

SUPPLEMENTARY NOTES FOR THE HOBBYMAT MD65

When all else fails, read the instructions

With your new MD65 you will have found the handbook. It contains most of what you will need to know, but in brief form. It is, though, an operator's handbook and not a standard textbook on engineering practice.

Before going into details, we should stress the safety aspect of machining. The lathe, in common with the automobile, electric fire and the hammer, is not dangerous in itself. All it does is to extend man's ability to hurt himself through his own idiocy. So take a look at page 8 of the handbook before going any further.

Having read it, you will probably think that it is all a bit obvious. But stick with it. Safety shouldn't be just a list of instructions; it should be a state of mind. However, there are two items which need to be stressed. Firstly, make sure that the mains plug is within reach when you are stood at the lathe. Secondly, don't wear a tie, a scarf or other loose clothing whilst working. It doesn't need much imagination to see the possible consequences.

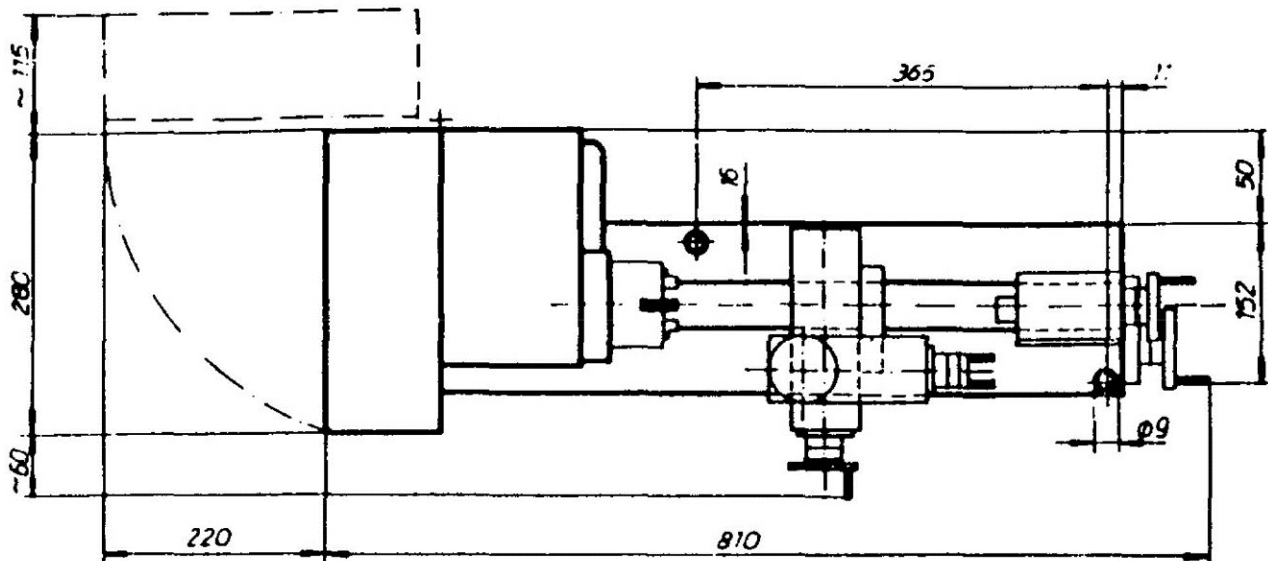
Finally, become obsessional about eye protection. Make it an automatic reflex to put the goggles or safety glasses on before your hand goes to the on switch, and DON'T change the direction of rotation whilst the lathe is running.

The various components are now laid out in front of you - looking somewhat larger than they did when you saw the lathe in the showroom or exhibition. The assembled machine weighs 45kg, which is around 100lbs in old money. So you will find it a good weight to lift up onto the workbench.

Pick up the various pieces and examine them. This is the best time to familiarize yourself with the nooks and crannies. You can be checking that all the bits are there (they will be, but it's nice to know anyway). Put a plug on the cable. This needs to have a working earth and a 7.5 amp fuse.

The components will be covered with grease, but this is only an anti-corrosion coating. This will need removing and Messrs C.Z. Scientific recommend using WD40 or Ambersil 140. In fact, most of the grease can be removed dry with clean cloths. The bright parts can now be greased and oiled. Conventional non-acid lubricants are fine, but as an alternative Teflon based grease is highly recommended. But whatever you use, be sparing with it. The main purpose of thick grease seems to be to attract swarf and make a mess.

The yellow body parts will look after themselves. If they get to look grubby, a slightly damp rag should clean it off. If you want to be house-proud, a slight whiff over with 'Pledge' will keep it in sparkling condition. The lathe won't work any better for it, but you might.



We are only going to mount the lathe once, so we might as well do the job properly. A lathe wants a flat rigid surface to sit on. A strong workbench is obviously desirable. What is useful is to have a good wipeclean surface. White Melamine-faced chipboard makes an excellent worktop, but needs to be fitted to something stronger underneath. A useful tip is to put a low "wall" of stripwood around the area to contain the swarf and oil. But if you try this, don't forget to leave a little "gate" in the wall where rubbish can be swept out.

Follow the instructions for mounting on page 7. It is important to make sure that the lathe is screwed down to a flat surface. The power obtainable from a nut and bolt is phenomenal and it is possible to distort quite massive machinery.

If you are going to make a mistake about the height of the lathe, the chances are that you will mount it too low. You are going to spend many hours with it, so make it comfortable to use. A good guide is that, like using a bench vice, the forearm held horizontally should naturally fall on the cross-slide handle. In fact, there is a good case to be made for having it higher. You can see the job that bit closer, but make sure that the transparent safety guard is in place.

Be prepared for visitors to be surprised at just how high you have it mounted. The only objection is if you intend to fit the BFE milling head at some stage. The top handle of this will be a long way up from the ground. But you may feel that it is worth it for the comfort obtained from using the lathe at a decent height.

You will see the work well only if you have decent light. Working in your own shadow doesn't have a great deal to commend it. A striplight over the lathe is better than nothing. Facing out over the tool to the window doesn't help much, either. The best solution is to get adjustable light right there where you want it.

For industrial application such a light has to be low voltage for safety. A transformer and car headlight will do. But it has to be said that an ordinary 240v Anglepoise fills our needs exactly. Work with this (or even two of them) for a while and then try going back to working under an ordinary light in the middle of the room and the difference will be graphically evident.

The MD65 will be new to you. The shapes and components will be unfamiliar. You may find changing a chuck awkward for example. But it does become familiar with a little practice. Screwing the chuck to the chuck flange calls for a bit of technique. You might like to hold the nut in the spanner provided with a bit of Blutack until it can engage the thread of the screw. If this is the way you do it, you will soon be able to omit the Blutack and whip it on and off in no time, (or use longnosed pliers).

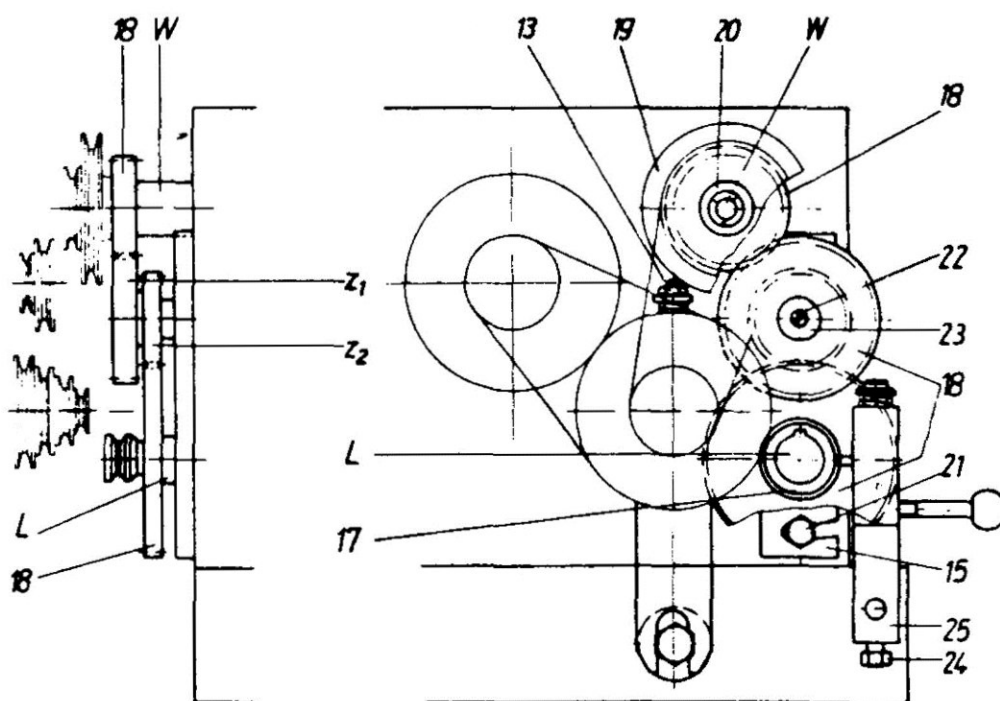
One oddity is that the MD65 has feed handles which turn in the opposite direction to many other lathes. If you have already used another lathe, you will need to make the first few cuts with card. If this is your first lathe you will wonder what on earth the above sentence is about

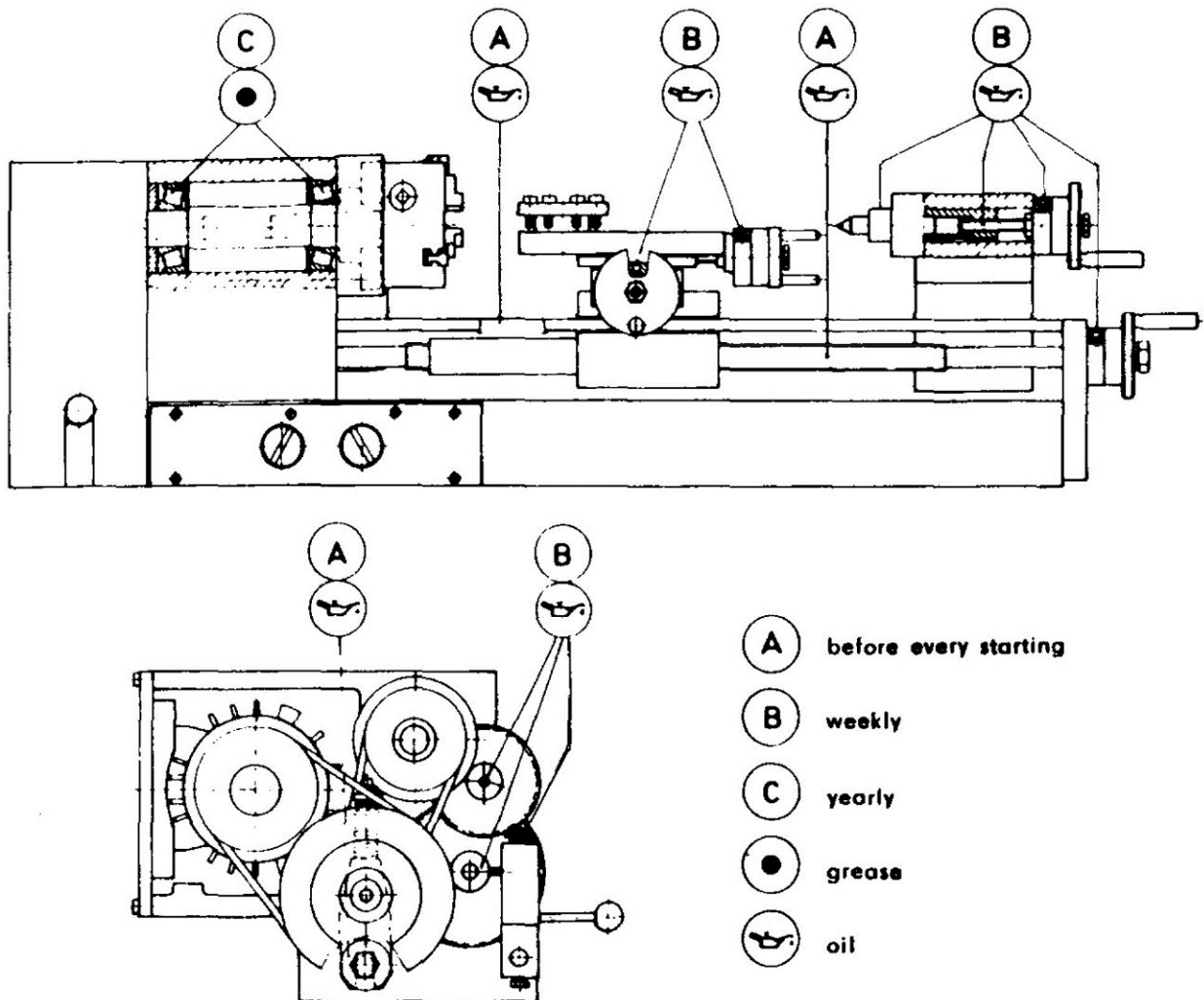
Make it a habit to be scrupulous about putting nuts squarely onto threads that have been cleaned of swarf. Indeed, the swarf brush should always be handy.

DON'T REVERSE THE MOTOR WITHOUT SWITCHING IT OFF FIRST

You will have noticed a little black knob at the front of the lathe on the left (bottom right in this illustration). If you pull it to one side, you discover that it engages the autofeed.

The fact that the lathe has autofeed facility means that we can cut screw threads. You will see that there are two sets of change wheels supplied. They are quite distinguishable from each other, but make it a practice to keep them physically separated. Don't throw them into a box with a pile of other precision tools. Slip them over a piece of dowel and, like all the rest of the accessories, keep them removed from the dirty area of the lathe when you aren't using them.





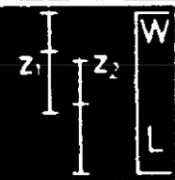




You will have noticed that, when you were assembling the lathe, you had to adjust the fit of some components. Lathes machined to perfect clearances would be easy to set up, but of course there would be no provision for wear. This is why there are gib strips and handles whose tightness is adjustable. Getting the right feel into the moving parts is a matter of adjustment. There is no point in having things so tight that the lathe becomes tiring to use. What we want is no backlash or slop; just a silky smoothness. You can almost feel the oiliness as one component moves against another. Please check the pulley and belt alignment carefully as well as belt tension. Users will be tempted to use the tensioner once and will "roll over" the belts with a pencil. The manufacturers say that components should be lubricated and looked after according to a schedule (pp 19-20). They don't print the instructions just to impress you. They are there for a very good reason. Remember that OIL IS CHEAPER THAN LATHES.

It is no bad thing to have a little notebook handy just to keep track of how much time you are spending on the lathe. You will discover that, outside of industrial applications, it takes quite a time to chalk up 25 operating hours.

Incidentally, one of the most useful tools you can use in the workshop is a small blackboard and a piece of chalk.

On the gearbox casing (and repeated on page 18) there is a baffling table of figures. Take time out to sit down and work it all out. At first it seems quite complicated but, again, it starts to make sense after a while. The trick is to get used to it now and not the first time you need to look at it.

Instruction plate - MD 65

		mm 				n/1" 					
		W	z ₁	z ₂	L	W	z ₁	z ₂	L		
		0,2	30	60	100	11	60	65	75	30	
		0,25	35	70	100	12	55	65	75	30	
		0,3	35	70	60	100	13	60	50	65	40
WW mm/Ø		0,35	35	60	60	100	14	55	65	75	35
0,08 0,16		0,4	35	70	60	75	16	55	65	75	40
W 30 30		0,45	60	40	30	100	18	50	65	55	30
z ₁ 75 75		0,5	35	60	60	70	19	50	75	60	30
z ₂ 20 40		0,6	35	70	60	50	20	55	65	60	40
L 100 100		0,7	35	60	60	50	22	60	40	50	65
Ø/min		0,75	35	70	60	40	24	50	65	55	40
A1 250		0,8	40	60	60	50	Mod 				
A2 500		1,0	60	30	50	100	0,1	55	75	30	70
B1 1000		1,25	50	60	60	40	0,15	55	50	30	70
B2 2000		1,5	75	50	60	60	0,2	55	50	40	70
A B M		1,75	60	60	70	40	0,25	55	60	60	70
		2,0	60	60	70	35	0,3	55	50	60	70
		2,5	75	60	60	30	0,4	55	75	60	35
		3,0	75	50	60	30	0,5	55	60	60	35
							0,6	55	50	60	35

SCREWCUTTING

Now here's a subject to frighten the beginner. Reading it up doesn't seem to help; many books merely shed darkness on the matter. Fortunately life is much simpler than that.

You will recall that we mentioned the autofeed; when it is engaged, the entire saddle moves slowly along the bed, as the lathe turns. When you have been doing some rough turning and want to put a fine finish on the job, the autofeed will move the tool across the job nice and smoothly. It also takes some of the work from your right hand. It will do it slowly; so slowly that it is tempting to go off and do something else. This may seem efficient, but I guarantee that you will forget about it one day and come back to a jammed up lathe with a faint aroma of smoke hanging over proceedings. So always stay and watch your machine.

If you were to use a V-nose tool, you would see that a spiral had been cut in the metal. If you then take the tool back to the right side and engage it in that faint spiral a bit deeper, you find that you are cutting a thread. With an internal threading tool, you could also cut a female thread.

Now read the next bit slowly because it is crucial. Provided that the tools are ground to the same profile, those two threads will fit each other, no matter what Threads Per Inch (TPI) they happen to be. The diameter of the job doesn't affect the form of the thread or the TPI. All you have to do is make one component the right diameter to screw into the other.

And basically, that is all there is to screwcutting. But we can take advantage of a further refinement. The distance the tool moves sideways in relation to the turning of the job is determined by the gearwheels (or change wheels) inside the cover on the right of the machine. Change these gears and you change the pitch of the thread: so now is the time to examine those change wheels which came with the lathe. You will see that they have numbers stamped on them. These refer to the number of teeth. At this stage we have to take note of a Hobbymat oddity. You will see in the handbook that the spindles that the wheels go on are not labelled A B C D as one might expect. No, the terms used are W, Z1, Z2 and L. But it amounts to the same thing.

I now draw your attention to the following chart:

Nominal TPI	W	Z1	Z2	L	Actual TPI
26	55	65	75	65	26.0158
28	55	65	75	70	28.0170
30	55	65	60	60	30.0182
32	55	60	65	75	31.9720
34	40	75	70	50	34.0179
36	50	65	55	60	36.0218
40	35	60	60	55	39.9143
42	50	65	55	70	42.0255
44	75	40	20	65	44.0267
50	55	65	60	100	50.0303
55	30	65	60	60	55.0333
60	30	65	55	60	60.0364

The nominal TPI referred to are Model Engineer threads. You will see that there are minute variations in the actual results, but for practical purposes you can ignore these. Now instead of having to buy a range of taps and dies, you can cut your own threads. The M.E. series of threads are quite closely spaced to give firm but controlled joining of components. You should refer to a table of M.E. threads for the typical diameters that you would normally turn for each TPI. But you now have the flexibility to go your own way.

For most common small threads you will still normally use taps and dies held in the tailstock. But under sundry information, you might care to file away the following notes. You can turn several useful BA threads. OBA has a 1mm pitch, so that is no problem, but you can also cut 1BA, 4BA and 7BA by putting change wheels on the spindles as per the following table.

Pitch	W	Z1	Z2	L	Size
0.90	60	40	60	100	1 BA
0.66	55	50	60	100	4 BA
0.48	30	75	60	50	7 BA

And there you have the subject of screwcutting in a nutshell. Forget about complicated formulae for now; just concentrate on cutting metal.

Now that the lathe is set up, most of what you may need to learn next (like screwcutting) is in the realms of engineering itself. Practise with various odds and ends of material. When you use a machine tool for the first time since you left school, EVERYTHING is new to you. Logic then tells us, as you practise each type of machining operation, it is no longer new. This particularly obvious sentence is important. You don't want to get used to turning cast iron on an expensive casting that is vital for some major project. It may come as a blow to discover that you may not be an experienced machinist right away. Fortunately, there is the consolation of knowing that it will all come with practice and quite rapidly at that. Simply enjoy the leisurely task of making friends with your lathe. Time thus spent will bring its own return in full measure.

FURTHER ACCESSORIES

One of the features of the MD65 is the extensive range of accessories that are supplied with it as standard. This compares very favourably with other makes and you can go straight ahead with various machining processes. But if you are new to the hobby you may be overawed by the vast range of bits and pieces that are obtainable. Fortunately you don't need the contents of a tool shop to do most tasks. But there are some that will be needed fairly early on in proceedings.

What you will need straight away are some cutting tools. A set of 6 3/8" tools will do most jobs and are freely obtainable. In the course of time you will doubtless end up with a tray full of the things - some of which won't get used. The important thing is that the point of cutting must be on a level with the centre line of the work.

Thus, if you had a few 1/4" tools, they would need additional packing underneath to bring the tip up to the right height. For example, the 4-way tool-post, which is available as an optional extra, uses 1/4" tooling. Therefore, keep a little tin of offcuts of metal available, so that you can pack tools up.

The Hobbymat has a somewhat idiosyncratic tool-post assembly which works best when a second tool is fitted directly opposite. This has the effect of balancing the load on the cross-slide and preventing it from slipping. Under no circumstances overtighten the two central locking bolts - this can cause sticking and, in extreme cases, cracking of the topslide.

Where you have tools you need some means of sharpening them. You have only just spent out good money on your lathe and advice to spend more will not exactly be popular, but a grinder is essential. You can get away with a little handcranked and geared grinder, but the pukka thing is quite cheap and will give a lifetime of good service with all your tools. It wants to be double ended with 2 grades of wheel between 5" and 8" diameter. DON'T DON'T DON'T put a grinding wheel in the chuck of the lathe. If you are going to use carbide tipped tools - which offer considerable advantages - you will want a green grit wheel to sharpen these.

Next on the list would be a faceplate at least, and/or a 4-jaw chuck. These will extend the capabilities quite substantially.

Incidentally, fitting a 4-jaw chuck is not altogether straightforward. First you will need a spare backplate, which is available as an accessory. This is required as a stand-off because the jaws on the 4-jaw chuck would otherwise foul the motor fan cover when opened out and also because the chuck flange (Item 3800-0103, pp 36-37) is not drilled and tapped to permit direct mounting of a 4-jaw chuck. Since chucks are only accurate if they are mounted correctly, the manufacturer recommends the following fitting instructions:

"On inspecting your backplate, you will see that one face is supplied with a 2mm deep bore which will seat on a shoulder on the chuck flange; this seating ensures true running of the backplate. Each backplate is supplied with three tapped holes close to the outer circumference. These are either of 5 or 6 mm diameter on a PCD (pitch circle diameter) of 67 or 70 mm depending on the type of 3-jaw chuck.

To ensure true running of the 4-jaw chuck, the user is required to machine a shoulder (2mm proud) on the other face of the backplate which in turn will locate in the recess on the back of the 4-jaw chuck. This is achieved by mounting the backplate onto the chuck flange using the three threaded studs from your 3-jaw chuck.

Now, remove the machined backplate from the lathe and place the chuck over it (seated in the recess mentioned above) and, using the four clear securing holes in the body of the chuck as a template, mark out, drill and tap four holes in the backplate. These must be threaded as per the four securing screws supplied with the 4-jaw chuck. Using these four screws, fix the chuck to the backplate you have prepared.

The combination of backplate and 4-jaw chuck is now ready to be positioned and secured to the chuck flange."

Don't worry if this all sounds rather theoretical. When you have the chuck and backplate in your hands it all becomes obvious.

A much needed addition to the range is the Back Gear. This is an extra gearing assembly which gives you an additional speed range, right down at the bottom end, and this is invaluable for some tasks.

The MD65 takes tooling with Morse Taper fittings and this means that a vast field of fittings from a variety of manufacturers is available to you. But some of these can be made on the lathe itself and provide an excellent introduction to basic machining procedures. Thus although a 4-way tool post is available as an option and represents good value, you could consider making your own as a project. A tailstock dieholder is valuable, but not difficult to make yourself. If you are like most lathe users you will eventually have a vast collection of small tools and jigs, some bought in and some home-brewed.

But the important thing to remember is this fact about not needing them all at once. You can buy a complete set of engineering drills if you want to, but you may find that you only need a couple for now. For example a Stuart Turner stationary engine may call for a lot of 5BA and 7BA fixings, and not much else.

So, easy-to-read conversion charts need to be handy; perhaps pinned up next to that blackboard.

Another invaluable accessory is a waste bin. A tidy workshop is a happy workshop, as the old manuals used to say. A pocket calculator is often worth its weight in gold. You need various lubricants for cutting different metals. Suds are messy and can cause rust. Much better is a very stable container of cutting oil and a small paintbrush. A Victorian inkwell is perfect. A spray of WD40 will often do the trick on a brief job.

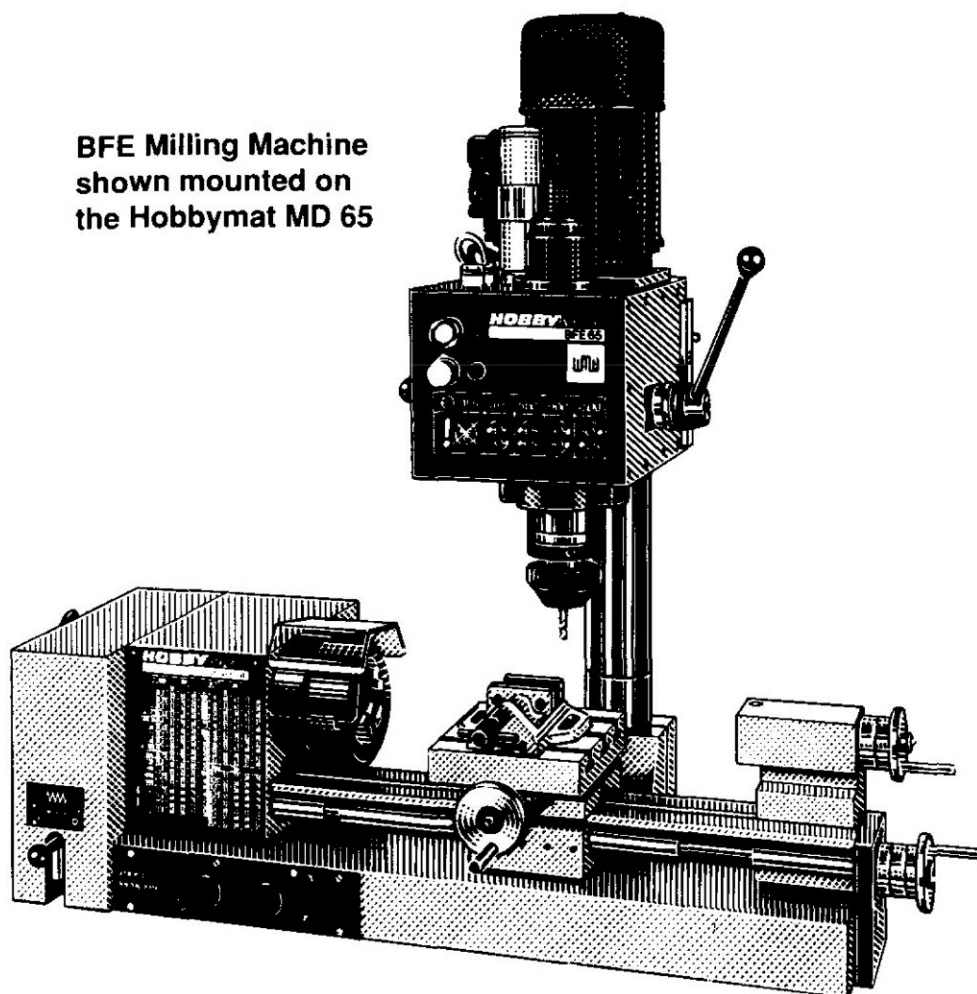
A spirit-based felt tipped pen provides instant marking fluid. Also keep Superglue to hand. You may care to glue in the handles of the handwheels to stop them coming unscrewed. You can also glue a component to a faceplate if it is difficult to mount. Heating the job afterwards will break the bond. This is just a modern form of the old wax chuck.

Keep a working coat nearby and put it on before machining. The best sort are the nylon warehouse coats. They are light and easy to clean. You will notice the dirty marks around the midriff area where you keep leaning against the worktop and getting gently spattered with flying oily swarf.

The biggest single accessory, though, is the **BFE MILLING MACHINE**.

This is a complete machine tool in its own right. By using the optional co-ordinate table the entire thing can be independent; it is also designed to bolt onto the back of the lathe bed. The instructions for assembling this are quite clear, as the BFE comes with its own handbook. You will need a dial gauge to set the machine up. This will have plenty of uses throughout your model engineering career, but for now you might think about borrowing one.

**BFE Milling Machine
shown mounted on
the Hobbymat MD 65**



The BFE is self-motorized and this is an improvement on the arrangement whereby a lathe has to be rebuilt to convert it from one function to the other. It also offers the facility of holding a revolving tool against a revolving workpiece. This can open out a whole world of techniques - such as gear cutting, using an indexing device (indexing means being able to rotate a job accurately through preset angles of a circle).

General care for the BFE is the same as for the lathe. Following instructions should keep it in good condition. Guard against rust. The best rust inhibitor by far is constant use. But failing that try and keep the lathe out of a hostile environment, where possible. Fortunately the machines are fairly quiet and attractive and may be acceptable to the domestic authorities in places where other makes dare not go!

If the lathe must be kept in a suspect area, don't try and protect it with a piece of polythene; that may only encourage it to sweat. No, it is better to cover it up with a blanket material - preferably the not too hairy variety. If this is soaked in oil it may help to protect the bright metal. Rust prevention is quite a widespread subject, like so much else connected with machine work. To get acquainted with it, try and pester a few friends to see how they go about jobs. Make friends with your local librarian, for that is where so much information reposes. But on top of that, there are one or two books which are so useful that you ought to consider investing in some of them over a period of time.

SUGGESTED FURTHER READING

The range of books on small scale engineering is vast. In particular Messrs Argus Press and T.E.E. produce large ranges of texts. You may want to use your MD65 for a variety of purposes, and your reading needs will consequently vary considerably. But there are one or two classics that every small lathe user should have on his shelves. My suggested Top Ten are:

The Zeuss book of tables - self explanatory, I think.

Tich - features in Model Locomotive Building by LBSC. You need never build a Tich, but the highly readable text makes you believe that you can walk on water; an absolute must.

Lathe Accessories - by E T Westbury. Although it has been in publication since the early 1940s, it is extremely useful. Like the Tich book it is published by Argus Publications.

Scale Model Traction Engine Building - featuring Minnie - by L C Mason (Argus). This is a perfect project for the Hobbymat.

Tool Grinding & Sharpening Handbook - Glen Davidson (Sterling).

Any general book on the metalworking processes you are now likely to encounter.

Building a Steam Engine from Castings - Westbury (Argus). This describes the Stuart Turner No. 10 - an excellent beginner's project.

Scale Model Electric Tramways - Jackson Stevens (D&C). If this is where your interest lies, the Hobbymat will be invaluable to you.

Model Engineering - Martin Evans - (Argus). A broad introduction.

Finally, perhaps a book on clockmaking.

A subscription to Model Engineer and/or Engineering in Miniature will soon be on your list.

The above selection of literature is merely a suggestion. Alternatives are legion.

Useful Accessories for your Hobbymat MD65

Motorised Milling & Drilling Unit BFE 65

Morse Taper 1 Toolholder for BFE 65

Sets of metric and imperial collets

Co-ordinate table 160 x 450 mm

82mm independent 4-jaw chuck

Set of turning tools

Centre turning set

4-way tool post

Face plate

Dust cover

Slow-speed attachment for 78 and 156 rpm

Set of soft jaws for standard chuck

Collet chuck

Metric collets 3-13mm in 1/2mm steps

Imperial collets 1/16" - 1/2" in steps of 1/32"

Fixed 3-point steady & travelling 2-point steady

Other articles in our range include:-

Praezimat large format lathe

Variant woodworking lathe

"Universal" miniature metal bender

For full details, contact your local stockist