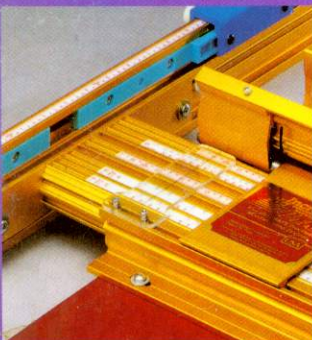


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C

CONTENTS

We have just tidied up after a hectic couple of months of exhibitions. It was great to meet so many of you either at Birmingham's NEC or at our new venue this year, Ascot. In this issue you will note a few ideas for those last minute Christmas presents and plenty of projects to keep you occupied through the winter months. If you are looking for a routing jig to develop your woodworking, the feature on dovetail jigs will be worth reading. For those with an eye for a bargain, we have a super offer on a Bosch router table.

On behalf of all involved in bringing you Routing magazine, may I take this opportunity of wishing you all a Happy Christmas and a safe and prosperous New Year.

Peter Roper
Editor.

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What's new

Router cutter catalogue

CMT Tools, in conjunction with The Woodcut Trading Company have published a new router cutter and tools mail order catalogue. It features many new cutters along with a selected range of hand and power tools. The catalogue is 84 pages and can be obtained from:

The Woodcut Trading Company, tel: 01424 214233.

Toolbox collection

Recently introduced by Minicraft is a toolbox collection of precision handtools. These range from tweezers at £1.99 to a kit of eight selected handtools in a plastic carry case for £24.99.

The range includes box jointed pliers, a set of needle files with handle, a measure calliper, knives and scalpels, mini hammer and turning chisel.

Further details tel: 07000 646427238.

Stanley's Christmas give away

Stanley's Christmas range includes a host of boxed tool sets which make ideal presents. We have teamed up with Stanley to give away four Stanley try square and bevel sets from the range to readers who send their name and address to us, on a postcard or sealed envelope, by the 15th December.

The first four cards pulled from the hat will each receive a set as described above. Entries should be sent to:

Stanley Give Away, Practical Woodworking, Nexus House, Boundary Way, Hemel Hempstead, Herts HP2 7ST.

For your nearest Stanley stockist call Customer services on 0114 2768888.



SMALL BANDSAW TECHNIQUES

Peter Bishop



Cutter Set

Trend Machinery & Cutting Tools Ltd., have just launched an economy four piece cutter set. The cutters are all Tungsten Carbide Tipped.

The set comprises a 10mm diameter straight cutter; a 60deg. V-groove cutter; a decorative panelling cutter; and a bearing guided rounding over cutter.

Further details tel: 0800 487363.

Bandsaw book

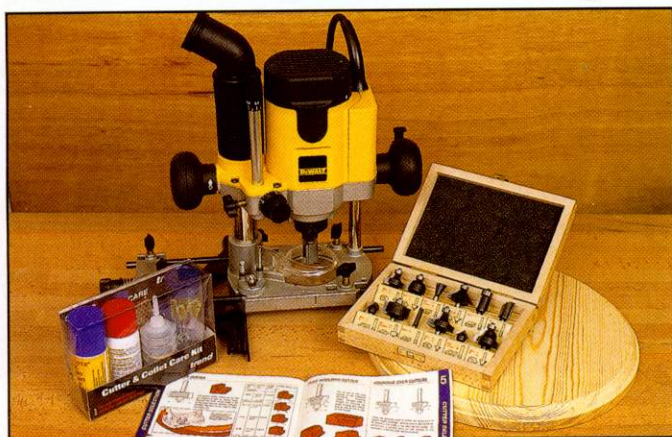
Small Bandsaw Techniques is a practical easy-to-follow guide to the many skills needed for working with small, narrow bandsaws.

Aimed at the serious woodworker it looks at the types of machines available, different blades, care and maintenance and a range of techniques from a basic level to a more complex skills. Written by Peter Bishop it covers the history and development of the bandsaw, advice on selecting a suitable machine and demonstrations of techniques.

Price is £12.99. Further details from, The Crowood Press, tel: 01672 520320.

Roy Sutton (Sales) Ltd The Routing Specialists

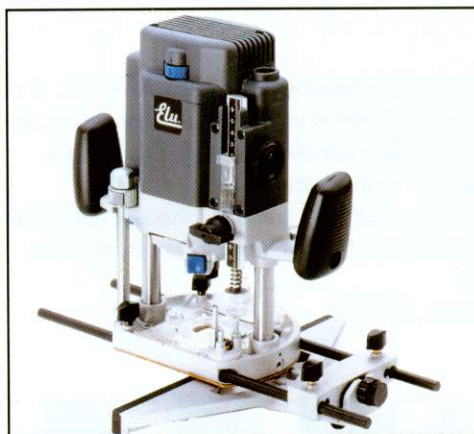
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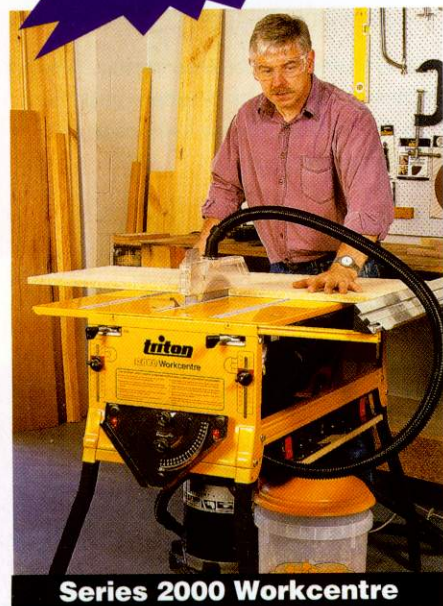
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Art of Routing Wallchart

Recently introduced by Trend Machinery & Cutting Tools Ltd., is an A1 size wallchart. One side contains useful routing applications and techniques, the other includes a specification on the company's complete range of Craft TCT router cutters.

The wallchart is available FREE from Trend stockists or direct from Trend Machinery & Cutting Tools Limited, Penfold Works, Imperial Way, Watford WD2 4YF

Further details tel 0800 487363.



Deep reach clamps

Available in a range of opening capacities from 12in. to 72in. is the latest series of Deep Reach Aluminium Bar Clamps.

Branded under the Jorgensen label the high impact jaws have a reach of 3 3/4in. and are suitable for frame and cabinet assembly.

The jaws are manufactured from high impact plastic reinforced with heat treated steel inserts and the stationery head is cast from best grade malleable iron for greater strength.

Prices range from £38.94 ex VAT up to £55.61 ex VAT.

Further details tel: 01785 250341.

Hand tool catalogue

Just launched from Jack Sealey Ltd., is a 196 full colour catalogue that contains details of their equipment, service and hand tools ranges. It details over 600 new products and is available free on request.

Further details tel: 01284 757500.

Routing book

Router Techniques, a Woodworker's Guide by Kevin Harris is a comprehensive manual of routing techniques. It aims to introduce the novice to basic router skills and suggests new ways of using the tool for more experienced woodworkers.

Topics covered include materials and cutters to use, jigs and templates and workshop safety.

Price is £12.99. Further details from, The Crowood Press, tel: 01672 520320.

Cordless Dremel

The Dremel Multi is now available in a cordless version. It features two speed control and comes complete with a battery pack, 80 minute rapid recharger, 25 accessories, sturdy carry case and booklet showing 100 ways to use the tool.

Price is £59.95.

Further details tel: 0645 395395.

Free video

A new video - 'Joining Kitchen Worktops' from Trend Machinery & Cutting Tools Ltd., now comes free when you purchase either of their Combi worktop jigs. With step by step demonstrations, the video shows how fitting a kitchen can be easily achieved with the use of a router, a worktop jig and a selection of router cutters.

The video has a running time of about 15 minutes and is available through the network of Trend stockists at a price of £2.95 plus VAT each or free with Combi jigs.

Further details tel: 0800 487363).



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4 DeWalt DW620	900w	230v/110v	1/4"	55mm	£175.95
5 Freud FT2000E Router	1900w	230v	1/4" - 1/2"	75mm	£199.95
6 DeWalt DW621K	1100w	230v/110v	1/4"	55mm	£219.95
7 Bosch GOF1700ACE	1700w	230v/110v	1/4" - 1/2"	75mm	£229.95
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Dovetails made easy

With the router, and a purpose-made jig the difficult task of creating perfect dovetails is a simple operation. Peter Roper reviews some of those currently available.

Leigh D4 Dovetail Jig

This is a jig that has grown in refinement over the past 15 years. It features cam-action speed clamps to quickly and accurately lock material in place. It is truly universal, allowing any type or size of dovetail to be created with perfect results. The D4 lets you create variations on the classic dovetail that can become an added decorative feature of any project. Through,

half-blind, sliding dovetails are easy to cut.

There is a single scale setting to rout the tails and to make life easy the company have colour coded the scales for quick identification as to the type of dovetail required. Each scale has its own identifying icon to help prevent mishaps. As with the tails, there is an easily identifiable pin scale, allowing the creation of precise, recordable and repeatable settings for different cutter sizes.

The D4 has fully adjustable guides permitting an infinite variety of joint layout. When creating through dovetails, once the tails have been routed, the whole finger assembly is rotated to present the pin mode to ensure perfect fitting joints. For half-blind joints both halves are cut with a single dovetail cutter and again an infinite configuration can be achieved on any thickness of timber.

The D4, 24in. jig, including cutters, comprehensive user guide, angled sidestop and screwdriver is priced at £360.00 inclusive of VAT

Further details from:
Leigh Industries (UK) Ltd.,
PO Box 666
Chippenham
Wiltshire SN15 5QT
Tel: 0800 893183

Leigh Isoloc

This is a brand new innovation from Leigh Industries. Basically it allows the creation of a structural joint of which there are six different patterns. It is of such a revolutionary design that throughout the long history of woodworking there is said to be no previous examples in existence.

The joints are unashamedly machine made and are simply produced with a router and template on the Leigh Jig System described previously. The joints would be virtually impossible to create using hand tool techniques.

Further details from:
Leigh Industries (UK) Ltd.,
PO Box 666
Chippenham
Wiltshire SN15 5QT
Tel: 0800 893183

Inkra Jig Ultra

This is the third generation of Inkra Jig offering unprecedented performance and accuracy in decorative dovetails. This has been designed to meet the needs of the serious woodworker, yet is easy enough for a beginner to routing to use. Simply described it is a very accurate fence system that fits onto your router table.

It comes fully assembled and ready to use. It is made from reinforced square tube and is very strong and rigid.

As a fence system it offers amazing precision. Accuracy is to within a few thousandths of an inch. As a joint making machine, the positioning capabilities permit an endless variety of box joints, half blind and through dovetails to be created. It can even produce decorative joints such as a 'Double Dovetail' and a 'Double Double Box'.

Setting up is simple, there is no maths, no measurements and no complicated set-up. Colour coded reference marks are provided for ease of use. Features include a micrometer fine adjuster, quick action cam clamp and five template channels. The complete system



Inkra Jig Ultra is easy to set up.



Leigh Isoloc joints are truly unique.

includes a jig, a 28 in. fence with incremental stop positioner and extended stop, right angle fixture and master reference guide and template library.

The complete package is priced at £195.00 inclusive of VAT. A refined, more compact version is available at £125.00.

Further details from:

Tilgear
Bridge House
69 Station Road
Cuffley Herts EN6 4TC
Tel: 01707 873434

Elu Router Dovetail Jig

Two models are produced by Elu. Both enable dovetail joints to be cut quickly, easily and most importantly accurately in both soft and hard wood.

Model A is for use with the Elu MOF 96 (E) routers. No adapters are required and a dovetail cutter is supplied as standard. Model B is for use with Elu 177 (E) routers and all other makes of router that have a base with one dimension less than 150mm. It is identical to Model A but an adapter sub-base is supplied as standard. This fits only Elu routers and may need to be re-drilled to suit other makes.

Both jigs allow for the creation

of fixed position lapped dovetails. Both the pins and tails are cut simultaneously. Only one cutter is required and there is only one set-up operation.

The jig is suitable for timber between 12mm and 30mm thick and up to 300mm wide.

Model A comes with a cutter, guide bush, depth gauge and a rebate stop and costs £120.00 excluding VAT whilst Model B includes all the components of A plus an adapter base and costs £134.00 excluding VAT.

Further details from:

Elu Power Tools
210 Bath Road
Slough
Berkshire SL1 3YD
Tel: 01753 576717

Elu Multi-functional Dovetail Jig

This jig is designed to produce dovetails of different sizes along with finger joints and dowel joints. Combining all the features incorporated into the Models A and B Dovetail Jig previously described it allows three different sizes of dovetail pitches to be produced. The maximum working width is 610mm and board thickness up to 38mm can be accommodated. The jig comes complete with only one

template to produce a joint size of 12.7mm, for 9.5mm and 22mm joint sizes optional templates are available priced at £65.50 each. The finger jointing and dowel jointing templates are also optional extras costing £65.50 and £87.40 respectively. It does, however, include a guide bush to fit an Elu 96 (E) and another to fit an Elu 177 (E), a cutter depth gauge, two adjustable stop pins and Allen keys. Cutters are extra.

The standard kit costs £218.50 excluding VAT.

Further details from:

Elu Power Tools
210 Bath Road
Slough
Berkshire SL1 3YD
Tel: 01753 576717

Woodcut Dovetail Jig

This is a useful 12in. model that features quick change cam action locking bars

It is supplied complete with a special cutter and a guide bush that fits the Elu 96 (E) routers.

However, other routers that can be fitted with a 12mm guide bush can also be used with the jig or you can adapt the bush supplied by making a sub-base plate yourself.

It is truly versatile, a guide bearing can even be fitted to the cutter to replace the bush. It should be noted that if this system is used the bearing must be kept in contact with the comb during use.

The jigs quick action eccentric cam locking mechanism allows rapid material change for batch production work.

The fully adjustable end stops allow for perfect joint positioning. There are various sizes of combs available for different sizes of joint. These include:

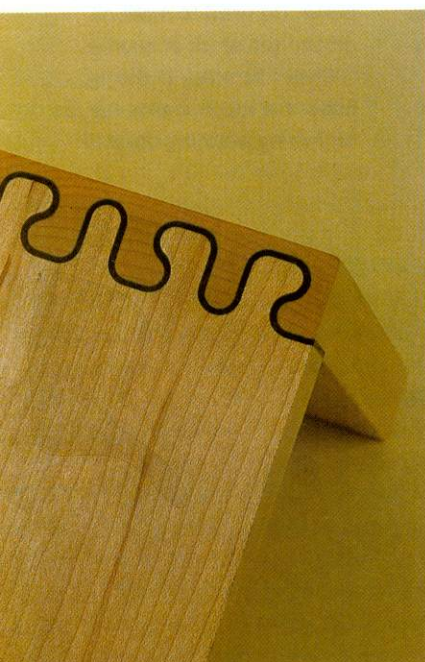
7/16in. (11mm) £12.00
Cutter to suit £12.00
9/16in. (14mm) £14.00
Cutter to suit £13.00

The guide bush must also match the comb size. (Extra combs are not made from aluminium)

The Woodcut system is priced at £79.00

Further details from:

The Woodcut Trading Company
& CMT Tools
8 Wainwright Road
Bexhill-On-Sea
East Sussex
TN39 3UR.
Tel: 01424 214233
Fax: 01424 730674

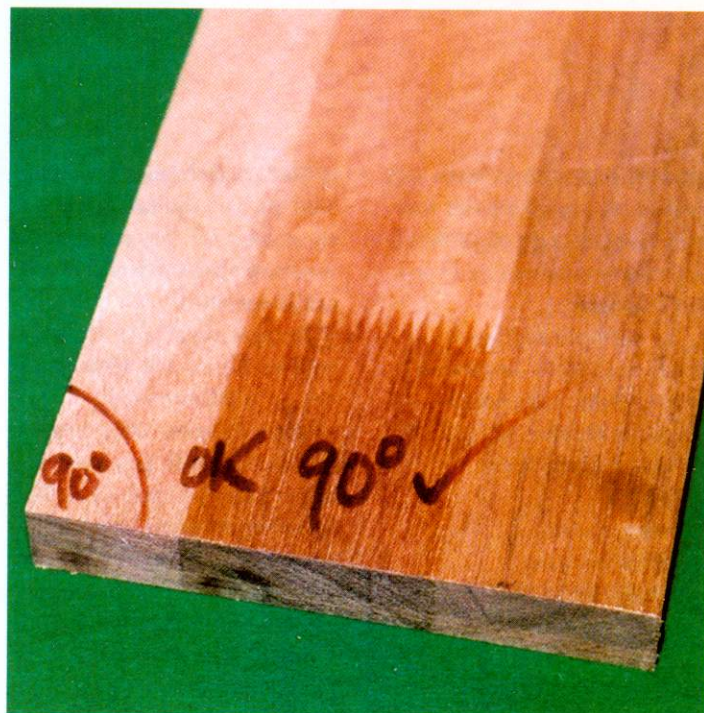


Leigh D4 jig, set up to cut tails.

Around The Workshop



John Walker looks at how to trim end grain with the Leigh Dovetail Jig



The Leigh Jig Re-Visited

With the Leigh Dovetail Jig, a suitable router and appropriate cutters, woodworkers can produce quality dovetails, in a variety of forms, with ease. However, that is not all there is to the Leigh Jig. Leigh Industries themselves have extended the use of the

jig, by designing accessories for cutting multiple mortise and tenons and finger-joints. (Although, Ramon Weston has shown that the Jig can be used to cut perfect finger joints without this latest refinement).

As the jig becomes more widespread in use, experimenting owners are finding even more uses for it. So, whilst designed for dovetailing, the

Leigh Jig, even in its basic form, is becoming more of a combination jig — almost a woodworking techno-centre.

For instance, when faced with the painful and laborious job (for me) of planing a lot of end-grain, or wide boards, I wondered if my Leigh Jig could help. After some thought, I realised, it could. I tried my ideas and, as expected, it worked.

To demonstrate :-

Take a piece of planed stock 150mm x 720mm and rough cut it to just over 350mm long.

Knife a square line across one end, as you would if you were about to trim with a hand-plane. No need to mark all around the stock of course.

Place the stock in the jig, under the top cramping bar, as for cutting a sliding dovetail



Stock advanced to show line of cut scribed across timber.



Elu E177E fitted with Leigh guide bush carrier 5/8 inch bush and 1/2 inch diameter cutter.

housing, with the line uppermost.

Square the stock against the side stop. Put the finger plate in the through-dovetail mode, setting the scale to the 'all' position. Fit the cross-cut bar to the finger-plate.

You now require two strips of waste, the same thickness as the stock and about 6mm wide.

Put one strip at each side of the workpiece. As the cut is made from left to right, the waste will guide the cutter into the work at the left-hand side, avoiding the plastic end-piece on the cross-cut bar and will prevent the cutter from splitting out the end-grain, on the right hand-side.

Secure these waste pieces, with a 'G' clamp or sash clamp, behind the jig.

Before going further:-

Note:-

My idea for end-grain trimming, was evolved from the Leigh Jig's basic method for cutting sliding-dovetail housings and, when

cutting these joints, the reference point for adjusting the cross-cut bar is the centre line of the housing (or cutter). Trimming back to a line is not the same thing. This time the cross-cut bar must be set, so the line is at the edge of the cutter. i.e. so the cutter will trim exactly to the line. Therefore, the line must be positioned forward of the cross-cut bar, by a distance equal to : (guide bush diameter, minus cutter diameter) divided by 2. (As per normal template routing, with guide bushes.)

I will not convert measurements here, as Leigh Industries' guide bushes and cutters come in imperial sizes. So 5/8 inch guide bush and 1/2 inch cutter. Difference = 1/8 inch divided by 2. Set the line forward by 1/16 inch.

The end result should be a clean, squared end, right on the line.

In practice, depending on how much waste is to be removed, the trimming is best carried out in small bites. Because the finger-plate can be moved in and out in relation to the workpiece,

it is possible to 'fine-tune' successive cuts, moving the finger-plate rearwards, until the cutter trims exactly to the line.

All this may sound complicated, but practice with scrap stock, will show how easy it really is.

I have used 150mm wide stock, merely to demonstrate. The procedure is probably best reserved for trimming wide stock, such as table tops. Using scrap pieces of 6mm, the jig will allow end-grain trimming in stock up to a maximum of 12mm less than the capacity of your jig. I would not like to try this with small section stock say 50mm x 25mm, unless I had the unused portion of the jig packed out with wider stock, of the same thickness.

Tips :-

1) Safety First! do not forget the cutter is unguarded.

2) Trimming end grain requires maximum cutter projection and normal router cutters may be too short. No problem with cutters designed for use with the Leigh jig. Even so, limit end-grain trimming to stock of 20mm maximum thickness. Thicker stock, will require trimming cutters with extra long flutes, or shanks, so there is plenty of 'meat' inside the router collet.

Proviso:-

Thicker stock could be flipped

over and a second cut made from the opposite face, so long as you are confident your board is parallel along its length. I have not tried this, but logic says it should work, with fiddling and a slight touch with a hand-plane afterwards. I leave that up to you!

3) If the workpiece moves about under the clamping bar, increase the grip by sticking 280 grit, wet and dry paper to the bearing surface of the bar and to the top of the jig body. In severe cases, lightly wedge a length of timber between the right-hand end of the work and the right-hand side of the jig. Although, if you take fine, cuts, this should not be necessary.

4) With some timbers, it is difficult to get a good finish on end-grain, but remember, stock which is to be dovetailed is usually cleaned-up afterwards. In the case, if the cut is square, do not be too critical of the finish from the cutter.

5) Using cutters with 1/4 inch shanks for working end-grain can cause worrying vibration. Leigh Industries appreciate this and supply cutters with 8mm shanks, greatly reducing the problem. They also offer reducing sleeves for use with 1/2 inch capacity routers.

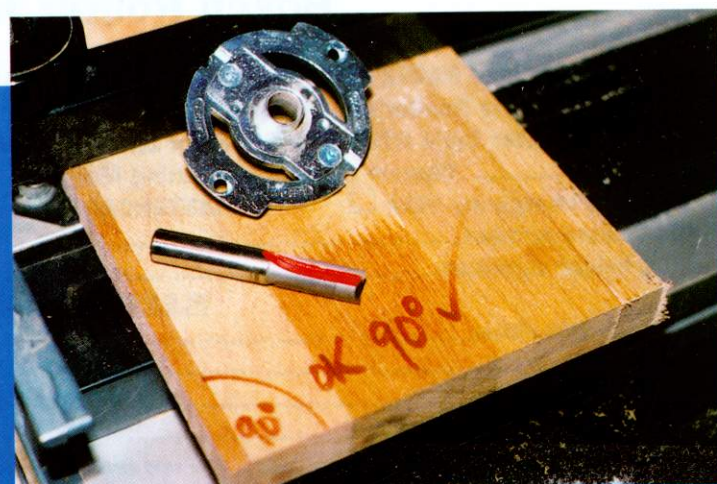
6) Whatever size of cutter you use remember good quality and sharpness are mandatory, both for a nice finish and your own safety.



Trimmed to 90 degrees.



Partially trimmed end grain.



The means to the end! Shows waste pieces at edges.

Bosch RT 60 Router Table

Exclusive offer Save £134

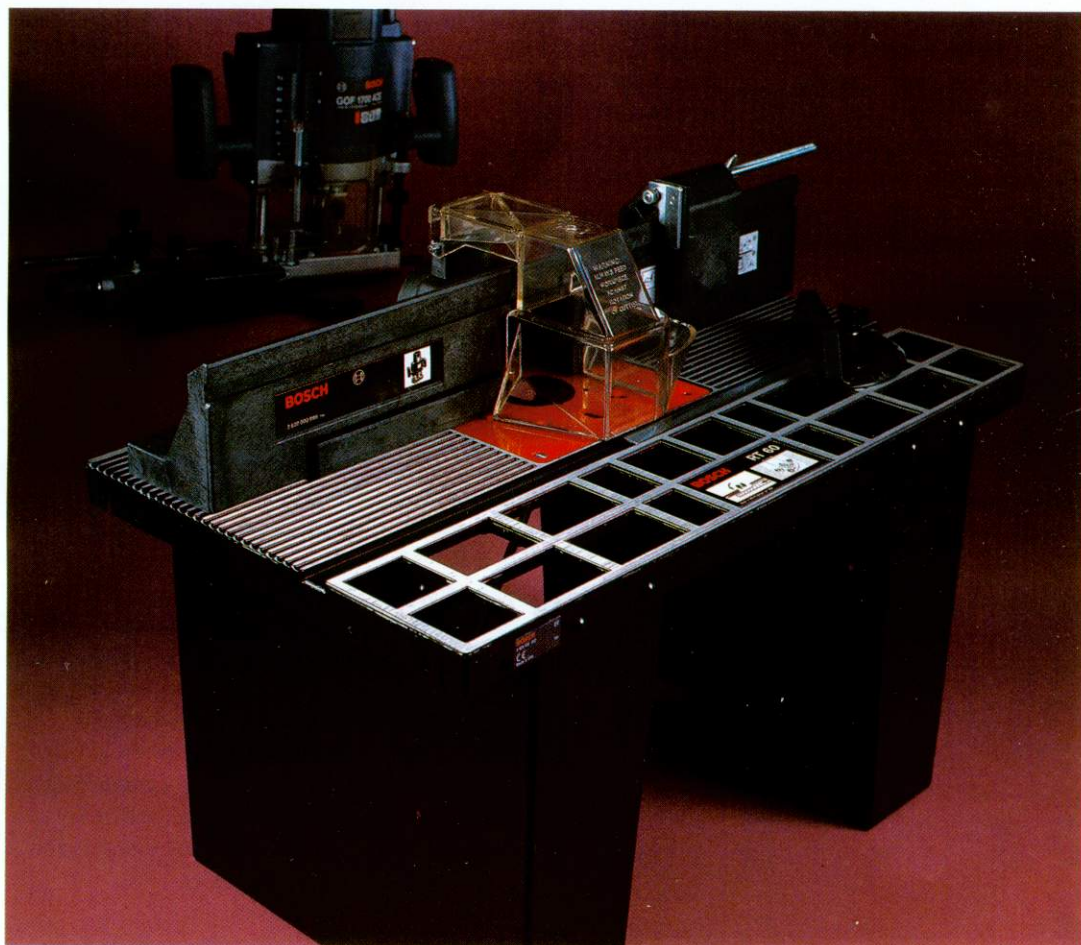
Routing has teamed up with power tool specialist Robert Bosch to bring you an exclusive reader offer on the RT60 Router Table, as reviewed in our feature in Routing Issue 20.

This high quality table has a list price, inclusive of VAT of £245.58. The offer price is only £159.95 (inclusive of VAT and Post and Packing), But that is not all! Bosch are including free of charge their dedicated stand so that the router table does not have to be fixed to a workbench or similar to be used.

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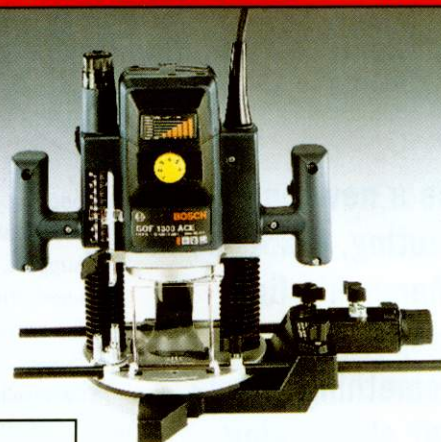
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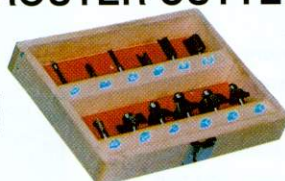
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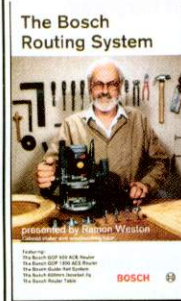
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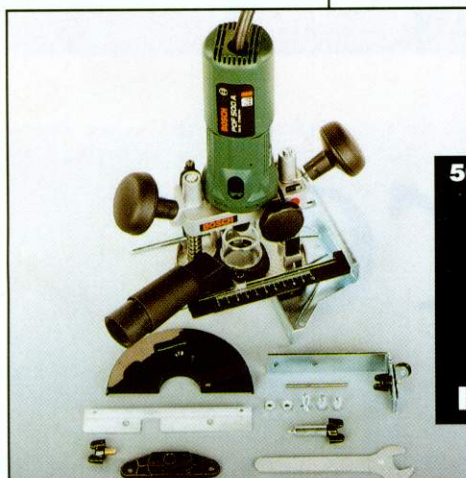
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Around The Home



As a newcomer to routing, reader John Marshall's first project was something simple, but challenging

The hall mirror described here was made over a couple of weekends - a more experienced woodworker should have no trouble producing it in far less time.

The piece was designed to fit into a small modern hall, but a larger shelf would not detract from it in any way - the dimensions can be modified to suit individual taste or location easily. The drawings show the design and dimensions for the piece as constructed. Obviously, the most significant item is the mirror itself and this should be obtained first, as if a different size is used, all dimensions will need to be adjusted. The mirror is made of 6mm glass with an 18mm bevelled edge and safety

backing - this is essential due to the small size of the mirror support. If safety backing is not used, the whole of the back of the mirror must be supported.

Construction

Construction can be separated into four parts :-

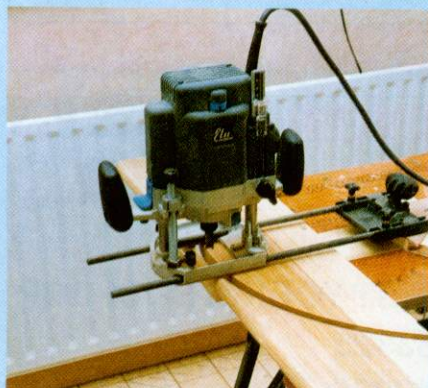
1. The legs
2. The shelf
3. The mirror support and retainer
4. Assembly

1. The legs were cut from odd lengths of 100mm x 20mm floorboard, but any suitable timber can be used.

Of the three legs, the two outside are smaller in depth than the centre one to follow the curve of the shelf.



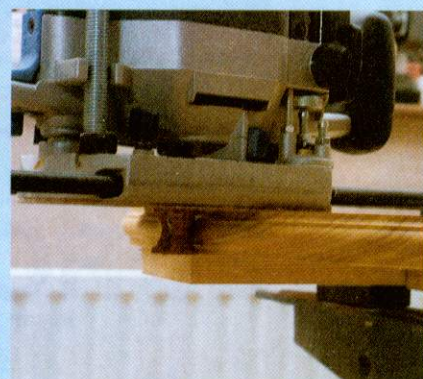
•Wall Mirror



1 Shelf just routed free, waste not yet removed.



2 Adding decorative edge to shelf.



3 Adding decorative edge to shelf - final cut.

Cutters used

Straight cutter 12mm
Decorative bead cutter
Dovetail cutter
'V' cutter
Keyhole cutter

Cutting list

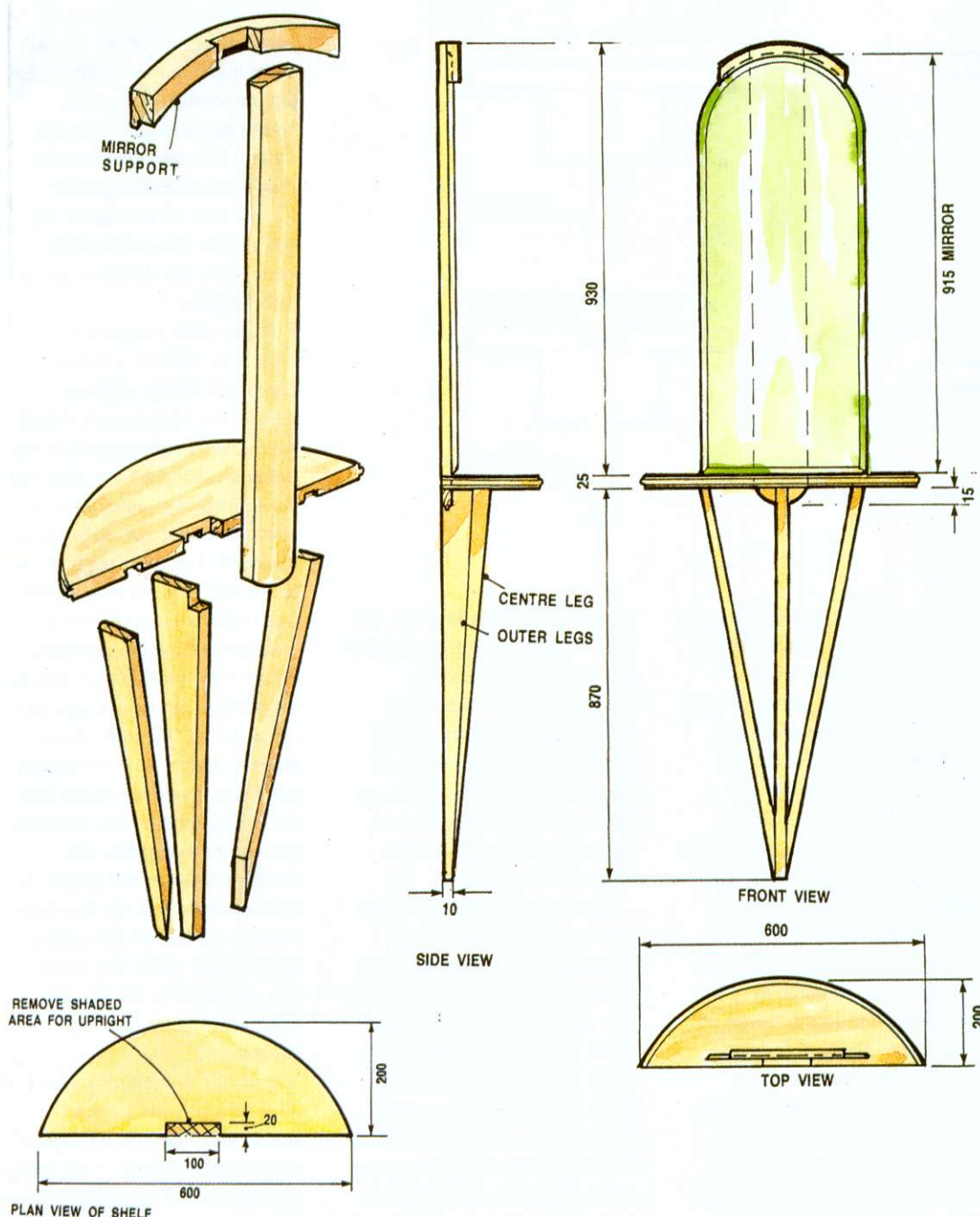
1 off 990 x 100 x 20
3 off 950 x 100 x 20
1 off 200 x 60 x 20
1 off 600 x 200 x 25

Component list

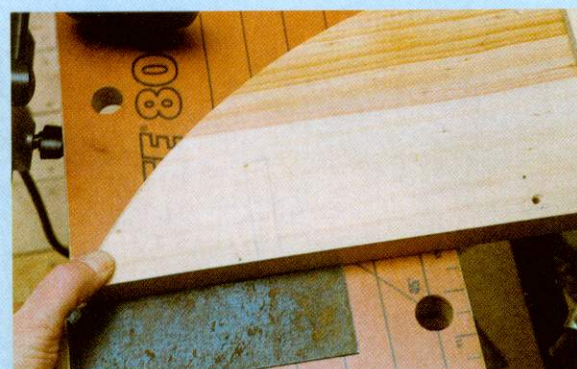
Mirror support 970 x 100 x 20
Mirror retainer 200 x 60 x 20
Shelf
200 x 600 x 25
Legs 1 off
880 x 100 x 20
2 off
900 x 60 x 20
Mirror
915 x 360 x 6mm

Polished and 18mm bevelled edge

Safety backed



The shapes were marked out and cut on



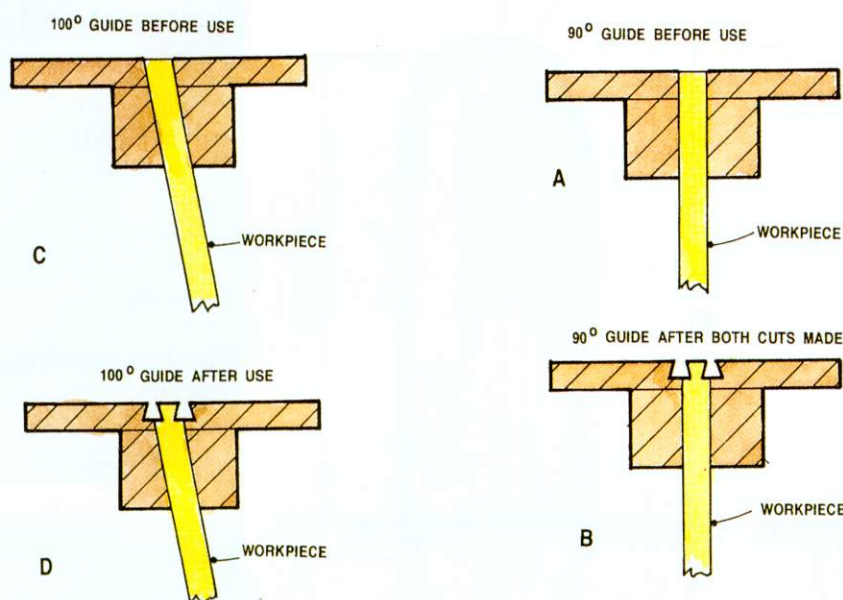
4 Setting up to cut dovetail housing.



5 Cutting second dovetail housing.



6 & 7 Cutting dovetail on angled leg - note use of scrap to avoid breakout.



the table saw slightly oversize to allow for finishing. The front and rear surfaces of the legs were planed to size, the outer legs being clamped together for this to ensure that they were identical. The legs were left over length for the time being. The three legs were then put to one side whilst the shelf was made.

2. This was perhaps the simplest, but for me the most fun, item to make involving the router and a trammel.

The timber used was a piece of old window board, planed down to the required thickness (hence the moulded edge visible in the photographs).

The workpiece was screwed to a supporting piece, (another length of floor board), ensuring that the screws passed through

that area of the workpiece which would be removed later. In this way, the workpiece was supported at the centre of what would become the shelf and there was a place to fix the pivot point of the trammel.

With the router on the workpiece, the pivot point height was adjusted with offcuts to equal the height of the workpiece. The radius of the curve had been determined at 330mm, the distance from the trammel point to the centre of the 12mm two-flute straight cutter was therefore set at 336mm. With the depth of cut set at 5mm the first cut was made in a clockwise direction, with one hand on the pivot and the other holding the router. Deeper cuts were made until the

workpiece was cut through. The waste was removed, leaving the shelf still attached to the support board. A decorative bead cutter was then used to shape the edge of the board, starting with a larger radius on the trammel, reducing this by 1mm per cut to give a clean finish to the moulding.

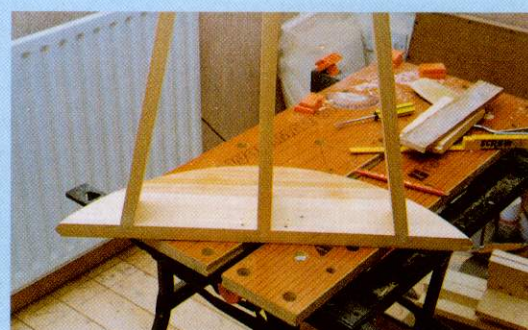
The workpiece was removed from the support and the positions for the dovetail joints were marked out. The workpiece was clamped to the Workmate at 90 degrees to the edge. The router was fitted with the side fence, adjusted to the correct position for the first of the three dovetail grooves which was then cut using 10mm wide dovetail cutter, using the edge of the Workmate as a guide. The other

cuts were made in the same way, setting the length of cut 5mm less than the depth of the leg, remembering that the centre leg is deeper than the others. The next stage was to make two different dovetail guides, one for the centre leg and one for the outside legs which have the dovetails cut at 100 degrees.

These were made from offcuts of 100mm x 20mm board and 40mm x 60mm timber. The boards were drilled, countersunk and screwed to the battens using the table saw, the joined edge was cut square on one pair and at 100 degrees on the other. The outer edge of the board was also cut true as this was used to guide the fence.

Before cutting the dovetails on the legs, trial cuts on offcuts the same width as the legs were made, to get the width of the dovetail a good fit in the groove cut in the shelf. The router was set to the depth of the dovetails groove, the workpiece was clamped between the guides in the Workmate with the top flush with the surface of the guides. When the fit of the trial piece was satisfactory, the leg was fitted in the guide and the dovetail cut.

A similar method of trial and error was adopted for the angled legs, the only difference being to trim the top of the test piece with a cut angled at 100 degrees to ensure that the top of the test piece is flush with



8 & 9 Initial fitting of legs - note breakout on shelf - should have been avoided by use of scrap clamped in place before routing.

the surface of the guide.

Before cutting the dovetails, the top end of each leg was trimmed to length, on the table saw with an angled cut at 100 degrees. The outside legs are of course handed and the dovetails can both be cut at the same time by clamping the legs back to back in the angled dovetails guide. When all dovetails were cut, the front 5mm were removed, to give an overlapping joint.

The centre leg was fitted and the other legs were offered up, but not pushed fully home, the positions of the joints were marked and the outside legs were removed and cut at the correct angle. They were refitted and after a couple of minor adjustments to ensure that no stress was placed on the joint, the positions were marked and the legs removed.

3. The mirror support was

made in two sections, the main support was rounded at both ends with the router and trammel using a radius 15mm greater than the radius of the mirror. The lower end was decorated with the moulding cutter used on the shelf - the different timber thicknesses giving slightly different results. The decorative mirror retainer was made using the same radius. A suitable length of timber was fastened to a backboard on which the trammel was fixed at the appropriate point to cut the external curve. This was cut in a series of passes. The distance from the trammel point to cutter was reduced by 37mm and the internal curve cut, producing a retainer 25mm wide (12mm diameter cutter used). The waste was then screwed to the board in order to clamp the workpiece whilst the decoration

was added with a V cutter. The piece was then turned over and with a 12mm straight cutter, a 10mm wide rebate was routed on the lower edge to a depth of 1.5mm, the thickness of the mirror at the edge.

4. When all parts were prepared, a slot was cut in the shelf, using the router, to accept the mirror support. When a satisfactory fit was achieved, the support and shelf were drilled and countersunk for screwing together, but not fastened at this stage. The centre leg was similarly machined to accept the lower end of the mirror support.

At this stage, all the pieces were sanded and varnished, using 3 coats of Cuprinol Enhance brown-mahogany satin varnish, rubbing down well between each coat. If this was left until later, it would be difficult to get a good finish at

the joints.

When dry and with the centre leg refitted, the other legs were offered up, the joints were glued, clamped and left overnight.

To fasten the mirror to the wall, I used a keyhole cutter, cutting two slots on the rear face wall of the mirror support, one near the top and the other near the shelf. Using the router's fence as a guide ensured that these were aligned centrally and vertically.

With the mirror support screwed in place and the unit lying on its back the mirror support was liberally coated with 'Silglaze', a silicone adhesive/sealant available from glass merchants, the mirror carefully aligned and pressed into place. Weights were applied (books) and left overnight to cure.

The retainer was fitted and screwed on from the rear. Mounting screws were fitted after carefully drilling and plugging the wall and the unit lifted into position.



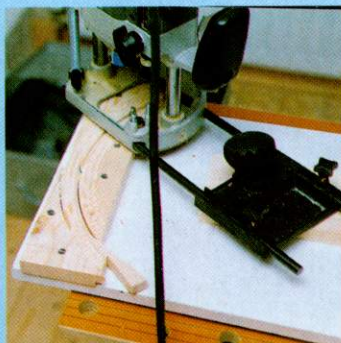
10 Routing curve on mirror support.



11 Routing slot to accept mirror support.



12 Test fit of mirror support to shelf.



13 Mirror retainer clamped in place and decoration added.



14 Rebate being added to rear of retainer.



Windsor Chair

part 2

John Perkins concludes his series mini series by showing how to make the seat and the back and describing the assembly procedure

The seat was laminated from three 160 x 38 x 480mm timber, glued and doweled together. Drill four 12mm dowel holes 38mm into the edge of one piece, centring them on a line drawn 15mm up from the bottom edge (This is to allow the top face to be scalloped). Match the holes on the centre piece and drill the centre section. Repeat this for the other side and glue, dowel and clamp the pieces together. When dry plane the faces flat.

The seat can be cut to shape using a jigsaw, but if you are making two or more chairs, cut a template from 6mm MDF and use a 10mm cutter guided by a suitable diameter guide bush. Ensure that there is at least 3.5mm clearance between the bush and the cutting edges to allow waste to clear quickly.

Draw the outline of the scalloped area on the seat. The router can be used to rough out scalloped area using a large

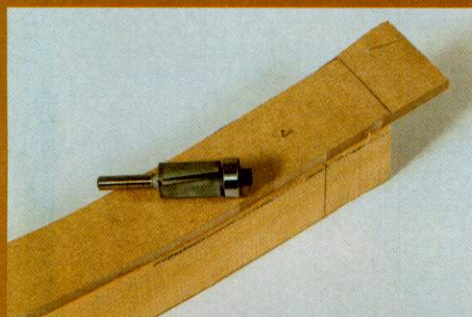
diameter straight cutter. It is easiest to use 'Skies' for this purpose, to help balance the router. Working freehand, start by removing the deeper areas, balancing the router on the uncut surface. Remove the remaining area leaving a series of shallow steps. Remove the contours using either a belt sander or random orbit sander fitted with a coarse grit abrasive. Finish to a smooth concave surface

Rounding over the front edge.

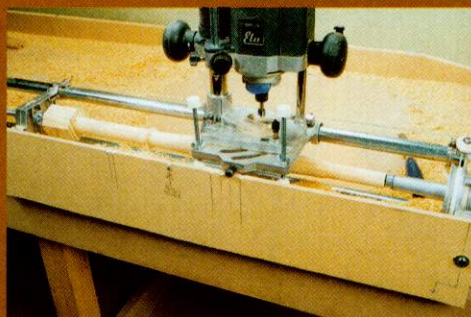
Set out the leg positions on the underside of the seat and mark the centre of each. Cut a gauge block to the leg angle (see drawing) and use this as a guide when drilling the blind holes for the legs. On the rear edge of the top surface, mark out the position of the slat and back support mortises. These can be cut using a 8mm diameter straight cutter, guided by a shaped block fitted to the routers side fence.

Back supports and slats:

Both the back supports and slats are cut from 38mm thick timber, either on a bandsaw or with a jigsaw. Prior to shaping with the router, smooth all curved faces and plane the sides of the back supports flat. Shape the front and back faces of each using a self-guiding shallow radius cutter fitted with an alternative bearing, to remove the quirk. When routing



MDF template fixed to rough cut section ready to be trimmed using bearing guided cutter.



The radial beads are positioned by locating the follower in each notch and plunge cutting while rotating the workpiece.



Close-up of turned detail.

curved surfaces in this way, fit a thin flat sub-base to the router to prevent cutting too deeply.

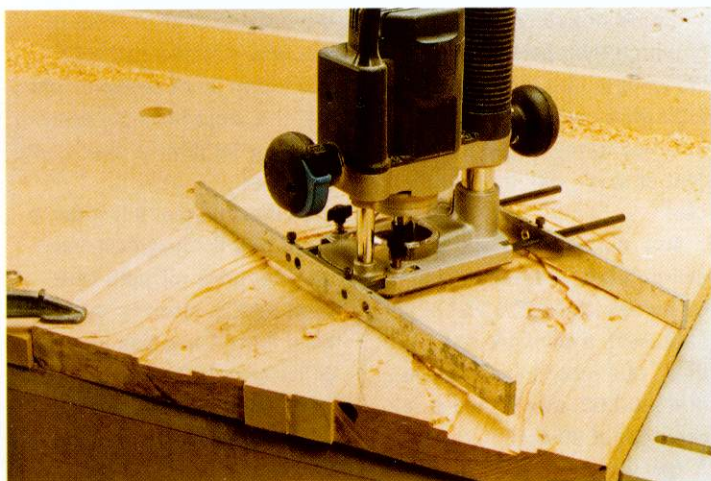
Cut the tenons at both ends of the slats and back supports with a chisel.

Cut the back to size from 100 x 150 x 600mm timber, and cut the curved faces on a band or frame saw. Finish on a drum sander. Cut the shaped ends, round over the top front edge and plane the bottom edge to match the rake of the seat back. Mark out the mortises for the five slats on the underside edge. These can be cut with an 8mm diameter straight cutter, guided by the router's side fence.

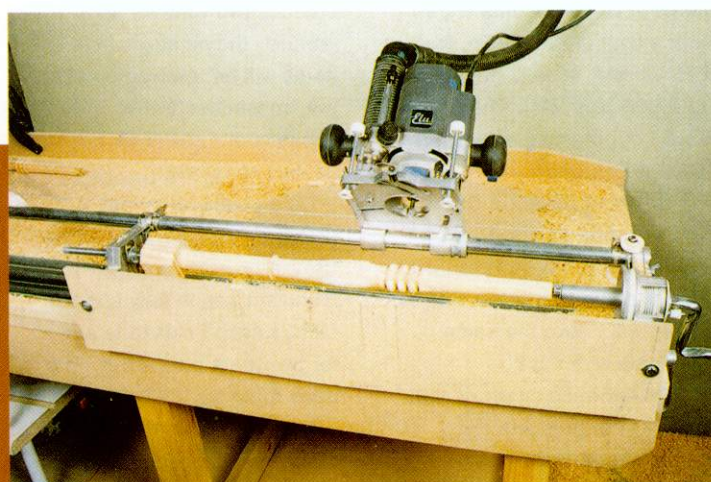
Arms:

Draw out the shape of the arms on to 6mm thick MDF and cut out and finish the edges smooth. Draw around the template onto 38mm timber. Use a jigsaw or bandsaw to cut out the arms keeping on the waste side of the line. Pin the template to the underside of each arm in turn and using a 38mm trimming cutter fitted in a table mounted router, trim the edges flush to the template. At the end of each arm, form an 18mm dowel.

Drill an 18mm hole in each back support to take the arm dowels, and drill the underside to take the arm supports.



The scalloped seat is first cut as a series of shallow contours, prior to sanding smooth.



Turned leg is completed.

Material list:

Legs (4)	1off 110 x 50 x 1200mm
Back	1off 150 x 100 x 600mm
Rails & Arm supports	1off 150 x 38 x 900mm
Seat	3off 150 x 38 x 450mm
Arms	1off 150 x 38 x 400mm
Slats (5)	1off 150 x 38 x 750mm
Back supports (2)	1off 150 x 38 x 750mm
Timber Quantity	150mm x 38mm x 3.25metres
	110mm x 50mm x 1.2 metres
	150mm x 100mm x 0.5metres

Assembly:

Push fit the legs into their sockets and take off the angle between the leg and side rails with a bevel gauge. Hold one leg in a bench vice using shaped wooden blocks to clamp it securely. Using the gauge as an angle guide, drill the rail sockets at the pre-marked positions. Drill the sockets for the cross rail at right angles into the thickest point.

Assemble the legs and rails onto the seat, gluing and cramping the joints until dry. Assemble and glue the back

supports and slats between the seat and back again. Gluing and cramping until dry. Locate the arms into their sockets, and mark the position of the arm supports on the top face of the seat. Glue the arms into their sockets and glue the arm supports between them and the seat. Remove any excess glue before it dries.

Finishing:

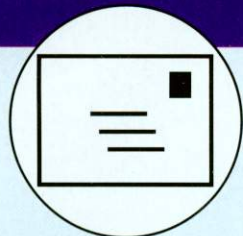
Sand the assembled chair before applying a sanding sealer and wax finish. Alternatively apply a natural or coloured wood stain.



Original chair from which style was copied.

In theory for the majority of plunge cutting, non-self guiding router cutters can be used, including straight cutters, coves and moulding cutters. Only straight cutters with suitable 'bottom cut' characteristics can be used for turning or rounding the workpiece.

Letters to the Editor



I enjoyed Geoff Wood's review of the TV offerings for DIY/Woodworking enthusiasts in issue 18. In particular, I wholeheartedly agree with his comments regarding Norm Abram's 'The New Yankee Workshop' - although it was a shame he got the man's surname wrong.

Having recently taken early retirement, I decided to try my hand at woodworking again, something I had not done since school. With this in mind I sampled the TV shows that offered to provide me with guidance. Some dealt with whole homes, some with kitchens, some with tools, but 'The New Yankee Workshop' dealt with single projects that gave me hope that I too could do what Norm was doing.

And that is his secret: he makes us believe that we too can do what he does, albeit a lot more slowly.

I became an avid fan of Norm's; got the tools recommended - although not the professional variety such as radial arm saw, bench planners and the like. But he did introduce me to the router and to biscuits and to those clever pistol-grip clamps.

During a phone conversation with my brother who lives in Toronto, I learned that Norm had also published books in the states based on projects featured in his series. I sent

over for the four he's published so far, 'The New Yankee Workshop', 'Classics from the New Yankee Workshop', 'Mostly Shaker from the New Yankee Workshop' and 'The New Yankee Workshop Outdoor Projects'. They are an absolute goldmine for an amateur like me who is gingerly making his way through a new and fascinating world. I have also taken full advantage of my VCR, too.

One day I might pluck up enough courage to try to make the Gazebo he demonstrated, but in the meantime may he long continue to bring pleasure to people like Geoff Wood and me.

Barry Stevens, Dunrossness, Shetland.

In the last issue of your magazine, there is an advertisement for the 'WoodRat' and for the courses, on the use of this very versatile device, run by Mike Humphrey at Isleham.

I have just completed a two day course with Mike Humphrey which I found very instructive, as well as being most enjoyable. Mike deals with the setting up and operation of the WoodRat; the cutting of various joints, including some more advanced ones; the production of mouldings and raised panels and how to extend the capability of the machine by the use of some support aids and some minor additions. The pace at

which matters are covered is set to suit the pupil and Mike is a good and experienced instructor.

This is a course I can recommend to anyone who has puzzled over some of the complexities of the WoodRat and who felt frustrated in making fuller use of Martin Godfrey's ingenious invention.

Allan Garden, West Malvern, Worcestershire.

In issue 16 of your excellent magazine, I was interested to see the Special Note following the article 'On Test' of the WoodRat Plunge Bar, from the Elu Company which referred to a fine vertical adjuster for the 177 group of routers.

I would advise any reader not to put off their purchase of the WoodRat in favour of the Elu alternative, which is, I am informed by my local Elu agent "out of stock, with no delivery date".

Also 'out of stock, with no deliver date', is the rear table for my Elu Model ETS 21 sawbench, a snip, one may think, at a recommended price of £1200.00, now limited to a cut width of 30cms!

This year, in addition to my sawbench and 177E router, I have purchased an Elu MSB93 Superjaw vice and an MFF81 plane, so, if Elu can't supply items such as optional extras, with a high profit margin, (the ETS 21 rear table is priced at £112.00 plus VAT), what chance have I of obtaining spare parts when necessary?

I have just bought a DeWalt DW705 mitre saw and as I believe DeWalt have taken over Elu, or are in the process of so doing, will I have the same problems with this?

I am informed by my dealer, that "as Elu products are manufactured in Italy and as Italian factories shut down for the month of August, there is no chance of a delivery date in the

near future, or ever".

I am sure that readers of Routing would be interested to see a little investigative journalism into the products that they use in their hobbies and/or businesses, and you sir, are far more likely to get some answers than the average Joe, so how about it?

Ian Colley, Stockport, Cheshire.

Reply from Simon Kinder, Marketing Director, DeWalt.

First, let me offer my apologies to Mr. Colley for the frustration he has experienced.

He was in truth, extremely unlucky to have been looking for two out of a small number of products affected by a very short term stock problem - not that this diminishes our concern at having let down a clearly loyal customer.

By the time that this letter is published, the height-adjuster and rear table will both have been back in stock for some time. If Mr. Colley has any difficulty in finding them, perhaps he would let me know.

The amalgamation of the Elu and DeWalt brands under a single DeWalt name is, at least in part, designed to eliminate just this sort of problem in the future. By removing the need to produce two variants on a product, the number of stock items will be reduced and stock will, consequently, be substantially easier for our dealers to manage.

On a couple of points of detail, only 30 per cent of the DeWalt product range is manufactured in Italy and the factory hasn't closed in August for two years now, although it used to do so.

Our commitment to our customers is absolute - we are as frustrated as Mr. Colley to have let him down in this instance.



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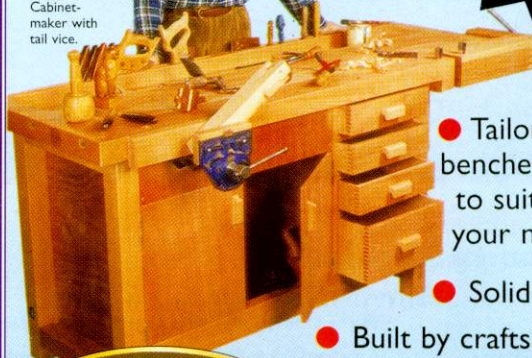
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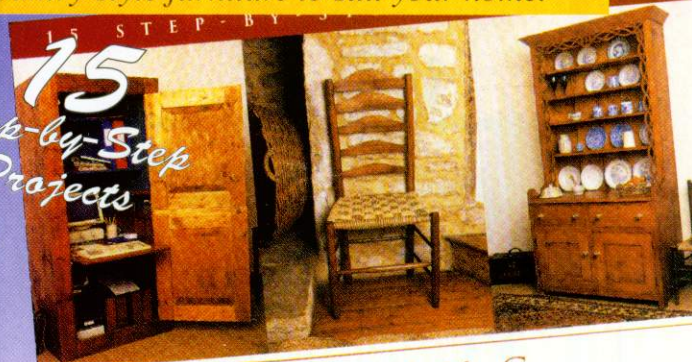
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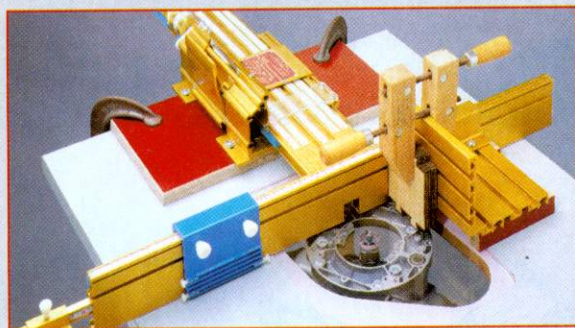
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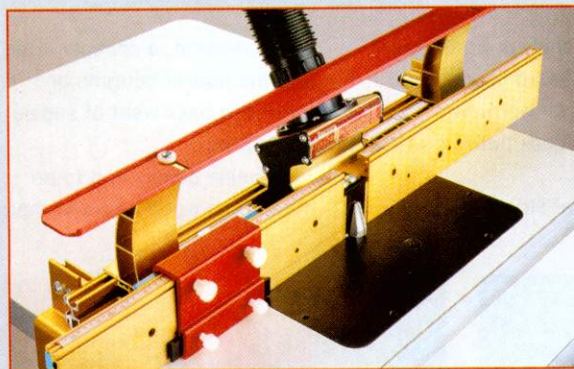
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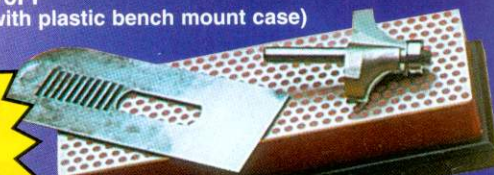
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Around The Home



This adaptation of a Victorian 'Waterfall' design by Betty McKeggie would fit in well with both older and modern conventional style furniture



Waterfall bookcase

The design provides free standing bookshelves that will accommodate different sizes of books from paper backs to larger reference works and box files. The galleried top can be used to display ornaments and the two drawers are useful for papers and general storage.

The broad base gives stability without the need to pin the bookcase back to a wall.

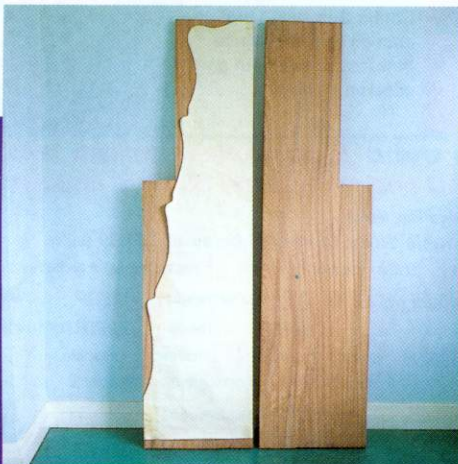
The wood chosen was sapele, bought from a yard that was a Timber Trade Federation member so the wood would have come from managed forests with a cut and replace

policy. The shelves were sapele faced blockboard lipped with sapele, the drawer fronts solid sapele with cock beading of the same wood.

The drawer sides and back

were chestnut, a cheaper wood and the drawer bottoms and bookcase back were of sapele faced 3 ply.

The side panels had to be made from wood narrower than



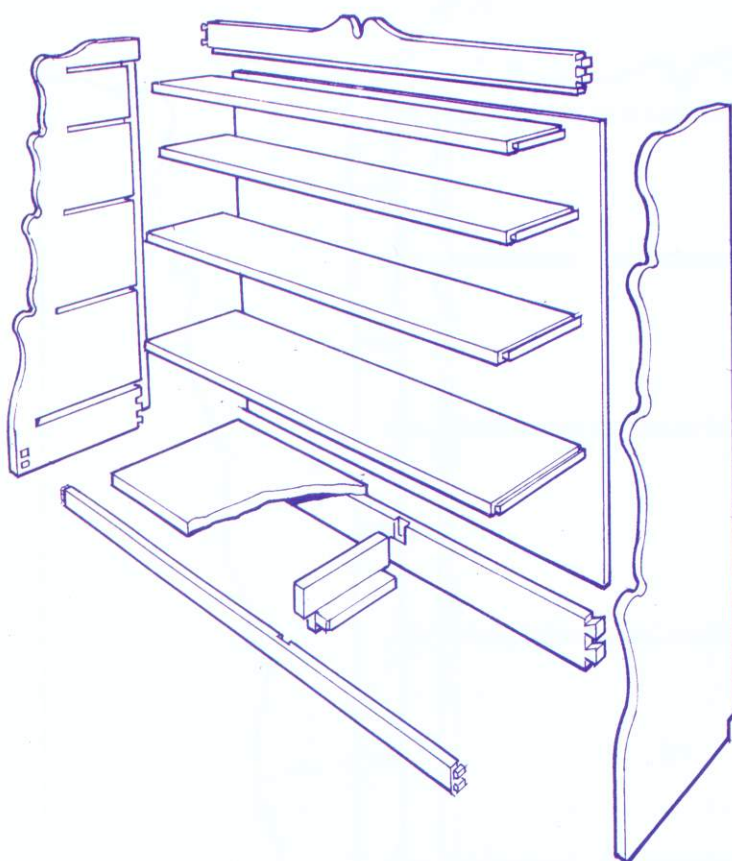
1. Side panels with paper template in place.



2. Parts of bookcase.



3. Details of plinth foot.



the 14 inches (355mm) required, so two narrower vertical panels were spline jointed, thin strips of 3 ply being used as tongues in the joint.

Template

Templates were made in thick wallpaper for the bookcase sides and the back of the gallery. The curves were drawn freehand at first, then when they looked right a firm line was drawn with a flexible ruler. As jointed wood was used for the sides it was important to see that no long vertical edges ran down the joint. In designing the curves the minimum curvature for the internal curves was limited by the diameter of the router bit that would be used for the moulding.

The Side Pieces

The paper templates were copied onto the wood in pencil. The small radius inner curves were drilled first to make it easier to cut round with the jigsaw. The size of the drill used was not less than the diameter of the guide pin of the router bit. The jigsaw was then used to cut the shaped edge of the sides. The cut edge was then smoothed with a large and small drum sander on an electric drill. This provided a smooth edge to guide the router which was then used to cut the moulding. The moulding stopped level with the top of the bottom shelf.

Slots were cut in the side pieces to take the shelves, using a dovetail cutter in the router. Each slot stopped 10mm short of the front edge. A rebate was cut in the back edge of each side to take the backboard.



4. Bookcase, showing side view.



5. Detail of gallery, showing mitred corner..

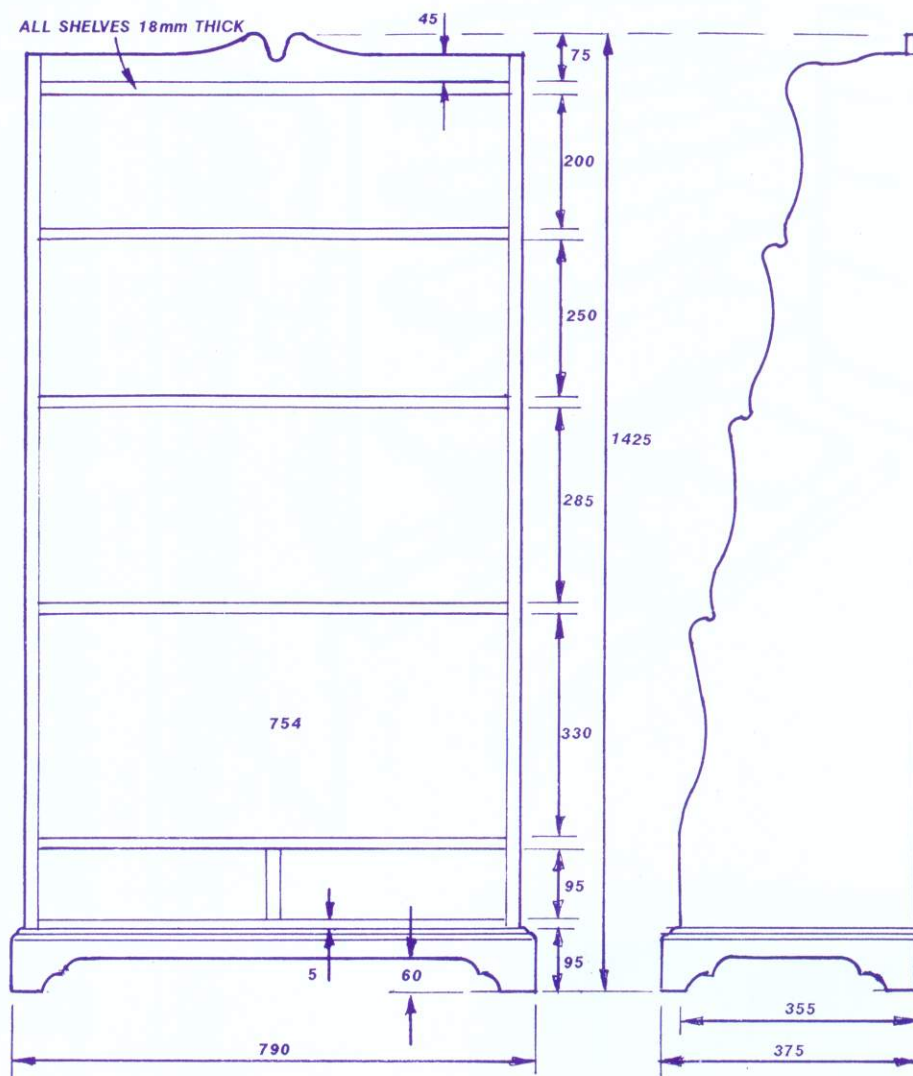
Shelves

The shelves were prepared next. They were, of course, of equal length, but not of equal width. As the shelves were made of blockboard they were lipped with solid wood to match the rest of the carcass. Tongues were cut on the inner edge of the lipping to match the grooves cut in the front edges of the shelves. The lipping pieces were finished to the same thickness as the blockboard and their width was sufficient to allow the routing of a moulding to match that on the side pieces. After gluing the lipping to the shelves the moulding was cut.

The dovetails were cut in each end of the shelves. This was done by clamping the same tapered pieces of scrap wood to both sides of each shelf in turn and using this as a guide for the router fence.

Marking Dovetails

The shelves were then temporarily fitted to the sides so that the dovetails that were to attach the gallery back piece and the bottom back rail to the sides could be marked. Both were lap dovetailed to the sides. The dovetails of the gallery back piece and the sides were stopped short of the top edges and the remaining edges were mitred to accommodate the moulding. The gallery back piece was rebated to fit over the top shelf and the top edge shape cut to the template and the moulding cut.



Bottom Rails

The bottom back rails were rebated to take the backboard and lap dovetailed to the sides.

The bottom front rail was stub tennoned to the two sides and notched in the middle to take the bottom of the drawer divider. The divider was cut so that it

butted up to the bottom back rail which was drilled to accept fixing screws.

A groove was cut in the underside of the bottom shelf to accept the divider between the drawers. This was stopped 6mm from the front edge. The divider was rebated to produce a



6. Jigsaw being used to cut shape of side, with hole drilled to facilitate change of direction of jigsaw.

tongue to fit the groove.

The sides, shelves, back and front rails were sanded and stained, then finally assembled.

Plinth

To economise on timber the feet and the rest of the plinth were cut separately. This also allowed the timber of the feet to be thicker than that of the rest of the plinth, so that the side pieces of the carcass rested down on the feet rather than on the rails of the plinth. The ends of the sides and front pieces of the plinth were mitred and the feet cut out with a jigsaw and the corners mitred. Each foot consisted of two pieces, the ones for the front feet being identical. The sides of the back feet were shaped, but the back sections were not as they are not seen.

The two sections of each of the front feet were mitred and joined with a loose tongue. For extra strength and rigidity the sections of the back feet were lap dovetailed together.

The front and side plinth rails were cut and moulded to fit round the carcass, the corners being mitred. The feet were doweled and glued to the plinth with the extra thickness of the feet projecting inside. The plinth and feet were sanded and stained, then screwed and glued to the carcass at the front.

Drawers

The drawer fronts, sides and backs were cut and trimmed to

size. The front and sides were grooved to accept the plywood bottom. The drawers were made up with the chestnut sides lap dovetailed to the fronts and the sides through dovetailed to the backs. After the drawers had been checked for fit, rebates were cut in the front edges to take the beading. The drawers were sanded and the fronts stained. The thin slivers of wood for the cock beads were rounded on the front edges and mitred at the corners, then glued in place to the rebates prepared for them on the front edges of the drawers.

The drawer fronts were drilled to accept the screws for the handles.

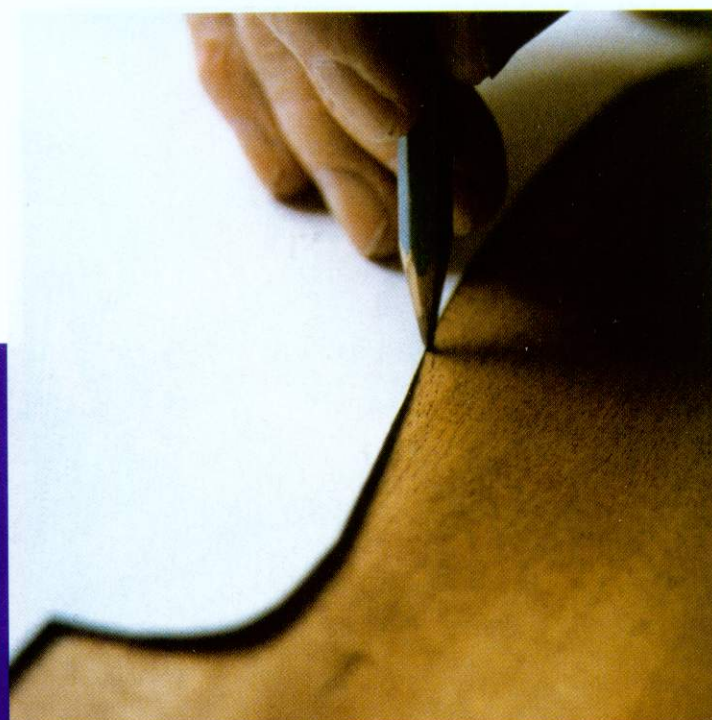
Finishing

The chosen finish was coloured polyurethane varnish. French polish might have been more appropriate for the style of the bookcase, but polyurethane is more durable, resistant to staining by flower vases put on the top and to scraping by the books being withdrawn and replaced. The handles were screwed in place when the varnish was dry.

The design could be modified slightly to take more books, but the weight of the books must be considered before any extensive changes are made. However this is a good design for anyone who wants to get away from the more usual boxes on a wall arrangement.

Cutting List

		millimetres
Sides	2 off	18 x 1313 x 355 (tapering to 205)
Shelves	1 off	18 x 730 x 130 18 x 730 x 145 18 x 730 x 180 18 x 730 x 260 18 x 730 x 325
Shelf lipping	5 off	18 x 718 x 26
Top gallery rail	1 off	18 x 730 x 90
Bottom back rail	1 off	18 x 730 x 130
Bottom front rail	1 off	18 x 730 x 32
Drawer divider	1 off	18 x 345 x 115
Drawer runners	4 off	18 x 320 x 18
Plinth front rail	1 off	18 x 790 x 35
Plinth rear rail	1 off	18 x 778 x 35
Plinth side rail	1 off	18 x 375 x 35
Plinth feet		
front and side	6 off	32 x 130 x 60
rear	2 off	32 x 130 x 60
Drawer fronts	2 off	18 x 350 x 95
Drawer backs	2 off	12 x 350 x 83
Drawer sides	4 off	12 x 340 x 95
Cock beading		
horizontal	4 off	4 x 350 x 18
vertical	4 off	4 x 95 x 18
Plywood		
carcase back	1 off	6 x 1155 x 735
drawer bottoms	2 off	6 x 335 x 335



7. Shape of side panel marked out using template.

NEC Competition round-up

Peter Roper reviews the competitions at the International Woodworking & Turning Exhibition, held at the NEC, Birmingham in September.

As always, the standard of workmanship for all categories was outstanding. There were a large number of entries for each class, in particular it was encouraging to

note the large number submitting pieces for the Rout a Box competition and the Making a Good Start for young or novice turners.

Winners of the Rout-a-Box Competition Sponsored by DeWalt Power Tools and Trend Machinery & Cutting Tools Ltd., were:

1st Prize - £1000 worth of DeWalt power tools:

D. Hilton for his Stationary and Writing Box

2nd Prize - £600 worth of DeWalt power tools:

M. Harvey for 'The Present'

3rd Prize £400 worth of DeWalt power tools:

Mr Horne for his Flat Pack Toy Box

4th Prize £250 worth of DeWalt power tools:

N.E Little for his Shoe Cleaning Box

4th Prize £250 worth of DeWalt power tools:

E. Davies for his Playing Card Box opening to a Cribbage Board

Runner up and winner of a Trend SS3 Box Set of 12 cutters worth £98.80 was:

J.C Greer for his Solitaire Game Marble Box

Take Your Turn Competition was sponsored by Craft Supplies in conjunction with Delta UK, BriMarc and Purlite. Winners are as follows:

Category A -Faceplate turning:

1st Prize - £500 worth of tools and equipment:

T. Owen - for his shallow Bowl in Walnut

2nd Prize £250 worth of tools and equipment:

D. Dezelsky for his Bowl in Jarrah and Holly

3rd Prize £125 worth of tools and equipment:

J Collett for his magnificent

Vase in spalted Beech

Runners up £25 worth of tools and equipment were:

L.E Goddard, R Patterson, E. Udall, G.J Hughes and I Clarkson

Category B -Between centre turning:

1st Prize - £500 worth of tools and equipment:

R Foden for his Childs Rocking Chair in Yew

2nd Prize - £250 worth of tools and equipment:

D. Roberts for his Candlesticks in Pav, Amarello and Ebony

3rd Prize - £125 worth of tools and equipment:

A.A Witham for his off centre Spiral Goblets in Ebony

Runner up - £25 worth of tools and equipment were:

J.C Greer, J.S. Gray, J Coakes, G.J. Hughes and R. Harvey

Category C -Composite turning:

1st Prize - £500 worth of tools and equipment:

G. J Hughes for his Candleholder in Padauk

2nd Prize - £250 worth of tools and equipment:



1. Face plate winner



2. Between centre winner

R. Harvey for his Dressing Table Mirror in Maple and Cherry

3rd Prize £125 worth of tools and equipment:

E.T.J. Vage for his Tibetan Prayer Rattle in Purple Heart

Runners up - £25 worth of tools and equipment were:

G Fradley, R Foden, D Roberts, G. Ravine and J. Coakes

Winners in the Making a Good Start Competition sponsored by Robert Sorby were:

1st Prize - £500 worth of tools:

S. Pickett for his Square Edged Bowl

2nd Prize - £300 worth of tools:

D. Singleton for his Vase

3rd Prize - £100 worth of tools:

J.A Winter for his Platter

Runners up - £20 worth of tools were:

D, Murray, R.H.K. Hewlet, J. Shapiro, S. Taylor, P.J. Bowyer, B. Nicholson, C.K. Capin and R.M.E Head



3. Composite turning winner



4. Rout-a-Box winner



5. Shoe cleaning box

Around The Workshop

Versatile
Table

John Webb creates a router table that can also double as a useful jig

Over a period I have acquired a number of jigs and fixtures presenting a storage problem, particularly as workshop space is limited. The answer was to design a versatile router table which would function as a conventional router table; with the router

mounted beneath the table, but which would also replace many of the existing jigs.

The concept was that the router be mounted on a base in such a manner that the router axis be capable of being rotated through an angle of 120 degrees, i.e., from the vertical (spindle mode) to 30 degrees beyond the horizontal.

In addition to the router's plunge action it also had to be capable of sliding along its guide rods in a controlled manner.

There also had to be a horizontal table capable of

sliding toward the hinged router bracket both to close the gap produced when the router bracket is rotated and additionally to serve as a work-holding table to allow clamped workpieces to be fed safely into the cutter.

The aim was to produce a wide range of joints such as halving joints, mortise and tenon, with if necessary the tenon at an angle for splayed joints, comb joints, tongue and groove as well as chamfers at any angle and fielded panels, all using standard router cutters. The design is based around an

MOF96/MOF96E router and consists of three sections, a base unit, a sliding table and a hinged router bracket.

The router is mounted between two side panels with the sole plate flush with the panel faces and restrained sideways by the panel edges.

It is mounted on its guide rods which are clamped at each end permitting the router to slide along their length controlled by either a bandwheel or lever as required.

The design can be adapted to suit other routers so long as they have guide rods.



Types of joints that can be produced.



Tongue and groove joint.

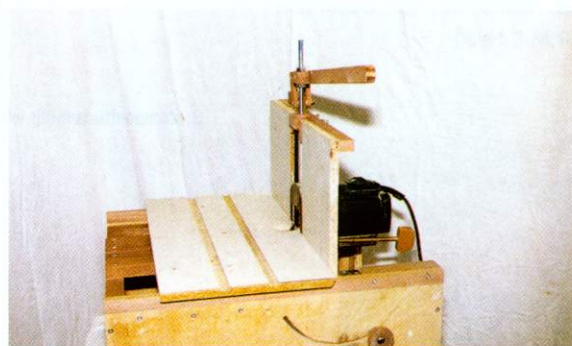
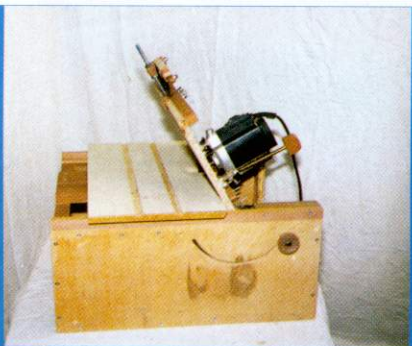


Illustration of slide table guides.



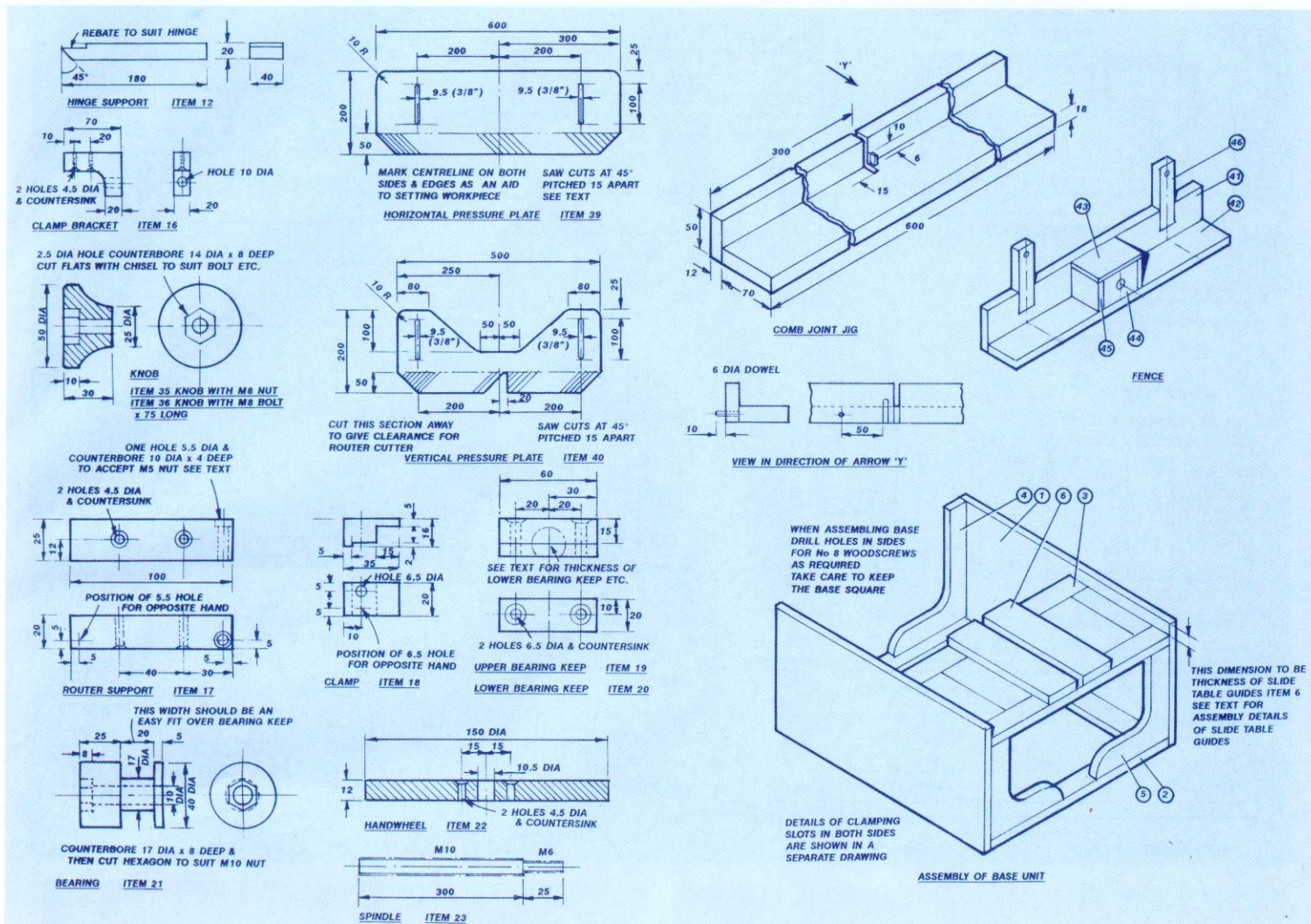
Hinged router bracket set at 30 degrees beyond vertical.



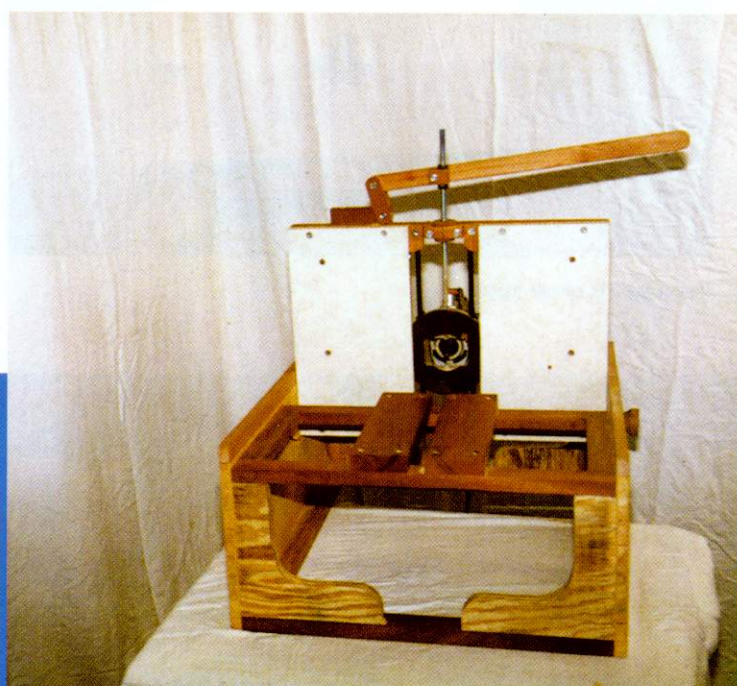
Hinged router bracket set at 45 degrees.



Router table in spindle mode with fence and spring pressure plates in position.



Comb joint jig in place.



Comb joint jig. Second working piece in place to make first cut.

Constructional Details

Base Unit

The side (item 1) are manufactured from 18mm thick MDF held in place by two hardwood frames (items 2 and 3) and four 90 degree brackets (items 4 and 5) all of which should be accurate to produce a base which is truly square.

The slide table guides (item 6) are next screwed in place; the first located 10mm to one side of the centre line of the base and parallel with the sides of the base.

The key (item 8) is then placed against this guide and the second guide screwed in place so that the key can slide without undue side to side movement.

Hinged Router Bracket

To assemble the components first screw the upper and lower supports (items 11 and 12) to one panel (item 9) ensuring that they are square with the inner (guiding) edge of the panel.

With the router base firmly held against the inner face of the panel present the second panel against the other side of the router base and hold in place using 'G' clamps.

Check that the router can slide easily between the two guide faces without undue slackness then screw the second panel in place.

It is worth spending some time getting this setting just right because the accurate functioning of the unit does depend upon this fit.

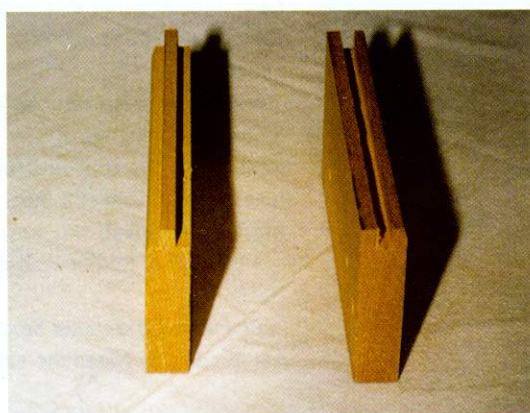
Place this sub assembly face down on a flat surface, with the fence guide rods in place in the router base insert it in the space between the two side panels.

Next screw in place the clamp brackets (item 6) locating the height adjusting screws (item 30) beneath the centre line of the guide rods.

The centre of the hole for the 10mm threaded rod (item 23) can then be marked off from the M6 hole in the router base by

Parts List

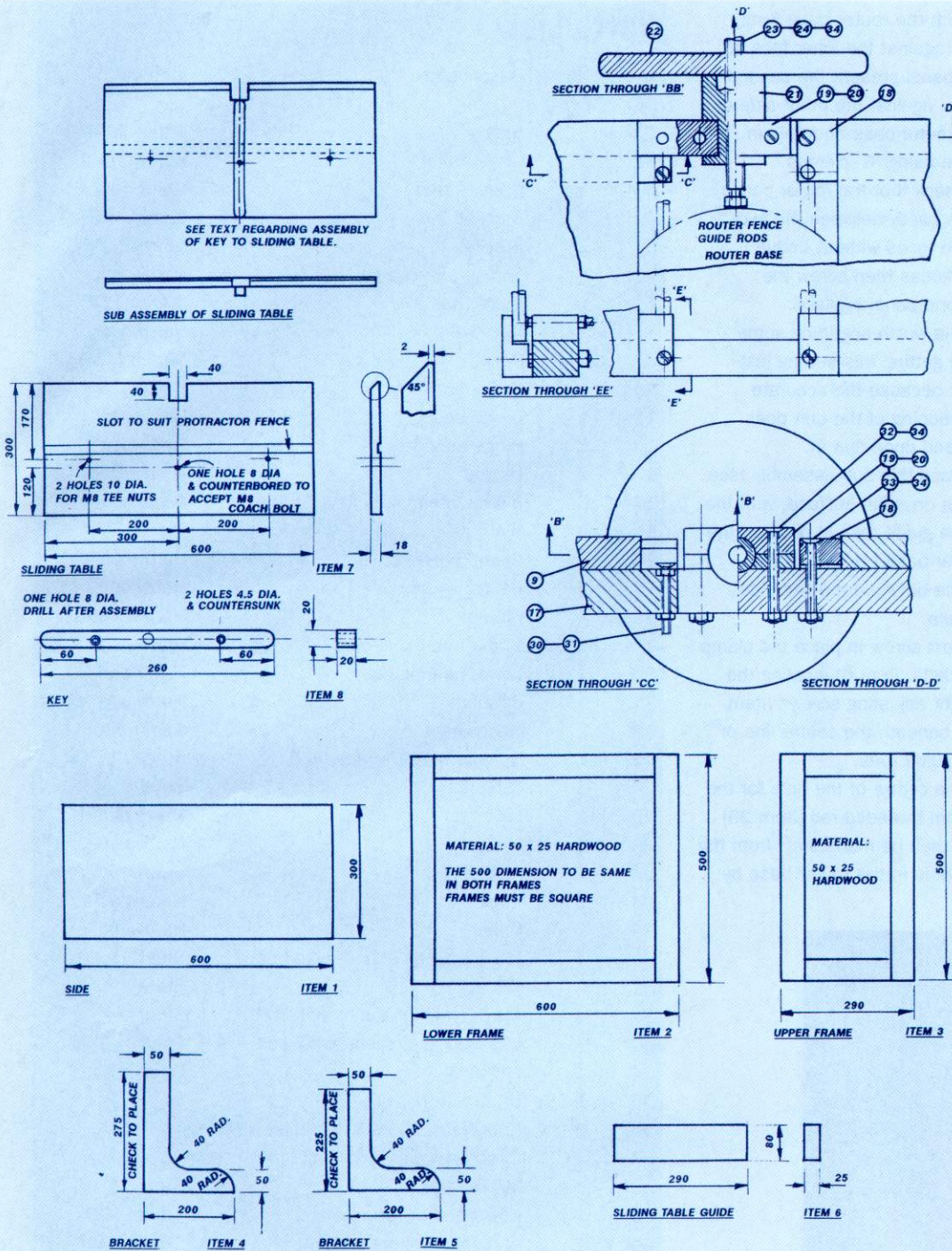
Item No.	No. Off	Description	Material
1.	2	Side	18mm MDF
2.	1	Lower frame	Hardwood
3.	1	Upper frame	Hardwood
4.	2	Bracket	18mm MDF
5.	2	Bracket	18mm MDF
6.	2	Sliding table guide	Hardwood
7.	1	Sliding table	18mm MDF
8.	1	Key	Hardwood
9.	2	Panel	18mm MDF
10.	1	Upper support	Hardwood
11.	1	Lower support	Hardwood
12.	2	Hinge support	Hardwood
13.	2	Hinge	40mm Backflap
14.	6	M4 countersink bolts x 25 long	Steel
15.	6	M4 nuts	Steel
16.	2	Clamp bracket	Hardwood
17.	4	Router support	Hardwood
18.	4	Clamp	Hardwood
19.	1	Upper bearing keep	Hardwood
20.	1	Lower bearing keep	Hardwood
21.	1	Bearing	Hardwood
22.	1	Handwheel	12mm MDF
23.	1	Spindle M10 threaded rod	Steel
24.	3	M10 nut	Steel
25.	1	Lever	Hardwood
26.	2	Link	Hardwood
27.	1	Anchor	Hardwood
28.	1	Pivot	Hardwood
29.	1	Bush	Hardwood
30.	4	M5 x 40 long countersink bolt	Steel
31.	8	M5 nut	Steel
32.	4	M6 x 70 long countersink bolt	Steel
33.	7	M6 x 50 long countersink bolt	Steel
34.	10	M6 nuts	Steel
35.	1	Knob with M8 nut	
36.	6	Knob with M8 hex. head bolt x 75 long	
37.	1	Coach bolt M8 x 75 long	
38.	1	M8 tee nut	Steel
39.	1	Horizontal pressure plate	18mm MDF
40.	1	Vertical pressure plate	18mm MDF
41.	1	Fence front	18mm MDF
42.	1	Fence base	18mm MDF
43.	1	Dust chamber top	9mm ply
44.	1	Dust chamber front	9mm ply
45.	1	Dust chamber side	9mm ply
46.	2	Pressure plate support	18mm MDF



Ready for assembly.



Completed tongue and groove joint.



first establishing the thickness of the lower bearing keep (item 20). After bolting the upper bearing keep (item 19) in place the 18mm hole for bearing (item 21) can be drilled.

The lever anchor (item 27) can now be screwed and glued in position on the upper support.

Fix the hinges (item 13) to hinge supports (item 12) with M4 countersunk bolts and nuts (items 14 and 15). The hinge supports may now be attached to the hinged router bracket sub assembly using 5/8th x 6 woodscrews, ensuring that they are 110mm from the lower edge.

It is important that both hinge supports be the same distance from the lower edge otherwise the router bracket will not swing smoothly between the sides of the base.

The two clamp brackets (item 16) may now be screwed to the lower support.

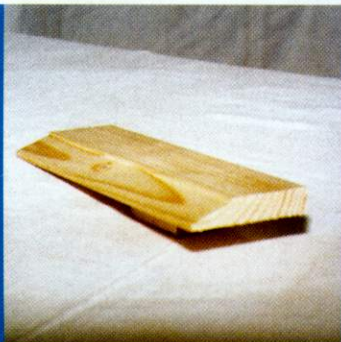
Sliding Table

Centralise the table on the base, ensuring that it is square with the sides and clamp in place.

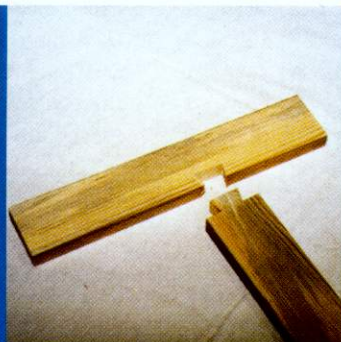
Invert and screw the key (item 8) in place using No. 8 woodscrew. The counterbored hole for the coach bolt (item 37) may now be drilled.

Assembly of Router Bracket to Base:

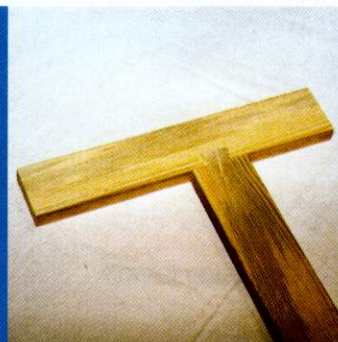
Check that the router bracket will fit easily between the sides,



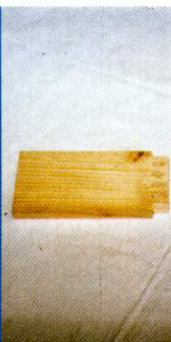
Splay cut.



Carcase dovetail joint.



Joint completed.



Comb joint separated.

correct if necessary. Clamp the sliding table onto the base in its working position and invert face down on a flat surface.

Insert the hinged router bracket in place between the side of the base and hard up to the edge of the sliding table; using No. 8 woodscrews fasten hinge supports (item 12) to sides of base.

Check that the router bracket swings freely between the sides of the base and that when the router bracket is in the vertical position the sliding table can easily move toward it to close the gap.

Due to the position of the hinges (item 13) in relation to the sides of the base it is difficult to simply define the precise position and shape of the curved clamping slots other than marking off through the holes in the clamp brackets (item 16) then drilling a series of holes which can be joined up with a chisel or file.

When completed the slots should allow the hinged router bracket to swing through 120 degrees, i.e., from the horizontal through to 30 degrees beyond the vertical and capable of being clamped with knobs (item 36) in any position.

The next task is to permanently mark the centre line axis of the router on the sliding table; this can be done as follows:-

Mount the router onto the bracket and insert the smallest

diameter cutter available in the router. Swing the bracket to the vertical and bring the sliding table as close as possible to the bracket. Adjust the position of the router so that the cutter is just touching the sliding table and mark the centre line of the router on the table.

Workpiece Pressure Plate

The horizontal pressure plate (item 39) should be the same width as the sliding table, i.e., 600mm and the centre line previously marked on the sliding table transferred to both sides and rear edge of the pressure plate; again this should be permanently marked.

This will assist in setting up procedures when using the router table.

The vertical pressure plate (item 40) has a section of sloping cuts removed to permit the router cutter to be raised above the workpiece.

Both pressure plates may be reversed to allow the workpiece to be fed from either direction.

Using the Router Table

Remove the two handles on the router to allow it to travel the full length of the guide rods.

Hinged Bracket Horizontal

In this mode it will be found more convenient to clamp the fence in a convenient position and move the router to adjust the cut.

Hinged Bracket Vertical or at an Angle

(1) When used in this mode it is generally more convenient to use the lever actuation rather than the handwheel. The router can be locked in any position using the fence guide rod locking screws.

(2) It is advisable to use the vertical and horizontal pressure plates to hold the workpiece in place.

(3) When setting up it is often convenient to view the workpiece from the router side of the unit.

(4) It is advantageous to use the router's vertical fine adjuster to control the depth of cut.

(5) When setting out joints mark additional lines inside the width of the joint, as shown in sketch.

(6) When cutting joints line up the inner lines with the centre lines marked on the sliding table or horizontal pressure plate. When complete the joint will be the correct size.

(7) Mortises are readily cut by setting the router cutter to the correct height and projecting out to the depth of cut then locking in place, the workpiece located against the horizontal pressure plate as outlined in (6) above and advancing the sliding table toward the rotating cutter until the workpiece touches the face of the hinged bracket.

Withdraw and continue drilling a series of adjacent holes until the second reference line is reached; slide the workpiece

sideways to clean out the slot.

Remove the workpiece, reverse and feed into the cutter and slide sideways, this will produce a perfectly centred mortise slot.

At all times the workpiece should be held firmly against the horizontal pressure plate and fingers well clear of the cutting areas.

(8) Tenons are cut using vertical strokes of the router with a piece of waste wood below to prevent breakout.

Setting up procedure

Hold the workpiece in place using both the vertical and horizontal pressure plates and, viewing from the reverse side, line up the tenon so that the cutter is just touching the line indicating the shoulder. Clamp a stop against the end of the workpiece using a suitable piece of wood and 'G' clamp.

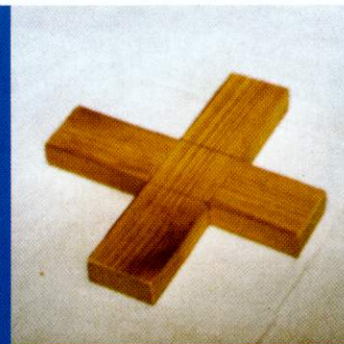
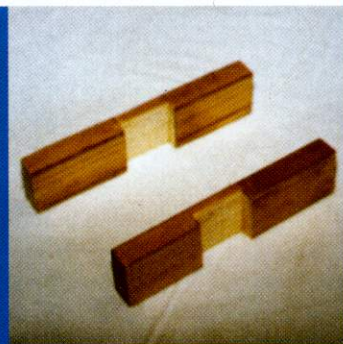
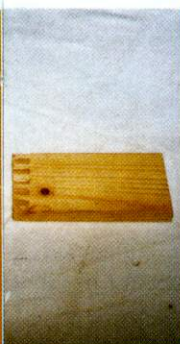
Withdraw workpiece and adjust cutter projection to produce the correct depth of cut.

Feed workpiece into rotating cutter removing material in successive vertical cuts until workpiece reaches the stop.

Remove workpiece, turn over and cut other side of tenon.

(9) The procedure to cut splayed tenons is as follows:-

Clamp the workpiece in the mitre fence set at the correct angle and adjust the projection of the cutter to the length of the tenon. Feed the workpiece into



Comb joint.

Half lap joint separated.

Half lap joint.

the rotating cutter, gradually removing material with vertical strokes. When the correct amount of material has been removed move the workpiece to the other side of the cutter and, without altering the setting, cut the other side of the tenon. Again use a waste piece of wood below the tenon to avoid breakout.

(10) The technique for halving joints is similar to that for tenons.

If it is possible to use a stop, then by placing a piece of timber the exact width of the joint between the stop and the end of the workpiece, removing it after the first cut and advancing the workpiece to the stop will produce the exact width of joint required.

(11) Carcase dovetails can be produced as follows:-

The tails are cut by clamping the workpiece in the mitre fence at right angles and with an appropriate dovetail cutter in the router chuck cut the tail with a series of vertical strokes in a manner somewhat similar to that described for a splayed tenon.

The pin (female) part of the joint is cut by placing the workpiece against the face of the hinged router bracket, holding it in place with both the horizontal and vertical pressure plates.

Having not altered the setting of the router cutter the pin can be cut with a series of vertical

cuts. Again use can be made of stops and the centre lines marked on the horizontal pressure plate as appropriate.

(12) Housing Joints :-

Dovetails can be cut in the ends of the shelves either on one or both sides using the mitre fence set at 90 degrees to assist in the process. Here again it is simpler to set the cutter below the workpiece and feed from left to right.

The matching groove in the upright is more simply cut using a hand held router guided by a tee square or housing joint jig.

(13) Dovetail fronts for drawer fronts, etc.:-

As I have a very good commercial jig for cutting dovetails for drawer fronts, etc., I have not attempted to design a jig for this purpose. However, it would be possible to devise a fixture based upon the design of the comb joint jig, cutting the tails first and then using the tails as a guide to cutting the pins.

Fielded panels and chamfers are produced by setting the hinged router bracket to the correct angle and cutter to the required projection, the router locked in place on the guide rods.

The cutter can be arranged either above or below the workpiece; wherever possible place the cutter below the workpiece, giving a safer and more controlled cut. Remember if the cutter is below the

workpiece feed from left to right and if above from right to left.

General comments

Most woodworking joints can be produced using the methods outlined above, generally with the minimum of additional fixtures.

Remember - always switch off the router at the end of each operation, if using lever actuation lock the router in place to prevent it moving.

Whenever possible use the vertical and horizontal pressure plates.

Comb Joint Jig

Construction Details

Manufacture the jig from 2 pieces of MDF glued and screwed together.

Fit a 1/4 inch diameter tungston carbide cutter (Trend 3/21) in the router.

Place the jig against the hinged router bracket, as shown in the drawing lock the sliding table against it and clamp the jig to prevent movement.

Cut the slot for the hardwood stop and glue the stop in place.

Return the jig to the router unit, lining it up with the side of the sliding table, i.e., exactly 1/2 inch to the right of the previous position and again clamp the jig to prevent movement.

Cut the second 1/4 inch wide slot. Prepare two pieces of timber and cut a sample joint as outlined in the instructions to

use the comb joint jig.

If the joint is too tight move the jig to the left, if too slack move to the right, adjust until a satisfactory joint is produced.

Without altering the setting of the jig drill a 6mm hole through the router bracket panel into the jig.

Glue in the dowel ensuring that there is a good taper on the end of the dowel to assist returning the jig to its working position.

Using the Comb Joint Jig

With the cutter above the jig and projecting about 1mm more than the thickness of the timber, place the workpiece against the stop and with a down stroke cut the first slot.

Remove the workpiece and raise the cutter. Insert the slot just cut into the stop and continue cutting all the slots.

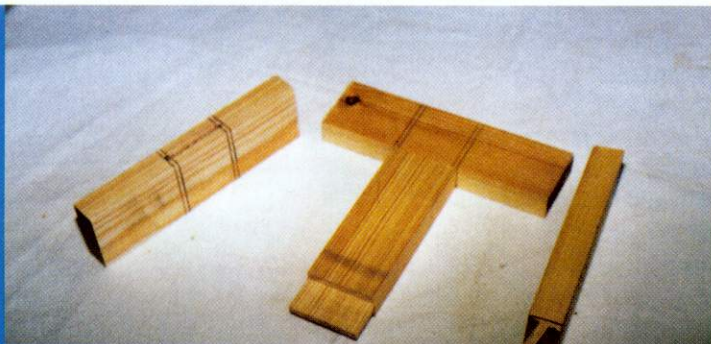
Reverse this workpiece and insert the first slot into the stop.

Place the second workpiece against the edge marked 'X' and cut the first slot.

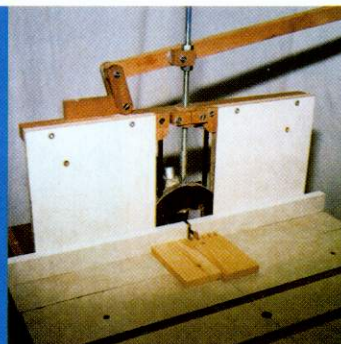
After removing the first workpiece proceed to cut all the slots in the second workpiece.

Note

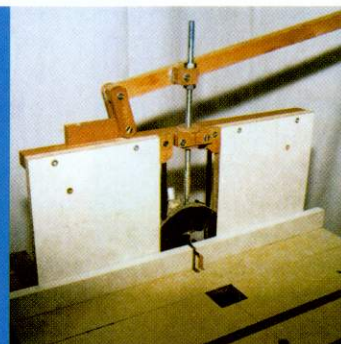
Always withdraw the workpiece before raising the cutter otherwise the timber will splinter.



Mortised tenon joint including splayed tenon. Note setting out lines on mortises.



Set up for tongue and groove cuts.

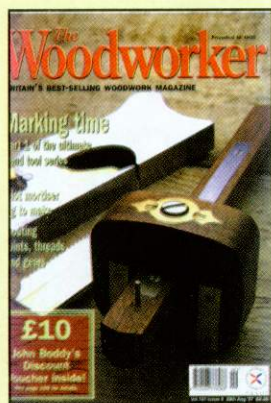


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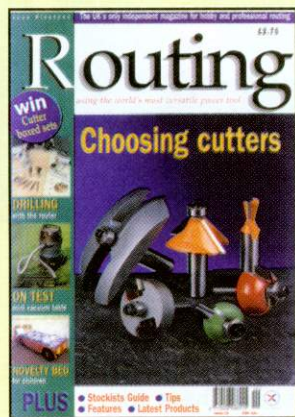
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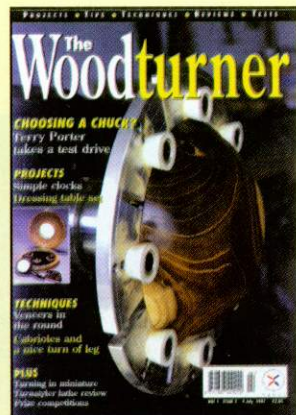


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Thumbnail mouldings

Ray Everest demonstrates how to produce Georgian mouldings using an Elu MOF96 and accessory table

The main picture shows the origin of the idea which produced the end result shown in fig. 1. A total length of moulding of about 25 to 30ft. was produced in a very short space of time once the timber was prepared and the router set up. Only two cutters are required the size of which depends on the overall appearance required. The English oak 1in. x 1 1/2in. about 54in. long is prepared and thickened to 7/8in. x 1 3/8in. see fig. 2. The 1 3/8in. was bandsawn to give two pieces approximately 1in. and 1/4in. (plus) as in fig. 3 when placed together fig. 4



and clamped the grain configuration is retained. If other than bandsawing was done the wastage from the larger saw kerf would lose the continuation of the grain appearance.

The thin strip is set aside whilst the 'thumbnail' is

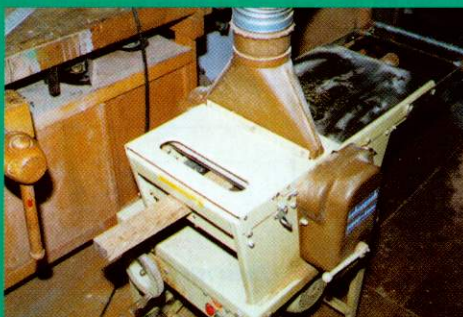
produced in the main timber - fig. 6 which also shows a 16mm cove cutter fitted to the Elu MOF96 which should have the horizontal and vertical fine adjusters fitted. At this point it is best to use a piece of scrap timber to run

over the cutter as the operator must judge on the appearance of the result in relation to the timber size, also the cutter size has to be chosen according to preference.

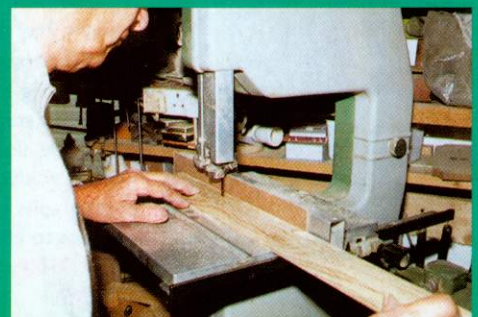
It is necessary to keep the working piece at right angles



1. End result.



2. English oak being thickened.



3. Prepared pieces being bandsawn in half.

when passing over the cutter. fig. 6 also shows that the timber when passed over the cutter, must be stopped by either the vertical back plate

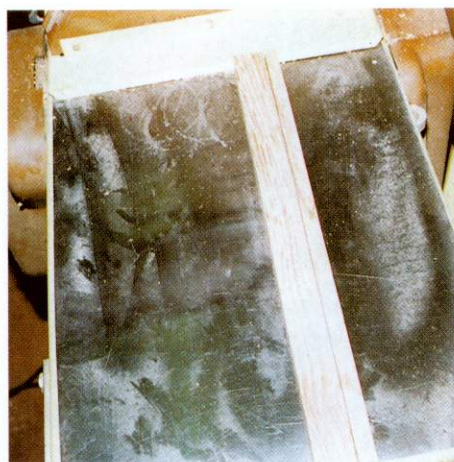
or, if removed, by the vertical support bars this latter allows a greater space for clearance of the cutter. It is necessary to make a small

replica 'thumbnail' from a suitably sized piece of dowel rod and when fixed by double sided tape to the router table located the previously made

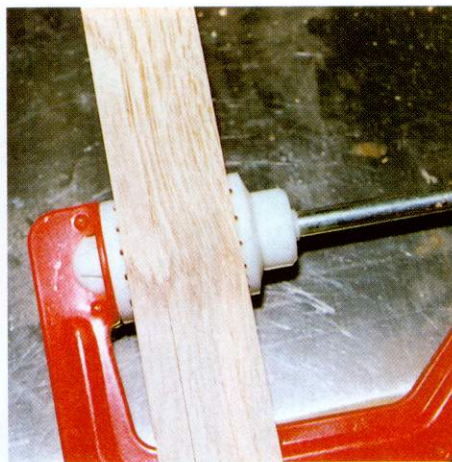
'thumbnail' so ensuring equal spacing as the workpiece is progressed through.

Marking

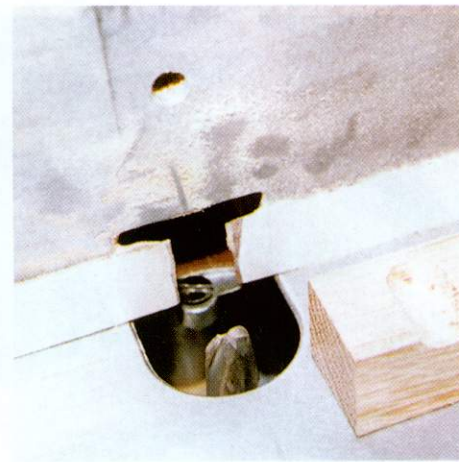
At this stage a pencil mark



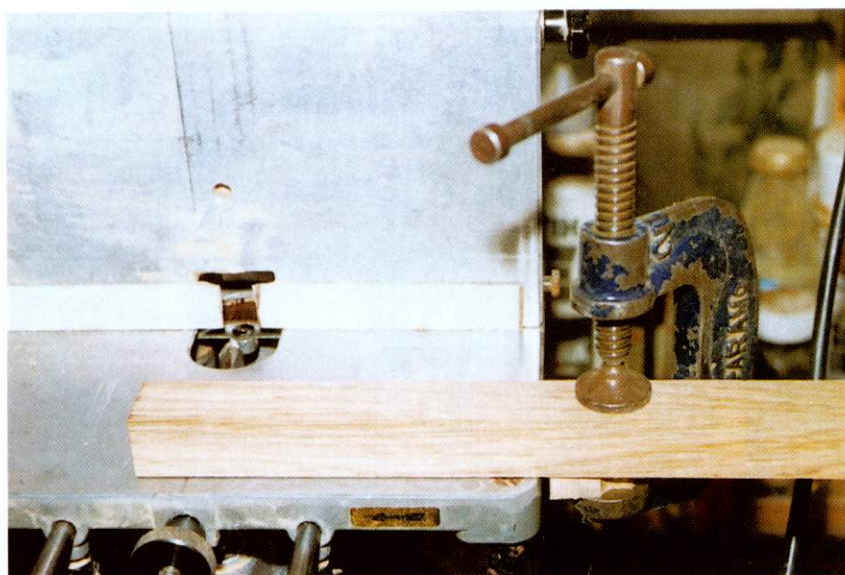
4. Bandsawing ensures wastage is minimised.



5. Grain configuraton is retained.



6. Thumbnail is produced in the main timber.



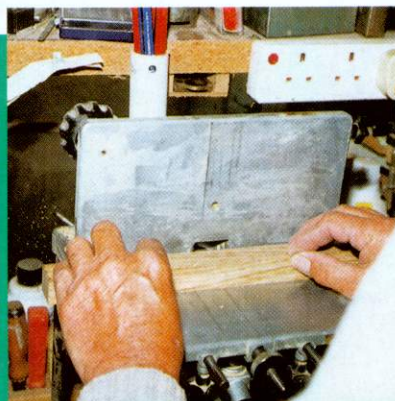
7. Use a piece of scrap timber to test results.



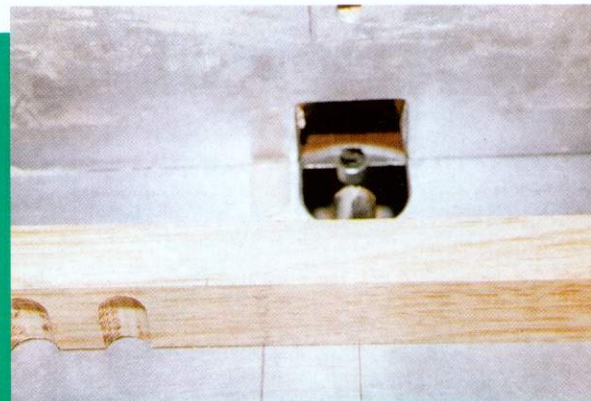
8. Sample thumbnail cut from dowel rod.



9. Replica thumbnail fixed to table by double sided tape..



10. Workpiece should be lightly marked on the trailing edge.



11. Cuts made at 1in. intervals.

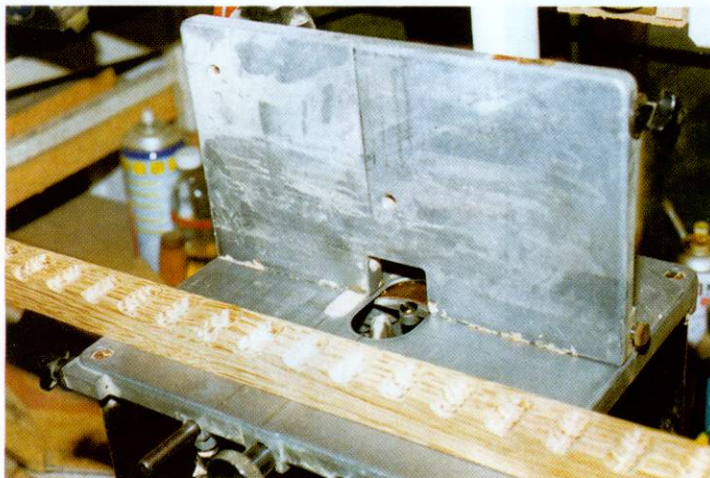
should be drawn at right angles to the back plate or stops, dissecting the centre of the cutter and a further line drawn at the position chosen for the spacing of the

subsequent 'thumbnails'. The workpiece should also be lightly marked on the trailing edge with equidistant marks equivalent to the two lines drawn on the router table. In

the sample shown 1in. is the spacing chosen for clarity, but for appearance the 'thumbnails' should be closer together as in fig. 1, preferably about 3/4in. The

cut needs to finish about 1/8in. from the front edge.

The 'thumbnails' routed, fig. 12, the timber is laid on its side with the open ended router cuts pointing upwards.



12. Once routed the timber is laid on its side and open moulding upwards.



13. A bead of glue is spread along the surface.



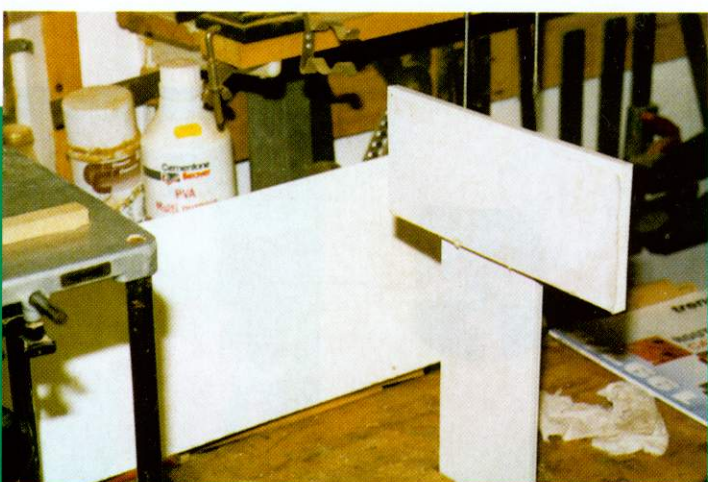
14. The original strip is glued and clamped to the moulded strip.



15. As there is little to remove a light tap with a mallet makes an incision.



16. A gouge the same width as the tumbnail is best.



17. The 'T' piece used to hold the workpieces steady.

A bead of glue (type that dries transparent) is spread along the surface fig. 13 and the 1/4in. batten cut from the original is glued onto open ended side of the 'thumbnails' - ensuring that it is not only the right way round, but also the right way up, so that the grain pattern matches, fig. 14. This is set aside for the glue to harden, whilst a suitable gouge, preferably bevelled on the inside and its cutting edge being the same width as the 'thumbnail' is chosen as in fig. 16.

With the glue hardened, the surface is sanded off and the gouge held on the edge of, but facing away from the 'thumbnail'. As there is

very little wood to remove, a light tap with a mallet makes an incision, fig. 15 each 'thumbnail' is dealt with in turn, the timber is then clamped to the bench whilst the gouge on its side, resting in the base and side of the routed 'thumbnail' gently pares both sides to meet the incision and so removing the other end of the 'thumbnail' leaving a reversed crescent shape. Some form of relief is required between each 'thumbnail', this is simply done by a veining or engraving cutter.

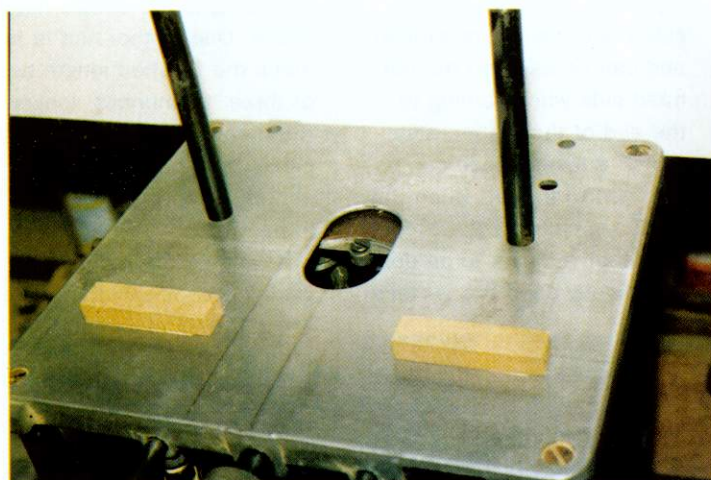
Before continuing onto the second stage, it is as well to explain the set up of the stops and guides which are of more importance when

making the elongated 'I' shapes which infill and break up the 'thumbnails' into individual units. fig. 17 shows the 'T' piece made up from a scrap of upvc, chosen because it allows the workpiece to slide easily without 'drag' when supporting the overhang on a long piece of timber. Fig. 20 shows the pencilled guide lines, one centrally to the cutter, the other line at the distance apart that is decided for the spacing of the 'thumbnails', in this instance it was 1in.

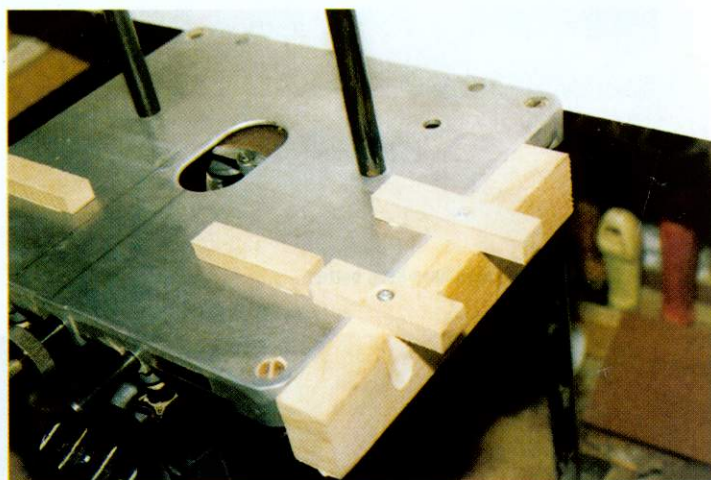
The two pieces of scrap timber, fixed with double sided tape are positioned to allow the workpiece to move across

the table to the rear vertical stops; the length of movement being decided upon by the positioning and length of the elongated 'I'. fig. 19 shows the simple jig used to hold the workpieces steady and at right angles. The two cross pieces held by single screws being a snug fit to the workpiece, but allowing it to slide easily.

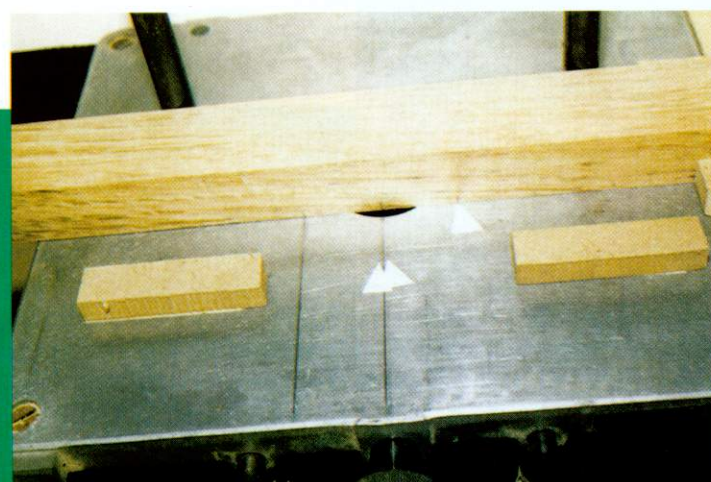
In practice, as seen in fig. 21, the right hand is lightly gripping both the workpiece and the jig as the two hands slide the piece over the cutter which, incidentally, is only cutting to a depth of barely 1/16in. or less, again a piece of scrap timber passed over the cutter will help determine whether one



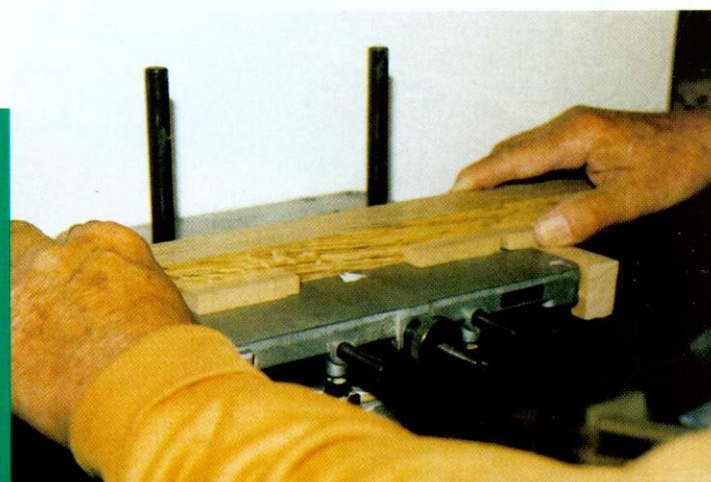
18. Two pieces of scrap timber fixed with double sided tape.



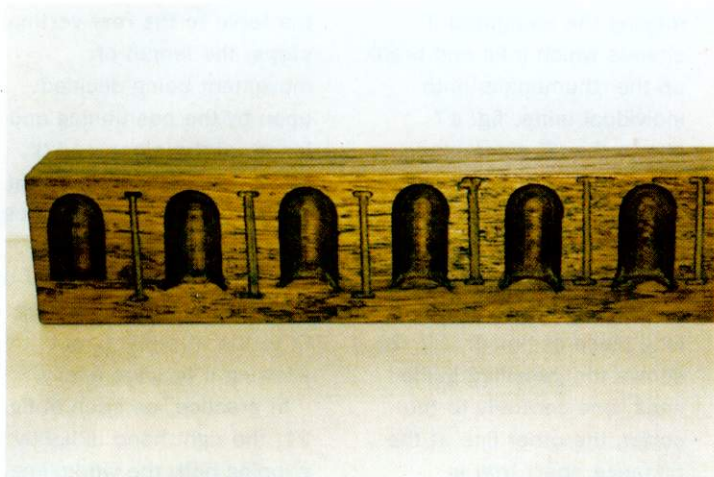
19. Length of movement is determined by a simple jig to hold the workpiece.



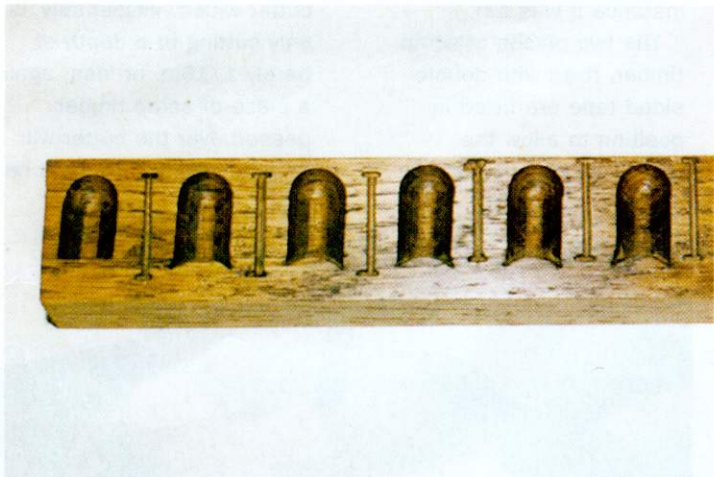
20. Table has pencilled lines marked on it for guidance.



21. Right hand lightly grips both workpiece and the jig.



22. Thumbnails are a little too far apart.



23. Positioning of the I could have been better.



24. Make the finished length longer than required to allow for mitred joints.

should raise or lower the cutter a fraction.

Fig. 20 shows the workpiece marked every 1in., the marks being centrally between the 'thumbnails'. The timber is lowered onto the cutter whilst holding it against the wood stops it is then 'jiggled' to the left and right, gauged by the two white pointers, centralised by the pencil marks and slid to the back upright stops where gauged by the single white pointer (there could be two as at the front stop) the work is again 'jiggled' left and right by the same amount. The workpiece is lifted sufficiently to clear the cutter, returned to the front stop and moved to the next pencil mark and the process repeated. The right angle guide is of course reversible and can be used on the left hand side when coming to the end of the timber, also the 'T' support piece can be clamped to the left when the overhang calls for it.

All that remains to be done is to lightly sand the surface

and the edges to remove any sharp edges. A coat of stain (I use Rustins medium Georgian oak stain) which when dry is treated to a good wax polish.

The sample shown in figs. 22 and 23 have purposely made flaws to exaggerate the problems if one does not take care in the setting up and execution of the operation.

1. The 'thumbnails' are too far apart, a little over 3/4in. would be better.

2. Positioning and length of the 'I' could be better.

3. The 'jiggling' at the top and bottom of the 'I' must be accurately done.

Referring back to fig. 1 these mouldings were completed without fault by attending to the details listed above. One further hint is to make the finished length two or three 'thumbnails' longer than required enabling the piece to be centralised, as shown by the mitred corner in fig. 24.

Having set up the jigs, guides etc., it only takes about twenty minutes to run off a 4ft. length and a morning or a few hours is sufficient to do about 25 to 30 ft. run in 4 to 5ft. lengths.

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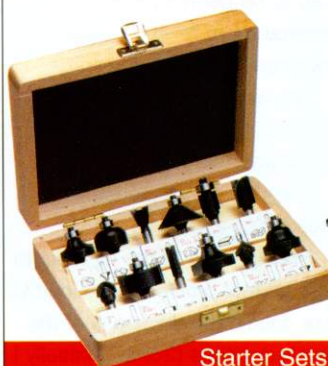
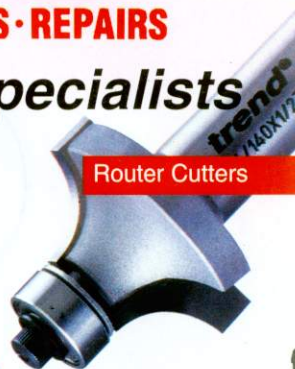
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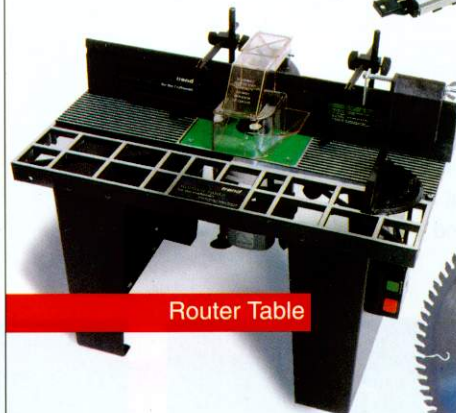
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Around The Home



As part of a renovation of his bedroom, Duncan Bell designed these reading lights, to match the decor of the room

The lighting cables were run behind the lath-and-plaster wall and out in the right position above where our heads would be. These cables were left blanked off until we used them. We bought picture lights from a second-hand shop and I mounted them on wooden disks with integrated toggle-switches so they could be switched off easily. This article describes the making of the disks, fitting the toggle-switches and the end results.

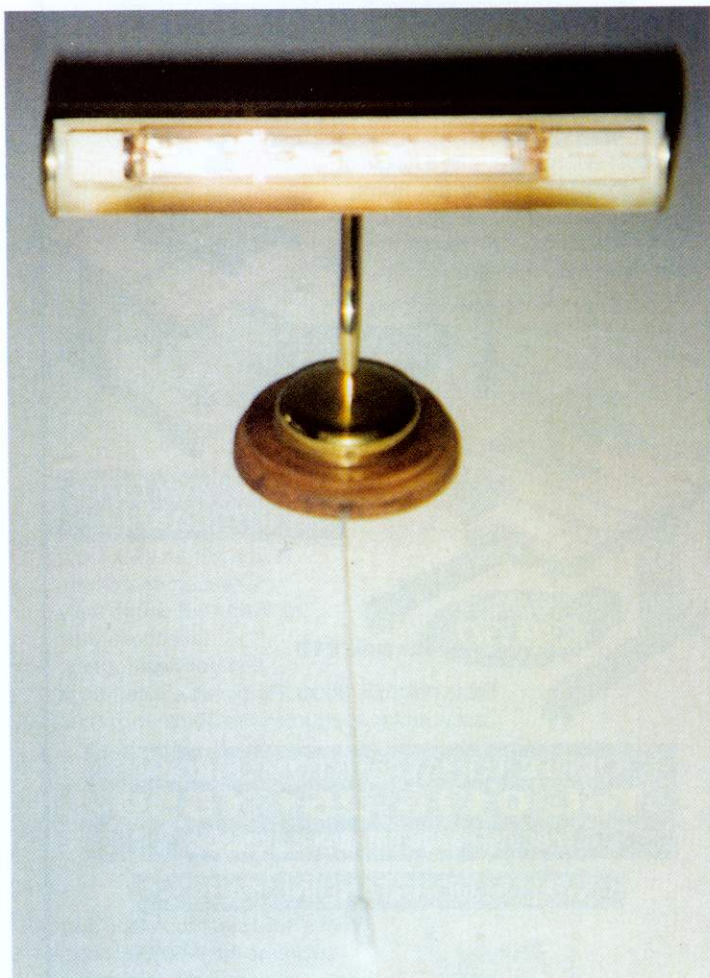
Making the disks

The main problem was to obtain suitable disks for mounting the light bases. They had to be deep enough to provide room for the toggle-switches.

The wood had to be sturdy and had to blend in with the other wood in the room.

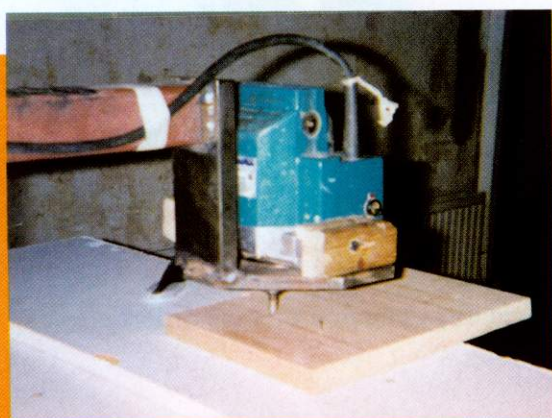
They had to be pleasant to look at.

Finding wood of the right depth was no real problem: I decided to use double the thickness of the toggle-switches (20mm). Initially I intended to use pirana pine, left over from another project.

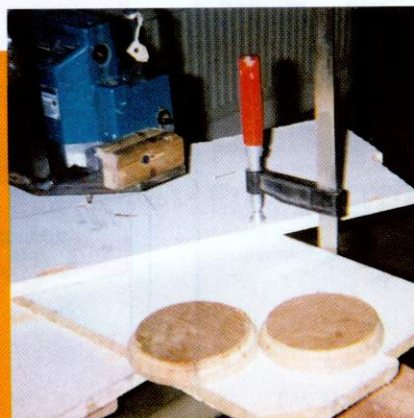


One of the lamps in place on the wall. The screws holding the base are in line with the toggle-switch cord.

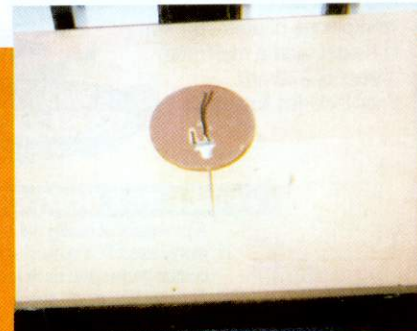
“Let there be light!”



1 Making the first cut.



2 The pirana pine disks with beaded edges.



3 The back of one of the disks with the toggle-switch in place. The toggle-switch cord has been threaded through its hole and the power cables are also in place. The disk is brown because the original colour-scheme of the room from which it was removed was chocolate and banana!

However, it got badly chewed up when I routed it (the grain split out), so I used scrape deal skirting board, which I had removed from one of the bedrooms during renovation. This was a hard, tough wood which matched the pine furniture.

I was given a custom-made overhead routing table by a friend, which fits my trusty Makita 3600B. The router can be raised and lowered about 300mm (using part of a car jack!). I packed up the table so that the workpieces would be just under the cutter and then cut two rectangular blanks. I drilled a small hole in the approximate centre of each one: this was to hold a panel pin driven into the table top, 60mm from the edge of the router cutter to produce a 120mm disk. The hole produced would be invisible when the lamp base was attached.

Two cutters were used to produce the disks:

First I cut the disks out with a straight cutter, taking 4mm cuts. I set the router going and lowered it onto the blank, which I steadied with my other hand. Once it reached the right depth of cut, I rotated the blank clockwise, against the rotation of the cutter. I soon found out this was the right way when I forgot and pushed one of the

pirana pine blanks the wrong way and the router frisbeed it across the room! Fortunately I was wearing leather gloves (to avoid splinters), but it always pays to be careful - overhead routing can be dangerous, as the cutter is not protected and it can get very near your hands.

Once I had cut the two disks, I changed the straight router cutter for a beading cutter and routed the edges of the disks. Again, I rotated the blank clockwise, against the rotation of the cutter. I then cleaned them up with abrasive paper, ready for the toggle-switches. I made two sets of disks: the second set, made from the deal skirting board, were better and were used for the final lamp bases.

Installing the toggle-switches

I need to work on the back of the disk to produce the following:

A slot to hold the toggle-switch

Grooves to take the power cables

A thin hole from the toggle-switch slot to the edge, for the toggle-switch cord.

I cut the slot with a chisel, after drawing round the toggle-switch. I left room for the short power cables that run from the power supply cables that come out of the wall at the back of

the disk through to the front of the disk. There they are connected to the lamp terminals.

The slot was positioned near the edge of the disk, at the point where the least attractive section of beading was situated. I used a small V-shaped chisel to cut the grooves for the power cables so that they would not prevent the disks from lying flat against the wall. I then set the disk vertically in my bench-vice, with the toggle-switch slot at the top.

Using a drill-press and a thin wood-boring bit I drilled through from the edge of the disk to the bottom centre of the toggle-switch slot. I threaded the toggle-switch cord through from the slot to the outside edge of the disk (having removed the cord-pull on the end of it). The toggle-switches were held in place by the rigidity of the short power cables.

Installing the lamp bases

I had to find a means of attaching the lamp bases to the front of the disks. The lamp bases are shallow brass cups with two holes on their edges. The pipe that holds the power cables and the light fitting is screwed to this cup. In the end I attached the bases by cutting out a disk of plywood with a diameter

slightly less than the internal diameter of the base and cutting curved sections off the edge. I attached these to the base with PVA glue and positioned them by putting the base over them and moving it until they were in the right place. When I had found the right position I fixed it by tapping in a couple of panel-pins in each curved section.

After the glue holding the curved sections was dry I replaced the lamp base and drilled guide holes for the two retaining screws, through the two holes on the base's edges. Now I only had to make the electrical connections, attach the bases to the wall and attached the lamps to the bases. After connecting the toggle-switches and light terminals to the lighting cables, I pulled the toggle-cords a couple of times to check the light. The lamps meanwhile hung down below the bases. To attach the wooden disks to the wall I used spring toggles which open up once they are pushed through a hole in the wall. I rotated the disks so that the hole used to hold the lamp bases were vertical. It was then an easy matter to slip the lamp bases onto their curved sections on the bases and screw them in place with small brass screws.



4 The front of one of the disks showing the curved sections used to attach the lamp base. You can also see the lamp base and one of the short power cables.



5 The front of one of the disks with the lamp base in position.



6 The lamps in place above the bed. Unobtrusive toggle-cords hang from each one, within easy reach of the bed. The wooden disks help the lamps fit in with the rest of the room.

Around The Workshop

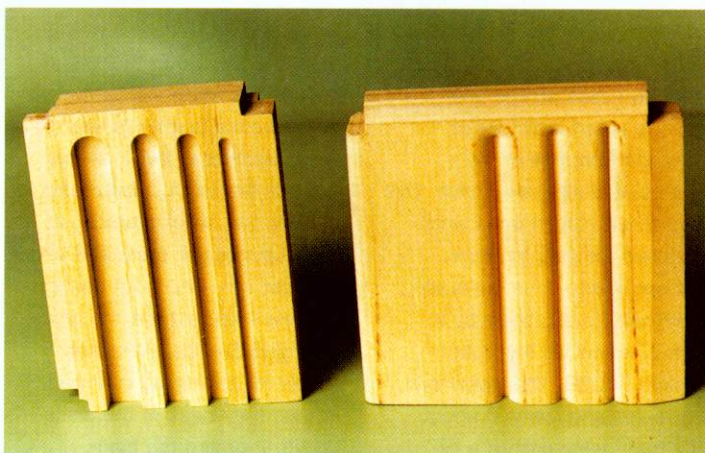


Australian reader Glenn Roberts offers a solution to the problem of identifying cutter profile shapes

So you have finally decided to start that project for "She who must be obeyed". You ask the usual questions about what it should look like - "What profile do you want around the edges"? In reply you get - "What can I choose from?".

To solve the problems of trying to describe what profiles I have available, I devised the straight forward sample blocks,

1 General view of two sample blocks.



Simple and effective sample blocks

see Fig. 1. They consist of small blocks of scrap veneered MDF generally 150mm square. However, readers may find larger, thicker pieces more suitable for 1/2 inch routers with large profiles. To achieve as many edges as possible (without resorting to cutting hexagons for example) I glued together 2 blocks of 17mm thick MDF to achieve 8 edges and 2 sides capable of full depth profiles. The MDF overcomes any problems associated with

cutting across the grain.

However, being veneered MDF I used bearing guided cutters fitted with smaller bearings, such as a beading cutter on one of the edges that cut across the grain of the veneer, see Fig. 2, leaving the other two sides for cutters that do not necessarily remove the veneer with a clean edge.

Obviously there is no practical limit to how many combined profiles that are available by using different combinations of

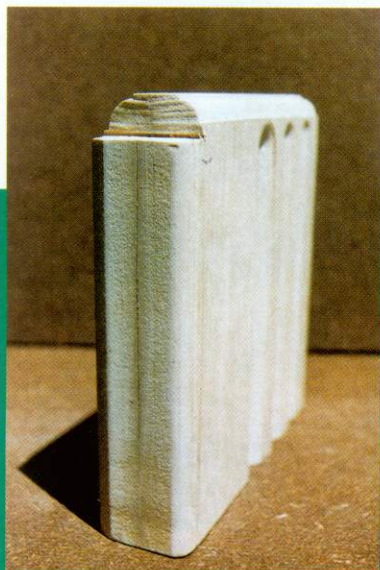
cutters or the use of parts of a single complex shaped cutter.

However to start out I used my available cutters in their singular form. In addition I used different bearings fitted to particular cutters. Fig. 3 shows the result of a rebate cutter fitted with 3 different guide bearings to show the versatility of a single cutter. Plunge cutters were used on the two faces of the blocks and continued to the edge to show their cross section, see Fig. 4.

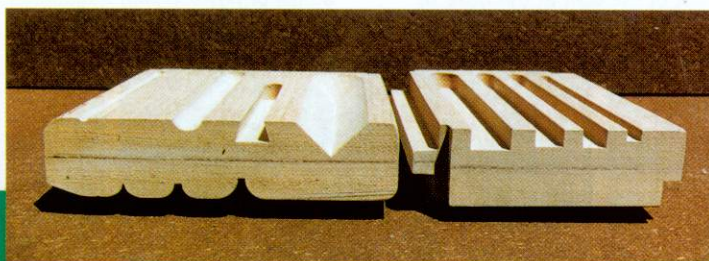
Finally, to provide a clear cross section for the edge profiles the corners of the blocks were removed where the two profiles intersect.

The profiles can be numbered and cross reference against the 'Trend' catalogue and/or against the rack where you store the cutters.

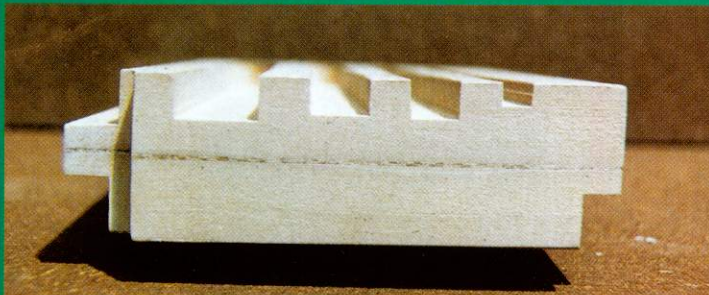
I must admit making the sample blocks is one of those jobs for a rainy day, as it can get monotonous changing from one cutter to another. An alternative is to keep the blocks handy for when you next use a particular cutter and test it on the block before using on that valuable workpiece.



2 View of beading cutter used to remove veneer. Corners removed.

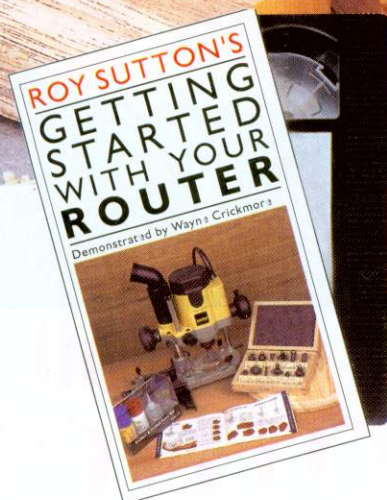


3 Rebate cutter used on edges with different bearings fitted.



4 Cross section of 'plunge' cutters

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Around The Home



A cabinet or cupboard mounted on the wall, such as this design from Percy Blandford can find uses in most rooms in the house

Sizes can vary and the doors may be constructed with either solid or glass panels. Wood may be chosen to match other furniture or painted softwood can be used.

The cabinet illustrated was made for a bathroom, where it was intended to hold considerably more than the usual medicine cupboard. The cabinet described is made of softwood and plywood with a painted finish, but you could use the same method of construction for other sizes and materials, including a glass panel in the door.

This cabinet (Fig. 1A) has a door and drawer. The bracketed shelf shown (Fig. 1B) provides support and is not attached to it. It might not be needed in some situations.

There are plenty of uses for a router. The back and door panels are rebated. Housing (dado) joints have to be cut. Several edges are moulded. Door parts have mortises. The door frame is chamfered. You could put a raised panel in the door, but in the sizes suggested the raised part would not be big enough to be very effective. The drawer has grooves and dovetails.

For softwood construction you may find it economical to use a stock size of wood planed all round to finish about 200mm by 19mm section, which will suit the wide parts and you can cut down other pieces.

Making the carcass

The work is best tackled in four parts. Make the carcass of the cabinet first, then make the door and drawer to fit into it. If it is to go above an existing shelf or other support there is no more to do, but elsewhere you should add the supporting shelf for strength and appearance. A separate shelf could be treated as another project to support something such as a clock or vase.

The key parts in carcass construction are the pair of sides



Wall Cabinet

(Figs. 1A, 2A and 3A). Mark out the pieces together. You may wish to delay shaping the tops (Fig. 4A) until after rebates and joints have been cut.

Cut the rabbets to suit the thickness of the plywood back right through, then enlarge behind

and above the top dados for the top back (Fig. 2B).

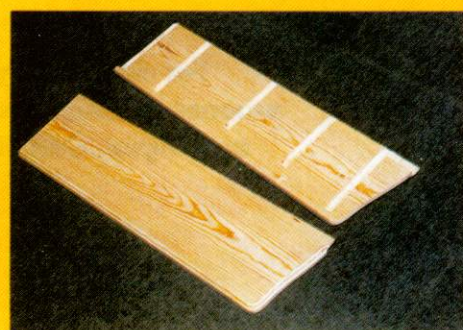
Cut the top dado groove and the one above the drawer to within 12mm of the front edge (Fig. 2C) and the rabbet for the bottom to the same point (Fig. 2D).



Rebate a side.



Grooving for shelves. Bench hook as guide.



Completed sides grooved and moulded.

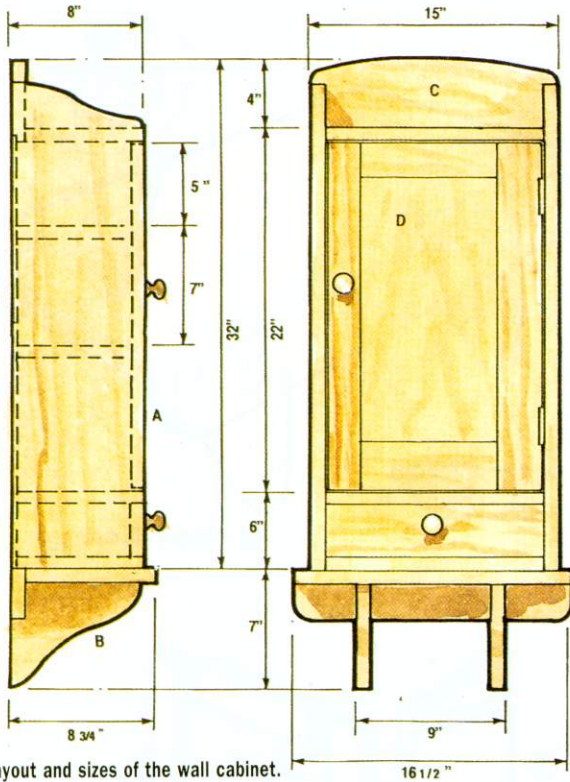


Fig. 1 Layout and sizes of the wall cabinet.

Cut the inner shelf dados to within 38mm of the front edge. Square the ends of all grooves with a chisel.

The top back (Figs. 1C and 3B) goes behind the cabinet top and has a rabbet for the plywood back (Fig. 2E). Make sure the cross members are all the same length (Figs. 3C and D).

Notch those that have to be level at the front. The inside shelves fit into the grooves without notching.

When you are satisfied with the joints, shape the tops of the sides and mould outer edges to within 1 inch (25mm) of the top

back. You can also mould the upper edge of the cabinet top. Besides the decorative value, moulding lightens appearance.

Drill the bottom for screws upwards into the sides (Fig. 2F). Drill the top back for screws into the sides and the cabinet top. Drill the cabinet top for one screw each side near the front edge diagonally upwards (Fig. 2G).

Cut the plywood back near to size ready to use to square the assembly as it is glued and cramped tight. When you fix the back with glue, you should find it adequate to use panel pins and a few screws.

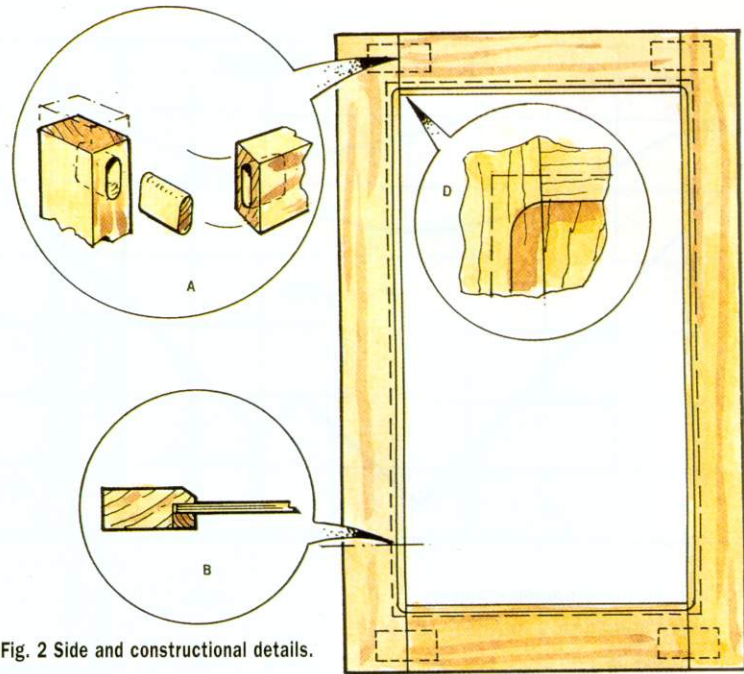


Fig. 2 Side and constructional details.

Door

A router allows you to assemble the squared wood framework for the door (Figs. 1D, 3E and 5) and cut the rabbets and chamfers afterwards. Corner joints are most conveniently made with loose tenons (Fig. 5A), so all parts are mortised. Mark out the door parts to match the opening. The door can be eased a little by planing edges after assembly. Leave the stiles (uprights) a little too long until after assembly. Mark out and cut identical mortises without squaring their ends. Prepare a sufficient length of wood with rounded edges to match the mortises and make the tenons.

Assemble the door frame and

check against the opening it is to fit. Cut the rabbet around the inside edge (Fig. 5B) and square its corners with a chisel. Cut the chamfer around the other side in a similar way, but leave its rounded corners.

Glue in the plywood door panel with glued and pinned fillets inside. Cut off the extensions to the stiles and trim the outside of the door to an easy fit in the carcass. You could fit an alternative glass panel in a similar way with fillets.

Hinges 50mm long would be suitable. You could let them in with a router cutter and a template, but in this small size you might prefer careful work with a chisel. A turned knob is shown,



The crosswise parts ready to assemble.



Door frame glued and cramped.

Fig. 3 Parts of the wall cabinet.

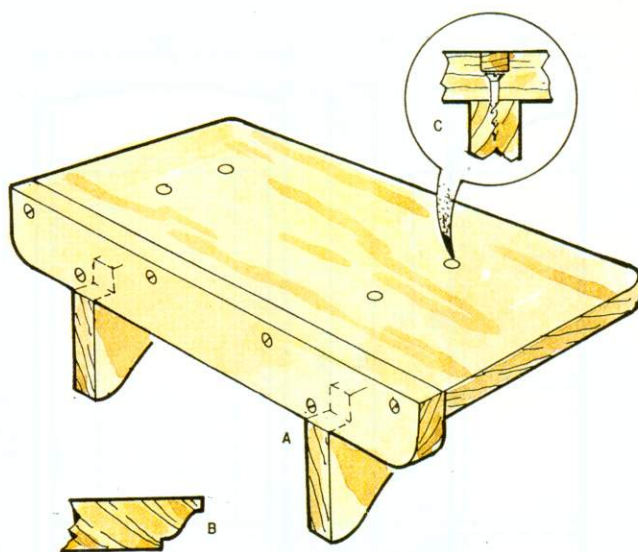
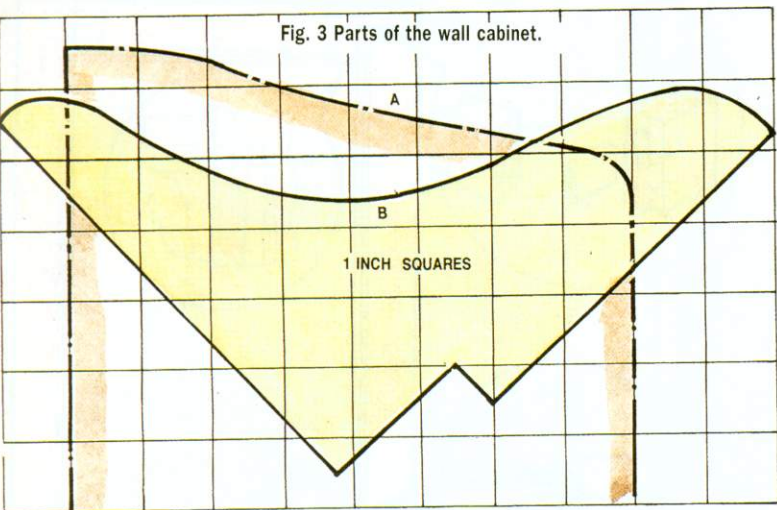


Fig. 4 Shapes of curved parts.

but any other handle could be used. If you use a magnetic catch it forms its own stop. With some other catches you may have to put in a small block of wood as a stop.

Drawer

There are many ways of making drawers, but this one is shown (Fig. 3F) made in the traditional way (Fig. 6). Cut the front an easy fit in its opening. Make the sides marginally too long at first, so they can be trimmed in the finished drawer to act as stops to bring the front level. Groove the front and sides for the plywood bottom (Fig. 6A). The back (Fig. 6B) comes above the bottom, which is slid in after the other parts are assembled. Suitable dovetails are shown, but you may vary them if you have to match a jig or template. Allow the rear tails to extend slightly beyond the back.

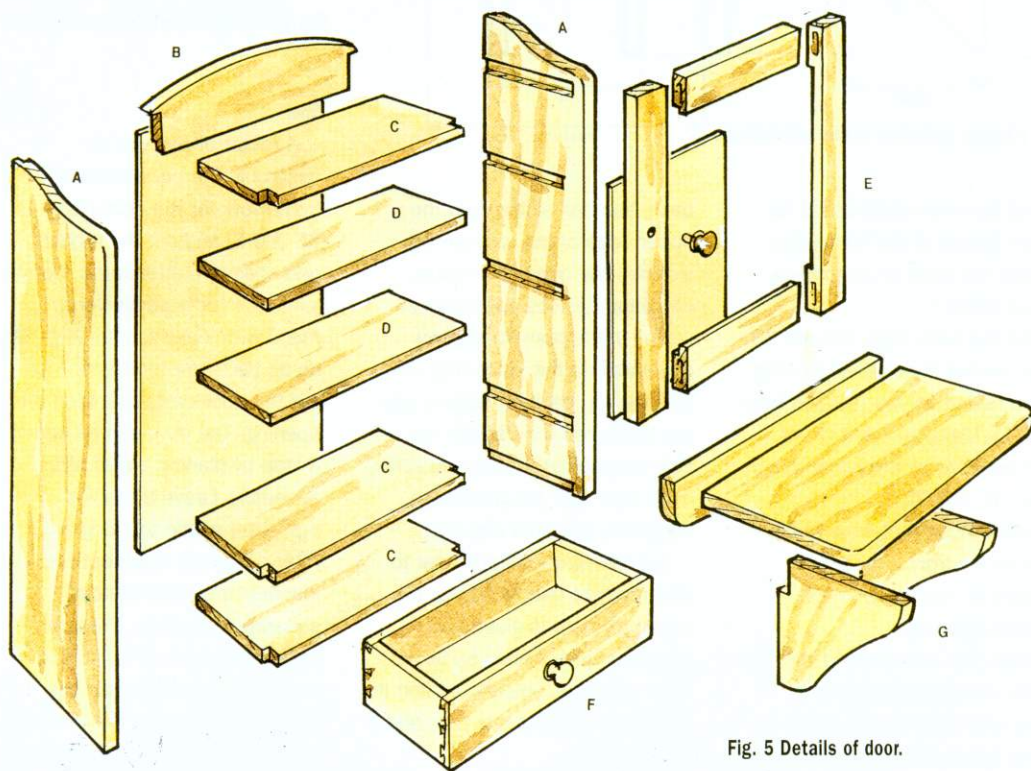
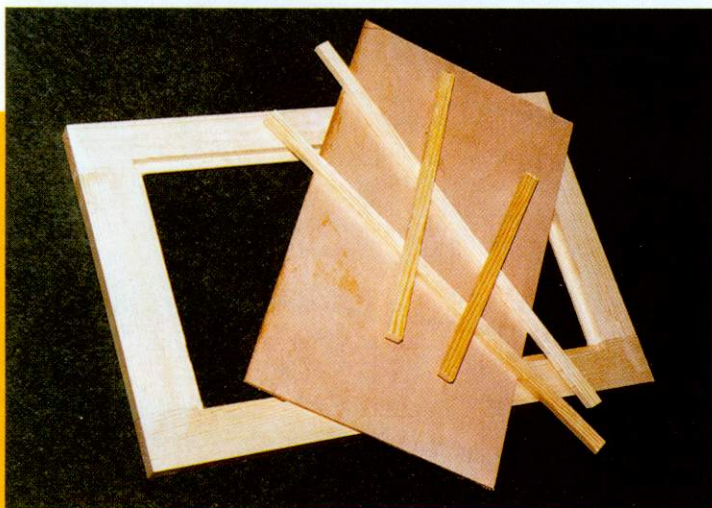
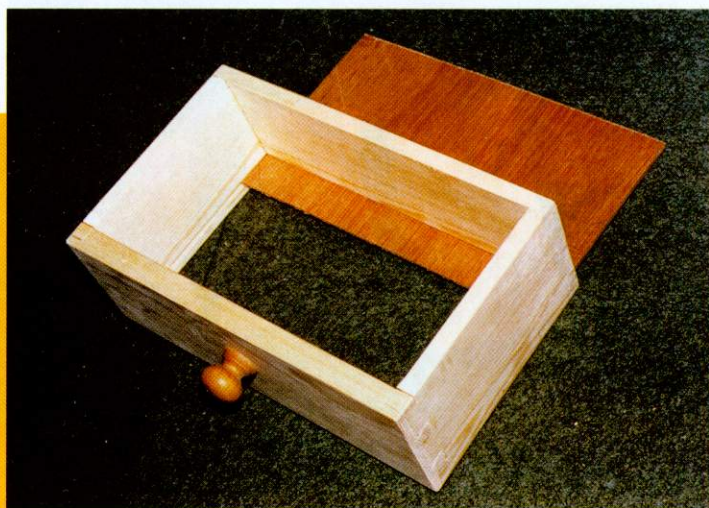


Fig. 5 Details of door.



Rabbetted door frame with panel and fillets.



Drawer bottom slides in.

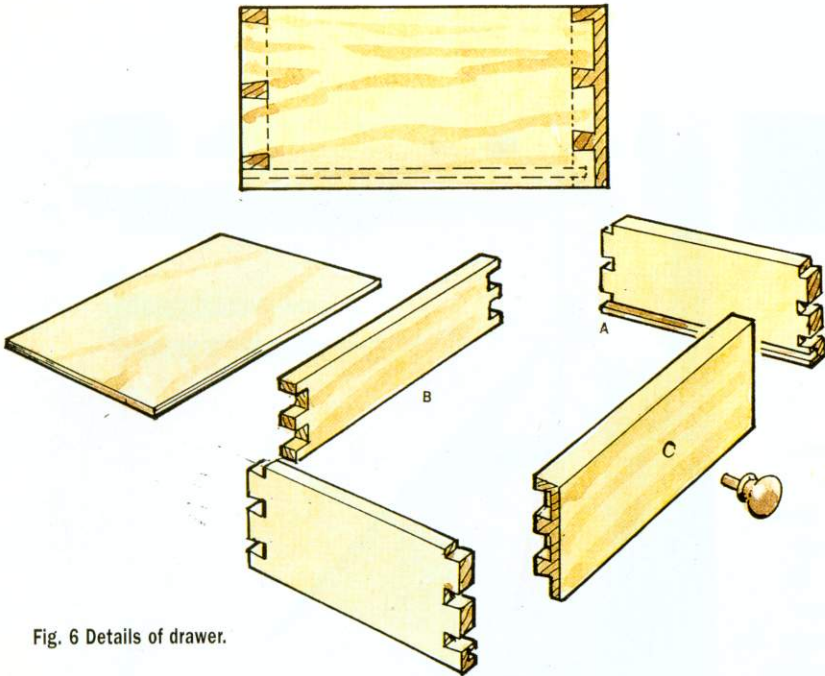


Fig. 6 Details of drawer.

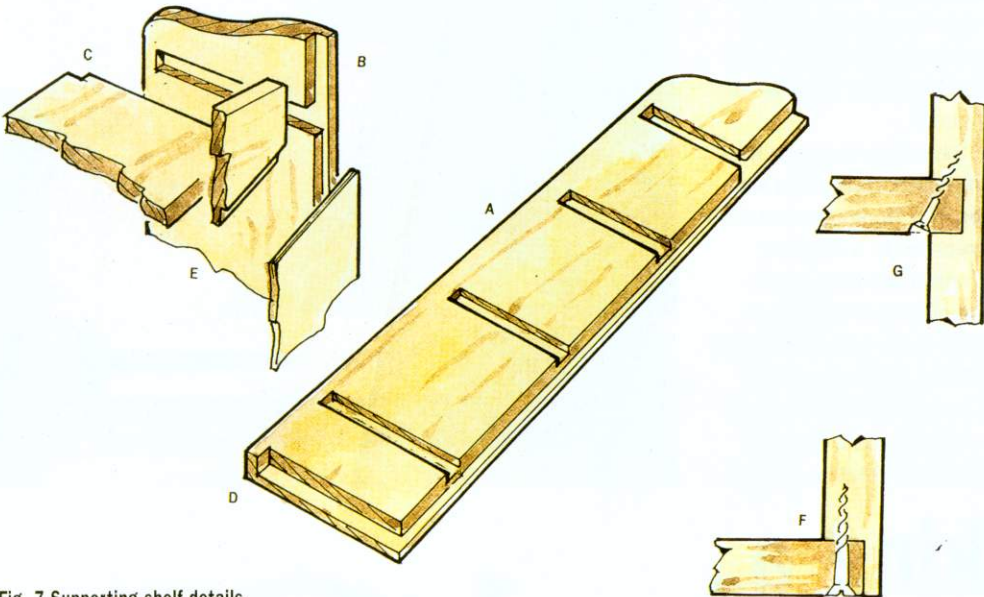


Fig. 7 Supporting shelf details.

Assemble the drawer and add a knob or handle to match that on the door. Trim so it slides easily and closes with the front flush.

Shelf

The supporting shelf is shown (Figs. 1B and 3G) extending 19mm beyond the cabinet. The shelf back fits behind the top

and the brackets are notched over it (Fig. 7A). The brackets (Fig. 4B) are strongest with the grain diagonal to the squared edges. Mould to match the

CUTTING LIST

Sizes in inches (Millimetres)				
No.	L	W	T	
Sides	2	31 (790)	8 (200)	3/4 (19)
Shelves	3	15 (380)	7 3/4 (195)	3/4 (19)
Shelves	2	15 (380)	6 1/4 (160)	3/4 (19)
Top back.	1	15 (380)	4 3/4 (120)	3/4 (19)
Door frames	2	22 (560)	2 (50)	3/4 (19)
Door frame	1	10 (250)	2 (50)	3/4 (19)
Door frame	1	10 (250)	2 1/2 (65)	3/4 (19)
Back (plywood)	1	22 (560)	14 1/2 (370)	1/4 (6)
Drawer front	1	14 (360)	4 1/2 (115)	3/4 (19)
Drawer sides	2	8 (200)	4 1/2 (115)	1/2 (12)
Drawer back	1	14 (360)	4 (100)	1/2 (12)
Drawer bottom (plywood)	1	14 (360)	8 (200)	1/4 (6)
Shelf top	1	16 1/2 (420)	8 (200)	3/4 (19)
Shelf back	1	16 1/2 (420)	3 (75)	3/4 (19)
Shelf brackets	2	11 (280)	6 (150)	3/4 (19)

cabinet around the underside of the shelf top (Fig. 7B) and the outer shaped edges of the brackets.

Assemble with glue and screws. It will not matter if countersunk screw heads are flush with the shelf top if the cabinet is going over it, but for an independent shelf they should be counterbored and plugged (Fig. 7C). Be careful that both the bottom of the cabinet and the top of the shelf are square to the wall, or they may not mate together properly.

Drill the ends of the shelf back for screws to the wall and you will probably find two more in the cabinet back will be sufficient.

If you use a dark painted finish outside, a lighter colour inside looks good and makes the contents more visible. Hardwood may be stained and polished or varnished.



Moulding a shelf bracket.



Parts of the shelf ready to assemble.

Around The Home



Alan Parry shows how to make an inexpensive wooden gate with a router and basic hand tools.

Recently a client asked me to make a strong gate to close his side path leading to the back garden. He wanted a TG&V boarded one, but the cost was more than he budgeted for the project. The agreed solution was to use sawn gravel boards that are usually placed at the bottom of a fence and rebate the edges to prevent unsightly gaps appearing during the dry weather when maximum shrinkage of

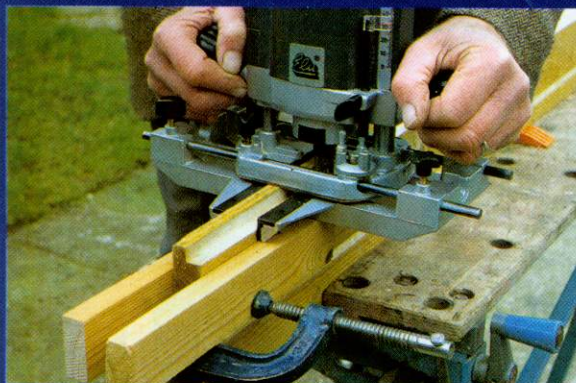
wood takes place. To improve the look of the gate it was decided to simulate a vee joint along the edge and down the centre of each board. (Fig. 1).

The first job was to select from the timber merchant six reasonably straight boards free from twist and wane edges. They were placed side-by-side to check that the meeting edges were acceptably accurate, some high spots required removal with the try plane.

After the edges had their high spots removed each board was cramped in a Workmate and the edges rebated to a depth of 15mm with a two flute cutter. The best cutting arrangement was found to be speed setting 4 (21,000rpm) fed at a steady rate to remove about 3-4 mm at a time, two standard fences held the router steadily in place.



Making a Boarded Gate



Edges being rebated.



Central Vee joint being routed.

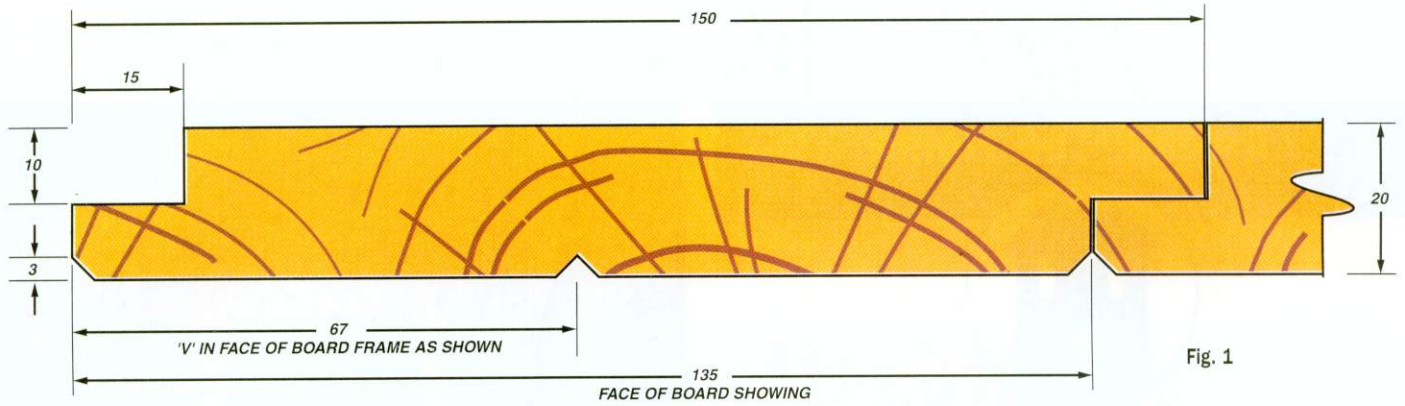


Fig. 1

PLAN VIEW OF ONE BOARD SHOWING REBATES & 'V' JOINTS

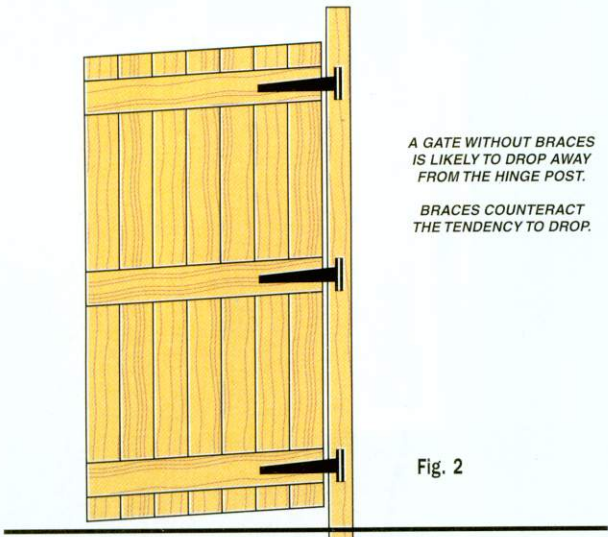


Fig. 2

Next the vee joint was routed to the centre of each board using one side fence. If I cut any more similar boards in the future I will extend the standard fence with a strip of wood so as to hold the router with greater firmness against the board's edges to avoid the worry of it being kicked out of place by knots and wild grain.

After the vee grooves had been cut the boards were placed together and ledges

sawn to length and screwed in place, next the braces were fitted in place. Braces are fitted to prevent the gate's natural tendency to drop away from the hinge side. (Fig. 2). The final job was vee jointing the rebated meeting edges, to guide the router a batten was cramped to each board in turn, only two shallow passes were necessary to form a vee. An alternative method of forming a vee between the boards would have

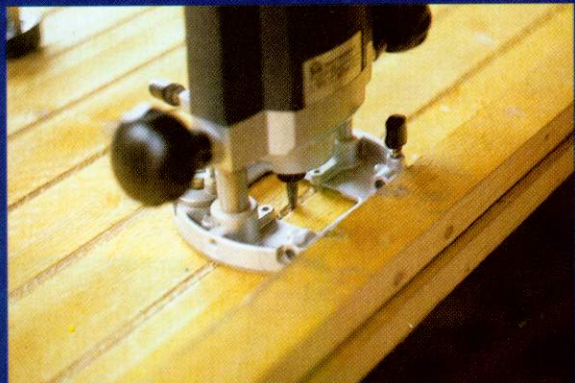
been to chamfer the meeting edges during the rebating process.

The gate took about three hours to make and the materials cost around £25.00, excluding the hinges, latch and slide bolts. Similar size gates from a fencing merchant cost in the region of £70.00, and are not so stoutly made. All-in-all the client was happy with the gate at a price he could afford and I could make some profit. The

completed gate was hung on new posts and two coats of preservative applied. Looked after it should last for years.

Tools for the job

- Elu 96E router.
- Chamfer V groove cutter .
- Two flute straight cutter .
- Standard Elu side fences.
- Trying plane.
- Panel saw.
- Hand brace and bits for screw pilot holes.



Vee jointing the rebated meeting edges.



Gate complete.

Around The Home



Cheval mirrors are often flimsy or expensive and sometimes both. Alan Parry describes how to make a stout one for around £40.00

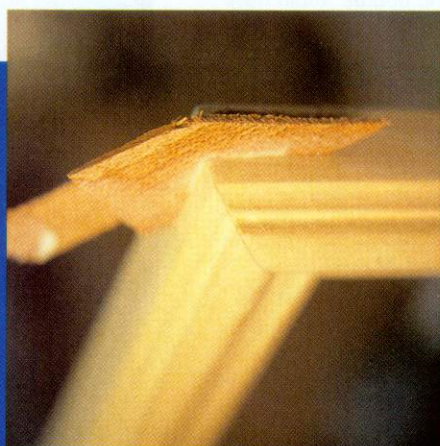
This cheval mirror is made with pine, ready-made dado rail and a small piece of beech for the swivel blocks. Beech was used because its light tan colour contrasted well with the pine's paleness, if beech is not available a piece of suitably stained pine can be used.



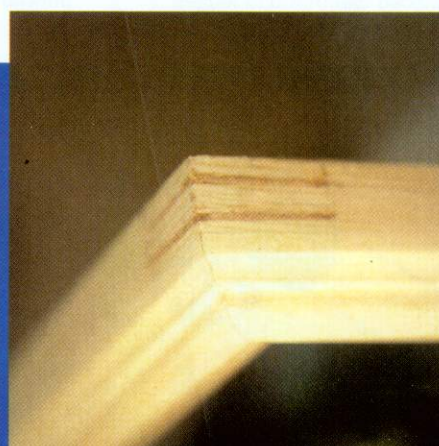
Cheval Mirror



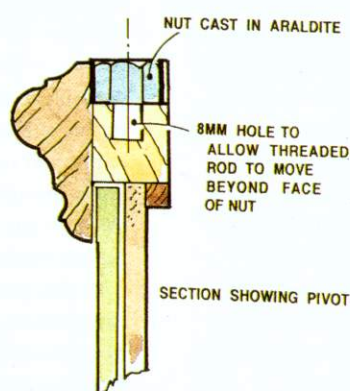
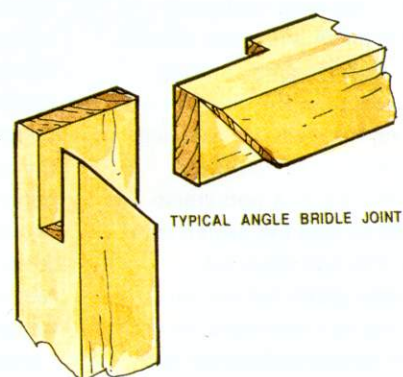
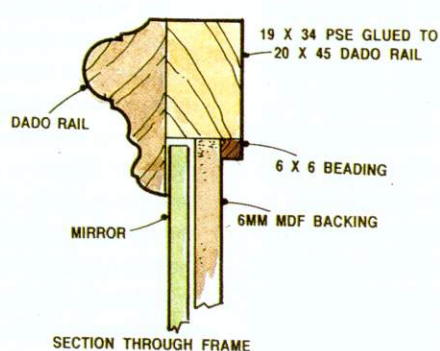
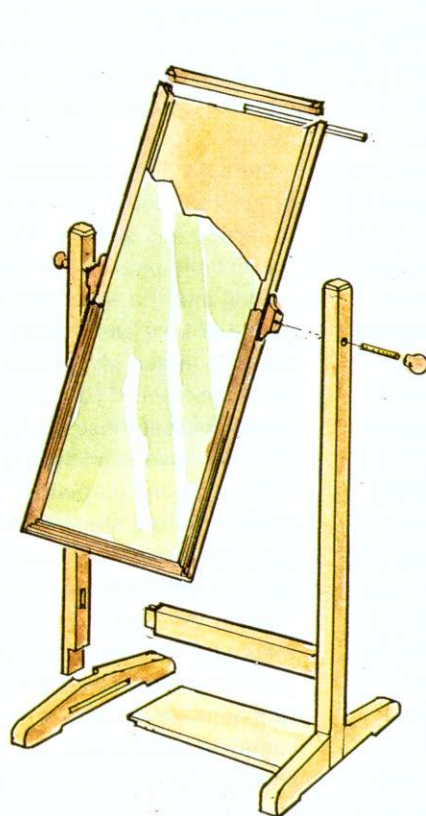
Dado rail is glued to the square edge timber to make a suitable section.



Mitre joint reinforced with hardwood feathers.



Mitre joint, feathers trimmed and cleaned up.



matter of choice and whilst this mirror is plain alternatives have been illustrated as a guide to the woodworker making a similar piece of furniture. The mirror frame was made first followed by the stand.

TIP If your joints are slack use a gap filling adhesive such as Cascamite or Araldite Epoxy.

Main Tools Used

Elu 96E router.

Two flute straight cutter for mortises, housing and halving joints.

Radius cutter for moulding upright/leg.

Hand mitre saw for cutting mitres and pieces to length.

Hobby bandsaw for cutting feet to shape.

Belt sander for final curving of the feet.

Basic handtools as required.

Materials required

All the materials can be obtained from good DIY stores and timber merchants. In addition to the pine and beech (see cutting list) the other items needed are two hardwood knobs, 8mm diameter threaded steel rod and four nuts, metal tube with 8mm bore and epoxy resin adhesive.

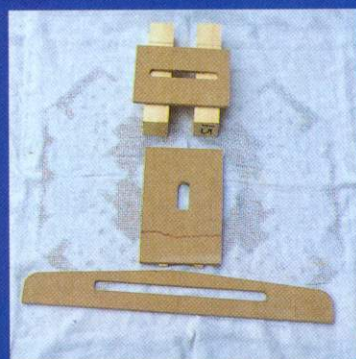
Most woodworkers have their own ideas and methods on how to approach and carry out a project, much dictated by the

tools and time available. This mirror was made over a period of a week during spare time and between other jobs so the sequences of construction suited the circumstances. You may prefer a different approach to the project. The total time to make the mirror was around ten hours.

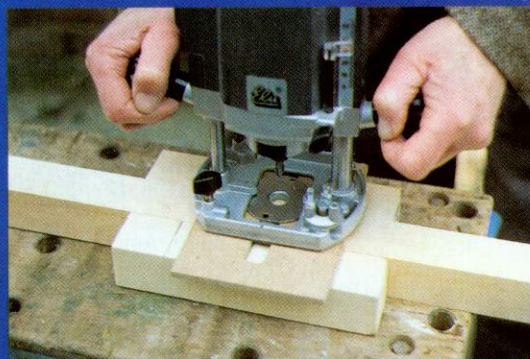
The stand is essentially a simple piece of work, but accuracy in its construction is vital otherwise the mirror frame will not sit true within the uprights. Mouldings are a

Making the Mirror Frame.

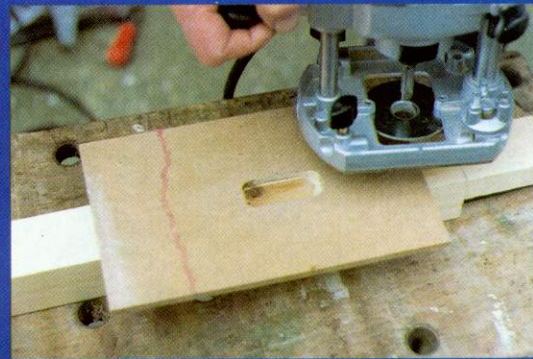
The first job was to glue the dado rail to the 34 x 19mm PSE (planed square edge) to make a suitable section for the frame. When the PVA had dried the side and end pieces were cut at 45 degrees with a mitre saw and ends rubbed with a fine abrasive paper to remove loose fibres. Before gluing the frame together it is best to assemble it dry to ensure that it comes together correctly and you have adequate cramps.



Jigs.



Cutter being guided across the uprights.



Routing the mortises.

The ends were coated with a diluted PVA and water mixture to seal the grain; sealing prevents the PVA being drawn along the grain and starving the joint of adhesive and weakening it. A web clamp was used to hold the pieces until the PVA had dried out.

Mitre joints are not very strong so I reinforced them with hardwood feathers and trimmed off the surplus material with a dovetail saw and sharp chisel. If you do not want to use feathers then I suggest you use dowels or a loose tongue. A similar joint to consider is a angle bridle which is quite strong, but shows a small amount of end grain. The frame was put to one side whilst the stand was made.

Fitting Hardwood Feathers

Mark out with a pencil the position of the feathers and use a tenon saw to cut out the slot which is with width of the kerf, slide in a fine abrasive paper to smooth the cut and blow out any dust. Cut a sliver of hardwood so that it will just slide into the slot and then glue it in position. It is best to practise this procedure with some scrap before attempting the actual job.

Making the Feet and Uprights

For accuracy in using the router I made three MDF templates to suit the 17mm

diameter guide bush supplied as standard with the Elu 96E. The top template guides the radius cutter across the uprights, the middle one is for the rail stub mortise and the bottom for the shoe shelf shouldered housing joint. The tenon was cut with a saw. The feet were marked out using the template, cut to the line with a bandsaw and finished with a belt sander, if you have suitable cutters the feet can be formed with your router. The method of shaping the feet is not important as long as they are identical when finished.

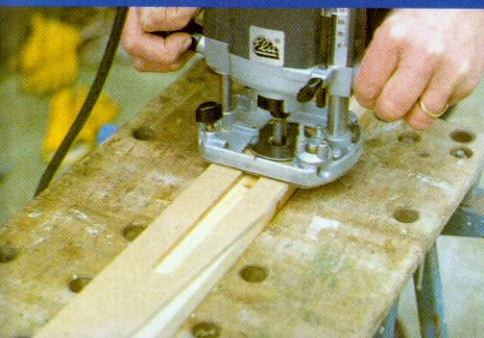
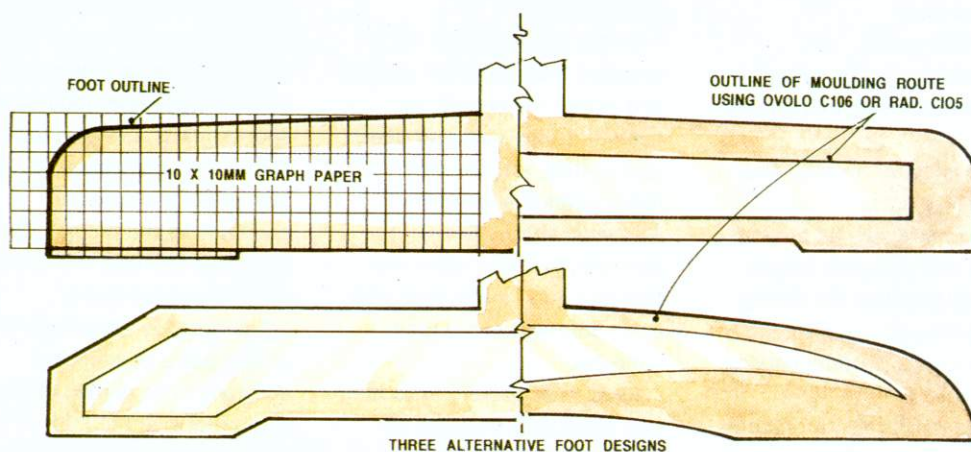
The leg mortises were cut to a depth of 25mm and the curved ends squared with a sharp chisel. Next the tops were chamfered and the moulding formed using the radius cutter. Finally the tee halving joint was cut on the bottom of the upright.

The feet were placed together and marked for the matching tee halving joint. Two guides were pinned to them and joints routed out to a depth of 20mm. It is important that these joints are a good fit for maximum strength so great care is needed in the marking and cutting. Finally the shoe shelf shouldered housing joint was routed to a depth of 15mm. The shelf was made with a piece of wide board and required planing to size and then set up to router out the rebate. If you do not have a wide piece of board handy then buying a short length of edge laminated pine board should solve the difficulty. Finally the rail was cut to length and tenons formed with a saw.

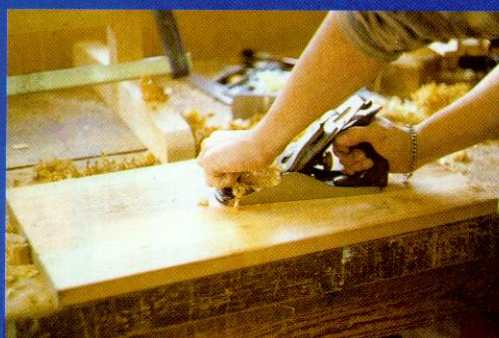
At this point the main components were made and assembled dry to ensure they fitted correctly. It is worth

taking great care to carry out any adjustments however trivial or tedious to ensure that a first rate job results from your work.

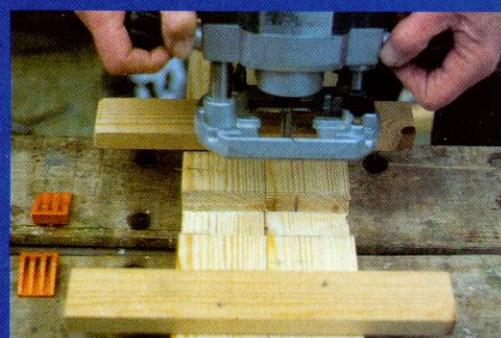
Next the 10mm diameter holes were bored in each leg to receive the sleeves. These prevent the pivot rod threads cutting into the wood over a period of time and making the hole larger. My sleeves are aluminium, if you use brass or steel these will be ideal because aluminium is rather soft and may wear quicker. Before starting the pivot arrangement ensure that the threaded rod passes through the bore of the sleeve without being too tight or slack. Finally the stand was assembled using a variety of cramps and checked for accuracy with a square and rule.



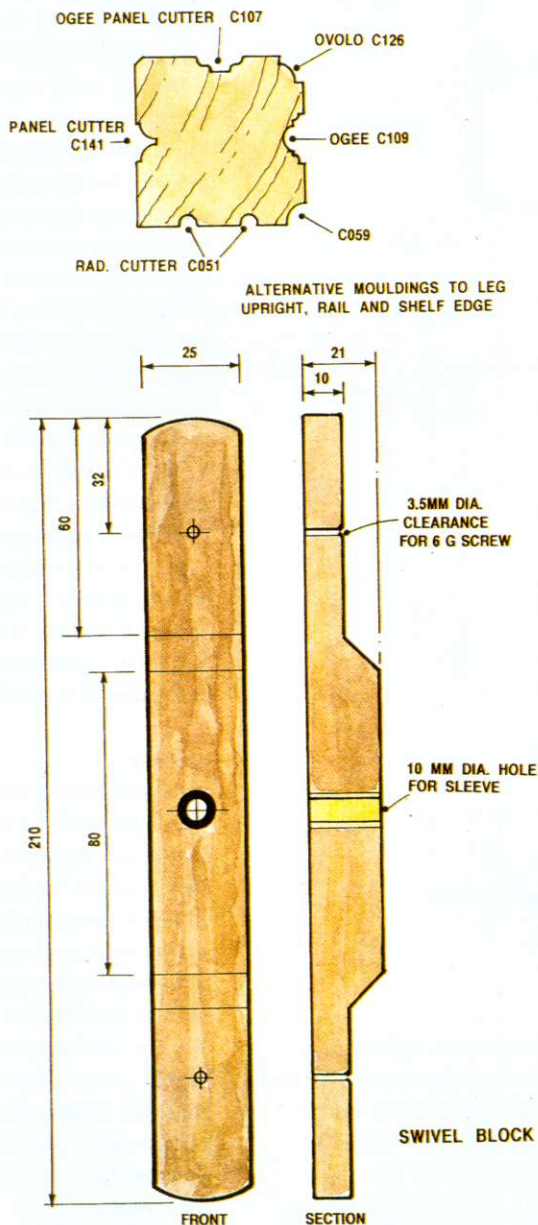
Routing the mortise in the feet.



Cleaning up the shoe shelf.



Cutting the halving joints.



Pivot Arrangement

Basically the mirror frame is held between the uprights or legs by long metal threaded

rod with a wooden knob at one end for turning and tightening, the other ends feeds into the nut cast into the frame. The

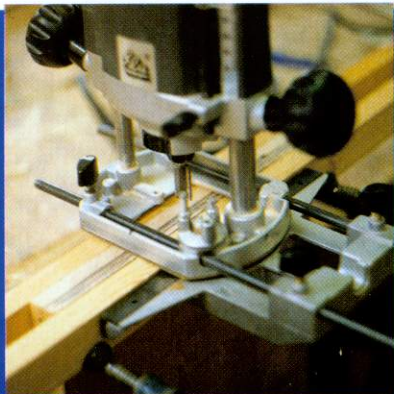
Cutting List

Item	No.	L	W	D	Remarks
Stand					
Feet	2	500	44	70	
Pads	2	100	44	2-4	Not essential to fit but handy if the is slightly uneven.
floor					
Leg/upright	2	1120	44	44	
Rail	1	562	34	70	Lengths include tenons.
Shoe shelf	1	542	275	25	Length includes housing.
Mirror Frame					
Sides	2	1280	20	45	Ready made dado rail.
Ends	2	470	20	45	
Glued to					
Sides	2	1280	19	34	
Ends	2	470	19	34	
Backboard	1	1212	402	6	MDF board or plywood.
Beading	2	1212	6	6	
	2	402	6	6	
Swivel blocks	2	210	25	21	Beech.
Knobs	2	45mm diameter			Beech or stained softwood.

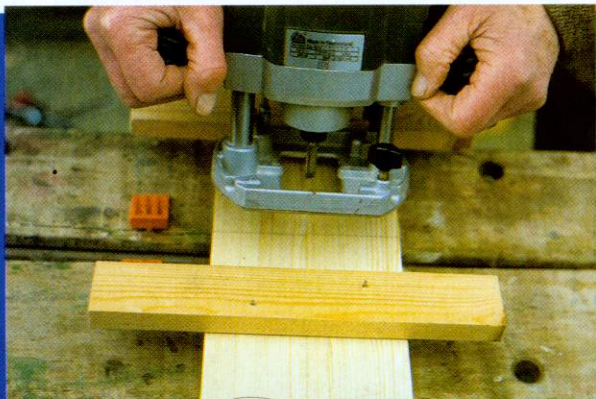
swivel blocks are screwed to the frame to allow access to the nuts if ever it is necessary to replace them.

The position of the pivot nut was marked on the side of the frame and a hole bored slightly larger than the nut. Before inserting the nut into the hole with Araldite the thread was plugged with a twist of tissue

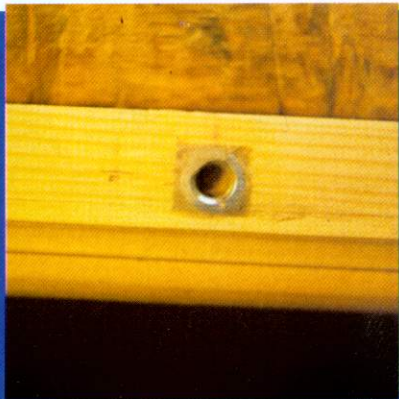
paper to prevent the epoxy being squeezed up the threaded hole. If this precaution is not taken it is likely that the thread will require cleaning with a suitable tap to enable the rod to screw into the nut. After setting the nut in position it was allowed to harden and the plug removed.



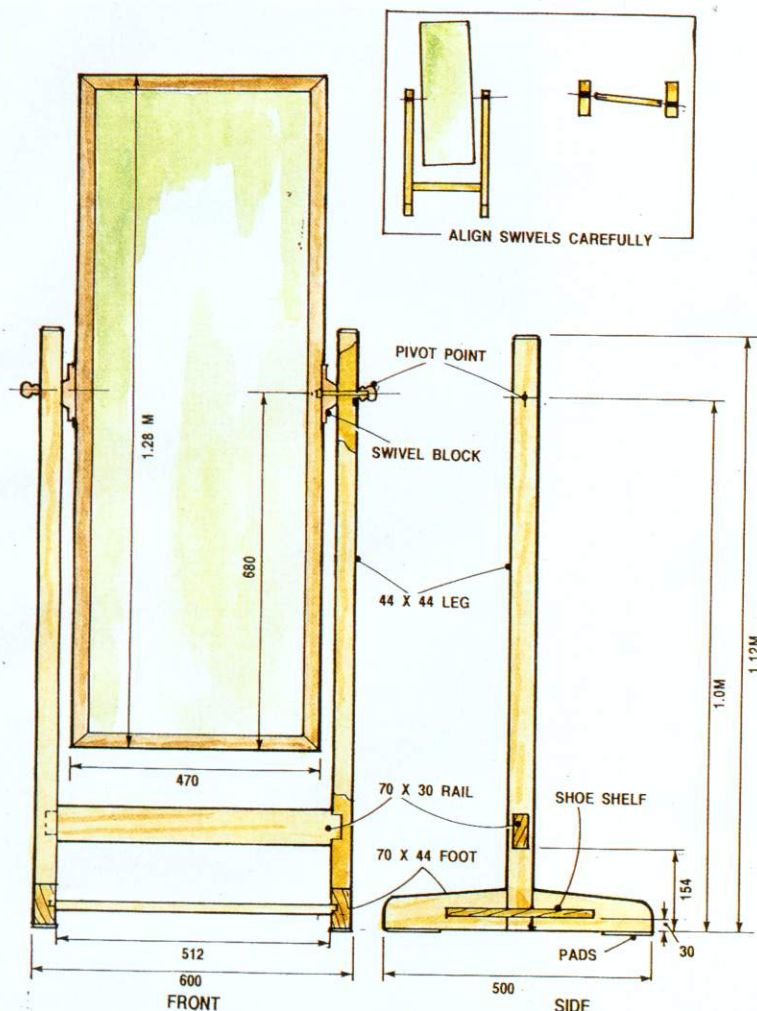
Forming the feet with the router.



10mm holes are bored in each leg.



Aluminium sleeve in position.



Finally a 8mm diameter bit was used to bore a hole beyond the inner face of the nut this prevents the ends of the rod being forced against the wood when it passes the nut and

possibly loosening it. Take care not to damage the nut's thread when boring the hole. Next the knob was bored to take the rod and nut. Over cutting the length of rod necessary allows for later

adjustments so I cut them to 150mm, screwed on the nut and burred the end of the rod to prevent them ever becoming detached and set them in Araldite. Later the knob's face

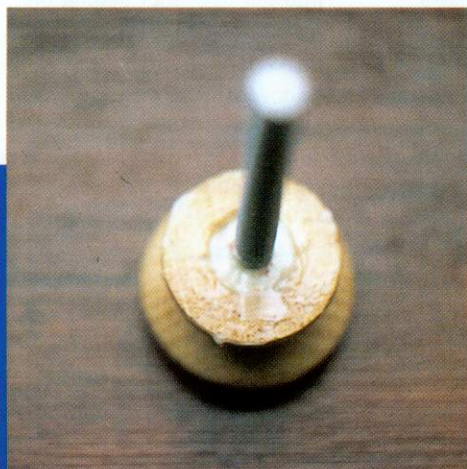
was covered with green baize to prevent it marking the leg when adjusting and tightening.

The last constructional job was to make the beech swivel blocks. These have to take up the space between the frame and uprights equally. After boring out for the sleeves they were screwed to the frame with 32mm 6G countersunk screws. The sleeves were cut to length, I found a plumber's copper pipe cutter ideal for a neat square cut and inserted into position and the threaded rod cut to length with a junior hacksaw. This completed the pivot arrangement.

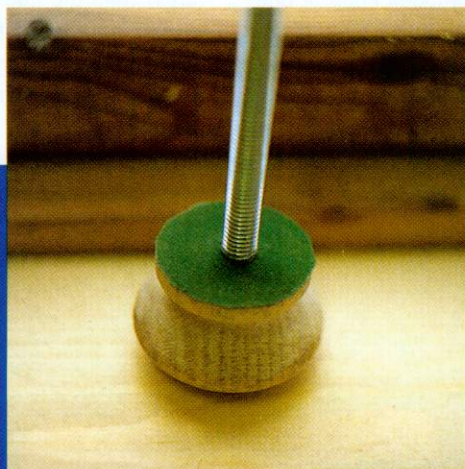
The mirror is held in place with sprigs and dabs of silicon sealant. An MDF backboard is secured with 6x6mm square section beads pinned to the frame.

Finishings

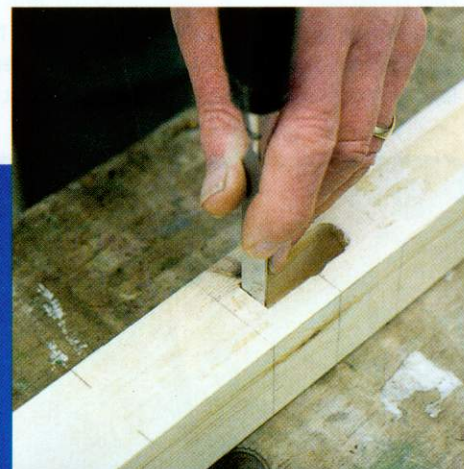
The pine has not been stained, if you stain yours it is best to carry out the work before the glass is fitted otherwise the stain is unlikely to penetrate the rebate and will show as an unstained line at the edge of the mirror. The piece was well rubbed with a medium then fine abrasive to achieve a smooth surface and well dusted off. Finally it was sealed with thinned varnish and rubbed down again and finally Briwaxed twice and buffed to a shine.



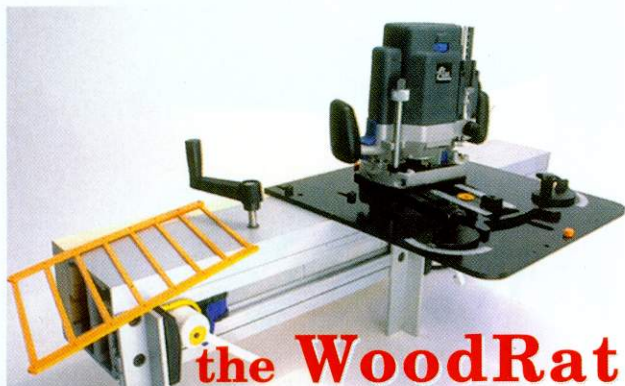
Threaded rod held in position by Araldite.



Pivot arrangement complete.



Cleaning up pivot arrangement.



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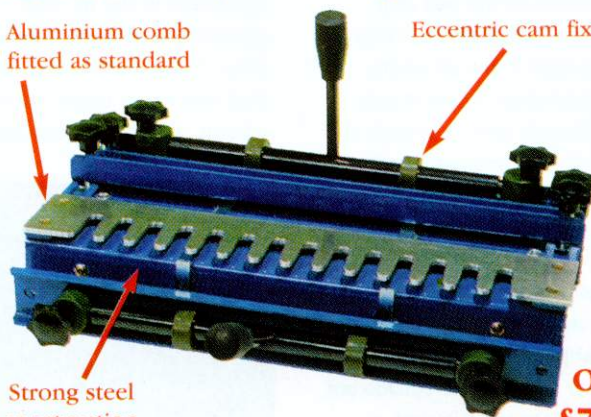
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Microclene air cleaners

Most woodworkers have, or wish they had, a dust extractor; a new type of machine is now available, the ambient air cleaner by Microclene. A report by Zachary Taylor

Strange how the average so-called dust-extractor is better at collecting chips and shavings rather than dust. As collectors of potential incendiary material and in keeping the workshop tidy they function very well, but the fact is that few extractor filters remove the very thing that is harmful - fine dust. Unless the filter can block particles as fine as 1 micron, the air breathed in a normal workshop is very hazardous with output from machines such as bandsaw, circular saw, lathe and especially sanders. Even hand sanding may produce potentially lethal dust.

The importance of the ambient air cleaner is now fairly obvious to most folk and in the U.S.A. many models are available. Some makes are very sophisticated but often too expensive for the average hobby craftsman with a slim budget. Faron Enterprises have come up with a solution to both problems, effective and economical - the Microclene.

Two models

In two versions, the 400 and the 1200, Microclenes convey 400 and 1200 cubic metres per hour, or as the suppliers point out, in a 7 x 10 x 7 ft workshop, the air from the smaller model is filtered 27 times in an hour! The larger model, aimed at the professional woodworker or larger workshops moves air at a much faster rate.

Sizes are surprisingly small with the 400 around the size of a small cylinder vacuum cleaner.

Economical

On the subject of economics, running costs for the machines are as little as 6p and 8p running continuously for a full working day for the 400 and 1200 models respectively. The filter units are also inexpensive and easily changed by the removal of the end cap.

Portable

Microclene may be stood on any flat surface such as a workbench or the bed of a machine. Alternatively it may be suspended in the air on its attached chain where it may remain until time to change the filter or until another location is necessary.

Cost

Dust extraction systems that work on the principle of drawing ambient air from the workshop out into a receptacle outside are also likely to remove heat, a disadvantage in the Winter, but not so the Microclene. It operates within the working environment re-circulating the cleaner air with little perceptible heat loss.

Maybe the biggest surprise of



all are the prices; at the time of publication the recommended retail prices of the Microclene 400 and 1200 are £159.99 and £249.99 respectively.

Conclusion

Without laboratory equipment to test the Microclene it is difficult to be very scientific about its effects, but there is little doubt about the apparent freshness in the air after operating it for even a short time. Those visible dust mites that rise in the beam of an electric light soon disappear.

I normally wear a mask for dusty jobs, since some of the exotics I use produce coloured talcum powder that doesn't smell too good! I also have a respirator for hefty jobs, but I don't want to wear these all day. The Microclene can be active before, during and after the process and in a short time, 20 minutes in my observation, virtually no dust motes were visible in the light beam. Not a scientific test but convincing to me and supportive of the claims of the manufacturers.

Specifications:

	Microclene 400	Microclene 1200
Diameter	8in (205mm)	12in (305mm)
Height	13in (329mm)	15in (381mm)
Weight	9lb (4.08kg)	14lb (6.35kg)
Airflow volume	400 cu m/h	1200 cu m/h
Running cost/working day	6p	8p
Recommended retail price	£159.99	£249.99

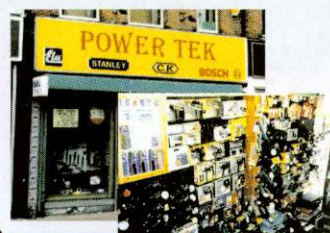
Both fitted with moulded plug on 1.5metre lead.
Microclene Air Cleaners are Robot Products from Faron Enterprises Ltd.
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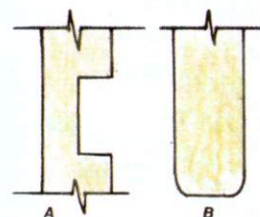
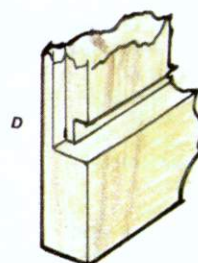
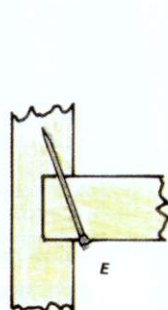
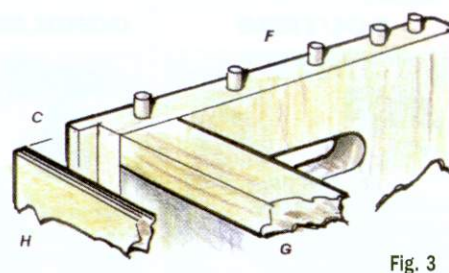


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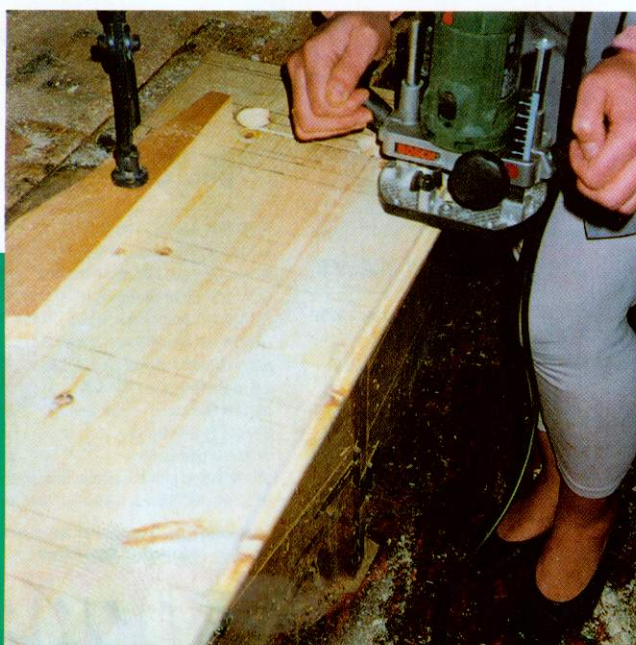
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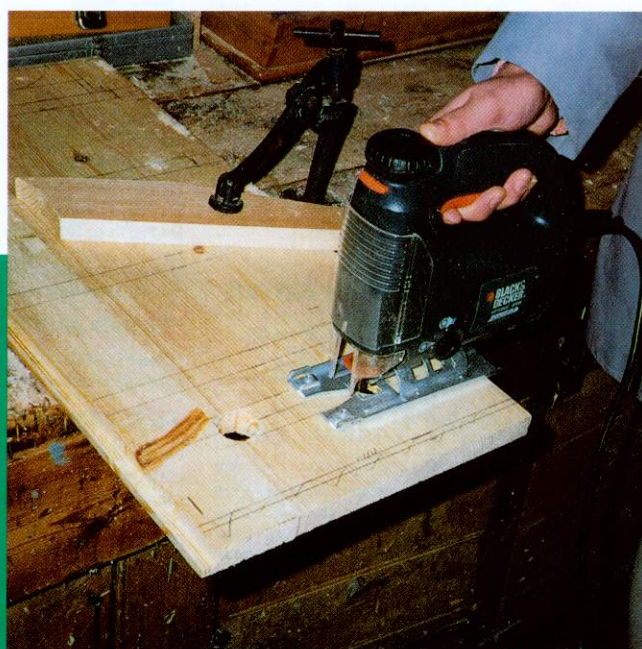


Shoe Rack

Percy Blandford designs a rack with four shelves, intended to provide storage for all a family's shoes



Side marked out and rabbet being cut.



Hand hole drilled and cut with jigsaw.

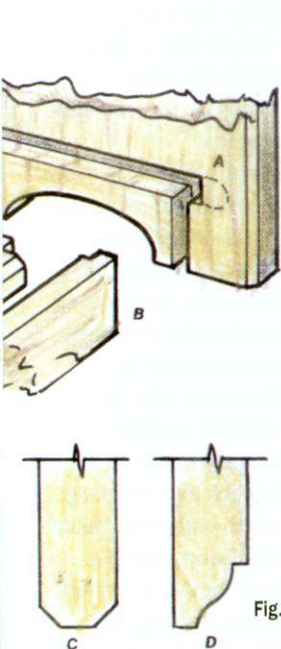


Fig. 4

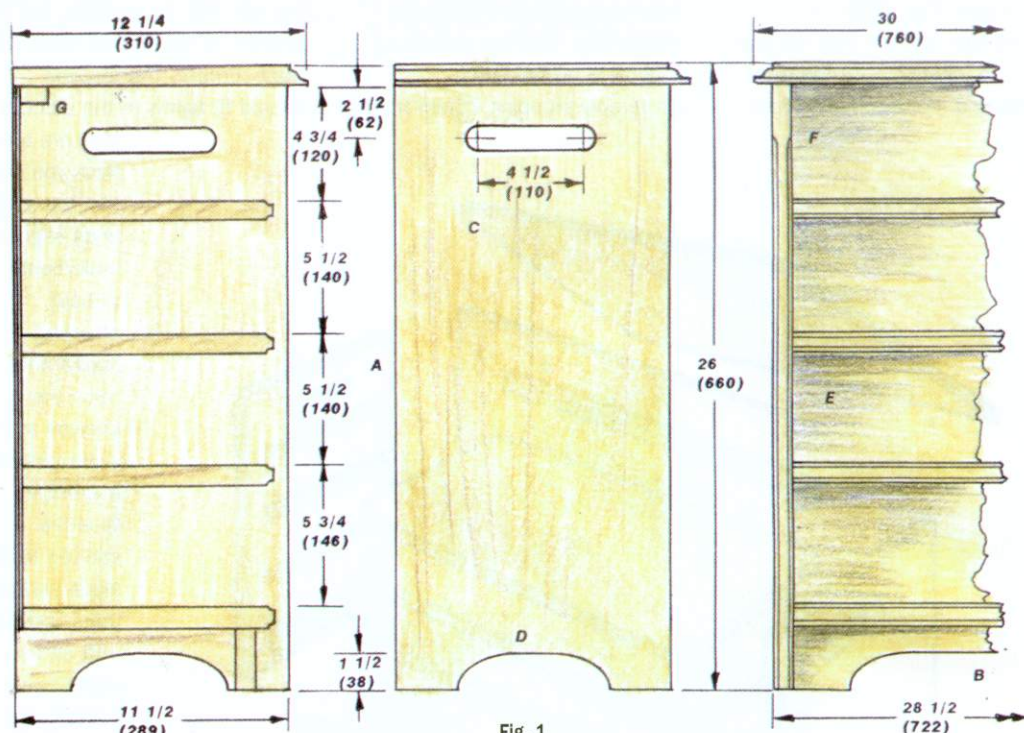


Fig. 1

The same method of construction could be used for other shelved pieces of furniture of many other sizes and proportions, such as for general storage or books. Much of the work can be done with a router and a few cutters, freehand or with the router mounted in a table.

The rack shown is made of pine to match other furniture,

but it would look good made in one of the furniture hardwoods. If softwood is bought 'PAR' (planed all round) as 25mm nominal, it will actually be about 19mm thick. It is unlikely you will be able to buy boards the full width, so the first work will be gluing to make up the widths. Widest boards available are usually near 230mm, so it should be possible to make up

widths with pieces cut down the centre.

Check what you want to put in the rack. Boots may need wider shelf spacing and you may have to sacrifice a shelf or make the whole rack deeper. The following instructions are for making a rack of the suggested sizes (Fig. 1), but you may wish to modify them. The key parts are the pair of sides (Fig. 1A and 2A). When you mark them out it settles details of some other parts. Mark out sides with shelf positions. Arrange for these to be set back 12mm from the front and then notched back a further 19mm to the end of the housing (dado) joint (Fig. 3A). Also mark the position of the

plinth (Fig. 1B and 3B). Hand holes (Fig. 1C) are optional, depending on how often you want to lift the rack.

Cut rabbets on the rear edges of the sides to take the plywood back (Fig. 2B and 3C). You can stop at the bottom shelf (Fig. 3D), or cut right through to the foot of the side.

Cut grooves for the shelves halfway through the sides (Fig. 4A). At the forward stopped end of a groove you can trim it square with a chisel or leave the groove end rounded and trim the notched end of a shelf to match.

To make a hand hole, drill 32mm holes, saw and chisel out the waste, then round over



Cutting housing against guide strip.

Cutting List

inches (mm)

Part	Qty	Length	Width	Thickness
Sides	2	26 (660)	11 1/2 (289)	3/4 (19)
Shelves	4	28 1/2 (722)	10 3/4 (270)	3/4 (19)
Plinth	1	28 1/2 (722)	2 3/4 (70)	3/4 (19)
Top	1	31 (785)	12 1/4 (310)	3/4 (19)
Back strip	1	28 1/2 (722)	1 1/4 (31)	3/4 (19)
Back (plywood)	1	28 1/2 (722)	24 (610)	1/4 (6)

the edges (Fig. 4B).

The four shelves (Fig. 1E and 2C) are identical. Cut them to width and, before dealing with

their ends, chamfer the front edges (Fig. 4C). Put similar chamfers on the sides, preferably stopping 75mm from

the top (Fig. 1F and 2D). Cut the shelves to length and notch the front corners. The shelves should fit tightly in the slots. If

they are too thick you can thin the shelf ends slightly underneath without affecting appearance. Sand the shelves and sides before assembly. Glue the shelves to the sides and pull them together with all the cramps you have. If you have to work with only one or two bar cramps, pull the bottom shelf tight and secure it with two nails each end (Fig. 3E) 38mm oval brads are suitable. Then do the same at the top shelf, but nailing downwards. Check the assembly for twist and squareness. If you have

the plywood for the back oversize, but cut with a square corner, that can be used to check squareness. You can also compare diagonal measurements.

Make the plinth with a cut out to match those on the sides. The cut outs (Fig. 1D) look better if the curves are parts of ellipses than if parts of circles. The plinth ends should fit closely in the sides (Fig. 2E). Glue and cramp it in place.

Make the top (Fig. 2F) to fit flush at the back and overhang 19mm at sides and front. Mould edges at sides and front (Fig. 4D). Mark out for five 8 or 9mm dowels at each end (Fig. 3F). Front dowels could be closer, where greatest strength is needed.

Assembly is easiest if you put the dowels in holes in the top first. The holes in the sides can be drilled too deep, then there will be no fear of the dowels bottoming. Groove the dowels to allow air and surplus glue to escape.

When the top is secure, remove any surplus glue and do what cleaning up is necessary before the back is fitted. Glue the back strip (Fig. 1G and 2G) under the top (Fig. 3G). Fit the plywood back (Fig. 3H) to this, into the rabbets and to the shelves with glue and panel pins.

Finish to match other furniture; probably with stain and varnish.

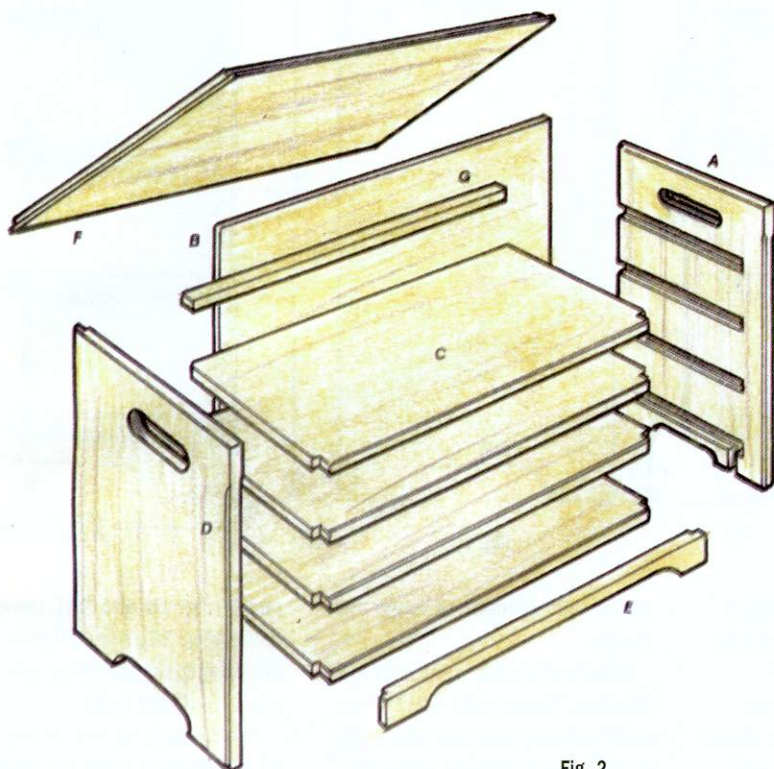


Fig. 2

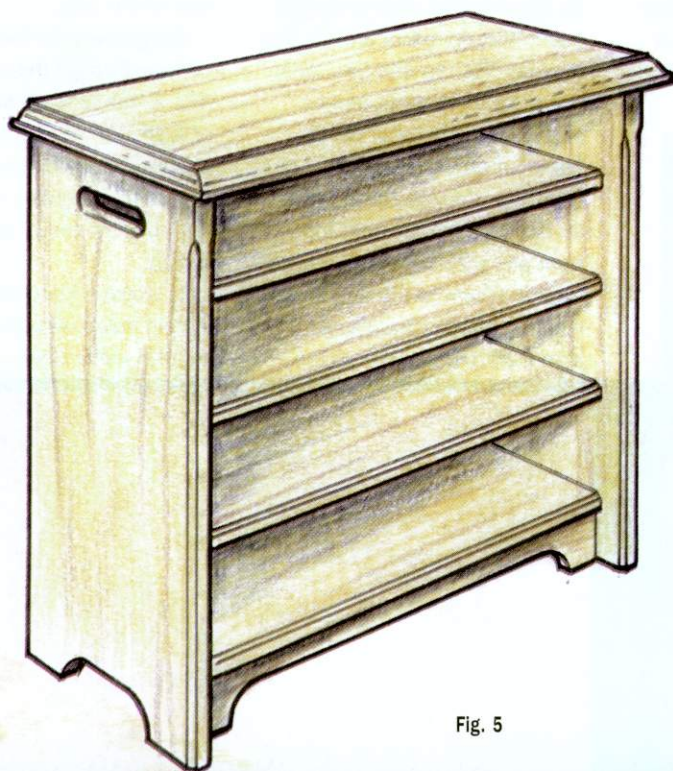


Fig. 5

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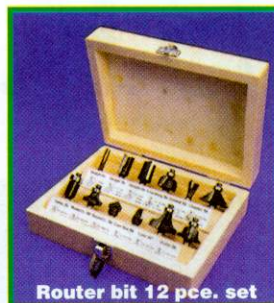
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A Shield from a Desk Top

Peter Dunsmore demonstrates how to make something useful from salvaged timber

A couple of years ago my pre war junior school decided to replace the original oak desks with brand new Formica covered chipboard desks. Fortunately I received a telephone call before the desks were broken up and heaped onto the bonfire and I was able to dismantle them and salvage a good number of well seasoned, if a little graffiti covered, desk tops.

This oak, when cleaned up, would make an excellent medal shield. The following pictures show how easy it is to produce this using a simple template and two cutters. The essence of this project centres around an MDF template of the shield.

Being symmetrical only one half

of the template was cut from MDF thus reducing the work involved in making the template exact on each side. Having cleaned up both sides of the oak a line was drawn on the rear side of the timber and the template used to draw the outline of the shield on both

sides of the line.

Either a bandsaw or a jigsaw is used to cut the outline of the shield. There is no need for great accuracy here so long as the cut is made a little outside the line as this will make the routing a lot easier at the next stage. The template is then

nailed in place using small veneer pins on the rear side of the shield lining the MDF up carefully with the out line previously drawn. Alternatively double-sided tape could be used. Firmly clamp the oak onto a suitable work top before starting to cut the profile.



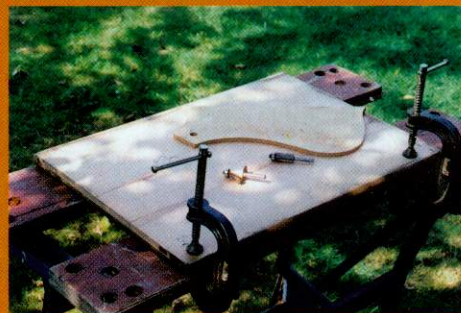
The completed shield, finished in less than 20 minutes.



The desk top as removed from the desk.



Clean up with abrasives.



The wood cleaned and the template cut. The two cutters used in the foreground.

A straight fluted cutter with a guide bearing, or template follower cutter, is used in the router and the router passed in an anticlockwise direction around the perimeter of the oak ensuring the bearing follows the MDF template closely. The edge of the oak will clean up, as can be seen in the photograph, to

give a perfectly smooth face following exactly the profile of the template. It follows then that the template itself must be made as accurately as possible as any irregularities will show up on the shield. When half of the shield is cut, remove the template and pin in place on the opposite half of the line, again

taking care in the lining up and proceed to repeat the routing. When completed remove the template and keep in a safe place for future use.

The shield is then turned right way up and clamped firmly in place. The cutter on the router is changed to a bearing guided ovolo or other moulding shape

and the router passed around the perimeter of the shield letting the bearing run round the edge of the shield. This is best cut in several shallow passes. One pass may result in scorching. The shield may require a little finishing with fine abrasive papers before sealing and waxing.



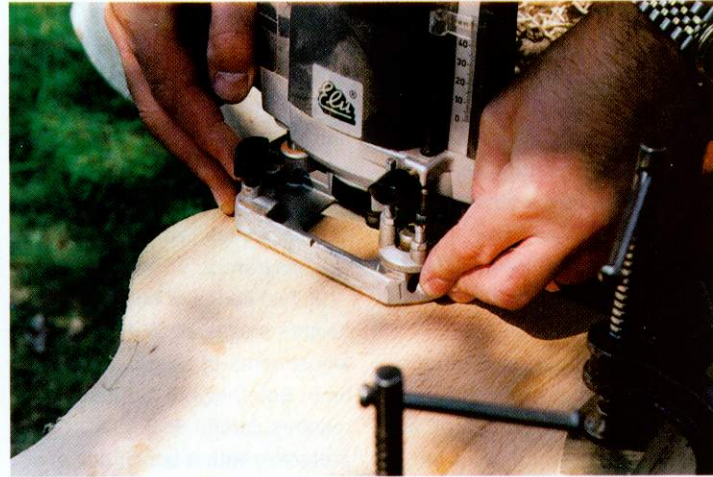
The shield is cut to rough profile.



The template is pinned in place.



The cutter in place.



Begin the cut in an anti-clockwise direction.

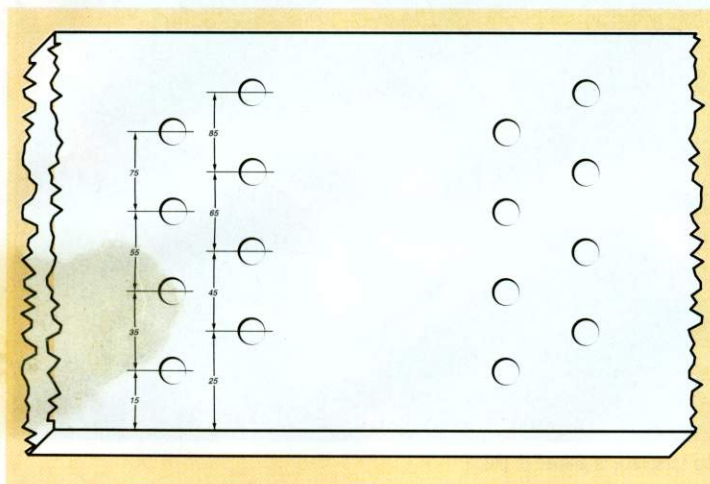


The clean profile is clearly seen.



The shield profiled, in the foreground is the moulding cutter.

Readers' Tips



Plane to Ski

(Routing 16 pages 38 -39)

At last I got around to making myself a pair of skis and then saw a problem - setting up the router square to the table. A spirit level is all very well provided you know the level is true, provided the table is level and provided you have a good eye to read the bubble. Also of course the router should be level both fore and aft as well as side to side. Seemed like a lot of fiddling about to get it all squared up.

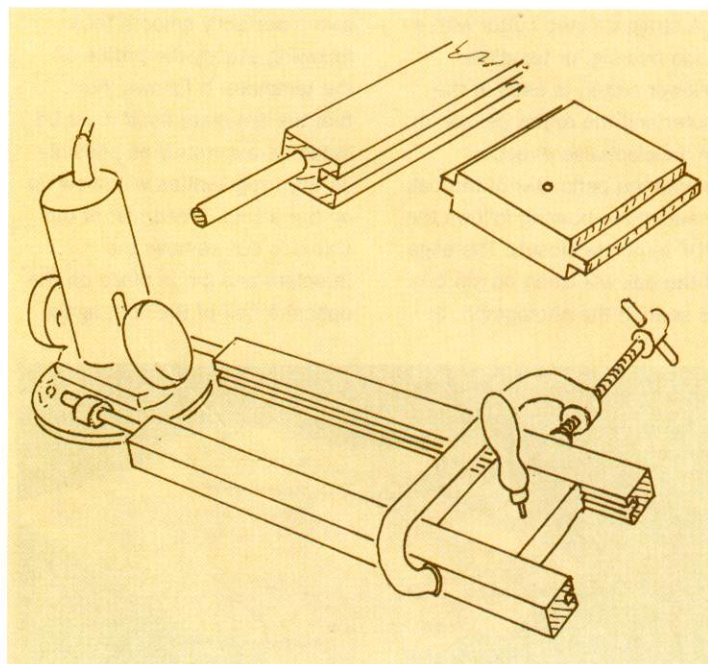
I suggest what I think are two

simple gadgets for setting the height of the rods.

1. A multiple gauge to set the height. A simple cross with arms of different lengths. These heights depending on the range of thicknesses likely to be used. See diagram 1.

2. Two series of holes, the heights staggered to give adjustments of 10mm. at a time. See Diagram 2. This requires careful drilling preferably with a bench drill and careful marking out.

D. R. W. Wootten, Luton, Bedfordshire.



Universal Compass

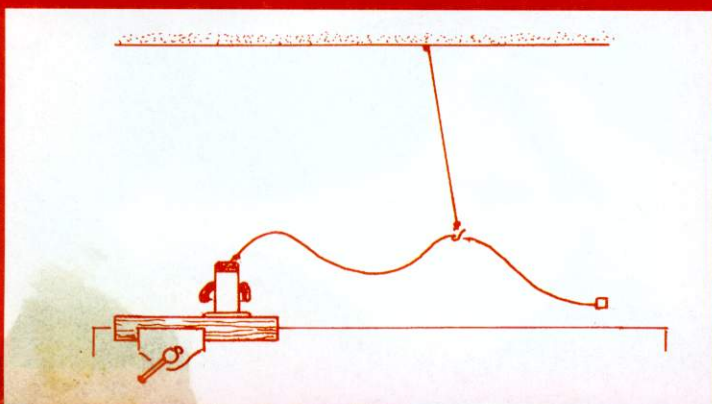
For routing curves of almost any radius I have made a 'compass' consisting of a pair of arms, with a centre block to cramp between them. The arms have dowel rod ends to fit where the fence rods normally go in the router base. I thought the hardwood dowels might not be strong enough and I should have to epoxy in some metal rods, but after many jobs the dowels are still satisfactory. The arms are grooved to take the centre block. This has a hole to take an awl or nail and can be held with a cramp at any position.

Peter Small, Huntingdon.

Accurate Plunging

The depth gauge on most plunge routers has some sort of calibration, but it is not very precise. For an exact depth of cut I use inside callipers set to the amount of movement needed. I set the cutter level with the base plate on a flat surface, then raise and lock the depth gauge to suit the inside calliper setting, so ensuring the amount of plunge is exactly what I want.

Wallace O'Brian, Berwick.



Cable-Wise

The cable to my router tended to get in the way, even to the extent of risking damage. I cured this with a piece of fine shock cord attached to a ring in the ceiling and finishing with a hook to take the cable. This is located above the middle of my bench about halfway between the socket and the vice. It holds up the slack cable, but allows all the movement necessary to use the router. It serves the same purpose with my electric drill and other hand power tools.

Stan Jones, Bristol.

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The north's newest woodworking centre 'Joe Greeners' was launched in September with a two day show. The event was very successful and attracted a good crowd, some of whom had travelled considerable distances to be there. Joe commented "I am delighted with the response and interest shown over the two days, this has given us the confidence to progress with further products". These have so far included Rexion workshop machines which offer high quality at very competitive prices, a range of high quality wood treatments and finishes by Liberon, wood fillers and high performance adhesives by Wudcare, clamps from the USA by Jorgensen and abrasives by Klingspor.

Joe Greener believes that the centre is unique to the region in that it has a purpose built demonstration room. The demo room serves several purposes, it provides a stage from which visiting experts can demonstrate, it also allows the customer to try products in a safe environment before they commit to a purchase and also to facilitate one-to-one instruction and training. We also have a full in-house workshop facility which allows us to service and repair most makes of power tool. Our philosophy is that customers make a business successful so we always listen to what they want and our aim is to provide them with a product that suits their needs and to ensure that they are not pushed into a purchase that is not right for them.

For the future Joe plans to produce a regular newsletter which will contain information about forthcoming demo days, special offers and new products. Training courses and woodwork surgeries are also in the pipeline for the future. On a final note, please remember that the staff at Joe Greeners are always interested in your suggestions and input.



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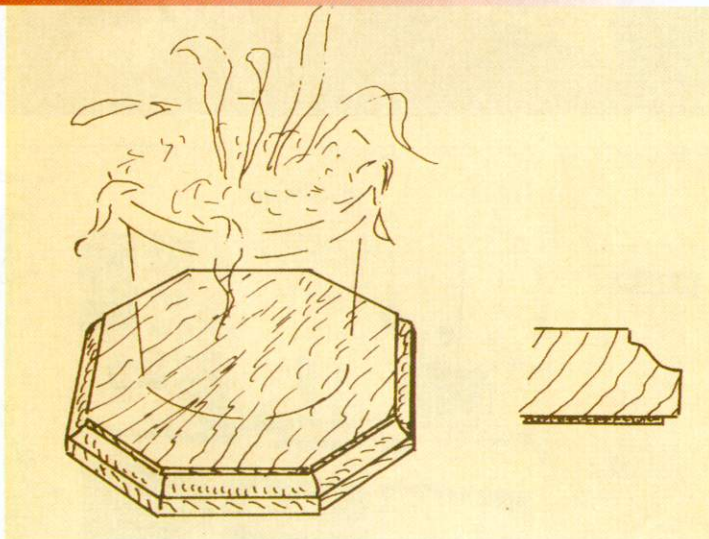
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Ideas & Innovations



Accurate End Mortises

For all my framed furniture I now use joints with inserted tenons, so there are mortises in both parts. To give adequate control when using a router to cut mortises in the ends of rails I made stout wood clamps to hold a batch of rails. There are bolts through at the ends, below fence level and the assembly is held in the vice or clamped to a trestle. The router fence has a good bearing surface and accurate cuts are easy to make.

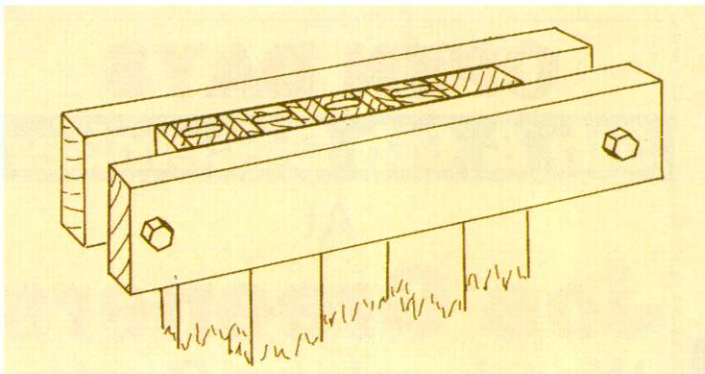
J. T. Thompson, Wakefield.

Tidier Plants

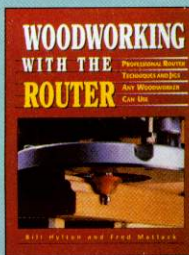
My wife had her pot plants and vases of flowers on an assortment of table mats, oddments of lino and plywood and anything else she could lay her hands on. These things detracted from the displays of flowers, plants and shrubs. I decided to tidy this affair and use up offcuts by making wood plant stands with moulded edges.

Some stands are square, but the most attractive are octagonal. All are about 18mm thick and in sizes from 125mm to 225mm and the moulding patterns vary. I sealed the wood with teak oil, which stop water absorption and gives a non-slip surface. I stuck self-adhesive felt-type Fablon to the undersides.

Fred Atkins, Swansea.



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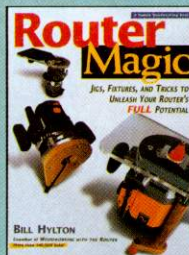
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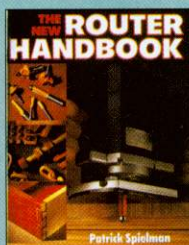
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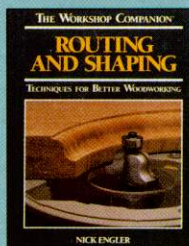
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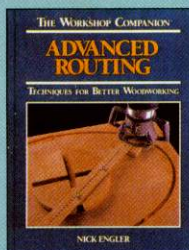
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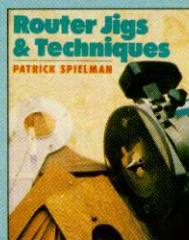
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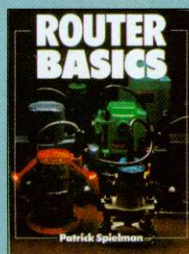
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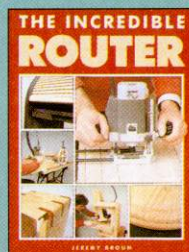
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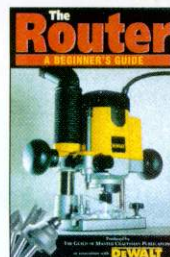
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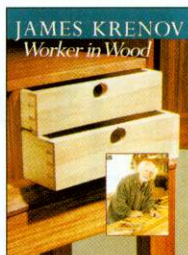
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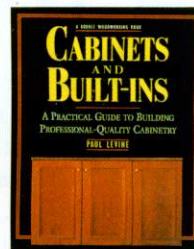


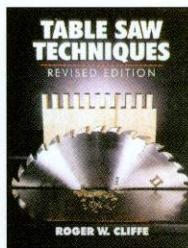
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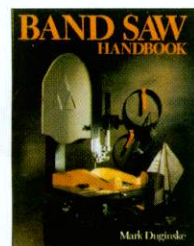
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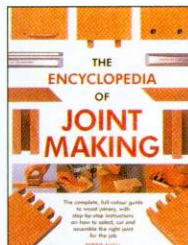
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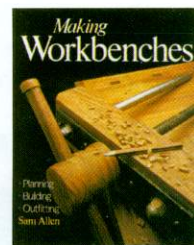
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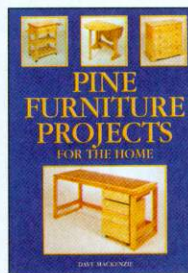
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Jack Cox reviews his favourite router - the ever popular 96 from Elu

My association with Elu began with the MOF 96, bought as my first router about 15 years ago. At that time electronic speed control systems were not available, or if they were I was not aware of them. I got myself into a lot of trouble by forgetting to use the switch on the router, and switching off at the wall socket instead, with the result that the router tended to throw itself off the worktop on start-up. I had quite a few near misses this way.

After some years, I fitted the machine upside-down to a home made spindle moulder table and bought the electronic version (MOF96E. I was so pleased with this that, shortly afterwards I bought another, largely to minimise the inconvenience in fitting and detaching machines from my home made jigs, which, by this time, were becoming ever more complex.

These two routers do the bulk of my work, although I have a later acquisition in the shape of an OF97, which I use as a kind of 'free agent', by not allowing it to be tied in jigs.

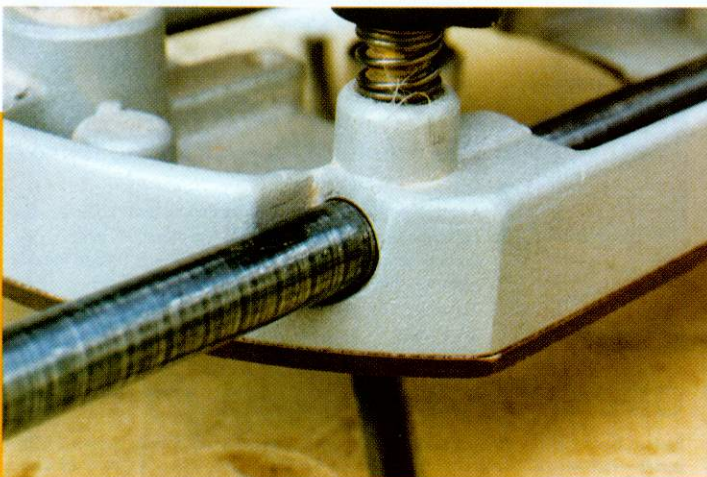
Despite my OF97, a much later design, with a rather clever built-in dust extraction arrangement, and despite the occasional use of a number of other routers over the years, the MOF96E remains, my firm favourite. This is largely due to the fact that it is a very easy machine to design jigs for, a most important attribute being that it is capable of a very high order of accuracy when used in conjunction with jigs which make use of its guide rod system - most of my jigs are of this type.

The router base is machined and aligned very accurately with the plunge mechanism and the

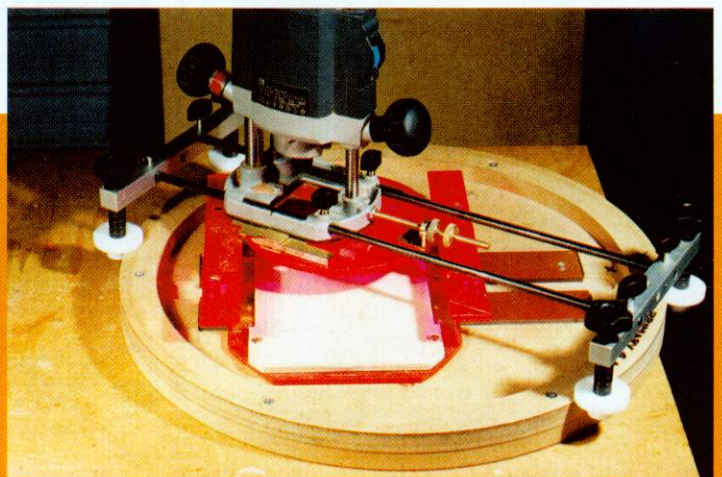
Elu MOF96



It is easy to flick the switch on and off with the thumb.



Guide rod holes are accurately machined.



Router fitted to a trammel jig.

guide rod holes are also accurately machined, allowing only the barest of clearance for the rods themselves.

The result is accurate, repeatable work, whether used with a trammel or a straight line guide guided ski system. For the type of jig which uses the router in a normal overhead mode, the two tapped holes which normally take guide bushes are quite sufficient for mounting and, in conjunction with the rather heavier tapped holes also provided in the base, allow the machine to be mounted upside down or even sideways with precision and safety.

I have a strong personal preference for tapped holes for such purposes, in preference to through-holes with a nut on the

other side, largely because it is much easier to guarantee that the bolt is tight (the nut may turn during tightening and is not always easy to get at with a spanner). Loose fixings can present a hazard if they become detached under normal vibration during use.

Despite the crop of safety switches which are tending to appear of late, I still prefer the simple toggle switch on the side of the 96E. I do a great deal of trammel work, requiring the router to start and finish its cut at all sorts of odd angles with respect to my own position, often in the middle of a large worktable. I therefore find it quite essential to be able to flick the switch on and off with the thumb of either hand without compromising my

handling of the plunge knobs or trying to make my elbow joints work in some way other than nature intended.

The knobs are themselves quite small, which I find an advantage rather than otherwise. To begin with, they rarely get in the way of any jig to which they are fitted and, as a bonus, it is possible to remove the non-locking knob completely, giving a good deal of extra clearance where required without impairing the operation of the plunge facility.

I think it is a mistake to assume that a 1/4in. collet router is fit only for 'small' work. Although I have found a great deal of pleasure in using the larger Elu machine (MOF177E) many times at demonstrations, I do not feel an overwhelming need to own a router of this capacity, despite the fact that I have made two exterior doors and frames in solid oak and mahogany respectively. The featured scribed moulded joints and fielded panels, I have also made a couple of window frames, a desk and a blanket chest all in oak.

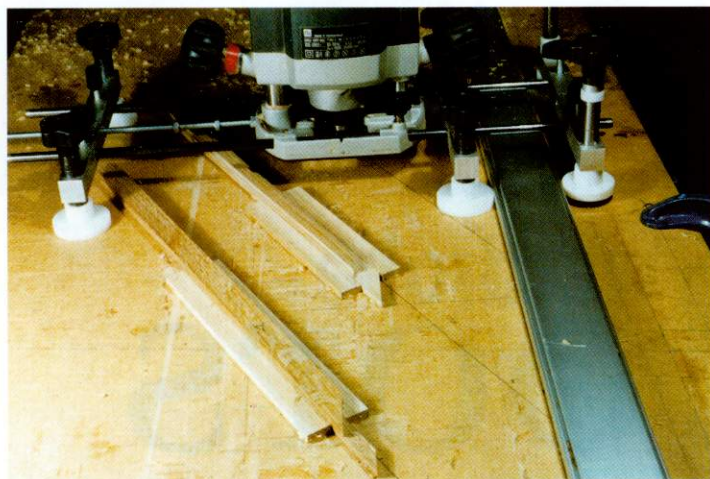
To be sure, I do occasionally covet the facility afforded by the more complex scribing cutters, available only in 1/2in. shank size but, at the expense of a little extra work, and a good

deal of thought on occasion, I usually manage to get by with my collection of 1/4in. shank cutters which, due to the fact that I have only this size shank to worry about, is fairly comprehensive, numbering about 100.

The diversity of cutters made possible by sticking to one shank size, given the limited budget common to most of us, does allow plenty of scope, even at the expense of having to use two or more cutters to do the job of one - needless to say I do not have to earn a living this way.

The plunge stop arrangement is admittedly a bit on the simple side but, for normal overhead work isn't too bad. When mounted upside-down as a spindle moulder, changing the height of the cutter relative to the table is a bit of a nuisance, which is why I made the 'upside-down' arrangement shown in the photograph. This is arranged to fit in place of the existing rod and anvil and can be fitted and removed very easily and swiftly.

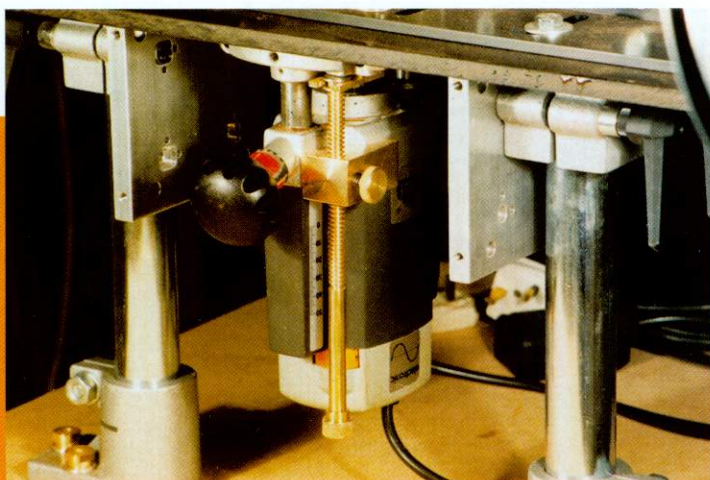
Finally, I gather that the Elu MOF 96 is to be given a new coat (brought into the DeWalt stable). I can only hope that they do not make too many other changes, for my money the design is a good one and difficult to improve.



Using a straight line guided system.



It is possible to remove the non-locking knob completely giving a good deal of extra clearance where required.



Home-made cutter adjustment is an asset when using router as a spindle.

First Steps



To save money on replacement doors Robert Avery offers some great design ideas that are simple to make

This article will deal with re-placement wardrobe doors produced from MDF and moulded with a panel mould cutter, the principle will be the same for kitchen doors or indeed any cupboard or fixed panel throughout the house.

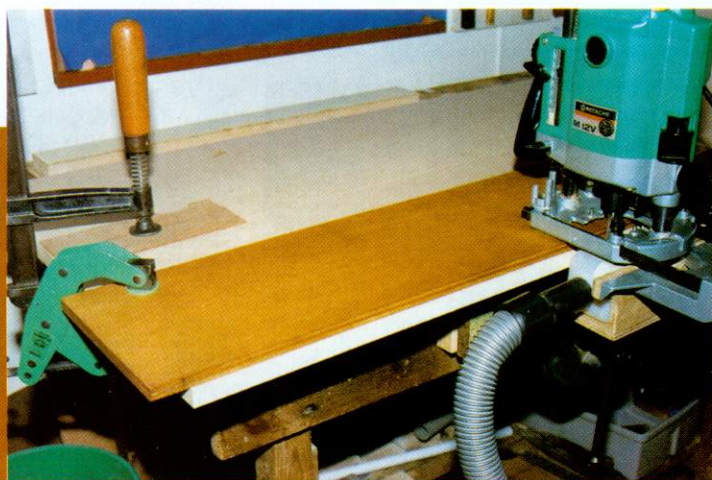
The first consideration is whether the doors will need to match any existing furniture either wood veneered or coloured, as this will determine the face finish to the MDF. If, for example mahogany was required a mahogany veneered MDF board could be used with the edge and panel mould coloured to match the finished veneer.

This is not as difficult as it sounds, a little trial and error soon establishes the right colour, with a steady hand and a good brush a perfect finish can be obtained. If a coloured finish is to be used a plain MDF board can be moulded and finished by hand, or better still sprayed. The edges and panel moulds could additionally be coloured to contrast with the face, which provides another interesting alternative.

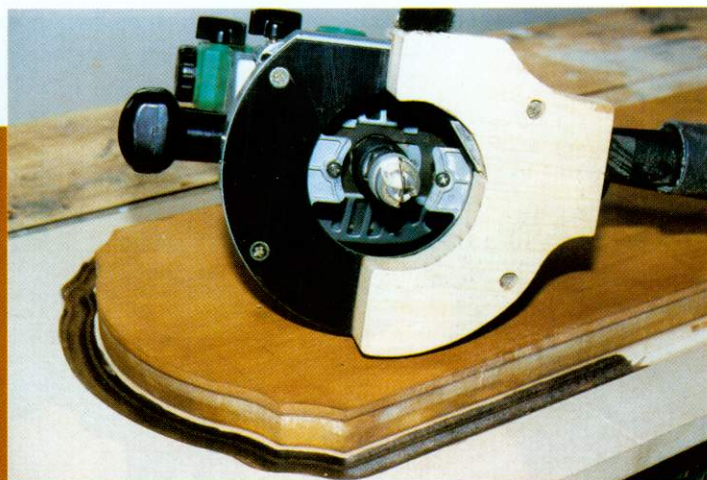
The thickness of the board required may be determined by the depth of the selected panel moulding, as it would be unlikely that the door thickness selected would be so thin, that should concealed hinges be used, which



Panelled wardrobe doors



1. A long straight edge is always useful but for applications like this it should be wide enough to allow the router to clear the clamp.



2. The extract shoe must be the same thickness as the template and securely fixed to the base of the router. It is advisable to test the shoe first by traversing around corners and shapes.

is most likely that they would, it would cause a problem. A 13mm deep hole is sufficient for most types of concealed hinges.

Unless there are particular considerations, using a board less than 15mm thick is not recommended. If a good selection of panel mouldings and concealed hinges are to be used a thickness of 18mm is ideal even for 2400mm high doors. The cost difference between the two thicknesses is not very much per sheet and when divided between a number of doors is relatively inconsequential.

Design considerations

If a variety of different size doors are to be used it may be worth considering using the same moulding

but with a different size of cutter. Design considerations all

generally need to be looked at simultaneously as the work involved is usually the same for both a successful job and a disappointing one. It is worth taking a door cut to the correct size and laying out the panel arrangement on it, this can be done by taping paper cut to the required shape and size onto the face. When doing this bear in mind the top centre and bottom spaces between the mouldings, these may need to line up with other items in the room. The centre rail position may dictate the position of the handles.

If full length mirrors are to be fixed to the outside of the doors between the mouldings the handles will have to go on the vertical space which on a traditional door would be the stile. This is fine providing that the width from the edge of the door to

the moulding is sufficient and the handles are of a suitable design.

The doors should be cut about 3mm oversize to allow for trimming and squaring to their final size, if during transit the sheets have been handled with care then some of the existing edges may be suitable without further machining. If all doors are the same size, initially trim and square one door only, otherwise trim and square one of each size.

The longest edges should be trimmed first using a template profile cutter which has a shank mounted bearing. Fix a straight edge on the top of the MDF leaving 1-2mm for trimming, the straight edge should be held in position either with cramps which will need repositioning to allow the router to traverse the whole length of the board. Alternatively double sided tape could be used

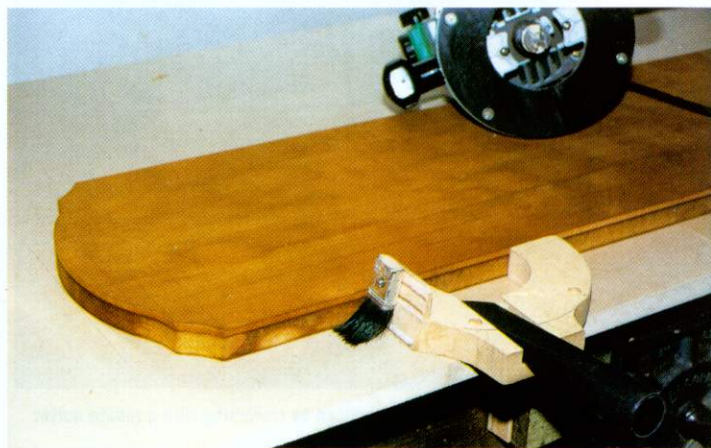
and either on their own, or in conjunction with the tape, fine panel pins could be used providing the holes are carefully filled, which the finish applied to the doors would effectively cover. The straight edge should be no thinner than 9mm thick for stability and to allow the shank mounted bearing to run securely along its edge.

The ends of the door can then be trimmed to length and squared off, a 9mm thick piece of plywood or a large set square is ideal not only for this but for a variety of other squaring jobs. This can be clamped onto the door as previously and the template profile cutter used to finish the first door.

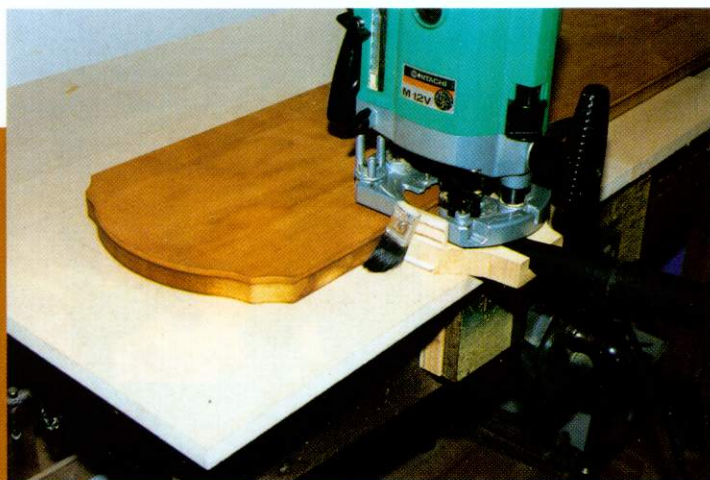
The straight edge and square can now be dispensed with, as the door can now be used as a template to trim the remaining



3. Although it doesn't look high tech the end of an old 1in. paint brush effectively sealed the gap left by the moulding.



4. The brush easily bent out of the way when not needed.



4. Producing the panel mould is the trickiest part of the job but after one or two have been successfully completed confidence in the router is restored to a new height.



5. Providing concentration can be maintained together with a smooth traverse of the template an excellent finish can easily be produced.

doors to size.

If a self-guiding trimming cutter is available it might be easier to use this instead of the template profiler. This is because the self-guided trimming cutter will not overhang the bottom of the two doors when traversing the perimeter and therefore the cutting position does not have to overhang the bench when trimming. Either way the end result will be the same. Whether the finished door is placed on the top or the bottom double sided tape is ideal to hold them in position for trimming.

Making the panel templates.

When panel mould cutters are used, the templates have to be quite thick, this is because the

cutter with it's shank mounted bearing has to be high enough to clear the face of the door before beginning the plunge action.

Thick templates are usually difficult to make because getting them correct to shape and blemish free takes a lot of time and effort. The simple answer to this problem is to make thin templates first and then use the router with the template profile cutter to shape the thicker one. There are other advantages using this method which will be explained later.

The shape of the template will be the inside line of the moulding cut in the door and if this is any more than just a simple profile only one half need be produced, the other half can be mirrored.

The first task is to set out half the top shape on a piece of 6mm plywood, this will be the initial template and should be shaped accurate and clean.

Two pieces of 6mm plywood will be needed, one to produce the top panel and one to produce the lower panel. The lower panel will have to be cut down later after machining the doors for the mirrors. With the two plywood panels cut accurately to size the small shaped template can be used to mark the profile onto the top panel which can then be roughly cut to shape. The small template can then be pinned onto the top plywood panel and the router, with the template profile cutter fitted used to finish the first half, the shaped template

simply needs removing and turning over and the process repeated to produce an exact mirrored shape.

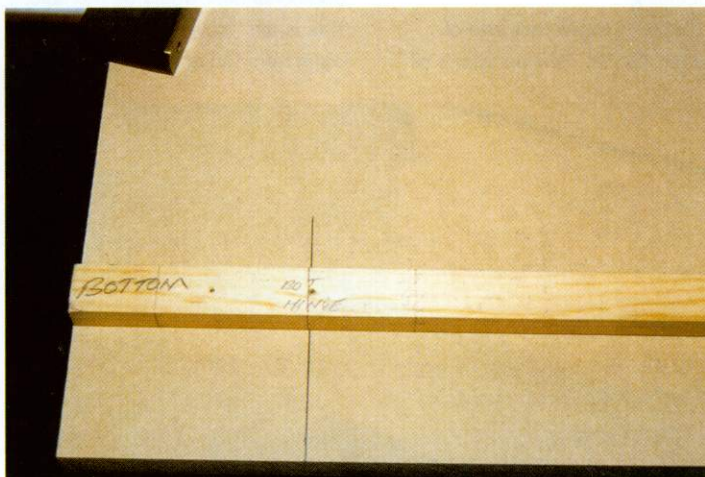
The thickness of the template to produce the panel mould will be dependent on the panel cutter chosen, a total thickness of 24mm will be sufficient for most mouldings, the 6mm thick plywood already shaped combined with a piece of 18mm MDF should be suitable.

The 18mm MDF should be cut about 3mm larger than the plywood template, which can then be securely pinned to the MDF ready for trimming to the final shape. This combined template will then be ready for the panel moulding.

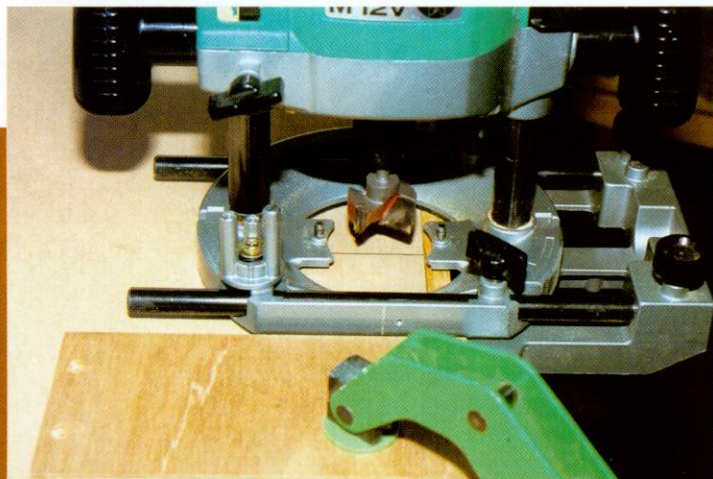
The corners of the templates



6. The pattern for the glass mirrors was produced by traversing with a rebate cutter set to the required depth.



7. The position of the hinges should be set out on a wooden rod and then checked against the carcass framing to ensure all is correct. If you do not want to mark the door with a pencil put on a piece of low tack masking tape. The centre line on the door should correspond to a line marked on the router base representing the cutter centre.



8. When cutting the holes for the hinges the router must be secured for safety as the cutter is too large for the router to be held by hand only. In addition the holes must be accurately positioned and securing the router definitely helps.



9. With the rod in place the hinge positions can be accurately transferred onto the framing.

should be lightly sanded to produce a small round, this has two effects, initially it allows the bearing on the shank of the cutter to traverse the corner smoothly and secondly the finished effect to the moulding looks better. If mirrors are to be fixed on the face of the doors the panels will have to be cut full height, the two templates will butt together and should not be rounded on the meeting corners otherwise the cutter will follow the indentation. It will be more convenient to allow only one panel to be cut down afterwards to produce the two panel doors.

Panel moulding

Fix the templates into position on the face of the door making sure the butt joints are perfectly flush, if the doors are to be finished with a solid colour double sided tape with fine panel pins should be sufficient to hold the template in position while carrying out the panel cutting.

If this type of work has not been carried out before it is essential to have some practice on some offcuts first. During the practice session two things will be immediately obvious the first one is the amount of dust produced and the second one is the importance of keeping the bearing tight against the template, especially when changing direction. Fortunately with a little

extra concentration the second one is easily overcome. I wish I could say the same about the dust problem, dust is blown out of the moulding recess at an alarming rate which forced me to make an extract shoe for the router. This worked very effectively and was well worth the time and effort, needless to say a good extractor and mask are also essential for this work.

Whether or not the extract is made in combination with the shoe the shoe itself is essential, as without it the router will be unbalanced unless a special effort is made to try and hold it down which is almost impossible. The shoe itself simply needs to keep the router base parallel to the face of the door and can be made from the 6mm plywood and 18mm MDF combination as used for the template. This can then be fixed to the base of the router preferably using bolts screwed into the threaded holes in the base.

From experience it is advisable to start the panel moulding in the centre along the straight edge, this is the easiest part to machine and any slight discrepancies can more easily be sanded out. I found that two passes were sufficient to obtain a good finish when using a 25mm dia cutter. I also found that when plunging into the MDF starting the traversing

simultaneously produced a cleaner start to the moulding. Because of the small distance between the bottom of the cutter and the face of the door when the bearing on the shank is in its highest position on the edge of the template, it is advisable to prevent the router from rising too high when finishing a pass, otherwise the cutter could foul the template thus spoiling the edge.

When the doors for the mirrors have all been machined one of the templates will need cutting down to produce the two panels. The corners of the templates should be sanded to match the others.

The two templates can now be fixed to the door in the same way as before, which will now produce the centre rail. It may be easier to fix and mould one panel at a time especially if the width of the centre rail is narrow.

To prevent spending a lot of time sanding down the moulding run the router at top speed combined with a slow feed speed but don't let the cutter burn the material. One other way to help obtain a better finish is to only take a small amount off the last pass.

Perimeter edge moulding

The edge moulding can easily and quickly be cut with one of the bearing guided cutters that are

available in a wide variety of shapes, some of which can be further varied by the use of different size bearings. The cutter I used was a 5mm ovolo/rounding over cutter combined with a bearing large enough to remove one quirk. This was simply traversed around the perimeter of the doors to produce a decorative edge.

Hinges

The most common method used to hang kitchen and wardrobe doors is with concealed hinges recessed into the back of the door. It is easy to see why this method of hanging doors is so popular, they are of course concealed which designers love and on the practical side they are adjustable in all directions which alleviates the necessity for extreme accuracy when making doors..

On larger doors such as full height doors on wardrobes and those fitted with mirrors the number of hinges becomes important for safety reasons. The height and weight are the two primary factors. If in doubt it is advisable to fit an extra hinge, or use heavy duty hinges particularly if mirrors may be fitted sometime in the future. Manufacturers or suppliers should be able to advise on the type and number to fit. To find the accurate weight of a door simply stand it on the bathroom



10. A simply made small jig to accurately position the screw holes is a great help.



11. This looks like a lot of hinges but with mirrors on this was the minimum.

scales. If as is usual the doors can only be hung one way up it is important to bear in mind that up to this point the doors could be hung on the left or right, but once the holes for the hinges have been cut this will hand the doors, to be safe mark the hinge side on all doors before cutting the holes.

The opening angle is dependent on the style of hinge selected 95 - 100 deg is quite common but others are available. When the number of hinges has been decided, locate them on the door to avoid any shelves or other obstructions that may prevent the mounting plates from being fixed to the carcass. Whilst on this point try not to position hinges too close to the top and bottom of the doors particularly if there is a large overhang, as the mounting plates may be difficult to fit, about 100mm from the edge of the door should be sufficient in most cases.

The most common hole size for concealed hinges is 35mm, sunk about 13mm deep and can quite easily be done with a hand held router, on larger doors this is probably the easiest way as the door can be carefully cramped to the bench. The router, when machining the large holes, should be held securely in position preferably with two cramps, it is not safe enough or accurate enough to machine these holes by holding the router by hand only.

Mark the centre position of the hinges on a timber rod cut to the length of the door and about 25mm wide x 15mm thick, also indicate which is the top and bottom. Use this rod to transfer the positions of the hinges to all of the hanging sides of the doors. The depth of the holes will be regulated by the depth stop on the router and the position from the edge of the door can be ascertained from the hinge manufacturer and set up on the router fence.

Mirrors

If shaped mirrors are to be fitted to the face of the door a template will have to be given to the glazier and this is where the combination templates come into their own. From experience glaziers (unless especially requested and this means a special price) do not cut glass that accurate and therefore tolerances have to be allowed. The mirrors should be made to fit between the inside edges of the mouldings but to allow for door making and glass cutting tolerances, it is better to set the mirrors in 5mm from each edge which from a practical approach works well and aesthetically is quite acceptable.

This is all straight forward apart from the shaped end which the glazier will need as a pattern to cut the glass. At the moment the

template is the size and shape of the inside line of the panel moulding which will have to be reduced by 5mm on each edge to give to the glazier. Take the shaped template with the 6mm plywood uppermost and using a bearing guided rebate cutter set to rebate 5mm machine around the template to reduce the plywood by 5mm. From the MDF base remove the plywood which can now be used as the glass pattern. The height of the mirror will have to be given as the plywood template is too short, by confirming the size of the mirrors on the plywood and giving this to the glazier it will avoid any mistakes.

Bonding the mirrors to the doors

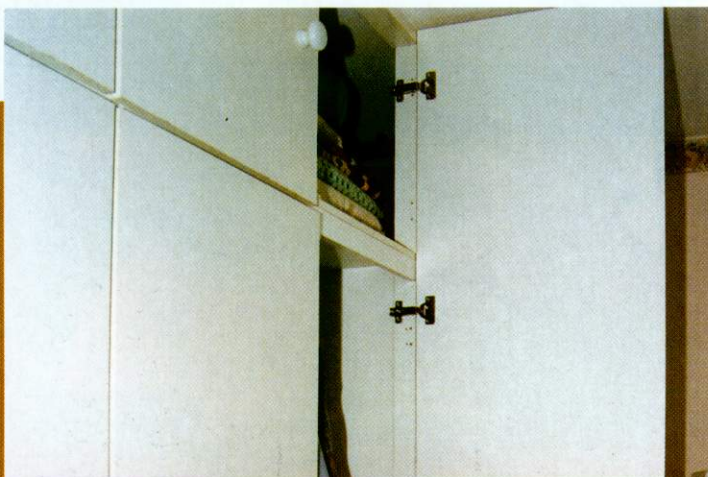
It is now common practice for mirrors to be bonded onto vertical surfaces, instead of being mechanically fixed, using a special adhesive. Only a mirror adhesive should be used as the chemicals in other adhesives could have an adverse effect on the silvering and consequently the bonding of the mirror. The adhesive is supplied in a plastic tube similar to the common sealant and is applied with a sealant gun and there is plenty of time to position the mirror before the adhesive starts to set.

With care and strictly following the manufacturers instructions this is a straight forward task. A large number of finishes are

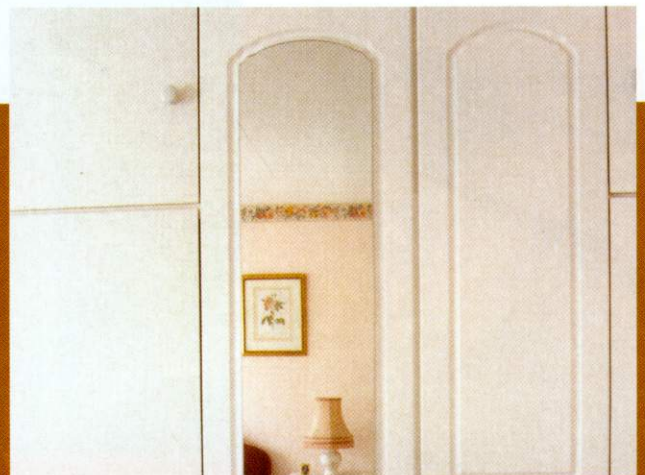
suitable to apply over MDF which give excellent results. If a commercially applied finish is to be applied to the doors it is advisable to ensure that all the holes and blemishes are properly filled and rubbed down, the mouldings are free of all blemishes and sanded to a fine smooth finish. If the doors are not finished to a good standard ready to seal and spray any extra work will have to be paid for, or if it is not done the overall effect will be second class.

Hanging the doors

The hinge positioning rod can be used to locate the mounting plates, as this will be too long to fit between the top and bottom of the carcass a suitable amount will need to be cut off both the top and bottom of the rod. Although the hinges are adjustable in height it pays to be as accurate as possible as occasionally the amount of adjustment runs out. It makes it easier and quicker to make a small gauge to drill the pilot holes for the bracket screws and if the lines to position the brackets are difficult to see a small piece of masking tape put on first will help. With the brackets in position the door is offered up the set screws are tightened and any adjustments made when all the doors are hung. The handles can then be fixed in position.



12. It is difficult to believe that these tired old doors were once our pride and joy.



13. When all the doors are in place a wardrobe looking like new will be the result and at a considerably lower cost than a new one.

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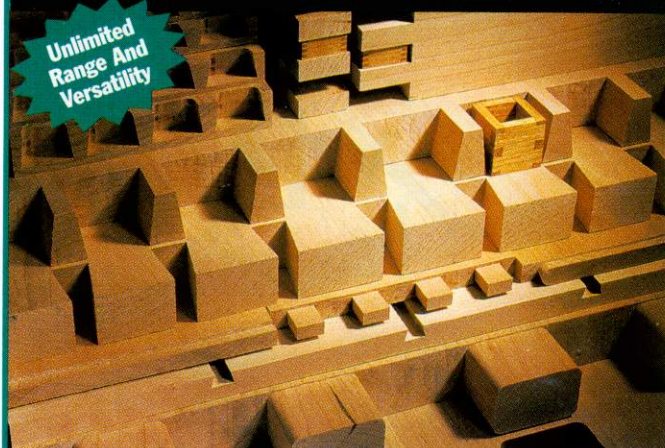


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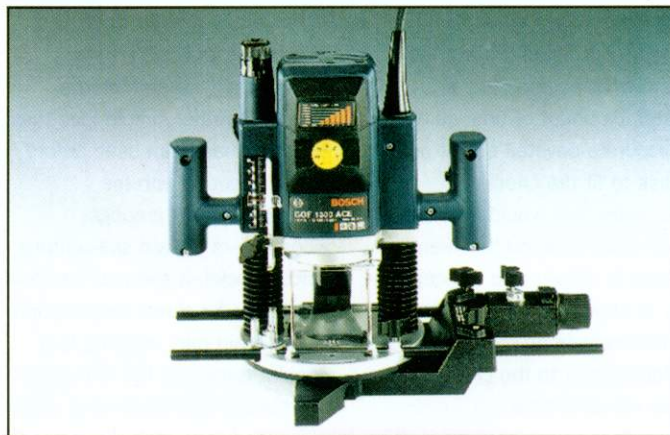
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Around The Workshop



To demonstrate that the router is truly versatile, Australian reader Glenn Roberts describes how the router can often improve other wood-working processes, such as woodturning



Woodturning

I have dabbled with woodturning for a while and recently decided to purchase a woodturning scroll chuck. I have often watched demonstration by woodturners using these chucks spend what seemed like a wasteful amount of time cutting an accurate dovetail spigot or recess to fit the chuck. Essentially they would turn the rough block of wood between centres or attach it to a faceplate only to allow the cutting of the dovetail recess or spigot, then swapping over to the chuck. This takes valuable time.

I thought, if the router can cut dovetails for drawers etc., why not quick, easily repeatable circular dovetail spigots or recesses for woodturning. All that is needed is a guide bush and circular templates for both external spigots and internal recess. A rather simple idea that no doubt has been used before today, although with the widespread shift amongst woodturners toward self-centring scroll chucks, it seemed the ideal procedure for closer examination.

The main part required is a circular template; the dimension for this will vary depending upon

the make of chuck. The chuck is measured first with its jaws set so that they are concentric, i.e. they make a perfect circle. The recess to be made and corresponding template diameter should be such that the chuck jaws grip around the full diameter, thus giving maximum grip and minimise the tendency to distort or mark the wood.

On the chucks shown (New Zealand made Nova Scroll and the Australian Vicmarc VM140) the dimensions of the external jaw diameters were 53 and 67.5mm receptively. Therefore the template for a dovetail

recess would need an internal diameter of:

Chuck jaw outside diameter + twice (guide bush margin) + * approximately 4mm.

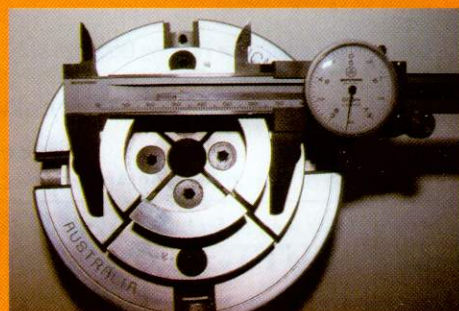
* Keeping in mind that the guide bush margin value must be increased to allow for the dovetail cutter shape that varies as the depth of cut is increased. Therefore I have added an additional 4mm. to the overall internal diameter of the recess template to allow for this. The chuck jaws can only be closed a small amount to allow them to enter the recess. It must also be noted that the dovetail cutter



1 Turned bowl mounted in chuck.



2 Nova Scroll chuck.



3 Vicmarc chuck.

should match the chuck jaw profile to ensure a correct fit.

To produce internal recesses the router is started toward the centre of template and worked on the first cut. The guide bush should not follow the template, rather you should leave a few mm. around the perimeter.

The deeper final pass is repeated with the guide bush touching the template, thus creating a dovetail recess without any steps. As the recess is often only 6mm or so in depth, two passes may be possible (depending upon the wood). The dovetail cutter I used is not particularly designed for plunge cutting, therefore the router needs to be angled slightly when first entering the wood.

Often there is no need to remove all the waste wood within the centre of the recess as the jaws are only approximately 10mm wide and the recess or spigot is often totally removed later, to improve the appearance of the bowl etc.

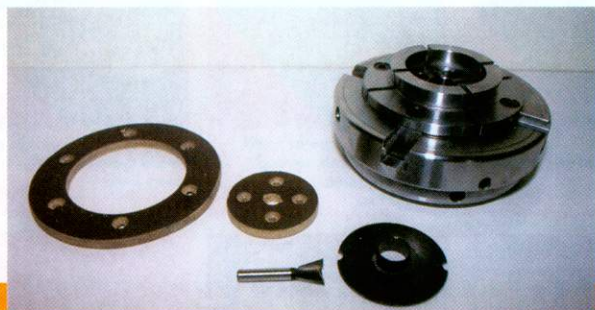
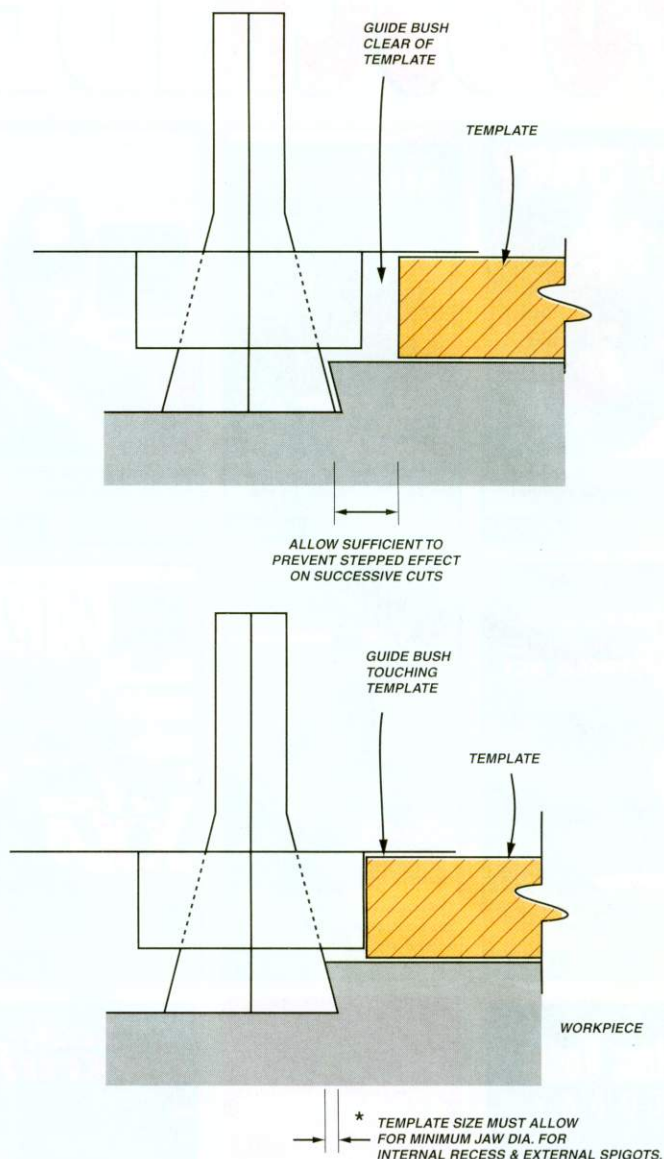
The templates, can be made from Tufnol etc. and can be turned on the lathe or made with the router using a circle jig or Trend Pivot Frame Jig Set etc. They are held in place on the wood blank with either double

sided tape, hot melt glue, or a few screws, brads, etc.

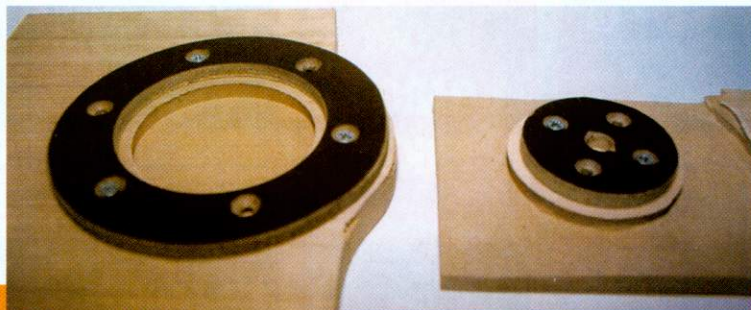
The template for spigots, (small circular template) may need additional external support for the router base due to its small size. Once again it must be used with subsequent passes of the router clearing the outside of the template so that a stepped dovetail does not result. The final cut is the only cut where the guide bush touches the template side. The process may seem just as involved to set up as cutting them on the lathe, however once the cutter and guide bush are fitted a number of blocks of wood can be done in a batch ready for rough turning in a very short time saving the need to alter chucking systems in the lathe and producing dovetails of guaranteed size first time.

It also allows for the block of wood to be held from one side, if required, without damaging the other side with drive centres or screw fixings.

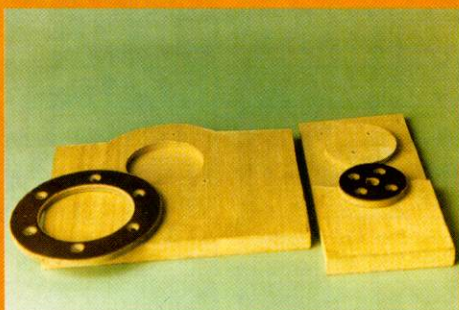
I realise that not all router users also enjoy woodturning, however I hope this article is food for thought for those trying to overcome woodworking problems and may have perhaps overlooked the router's versatility.



4 Templates, chuck and guide bush and cutter.



5 Close-up of templates.



6 Internal and external dovetails in scrap wood.



7 Templates mounted.

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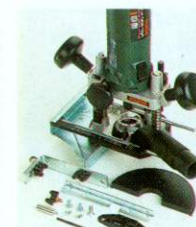
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110 Volt	No	No	No	No
Fixed rpm	27000	27000	30000	27000
Variable rpm	No	No	No	No
Spindle lock	No	No	Yes	No
Dust deflector only	No	No	No	No
Dust hood with spout	Yes	Yes	Yes	No
Max plunge depth	48	52	55	52
Collett chuck size	1/4	1/4	6,8mm, 1/4	1/4
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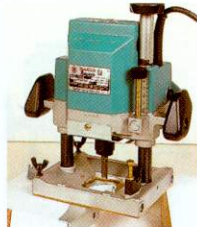
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110 Volt	No	Yes	No	No
Fixed rpm	No	24000	No	No
Variable rpm	8-30000	No	12-27000	16-26000
Spindle lock	Yes	No	No	No
Dust deflector only	No	No	No	No
Dust hood with spout	Yes	Yes	Yes	No
Max plunge depth	55	50	52	55
Collett chuck size	6,8mm,, 1/4	1/4, 3/8	1/4	1/4
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Variable rpm	No
Spindle lock	No
Dust deflector only	No
Dust hood with spout	No
Max plunge depth	N/A
Collett chuck size	1/4
Collets supplied as accessories	None
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Router make	MAKITA
Model ref. number	3620
Watts input	860
230 Volt	Yes
110 Volt	No
Fixed rpm	24000
Variable rpm	No
Spindle lock	No
Dust deflector only	No
Dust hood with spout	Yes
Max plunge depth	35
Collett chuck size	1/4, 3/8
Collets supplied as accessories	8mm
Net weight (KG)	2.4
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Router make	MAKITA
Model ref. number	3703
Watts input	350
230 Volt	Yes
110 Volt	Yes
Fixed rpm	30000
Variable rpm	No
Spindle lock	No
Dust deflector only	Yes
Dust hood with spout	No
Max plunge depth	N/A
Collett chuck size	6mm, 1/4
Collets supplied as accessories	None
Net weight (KG)	1.5
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Router make	HITACHI
Model ref. number	TR6
Watts input	440
230 Volt	Yes
110 Volt	Yes
Fixed rpm	30000
Variable rpm	No
Spindle lock	No
Dust deflector only	No
Dust hood with spout	No
Max plunge depth	N/A
Collett chuck size	1/4
Collets supplied as accessories	None
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110 Volt	Yes
Fixed rpm	No
Variable rpm	8-24000
Spindle lock	No
Dust deflector only	No
Dust hood with spout	Yes
Max plunge depth	50
Collett chuck size	1/4, 3/8
Collets supplied as accessories	None
Net weight (KG)	3.1
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Router make	ELU
Model ref. number	KF56
Watts input	600
230 Volt	Yes
110 Volt	Yes
Fixed rpm	30000
Variable rpm	No
Spindle lock	Yes
Dust deflector only	Yes
Dust hood with spout	Yes
Max plunge depth	N/A
Collett chuck size	6.8mm, 1/4
Collets supplied as accessories	None
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Router make	DEWALT
Model ref. number	DW613
Watts input	800
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110 Volt	Yes
Fixed rpm	27000
Variable rpm	No
Spindle lock	Yes
Dust deflector only	No
Dust hood with spout	Yes
Max plunge depth	35
Collett chuck size	1/4
Collets supplied as accessories	6, 8mm
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Model ref. number	OFE630
Watts input	630
230 Volt	Yes
110 Volt	No
Fixed rpm	No
Variable rpm	10-27000
Spindle lock	Yes
Dust deflector only	No
Dust hood with spout	Yes
Max plunge depth	50
Collett chuck size	1/4
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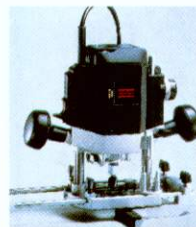
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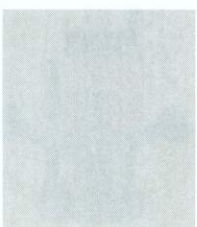
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230 Volt	Yes	Yes	Yes	Yes
110 Volt	Yes	Yes	No	No
Fixed rpm	25000	No	25000	26500
Variable rpm	No	8-24000	No	No
Spindle lock	Yes	Yes	Yes	Yes
Dust deflector only	No	No	No	Yes
Dust hood with spout	No	Yes	Yes	Yes
Max plunge depth	50	75	50	50
Collett chuck size	1/4	1/2	1/4	1/4, 8mm
Collets supplied as accessories	6mm, 8mm	1/4, 8mm	6mm, 8mm	6mm
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Watts input	600	720	750	750
230 Volt	Yes	Yes	Yes	Yes
110 Volt	Yes	Yes	Yes	No
Fixed rpm	30000	25,000	27000	24000
Variable rpm	No	No	No	No
Spindle lock	Yes	Yes	No	Yes
Dust deflector only	No	No	Yes	No
Dust hood with spout	Yes	Yes	No	Yes
Max plunge depth	N/A	50	50	55
Collett chuck size	6,8mm, 1/4	1/4	1/4	1/4
Collets supplied as accessories	None	None	6mm, 8mm	6mm, 8mm
Net weight (KG)	2.2	2.7	2.8	2.8
List price Ex. VAT.	225.00	228.00	229.00	230.00

Routers from £231-£272

**Where
to
Buy
Routers**



Router make	ELU	FESTO	SKIL	HITACHI
Model ref. number	OF97	OF900E Plus	1875U1	M8V
Watts input	900	900	1400	800
230 Volt	Yes	Yes	Yes	Yes
110 Volt	Yes	No	No	Yes
Fixed rpm	24000	No	No	No
Variable rpm	No	10-22000	8-22000	10-25000
Spindle lock	Yes	Yes	Yes	Yes
Dust deflector only	No	Yes	Yes	No
Dust hood with spout	Yes	Yes	No	No
Max plunge depth	55	50	63.5	50
Collett chuck size	1/4	1/4, 8mm	1/4, 1/2	1/4
Collets supplied as accessories	6mm, 8mm	6mm	12mm	6mm, 8mm
Net weight (KG)	3.1	2.7	4.5	2.8
List price Ex. VAT.	240.00	266.00	269.00	272.00

SKIL

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PO Box 98,
Broadwater Park,
North Orbital Road,
Denham,
Uxbridge,
Middlesex,
UB9 5HJ.

Tel. 01895 838743

Fax. 01895 838802

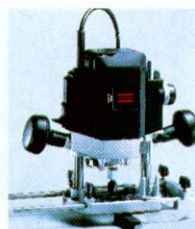
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Stayer Power Tools,
Unit 9,
Guildford Industrial
Estate,
Deaconfield,
Guildford
GU2 5YT.

Tel. 01483 454502

Fax. 01483 454415

Routers from £273-£280



Router make	BOSCH	AEG	ELU	ELU
Model ref. number	GOF 900ACE	OFSE850	MKF67	MOF96E
Watts input	900	850	600	900
230 Volt	Yes	Yes	Yes	Yes
110 Volt	Yes	No	Yes	Yes
Fixed rpm	No	No	24000	No
Variable rpm	12-24000	8-25000	No	8-24000
Spindle lock	Yes	Yes	No	Yes
Dust deflector only	Yes	No	No	No
Dust hood with spout	Yes	Yes	No	Yes
Max plunge depth	50	50	N/A	55
Collett chuck size	1/4	1/2	1/4	1/4
Collets supplied as accessories	6mm, 8mm	6mm, 8mm	6mm, 8mm	6mm, 8mm
Net weight (KG)	3.5	2.5	3.3	2.8
List price Ex. VAT.	279.00	279.00	280.00	280.00

WATFORD

Watford Routers,
C/O William
Distributors,
108 Burghley Road,
Peterborough,
Cambridgeshire,
PE1 2QE

Tel. 01733 54352

Fax. 01733 555275

VIRUTEX

Ney Limited,
Falkland Close,
Charter Avenue Ind.
Estate,
Tile Hill,
Coventry,
CV4 8UA

Tel. 01203 694794

Fax. 01203 695005

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TOOL CENTRE**

Axminster,
Devon EX13 5DZ

Tel. 01297 33656

BJR INTERNATIONAL

266 Harrogate Road,
Bradford, BD2 3RG

Tel. 01274 626805

CHARNWOOD

1-3 Rowan Street,
Leicester LE3 9GP

Tel. 0116 251 1550

CMT TOOLS (UK)

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Bexhill-on-Sea
Sussex TN39 3UR

Tel. 01424 730674

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LTD**

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Estate,
Springwell Road,
Leeds LS12 1AT

Tel. 0113 245 3737

Routers from £290-£328



Router make	FREUD	ELU	METABO	MAKITA
Model ref. number	FT2000E	OF97EK	OF528	3612
Watts input	1900	1100	500	1650
230 Volt	Yes	Yes	Yes	Yes
110 Volt	Yes	Yes	Yes	Yes
Fixed rpm	No	No	27000	22000
Variable rpm	8-22000	8-24000	No	No
Spindle lock	Yes	Yes	Yes	Yes
Dust deflector only	No	No	Yes	Yes
Dust hood with spout	Yes	Yes	Yes	Yes
Max plunge depth	70	55	50	60
Collett chuck size	1/2, 1/4	1/4	1/4	1/2
Collets supplied as accessories	3/8	6mm, 8mm	3,6, 8mm, 1/8	None
Net weight (KG)	6.0	3.2	3.0	5.8
List price Ex. VAT.	290.00	310.00	312.00	328.00

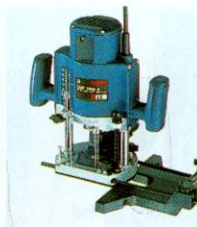
Routers from £328-£339



Router make	MAKITA	BOSCH	RYOBI	HITACHI
Model ref. number	3612BR	GOF1300ACE	R502	M12SA
Watts input	1600	1300	1600	1600
230 Volt	Yes	Yes	Yes	Yes
110 Volt	Yes	Yes	Yes	Yes
Fixed rpm	23000	No	24000	22000
Variable rpm	No	8-22000	No	No
Spindle lock	Yes	Yes	No	Yes
Dust deflector only	No	Yes	Yes	No
Dust hood with spout	Yes	Yes	Yes	No
Max plunge depth	65	60	60	62
Collett chuck size	1/4, 3/8, 1/2	1/4	1/4,3/8,1/2,8mm	1/4, 1/2, 3/8
Collets supplied as accessories	None	1/2, 3/8, 6, 8, 12mm	None	6mm, 8mm
Net weight (KG)	5.7	4.8	5.0	5.2
List price Ex. VAT.	328.00	329.00	329.00	332.00

Routers from £344-£350

**Where
to
Buy
Cutters**



Router make	RYOBI	BOSCH	METABO	ELU
Model ref. number	R600N	GOF1600A	OF1028	MOF131
Watts input	2050	1600	1010	1300
230 Volt	Yes	✓	Yes	✓
110 Volt	Yes	✓	Yes	✓
Fixed rpm	22000	25000	27000	22000
Variable rpm	No	✗	No	✗
Spindle lock	Yes	✓	Yes	✓
Dust deflector only	Yes	✓	Yes	✗
Dust hood with spout	Yes	✓	Yes	✓
Max plunge depth	60	75	50	62
Collett chuck size	1/4, 3/8, 1/2	1/4, 1/2	1/4	1/4
Collets supplied as accessories	None	6,8, 12mm, 3/8	3,6, 8mm, 1/8	3/8, 1/2, 10 & 12mm
Net weight (KG)	6.2	5.7	3.3	4.8
List price Ex. VAT.	339.00	339.00	344.00	350.00

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Router make	FESTO	METABO	HITACHI	BOSCH
Model ref. number	OF2000 Plus	OFE1229	M12V	GOF1700ACE
Watts input	1600	1200	1850	1700
230 Volt	Yes	Yes	Yes	Yes
110 Volt	No	Yes	Yes	Yes
Fixed rpm	25500	No	No	No
Variable rpm	No	5-25500	8-20000	8-22000
Spindle lock	Yes	Yes	Yes	Yes
Dust deflector only	Yes	Yes	No	Yes
Dust hood with spout	Yes	Yes	No	Yes
Max plunge depth	65	50	62	75
Collett chuck size	1/2, 8, 12mm	1/4	1/4, 1/2, 3/8	1/4, 1/2
Collets supplied as accessories	1/4, 3/8, 10mm	3, 6, 8mm, 1/8	6mm, 8mm	6,8, 12mm, 3/8
Net weight (KG)	5.1	3.4	5.3	5.8
List price Ex. VAT.	370.00	371.00	389.00	395.00

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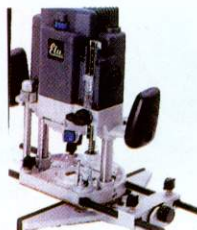
Tel. 0700 565000

Routers from £398-£449



Router make	MAKITA	RYOBI	ELU	FESTO	METABO
Model ref. number	3612C	RE600N	MOF177	OF2000E Plus	OF1612
Watts input	1850	2050	1600	1800	1600
230 Volt	Yes	Yes	Yes	Yes	Yes
110 Volt	Yes	Yes	No	No	Yes
Fixed rpm	No	No	20000	No	24000
Variable rpm	9-23000	10-22000	No	12-22000	No
Spindle lock	Yes	Yes	Yes	Yes	Yes
Dust deflector only	Yes	No	No	Yes	Yes
Dust hood with spout	Yes	Yes	Yes	Yes	Yes
Max plunge depth	60	60	65	65	80
Collett chuck size	1/2	1/4, 3/8, 1/2, 8mm	1/4, 1/2	1/2, 8, 12mm	1/2
Collets supplied as accessories	1/4, 3/8	None	6, 8, 10 & 12mm, 3/8	1/4, 3/8, 10mm	6, 8, 12mm, 1/4, 3/8
Net weight (KG)	6.0	6.2	5.1	5.1	5.0
List price Ex. VAT.	398.00	399.00	420.00	436.00	449.00

Routers from £450-£514



Router make	ELU	ELU	METABO	PORTER CABLE
Model ref. number	MOF177EK	MOF 112	OFE1812	7539
Watts input	1850	2000	1800	2423
230 Volt	✓	Yes	Yes	No
110 Volt	✓	No	Yes	Yes
Fixed rpm	X	18000	No	No
Variable rpm	8-20000	No	8-22000	10-21000
Spindle lock	✓	No	Yes	No
Dust deflector only	X	No	Yes	No
Dust hood with spout	✓	No	Yes	No
Max plunge depth	65	No	80	76
Collett chuck size	1/4, 1/2	M12x1	1/2	1/2
Collets supplied as accessories	6, 8, 10 & 12mm, 3/8	6, 8, 10 & 12mm, 3/8 1/2	6, 8, 12mm 1/4, 3/8	1/4, 3/8, 6, 8, 10, 12mm
Net weight (KG)	5.1	7.3	5.1	7.8
List price Ex. VAT.	450.00	465.00	512.00	514.00

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Our sales on routers have increased by 80 per cent over the years. This is due to the strong support we receive from the manufacturers and their representatives, especially Trend Machinery & Cutting Tools on their router cutters, jigs and

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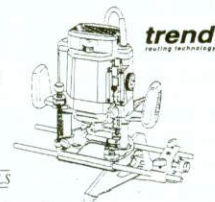
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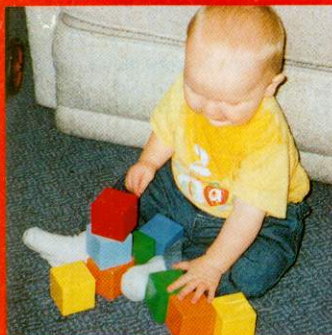
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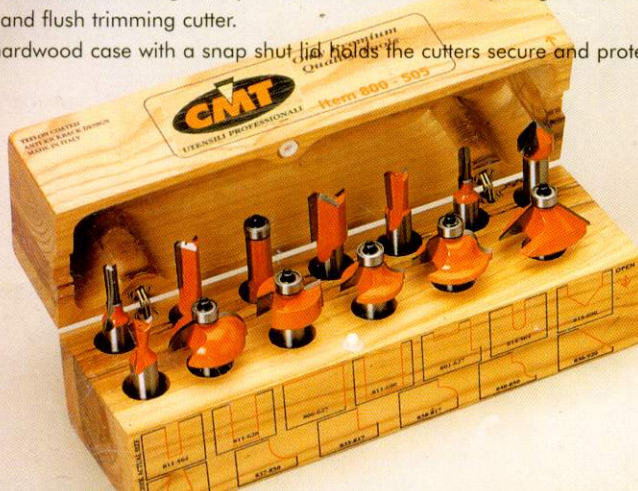
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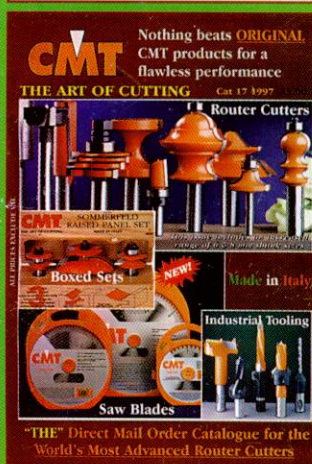
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