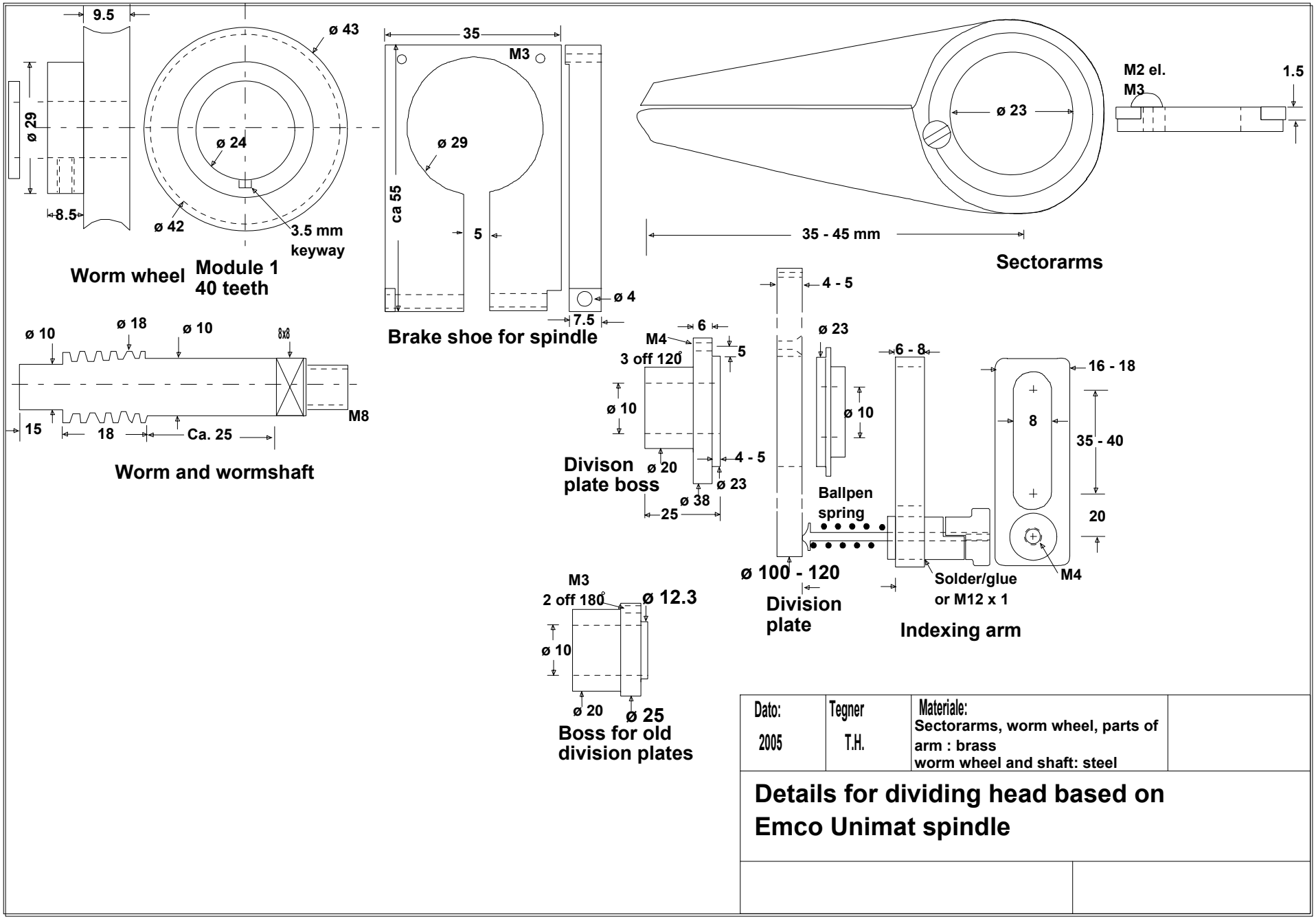
The picture shows the chuck with backplate mounted on the dividing head. I just need to reduce the diameter of the backplate slightly.






| Dato: | Tegner | Materiale: |
|---|---|---|
| 2005 | T.H. | Frame: steel<br>worm wheel, detent knob : bronse/brass |

# Dividing head based on Emco Unimat spindle




| Dato: | Tegner | Materiale: |
|---|---|---|
| 2005 | T.H. | Sectorarms, worm wheel, parts of arm : brass<br>worm wheel and shaft: steel |

# Details for dividing head based on Emco Unimat spindle