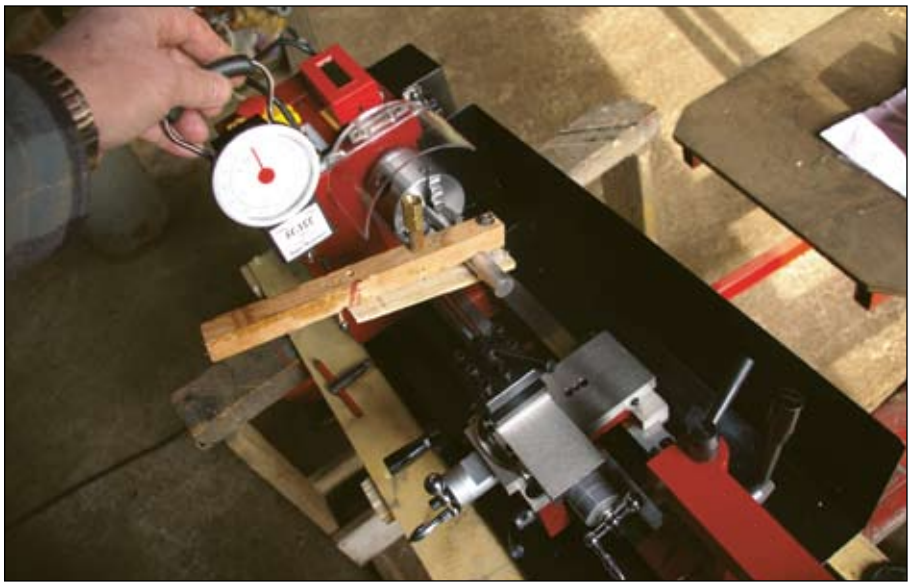
AN IMPROVED MINI LATHE FROM SIEG

Dave Fenner tries out this updated popular lathe

1. New Mini Lathe. The main visible changes are the control panel and leadscrew guard.



2. Heath Robinson torque measurement using wooden clamp brake and hanging scale.

3. Depth of cut here is 2.3mm.

OVERVIEW

Never a firm to rest on their laurels, Sieg have raised their game with a revised version of this popular little lathe (**photo 1**). Probably the most significant, although not the most obvious change is the motor where the DC brushed motor has now been replaced with a brushless type.

This type of motor has become very popular in aeromodelling circles where the advantage of high power in a small package is particularly relevant.

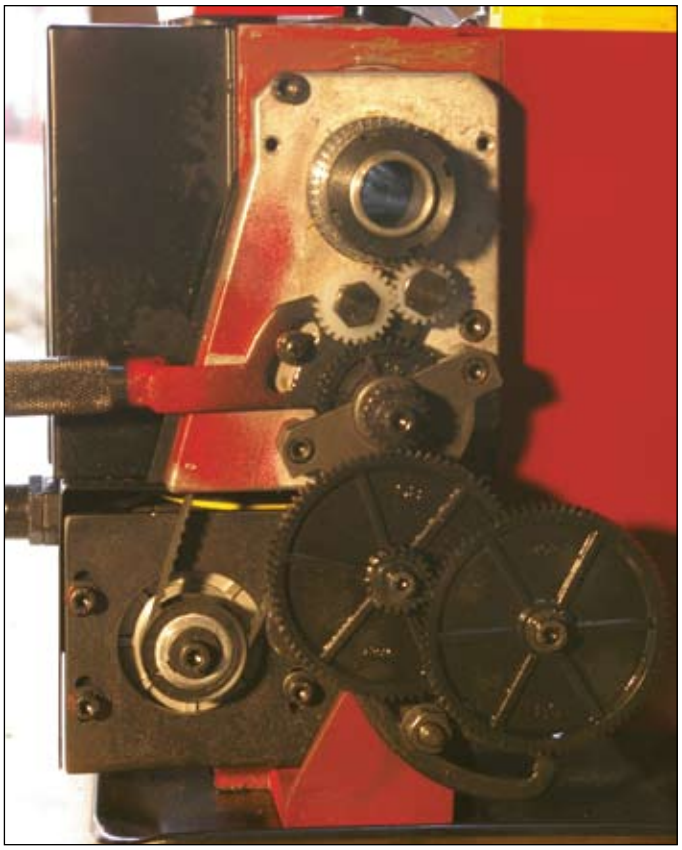
As with the earlier C3 lathe, this is a machine that Arc Euro Trade will be selling either "Factory Assembled" or "Arc Prepared". This policy acknowledges that while these machines will function adequately "out of the box", the performance can be substantially improved by a careful strip down and rebuild/readjustment exercise. Details of the suggested work can be found by referring to the sources given in the 'Resource Box' at the end of this article.

General

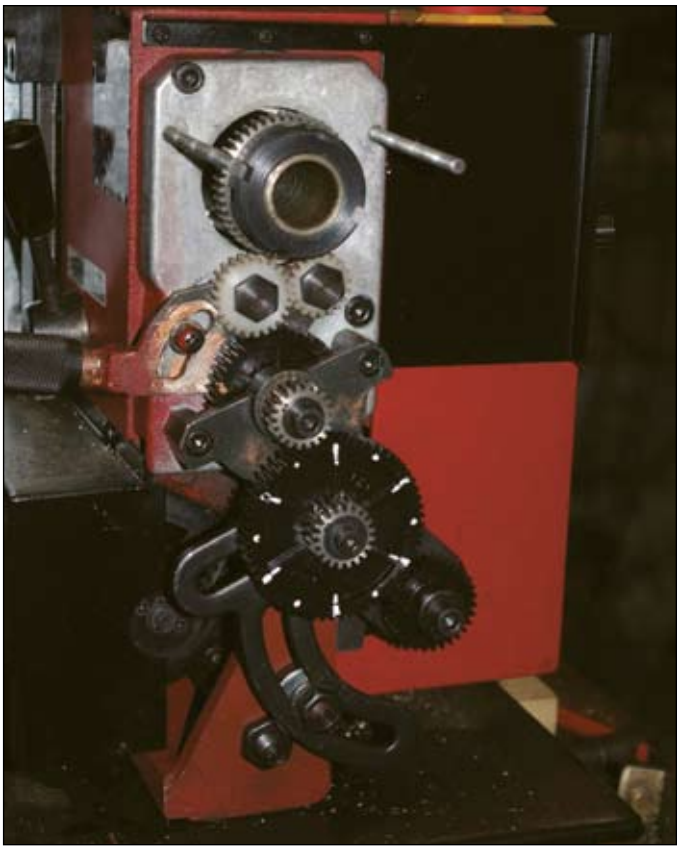
Looking at the data plates on the old and new machines gives a flavour of the changes. The motor power has increased from 350watts to 500 watts (i.e. it's now about ⅔hp) and the between centres dimension has increased by 50mm to 400mm.

Headstock

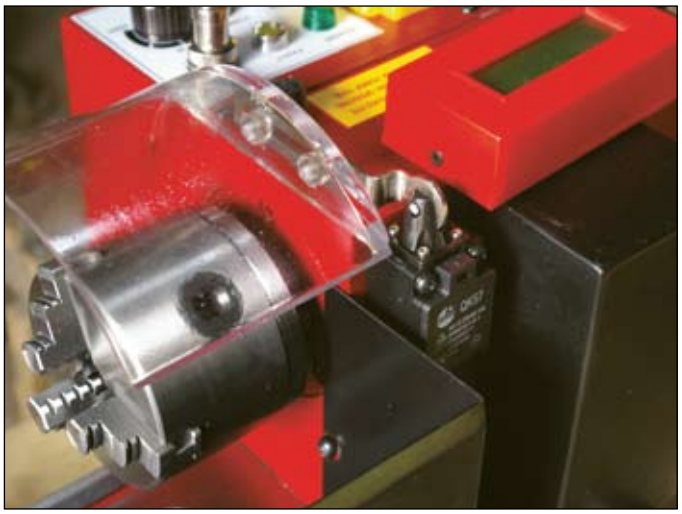
Apart from the leadscrew guard, the noticeable changes are all in the headstock area. Because the motor is controllable from a high speed (about



4. On the new machine, the belt drive is directly from motor to spindle....



5. ....whereas on the old, the drive is taken to a countershaft with two speed gear selection.



6. The new chuck guard hinge and safety switch. Also visible is the tachometer speed read out.

7. The older style chuck guard hinge and safety switch.

2500 rpm) down to a very low speed, (about 50 rpm) the high/low speed gear change is no longer necessary. My first thought was that this might compromise the machine's ability to remove metal, particularly at low rpm. As a rough and ready means of investigating this, I rigged up the torque measuring arrangement which can be seen in **photo 2**. On the original Mini-Lathe, running at about 250rpm in low gear, I could wind up the adjuster nut until the overload tripped with the scale showing about 3 Kg. The revs dropped by about 40rpm just prior to tripping.

On the new machine, at the same speed, it had not tripped at over 4 Kg and at this stage the torque brake was getting seriously hot and I chickened out. Interestingly, the revs did not seem to drop although the motor sound did change suggesting that the system was working harder. In general the new machine runs more smoothly and quietly, probably because it no longer uses gears in the power transmission to the spindle. **Photo 3** shows a rudimentary test using a piece of 22mm mild steel. After adjusting the topslide, it was possible to take a cut of 0.090in. (2.3mm) without chatter.

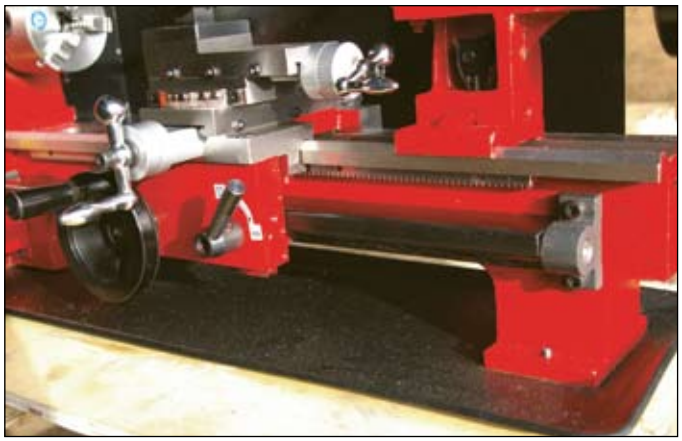
Photograph 4 showing the new change gear train may be compared with **photo 5** showing the old version. Slight changes have been made to the light alloy casting and also to the gear cover. The drive is now direct from the motor to the spindle, since the two-speed countershaft is no longer present. Another small change concerns the chuck guard safety switch; **photo 6** shows the new switch and **photo 7** shows the old version.

Regarding the electrical controls, the old machine had a built in tachometer readout. On the new, this feature is an optional extra, which plugs in and can be attached by magnets to the top of the headstock, as shown in **photo 8**.

Motor speed is controlled by a rotary knob that is marked between zero and 2500rpm and it is likely that this would allow sufficiently accurate speed selection for most purposes. Those wishing for higher precision in speed control can simply plug in the readout.

Having fitted the tachometer set, it was possible to set the knob against the line graduations and compare with actual revs. The following readings were noted:

8. The new style control panel with add on speed read out.



9. Full length guard to keep swarf, fingers and loose clothing from contacting the leadscrew.

Knob setting	Tacho readout
100	0
200	90
300	270
400	410
500	580
1000	1020
1500	1560
2000	2080
2500	2490

One very visible change is the inclusion of a guard for the leadscrew (**photo 9**). Apparently this is now a Health and Safety requirement for some markets. On the plus side, the guarding certainly keeps swarf from becoming lodged in the leadscrew thread; on the minus side it causes a change from two clasp nuts to a one clasp half nut system. I have not been able to confirm this point, but it looks possible to modify the new machine to "old status" by removing the guard and adding the second half nut. Assuming this to be correct then for owners who prefer the old "two half nut" arrangement, it is likely that the spare parts to retro fit this will in due course be offered by Arc Euro Trade.

Summary

All in all the Mini-Lathe has now acquired some serious grunt. For the older machine, the makers claimed a lowest speed of100 rpm. For the new, the practical bottom of the range is probably about 60 to 70 rpm. If you go to look at one of these little machines, remember it now has a ⅔hp motor (many Myfords have ½hp) so do not be tempted to try holding the chuck to stall the motor; it now has real bite. ■

■ MEW RESOURCE BOX

Details of the procedure for dismantling - improving - rebuilding and readjusting the Mini-Lathe may be found in /on:

- Arc Euro Trade website **www.arceurotrade.co.uk**
- Model Engineers' Workshop Issue number 133
- The Mini-Lathe (Workshop Practice series No 43) available from **www.myhobbystore.co.uk**