

Routing

using the world's most versatile power tool

www.getwoodworking.com

GUIDE BUSH BASICS

Complete insight to the most creative area of routing

ON TEST

DeWalt DW733S
Planer/Thicknesser



£1500
Competition
Win Trend
Airshields

ANIMAL MAGIC

Down on the farm with our latest toy project

FULL ELLIPSE

Mark out your own with a home-made jig

FERM HOLD

We test the latest budget router

INSIGHT

Guide to
router cutters

PROJECT

English oak dresser

PLUS

- Stockist Guide
- Top Tips
- Features
- Latest Products

Issue 42



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04 >



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The Snappy system will change the way you fit drilling and screwdriving tools into all your cordless, power or pillar drills. By simply fitting a Quick Chuck® into the drill, Snappy or any bits with a 1/4 inch hex shank, will 'snap' in effortlessly. Tools are released by retracting the sprung loaded outer sleeve.

Snappy tools are offered either individually, as sets or in kit boxes and are available from Trend stockists around the UK.

Freephone 0800 487363 for your free *2001 Routing Catalogue* and details of your nearest stockist.

NEW SETS IN TOOL HOLDERS

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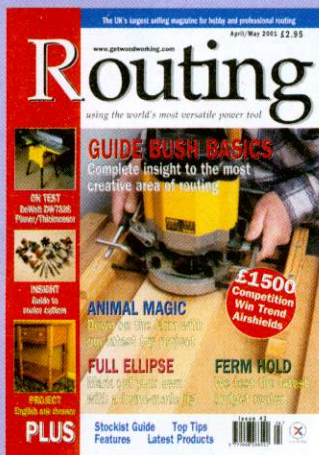


NEW CATALOGUE



www.trendm.co.uk/snappy
0800 487363

trend®
routing technology



Editorial

As the price of power tools continues to plummet, the number of budget priced routers coming onto the market is increasing all the time. Sure, many of them look alike and may even originate from the same factory, but they do offer exceptional value for money. They also seem to be able to withstand the rigours of normal use, they're certainly not 'disposable' models as was first thought.

Another advantage of their simple, but effective 'Elu 96' style design, on which most of them are based, is that you can use most of the huge range of accessories which were originally designed for this icon, or the 'God' (as one of our contributors refers to it), of routers. The arrival and continued proliferation of these cheap machines means that routing has never been so accessible, and their use by skilled woodworkers and DIY enthusiasts alike is certainly set to increase in the near future. Good news for all of us! That said, it'll come as no surprise to learn that the two routers we've tested this issue fall into the budget price range, the FERM model from Screwfix (p31) and the small machine from Wickes (p72). A budget machine may well be the ideal way to enter the world of routing, but it won't be long before these new users want to exploit this versatile tool to the full and they'll then have to try and choose between the huge number of more expensive products available. That's one of the reasons we've been busy completely redesigning our website. Launched at the recent International Woodworking Exhibition in London, getwoodworking.com offers visitors a complete database of product reviews and tests which can all be cross referenced and compared using a number of different criteria to make your purchasing decisions as easy as possible. Add to this an updated forum, the latest news, projects, Planshop and some great new interactive features specially designed to help the woodworker, and we truly believe we have the best woodworking resource on-line today. So go on getwoodworking.com

Neil Mead

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EDITORIAL

Editor
Neil Mead

Group Editor
Mark Ramuz

Editorial Administrator
Sarah White

PRODUCTION

Designer
Paul Forster

Illustrators
Michael Lindley
Phil Holmes

Photography
Concept Photography
Roger Phillips

Production Manager
Mike Burns

Production Executive
Claire Medland

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E.T. Heron

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Senior Sales Executive
Reza Zaman

Classified Sales Executive
Emma Padwick

Northern Area Sales
Colin Walker
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Fax: 0161 777 6524

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Steve Hobbs

Circulation Manager
Richard Kingerlee

Specialist Outlet Development
Daniel Webb

MANAGEMENT

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Dawn Frosdick-Hopley

Divisional Sales Manager
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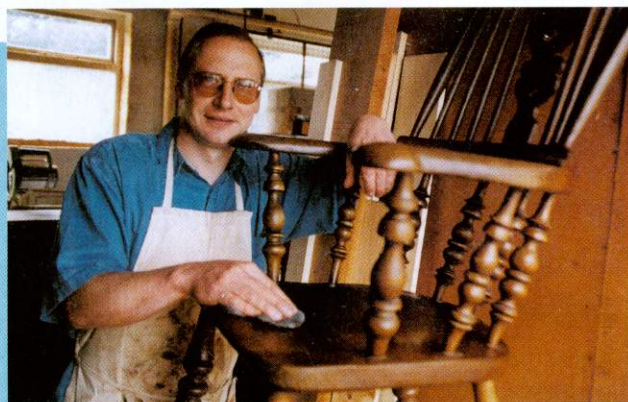
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Cutting edge



Back to school

Professional woodworker, author and journalist Mark Finney is inviting woodworkers to go back to the school room. Mark, who runs a series of courses at his Wood School in Sheffield, also offers private tuition. Reduced course rates are available for Wood School members, who also receive a 10% discount on all furnishing materials bought through the Wood School shop. Other benefits include help with sourcing materials, advice on project designs, and access to a free Woodworker's helpline. All courses are hands-on and practical, and pre-booking is essential. For dates, courses and course fees, contact Mark Finney on 0114 258 8399.

WRAP Technology



If you have problems deciding which timber or panel product you need, don't know where to buy, can't understand the quality grading systems, don't know how to stop your timber warping or just need advice on how to store your timber once you have bought it? A new series of Open (Distant) Learning books developed by WRAP Technology could be just what you are looking for!

The books, called BAST (Buying And Selling Timber) are for individual woodworkers, craftsmen and DIY enthusiasts alike. The BAST series consists of just four books and are ideal for the individual craftsman wishing to update their knowledge and the Home Woodworker wishing to improve their skills. For more information about this exciting development contact WRAP Technology by phone/fax 01386 761101; email wrap.technology@talk21.com or visit their website www.wrap-technology.co.uk.

New plastic guide bushes

Trend has launched two new sets of hard wearing, injection moulded, plastic guide bushes, which come in both even and odd sizes, and have been designed to fit directly to the Trend T5 and T9. Alternatively, Trend's Unibase can enable the bushes to be used with virtually any router currently available in the market place. Designed for router users who fabricate their own templates, the guide bushes are 60mm in diameter, and have two countersunk holes for fixing to the router. With a wall thickness of 1.5mm, the inner bush projects 6mm from the base of the guide bush, making it ideal for following 6mm plywood or MDF templates. The two sets comprise a set of 12, even sized guide bushes ranging from 10mm to 32mm in diameter, and a set of 12 odd sizes ranging from 11mm to 33mm diameter. Each one costs £19.95 excl. VAT. For more information and stockist details phone 0800 4 TREND OR 01923 224657.



Crafty cuts

Two new tungsten carbide tipped template profilers have been added to Trend's Craft Range of router cutters. Designed to follow a template secured to a workpiece that has been rough cut approximately 2-3mm oversize, the cutters can be used to trim the material back to the exact shape of the template. Both tools are 1/2in shank, have bearing guides and diameters of 3/4in (19.1mm).

The C165 cutter has a 3/4in (19.1mm) in cut length, and the C166 a 2in (50mm) cut length. Both can be used to trim and profile natural timbers and manmade boards and are suitable for use in any hand held router. Prices start from £17.95 excl. VAT.

For more information and stockist details phone 0800 4 TREND OR 01923 224657.



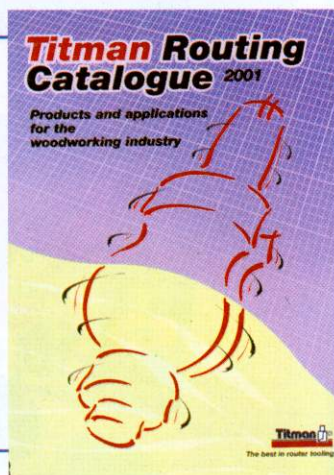


New tool dot.com

tooltastic.com is a new on-line shop for DIY, gardening and car maintenance tools. Owned by tool distributors Buck & Hickman, it features over 800 tools from leading manufacturers at competitive prices, along with the promise that orders will be delivered the next working day, from stock, for an additional £3.95, regardless of order size. Multi-buy offers are a regular feature, and DIYers registering now will receive a free steel measuring tape worth £4 (while stocks last). For further information, contact Buck & Hickman on 024 7630 6444.

Quick'n'easy

Make light work of sanding with the new Festool Duplex LS 130 EQ 4mm linear sander. It gives all the finesse and control of hand sanding, but at three times the speed. The sander goes right up to the edges, as well as into inaccessible areas such as rebates, profiles and tongue and groove joints - and because it has a clean, reciprocating motion, there is no need to use fine grit paper to remove circular sanding marks. A variety of pad profiles can be changed quickly and easily to suit different work, using the Festool Fast Fix clamping system. A variable speed control allows operating speeds to be adjusted to the requirements of the job in hand. The LS 130 EQ is available from a nationwide network of Minden Industrial distributors. For further information phone Minden on 01284 760791.



New from Titman

A host of new products can be found in the new 2001 Routing catalogue from Titman. Items include the pine cut range of router cutters, specially designed to give maximum performance on softwoods and the unique aluminium worktop Ali-Jig, which is stronger and more versatile than normal compact jigs. Also featured is a complete section of spindle tooling as well as the largest range of UK manufactured quality TCT router bits. For your free copy, contact Titman's sales department on 01255 220123 or ask your local stockist.

Revised spindle moulder

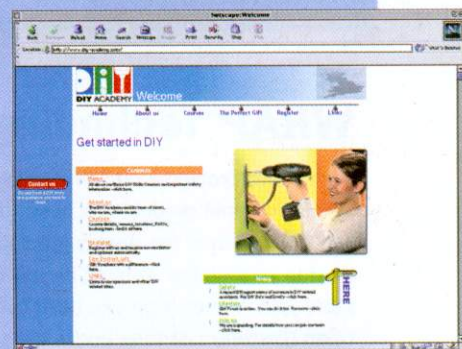
A completely revised spindle moulder has been launched by Sedgwick, to include models SM3ii, SM4ii and SM255-t - the first of the company's spindle moulders to feature a fitting spindle. All three feature an interchangeable top spindle, and are capable of carrying both 30mm and 1 1/4in bore tooling,

as well as counter-bored tooling for tenoning, and router cutters. There is also an option to store additional spindles with pre-set stacked tooling on them for repetition work. Optional extras include a sliding table, a ring fence and cage guard set, and cast aluminium table extensions. For further information, contact Sedgwick on 0113 257 0637.



Back to DIY school

www.diy-academy.com is among the newest websites aimed at novice DIYers. A one-stop, online information point, its popular hands-on DIY courses include basic DIY skills, furniture making skills and routing. The site features details of course venues, dates and costs and students are able to register on line. The Academy is sponsored by leading DIY companies Bosch, Focus Do It All, Stanley Hand Tools, Richard Burbridge, UHU Adhesives, Dremel and Sadolin. Weekend courses cost £99 per person, and include tuition, materials, a take-home DIY project, goodie bag and refreshments. For further information phone the Academy on 020 7564 4832.



New books

The first of our new books this issue is 'Mastering the router' by well known router expert and contributor to *Routing*, Ron Fox. Published by GMC Publications and priced £12.95, this book examines how this versatile power tool can perform so many different tasks.

Illustrated with excellent photography by Anthony Bailey, Ron covers tools, techniques and safety in this distillation of his decades of knowledge and experience. To place an order or for more information call 01273 488005.

Mastering the Router A COMPLETE COURSE



SMALL TOOLS Handbook



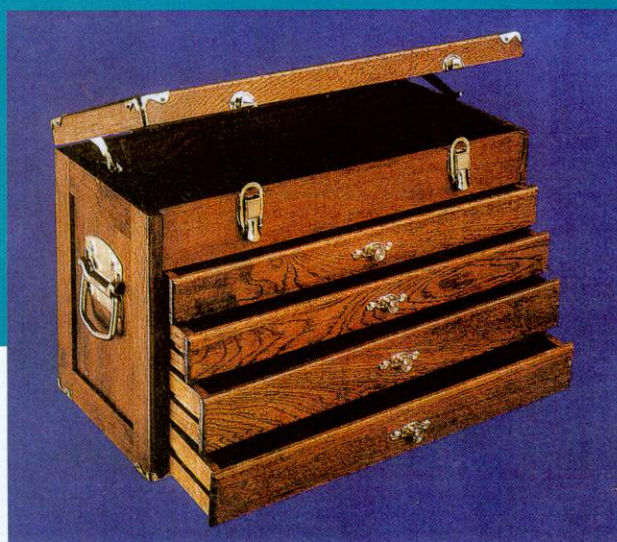
Peter Bishop

The second of our new publications is the 'Small Tools Handbook' by Peter Bishop. Drawing on his own substantial experience, Peter grades each tool for desirability, offers invaluable tips on their safe use, and advises on their care and maintenance. Published by The Crowood Press and priced £18.99. Call 01672 520320 for more details.

Tool tidy

Chesterman Marketing has introduced a solid hardwood multi-purpose chest to its range. New to the UK, it comprises five storage compartments, suitable for tools and other items. The unit measures 23 x 11 x 14.6ins. (58 x 27.95 x 37cm), has a high polish finish and felt lined drawers. Other features include brass-plated drawer knobs, lid safety catches, carrying handles and protective corner plates. The chest costs £79.85 incl. VAT and is available from stock.

For further information, contact Chesterman Marketing on 01785 250341.



DIARY

March

9-11 Picture framing with John Hill
West Dean College, Chichester
Tel: 01243 811301

Record Power instore demonstration days

- 2-3 RS Paskins, Kidderminster**
Tel: 01562 829722
- 3 Linton & Robinson, Strabane**
Tel: 028 713 84920
- 7 M&M Woodcut, Bexhill-on-Sea**
Tel: 0800 378027
- 13 Yandies, Martock, Somerset**
Tel: 01935 822207
- 16 Tool Store, Christchurch, Dorset**
Tel: 01202 486240
- 23-25 M&M Woodcut, Bexhill-on-Sea**
Tel: 0800 378027
- 28 The Tool Shop, Derby**
Tel: 01332 755799
- 6-7 April Yandies, Somerset**
Tel: 01935 822207

10-11 Record Power's 'Try before you buy' open day (appointment only)
Record Power, Sheffield
Tel: 0114 2519 115

14 Trent Valley Woodturners AGM
Kegworth Community Centre, Leics
Tel: 0116 2677233

16-18 Caring for furniture course
West Dean College, Chichester
Tel: 01243 811301

16-18 The Scottish National Woodworking Show
The SECC, Glasgow
Tel: 01934420365

17 Routing with Ted Heathcote-Walker
John Boddy's, Boroughbridge
Tel: 01423 322370

17 EHA Exhibition 2001
Hylands House, Chelmsford, Essex
Tel: 01268 523542

17 Hollow vessels with Tony Witham
Peter Child Woodturning Supplies, Halstead, Essex
Tel: 01787 237291

17-23 Country chair making course
West Dean College, Chichester
Tel: 01243 811301

22 Furniture craft today with Colin Eden-Eadon
The Mytchett Centre, Surrey
Tel: 01252 542901

23-26 Woodcut Woodworking Show
De La Warr Pavilion, Bexhill, E. Sussex
Tel: 01424 819900

23-26 Carving in relief course
West Dean College, Chichester
Tel: 01243 811301

23-25 Tool Shop Auctions
Peterborough
Tel: 01449 722992

24 Veneering with Robert Cooksey
John Boddy's, Boroughbridge
Tel: 01423 322370

24 Drilling and indexing on the lathe with Ian Wilkie
Tewkesbury Saw Company
Tel: 01684 293092

25-30 Fine furniture making course
West Dean College, Chichester
Tel: 01243 811301

30-April 2 Carving course
West Dean College, Chichester
Tel: 01243 811301

31 Issac Lord demos
Isaac Lord, High Wycombe, Bucks
Tel: 01494 462121

31-April 1 NFWG Seminar
Knutsford, Cheshire
Tel: 01565 651681

April

2 Apr & District Woodturning Club
Tel: Jamie Speirs 01292 570112

6-7 Tool Shop Auctions

Martock
Tel: 01449 722992
6-7 Yandies Woodworking Show
Yandle & Sons, Martock, Somerset
Tel: 01935 822207

6-10 Picture framing course
West Dean College, Chichester
Tel: 01243 811301

7 Spindle work with Derek Phillips
Peter Child Woodturning Supplies, Halstead, Essex
Tel: 01787 237291

7 Carving demos
The Rocking Horse Shop, York
Tel: 01759 368737

7 Woodcarving with Dave Johnson
John Boddy's, Boroughbridge
Tel: 01423 322370

7-8 Craft Supplies demos
The Mill, Millers Dale, Buxton
Tel: 01298 871636

11 Trent Valley Woodturners demos
Kegworth Community Centre, Leics
Tel: 0116 2677233

14 Issac Lord demos
Isaac Lord, High Wycombe, Bucks
Tel: 01494 462121

14 Woodturning with Tony Wilson
John Boddy's, Boroughbridge
Tel: 01423 322370

14 Turning with Ian Wilkie
Tewkesbury Saw Company
Tel: 01684 293092

20-22 Making craft handtools course
West Dean College, Chichester
Tel: 01243 811301

21 Machinery Workshop with Robert Sorby
John Boddy's, Boroughbridge
Tel: 01423 322370

21 Turning with Tony Witham
Peter Child Woodturning Supplies, Halstead, Essex
Tel: 01787 237291

22-27 Caring for furniture course
West Dean College, Chichester
Tel: 01243 811301

26 Furniture construction & restoration with Michael Huntley & Howard Page
Godalming, Surrey
Tel: 01252 542901

27-29 Midlands Woodworking & Turning Exhibition
Warwickshire Exhibition Centre
Tel: 01926 614101

27-29 Basic woodwork course
West Dean College, Chichester
Tel: 01243 811301

28 Finishing with Jim Kitson
John Boddy's, Boroughbridge
Tel: 01423 322370

28 Issac Lord demos
Isaac Lord, High Wycombe, Bucks
Tel: 01494 462121

28 Turn Essex 2001
Chelmer Valley Woodturners
Tel: 01621 860447

29-May 4 Fine furniture making
West Dean College, Chichester
Tel: 01243 811301

May

4-5 Trade Days Summer Sale
SJ Carter Tools, London
Tel: 020 7587 1222

4-6 Low-relief carving course
West Dean College, Chichester
Tel: 01243 811301

5 Making boxes with Derek Phillips
Peter Child Woodturning Supplies, Halstead, Essex
Tel: 01787 237291

5-6 Craft Supplies demos
The Mill, Millers Dale, Buxton
Tel: 01298 871636

6-7 Tool Shop Auctions
Pangbourne
Tel: 01449 722992

7 Apr & District Woodturning Club
Tel: Jamie Speirs 01292 570112

9 Trent Valley Woodturners demos
Kegworth Community Centre, Leics
Tel: 0116 2677233

9-11 Introduction to green woodwork with Mike Abbott
Clissett Wood, Herefordshire
Tel: 01531 640005

Send diary entries to us at least five weeks prior to publication. As details can sometimes change, readers should always contact the venue concerned in advance. Please mention *Routing* when calling.

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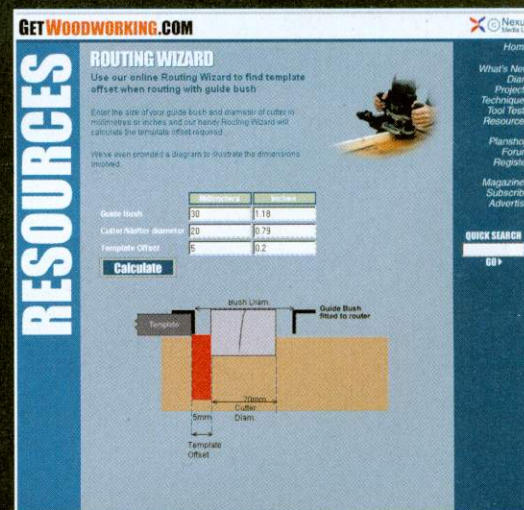
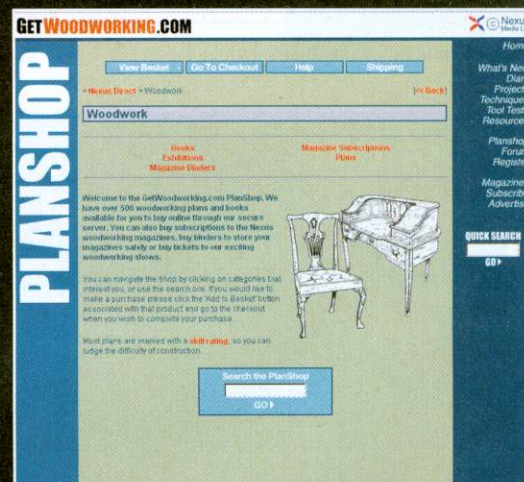
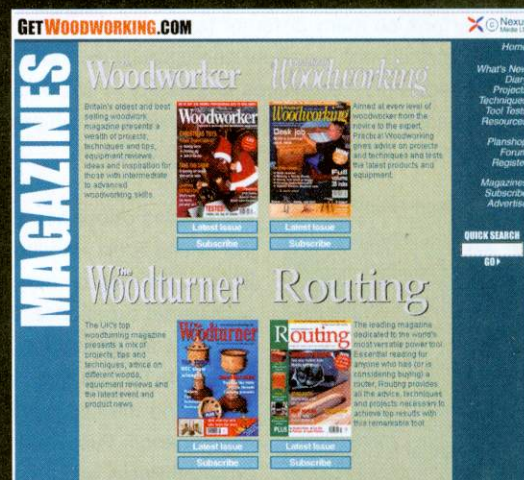
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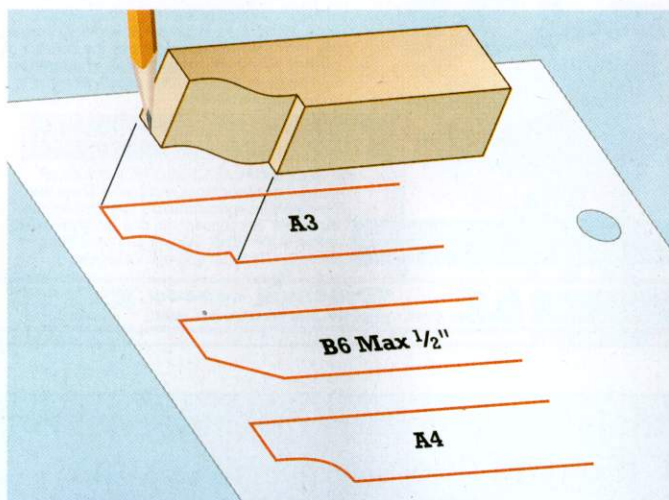
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Sharp tips



Cutter index

As your stock of router cutters increases it is not always easy to remember what you have and what shapes and other work are possible with them. You could keep sample pieces of wood with specimen cuts, but they take up space. Things get further confusing if you have 1/4in, 1/2in and maybe 8mm shank cutters, so you forget which profile or cut you get with a particular size.

I have made an index, in a loose-leaf book, of the shapes I can cut, each with a reference to which box or rack the cutter is kept. It was a little tedious, but only a one-off job, which I felt was worthwhile.

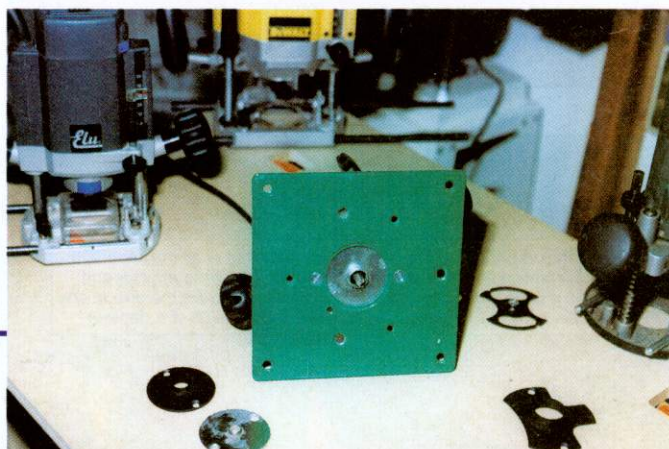
I made a cut with each cutter, then used a piece of the wood as a pattern to draw round. Besides the location reference I made a note, where necessary, of variations possible or maximum cuts, as with chamfer widths or mortise depths. I listed in groups according to shank sizes. With loose leaves there is scope for additions and alterations.

F J Jackson (Lymington)



Win a Bosch power tool!

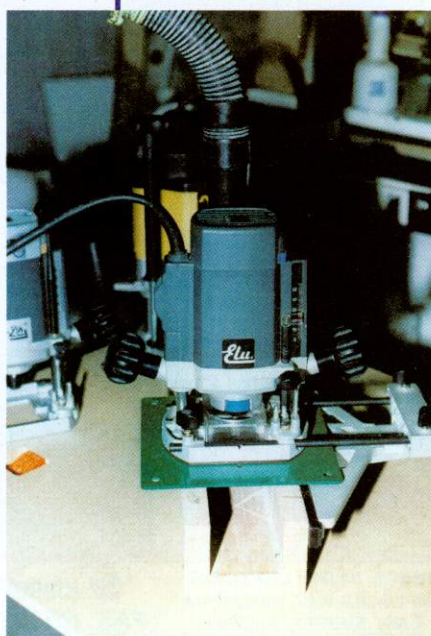
Each issue, Bosch and Routing have teamed up to give you the chance of winning some great new power tools. Simply send in your top routing tip and the sender of the most useful, inventive or entertaining tip we publish will win a Bosch power tool of their choice to the value of £120 inc. VAT. The Bosch DIY range includes well designed premium quality power tools you can trust such as mains drills, cordless drills, jigsaws, sanders, planers and routers.



Sub-base scenario

Here is an idea for making your own router sub-base. The underneath view of the base shows a guide bush mounted on the router, you could use thinner template material. The picture of the sub-base/CRT insert following a batten/straight edge, also demonstrates that you can clamp more easily without the router fouling the clamps. The sub-base can also be used with side fences and there are no problems with using dust extraction. I'm certain many people will come up with more uses and that it may affect the way they design many of their jigs.

M A Cuthbert (Cornwall)

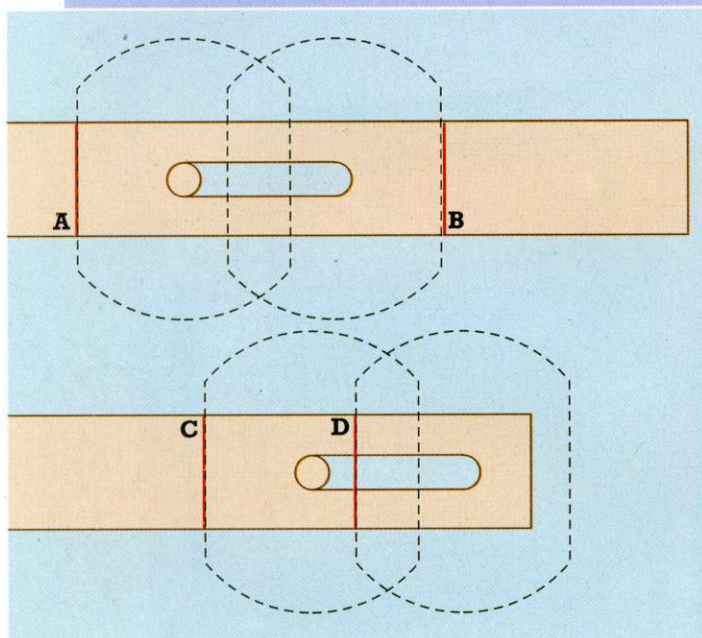


Accurate mortise lengths

Visibility through the base of a router is not very good and this leads to difficulty when plunging mortises. It is easy to cut too far. I find it helpful to mark where the outside of the router base should come when the cutter is at each end of the slot.

If the mortise is far enough from the end of the wood, lines can be drawn across to mark the limit each way (A and B). If the mortise is near an end, the start can be marked (C), then the position of that side of the base marked for the other end. That line will be obscured as the base is moved along. A lead-up to it is marked with a V (D) - As the V gets narrower, you know you are approaching the line.

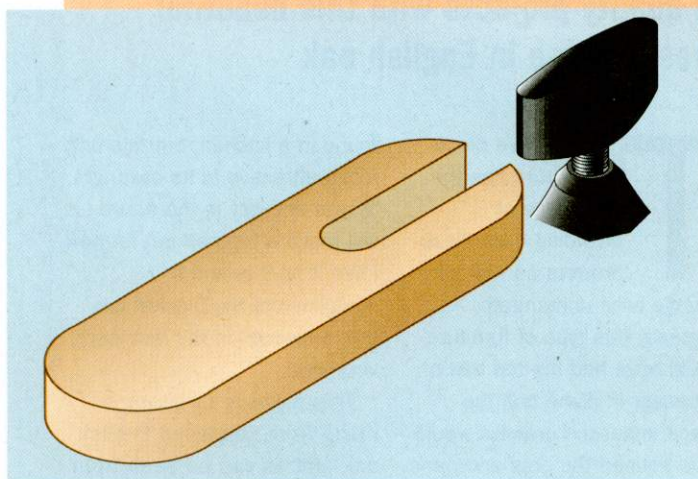
W F Savage (Worthing)



Knob spanner

At some settings of a router it is not always easy to get at and turn the knobs of the screws holding the fence rods. I made a notched piece of wood, as shown, to use as a spanner to loosen or tighten these screws when they could not be easily reached.

Robert Hunt (Watford)



Vertical plunge

The idea of using two router fences with large screw-on flat plates for edge-machining is not exactly new. If, however, one of the fences is of the 'two-part' adjustable variety (normally used for precise positioning of the cutter relative to the fence), it can also be used as a clamp, as the picture shows. This immediately allows plunge routing in vertical components (e.g. hung doors), with the router held precisely in the required position. If the cramping action is released slightly, the router may also be slid up and down between stops, to machine mortises, rebates and channels as required by locks. These operations may be carried out precisely and above all, safely. It is of course necessary to fix the door securely to stop it swinging during operations.

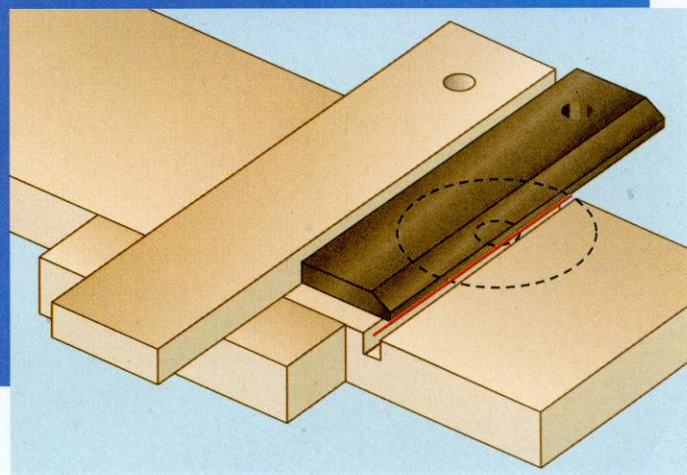
Jack Cox (Berks)



Groove gauge

Most of us use a piece of wood or a shop-made T-square cramped on as a guide for the base to run against when using a router and straight cutter to cut a groove across the grain. Its position has to be measured each time and there could be minor errors. To simplify the job and ensure accuracy I made a gauge as wide as the distance between the centre of the cutter and the edge of the base. If I put the gauge against the centre of the groove, its other edge gives the position of the guide piece. So it should not be mistaken for a piece of scrap wood, I chamfered one edge and drilled a hole for hanging.

Colin Woodroffe (Spalding)



Dresser to impress



Peter Dunsmore continues his series of quality projects with this beautiful dresser base in English oak

This attractive piece of furniture has the advantage of providing three deep drawers as well as a storage area underneath. Originally this type of furniture would have had the top half of a dresser in place and the space under the drawers would have housed the pots and pans

found in a kitchen, but this unit looks attractive in its own right. Maybe one day in the future I will make a top half but for now I like it as it is and it compliments the blanket box that appeared in the last issue very well.

This piece of furniture is made from seasoned English oak and as can be seen from

the drawings the six legs are held together by a number of rails tenoned into mortises cut into the legs. The three drawers fit in the spaces between the legs and the rails. The top is an attractively grained piece of brown oak.

Making a start

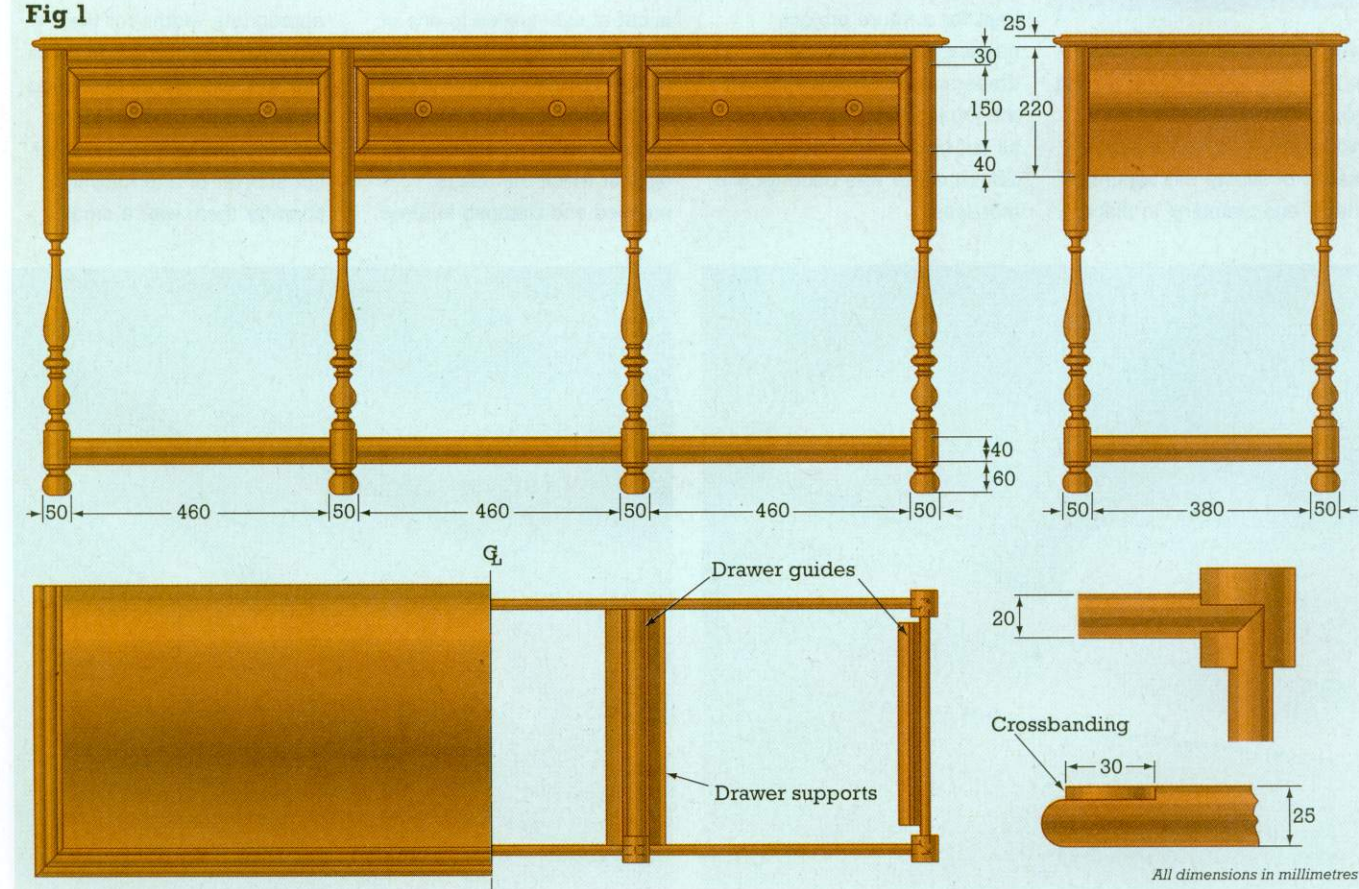
Only the front legs are turned on the lathe and this is probably the best place to start. I found the timber bounced a little in the middle and as I do not have a lathe steady these were turned in two parts and then glued together ensuring the square parts were aligned. The remainder of the carcass comprises of rails, mortise and tenoned into the legs. With six legs, each with varying lengths of mortise being cut into them it is all too easy to cut the mortise in the wrong face. To avoid this possibility I find it useful to stand all six legs in

relation to each other and to place masking tape over the area where the mortise is to be cut. This is removed just before cutting. To make accurate mortises I make a small jig. A piece of 9mm MDF is cut with a straight edge and a pencil line drawn the length of the MDF parallel to the straight edge.

The router fitted with a fence cuts a long slot in the MDF with the pencil line in the middle of the slot. The slot is cut wide enough to fit a suitable guide bush for a 16mm cutter. As can be seen from the picture, two lengths of timber the same width as the legs are used to screw the MDF on to. It is important that these timbers are both parallel with each other and just wide enough apart to slide the legs to be mortised in-between. A centre line drawn on the legs should also line up with the pencil line on the MDF panel. This assembly is then screwed



Fig 1



Useful addresses

Good Timber

New Creation Farmhouse
Nether Heyford
Northampton
NN7 3LB
Tel: 01327
349991/341155

Art Veneer Company

Chiswick Avenue Industrial
Estate
Mildenhall
Suffolk
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Tel: 01638 712550

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CO15 4AB
Tel: 01255 220123

Makita (UK) Ltd

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Tongwell
Milton Keynes
MK15 8JD
Tel: 01908 211678

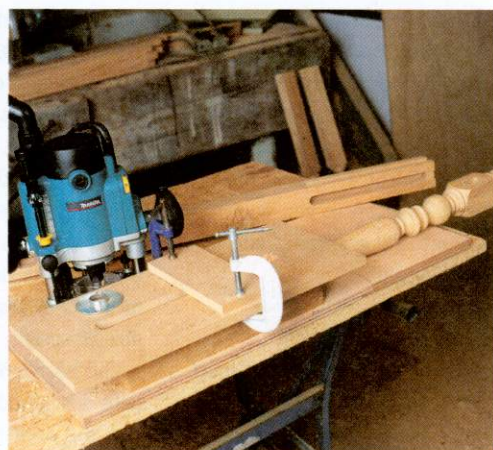
onto a suitable work surface. In my case this is some stirring board clamped in the Workmate. It is now a simple matter of sliding the legs into the jig and clamping in place.



The rails are cut from a wide board after the tenons have been cut on their ends. Note the home-made jig

Having previously marked the limits of the mortises some scrap timber can be clamped to limit the travel of the router and the mortises cut. The mortises at the top of the legs are haunched so the router is used in two stages.

This process takes a little while but the mortises are square and there is little danger of the router slipping sideways and ruining one of the legs. The jig can also be kept for a future project needing only the spacer timbers to be changed to suit the job in hand. The rails are all cut from 20mm oak so a 16mm cutter was used for the mortises.



A home-made jig to cut mortises in the legs

Cutting the rails

I find it tedious cutting individual tenons to suit the mortises. A method I use that is both accurate and quick is to make a jig very similar to the above one. As 20mm thick timber is used throughout for the rails some scrap 20mm timber is used as the spacer underneath the MDF. The slot is wider than the guide bush as the tenons are cut about 25mm in length, but it is important that the slot is cut at right-angles to one of the straight edges. Again this jig is screwed down onto the work surface and a straight batten is screwed down as a guide against which the oak is pressed and clamped in place.

The router fitted with a fine depth adjuster is used to remove sufficient timber from each side of the oak until a nice fit is obtained in the mortise.

To ensure the rails are all the correct length it is important to accurately mark the timber from where the waste is to be removed and to position the timber accurately in the jig. With the tenons cut at each end of a wide board this is then cut into the appropriate widths for the individual rails on a table saw. The top rails are all haunched into the legs. On the corner legs the tenons can be either cut shorter or alternatively chamfer them with a small



The tenons are chamfered to make maximum use of the mortise depth



The spindles were made in two pieces



The drawer runners are notched into the rails

block plane so that the rails meet each other and so provide more gluing area. Before gluing any of the rails into the legs the edges are decorated with a small beading using a decorative staff bead cutter (Titman DEC6). The tenons are either rounded or the mortices squared with a chisel to suit.

Assembly of the carcase

The two end panels are glued together first using PVA glue and some sash cramps and allowed to dry. The two inner legs are then clamped to the outer panels and allowed to dry before clamping the rear board and the front central rails to the assemblies. Bolting two sash clamps together should give the length required to clamp the rear legs together. Any excess adhesive spilling out should be wiped away with

a damp cloth before it dries otherwise it will spoil the finish. When clamping the various rails together check that the each pair of top and bottom rails are parallel and all the same distance apart as into this gap fits the drawer fronts.

Fitting the drawer guides and drawers

The assembly so far makes up the main body of the dresser. Into this framework fits the drawer runners. Some 20mm oak about 90mm wide is used to make the two central runners and two 45mm wide boards are fitted on the inside of the two outer panels. As can be seen in the pictures, the two outer runners have a rebate cut on the edge and the resulting lipping is glued into a groove cut into the inside face of the outer panels. The two central runners are notched at



A groove is cut for the drawer rails to fit into the end panels

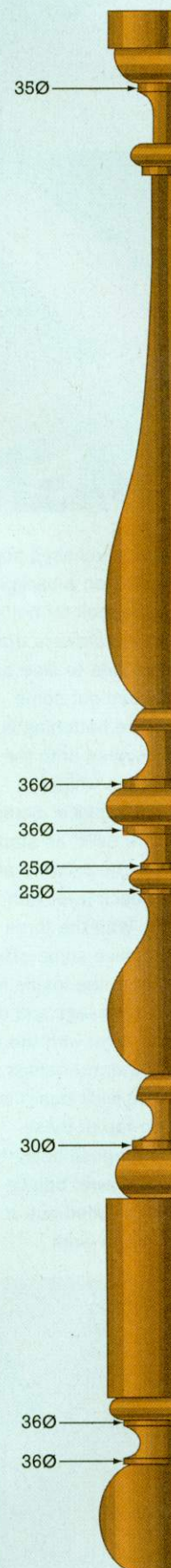
the front into notches chiseled on the top edge of the rails. The rear is fitted into a groove routed in the rear panel using a fence guide along the bottom edge. For the drawers to open smoothly the four runners must all be level with each other.

To achieve this measure from the top of the carcase to the top face of the lower drawer rail and take this as the reference measurement to the rear and the end panel. In this way all four will be level.

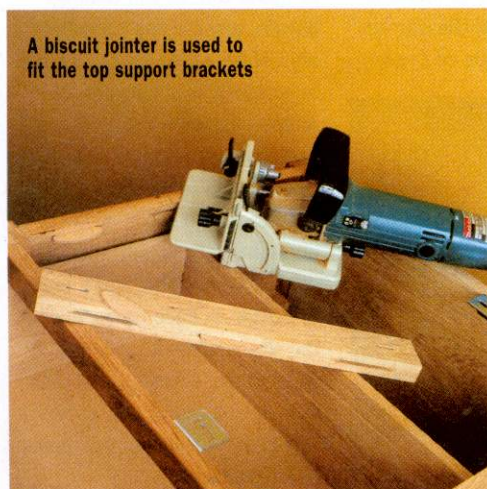
The drawers themselves are made from oak with a plywood bottom let into 6mm grooves routed along the drawer sides. The sides are dovetailed into the front and back. Prior to gluing the drawers together, the fronts are decorated with some oak burr veneer surrounded in boxwood stringing and crossbanded in oak veneer.

Although originally finished with wooden knobs as handles

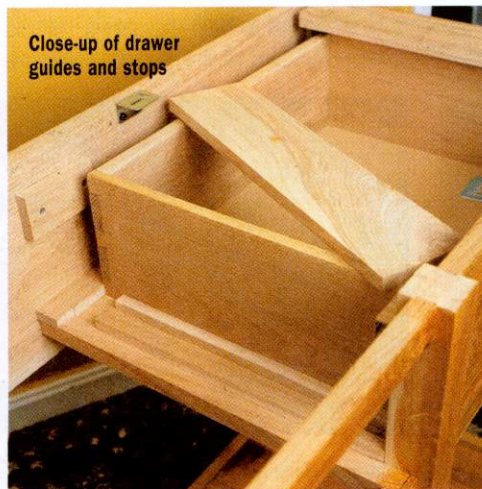
Fig 2 Leg profile



All dimensions in millimetres



A biscuit jointer is used to fit the top support brackets



Close-up of drawer guides and stops



I have since purchased some brass handles on a backplate that really do look far better. To prevent the drawers from sliding from side to side as they are pulled out some 12mm square battening is glued and pinned onto the drawer runners while the drawers are in place. Scraps of timber are used as stops at the back so the drawers are all pushed back level with each other. With the three drawers in place some off-cuts are glued onto the inside face of the two inner legs and on the rear rail level with the top edges of the drawer sides. Some 90mm wide board is screwed on top of these blocks the purpose being to prevent the drawer tipping down as it is pulled out. In order for this to work

satisfactorily the drawer must be made square in the first place and care is to be taken when they are clamped up to dry.

Making and fitting the pot shelf

The pot shelf along the bottom of the dresser is straightforward to make. Some battening is screwed to the front and back rails about 20mm below the top edge. Oak planks about 100mm wide are cut to length and fitted in place starting from the centre and working outwards. Where necessary they are joggled to fit around the legs. As the rear rail curves outwards slightly, pin the centre plank down using one nail at either end only. This is sufficient to hold it in place. The remainder of the

Finishing

To tone down the freshness of the newly planed oak I fumed the dresser in a ammonia. This is a liquid obtainable from most chemists that gives a pungent smell that is extremely irritating to both the nose and eyes and therefore great care should be taken when using it. A framework of battening is made around the dresser with a large plastic decorators sheet draped over. It should be made as draughtproof as practical. The ammonia solution is poured into some dishes laid on the floor around the unit and the ammonia left to react with the tannic acid found naturally in the timber.

The dresser will very quickly begin to darken and the dishes can be removed when the shade desired has been reached. In this case it was only a couple of hours or so, but the longer it is left the darker the wood will go. When satisfied with the colour the unit is sealed with three coats of button polish applied with a polishing mop and de-nibbed with 400 grit emery paper. The burr on the drawer front is bodied up a little with a polishing rubber to fill the open grain a little more. When dry a brown wax is applied and the unit buffed to a nice lustre.

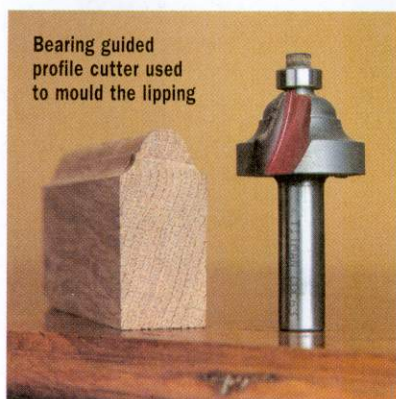
planks are left loose in the bottom of the dresser to allow the pieces to move a little with the varying humidity. Before finally fitting the top, edges are chamfered slightly with a small block plane to give an attractive effect.

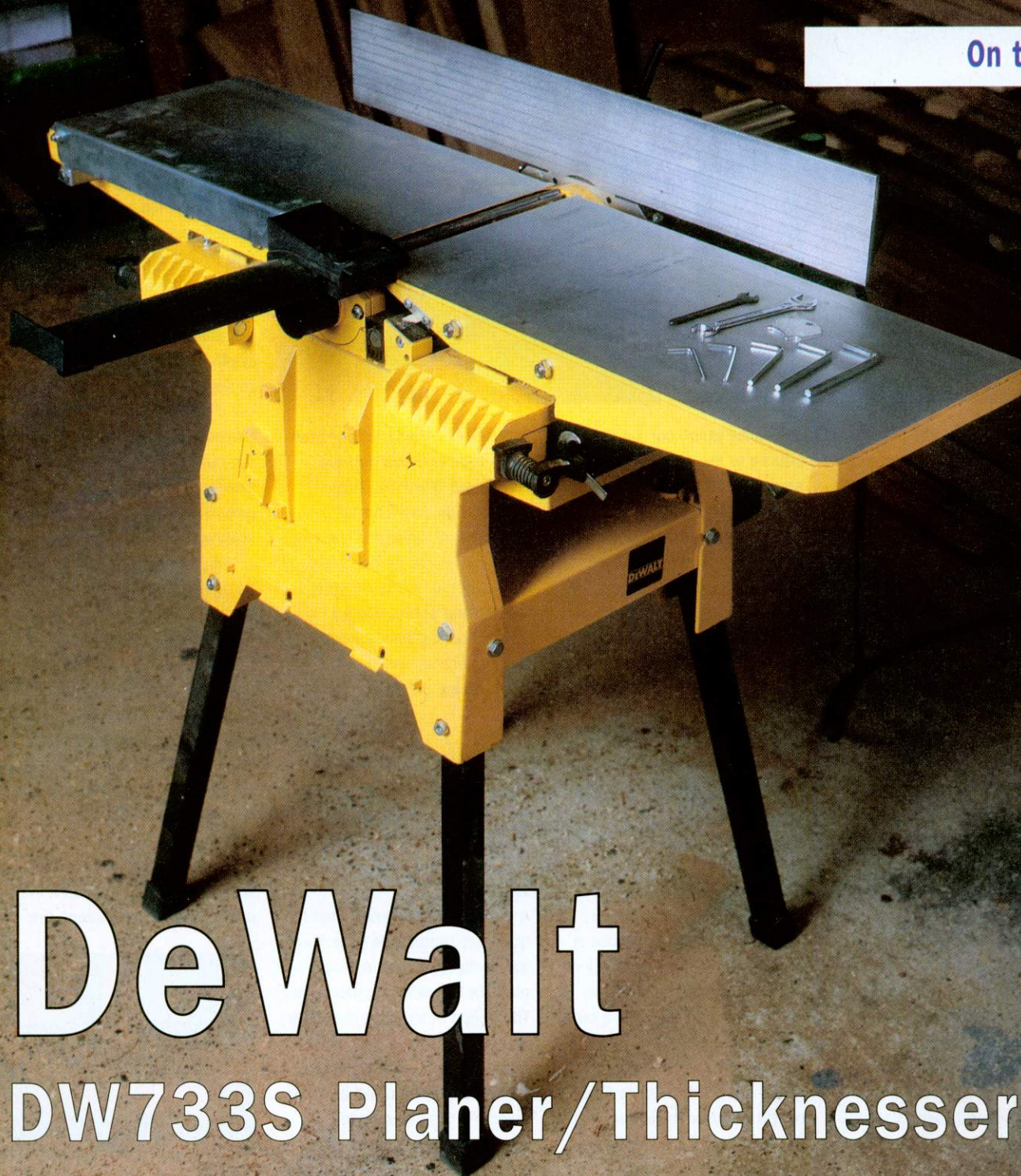
Making and fitting the top

The top for this is made from one piece of solid oak with a 50mm wide lipping on each end and on the front edge. There are two reasons for this. Firstly, the two end lippings help to prevent any tendency for a wide board to warp, and secondly the front lipping makes it far easier to make a neater mitre join at the corner. The top is one piece of brown

oak with an attractive grain. It is not essential that this part is exactly the thickness as the lipping around it as any difference in thickness can be adjusted with thin strips of wood when the top is screwed on the base. It is important, however, that the lipping is finished to 25mm thickness for the bearing guided cutter I used (Titman CDC63). It is also easier to mould the lipping on the router table before fitting it around the central panel. A biscuit jointer is used to reinforce the join between the lippings and the edge.

Particular care should be taken when cutting the mitres to make a neat join and, as before, any excess adhesive should be wiped away. The top is screwed in place with table shrink plates on the front and back rails. Some oak about 50mm wide is biscuit jointed onto the inside face of the two end panels level with the top edge. The router is used to cut two slots in each through which the top is screwed down. The slots in the shrink plates and the end pieces of oak allow the top to move slightly and prevent any splitting.





DeWalt

DW733S Planer/Thicknesser

**Peter Dunsmore
tests out the
latest addition to
his workshop**

Since taking up professional woodworking some years ago I have relied very much on obtaining the varying sizes of timber for the job in hand from the local timber merchant already planed to thickness.

This has proved to be both costly in the initial purchase of the timber as I invariably had to buy more than I required, but it was also wasteful as an ever increasing pile of off-cuts in the corner of the workshop bears testament to.

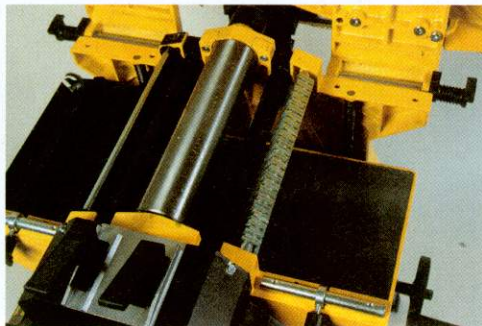
A good planer/thicknesser is a tool that would readily convert this pile into usable pieces of timber both quickly and accurately and would permit me to purchase sawn boards of wood that I could convert to the required

dimensions and thus save a considerable expense at the outset of the next project. The initial purchase cost of such a machine may be high, but whether used in a busy workshop or in the garage of an avid hobbyist/DIYer the initial outlay will be very quickly recouped.

Well packaged

The DeWalt DW733S planer/thicknesser is supplied in a large heavy box that requires two people to lift it.

This very well packaged machine does require some assembly which took longer than I originally anticipated. Although the instructions are clearly written with plenty of exploded drawings, it still took nearly three hours to assemble the various parts together, but I didn't encounter any problems. Apart from a screwdriver all the tools needed to both assemble and adjust the machine are supplied as standard.



Quickly adjusted

The motor is fitted to the side of the machine and drives the cutter block via a two-speed pulley that is quickly adjusted to suit the timber size in hand. Most planer/thicknessers are permanent fixtures in the workshop being, built into some kind of cabinet, but the DeWalt is fitted with four splayed legs that do make the machine a little more portable than most others on the market. Saying that, it is extremely heavy and care should be taken. To plane timber flat, both planing tables are lowered and the tiltable fence guide slid over the cutter area. A substantial plastic guard is slid over the exposed cutter area and the rough timber smoothed. An adjustable handle located underneath the infeed table can adjust the amount of timber removed in one pass by up to 3mm and this corresponds with a small scale at the edge of the table.

The fence guide can be kept square to the cutters to give a square edge or it can be tilted for bevelled edges.

Both the in and outfeed tables are polished smooth aluminium making the passing of the timber smooth and clean, although a periodic application of some wax makes this even easier. Although the

order to thickness timber both the infeed and the outfeed tables are tilted into the vertical position. This is achieved by loosening the two retaining knobs by hand and swinging the tables upright. Two strong spring loaded plastic locking knobs keep the tables vertical and prevent them falling down.

A good planer/thicknesser is a tool that would readily convert this pile into usable pieces of timber

HSS cutters supplied as standard give an extremely good finish it does produce a lot of chippings the majority of which fall under the cutters. There is no facility to fit a dust extractor as standard when planing timber although it would not be difficult to fit a nozzle underneath to remove the majority of the waste. In

In use

A metal shield is swung over the blades to protect the user from the revolving cutters and held in place by two spring loaded clips. The height of the cast iron table is adjusted by turning a wheel that is easily reached, but one that I found quite difficult to turn smoothly despite several attempts at adjusting or oiling.

To engage the rubber coated infeed and outfeed rollers a lever to the left of the machine is raised to engage the pulley belt to pull the timber under the cutters. Anti kick-back fingers prevent any timber being caught and thrown out. The maximum depth of cut that can be removed in one pass is 6mm but if the motor is overloaded there is an automatic overload cut out fitted to the motor to prevent damage. It is in this area that I came across the first real niggle.

With the thicknessing table being made of cast iron the surface is liable to surface rust if there is any damp in the atmosphere, but also the prepared timber was marked with black from the table as it was fed through the machine thus spoiling what would otherwise be a first class finish. I overcame this problem by making a top to fit on the table from some 12mm MDF with a lipping either end to keep it in place. This not only keeps the



Specifications

Motor Power	2200W/240V
Knife Block Speed	6200rpm
Max. planing depth	3mm
Planing table size	260 x 1050mm
Max. thicknessing capacity	160mm
Thicknessing table size	250 x 500mm
Thicknessing feed speeds	5/7m per min
Length	1050mm
Weight	63kg
Standard equipment	Cutter blades, guards, fences and tools.
Price	About £700.00 from most dealers, but worth shopping around.
DeWalt	01753 567055

finished surface clean but the timber went through the table a lot smoother and more efficiently. With the extra thickness of table it is now possible to thickness timber to a little over veneer thickness which is useful in more delicate work. Care should obviously be taken to ensure the table is not raised so high that the cutters dig into the MDF.

Dust extraction

The other problem I encountered is in the area of dust extraction whilst in the thicknessing mode. A plastic hood that bolts onto the cutter cover is supplied as standard but unfortunately the outlet pipe to fit to the dust extraction is of a non-standard size and requires copious amounts of plastic tape to make it work efficiently. It appears to be an afterthought and when I spoke to DeWalt about this they



said they were using a hood from an older model, but this was an area of the machine that they were looking at improving in the near future. The DeWalt 733S Planer/Thicknesser is supplied with HSS blades as standard and TCT blades are not available for this model. They are held in place with Allen screws and very easily adjusted to give the correct setting.

The verdict

Having used this machine now for nearly four months on an almost daily basis I sometimes wonder how I got by without one for so long. The machine is smooth in operation and after four months of almost daily use it still produces consistently accurate results and there is still no sign of the blades needing to be sharpened. The pile in the corner has been considerably reduced in size as the timber is used for various projects and sawn timber is now purchased at a much cheaper price and quickly converted. Apart from the two slight niggles, one of which is easily overcome, it is a machine that I would highly recommend.

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W320 £579.00 12" Crosscut. 2hp Motor.	W308 £145.00 1/2" Capacity. 6" Max. Timber. INCLUDES 3 FREE CHISELS	W306 £459.00 3/4" Capacity. Cast Iron Table		

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For the more ambitious enthusiast or tradesman this 12 piece TCT set contains the most commonly used cutters giving many options when used in combination. These cutters boast anti-kickback design, red electrostatic coated cutter bodies, removable and interchangeable dust proof bearings. W251/2 1/4" or W251/3 1/2" shank.

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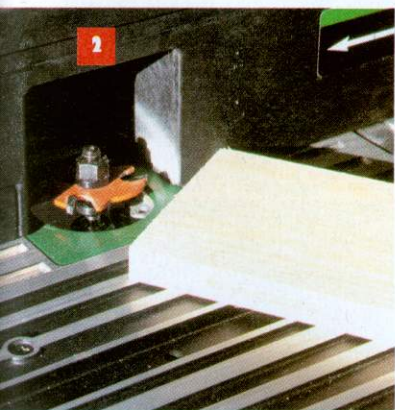
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W791 £299.00 2000 cm/h. 1500W Motor.				W812 £199.00 36" x 12" turning capacity. Rotating headstock, variable speed.



Miscellaneous cutters

Cutter corner
PART 5
By Ron Fox



A small board being slotted for biscuits with the CMT $\frac{5}{32}$ in slotter on a $\frac{1}{4}$ in shank arbor. Heavy-duty routers and tables are not necessary for this operation

In this, the last article in the present series on cutter types, we look at some extremely useful cutters, which do not fit readily into any of the main cutter families. We begin with arbor-mounted slotting cutters.

Arbor-mounted slotters

These cutters consist of one or more circular cutters, resembling miniature circular saws, mounted on an arbor. The basic standard-duty slotters are designed to fit on $\frac{1}{4}$ in shank arbors. Cuts are

made by means of two, three or four TCT teeth brazed to a circular disc of 35 - 40mm. Kerf width ranges from 1.5mm to 10mm.

Depth of cut i.e. the depth of the slot, can be controlled by the router side fence or the table fence, with the maximum determined by the diameter of the cutter and the thickness of the arbor. Alternatively, depth of cut can be set by means of a bearing mounted on the arbor adjacent to the cutter. The smaller the bearing the deeper the cut. With a set of different

diameter bearings, a range of predetermined slot depths is readily available.

The best known use of the slotter in this mode is for biscuit jointing. A 4mm slotter (or $\frac{5}{32}$ in, the two are the same for practical purposes) and a bearing of diameter to give the required depth of cut for the size of biscuit makes easy work of biscuiting with a hand-held or table mounted router. Strictly speaking, you do not need a bearing since you can set the depth of the slot by means of the router

side-fence or table fence, but the bearing makes the job much easier (and it also, of course, enables you to follow curved edges).

Pic 2 shows a small board being slotted with the CMT $\frac{5}{32}$ in slotter on a $\frac{1}{4}$ in arbor. Since I am doing this on a table I have not used a bearing. I have set the table fence with the aid of a simple home-made gauge. The joined boards will be used to make the panel in a small panelled door.

Most cutter suppliers offer a slotter set especially for biscuiting. Typically this consists of an arbor, which might be on a $\frac{1}{4}$ in, 8mm or $\frac{1}{2}$ in shank, a slotter, which might be 2- 3- or 4-tooth, and three bearings which give the required depth of cut for the three standard biscuit sizes.

Pic 3 shows three biscuit jointing sets. From left to right: CMT on a $\frac{1}{2}$ in arbor, Wealden and Trend, both on $\frac{1}{4}$ in arbors. With the CMT and Wealden cutters the slotters are all bored to the same diameter (8mm for CMT and $\frac{1}{4}$ in for Wealden) which means they fit any of their own arbors irrespective of shank diameter.

Apart from biscuiting, slotters have many other applications. These range from tongue-and-groove jointing to small tenons, rebates, spline joints, edge-strip inserts and inlays.

Pic 4 shows the components of a small panelled door. Apart from a saw, the machining was done entirely with only the two slotters shown: a $\frac{5}{32}$ in for the biscuit joints and a $\frac{1}{4}$ in for grooving the rails and stiles of the frame, tenoning the ends of the rails, and rebating the edges of the panel to fit the frame grooves.

Heavy-duty arbors

Bigger slotters can be mounted on heavy-duty arbors. For example, the Trend $\frac{1}{2}$ in shank arbors take slotters with a 12mm bore and diameters from 50mm to 100mm. Similarly Titman supply a $\frac{1}{2}$ in shank arbor with a matching range of 50mm diameter 4-tooth cutters with kerfs ranging from 4 to 12.7mm. Wealden offer a $\frac{1}{2}$ in shank arbor for the thicker (deeper kerf) slotters.

Several suppliers offer sets of four slotters mounted on a $\frac{1}{2}$ in shank plus a selection of bearings to give varying depths of cut and a set of shim



The CMT, Wealden and Trend biscuit jointing sets

washers to fine-tune the spacing. The cutter kerfs range from $\frac{1}{8}$ in (3.2mm) to $\frac{1}{4}$ in (6.3mm). They can be used singly or in combination to give cuts from $\frac{1}{8}$ in to $\frac{23}{32}$ in (approx. 3mm to 18mm). Pic 5 shows the CMT set plus two other heavy-duty slotters from Wealden and Titman.

With all these cutter sets, the slotter blades can be bought separately. You can therefore put two slotters of, say, $\frac{1}{4}$ in kerf on to the arbor separated by a spacer or a bearing so as to cut the tongue in a tongue and groove joint in one pass.

Tenon cutters

Router-cut tenons are usually made with straight cutters of $\frac{3}{4}$ in diameter upwards in a router table or with a hand-held router and a suitable jig. Two exceptions are the WoodRat and the Trend/Bosch tables where the cuts can be made with the workpiece held vertically, using the length of the blade rather than the bottom.

Wealden Tools have recently introduced a pair of cutters designed specially for tenon cutting. They have four cutting edges with two down-shear blades for the shoulder and



The components of a small panelled door with the only two cutters used to make them - $\frac{5}{32}$ in for biscuit jointing the panel boards, and $\frac{1}{4}$ in for grooving the rails and stiles and tenoning the rails. They were used on a $\frac{1}{4}$ in arbor



Three heavy-duty slotters: CMT, Wealden, Titman. The CMT slotters can be used singly or in combination

Two tenon cutters from Wealden



6

two up-shear blades for the face of the tenon. These four blades give a clean finish to tenons: in addition the cutters can be used for rebates and surface trimming e.g. taking the curl out of boards and bringing them to exact thickness. In fact, their configuration on the cutter also produces extremely clean rebates in difficult cross-grained wood.

Pic 6 shows these two cutters, one on a 1/4in shank and one on a 1/2in shank. The alternating shear of the blades can be clearly seen.

Surface trim cutters

One of the lesser-known applications of the router is flattening and thickening boards. This is a particularly useful ability when making

miniature mouldings etc., since there is very little leeway for error in the thickness of the timber being moulded.

Other useful applications include planing difficult timbers where a planer/thicknesser tends to pull the surface of the board, and preparing small workpieces, e.g. oddments of expensive hardwood left over from a larger project, where the pieces are too small to pass through a thicknesser but plenty big enough to use for small boxes, etc.

Pic 7 shows a selection of such cutters from CMT and Wealden. The centre one was introduced originally for trimming Corian, the very hard marble-like plastic used extensively in kitchens and bathrooms. It has proved, however, very effective on all

timbers and synthetic boards. A similar cutter is available from Trend. Note that the Wealden tenon cutters mentioned above are also very suitable for this kind of work.

Pic 8 shows thickening in progress with the 6-wing cutter on my home-made thickening table with the router mounted on home-made 'skis'.

Drilling cutters

Yet another undervalued use of the router is as a drill. The beauty of the router is that you automatically have a perfect 90° angle of entry into the workpiece and precise depth of cut. Whenever a hole is required further in from the edge of the panel than the throat of your drill stand allows, the router comes into its own.

Many cutter suppliers now offer a range of drilling bits that operate at router speed. For most of these a variable-speed router is advantageous but some of these drilling bits operate over a speed range of 1,500 to 24,000rpm and can therefore be used in single-speed routers.

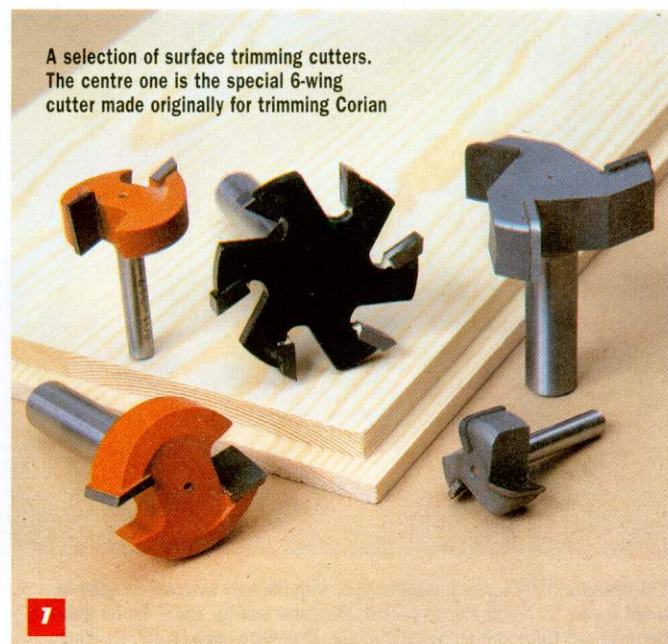
Pic 9 shows a number of drilling bits. These are all TCT and all from the Wealden range but similar cutters are

available from other suppliers. All are lip-and-spur type on 1/4in shanks, and the one on the left is a combined drill/countersink/counterbore bit.

Special bits make the job a little easier but are not absolutely necessary. I have drilled many holes with the router fitted with straight bits (with bottom cut). Better still are the solid carbide spiral-upcut cutters available from CMT, Trend and others. These make short work of most materials and the twist in them helps lift sawdust out of the hole.

If you use your router for drilling as often as I do, you might want to make a simple false base to make the job easier. A useful prerequisite for this is an MDF pattern of your router base - a work aid that I have mentioned in previous articles. The idea is to have a false base of clear plastic - Perspex or one of the other glass substitutes - which screws to the sole plate of your router. With it fixed to your router base, put a V-grooving cutter in the router (unplugged), plunge it to the surface of the false base and twiddle it to leave a dot marked on the plastic. This dot

A selection of surface trimming cutters. The centre one is the special 6-wing cutter made originally for trimming Corian



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Further information

The cutters described in this article represent a small selection of the miscellaneous cutters tucked away in the catalogues and present a strong argument for collecting as many catalogues as you can and browsing through them.

CMT Cutters (Woodcut Trading Company)	01424 819900
Trend Machinery and Cutting Tools	01923 224681
Titman Tip Tools Ltd.	01255 220123
Wealden tool Company	07000 565000



Thickening in progress with the 6-wing cutter in the DW 625 router, on my home-made thickening table with the router mounted on home-made 'skis'

will be dead-centre in your router base and can now be used as the marker for two hair-lines to be scribed at right angles to each other to fix the position for drilling. Now put the false base back on the router, take a straight cutter a little larger in diameter than the proposed drilling bit, install it in the router, plug in, switch on and plunge the cutter through the plastic base to give a clearance hole for the drilling bit.

Pic 10 shows a false drilling base fitted to my Hitachi M8V router with the 10mm drilling

bit installed. The clearance hole was made with a $\frac{1}{2}$ in straight cutter. If, when drilling, there is any tendency for the router to slip on the workpiece, two small pieces of coarse abrasive paper can be stuck to the false base with double sided tape.

Keyhole cutters

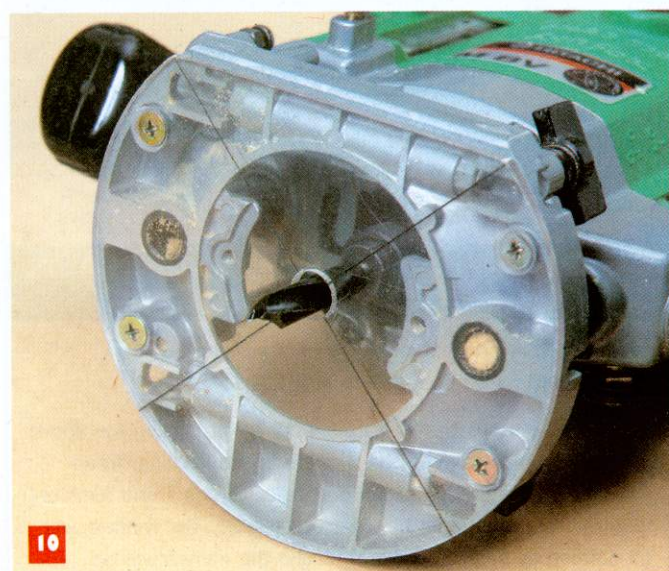
Keyhole cutters are among the specialised cutters that perform very useful 'odd jobs'. They are used to sink a keyhole shaped recess in the back of a picture frame, clock



Four drilling bits: from left to right: $\frac{3}{16}$ in drill/countersink/counterbore, $\frac{3}{16}$ in lip-and-spur, 10mm lip-and-spur, 6mm lip-and-spur

or plaque that is to be hung flush from a wall. The cutter is plunged into the workpiece and moved forward about 12mm. It is then reversed to its original position and raised out of the workpiece. The effect of this movement, taken with the shape of the cutter, creates the 'keyhole', which allows the plaque to be hung on a round-head screw. Two sizes of cutter are available: one for No. 8 and No. 10 screws and one for No. 10 and No. 12 screws. Although the job can be carried out freehand, it is easier and

more accurate if you use a guide bush with a suitable jig. This consists simply of a piece of MDF with a slot cut in it to provide a snug fit for the intended guide bush. The jig guides the cut in a straight line and the length of the slot can be controlled by stops or by lines pencilled on the jig. The Trend keyhole cutter comes with instructions for use, including the making of a specific guide bush jig, but I use my general purpose guide bush guide for the purpose. Pic 11 shows the jig and cutter in use.

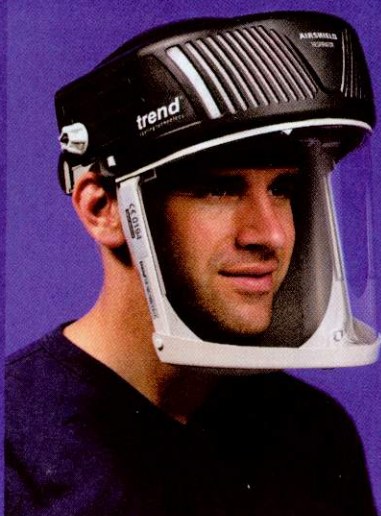


A false transparent drilling base fitted to my Hitachi M8V router with the Wealden 10mm drilling bit in the collet



A keyhole cut being made in the back of a plaque for wall mounting. Note the simple home-made jig to guide the guide bush

**£1500 Trend
Competition**



WIN the new Trend Airshield

Airshield features

- Large pre-filter and main filter for greater particle retention and efficiency
- Wide visor/frame for good visibility and strength
- Fully adjustable head frame to suit most crown sizes
- Floating head-frame pivot assembly for user comfort
- Well balanced and lightweight for ease of use and comfort
- Incorporates rear comfort pad and sweatband brow deflector
- Easily accessible switch and battery compartment(s)
- Flip-up visor for convenience
- Soft face seal
- Eight hours continuous use upgrade option
- Easily replaceable motor/fan assembly
- Contour fitting visor overlays

Thanks to Trend Machinery and Cutting Tools, this issue we're giving you the chance to

win the latest in respirator technology - the new Airshield

The Airshield is a battery powered respirator for use with all woodworking applications, especially routing and woodturning.

Providing excellent protection from the inhalation of harmful dust with a pre-filter and fine dust filter. The polycarbonate flip-up visor also protects eyes and face against the impact from flying debris.

Includes a rechargeable 4 hour Nicad battery which drives a quiet fan to keep a constant flow of filtered air flowing across the face. The respirator has a minimum air flow rate of 140 litres per minute, although when fully charged this is increased to as much as 180 litres per minute.

How to enter

If you would like to win a Trend Airshield all you have to do is write your name and address on a postcard or sealed envelope together with your answers to the three simple questions below and send it to: **Routing/Trend Airshield Competition, Nexus Media, Nexus House, Azalea Drive, Swanley, Kent BR8 8HU**

Q1. What is the Airshield's flip-up visor made from?

Q2. How long does the standard Nicad battery last?

Q3. What is the Airshield's minimum air flow rate?

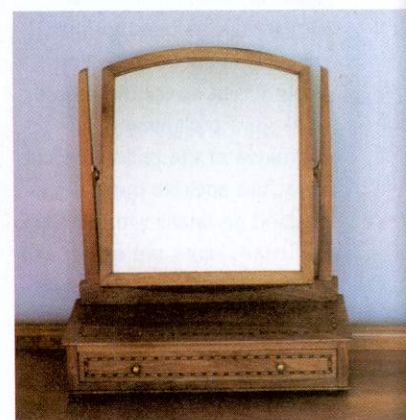
Rules

Only one entry per reader will be entered into the draw. Closing date for entries is 10th May 2001.

The first 8 correct entries pulled out of the hat on the above date will be judged to be the winners of the Routing/Trend Airshield Competition and will each receive one Trend Airshield respirator. Entries must be clear and legible. The winners will be notified by post after the draw and the names will be published in a future issue of the magazine. There is no cash alternative to the prize.

In the frame

Look good from any angle with this swivelling framed dressing table mirror by Betty McKeggie



This is the third mirror made to this design, the other two having disappeared into the boots of our daughters' cars as soon as the varnish was

dry. The wood and decoration were chosen to complement existing traditional furniture, but with a different choice of wood and without the banding, the design would fit in to a modern setting.

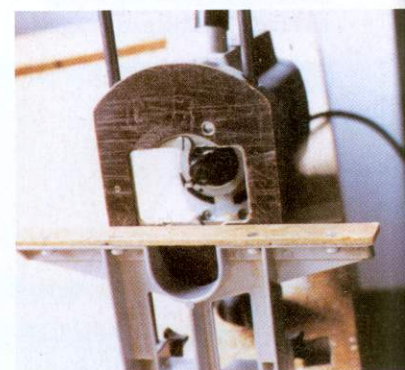
The wood chosen was sapwood walnut, which is lighter in colour, not as boldly figured and cheaper than the heart wood.

Construction

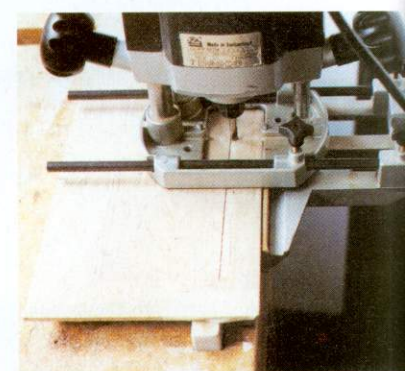
At each stage of the construction the pieces are smooth finished with successively finer grades of abrasive paper, joints checked for fit, and the base and drawer checked for squareness.

The base

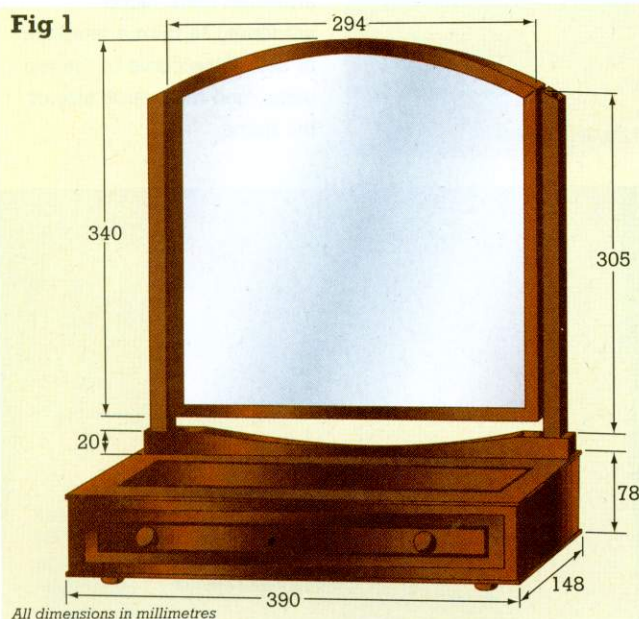
The top, side and bottom pieces are cut to size, and the top and bottom rebated using a straight bit in the router to form a decorative lip on the front and sides and to take the plywood back. The pieces are joined with double lapped comb joints. These are marked out and the sections to be cut away are scribbled on with



Fence screwed to base of router

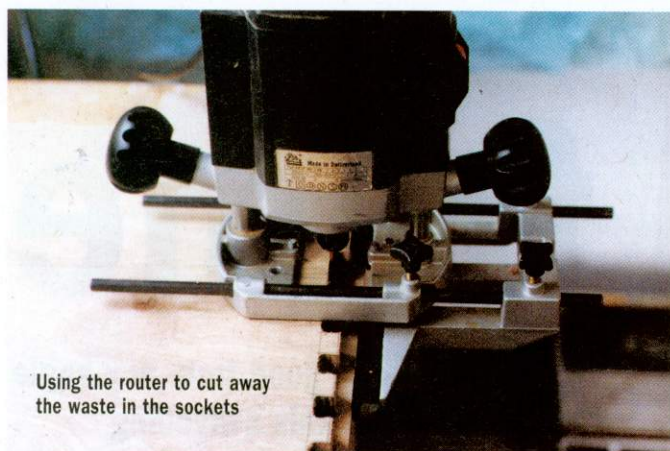


Routing the channels for the banding



All dimensions in millimetres

Project



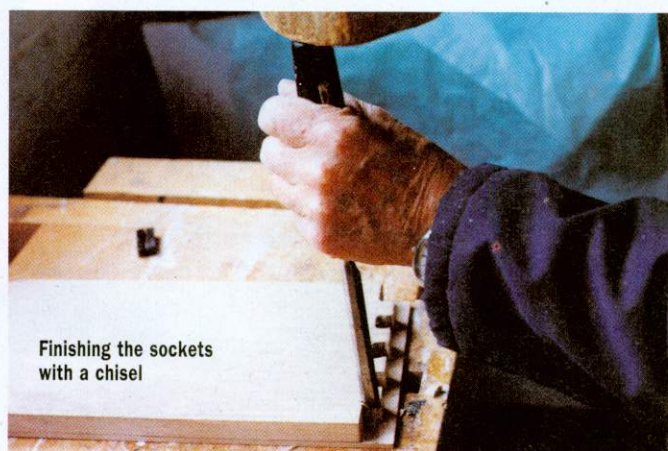
Using the router to cut away the waste in the sockets

pencil, to prevent any mistakes being made. The router is used, fitted with the same straight bit, as used for the rebate and set to the same depth of cut as for the rebate, to make a preliminary clearance of the bulk to be cut away, the sockets being cleaned up finally with a chisel. The comb joints are easier and quicker to make in this small size than say, double lapped dovetails and are sufficiently strong for the purpose, giving a good area for gluing, and providing an overhang to top and bottom all in one process.

Banding

The channels for the banding are marked out, and their limits marked with masking tape, as a guide for the router. The router is fitted with a strip of wood to provide a continuous fence, having removed the standard plastic liners. A straight cutter is used to suit the width of the banding.

The lengths of banding are cut to size with the ends mitred. Care should be taken to see that the arrows in the banding will all be facing anti-clockwise in the finished decoration and that they will be



Finishing the sockets with a chisel

at similar distances from the comers. The banding is glued in place, covered with plastic sheet and clamped to set. The base is assembled, glued, clamped and left to set.

The drawer

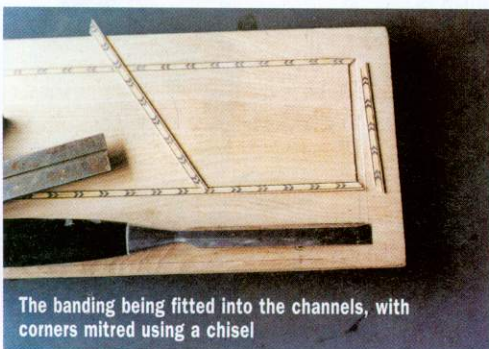
The drawer pieces are cut to size, and the drawer front decoration applied in a similar way to that of the base, as above.

The fronts and side pieces are joined with lapped dovetails. The top edges of the rear ends of the side pieces are rounded down to meet the

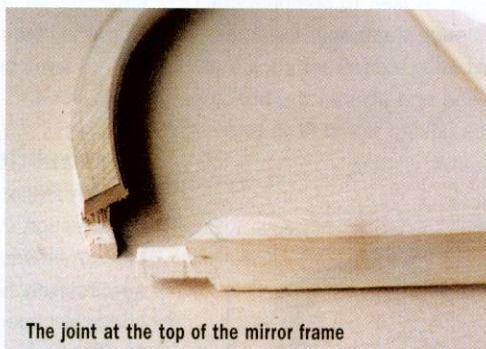
back piece which is narrower than the sides. This will make the drawer easier to insert.

The sides and front of the drawer are temporarily assembled, and slipped into the base before the back has been fitted. It is then possible to mark where the drawer stops on the bottom of the base should go, and these can be glued in place.

The front and side pieces are grooved to take the plywood bottom, and the back and sides joined with through dovetails. The front sides and back are glued, clamped and left to set. The plywood bottom is slipped into place to check for fit and squareness.



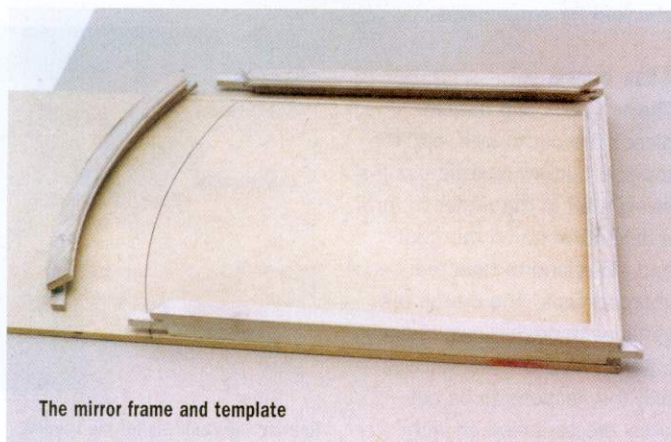
The banding being fitted into the channels, with corners mitred using a chisel



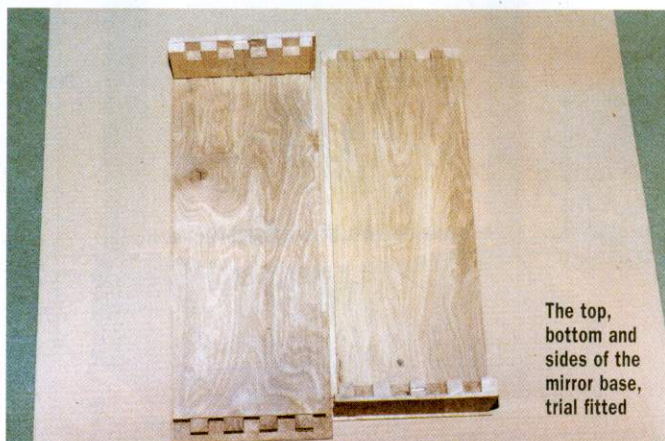
The joint at the top of the mirror frame

Mirror frame

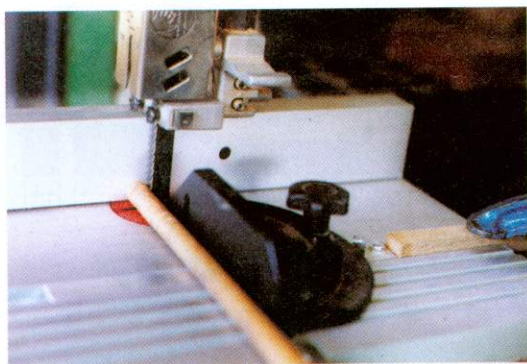
An outline of the frame is drawn on white faced hardboard to form a template to define the curve of the top piece, and the overall size of the frame.



The mirror frame and template



The top, bottom and sides of the mirror base, trial fitted



Using the bandsaw to make the legs



The bottom of the mirror, showing the legs in place and the holes used when screwing the mirror supports to the base

A trammel is used to cut the curved top piece of the frame. The trammel is a home-made device, consisting of two long dowels fixed into a block. The block is attached to a larger block by a screw, round which the trammel can pivot. The larger block is clamped to the bench.

The other ends of the dowels are fixed into the router, which can then be moved through an

arc whose size can be controlled by adjusting the distance between the pivoting block and the router.

The wood for the top of the frame is clamped to a larger piece of scrap wood, and the router, fitted with a straight bit, is used to cut the outer curve, the rebate and the inner curve. The piece is then turned over and the decorative moulding is

cut, using an ovolo cutter. The scrap wood is needed to stop the router cutting into the bench.

The side and bottom pieces for the frame are cut to size, rebated to allow for the thickness of the mirror and

moulded to match the top. Bridle joints are used to join the frame pieces. The frame pieces are laid out on the hardboard template and the bridle joints marked out, including the angled joints joining the side pieces to the top.

Cutting list

Description	No	Length	Width	Thickness	Material
Base, top & bottom	2	390	148	16	Walnut
Base, sides	2	144	70	16	
Drawer, front	1	346	45	16	
Mirror support base	1	370	30	20	
Mirror support uprights	2	340	20	20	
Mirror frame btm.	1	294	28	20	
Mirror frame top	1	294	40	20	
Mirror frame sides	2	318	28	20	
Drawer sides	2	130	45	11	Oak
Drawer back	1	318	30	11	
Drawer bottom	1	340	130	4	Plywood
Base back	1	370	68	4	
Mirror back	1	275	310	4	
Banding	2 metres				
1/2in Brass Knobs	2				
1/2in Dowelling for Legs					
Mirror swivels	2				
Mirror	1				

All dimensions in millimetres unless stated otherwise

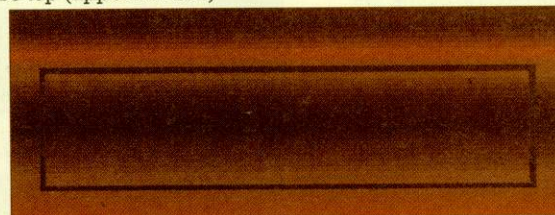


The back of the mirror, showing masking tape used to seal the back

Fig 2

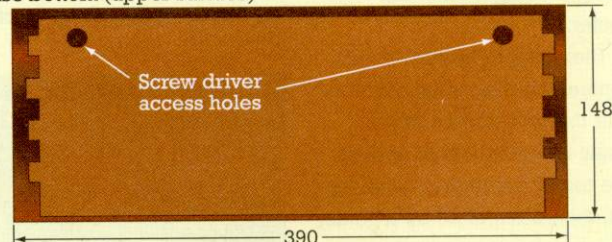
All dimensions in millimetres

Base top (upper surface)

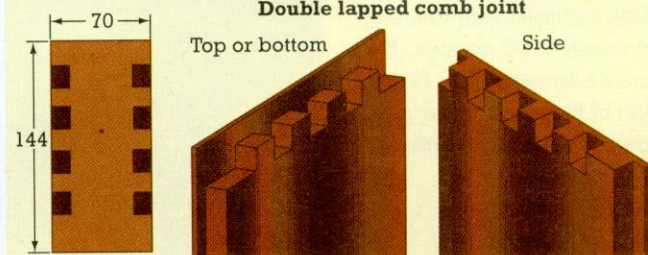


Section through base top & bottom

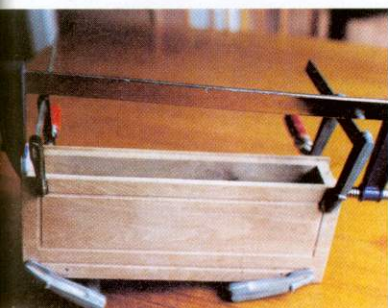
Base bottom (upper surface)



Double lapped comb joint



Project



Cramping the base



The legs

The frame is assembled, checked for squareness, glued, clamped and left to set. The frame is then taken to a glazier to have a piece 2mm silvered mirror glass fitted. The plywood back is cut to shape on the bandsaw.

Mirror support

The support rail has a curved upper surface reflecting the curve at the top of the mirror, and will allow a person using the mirror to put a hand underneath to tilt it. After cutting the rail piece to size, the trammel is used to cut the curve. The rail piece is clamped, and the cut made using a straight bit in the router.

The uprights are cut to size, tapered on their outer surface, and the tips slanted at an angle which continues that at the top of the mirror, using the hardboard template as a guide. They are tenoned into the rail, taking particular care that they are exactly at 90 degrees. The distance between them is the width of the mirror frame plus the thickness of the mirror swivel fittings.

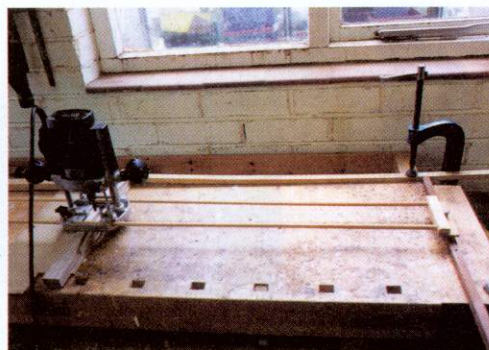
The mirror support is attached to the base by

screwing up into the rail from underneath. Two holes are made in the bottom of the base to allow access for the screwdriver.

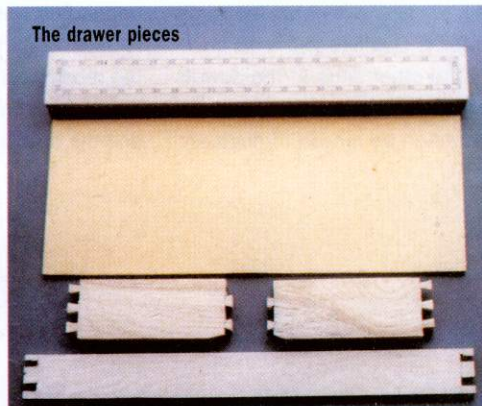
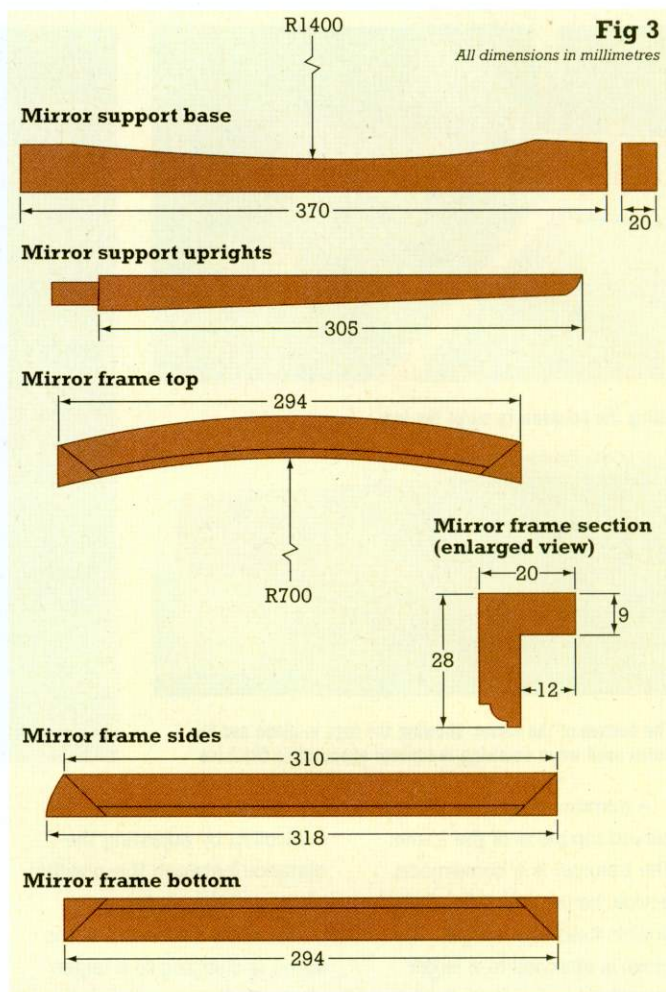
Walnut burr and crown cut veneers over an oak carcass with solid walnut for the mouldings

Legs

The four legs are made from 1/2in dowelling. The position of the grooves and lengths of the legs are marked in pencil on the dowelling. Stops are positioned on the bandsaw bed to limit the dowel's movement forward and sideways, and the dowelling is turned against the blade to form the smaller diameter top of the leg and decorative grooves. The legs are then separated and smooth finished.



The trammel used in cutting the curved mirror top and support rail



The drawer pieces

Finishing

The finish chosen was acrylic varnish, two coats being applied. The plywood back is fitted to the mirror and sealed round with good quality masking tape. To find where the mirror swivels should be placed, the balance point of the mirror is found by laying the completed mirror across a piece of dowelling, seeing where it balances and fitting one half of each swivel there. The other half of each swivel is fitted to each upright making sure that the curve of the top of the mirror lined up with the angle of the top of the uprights. The brass handles are fitted to the front of the drawer, and the legs glued into holes of suitable depth drilled in the base bottom.



Andy Standing checks out the latest budget priced machine



Ferm FBF8E

Router

The Ferm range of budget priced power tools is sold exclusively through Screwfix Direct. I have had several of their tools on test and have been impressed with their overall performance and excellent value for money. The FBF8E is their contender in the small router market. Loosely modelled on the 'God' of small routers, the Elu MOF96E, it has a 850watt variable speed motor and is supplied with three collets 1/4in, 6mm and 8mm. It also comes with a side fence, dust extraction hood, 12mm straight cutter, 17mm

guide bush and a spanner for cutter changes. This lot will set you back the princely sum of £42.99 plus delivery.

“Loosely modelled on the ‘God’ of small routers”

The build quality is surprisingly good. The body is made from tough plastic and fits together well with no poor joints or flimsy attachments. The lower part of the body is alloy and the two side handles screw into it at a slight angle. The body is supported on two 18mm

diameter columns which are held into the alloy base plate with a pair of grub screws. The underneath of the base plate is plastic covered to protect the workpiece from scratches.

Variable speed

The Ferm has an 850 watt motor with variable speed from 9,000 to 28,000rpm which is more than enough to cope with a wide range of cutters. Variable speed is an important feature on a router as it allows the cutter rotation to be tailored to the job in hand. The basic rule is that the larger the cutter diameter, the slower the speed. This is because the quality of cut is determined by the speed of the cutting face itself through the material. Therefore the larger the diameter of the cutter, the further away from the centre the cutting face will be, and



Simple depth setting rod with 3 position turret below



Small spring pushes collet out to ease cutter removal



consequently it will move at a much higher peripheral speed for a given RPM. Running cutters too fast can cause several problems. Firstly it can cause damage to both the machine and the cutter, through overloading. Secondly the cutter will overheat and burn the workpiece unless a high feed speed is used. Thirdly the cutter will wear much faster and lose its edge. Router cutter manufacturers generally quote the maximum safe speed at which a cutter should be used.

Another advantage of variable

Overall the plunging action is smooth and easy

speed is that it allows you to slow down the cutter speed for intricate work, so that you may move the tool at a slower pace across the workpiece without fear of burning.

The Ferm's variable speed is fairly primitive, but effective. It lacks the sophistication of some of the more expensive tools that are able to maintain a constant speed even under load, so it does slow a bit under pressure.

Taking the plunge

The Ferm is comfortable to hold with large plastic handles. The plunge lock lever is located behind the left handle. It has an unusually strong return spring which means that it will release itself unless very firmly pressed down. There is a small amount of play in the right-hand column, though this disappears when the plunge lock is applied.

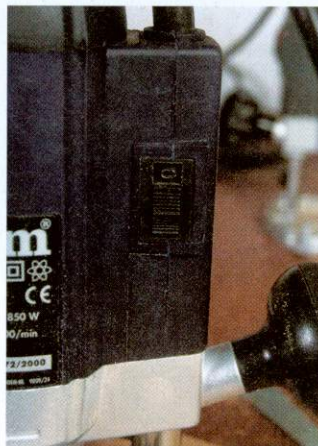
Overall the plunging action is smooth and easy. There is a simple depth setting rod with a three position turret below. The rod size and thread are the same size as the Trend T5 so it can share the same fine height adjuster.

The power switch is on the right hand side of the machine. It is a simple slider switch with a positive action that does not need to be held to keep the motor running. I personally prefer this type to the newer safety switches that will not lock on.

Cutting edge

Cutter changing is a fairly simple task. The Ferm is supplied with three collets, of the conical type. These do not locate in the collet nut so they are not pulled out of the taper as the nut is loosened. This

can mean that tightly fixed cutters can be hard to remove, however Ferm have fitted a small spring in the base of the taper to push the collet out as the nut is loosened, which greatly eases cutter removal. There is a spindle lock operated by a perspex lever, so only one spanner is needed.



Simple slider switch has positive action

Dust extraction

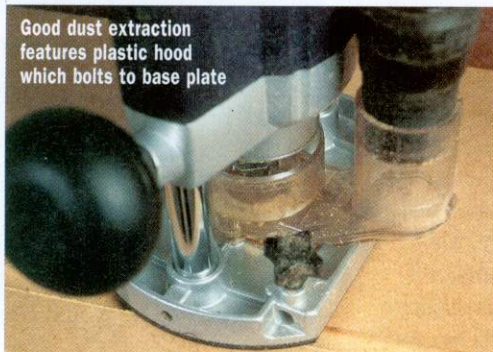
In these health conscious days, all machines usually come with some kind of dust extraction connector. The FBF8E has a very efficient system. A plastic hood bolts to the base plate through the guide bush holes. As the router is plunged, the hood

encloses the nose of the motor providing a good seal. With a vacuum connected, routing housings in MDF was an almost dust free operation. When edge moulding, rather more dust escapes, but then extraction is really needed below the cutter rather than above.

Base plate

The base plate of the Ferm is a slightly smaller version of that found on the Elu. It also takes the same size collets so it can use the full Trend range. For table mounting the guide bush holes may be used, or alternatively the four threaded holes used to hold the plastic cover plate.

In use the Ferm performs very well for a sub £50 machine. It has a pressed steel side fence for straight edge work, and this could be extended with some timber to give better support. There is no soft start on the motor, so it does start with a bit of a jolt, and a firm grip is needed. The motor runs fairly smoothly, but the plunge lock needs to be securely locked down to stop it from releasing. A great advantage is that the Ferm is compatible with many of the accessories from the Trend range. It is also identical to the Power Devil PDW850.



Good dust extraction features plastic hood which bolts to base plate



Pressed steel side fence for straight edge work

Specifications

Motor Power	850 watts
Variable Speed	9000 - 28000rpm
Collets Supplied	1/4, 6mm, 8mm
Guide Bush Supplied	17mm
Weight	3.8kg
Price	£42.99 + delivery
Contact	Screwfix Direct 0500 414141

The verdict

Overall this is a competent tool at a bargain price, and provides a cheap way into the world of routing.

Stairway to heaven

Jack Cox shows how, with the aid of Trend's new Joinaboard dovetail jig, it's possible to achieve strong, decorative joints in small home projects

The Trend 'Joinaboard' jig, shown in pics 1 and 2, is primarily intended to produce large end-to-end

dovetails in floorboards, decking, wall-panelling and the like. One might imagine therefore that its use for small home projects might be rather limited. I have discovered that this is not necessarily the case. The project illustrated (and I have others in mind) is a case in point and is, on the face of it, simple enough - a handrail to fit on a wall alongside a staircase. My personal problem was simply that the rail needed to be about twelve feet long (about 3700mm). Acquiring a single, stable piece of hardwood of this length would probably be possible, but working it down to precise cross-sectional dimensions in my small workshop would be rather more difficult. So inevitably, the question of end-to-end jointing arose - which in turn suggested dovetails.

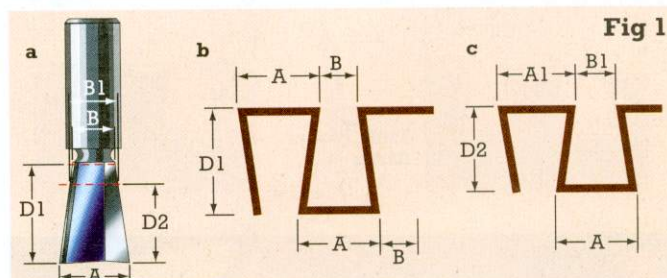
Sturdy and decorative

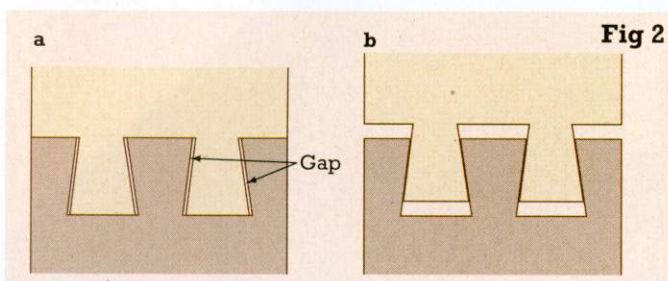
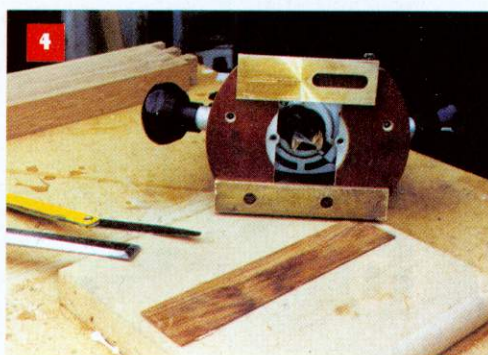
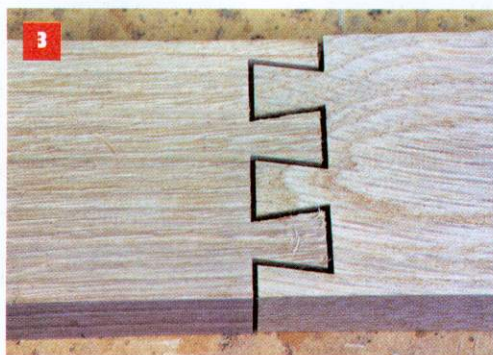
A project of this kind needs to be sturdy as well as (hopefully) decorative, so the dovetails need to be fairly large, a requirement which is well and truly met by the Joinaboard. Leigh jig owners will be aware that this jig will do the same job, with the same cutter (in my case, the Trend L90), but will require a home-made fixed half-pitch offset to be temporarily fitted, or an 'inverse' arrangement, using both ends of the jig, since only the 'straight' fingers are used. The nominal dovetail size (in the timber) is $1\frac{1}{16}$ in (17.5mm) wide by $\frac{15}{16}$ in (24mm) deep at a pitch of $1\frac{1}{8}$ in (28.5mm) with a flank

angle of 82°. The jig itself is of the offset type, thus requiring that 'pins and tails' or in this case 'tails and tails' are of equal width.

With any dovetail jig which uses a dovetail cutter to cut both mating components, the class of fit is determined by the depth setting of the cutter, a deeper setting giving a tighter fit and

vice-versa. This feature is exploited in the present design to provide a decorative joint, which uses an inlay of contrasting timber to pick out the joint outline. To begin with, it is helpful to see how this feature works. Fig 1(a) shows a typical dovetail cutter, suitable for the job to be described. Any dovetail jig which uses a guide template



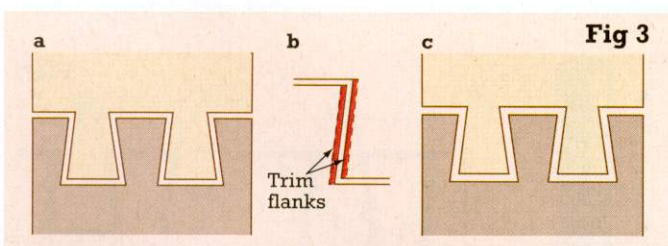


of a fixed pitch (i.e. the distance between any two identical points on a set of dovetails), will normally specify a particular cutter for use with it. Actually, the important parameter is the maximum width of the cutter and, provided that this is as specified, the flank angle of the cutter doesn't matter.

Pins and tails

Referring to fig 1(a), if the depth of cut into the timber is set to 'D1', then 'pins and tails' will be equal. Referring to fig 1(b), the

lower dimension 'A' will be determined by the cutter, and the upper dimension 'A' will actually be determined by the fixed offset provided by the pitch of the jig. Since both dimensions are equal, a pair of joints will (theoretically) fit perfectly. If the depth of cut is reduced to 'D2' as shown in fig 1(a), the dimension 'B' is increased to 'B1', (see fig 1(c), which also has the effect of reducing the dimension 'A' to 'A1' (because the pitch remains the same). This has the effect of making the



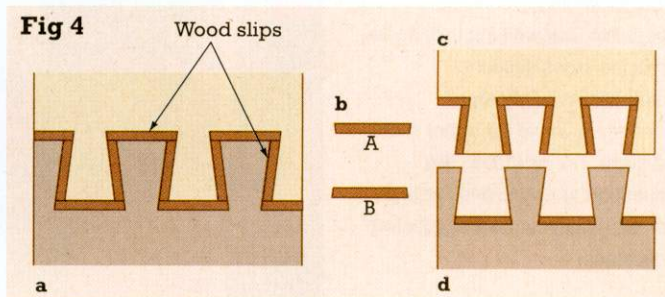
Contrasting timber

It is then possible to fill the gaps with slips of contrasting timber, as shown in fig 4(a). Only two nominal profiles are required, shown as 'A' and 'B' in fig 4(b). I suppose if the overall machining were perfect, it would be possible to calculate the dimensions of these (including thickness), make several, and then simply fit them. Things didn't work out quite that way in my case, and I was obliged to hand-fit more or less every piece.

Use a router on a flat surface to complete the job

The slips are made by bandsawing a few off-cuts of 'exotic' somewhat oversize on thickness, and then use a router on a flat surface to complete the job. The slight 'stand-off' of the router base from the work surface is dealt with by temporarily fixing a couple of scrap bars of metal of known thickness to the router base with double-sided tape (pic 4).

The workpiece is held to the work surface with several small slips of the same tape (do not, under any circumstances, completely cover the workpiece with tape - it will be found very difficult to remove afterwards). The slips are cut slightly over-length - i.e. slightly greater than the thickness of the main members. Note here that the dovetail profile is picked out in end-grain, since this shows a slightly darker and generally more consistent shade than side-grain.



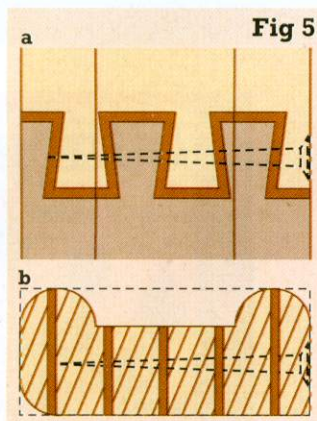
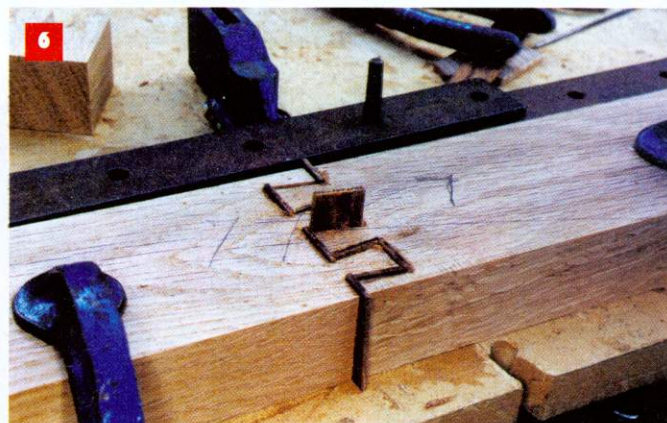


Fig 5

Edge profiling (fig 4(b)) is achieved with a disc sander, with the worktable set to the required angle of 82° (pic 5). The aim is to produce slips which slide fairly easily into place with the two members cramped to the worktop in the required position (pic 6). Each slip is held in place (on one member only) with superglue as illustrated in fig 4 (c) and (d) and pic 7. This allows the joint to be dry-fitted for further work (due to the overall length of the job, it is inadvisable to fully-glue all joints at this stage). With the joint refitted, it is now possible to trim the slips to the size of the main members. I would advise the use of a medium-cut metalworking file for this, as the use of abrasive paper or cloth may leave a few abrasive grains in the timber, which will do router cutters no good at all.

Enhanced appearance

However careful the work to this stage, it will almost certainly be found that one or two tiny steps will appear between jointed main



members. Before routing the lengthwise profile, it is advisable to remove these - and it will be necessary to hold the joints together tightly whilst doing so. This can be effected by means of a single No. 6 woodscrew running almost the full width of the work, through the dovetails,

Edge profiling is achieved with a disc sander

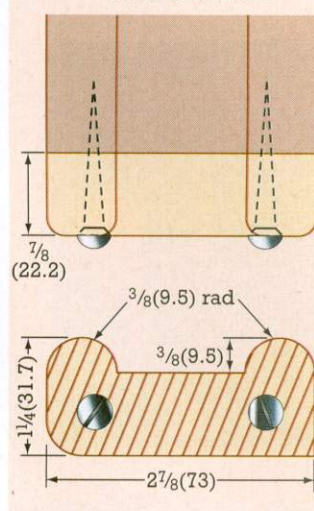
inserted from the rear (where it won't show), and placed such that the router cutter will miss it completely (fig 5). This will allow each joint area to be lightly dressed with a plane, to provide a smooth passage for subsequent routing. The appearance of the project can also be materially enhanced by providing a pair of end caps in the same timber as used for the joint infills. At this point it is perhaps as well to supply a few dimensions (fig 6), although these can be varied to suit individual needs.

Fixed offset

It is not necessary to modify the 'Joinaboard' jig in any way to widen the dovetail openings, as illustrated in fig 3(b) and (c). It is necessary only to add a temporary spacer to one edge of each workpiece with a small strip of double-sided adhesive tape. The general idea is shown in fig 7. Jigs of this type include as standard, a plastic offset spacer, marked as 'A' in fig 7(a). This is intended to provide a fixed offset for 'normal' jig operation, where it is intended that one member is machined against the spacer, and the mating part against the side of the jig - this requires either that both pieces are machined together, or the second is machined with a scrap spacer (marked as 'C').

This latter operation is necessary when the workpiece is too thick to allow simultaneous machining - as is the case with this particular project. Each piece is first machined 'to the book' as described above. This is followed by a second machining operation, with home-made

Fig 6 All dimensions in inches and millimetres in brackets



spacer 'B' added to every workpiece regardless of whether this is machined with scrap spacer 'C' or not. This will trim the right-hand side of every tail but, as one member is reversed on assembly, this becomes the left-hand tail eventually, thus meeting the requirement shown in fig 3(b). This will decrease the width of the tails. Although it is possible to calculate the thickness of 'B', as well as that of the position of the workpiece relative to the comb, it is better perhaps to make one or more trial joints with scrap timber of exactly the same width as the final workpieces (I found my own sums didn't work out at all well).

Next issue...

In the second part of his project, Jack Cox deals with the overall rail profiling, making the supports and fitting the completed job.

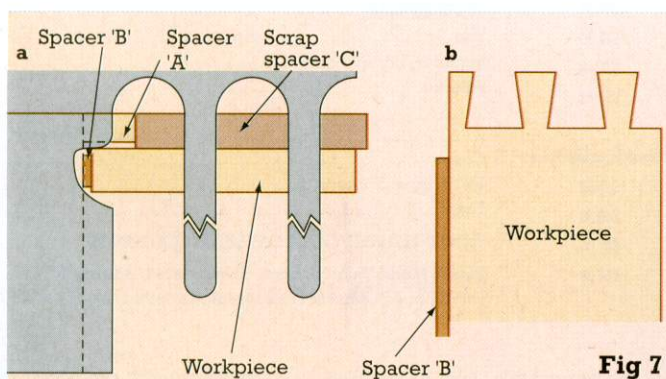
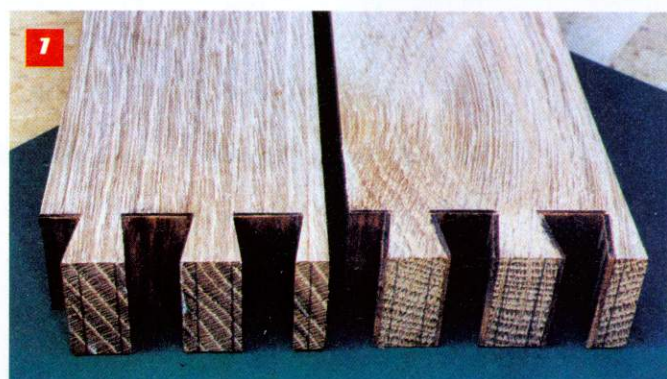
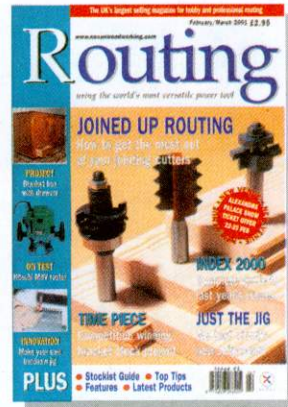
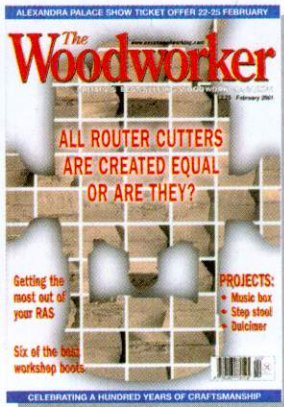


Fig 7



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A081

Perpetual motion



Here's a project to tax the craftsman who has something of the engineer and the inventor in him, for it demands exact working combined with a touch of experimenting! It's fascinating to make and captivating to watch, but patience will be required when it comes to the 'fine tuning' to get the swinging bucket to lift its load.

Critical mass

The marble must be obtained at the outset, not only is the size of this important, its weight is critical. It needs to be fairly large, the run illustrated was designed to operate with a marble with a diameter of 34mm. A hardwood should be used for this project, beech is ideal and has long been popular for toymaking. The two parts of the run are hollowed to allow the marble to run, and

for this either one of the larger radius cutters, or the large water channel cutter, should be used. It is also essential to use the router in a table.

One end of the upper run needs to have the lower surface bevelled to provide clearance for the marble as it travels down the lower run, and the upper end needs to have packing fixed to the edges, and a small lip added to the underside. A small piece needs to be cut

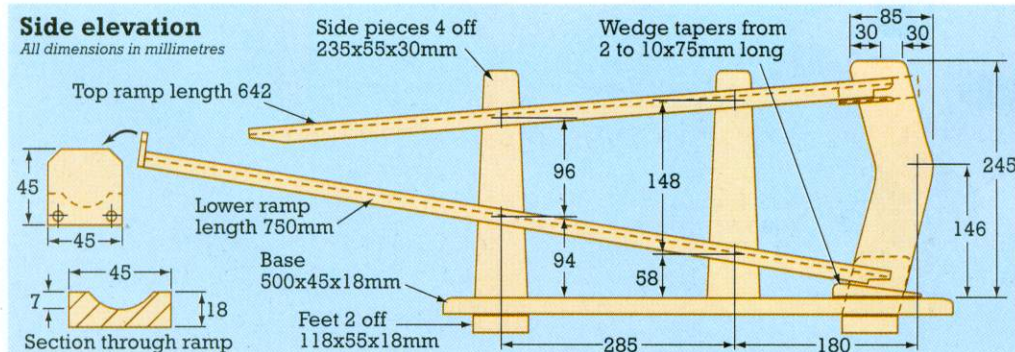
from one of the runs so as to form the base of the 'bucket'. The lower run should have the buffer end added at the higher end, while at the lower end a small rebate, or step, should be cut on the underside. This is so that the lip at the front of the bucket can locate.

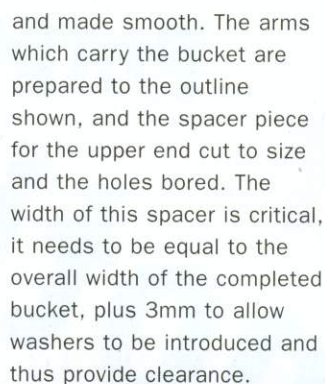
Making the bucket

The base member is cut to the same section as the runs, but is not of course grooved. The four tapered side supports are prepared to the outline shown, but only the lower holes should be made at this stage. They can now be screwed to the base, ensuring they are vertical, but not glued at this point in progress.

Hardware

Studding, washers, and nuts can be bought at B&Q stores, and these items, along with small machines crews and nuts, can also be obtained from Screwfix Direct - 0500 414141.





Next, the two runs can be temporarily secured to the four vertical supports, using G-cramps for this. The two supports which carry the bucket arms are prepared as shown, but before fixing, packing must be added which must be the same thickness as that added to the upper run. Screw the packing in

The base of the bucket needs to have a rebate formed on the underside, and the lip glued in place. Alternatively, this lip could be formed by removing wood on the upper part of the base so that it is made 'from the solid'. The bucket needs to be made up in stages using glue alone. First the back is glued on, then the top. The vice is a convenient way of cramping the work for these stages. The sides need to have the front

edges made to slope, and before adding to the rest of the assembly, the holes should be bored and countersunk. The countersinkings are on the inside, these allow for countersunk headed machine screws to be used, as it is important there are no obstructions to the marble on the inner surfaces of the bucket.

After gluing these sides to the rest of the bucket, outer surfaces can be flushed off

Once satisfied that all is well, the side supports can be removed two at a time so as not to disturb the setting of the runs, any remaining screw holes bored then replaced adding a little adhesive. The temporary screws to the bucket and arm can now be replaced with 4mm diameter ones with countersunk heads, cutting to length if needs be. Washers should be used between the wooden parts, and also under the heads of the nuts. It is preferable to use 'nylock' nuts for this, otherwise lock nuts can be added. The pieces should be sanded smooth as assembly takes place. Finish the project to personal preference, the original was given a couple of coats of clear lacquer.

The fit of the bucket in its lower position is critical. If too tight, the impetus of the marble will not release it, if too slack it will not be retained at the end of the lower run. It will help if a very small piece of felt is added to the top of the wedge shaped piece, this will provide just enough friction to hold it as required.

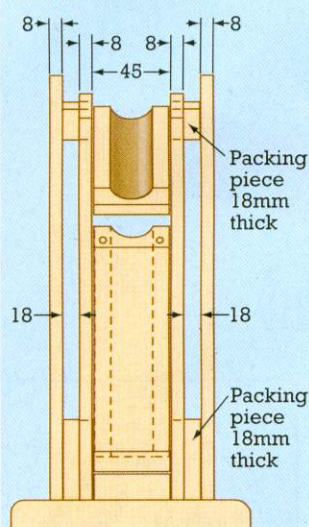
All dimensions in millimetres



place but do not glue. Screw the shaped vertical supports at the lower end only, again use a G-clamp at the top. A small wedge-shaped piece needs to be made for adding to the base under the lower end of the bottom run. This is

End elevation

All dimensions in millimetres



to ensure the lip of the bucket is properly located at the start of the marble running down.

It's wise to use temporary machine screws of less than 4mm diameter to fix the bucket to the arms, and the arms to the shaped vertical. The counterweights are formed from short pieces of 12mm studding and nuts.

Now for refining the positions of the various parts, and in particular the weights. Remember that the bucket lip must engage with the ends of both runs. The use of studding and nuts allows for fine tuning to take place by adjusting the projection of the studding and the number of nuts used. Washers can also be introduced if a little extra weight is needed.

More marbles

Interested in more traditional marble games? Then see issue 4 of Trend's 'In Profile' magazine which contains details of a marble run and solitaire game by Gordon Warr. Call Trend on 0800 487363 for more details or visit their website @ www.trendm.co.uk

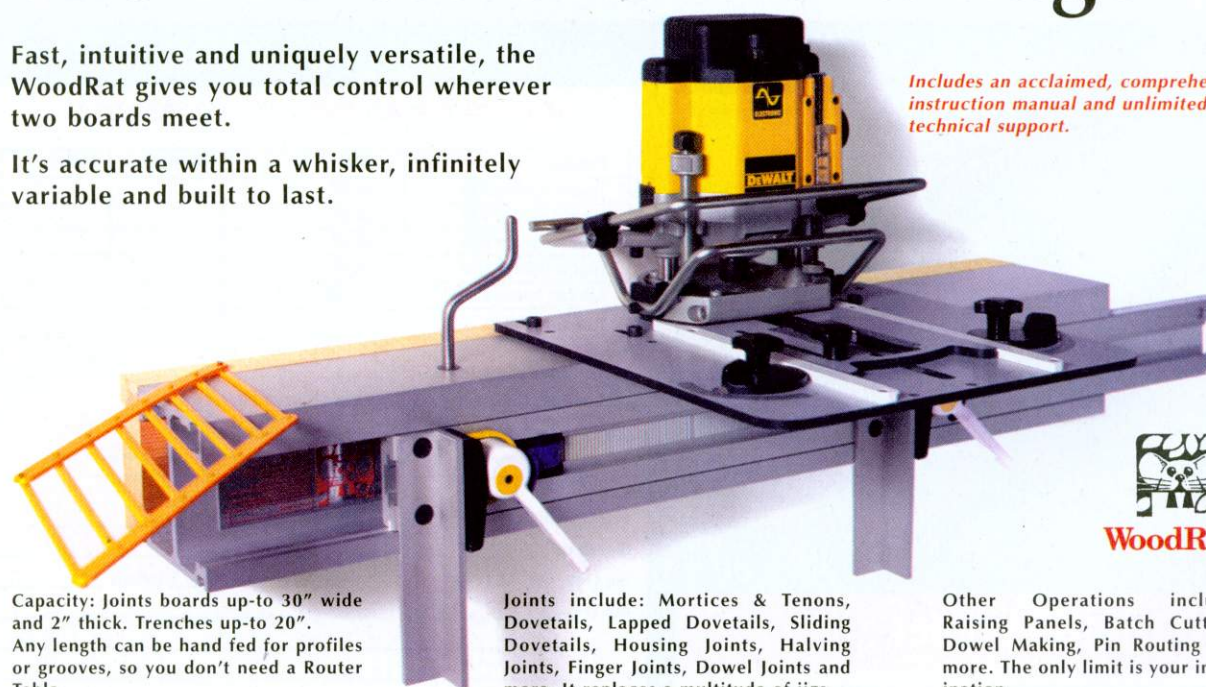


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Ellipse jig

Mark out ellipse easily and accurately with your own self-made jig. Jim Phillips shows you how to make one

My self-made ellipse jig is made from wood components and designed for marking out ellipses up to 600mm long. If made out of hard plastic or metal it could be adapted to actually cut ellipses with a light router fitted in lieu of pen or pencil. But because of the stress imposed on the sliding parts, ellipse jigs designed specifically to accept hand routers are recommended.

Material

The base and slides should ideally be made out of hard resilient wood, such as oak or beech. This will avoid any

tendency to split out at the slot interchanges and ensure the sliding action does not degrade the wood edges.

Main components

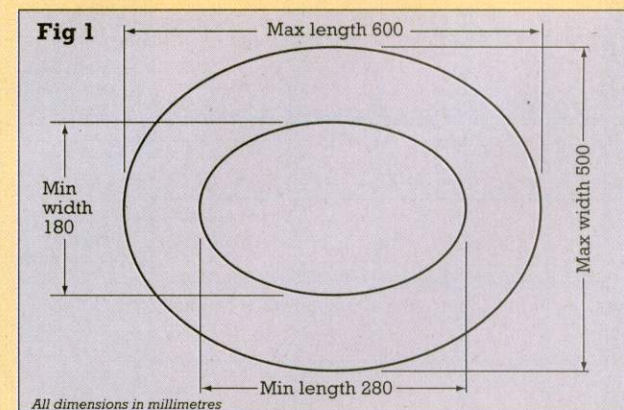
The jig has three main parts (see picture 2). The jig base has two pairs of dovetailed grooves cut centrally at right angles to each other. The size of the dovetail and configuration are shown in figure 3. Sliding dovetailed strips, (pair for each jig), which reciprocate within the grooves (see pics 7, 8 and 9 also fig 4). Scribing arm which accepts a pen or pencil in spaced slots along its length. Picture 2 and figure 5, show the design and size.

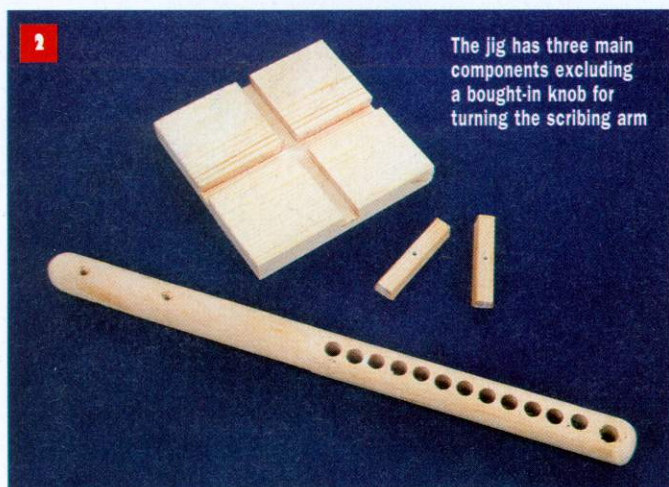
Making the jig base

For convenience, I chose to make the jig in batches of four as the larger workpiece simplifies the setting-up process and also the cross routing operation. The workpiece includes a waste

surround which not only extends the edges to give more support for the router but also contributes to obtaining a clean cut edge on the finished work. Waste edges are trimmed off after all machining work is completed (see fig 2).

Size range of Ellipses. This Jig is designed to draw ellipses between 280mm and 600mm in size but there is no limitation to the size of a jig of this type. However, an undersize jig base which limits the stroke of the sliding elements, will affect the stability of the device when the arm is rotated.





Tips

If a reversed dome headed bolt is used to secure the grip knob on the handle, the bolt head will give support for the handle when it is rotated but will not score the paper (pic 10).

A slightly tight fit on the slides is better than a slack one and a wipe with some grease on the faces of the dovetailed parts is helpful.

Step A

The base board should be cut exactly square, 350mm by 350mm which allows four jig bases to be made together with a waste surround of 45mm width. This is all portrayed in pic 3 and fig 2.

Step B

Routing relief grooves prior to the dovetail ones. Fit a $\frac{1}{4}$ in diameter standard grooving cutter, Ref 3/20, to the router and set the depth to 4mm for the first of two passes and adjust the side fence so the cutter lines up exactly over the marked out lines (see pic 4).

Could be adapted to cut ellipses

Step C

Rout grooves along the two cross grain faces and then along the grain for the other two.

Step D

Now rout the second pass to the full cutting depth grooving slots to 9mm deep throughout (see fig 3).

Step E

Remove the $\frac{1}{4}$ in cutter and replace with a dovetail cutter, Trend Ref 31/5, and set router to cut full depth of 9mm in one pass. Refer to configuration shown in fig 3.

Step F

With side fence still set in same position, repeat the sequence of routing when now the path of the dovetail cutter coincides with the previous cut, (step D), made with the $\frac{1}{4}$ in square edged cutter, ref 3/20.

Step G

Now cut away the outer waste pieces and divide the centre area into four equal parts, which constitute four ellipse jig bases (see pics 5 and 6).

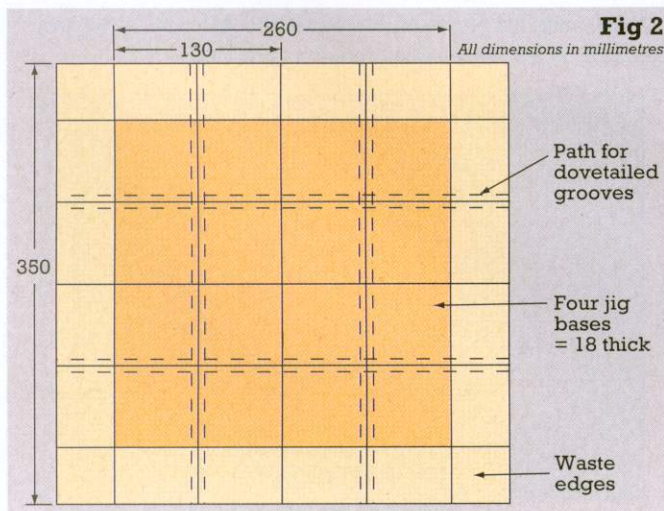
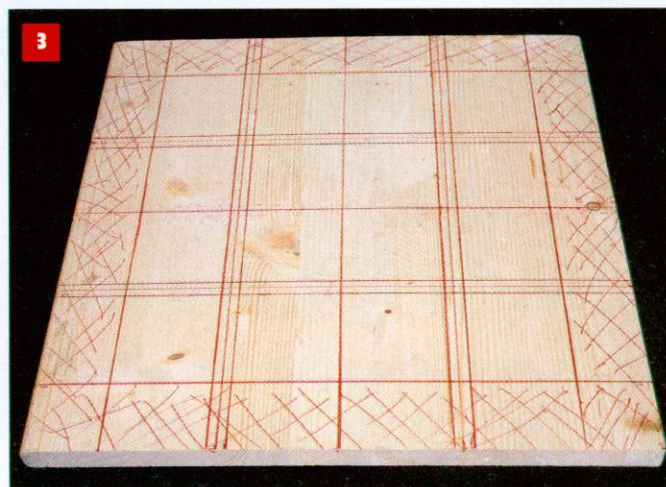
Note it is possible to rout the dovetail grooves without resorting to first making a relief

cut with a square cutter, but in practice the reduced stress reflects in greater accuracy and better finished edges.

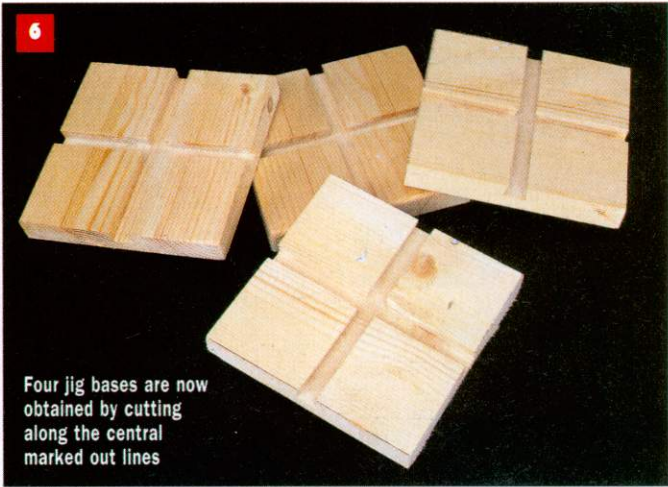
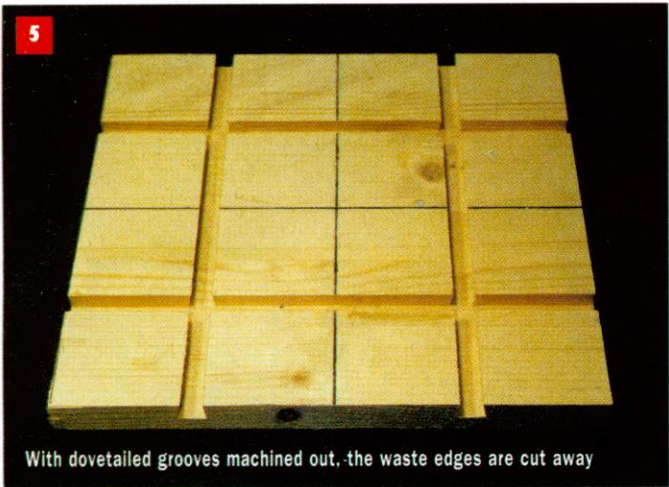
Step H

Mount the router under your table and using the same dovetail cutter as used for grooving the dovetailed slots, machine a dovetail tongue along the edge of a 50 x 22mm thick batten (pics 7 and 8). Make sure the depth and width of the dovetail matches the configuration of the groove (figs 3 and 4). A few test runs on scrap wood is wise, the aim being to obtain a slide fit without slack (i.e. finger pressure only needed to move it along. It is preferable to machine such narrow workpieces on a table mounted router as clamping and setting up for routing in a portable mode is time consuming.

The square base board from which four jig bases will be cut

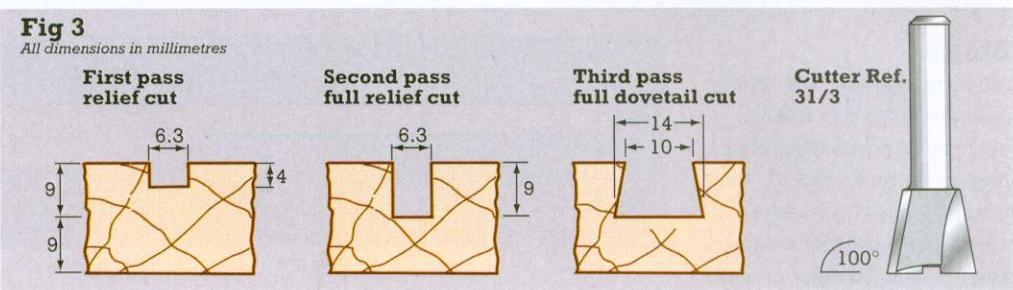


Dovetails being routed with side fence set to cut equidistant slots from each of the four sides of the board



Step I

With dovetail tongue machined along the batten, saw off the tongued portion making sure that the saw cut leaves the full dovetail configuration in the strip removed and cut the strip into sections 60mm long, two pieces being needed for each jig (fig 4).



“There is no limitation to the size of a jig of this type”

Step J

In this feature, each arm was made from 25mm ramin dowelling and cut to a length of 352mm. The part of the arm which is screwed to the sliding

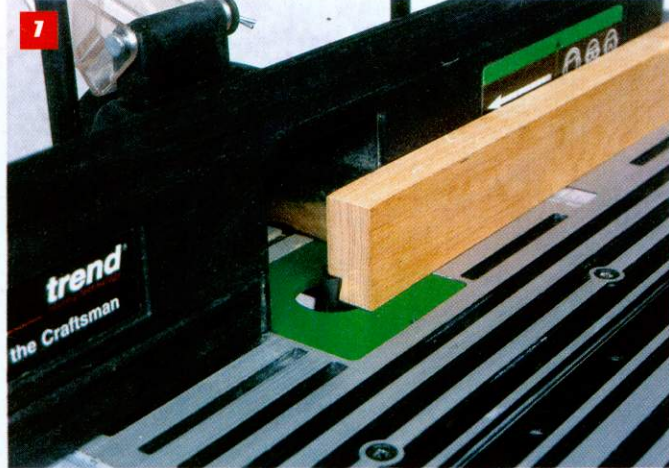
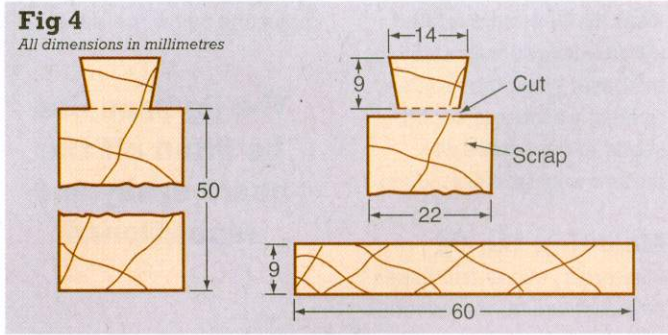
members on the base, is rebated to leave 12mm thickness, length of the rebated part being 162mm (see fig 5 for clarification).

Note there is no limit to the arm's length and one could visualise the marking out for an elliptical mirror or table top which might require a 6ft size ellipse span. But a larger base assembly would be needed to provide the stability and at the end of this feature, a commercially heavy duty jig is described for such applications.

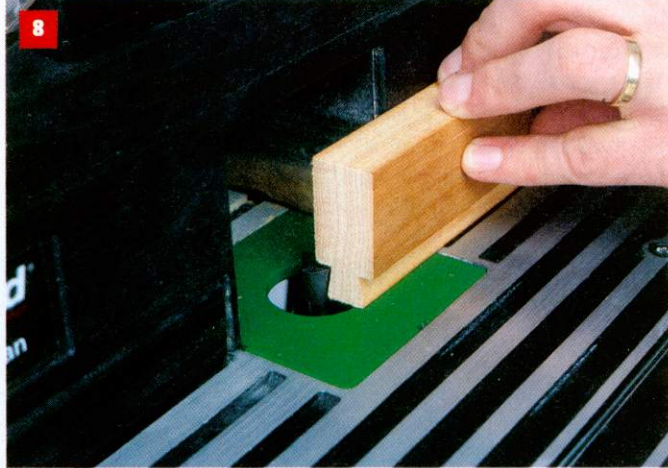
Step K

Drilling the holes. The projecting part of the arm, was, for this feature, drilled with 8.5mm diameter holes along its length,

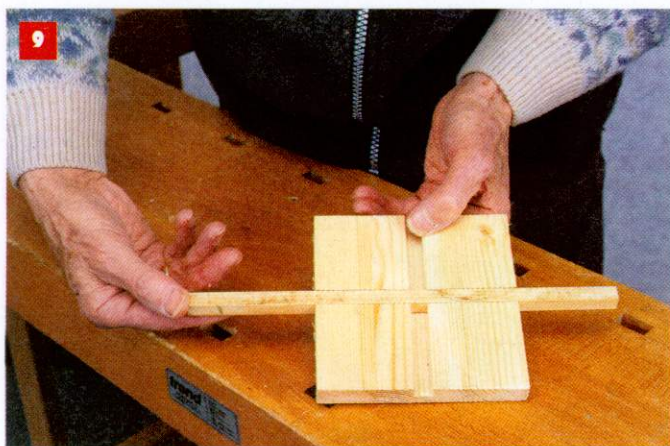
holes spaced at 15mm intervals to receive a Staedtler felt pen of the same diameter. A grip knob can be mounted at any point along the arm (see fig 5).



Batten with long dovetail tongue is machined on a router table.



The same cutter is fitted for cutting the tongue as was used for the grooves



Dovetail tongue is now sawn off the batten and inserted into the grooves for a test fit. A slide fit is needed without slack, and tongue smoothed flush with jig base

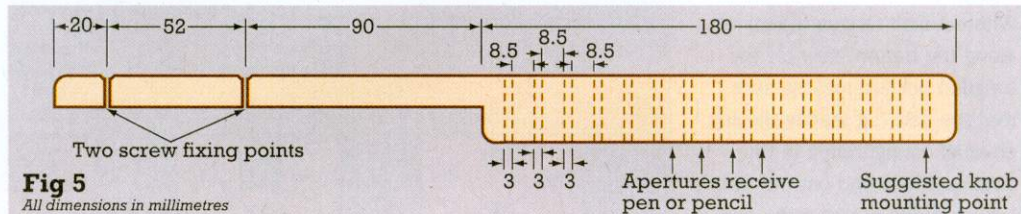
Step L

Mounting the arm. The arm is screwed to the two sliding sections at points illustrated in drawing fig 5 and pic 10. The mounting position is quite critical as the sliding members must clear each other on each 360 degree sweep of the arm.

Note small No. 6 screws, 20mm long are recommended to prevent the narrow slides splitting. The two holes in the arm to receive the screws should be large enough to allow the arm to be rotated with the screws held static in the base. When the arm is rotated, washers under the heads of the screws will prevent wear at these points.

Mounting the jig

With arms, slides and base now assembled, the question of fastening the jig to a board faced with strong drawing paper, needs to be addressed. There are several alternatives. Whilst double-sided tape or Bluetack can be chosen for a temporary mounting of the jig, one ideal solution is to drill



two 8mm dia. holes through the jig base and into the support board beneath it. Two 8mm dia. dowels, 30mm long, are driven in and glued flush into the jig base. To mount the jig in place, the dowels projecting below the base

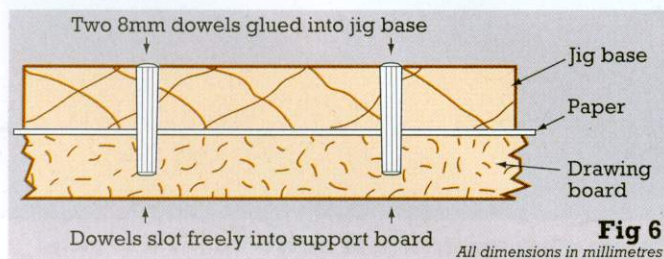
Note if the two holes in the board are fractionally opened up to obtain a slide fit, the jig base can be lifted off the board easily and repositioned together with a new sheet of paper, clipped to the board...all in a matter of seconds!

Using the ellipse jig

Having worked out the size of the ellipse required, a pen or pencil is passed through the chosen 'slide-fit' hole in the arm. This is then rotated 360 degrees to mark out your ellipse (see pic 10).

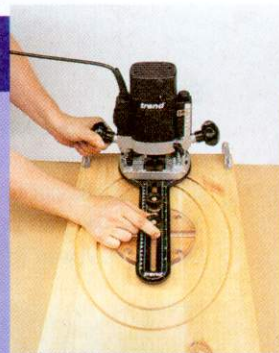
The jig base can be lifted off the board easily and repositioned

locate in two 8mm drilled holes in the support board. Sheets of paper are sandwiched between the base and board, thus the only imperfections on the sheet being two small 8mm holes (see fig 6 and pic 10).

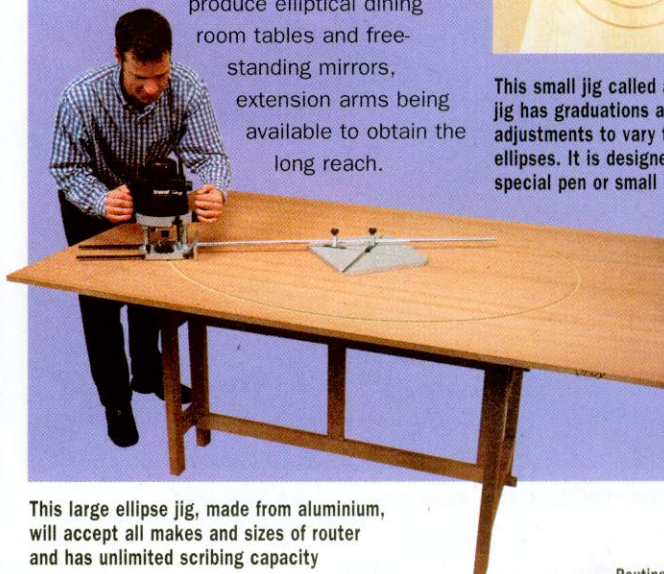


Elipse jigs for routers

Shown here are two typical ellipse jigs, made by Trend, which are designed to rout elliptical shapes in wood or composite boards. The Mini-ellipse jig is used usually to produce picture frames but the larger unit has been used to produce elliptical dining room tables and free-standing mirrors, extension arms being available to obtain the long reach.



This small jig called a Mini-ellipse jig has graduations and adjustments to vary the size of the ellipses. It is designed to accept a special pen or small hand router



This large ellipse jig, made from aluminium, will accept all makes and sizes of router and has unlimited scribing capacity

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ROY SUTTON'S

Jig Making FOR THE ROUTER



The housing jig

In an extract taken from his book 'Jig making for the router', the late Roy Sutton describes how to make and use his housing jig

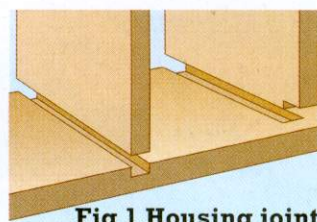


Fig 1 Housing joint

Housings, or grooves, are frequently used in joinery and cabinet making, and the router is the ideal machine for this joint (fig 1). Housings can be made for such items as shelving by simply fitting a straight two-flute cutter of suitable diameter in the router, setting the correct depth of cut and running the router against a straight edge that has been clamped to the workpiece. However, two problems can arise when using this method. Firstly, it is difficult to set up so that the position of the joint is accurately located; secondly, unless the router is firmly held against the straight edge, the joint can easily be ruined.

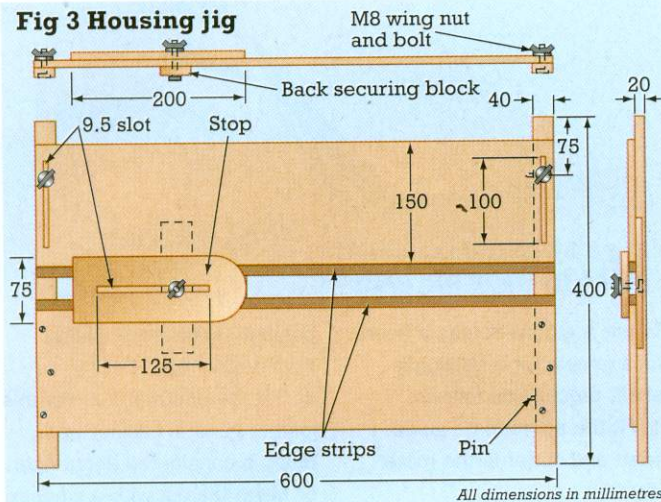
The housing jig overcomes these problems by ensuring that the groove is accurately positioned and as the router is fitted with a guide bush which runs in a channel, there is no danger of any sideways movement to spoil the joint.

A further advantage is that the jig is adjustable, so that by using different guide bush combinations, grooves of various widths can be formed. An example is a 24mm diameter guide bush and a 19mm cutter. There is a difference of 5mm between the

Fig 2



Fig 3 Housing jig



outside of the guide bush and the diameter of the cutter, so by opening up the jig to 30mm a groove 25mm wide can be cut by simply traversing the router back and forth. This makes the jig extremely versatile.

Construction

The overall sizes shown in fig 3 are for a good, general purpose jig that will accept workpieces up to about 400mm wide. The jig could be made larger if required. Ply or MDF may be used for the base boards but can be no more with suggested sizes than 12mm or less than 9mm thick.

Prepare the materials in accordance with the cutting list (fig 4). The effectiveness of the jig depends on the two edges to which the hardwood edging strips are to be glued being perfectly straight. The first operation is therefore to ensure

that this is so by removing any variations with a sharp plane.

Next, glue the edging strips to the straightened edges of the base boards. These can be glued and pinned but it is better to glue and cramp, as pins do not hold very well in the edges of ply or MDF. Fig 5 shows a method of clamping if sash cramps are not available. When the glue is dry, ensure that the edging strips are flush with the faces of the base boards by planing and sanding if necessary. Check that both boards are exactly the same length and that their ends are square.

The slots are now cut in the right-hand base board. Fit the router with the side fence and a 9.5mm straight TCT two-flute cutter. This is set so that the centre of the slot is exactly 20mm from the edge of the base board. Fig 6 shows the set-up for cutting the slots.

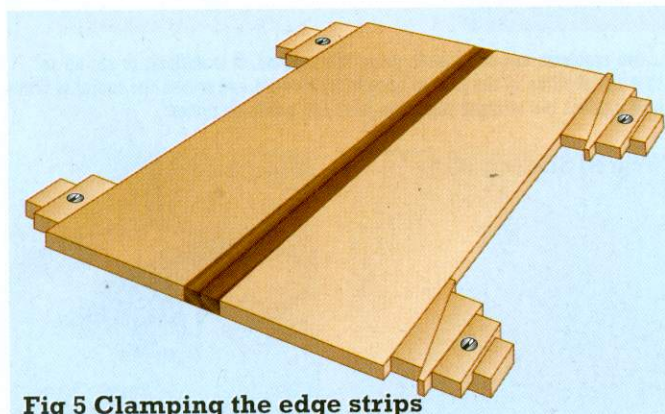


Fig 5 Clamping the edge strips

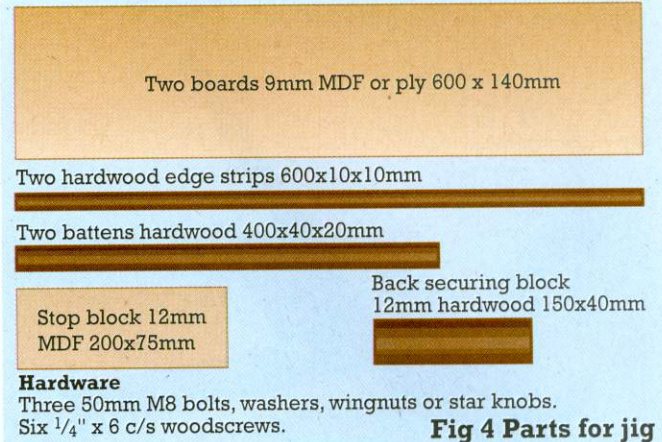


Fig 4 Parts for jig

Two panel pins are driven into the edge of the front batten only. The heads are removed leaving about 5mm projections, which are then filed to sharp points. This will ensure that the workpiece is held firmly in the jig.

The left-hand board is now drilled and countersunk for No. 6 screws, then screwed to the hardwood battens making sure that angles 'A' and 'B' shown on the drawing are perfectly square. This is important, as any discrepancy will cause the jig to form inaccurate grooves. To ensure squareness, clamp the baseboard to the batten with a G-cramp clear of the screw holes, check for square, then insert the screws. Do not use glue for this operation, to enable the jig to be easily dismantled for truing should it get damaged (fig 7).



Housings can be made by running the router against a straight edge...

The position of the holes for the 8mm bolts in the right-hand sides of the hardwood battens can now be marked by referring to the slots in the right-hand board (fig 8).

These 8mm holes are counterbored on the underside so that the bolt heads are flush. It is easier to make the counterbore first. To do this, mark the centre for both the 8mm bolt and the counterbore, by drilling through the batten with the finest drill you have (say 3mm). Then make the

Fig 6 The set-up for cutting the slots in the right hand base board

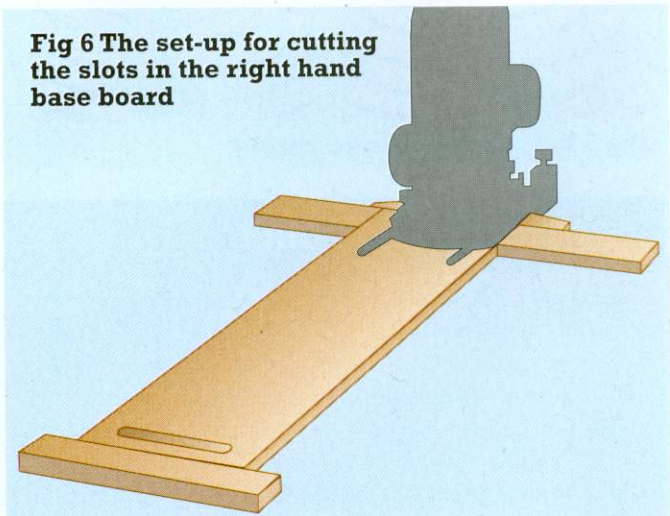
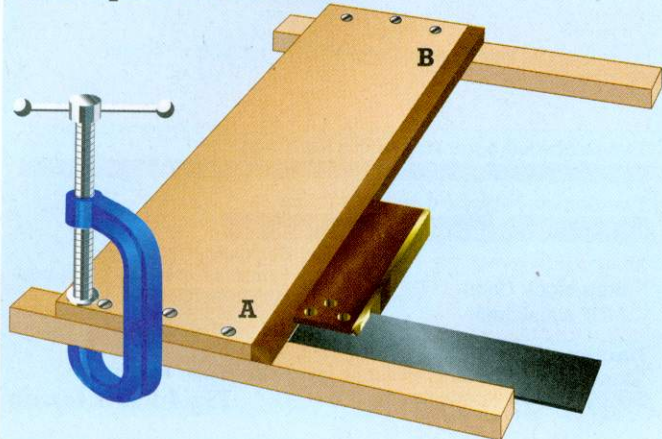


Fig 7 Ensure that the left-hand base board is fixed square to the battens



counterbore about 12mm to 14mm diameter and 5mm deep, so that the hexagonal head of the bolt is a tight fit. The 8mm holes can then be bored from the top (fig 9). With the bolts in position, the right-hand board should move freely in the slots.

Form the slot in the sliding stop by using a 9.5mm two-flute TCT cutter, and round off one end as shown in the drawing. Bore an 8mm hole in the centre

of the back-securing block. The jig can now be assembled. The sliding stop will halt the router in the desired position when stopped grooves are being cut.

Using the housing jig

It should be noted that when using the jig in this form the depth of any groove is limited to 10mm. If deeper grooves are required, thicker battens must be used.

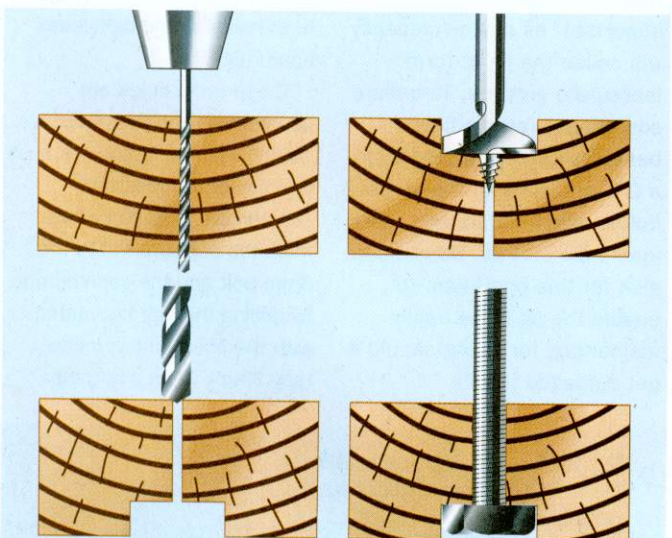


Fig 9 Boring and counter boring

Book offer

This extract is taken from Roy Sutton's book 'Jig making for the router'. This excellent book is now available to *Routing* readers for the special offer price of £12.90 postage and packing free. To order your copy call the sales hotline on 01322 616300, fax your order on 01322 667633 or write to Roy Sutton Book Offer, Routing, Nexus Media, Nexus House, Azalea Drive, Swanley, Kent BR8 8HU.

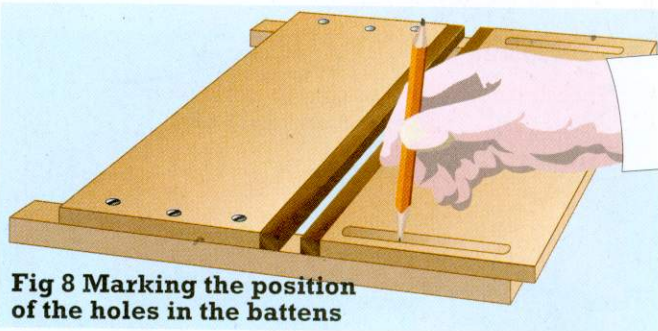


Fig 8 Marking the position of the holes in the battens

To cut a groove across a board, for example for a bookcase shelf, proceed as follows:

1. Fit the appropriate guide bush and cutter in the router (fig 11).
2. If the groove is wider than the cutter, adjust the jig accordingly. For example, if the width of groove required is 18mm, the guide bush 18mm, cutter 12mm, then the slot in the jig is set at 24mm. The cut is made in two passes.
3. Secure the workpiece to the bench and clamp the jig in

position, setting the sliding stop if required.

4. Set the depth of cut. For this joint in general cabinet work, 6mm is considered about right.
5. Make the cut with a smooth steady action, retracting the cutter on completion before removing the router. The first cut will cut through the front batten, which is why the depth is limited to 10mm. The time spent making this jig will soon be repaid by the accuracy and speed now possible when making housing joints.



...two problems can arise when using this method. It is difficult to set up so that the position of the joint is accurately located and unless the router is firmly held against the straight edge, the joint can easily be ruined

Fig 10 Sliding stop

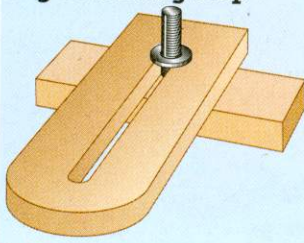
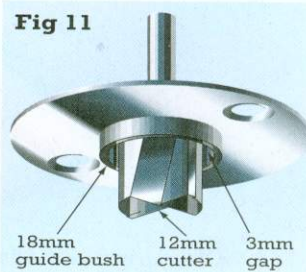


Fig 11



Part 2

In a spin

In the concluding part of his project Don Phillips shows how to make the frame and complete your spinning wheel project

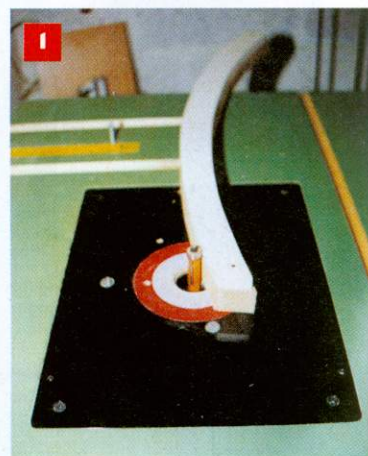
The frame components can now be made, but not yet fully assembled as it has to be put together around the wheel and the axle assembly. The frame is a tripod with the rear legs being of curved section, jointed to two straight side bars and a front leg. For stability it is

made to taper inwards from all around and because of this some pieces need to be cut at an angle. However, this angle is a constant ten degrees from the right angle throughout.

Leg design

The rear legs are 600mm long and are of 25 x 35mm section. Their curve is taken from circle

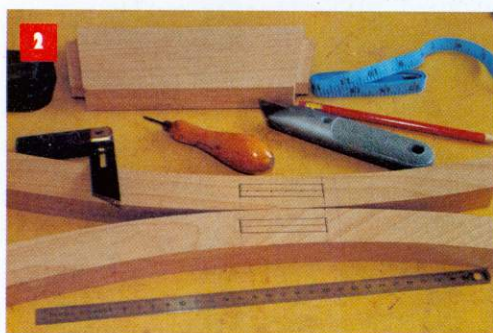
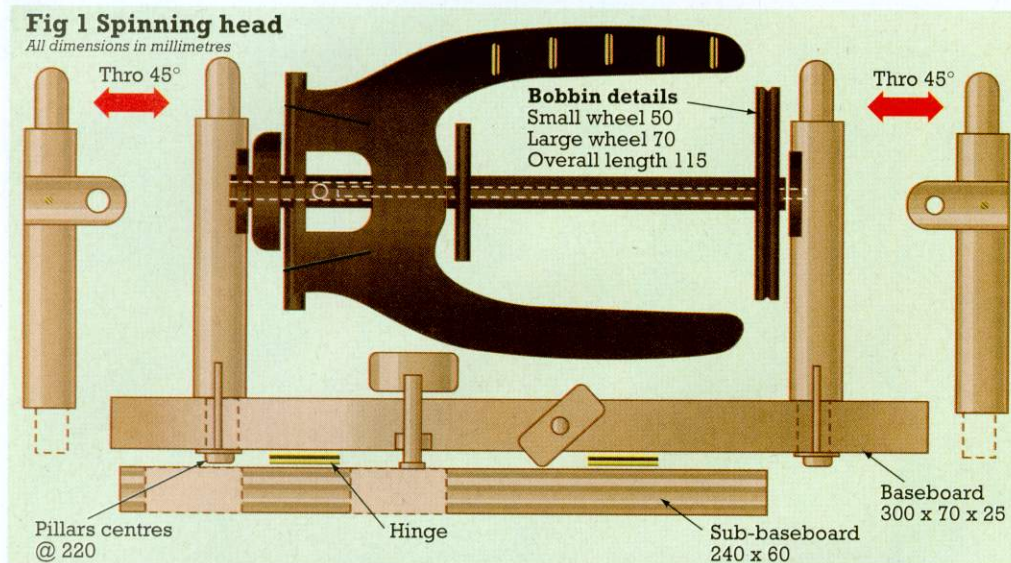
with an outer diameter of 1600mm. Make sure you get the grain along the leg as straight as possible to avoid weakness. Because both legs have to be identical make a template from 12mm plywood and then use this to mark out the legs on the timber. Cut them out with the bandsaw and then, tacking the template to them



Note template for accuracy

Fig 1 Spinning head

All dimensions in millimetres



2 Its essential to mark mortises accurately

with small brads on the inside surface, use a bearing guided profile cutter to get them to finished size (see pic 1).

The front of the legs need a flat section where the side bars are mortised to them so that the mortise will fit snugly without gaps. This should start 160mm from the top and continue for the width of the

side bar. Centrally in this flat we need to cut a mortise 15mm deep by 50mm long by 12mm wide. Cut this mortise with the router and side fence and then clean the corners out with a chisel.

The second mortise is cut into the inside of the leg to accept the brace and is only 10mm deep. With these drill



3 Accurately cut angles make life easier

the majority of the waste out on the drill press and then use a traditional mallet and chisel. It is important that each pair of mortises are identically placed (see pic 2) or your legs will not be in line.

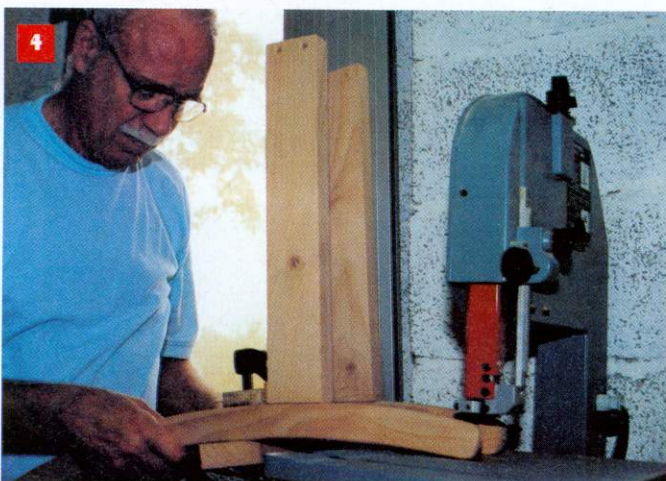
The brace is cut at a ten degree angle at each side. Its bottom edge should be 190mm long, plus the two 10mm

tenons and 120mm up from the base of the leg. This will bring the top of the legs together in the right place to take the wheel. I used an angle finder and a home-made jig to cut the angles and the tenon (see pic 3).

The side bars are 400 x 70mm and their top and bottom edges are angled by ten degrees to allow the spinning head to be screwed to a level surface. The tenon for the legs is cut only on one end. Chamfered holes need to be drilled in the other end for the screws that hold the front leg to the frame, two each side. The front leg should sit flush between the side bars.

The front leg is a shaped piece (see main picture). Its shape is a matter of personal preference except for the top; this must be 90mm at its widest point and the last 75mm must be cut at ten degrees to match the angle of the back legs.

When these components are finished, it will pay you to dry assemble them with clamps for several reasons. Firstly you will find that the angle of assembly means that the bottoms of the three legs will need some alteration to sit flat to the floor. Secondly you need to check that everything will glue into line accurately, and lastly to ensure that there is the correct



4 Keep both legs in contact with the table



5 A cleanly cut bearing hole is important

gap to position the wheel.
Better to find any problems out
at this stage when you can still
change things.

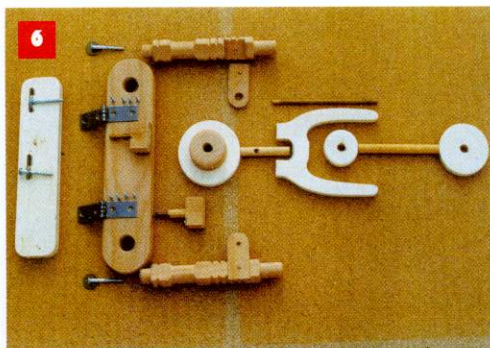
You also have to cut the angle at the top of the rear legs. This needs to allow for the width of the hub and two washers. Stand the frame on the bench, clamp a small spirit level to it and then mark lines down from the top of the legs with the aid of a set square. Then cut the angles freehand on the bandsaw (see pic 4). If you keep both legs flat against the table while cutting everything will come out square. Now you can drill the bearing holes for the axle at this stage (see pic 5).

Assembly

If you are happy that all is as it should be you can start assembly. First glue the legs to the side bars. The two should be a mirror image. When these are dry you can glue in the brace. I had previously drilled the holes for the front leg and screwed that into place at the same time to keep the whole frame rigid while the glue set.

You can now fit the wheel. Glue all the drive components to the axle and allow to dry. Slide the axle through the first bearing hole, then a washer, then the wheel, another washer and out through the other bearing hole. Candle wax in the bearing holes will help.

You now have to drill a 6mm hole down through the hub and the axle dowel. Apply a generous amount of glue to



The spinning head components

this hole and use a piece of wire to ensure it goes right to the bottom. Now tap a length of 6mm dowel down into the hole right to the bottom. Allow to dry, trim off and sand flush.

Spinning head

The spinning head is a fairly sophisticated piece of equipment with a variety of components (see pic 6) and if the wheel provides the power then the spinning head provides the brains. It consists of a base board on which are mounted two pillars. The pillars fit into holes in the base board and must be a snug fit, but must still be able to be turned to enable the bale arm and bobbin to be inserted and removed. They are counter drilled from below to take a screw and washer so that they can be nipped up to the right tension to allow them to be moved, but remain firm while spinning.

The pillars have a flat machined on their inside faces, done on the belt sander, to give clearance to the bale arm assembly. This clearance should be just sufficient to allow the



The spinning head installed



Reverse view of the spinning head

bale arm and bobbin to turn freely. Into this flat side are fitted two replaceable bearings, each held by a single screw, in which the bale arm spindle runs (see pics 7 and 8).

The Sub-base

The sub-base is made from 20mm plywood. It is held to the frame by screws and washers through slots that allow the whole head to be moved sideways to allow access to both pulleys.

The bale arm

The bale arm assembly consists of five components. A wide pulley of cherry wood and a narrow pulley of 12mm plywood, glued together, both need drive grooves. The bale arm itself is made from 12mm plywood (see pic 9) and fitted with five brass hooks on each arm. It is glued and nailed into this double pulley (see fig 1). The hollow axle, made from 12mm dowel is glued into the double pulley, and the solid

Further information

This is not a straightforward project and I found myself having to improvise continually. If I had been making it commercially it would have been ruinous as it took so many hours to complete. That said, I enjoyed making it tremendously and I hope you enjoy it as much.

If you have any queries on this project, Don Phillips can be emailed at woodchip@terra.es

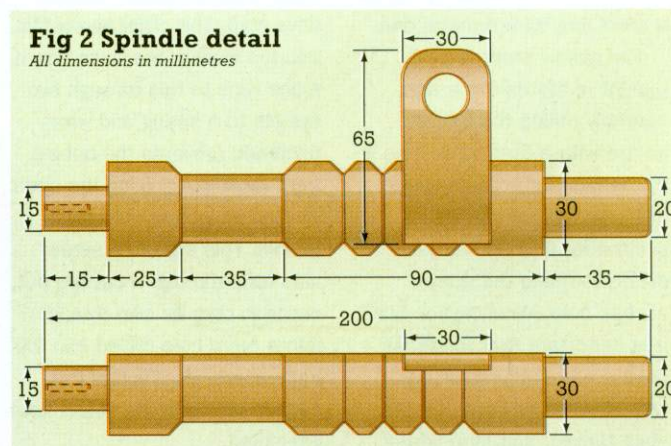
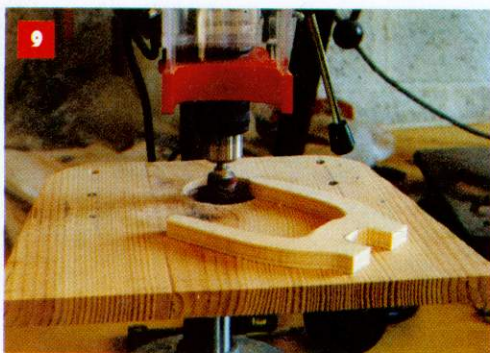


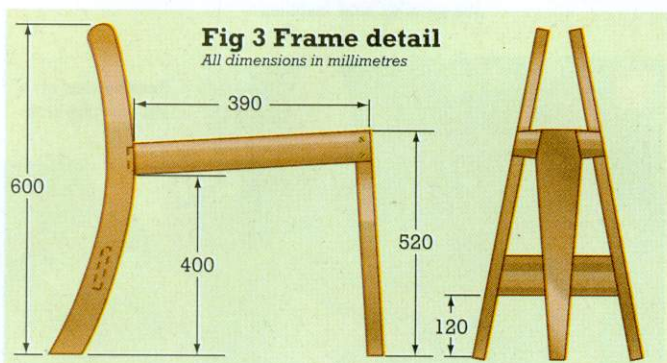
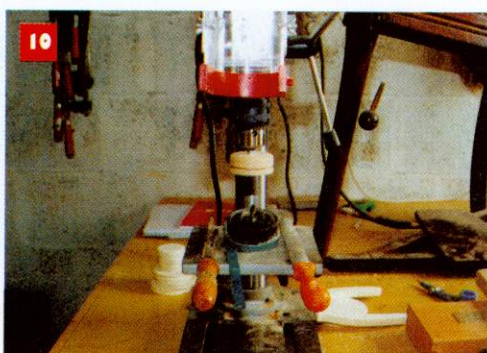
Fig 2 Spindle detail
All dimensions in millimetres

Project

Shaping the bale arm



Cutting the grooves in the pulley wheels



axle made from 6mm threaded brass rod is threaded through the bale arm and glued into the dowel axle (see drawing). Onto this solid brass axle slots a bobbin made from two different sized discs and a 12mm dowel centre shaft. The larger disc contains a drive groove.

Cut all the discs for the pulleys and bobbins with a hole saw. Next make a mandrel from a 6mm nut and bolt and lock each component onto this in turn in the drill press. Then cut the drive groove with a hand-held hacksaw blade at low speed and finished with sandpaper (see pic 10). Next take the centre holes out to 12mm with a chamfer bit to get a start and then a metal drill.

The hollow shaft is held upright in the drill vice and carefully drilled through the centre with a 6mm drill. This is the reason for ensuring your drill vice will hold things accurately. It is then cross-drilled to make the thread access hole. When assembling, it is important that the cross hole is not obscured in any way, as it is the route for the spun thread, and is inside of

the second pulley (see fig 1). The bobbin shafts are drilled out in the same way except because of their length they have to be drilled from both ends. This time a 6.5mm drill is used to give more clearance. All components in the spinning head/bale arm are glued with Araldite for extra strength.

Adjusting screws

Finally, there are two adjusting screws (see pics 7 and 8 and drawing). The first runs down through the base board through a captive nut and seats on a press pin in the sub-base board. This allows the base board to be swivelled away from the wheel thereby tensioning the drive cord. The other screw fits into the front of the base board. A line runs to this through two eyelets to a spring and when tightened prevents the bobbin from rotating, allowing the spun wool to be wound onto the bobbin. This adjusting screw also runs through a captive nut, but then cuts its own thread into a 5mm hole drilled into the base board. The friction this causes prevents the screw from loosening.

These adjusting screws are made by drilling a 5mm hole into the wooden handle and then screwing a length of 6mm threaded brass rod with a thin film of Araldite, directly into the wood. The threaded rod is then cut to length.

The treadle

The treadle is made from two lengths of 25mm square material and a section of 12mm plywood (see pic 11). I have not given sizes as the lengths will depend on the spread of your legs which in turn will depend on where the side arms are mortised to the legs. A degree of difference here will alter the length.

I measured the distance from the front leg to the rear leg and made mine 10mm shorter. Drill into each end of the main member and Araldite into it two pieces of the brass 6mm rod used in the bale arm. Remove the threads where it leaves the timber which reduces its diameter to 5mm.

The second member needs to be of a length where it can join the drive rod to the main wheel without anything fouling. The angle between the members is 30 degrees and they are joined by a countersunk screw. This is enough as the screws that hold the treadle board in place will give enough strength. It and the drive rod are slotted at one end to take a leather linking strap.

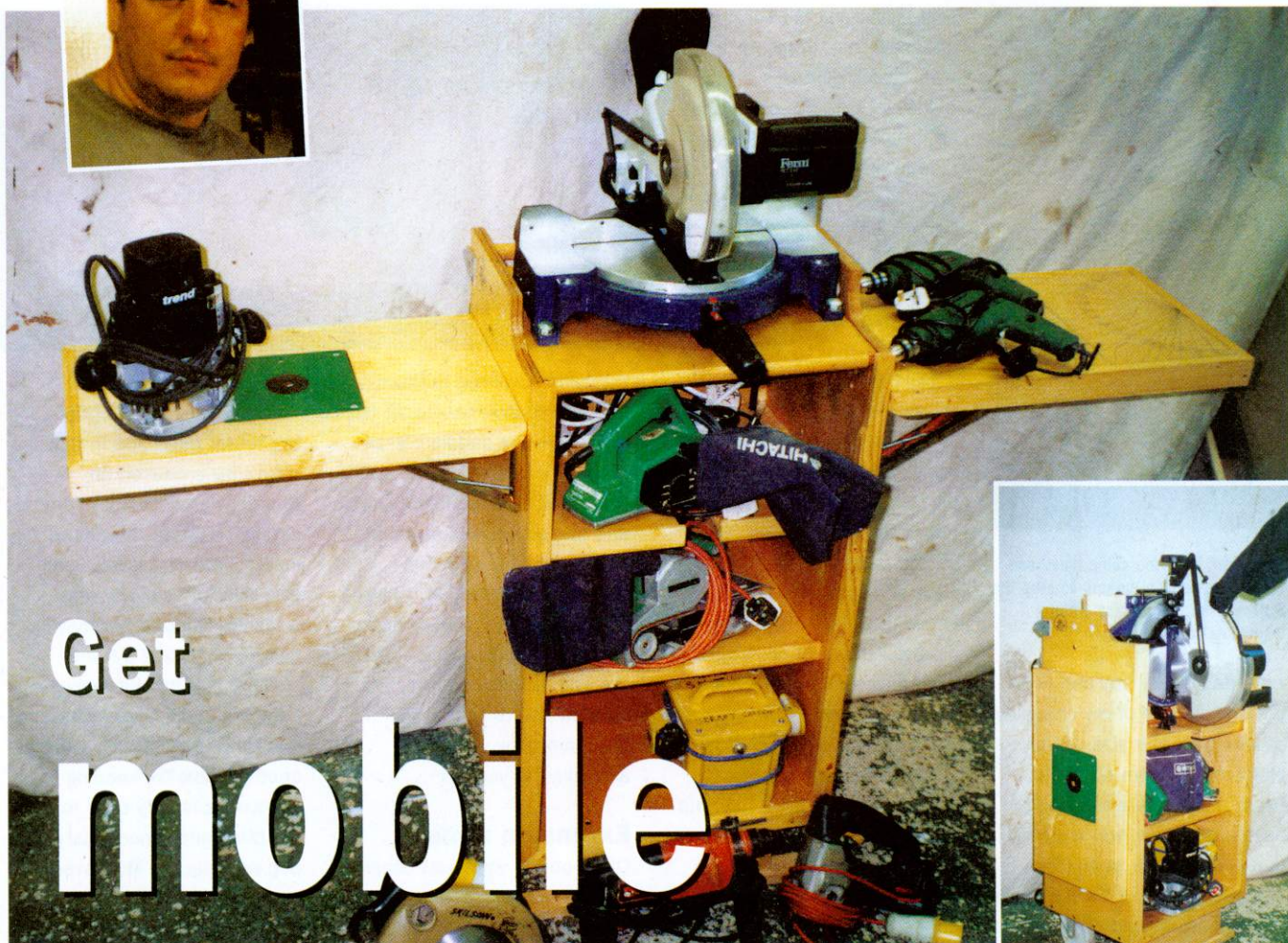
You then need to drill the legs to accept these brass spindles. I could find no easy and foolproof way to do this. I ended up using an electric drill and relying on eye and hand co-ordination to get it right. Again if you intend to use your wheel seriously, metal bushes should be fitted to take the wear. To fit the treadle board you will have to remove the front leg and then refit it.

Finishing

When you mix up plywood and hardwood in the same project it is hard to get a colour balance as both react differently to stain. This added to the fact that my client did not want her wheel varnished as she felt it would be against the overall effect she was looking for.

I ended up using a medium oak wax stain on the plywood components, leaving it unpolished and giving all the cherry wood components two coats of teak oil, sanding at 600 grit in-between coats. This matched up the colouring and made sure the wheel fitted in with the furniture in the lounge.





Get mobile

This issue Kevin Smith details how to make your own multi-function portable workshop

All dimensions in millimetres

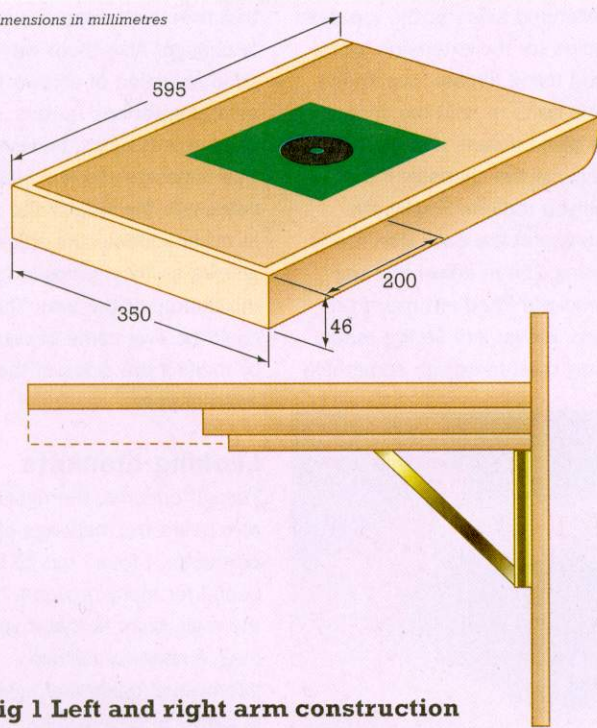


Fig 1 Left and right arm construction

"It's not the size that counts, it's what you do with it". Or, to put it another way, this project is ideal for the professional or the DIY enthusiast whether you have a large workshop or you're working from a garden shed.

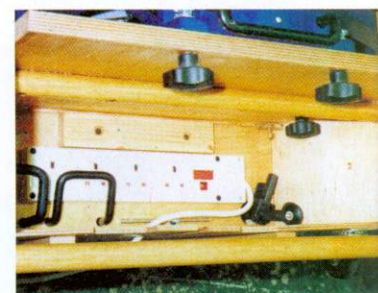
Many functions

Initially I made this 'caddy', for want of a better word, purely as a means of getting my power tools from the workshop to the van and around the site with as little effort as possible, and if possible in one journey. The project grew from that idea and now comprises many functions that help in site work, most of all when shop fitting or kitchen fitting. The sides and shelves are made from 18mm ply and the back is made from 6mm ply. I find this to be adequate but the reader may wish to use MDF in the same or lesser sizes.

Logical thinking

There are a few points that have to be adhered to, but these have been brought about by common sense and logical thinking, other than those the caddy is still open to individual adaptation and I would be glad to hear of any modifications or faults that the reader finds.

By far the overriding consideration is the chop saw. All of these measurements



Compartment behind/under the chop saw table including 4-way socket

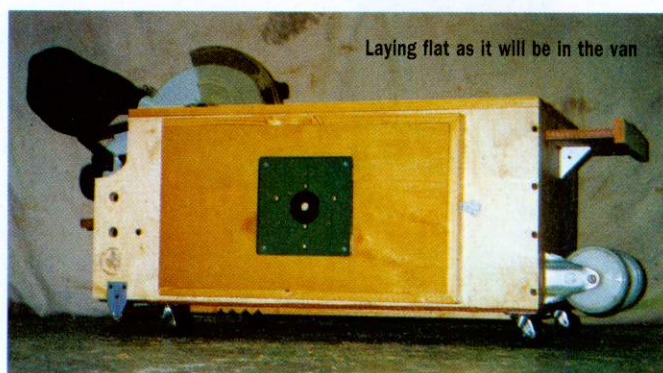


Rear view. Note the cable holes and the notches in the runners to stop the workcentre from slipping when leaning against the van.

were derived by starting with the dimensions of my chopsaw as this gave the size of the tilting mechanism at the top. For those of you who already have a chopsaw, you will have to make this top to suit the saw you have and if necessary alter the width and depth accordingly. I spent quite a

while choosing the Ferm KZ250 chopsaw from Screwfix, and it won overall as it has a 10in blade, it performs compound mitre joints, and best of all it falls into a price range that suits a wide variety of pockets, namely £99! Also, after putting it through its paces I have found it to provide a service more than adequate for my needs.

Next we have the foot and the two skids. The foot, which is attached to the bottom upright that has a steel corner bracket attached for rigidity, is not glued. Like the two skids on the back these will take wear and tear over time and because of this I have only screwed them on allowing me to remove them and replace them when necessary. You will also notice grooves on the skids. These are fulcrum points. When loading this into the back of a van it is necessary to tilt the caddy backwards until the fulcrum points catch the floor of the van. By catching these grooves



Laying flat as it will be in the van

the caddy will not roll away easily and allow you to lift the base until the caddy can be rolled in on its rear wheels. Once in it is very manoeuvrable and should be held static in some way. It is possible, depending on the van, to store it upright, either way by not having doors all of the contents are still accessible. The fulcrum points should be determined by yourself according to your van.

Extension arms

Other points you must consider are the arms, when down need to be held captive so they do not swing around when laying the caddy flat. The bolts that hold the chopsaw up must also have holes to keep the table static when down. The extended sides at the top need holes for the extension arms, and using female lobe knobs and bolts to hold the chopsaw in place means it is easy to remove the chopsaw if that is all you require. Finally, the handle at the back was made using 25mm dowel and two brackets I had left over from door closer kits so the reader may have to design something

here for themselves.

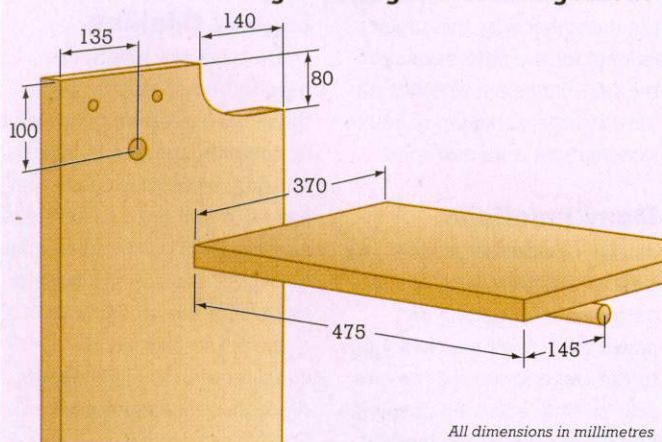
There were a few options for the router table and in this case I have chosen an excellent product from Trend's extensive range. The Trend insert plate and levelling kit give a lot of scope as the weekend woodworker may be unsure of getting a level surface and this kit makes sure you cannot fail. Also, as this 'arm' may just be used as another table for keeping tools at hand, it is very easy to lower the plate and if necessary to pop an insert of MDF over the plate to protect it from unwanted scratches.

At this point I must say that I was very pleased to find that the plate came with a set of insert rings to reduce or increase the table aperture and that they were extremely easy to change. Also there was a good selection of screws for attaching various routers. By using this method, however, it was necessary to drill four holes into the side of the unit to accommodate the adjusting screws as they protruded from the bottom of the arm. This could be over come of course by making the sides of the arms deeper.

Locking brackets

Though optional, the right-hand arm bears the markings of a protractor. I found this to be useful for many reasons, but the main point is that if you have a need for certain information again and again it is handy to clearly mark it onto

Fig 2 Tilting table arrangement



All dimensions in millimetres



Shelf support in the upright position. Note the release mechanism on the end

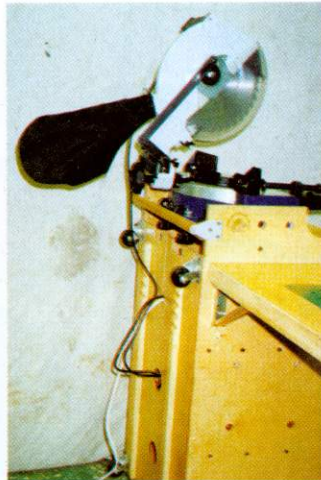


Insert plate removed to show the levelling kit

Rear view. Proper use of the holes and slot keep the cables neat and tidy



Underside of the router table showing the levelling kit



your work surface and varnish over it. This way you will always have the information for reference at hand and the varnish should give this information some protection from wear and tear.

I spent an awful lot of time trying to develop a way of locking the arms up and still have them sturdy when in use but to no avail. Then one day I came across these brackets in an Hafele catalogue. I fitted a pair to each arm allowing 40kg carrying capacity. I had to use packers to allow them to lay flat due to the depth of the arm sides, however, they have proven to be the only bracket I would recommend for this project.

The arms are simply lifted into position and the brackets lock themselves. When you want to drop the arms you simply press the end of the bracket with your fingers and the support releases itself! They are simple, strong, cheap and excellently made and I think I may have a use for them in the near future as well. I have included information at the end of the article where they can be obtained from.

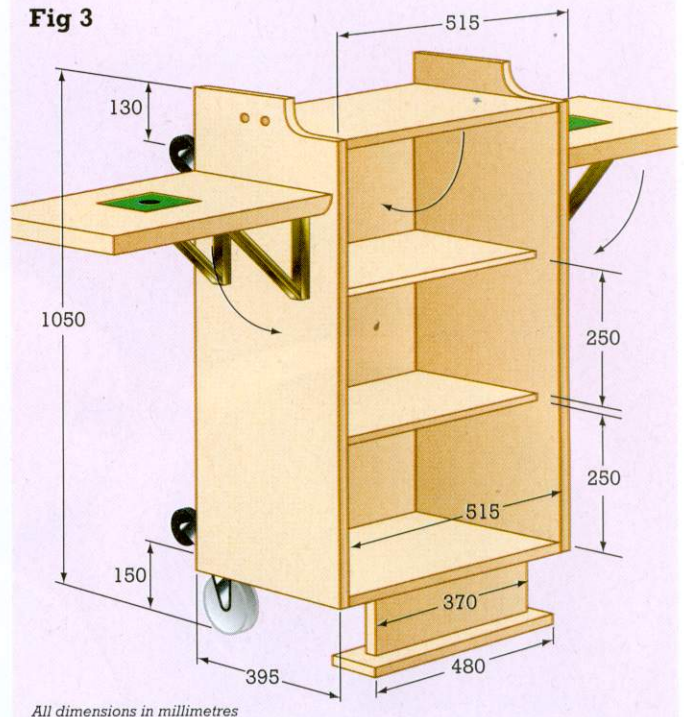
Capacity

The capacity of the main body can be varied to suit the tools you have or even the height you stand at. I happen to find this height comfortable and I can get quite a variety of tools

into the cubby holes depending on what is required for each job, i.e. I do not always need a router with me but I nearly always need a transformer, this I find fortunate as it provides a good weight to have in the bottom of the caddy and that gives the whole thing good stability. The caddy itself is strong and stable and only by using it will you get a feel for how to use it safely. That said, it is always best to keep the tools not being used within the main body that way their combined weight is being put to use and they are tidy and accessible at all times.

The first shelf under the chopsaw will need a cut-out for the protruding/locking handle in the front of the chopsaw, alternatively, you could just remove this each time it is lowered. I also found it necessary to cut a bit of the facing baton to allow the body of the chopsaw to be lowered. The reason for the tilting shelf is so the back of the chopsaw does not hang lower than the

Fig 3



back of the caddy when laying flat. I have fixed a 2 x 1in baton to stop the tilting shelf from going back too far and this has formed a void into which I have housed the accessories for the chopsaw and a four-way socket which is screwed to the shelf.

I have clearly marked the plugs of all of my tools and even the plug for the four way socket. Into the back I have cut a slot so that leads can be passed through and hung down

the back of the caddy out of the way. There is also a hole in the back to pass a plug through so the transformer can stay inside the unit keeping it stable.

A friend of mine who was curious about the project said, "What I like most about this is, not only will it help me keep tidy in my shed (8 x 4ft) but on a sunny day I can wheel it outside and work in the garden". You know, I might just do that myself!

Further information

Hinged spring brackets. Cat. No. 287.41.915 available from: BK Services, 8 green drift, Royston, Herts SG8 5DB

Tel: 01763 221590 Fax: 01763 221594

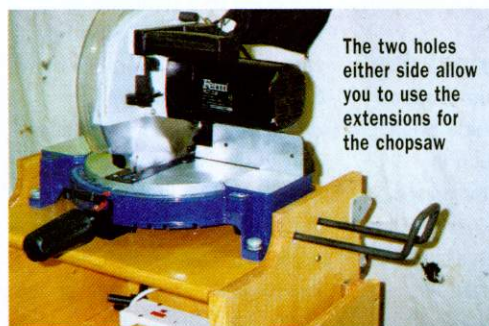
Trend Insert Plate (CRT/Plate A)

£19.60 plus VAT

Trend Levelling kit (CPL/kit)

£13.95 plus VAT

Available from the current Trend catalogue. Tel: 0800 487363



The two holes either side allow you to use the extensions for the chopsaw



The insert plate comes with this set of reduction rings



Guide bushes

By Ron Fox

Guide bush work is one of the most creative areas of routing, but one of the most neglected. A guide bush is one of the standard accessories supplied with nearly all routers, but reaction from my course students suggests that in many cases it remains unappreciated and unused. This is a great pity because guide bushes, used with templates, open up whole new areas of creative routing.

In this and the subsequent article I shall review the range of bushes available and look at some of the most useful applications.

Guide bush principles

To begin with, let us examine the principles of guide bush work. The guide bush is essentially a circular flange, usually between 10 and 40mm in diameter (always expressed as the outside diameter), which fixes to the router base

and projects below it. The cutter plunges through the middle of the bush and the edge of the flange runs against the edge of a template to reproduce the shape of the template. The cutter, obviously, has to be of a smaller diameter than the guide bush and this means that the cut in the workpiece is offset some distance from the edge of the template. This, in fact, is the key to guide bush work, as we shall see.

Fundamental factors in understanding guide bushes:

1 The circular flange of the bush should be concentric with the cutter. With most routers there is no adjustment available to the user but with some of the accessory sub-bases (which we shall examine later) there is a centring device. The bush should also be large enough in diameter to allow the cutter to pass through with 2-3mm clearance all round to let the waste clear.

2 The flange of the bush projects below the base of the router so the template must be made of material at least as thick as this projection. In practice this means having the template slightly thicker than the projection of the flange but you do not want it thicker than necessary because maximum depth of cut is reduced by the template.

3 The cut takes place some distance from the edge of the template. This distance, called the offset, depends on the combination of cutter diameter and guide bush diameter and has to be allowed for when making a template. It is calculated as:

$\frac{1}{2}$ (outside diameter of guide bush - diameter of cutter).

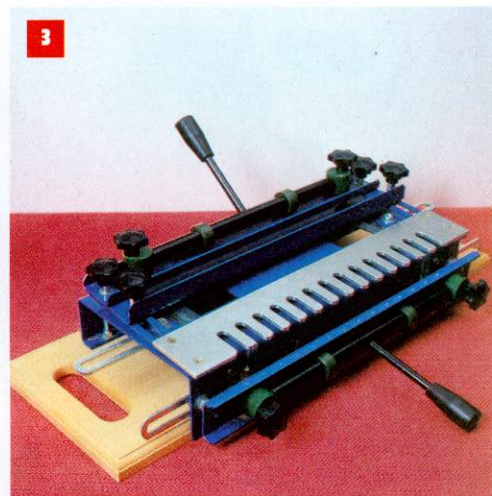
Thus with a guide bush of 24mm and a 10mm cutter the offset will be: $\frac{1}{2}(24 - 10) = 7\text{mm}$.

Note that with an 'inside' template, as in our example, the cut is smaller than the template, but with an 'outside' template the cut is larger than the template. Figure 1 shows diagrammatically the guide bush/cutter offset.

First hand-hold being cut in a dovetail jig mounting board. Also shown are smaller pieces of MDF showing top the completed hole and bottom the ovolo decoration



The finished board with the dovetail jig mounted on it. Note that both hand-holds and the edge of the board are finished with an ovolo moulding cutter



Fortunately for us we are spared the mental arithmetic involved in calculating the offset, simple though it is, if we have the Trend Routing Catalogue. This contains, in the guide bush section, a ready-reckoner table showing the offsets for various combinations of guide bush and cutter. The table is reproduced by kind permission of Trend.

Different size hand-holds

As a simple introduction to the creative use of guide bushes, consider the question of different size hand-holds. One of my mounting boards was so narrow that the combination of

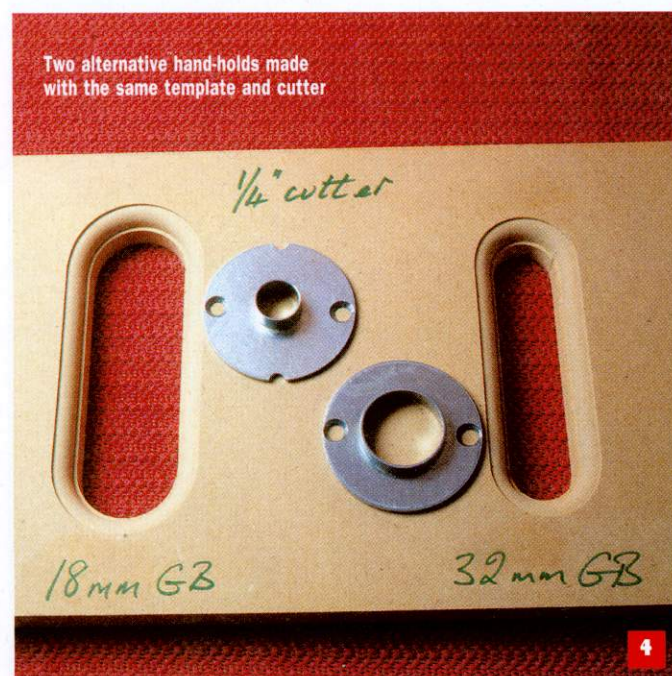
cutter, guide bush and template used in the example above would have produced a hole longer than the width of the board. There was no need to make another template. In order to reduce the size of the hole all that is necessary is to use a guide bush with a larger diameter so that the offset becomes bigger and the hole therefore smaller. Equally, by using a smaller guide bush (as long as it is big enough for the cutter), the hole is made larger. Pic 4 shows two alternative hand-holds made with the same template and cutter. The 18mm guide bush gives a larger hole and the 32mm bush gives a smaller hole.

This shows the value of having a range of guide bushes. Think of them as a system for following a template while pushing the cut further away from the edge of the template or pulling it in closer.

AVAILABILITY OF GUIDE BUSHES

Trend

The largest ranges of guide bushes are found among the medium power routers, with their combination of capability and portability. There is one notable exception, however. The 1800W Trend T9 has the largest range of all models,



The Trend T5 and T9 routers with the complete set of Trend bushes. Note large inner plate in front of the T9 for mounting standard size bushes

Some of the routers which take the Trend standard range of guide bushes



consisting of the standard set of twelve manufactured by Trend, plus three that are unique to the T9 at 50mm, 60mm and 70mm diameters. Pic 5 shows the two Trend routers with the complete set of Trend bushes. Note that with the T9, the standard size bushes are mounted on an inner plate, which is adjustable for concentricity.

The standard Trend bushes fit a number of other medium power routers although manufacturers tend not to publicise this point. Pic 6 shows some of the routers that accept the Trend standard range. In some cases e.g. the DeWalt DW 613 and 615 models and the Power Devil, fitting is by means of nuts and bolts through plain holes in the

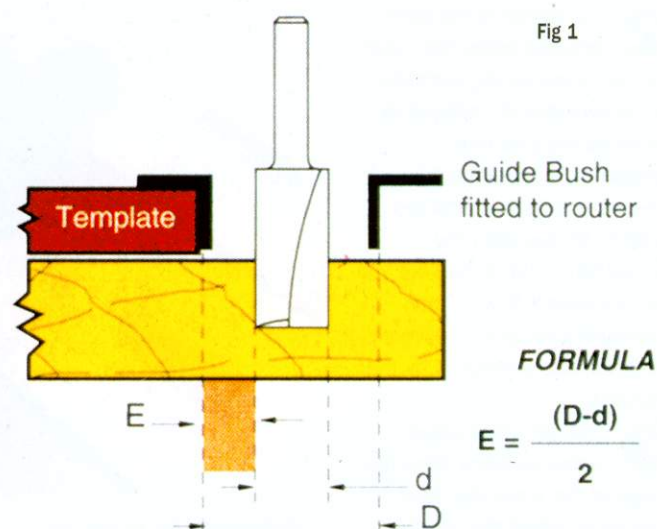


Fig 1

router base, but with most of these models bushes are fitted by means of M5 screws into tapped holes in the router base.

Hitachi

Hitachi is another manufacturer providing a good range of guide bushes and the same bushes fit the small, medium and large Hitachi models. Hitachi guide bushes are the same diameter as Trend and Trend bushes can be adapted to fit the Hitachi.

Two notches have to be filed in the edge to take the shanks of the two fixing screws. The adaptation can be carried out in reverse: Hitachi bushes can be drilled and countersunk to fit Trend-compatible routers. One benefit of this is that if you have a Hitachi router plus one of the Trend-compatible models, one set of bushes will serve both routers. Another advantage is that Hitachi owners can buy a standard dovetail jig such as the DeWalt,

Example

As a first example of guide bush work we shall rout handholds in a board of MDF which will be used to mount a dovetail jig. This is typical of the many simple but useful applications of guide bushes. It involves the making of a simple template. The router used is the HolzHer 2356, a model which accepts the Trend bushes.

We begin by choosing a guide bush and cutter for the job. We are going to cut a hole right through an 18mm piece of MDF and so we require a fairly narrow straight cutter (to minimise the cutting effort) and a guide bush big enough to give the required clearance. I am using a 24mm guide bush and a 1/4in cutter. This combination determines the offset which in our case is (from the table) 8.8mm. Because the cut is an inside one the template should be 8.8mm bigger all round than the required hole. It is made of 9mm MDF, an excellent material for template manufacture because it is flat, stable and easily worked (apart from the dust). You could get away with 6mm MDF with the Trend guide bushes but I prefer the extra bulk of the 9mm stuff.

Our hand-hold is one of many examples of template making where the exact size is not critical. As long as the hand-hold is big enough to comfortably take your hand, a millimetre or two either way does not matter. I simply laid my hand on the MDF to judge how big the hole should be then added a bit for the offset and a bit more for luck. For the offset I rounded up the 8.8mm to 9mm. I then cut two circles in the MDF with a hole saw and joined them with two straight cuts with router and straight edge (I shall look at template making in more detail in the second article).

The workpiece is clamped to a cutting table with the clamps positioned so that they do not foul the path of the router. Alternatively the workpiece can be taped down with heavy-duty double-side carpet tape. Whichever way you choose, a piece of tape under the centre of the cut helps prevent the waste jumping around as the final pass is made. The template is now taped or tacked to the workpiece. Remember that you are cutting right through the workpiece so you need a sacrificial cutting table or a sacrificial board under the workpiece to avoid cutting into the top of your workbench.

Pic 2 shows the first hand-hold at the halfway stage. The smaller pieces of MDF in the picture show the sequence of cuts: top, the finished cut with the waste lifted out, bottom, the hand-hold decorated with a small ovolo cutter. Pic 3 shows the finished board with the dovetail jig mounted on it. The finishing touches were made by applying an ovolo mould to the upper surface of the holes and the edges of the board.

Titan or Trend and quickly adapt the Trend-compatible bush which comes with these jigs. Pic 7 shows examples of modified Trend and Hitachi bushes; left, Trend notched for Hitachi, right Hitachi drilled and countersunk for Trend.

DeWalt DW 621

The DeWalt DW 621 and its predecessor the Elu 97 have state-of-the-art guide bushes which are made in skeleton form to maintain the high standard of dust extraction that comes with these models. These bushes are not interchangeable with other models except for the two new Makita models, the RP 0910 and the RP 1110C. These offer only one bush, but the DW 621 bushes fit without any modification. Pic 8 shows the DW621 with its complete range of bushes, plus the Makita RP1110C with its single bush.

Bosch 900 ACE and 1300 ACE

Bosch 900 and 1300 bushes are also state-of-the-art but in a different way. They have a quick-release bayonet fitting requiring no screws or screwdriver, which makes for

quick and easy changing. There are 5 diameters in the range but unfortunately for creative work the length of the projection increases as the diameter increases. That means that, as supplied, the larger the guide bush the thicker the template required.

As an example of the problem this causes, most kitchen worktop jigs require a 30mm guide bush used with a 1/2in straight cutter. The Bosch range includes a 30mm bush but it is too long to be used with the worktop jig. Templates always result in loss of depth of cut and if I had one of these routers with a full set of bushes I would have them all reduced to the length of the smallest diameter one.

Festool OF 900/100/1010

The Festool OF 900/100/1010 series has a comprehensive set of guide bushes, which again are specific to these models. Unusually, Festool offer a conical centring device with slightly oversize fixing holes and pan-headed screws. The Bosch and Festool routers are shown with their guide bushes in pic 9.



Hitachi and Trend guide bushes modified to fit either router

Metabo OfE 1229

The Metabo OfE 1229 model has a set of six guide bushes, which are unusual in that the bushes themselves are threaded with the fixing screws passing through plain holes in the router base. The router and its guide bushes are shown in pic 10.

Heavy-duty routers

In general, large routers do not provide for a good range of guide bushes, partly because guide-bush work is mainly hand-

held work and big heavy routers are not as suited to it as the more portable medium power models. There are exceptions, of course, such as the Trend T9 and the Hitachi M12V which we have already noted. Generally, however, guide bush work with big routers seems to be reserved for heavy-duty applications such as dovetailing, kitchen work tops, stair housings etc. for which specific jigs with their own guide bushes are usually required.



The DW621 with its complete range of bushes, plus the Makita RP1110C with its single bush



The Bosch 900 and 1300 models and the Festool OF 900 with their complete sets of guide bushes

Fig 2

GUIDE BUSH		Ref.																	
DIA. CUTTER	Outside Dia.		GB10	GB12	GB14	GB16	GB18	GB20	GB22	GB24	GB26	GB28	GB30	GB32	GB40				
			10	12	14	16	18	20	22	24	26	28	30	32	40				
			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm			
7/64	3		3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	18.5				
1/8	3.2		-	4.4	5.4	6.4	7.4	8.4	9.4	10.4	11.4	12.4	13.4	14.4	18.4				
5/32	4		-	4	5	6	7	8	9	10	11	12	13	14	18				
3/16	4.8		-	3.6	4.6	5.6	6.6	7.6	8.6	9.6	10.6	11.6	12.6	13.6	17.6				
13/64	5		-	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	17.5				
7/32	5.5		-	-	4.2	5.2	6.2	7.2	8.2	9.2	10.2	11.2	12.2	13.2	17.2				
15/64	6		-	-	4	5	6	7	8	9	10	11	12	13	17				
1/4	6.3		-	-	3.8	4.8	5.8	6.8	7.8	8.8	9.8	10.8	11.8	12.8	16.8				
5/16	8		-	-	-	4	5	6	7	8	9	10	11	12	16				
23/64	9		-	-	-	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5	15.5				
3/8	9.5		-	-	-	-	4.2	5.2	6.2	7.2	8.2	9.2	10.2	11.2	15.2				
25/64	10		-	-	-	-	4	5	6	7	8	9	10	11	15				
7/16	11		-	-	-	-	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5	14.5				
15/32	12		-	-	-	-	-	4	5	6	7	8	9	10	14				
1/2	12.7		-	-	-	-	-	3.6	4.6	5.6	6.6	7.6	8.6	9.6	13.6				
-	13		-	-	-	-	-	3.5	4.5	5.5	6.5	7.5	8.5	9.5	13.5				
-	15		-	-	-	-	-	-	3.5	4.5	5.5	6.5	7.5	8.5	12.5				
5/8	16		-	-	-	-	-	-	-	4	5	6	7	8	12				
-	18		-	-	-	-	-	-	-	-	4	5	6	7	11				
23/32	18.2		-	-	-	-	-	-	-	-	3.9	4.9	5.9	6.9	10.9				
3/4	19		-	-	-	-	-	-	-	-	3.5	4.5	5.5	6.5	10.5				
-	20		-	-	-	-	-	-	-	-	-	4	5	6	10				
7/8	22.2		-	-	-	-	-	-	-	-	-	-	3.9	4.9	8.9				
1	25.4		-	-	-	-	-	-	-	-	-	-	-	-	7.3				
1 1/8	28.5		-	-	-	-	-	-	-	-	-	-	-	-	5.7				
1 1/4	31.8		-	-	-	-	-	-	-	-	-	-	-	-	4.1				

There is no need, however, for owners of large routers to be excluded from general guide bush work. If your router comes with only one guide bush, or none at all, you can buy or make a sub-base which will fit to the base of your router and take the standard range of Trend guide bushes. The least expensive way of doing this is to purchase a Trend Unibase

(reviewed in *Routing* 37). This is a 170mm diameter x 8mm thick injection-moulded plastic disc, which is recessed to accept standard Trend guide bushes. The Unibase is drilled with fixing holes for a wide range of routers and comes complete with a selection of fixing screws and a plastic alignment bush and two pins. The recess in the Unibase will

also take various other Trend-compatible guide bushes such as those supplied with the Leigh, Trend and other dovetail jigs. The latest introduction to the range is a set of plastic guide bushes, which fit the Unibase, the T5 and all Trend-compatible routers. Actually there are two sets, each of twelve bushes. One set is in odd sizes the other even. Both go up in 2mm increments.

An alternative to the Unibase is the Trend circular sub-base. This, like the Unibase, is 170mm in diameter, 8mm thick, and recessed to take the standard trend bushes. Unlike the Unibase, however, it is made of Tufnol and is specific to a particular router. Actually, there is a way in which it can be used with more than one router. All circular sub-bases are drilled with two fixing holes for the Elu/De Walt/Trend standard fixing holes. If you want one for a different router, say a Bosch 900 ACE, you specify this when you order the sub-base. Extra holes, to suit the Bosch (or whatever router you have specified it for) are then drilled in the sub-base and suitable fixing screws supplied. Thus, if you had, say, a DeWalt 625 and a Bosch 900 ACE, the

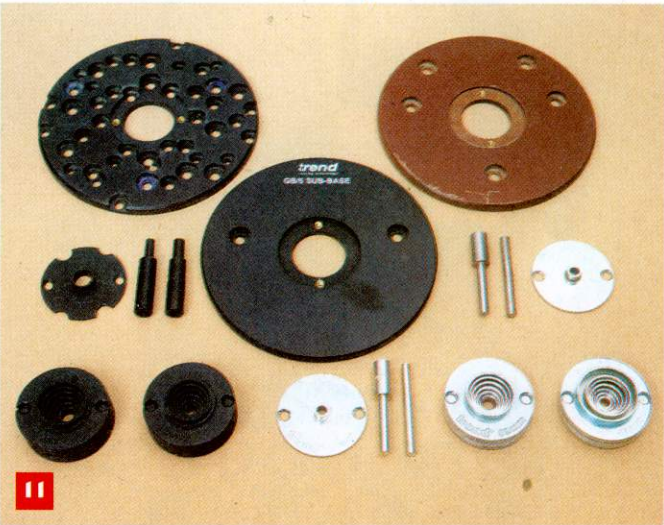
one standard sub-base specified for the Bosch would fit them both and would accept the standard Trend range of bushes. The Tufnol circular sub-bases are more substantial and more expensive than the Unibase but, if you intend to do much guide bush work, they repay the extra cost.

Pic 11 shows the Trend sub-bases: from left to right: the Unibase, the current standard circular sub-base, and an older one which I bought for my Bosch 900 ACE. The additional holes drilled in the older model for the Bosch are clearly seen. Also shown in the photograph are the sets of Trend standard guide bushes, both plastic and metal and the alignment bush and pins for each sub-base.

Having reviewed the available equipment and seen a very simple example of guide bush work, in the next article we will look more closely at guide bush applications and the making of templates.

Next issue...

Ron looks at using guide bushes for various routing applications.



Trend sub-bases. Left to right: the Unibase, the current circular sub-base with Elu/De Walt/Trend standard fixing holes, an older version specified for the Bosch 900ACE, with additional holes drilled in it

Perfect finish

Ralph Sinnott discovers a man-made material that offers a very attractive alternative finish to some banned and endangered materials

When my attention was attracted to an advertisement for alternatives for ivory and other banned or endangered materials I sent off for samples. I particularly liked the appearance of a sheet material described as Abalone Colour 9

and I designed the jewellery boxes and carriage clock to accommodate some of it. The sample was 3.5mm thick and this was the thickness I ordered, however this thickness was out of stock and I was sent what was nominally 5mm thick. This meant making the recesses for the panels deeper than I had planned and

that shown in the drawings. The 560 x 450mm sheet (22 x 17¹/₂in) was cut in half for sending by post. There was a slight bend in it, but this was corrected in the panels after they were cut by placing them in hot water from the tap until they were warmed through and flattening them between two boards. For cutting the material a bandsaw was used, the edges were trimmed with a disc sander or steel plane and where holes were required an appropriate woodworking bit proved suitable. Epoxy resin adhesive was used to glue the material to the wood.

The timber I decided to use was sycamore and the most suitable colour I could find to

tone in with the abalone was that of a Liberon gilt vanish called St.Germain. Had I been able to find a timber which had a natural colour to go with that of the abalone I would have been prepared to use it, but as I could not gilt vanish it had to be.

Materials

Abalones are shellfish often known as Sea Ears because of their shape. There are around 100 named species, they are found in various parts of the world and are good sea food. One of the largest is the Green Abalone found in Southern California and Mexico. It has an attractive mother-of-pearl interior that is used for inlay work. It is this species that the plastic alternative is made to resemble.



Side of box lowered on to router cutter with stops to control start and stop

Project

Cheaper materials can, of course, be used instead of abalone alternative for the panels. Small sheets of decorative acrylic sheets are available in gold, silver, mother-of-pearl, marble finishes.

Rectangular box

After preparing the timber cut the sides about 12mm (1/2in)

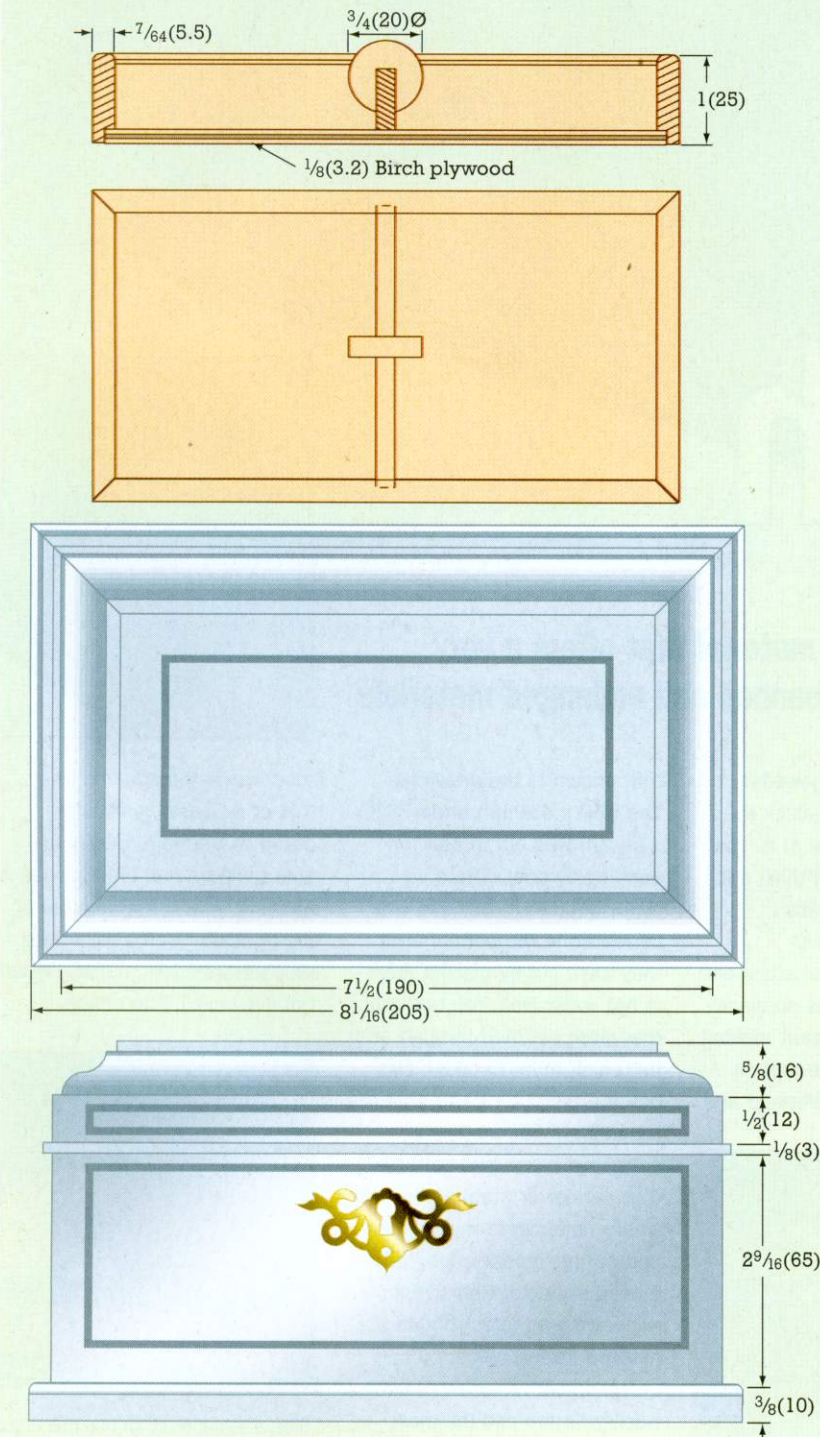
longer than the finished length, true the ends and make sure that opposite sides are exactly the same length. With the router in its table and a suitable cutter in the router recess the sides to receive the abalone panels. Use stops fastened to the table to fix the starting and finishing points and lower the sides on to the

cutter to start the cut, pic 1. The same cutter may also be used to make the rebates for the top and bottom of the box. These must be stopped 6mm (1/4in) short at each end of the finished length so re-set the stops to ensure that the cut does not go too far. Square the ends of the recesses with mallet and chisel, pic 2.

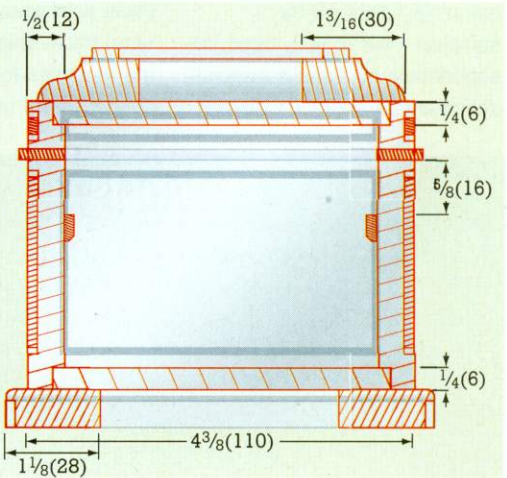
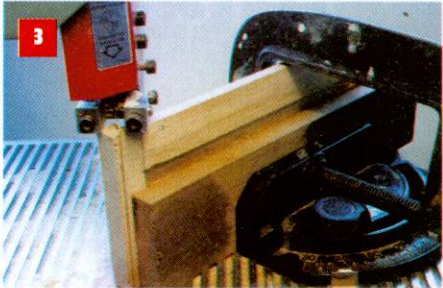
Joining

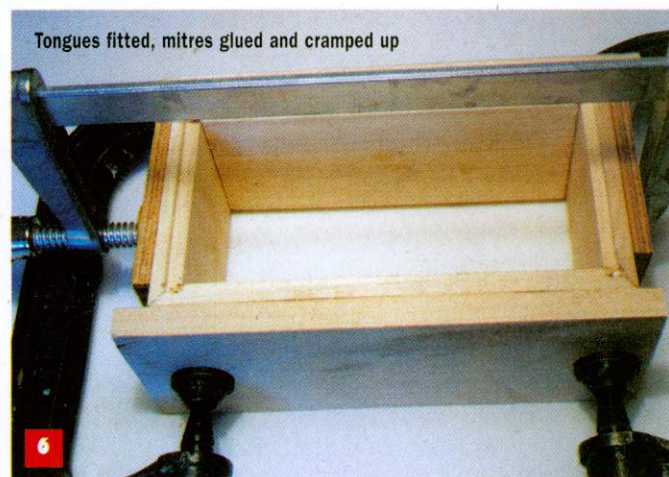
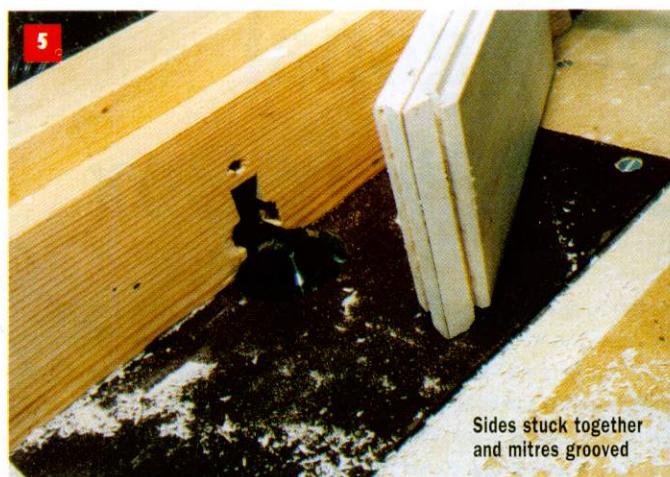
Mitre the sides using the bandsaw and disc sander, pics 3 and 4. Fasten two sides together with double-sided tape or masking tape to get two square surfaces which are held between the router table and fence while 3.2 mm (1/8in) grooves for the plywood tongues are cut, pic 5. When

Fig 1 & 2 Rectangular jewellery box



All dimensions in inches and millimetres in brackets





the tongues have been fitted cramp up the mitred joints, this is easy because the tongues prevent the mitres from slipping and cramps can be applied square to the sides, pic 6.

Lid

Fit and glue in place the bottom of the box. The top may as well be fixed at this stage. I left it off until I had cut off the lid but I cannot now think of any reason why I did this. Gauge a line where the cut is to be made and working first from one side and then from the adjoining end make the cut, pic 7. The lid is completed by mitring and fixing the strip round the edge and the moulding on the top: an ogee cutter with two curves of 6.3mm ($\frac{1}{4}$ in) radius is used for the moulding.

Lock

Make a template and using a guide bush and suitable cutter router out the recess for the body of the box lock. Hang the lid with a pair of 25mm (1in)

brass butt hinges. Now complete the box by rebating the base moulding for the abalone, mitring the moulding at the corners and fixing it in position with screws from the underside.

Panels

The abalone panels are edged with a 1.5mm ($\frac{1}{16}$ in) thick gold coloured strips, cut these from 1.5mm mahogany panels, as sold by model shops, and paint them with gilt vanish before fixing. After painting the box, glue the gold strips around the recesses for the panels. The panels are then cut to size and glued in place with epoxy resin, pic 8.

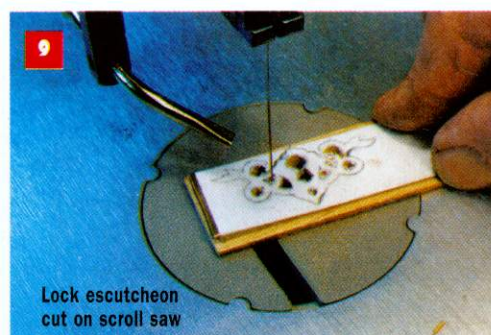
Lock escutcheon

Use the escutcheon supplied with the box lock or cut one to the pattern shown. Reproduce the pattern and paste it on to a piece of 0.8mm ($\frac{1}{32}$ in) thick brass. Stick the brass to a piece of plywood with double-sided tape, bore for the keyhole and other circular parts of the design after first marking the centres with a centre punch. Cut out the rest of the escutcheon with a metal cutting fretsaw blade either by hand or using a scrollsaw, pic 9. Polish the brass with wet-and-dry papers down to No. 1000 finishing with burnishing cream. Stick

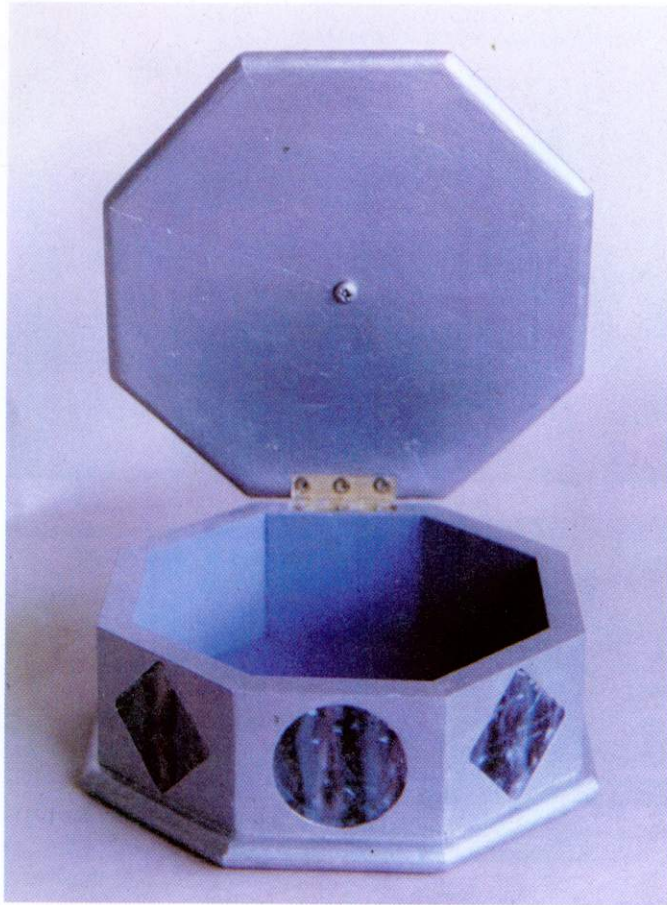
the escutcheon on to the abalone with epoxy resin.

Tray

Prepare the material for the sides and partition of the tray shown in fig 2. Rebate the sides and round the tops. Mitre the corners, make the housing for the partition, make the handle and prepare it to fit on the partition. Lay the sides of the tray flat and stick masking tape across the mitres. Put a spot of glue on the mitres then bend the sides at right-angles. Fix the partition and plywood bottom of the tray and glue to the right-angles, pic 10. Fix the partition and plywood bottom of the tray and glue to the box the bearers that support the tray. Stain the tray and the inside of the box. I used lavender coloured Liberon palette wood dye for this and gave it one coat of polyurethane varnish.



Octagonal Jewellery Box



for the tongues using a jig, pic 12. Glue the mitres using a glue that sets slowly enough to enable you to assemble the parts and cramp them. For a cramp use string tied round the assembly which is tightened by wood blocks pushed in between the string and the sides, pic 13.

the abalone, pic 14. Cut out the triangular pieces for the top and the bottom and true up the edges. Truing up is best done on the disc sander, reversing every other piece on the table of the sander to cancel out any slight variation in the squareness.

Completion

Glue on the bottom of the box, hinge on the top with a 38mm ($1\frac{1}{2}$ in) brass butt hinge. Paint the box, then fit and fix the abalone. Finally make the knob for the top of the box. Build up the shank with small pieces of abalone stuck together with epoxy resin, shape it to an octagon measuring about 13mm ($\frac{1}{2}$ in) across opposite sides, then glue on pieces of abalone, octagonally shaped and overhanging 2mm ($\frac{5}{64}$ in) all round. Screw on the completed knob from inside the lid.

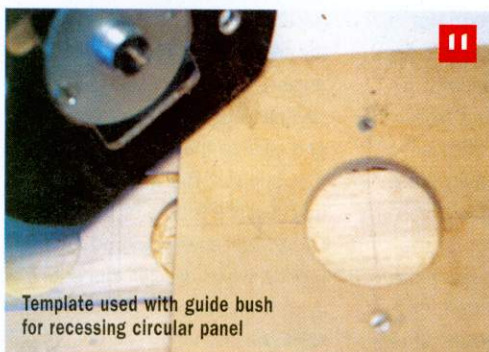
Each made up of eight triangular pieces glued together

Top and bottom

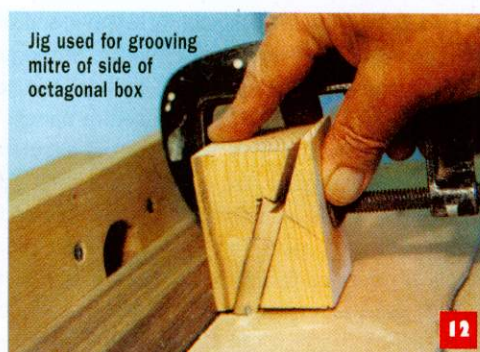
The top and bottom of the box are each made up of eight triangular pieces glued together with butt joints. While the material used for the top in its length groove and recess it for

Obtain the length of the sides and the angles of the mitres from a full size drawing of the plan of the box. Take the material to be used for four

sides of the box and (keeping the material in the length) cut the recesses for the circular panels using a template and guide bush, pic 11. Repeat for the square panels, then make the mitres. Groove the mitres



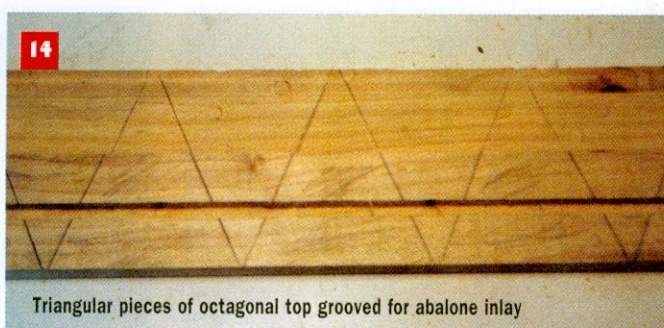
Template used with guide bush for recessing circular panel



Jig used for grooving mitre of side of octagonal box



Tightening glued joints with string and blocks



Triangular pieces of octagonal top grooved for abalone inlay

Further information

Abalone alternative

GPS Agencies
01243 57444

Decorative sheet

Hindleys of Sheffield
01142 787828

Brass handle, bullet catch, door knob, box lock

W. Hobby 02817 614244

Next issue...

Ralph uses some more of his alternative finishing material on a carriage clock.

Fig 3 Octagonal jewellery box

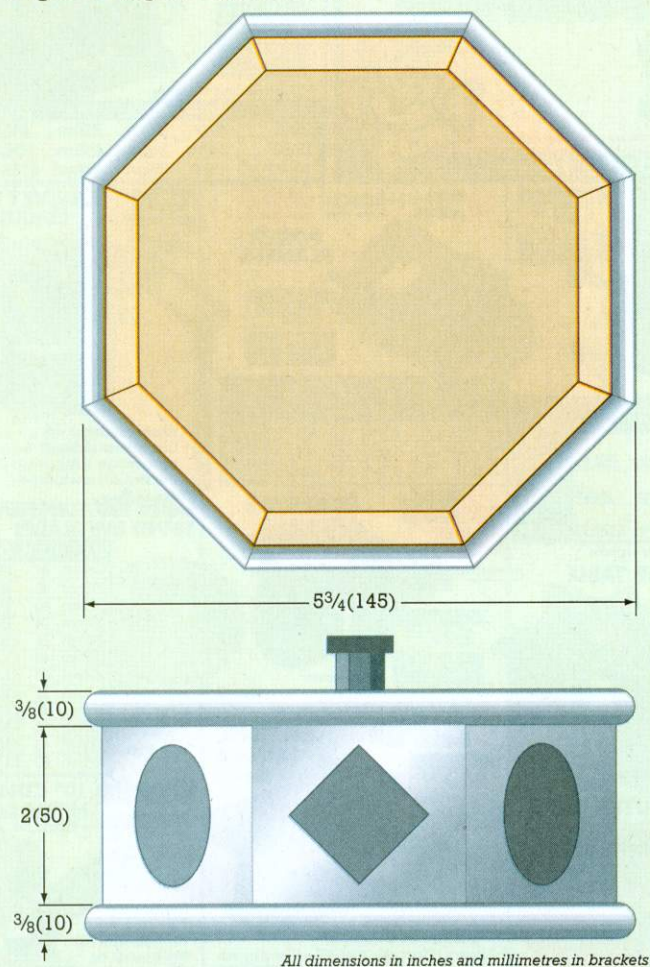
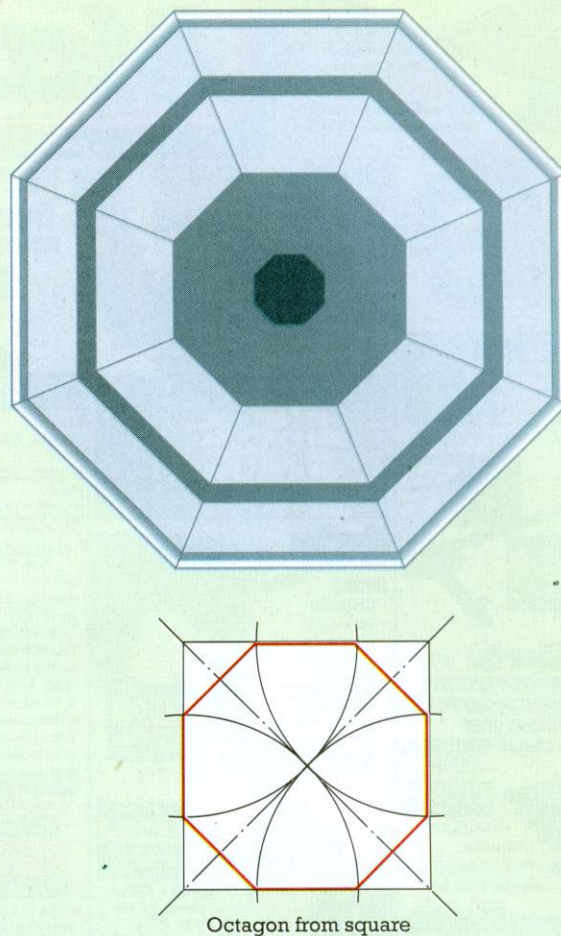


Fig 4 Octagonal jewellery box



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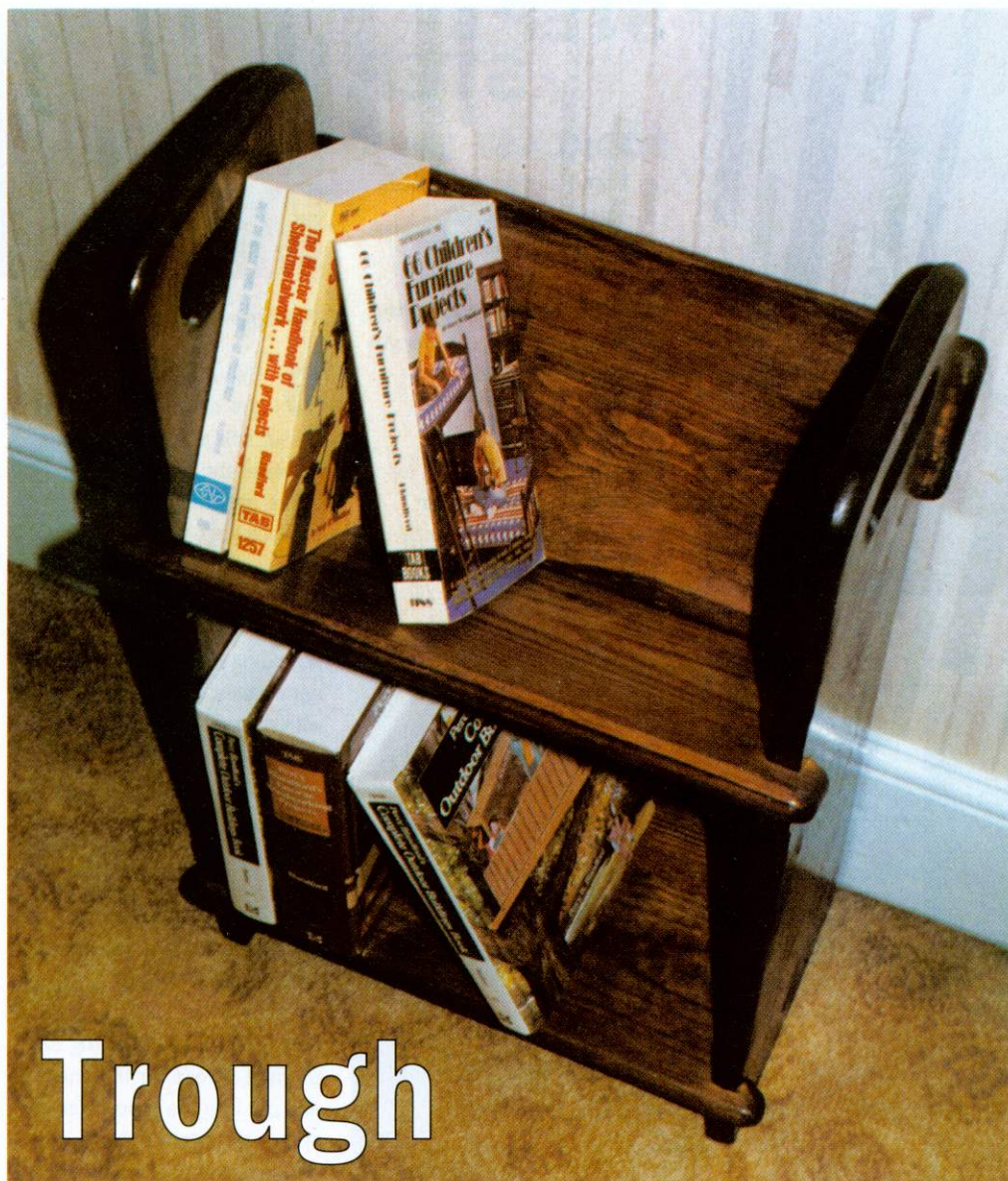
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are easily identified. Alternatively, the trough can be used for sewing or knitting things, while the bottom shelf could still hold books or there could be boxes, baskets or other containers.

Design

The sizes suggested (fig 1) make a free-standing bookcase to put anywhere, but the hand holes allow it to be carried to where it is needed. In particular, it is a height and size to have beside an armchair, with the contents at a comfortable height for access.

Materials

The bookcase illustrated was made from building quality softwood (pine), which is available finished a full 43in (19mm) thick and the maximum width usually available is a nominal 9 inches (230mm) - which is finished about 8¹/₂in (215mm). The wood for the bookcase shown cost less than £10. The piece would look good in any furniture hardwood.

Everything can be done with either a hand-held router, or a router mounted in a table

You will need straight router cutters, either a full-size one for the housing joints (fig 2A) or you can use the one for the back grooves (fig 2B) in two passes. This will also cut the hand holes. There is plenty of rounding over (fig 2C). Everything can be done with either a hand-held router, or a router mounted in a table. If you alter sizes, check your book measurements and allow a sufficient base area for stability.

The key parts are the pair of ends (fig 3A). Make them completely first, as their grooves and notches affect cuts on the ends of other parts.



STEP BY STEP

BOOKCASE ENDS

1 Mark out a pair of ends as completely as possible (fig 1A and 3a). Widths of grooves should match the actual wood for the crosswise parts. Cut to length and square the ends.

2 Cut the hand holes before shaping the top corners, to give maximum bearing for the router fence. Drill two 1¹/₄in (32mm) holes.



Plinth groove

3 Use a straight cutter in the router (³/₈in would be suitable) to cut the outline between the holes (fig 5A). Cut in the direction that gives a smooth edge at the outside. You may find it best to cut slightly more than halfway through from opposite sides. Rounding over the edges of the hand holes can be done later with other rounding.

4 Shape the top corners.

5 Cut the shelf grooves with a full-width cutter or two passes of a narrower one. Cut to a depth of half thickness. Cramp on a guide strip in each position. (fig 5B). Go right across for the shelf and cut into the groove for the end of the plinth (fig 3b). You will have to square the corner where the trough grooves meet with a chisel (fig 3c).

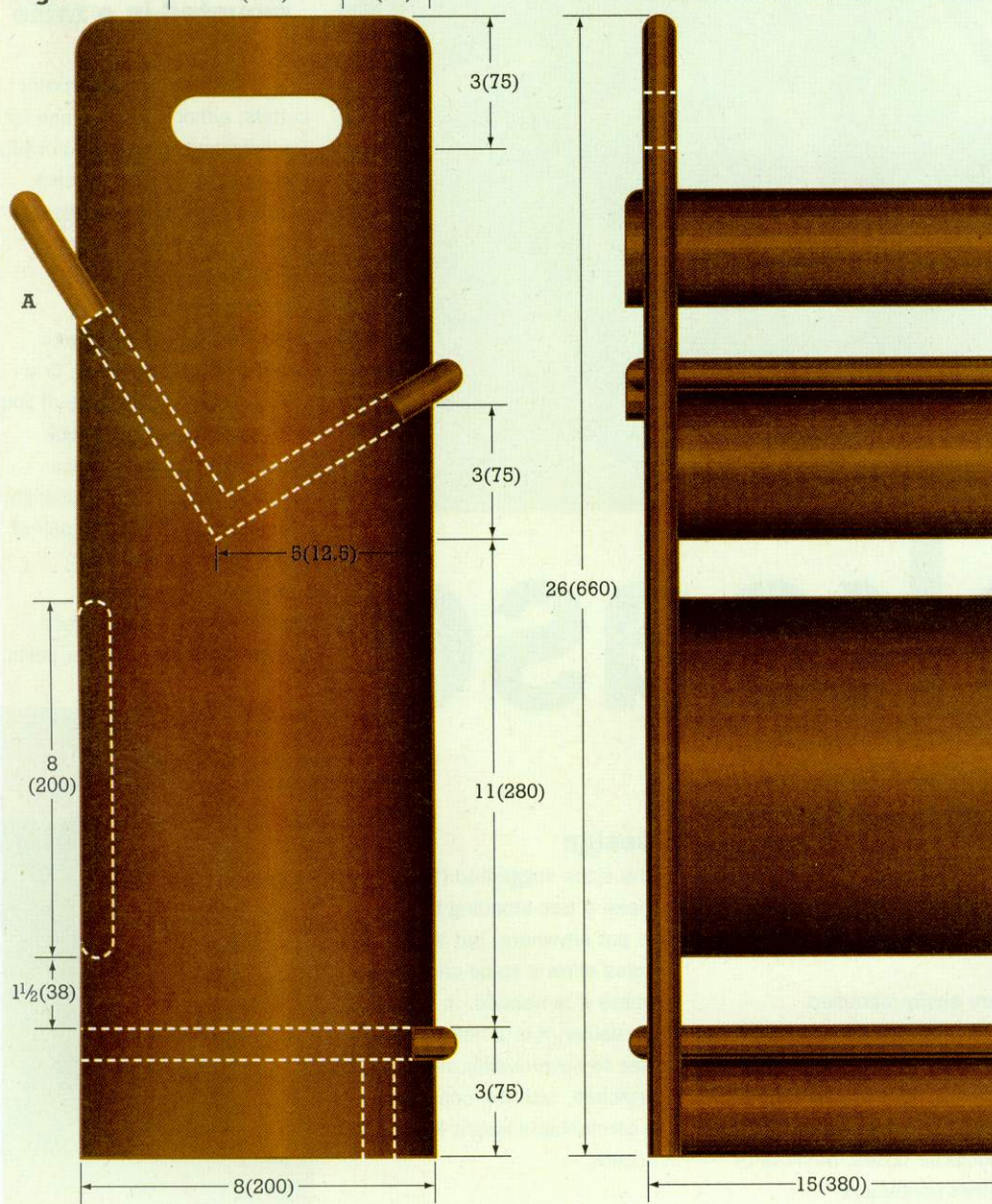


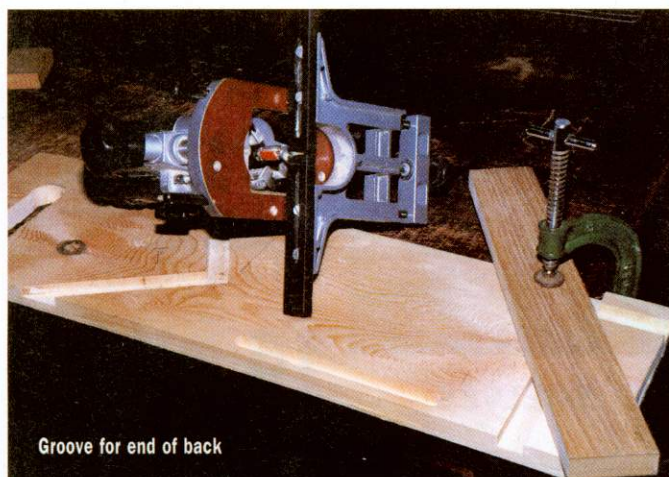
Cutting grooves for trough



Square groove corner with chisel

Fig 1 All dimensions in inches and millimetres in brackets





Groove for end of back



Hand hole shaped

6 The shelf will be flush at the back, but it extends forwards and outwards at the front (fig 1B). To allow for this, cut back the fronts of the grooves $\frac{1}{2}$ in (12mm) (fig 5D).

7 The ends of the trough go through in a similar way at front and back. Cut back these grooves $\frac{1}{2}$ in (12mm) from the lower corners.

8 The back (fig 1C) should finish level with the rear edges of the ends. It is held with a $\frac{3}{8}$ in (9mm) tenon in a groove (fig 3d). Allow for the tenon being cut back $\frac{1}{2}$ in (12mm) from the edges of the back (fig 5E).

9 Round over both sides of the edges of the hand holes.

10 Round over both sides of the top edges from $1\frac{1}{2}$ in (39mm) above the rear trough groove around to the same distance above the front groove.

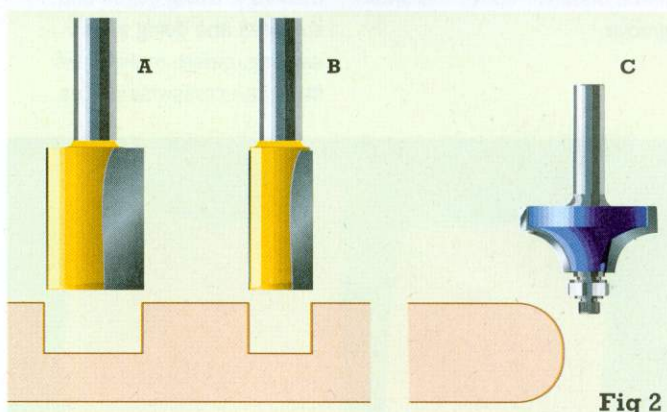
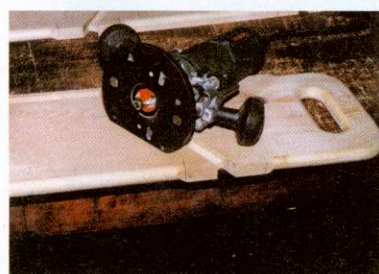
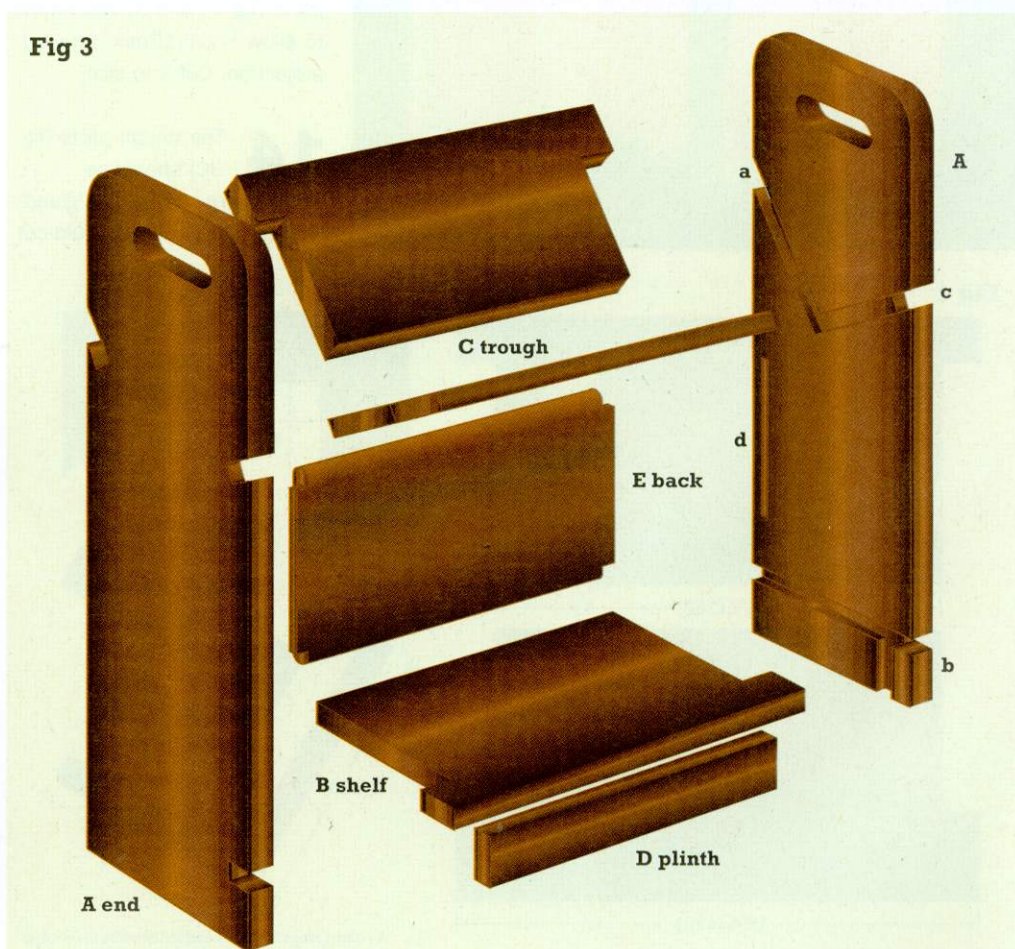


Fig 3

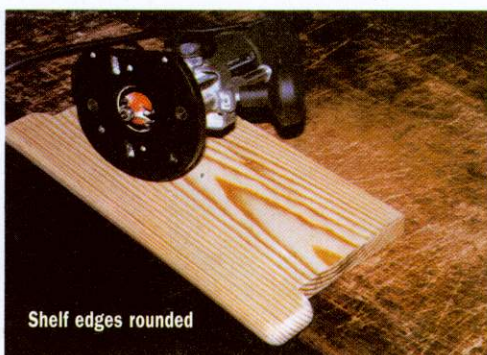


Hole and outer edges rounded





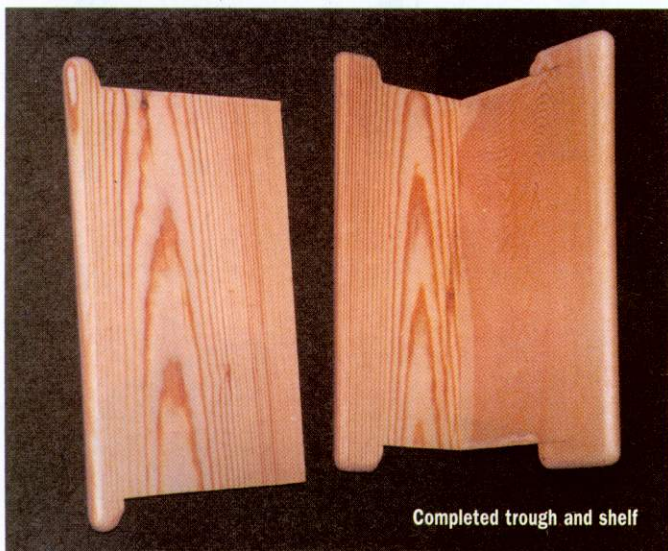
Matched pair of sides



Shelf edges rounded

11 Do the same from 1 1/2in (39mm) below the front trough groove to the same distance above the shelf groove.

12 You will probably find it best to clean up the ends at this stage, removing markings, truing edges and surfaces and doing a first sanding, before making and fitting the crosswise pieces.



Completed trough and shelf

SHELVES

For the parts to fit properly and the bookcase to stand squarely, crosswise parts have to be matching lengths. Make the trough parts and the shelf the same length in the pieces that fit in the grooves. Allow for the actual depths in the grooves when marking the lengths of the back and the plinth.

13 Mark out the shelf (fig 3B) with ends to match the grooved and notched parts (fig 4A and B) and widths to allow 1/2in (12mm) forward projection. Cut it to size.

14 The trough parts (fig 3C) should be satisfactory with a plain glued joint (fig 4C), but you could cut

a tongue and grooved joint if you wish (fig 4D). Widths are suggested (fig 4E), but you could adjust them to suit your books. Use the shelf as a guide to length and cut the ends to match the grooves and notches and projections the same as the shelf.

15 The plinth (fig 3D) is a plain strip (fig 1D) to fit under the shelf. Make sure it will not project below the ends. The bookcase will stand steadier if the plinth is slightly too narrow.

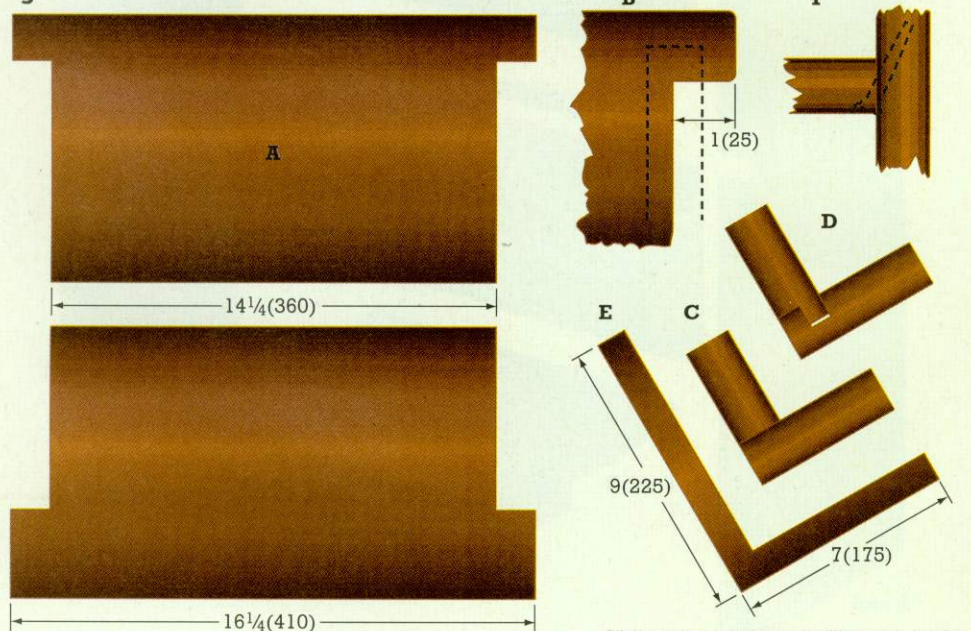
16 Mark out the back (fig 3E) to a length where its shoulders will fit between the ends and its tenons will reach into grooves without quite touching the bottoms. Reduce the tenons top and bottom to suit the grooves (fig 5E).

17 You may have a rabbet cutter to suit, but you will have good control of size if you use a straight cutter and the router fence as a guide to shape the back tenons.

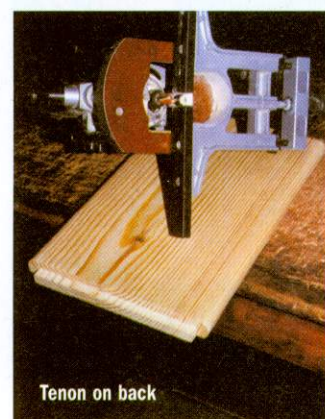
18 Round over both sides of top and bottom edges of the back, front edge of the shelf and exposed edges of the trough.

19 Make a dry check of the fit of joints and that relative sizes are correct.

Fig 4



All dimensions in inches and millimetres in brackets



Tenon on back

Sand everything before assembly



Underside, showing screw



ASSEMBLY

20 Glue and cramp the two parts of the bookcase trough.

21 Glue the trough, shelf and back to the ends and cramp until the glue has set.

22 The parts should pull together squarely, but check by comparing diagonal measurements and sight across to test for twist during assembly.

23 Fit the plinth below the shelf and glue to it as well as at the ends.

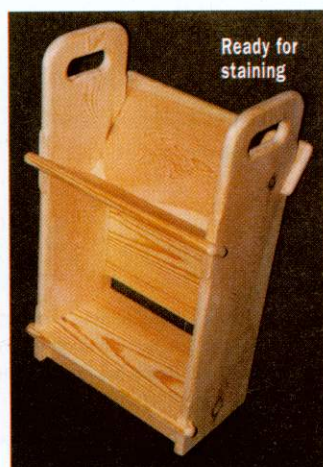
24 All parts, except the back, have side to end grain glued surfaces, not the best condition for glued strength. If joints are tight, the bookcase should be strong enough, but if you want to increase strength you can add screws (fig 4F), one under the centre of each end of the shelf and one each end near the corner at the bottom of trough.

25 Remove excess glue and do final sanding.

26 Apply your chosen finish. The trough bookcase illustrated is made of pine, stained to match other furniture and given three coats of varnish.



Corner after assembly



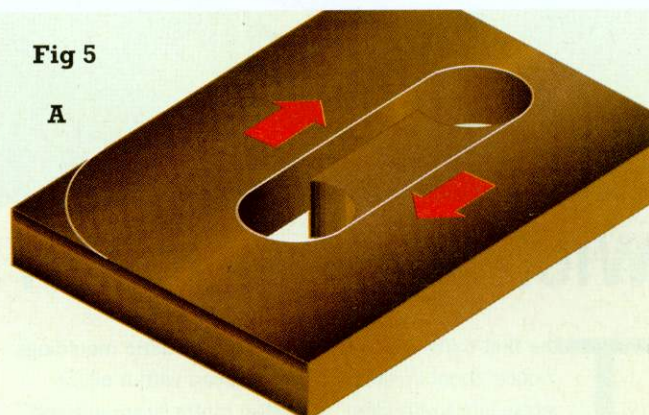
Cutting list

Part	No.	L	W	T
Ends	2	26 (660)	8 (200)	3/4 (19)
Shelf	1	16 1/2 (420)	8 1/2 (212)	3/4 (19)
Back	1	14 1/2 (370)	8 (200)	3/4 (19)
Trough	1	16 1/2 (420)	7 (180)	3/4 (19)
Trough	1	16 1/2 (420)	8 1/2 (212)	3/4 (19)
Plinth	1	15 (380)	2 1/4 (55)	3/4 (19)

Inches (Millimetres)

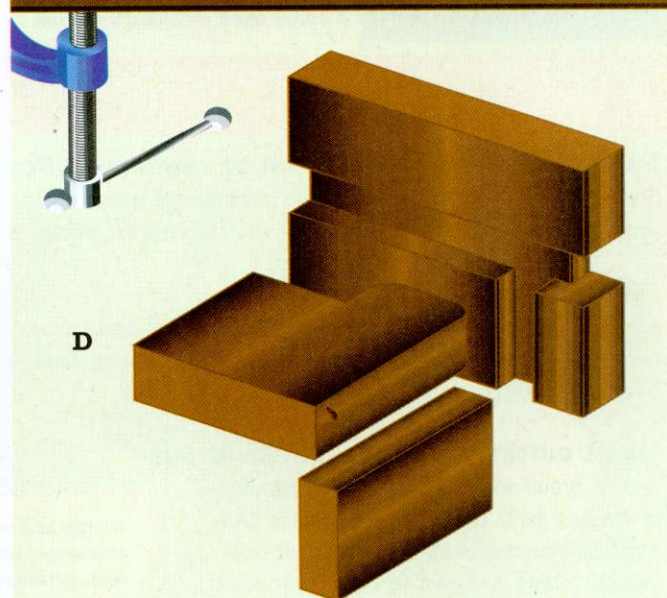
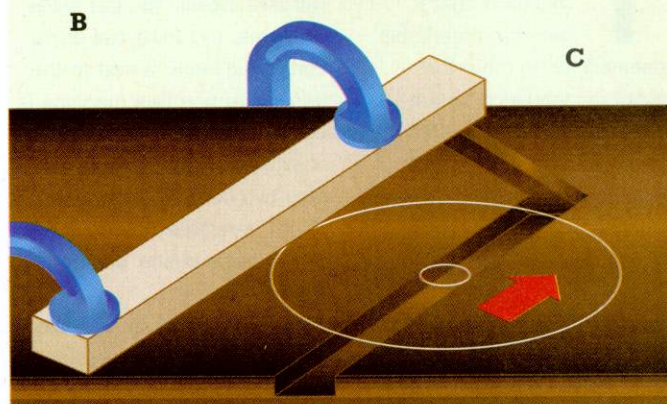
Fig 5

A



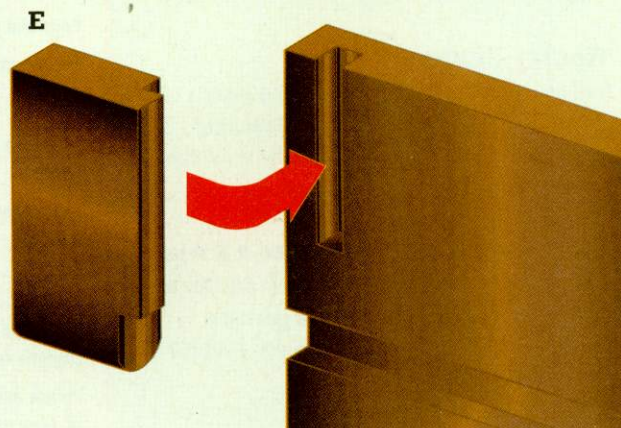
B

C



D

E





Wickes small router

The first thing you notice about Wickes' entry into the budget market is that it bears a remarkable resemblance to other low-priced models such as the Ferm, tested earlier in this issue, and the Power Devil.

Further information

Available at Wickes stores nationwide
Price: Around £49

The grey plastic mouldings are relieved with a silver-coated motor surround and red switchgear. You get loads of extras, including two extra carbon bushes - a nod to the heavy site use this machine is bound to endure at the hands of White Van Man. There's also two collets (8mm and 1/4in), template bearing guide, fence and a blister pack of five cutters.

With 900 watts on tap, the motor feels up to most jobs and had no problem cutting some ogee mouldings on oak

edging and a 12mm square rebate in MDF. The power switch is a simple button that can't be locked but is located on the side of the router where it can be held 'on' with a strap for table work.

The Wickes machine has a speed rating of between 11,500 and 28,000rpm and a plunge depth of up to 44mm.

Overall finish on our sample model showed price compromises in the form of a cheap shiny plastic base and a poorly coated turret depth stop which showed minute signs of corrosion. However, you are talking about a router that costs less than some ten piece cutter sets and with a full two year guarantee.



The verdict

We are putting some of these budget tools through a Giant Test in the near future so look out for more results. As it stands, Wickes' offering is ideal for no-nonsense straight cuts and joinery work. It doesn't have the range of accessories or fine adjustment of a more expensive model but you get what you pay for.

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Down on the farm

David Lucas shows how to create a little animal magic with his latest toy project

It was my daughter who first asked me to make a toy farm for my youngest grandchild but it soon became an ideal gift for the little girl. So perhaps you have someone who could enjoy a similar present?

First of all, obtain the animals. I suppose that if you had the appropriate skills you could carve a set or perhaps make them with a fretsaw, but I do not claim to be able to do this, so it was off to the toy shops for some of the plastic variety. The real reason for getting the animals first is that the buildings

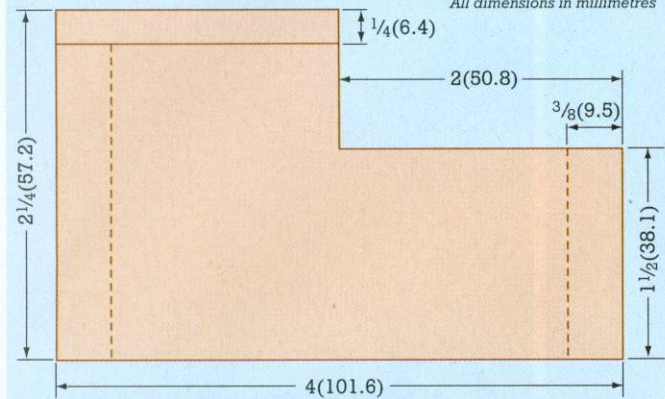
must be designed to fit round them rather than the reverse, so you may need to change the sizes given if your animals are of a significantly different size to those we obtained.



Cutting the slope on the end pieces

Fig 2 Side of pigsty

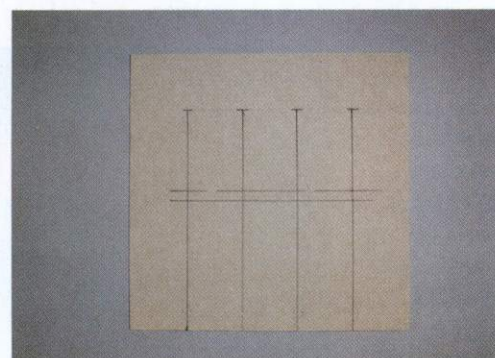
All dimensions in millimetres



Machining the ends to receive the roof (guard removed for photograph)



Machining the ends to receive back and floor (guard removed)



The floor/back marked out



Machining the roof mitre (guard removed)



Setting the depth of cut

Cutting list

All parts (except fence) were cut from MDF.

Dimensions in inches and (millimetres in brackets).

STABLE

Ends	2	6 (152.4) x 4 (101.6) x 3/8 (9.5)
Back*	1	8 1/4 (209.6) x 4 (101.6) x 3/8 (9.5)
Floor*	1	8 1/4 (209.6) x 3 13/16 (96.8) x 3/8 (9.5)
Partitions	4	3 13/16 (96.8) x 2 3/16 (55.6) x 1/4 (6.4)
Back Roof	1	8 1/4 (209.6) x 2 53/64 (71.8) x 1/4 (6.4)
Front Roof (1)	1	8 1/4 (209.6) x 3 5/64 (78.2) x 1/4 (6.4)
Or (2)	1	8 1/4 (209.6) x 3 3/8 (85.7) x 1/4 (6.4)

* Cut as one - see text

SHED

Same as Stable but without partitions and without floor if preferred

PIGSTY

Ends	2	4 (101.6) x 2 1/4 (57.2) x 3/8 (9.5)
Front	1	3 5/8 (92.1) x 1 1/2 (38.1) x 3/8 (9.5)
Back	1	3 5/8 (92.1) x 2 1/4 (57.2) x 3/8 (9.5)
Top	1	4 (101.6) x 2 (50.8) x 1/4 (6.4)

BASE

Base	1	24 (609.6) x 19.5 (495.3) x 1/4 (6.4)
Fence Posts	29	1 11/16 (42.9) x 3/8 (9.5) dowel
Fence Rails	2	22 3/8 (568.3) x 1/4 (6.4) dowel
	2	17 1/4 (438.2) x 1/4 (6.4) dowel
	1	13 (330.2) x 1/4 (6.4) dowel
	1	8 1/4 (209.6) x 1/4 (6.4) dowel

The stables

This is a shed with partitions, ideally one for each appropriate animal. The ends are first sawn as rectangles and then two cuts are made at 45° for the roof. A stop is used on the saw table so that, by turning the MDF over the two cuts are symmetrical. A rebate 3/16in (4.8mm) deep and 1/4in (6.4mm) wide is machined along both roof slope edges and another rebate of the same depth, but 3/8in (9.5mm) wide is formed along the back and base of each end. The rebates must be cut to give a matched pair of ends. I used a slotting cutter in the router with the router in a table, but a rebate cutter could have been equally well used.

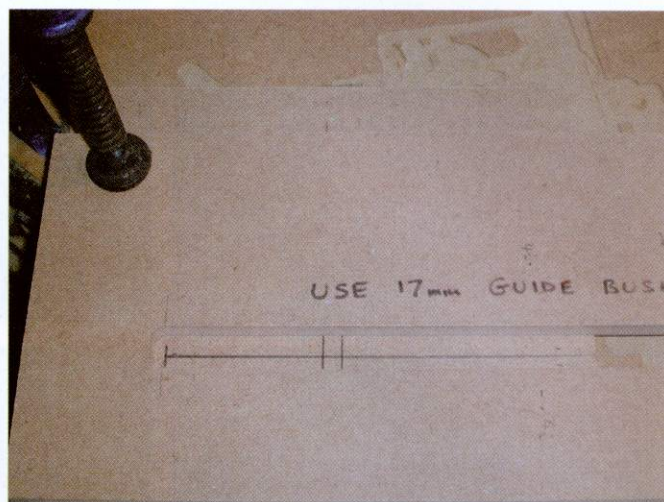
The roof could be made in one of two styles, as preferred. In each case the back panel is



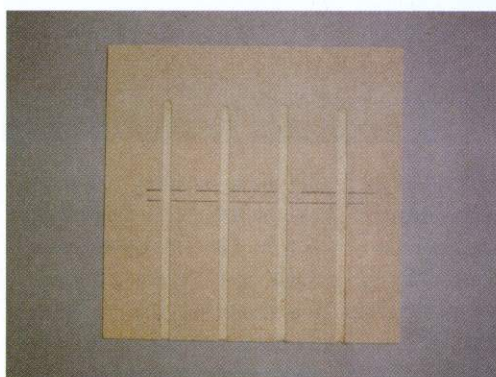
Machining the slots in the floor/back

sawn to size and then bevelled along each long side with a 45° bevel cutter, again with the router in a table. As the bevel extends right across the edge, the usual problem, that as the cut is completed there is nothing but a feather edge to guide the piece across the cutter, is solved by fixing a scrap, straight edged piece of MDF to the roof panel with double-sided tape, so that this extra piece acts as a guide. The two bevel cuts must be cut in opposite senses, as shown in fig 1.

The front panel can be cut in basically the same way, but with the two bevels parallel to each other so that the front one fits flush to the side of the end. Alternatively, the front

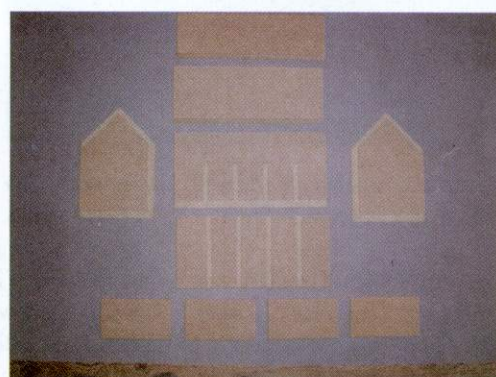


Close up of jig used



Floor/back with machined slots

panel can be cut a little larger, one side bevelled as before and the other rounded over to give a slightly protruding roof. The choice is up to you, but if you look carefully at the photographs you will see that I made one of each, really as a



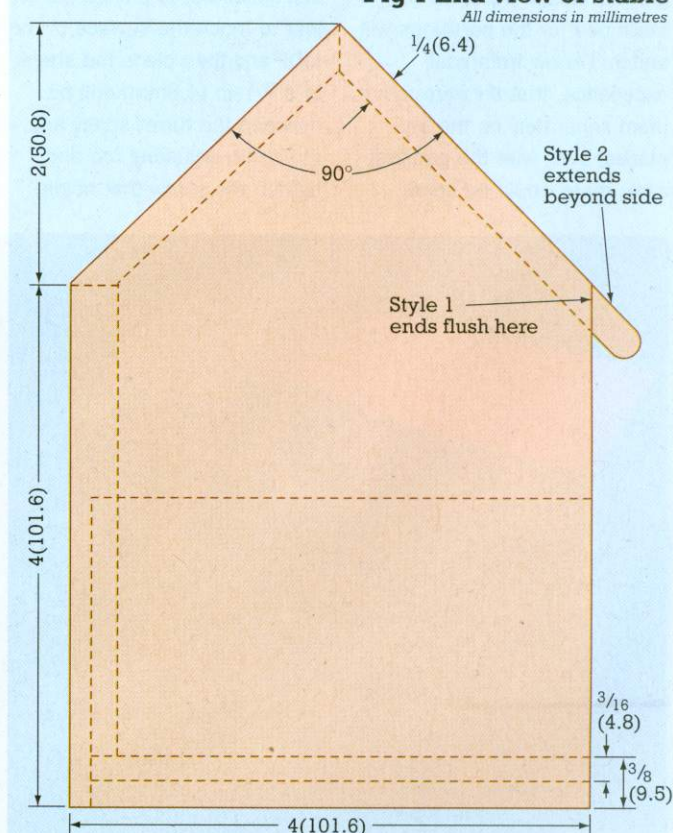
The components of the stable

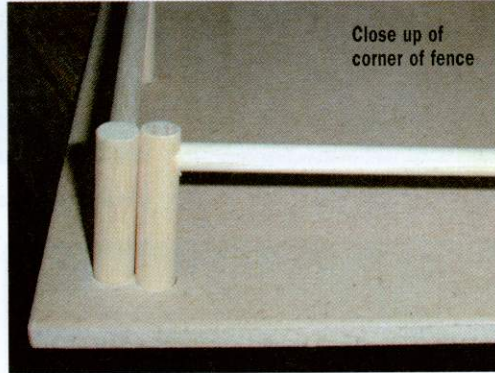
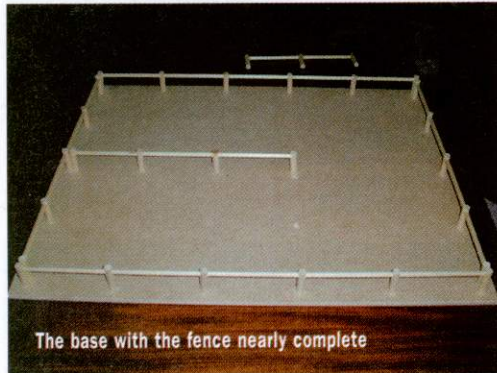
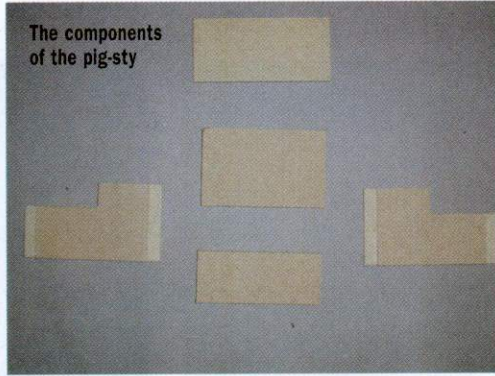
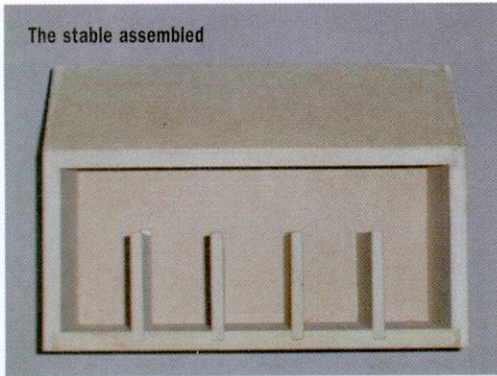
The fence

Made of $1/4$ in (6.4mm) diameter dowel rails and $3/8$ in (9.5mm) diameter dowel posts. The posts are carefully drilled with a hole that will allow the rails to be pushed through. I found it easier to first drill the holes in a long length of dowel and then to saw the posts to size rather than the other way round. This reduced splitting, although posts that had split a little were not rejected because a lot of real fence posts are split! The height of the rails is not very significant as long as it is consistent. Originally I had planned to drill some posts with two holes at right angles, but this did not prove practical so at the corners two posts were used, but the holes were not drilled all the way through. When everything has been cut to size and tested by a dry assembly the rails are glued to the posts, but the posts are not glued in place until after painting had been completed.

Fig 1 End view of stable

All dimensions in millimetres





result of developing the design as I went along, rather than because of any deep philosophical reasoning!

The back and floor are sawn out as one piece and later divided, so allowance is made for the width of the saw kerf. This is done so that the grooves which are to be machined for the partitions will match. I knew from past experience, that if I were to cut them separately on the two pieces, even with the greatest care, there would be some

mismatch. The grooves are cut with a $\frac{1}{4}$ in (6.4mm) straight cutter, using a guide bush on the router and a simple slot jig (with the slot width equal to the guide bush diameter), to a depth of $\frac{3}{16}$ in (4.8mm). The easiest way to set this depth is, with the router disconnected, to plunge the bit just to touch the surface of the MDF and then place the shank of a $\frac{3}{16}$ in (4.8mm) drill bit between the turret screw and the depth adjusting rod and tighten the screw that holds

the rod in position. The grooves are cut $1\frac{3}{8}$ in (34.9mm) apart, but, as was said earlier, this might need adjusting to suit the size of the animals. When the back and floor have been separated a final rebate, $\frac{3}{16}$ in (4.8mm) deep and $\frac{3}{8}$ in (9.5mm) wide is machined across the inside of the bottom of the back (i.e. across the grooves) to receive the floor.

The stable can now be assembled simply by gluing all the parts together. After I had done this I looked at it and

suddenly thought that it was going to be very difficult to paint, so should I have done some of the painting before assembling? However, it did not prove as difficult to paint as I feared so I recommend assembly before painting.

The shed

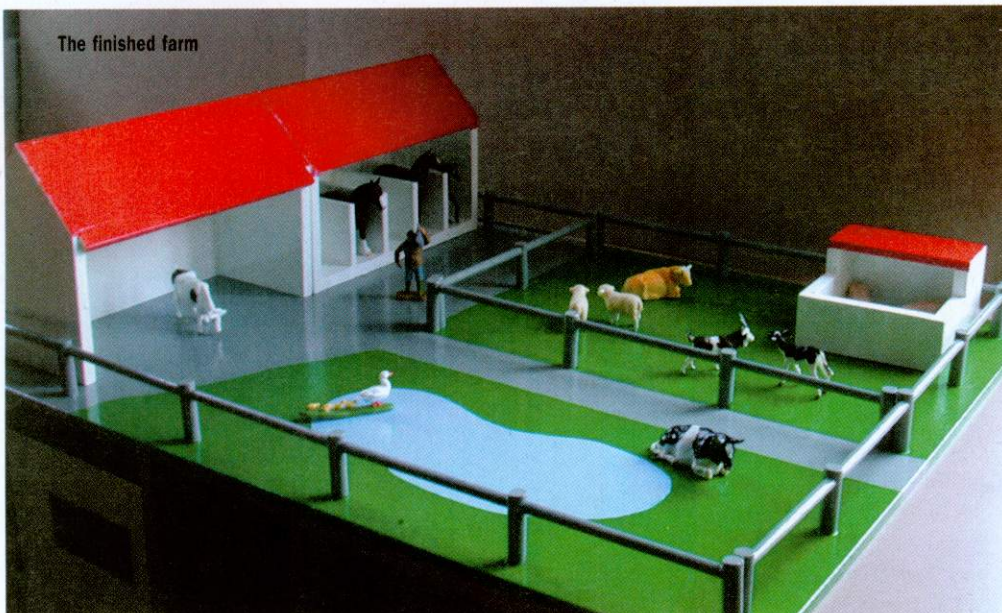
This was just a simplified version of the stable without partitions and floor, although a floor could easily be incorporated if preferred. It was made in exactly the same way as the stable but leaving out the grooves in the back wall and the lower rebate in the back unless a floor was added. It can be made to any length but remember that the buildings must fit comfortably within the base.

The pigsty

This was a very simple construction, the front, back and top being simple rectangles. The L-shaped sides had rebates machined at each end, $\frac{3}{16}$ in (4.8mm) deep and $\frac{3}{8}$ in (9.5mm) wide.

The base

This was just a piece of MDF cut to whatever size is suitable for the little recipient. Then $\frac{3}{8}$ in (9.5mm) diameter holes are cut $\frac{3}{4}$ in (19.1mm) in from the edge and round the 'paddock' for the fence posts. This was done with a straight cutter (suitable for plunge cutting) in the router so that the depth could be readily controlled at $\frac{3}{16}$ in (4.8mm).



Final painting

This is a matter of personal preference. My wife planned the layout of the base to include a 'duck-pond' as well as the 'paddock', but time will tell what animals Anna will deem suitable for each part of her farm.

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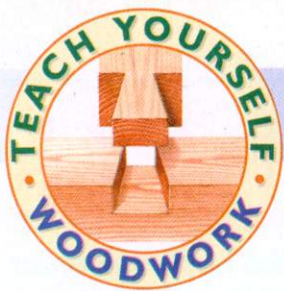
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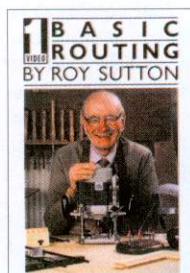
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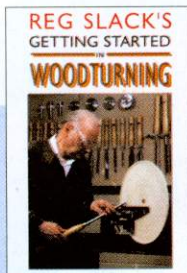
Video Offer

Nexus and Fine Grain Productions have teamed up to bring you these great Teach Yourself Woodwork video offers



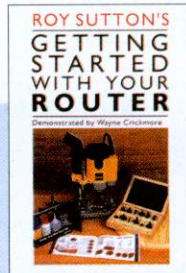
Basic routing £12.99

First principles of routing, including safety, care and selection of cutters, use of accessories and jig making.



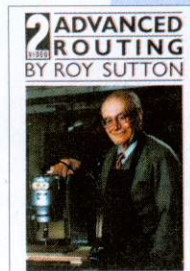
Getting started in woodturning £11.99

Lathe and tool selection, tool grinding, use of the roughing gouge, skew chisel, spindle gouge, parting tool, bowl gouge and scraper. Bowl and spindle turning.



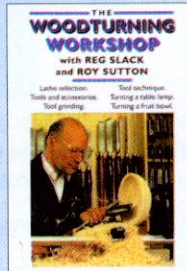
Getting started with your router £9.99

This video has been designed to guide the newcomer safely through the basics of routing.



Advanced routing £12.99

Ideal for those wishing to use the router in a more ambitious way and to exploit the great potential of the machine.



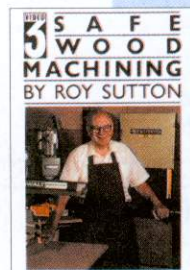
Woodturning workshop £12.99

Reg Slack and Roy Sutton share their great knowledge and experience to help you improve your woodturning skills.



Getting started in woodcarving £11.99

Professional woodcarver, Michael Painter gives a step-by-step guide to carving using traditional tools, materials and techniques.



Safe wood machining £12.99

Roy Sutton introduces the basic operating principles and safe working techniques for many different machines.



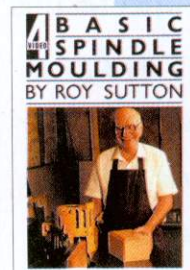
Popular woodturning projects £12.99 (Double cassette)

The experienced pairing of Reg Slack and Roy Sutton take you through the more popular woodturning projects.



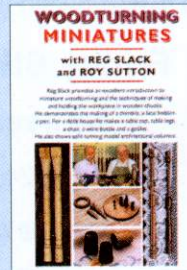
Getting started with the circular and bandsaw £11.99

This is an excellent video for those who are new to these machines and a useful reference for the more experienced woodworker.



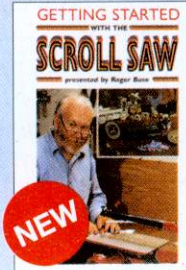
Basic spindle moulding £12.99

This video shows how, with modern machines and tooling, plus safe working practices, the average woodworker can use a spindle moulder safely.



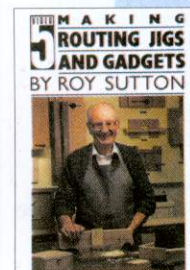
Woodturning miniatures £12.99

Reg Slack demonstrates turning thimbles, bobbins, pens and dolls' house furniture as well as split-turning columns.



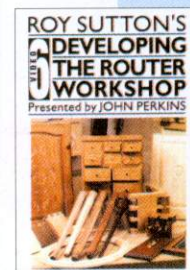
Getting started with the scrollsaw £11.99

This video is an excellent primer for all those interested in exploring the wonderful craft possibilities offered by the scrollsaw.



Making routing jigs and gadgets £12.99

An introduction to the principles of jig and template making including the selection of tools, and step-by-step making.



Developing the router workshop £12.99

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To order your videos telephone the sales hotline on: 01322 616300 or fax your order on: 01322 667633. Alternatively simply complete the details on this order form and return it to: Fine Grain Video Offer, Nexus Media, Nexus House, Azalea Drive, Swanley, Kent BR8 8HU.

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☐ Getting started with your router	£9.99	☐ Getting started in woodcarving	£11.99
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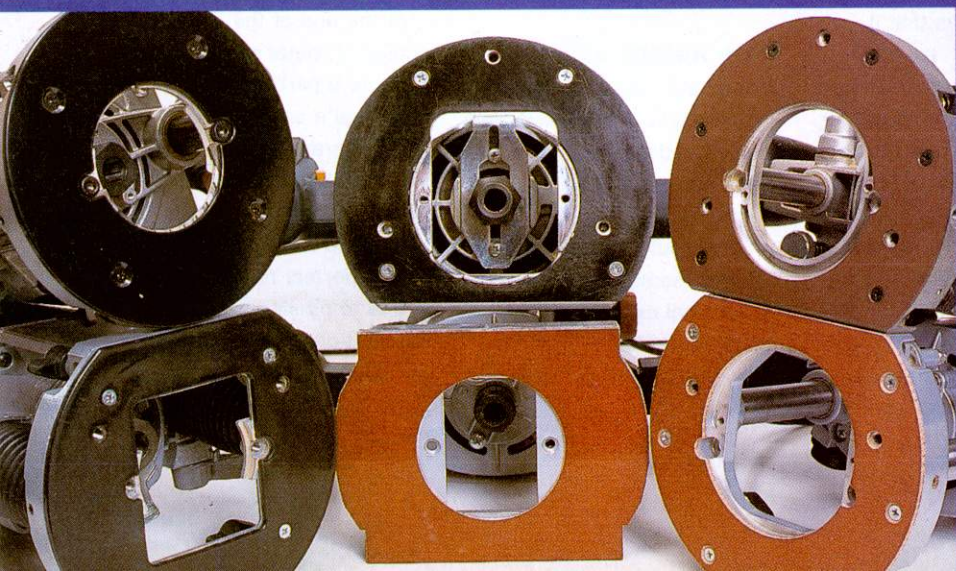
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Routing

Router Guide



The New Routing Router Guide

With each issue of Routing we feature our new improved 'Router

Guide'. Our aim is to give more information of the kind that will help the potential purchaser of a new router. To this end, additional information not usually found in manufacturers' specifications has been added to the familiar details regarding power, collet size etc.

To provide this extended data for all routers is a major exercise and we are constantly gathering more information. Updating and extending the specifications to include every current router will be an on-going task, but we felt that it was more useful to provide slightly incomplete data as soon as possible rather than wait until all makes and models have been given the full treatment. A number of the new items of information are noteworthy:

Switch

We state the type of switch provided eg simple slider, 'dead man's handle' etc. This is of importance, for example, if the router is to be used inverted in a table since some switches have to be clipped or strapped 'ON' while others don't.

Collets

Collet types vary considerably. We say what type and size of collet comes as standard and what range of additional collets



or, less satisfactory, what range of reducing sleeves is available.

Collet plunge

We include for the first time information on the important question of how deep the collet plunges in relation to the router base. The ideal router would have a collet that plunged through its base plate. We measure this feature on all routers and show it as a 'plus' or 'minus' figure in millimetres. Thus, +5 indicates that the collet protrudes 5mm through the base plate when fully plunged, -3 indicates that it falls short of the base plate by 3mm and 0 means that it plunges flush with the base plate. This information will help narrow the choice of router for use with a router table or for guide-bush and template work, where thickness of the table insert and template reduce the effective depth of cut.

Visibility

Most manufacturers specify the size of the cutter aperture

in the base plate aperture but, in addition, we have added a subjective assessment of visibility through the base plate.

Note, however, that with many models the dust extractor spout, when fitted, drastically reduces visibility.

Plunge lock

We state the type of plunge lock for each router eg twist knob or clamping lever, and whether the latter is plastic or metal. Many users have a preference for one kind or the other and this information is now available at a glance.

Fine height adjuster

A fine height adjuster is of great benefit in table work and in precise depth setting for hand-held routing, eg dovetailing.

Some routers have a built-in adjuster, some include one as an optional extra, and others make no provision at all. We show the position for each router.

Guide bushes

Most routers come with one guide bush as standard. We show for each router what size the standard bush is and what additional sizes are available. It should be noted, however, that any router which does not provide its own range of guide bushes can usually be adapted to use Trend guide bushes with the aid of an adapter plate which can be bought or made.

Table fixing points

Sooner or later most routers, especially the heavy duty models, are required to be used in a table. Not all routers have effective mounting points in their base plates.

This makes table mounting difficult, or restricts the choice to tables that have clamping systems to hold the router. At the other extreme, several models have the standard Elu/DeWalt fixing points, which give compatibility with a number of table insert plates and other accessories. We specify the fixing points for each router.

At the end of the day, the choice of router still comes down to a particular individual's own requirements and preferences. Different people will give different weight to various features.

There is still no such thing as the perfect router, but our aim is to provide more information of the kind that will help the individual to make an informed choice.

a – b



Make	AEG	Atlas Copco	Atlas Copco	Black and Decker	Black and Decker
Model	OFS 710	OFSE 1000	OFSE 2000E	KW 800	KW800 EK
Serial number		4000 3615 91	0164K 1998		
Input Watts	710	1010	2000	800	800
230/240 Volts	Yes	Yes	Yes	Yes	Yes
110/115 Volts	No	Yes	Yes	No	No
Fixed RPM	25,000	No	No	27,000	No
Variable RPM	No	8,000 - 25,000	8,000 - 24,000	No	8,000 - 30,000
Spindle lock	Yes	Yes	Yes	Yes	Button
Switch		Toggle	Toggle		Slider
Collet type		Multi-slit	Multi-slitEC		Simple slit cone
Collet standard	1/4in	1/4in	1/2in	6, 8mm, 1/4in	6, 8mm, 1/4in
Collets available	6mm, 8mm	8mm			
Collet plunge		+ 8mm	0		- 2mm
Base aperture		41mm	60mm		40mm
Visibility		Good	Good		Good
Plunge lock		Plastic lever RH	Lever		Plastic lever RH
Side fence		Plastic faced. Fine adj on fence rod	Fine adj. Fixed short rods, cheeks		Bolt-on rods, roller guide & trammel pt
Fine height adj		No	No		No
Plunge limiter			No		
Guide bush Flange					
Guide bush standard		None	30mm		16mm
Guide bush available		Trend 96 type	27, 40mm		
Dust extraction	Yes	Trans. Spout held on with fence rods	Trans. Screw-on spout	Yes	Clear plastic spout
Take off diameter					
Table fix points		Only guide bush holes. 5mm tapped	3 x 6mm tapped holes. Not quite Elu		Plain 5mm guide bush holes
Maker's accessories					
Weight (kg)	2.5	2.7	6.4	3	3
List price (Incl. VAT)	257	355	478	79.99	99.99
Package available					
Storage			Kit case		
Comments		An Elu clone with slightly longer base. Takes most Elu96 accessories	Almost identical to Freud, but not quite		

Where to Buy Routers

AEG

Atlas Copco Tools Limited,
Swallowdale Lane,
Hemel Hempstead,
Hertfordshire,
HP2 7HA

Tel: 01442 61201

Fax: 01442 214705

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AXMINSTER POWER TOOL CENTRE

Chard Street,
Axminster,
Devon EX13 5DZ

Tel: 01297 33656

Fax: 01297 35242

BLACK & DECKER

Black & Decker Limited,
210 Bath Road,
Slough,
Berkshire SL1 3YD

Tel: 01753 511234

Fax: 01753 500843

Router Guide

Where to Buy Routers

BJR INTERNATIONAL

266 Harrogate Road,
Bradford
BD2 3RG

Tel: 01274 626805

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BOSCH

Robert Bosch Limited,
Broadwater Park,
North Orbital Road,
Denham,
Uxbridge,
Middlesex UB9 5HJ

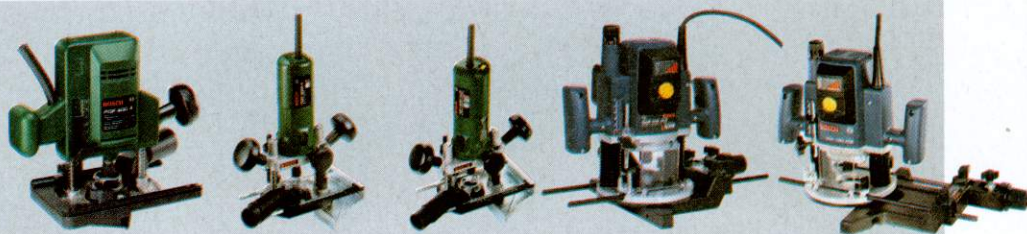
Tel: 01895 838743

Fax: 01895 838802

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b —



Make	Bosch	Bosch	Bosch	Bosch	Bosch
Model	POF 400A	POF 500A	POF 600 ACE	GOF 900 ACE	GOF 1300 ACE
Serial number	603261142			4640121	5650891
Input Watts	400	400	600	900	1300
230/240 Volts	Yes	Yes	Yes	Yes	Yes
110/115 Volts	No	No	No	Yes	Yes
Fixed RPM	27,000	27,000	No	No	No
Variable RPM	No	No	12,000 - 27,000	12,000 - 26,000	8,000 - 22,000
Spindle lock	Tommy bar	No	No	Yes	Yes
Switch	Slider			DMH	DMH
Collet type	Simple slit cone			Multi-slit	Multi-slit
Collet standard	1/4in	1/4in	1/4in	1/4in	1/4in
Collets available	6, 8mm	8mm	8mm	8mm	1/2, 3/8, 6, 8, 12mm
Collet plunge	~ 2mm			~ 8mm	~ 2mm
Base aperture	42mm			46mm	46mm
Visibility	Poor			Poor	Poor
Plunge lock	Twist knob			Spring lever	Spring lever
Side fence	Crude plastic. no rods			Rigid plastic. Fine adjuster	Rigid plastic. Fine adjuster
Fine height adj				Built-in	Built-in
Plunge limiter					
Guide bush Flange					
Guide bush standard	12mm plastic			17mm	17mm
Guide bush available				13, 24, 27, 30mm	13, 24, 27, 30mm
Dust extraction	Screw-in spout		Yes	Black screw-on spout	Black screw-on spout
Take off diameter					
Table fix points	4 x 6mm tapped holes			3 x 6mm plain holes	3 x 6mm plain holes
Maker's accessories	Router table, dovetail jig	Router table, dovetail jig	Router table, dovetail jig	Table, dovetail jig, guide rail	Table, dovetail jig, guide rail
Weight (kg)	1.8	2.3	2.3	3.5	4.8
List price (Incl. VAT)	123	131	185	290	387
Package available					
Storage					
Comments	Too low powered for any accessories. Can make a fine adj.				

b – d



Make	Bosch	Bosch	DeWalt	DeWalt	DeWalt
Model	GOF 1600 A	GOF 1700 ACE	DW 613	DW 615	DW 670
Serial number		5660054	1037360		
Input Watts	1600	1700	800	900	600
230/240 Volts	Yes	Yes	Yes	Yes	Yes
110/115 Volts	Yes	Yes	Yes		Yes
Fixed RPM	25,000	No	27,000	No	30,000
Variable RPM	No	8,000 - 23,000	No	8,000 - 24,000	No
Spindle lock	Yes	Yes	Button	Button	Yes
Switch	DMH	DMH	Slider	Slider	
Collet type		Multis-slit	Multi-slit	Multi-slit	
Collet standard	1/4, 1/2in	1/4, 1/2in	1/4in	1/4in	6, 8mm, 1/4in
Collets available	6, 8, 12mm, 3/8in		6, 8mm	6, 8mm	
Collet plunge		+ 11mm	+ 6mm	+ 6mm	
Base aperture		67mm	40mm	40mm	
Visibility		Excellent	Good	Good	
Plunge lock		Spring lever	Twist knob RH	Twist knob RH	
Side fence		Rigid plastic. Fine adjuster	Non-adj. Plastic cheeks.	Non-adj. Plastic cheeks.	
Fine height adj			Accessory	Accessory	
Plunge limiter					
Guide bush Flange					
Guide bush standard		30mm	17mm	17mm	
Guide bush available		27, 40mm	Trend T5 will fit	Trend T5 will fit	
Dust extraction	Yes	Black screw-on spout	Clear plastic screw-on spout	Clear plastic screw-on spout	Yes
Take off diameter					
Table fix points		3 x 6mm tapped holes. Elu std	2 x 6mm tapped holes. Elu std.	2 x 6mm tapped holes. Elu std.	
Maker's accessories	Table, dovetail jig, guide rail	Table, dovetail jig, guide rail	Fine height adj and many others	Fine height adj and many others	Fine height adj and many others
Weight (kg)	5.7	5.8	2.8	2.9	1.7
List price (Incl. VAT)	398	488	233	199	229
Package available					
Storage					
Comments		Base same as Elu 177. Same fixing holes			

Where to Buy Routers

BRIMARC

8 Ladbrooke Park,
Millers Road,
Warwick CV34 5AE

Tel: 01926 493389

Fax: 01926 491357

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SJ CARTER TOOLS

Gloucester House
10 Camberwell
New Road
Kennington Park
London SE5 0TA

Tel: 020 7587 1222

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CHARNWOOD

1-3 Rowan Street,
Leicester LE3 9GP

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The Woodcut Trading
Company
80 Ninfield Road
Sidley
Bexhill-on-Sea
East Sussex
TN39 5BB

Tel: 01424 214233

Fax: 01424 819909

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d -



Make	DeWalt	DeWalt	DeWalt	DeWalt	DeWalt
Model	DW 620	DW 621 EK	DW 621 KL	DW 625	DW 625 E
Serial number		008368			006988
Input Watts	750	900	1100	1600	1850
230/240 Volts	Yes	Yes	Yes	Yes	Yes
110/115 Volts	No	Yes	Yes	No	Yes
Fixed RPM	24,000	No	No	20,000	No
Variable RPM	No	8,000 - 24,000	8,000 - 24,000	No	8,000 - 20,000
Spindle lock	Yes	Yes	Yes	Yes	Button/pin
Switch		Safety/latching			Slider
Collet type		Multi-slit			Multi-slit
Collet standard	1/4in	1/4in	1/4in	1/4, 1/2in	1/4, 1/2in
Collets available	6, 8mm	6, 8mm	6, 8mm	6, 8, 10, 12mm, 3/8	8mm, 3/8
Collet plunge		- 2mm			- 3mm
Base aperture		62mm			66mm
Visibility		Fair			Good
Plunge lock		Twist knob LH			Metal lever (RH)
Side fence		Removable rods, plastic adj. cheeks			Fine adj, Sliding cheeks, 10mm rods
Fine height adj		Accessory			Accessory
Plunge limiter					Yes
Guide bush Flange					Not circular
Guide bush standard		24mm			30mm
Guide bush available		10 - 40mm			10, 24, 27, 40mm
Dust extraction	Yes	Built-in incl. removable spout	Yes	Yes	Trans plastic screw-on spout
Take off diameter					
Table fix points		2 x 6mm tapped holes. Elu std.			3 x 6mm tapped holes. Elu std
Maker's accessories	Fine height adj and many others	Fine height adj and many others	Fine height adj and many others	Fine height adj and many others	Fine height adj and many others
Weight (kg)	2.8	3.1	3.2	5.1	5.2
List price (Incl. VAT)	270	376	364	494	562
Package available					Yes
Storage					Tin case with EK
Comments		EK version supplied in metal case			

Where to Buy Routers

DEWALT

DeWalt
210 Bath Road,
Slough,
Berkshire SL1 3YD

Tel: 01753 567055

Fax: 01753 521312

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FESTO/FESTOOL

Minden Industrial Ltd
Saxham Business Park
Saxham
Bury St Edmunds
Suffolk
IP28 6DX

Tel: 01284 760791

Fax: 01284 702156

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e - f



Make	Draper	Draper	Einhell	Felisatti	Ferm
Model	R850V	R1900V	EOF 850SP	TP 246E	FBF-8E
Serial number	99110214	99126952	0198649	39822	103872/2000
Input Watts	850	1900	850	1800	850
230/240 Volts	Yes	Yes	Yes	Yes	Yes
110/115 Volts			No	No	No
Fixed RPM	No	No	24,000	No	No
Variable RPM	9,000 - 27,000	8,000 - 22,000	No	8,000 - 22,000	9,000 - 28,000
Spindle lock	Metal slider	Metal slider	Metal slide	Button/Pin	Yes
Switch	Slider	Toggle LH	Slider	Safety squeeze	Slider
Collet type	Multi-slit	Multi-slit	Multi-slit	Multi-slit	Simple cone
Collet standard	1/4in	1/2in, 1/4in	1/4in, 8mm	1/2in	1/4in, 6, 8mm
Collets available	None listed		T5 compatible		
Collet plunge	+ 4mm	+ 6mm	+ 2mm	+ 4mm	- 1mm
Base aperture	40mm	63mm	40mm	50mm	40mm
Visibility	Good	Excellent	Good	Fair	Fair
Plunge lock	Twist knob	Lever RH	Twist knob RH	Plastic lever	Plastic lever LH
Side fence	Sliding cheeks. Fine adjuster	Metal cheeks, fixed rods	Removable rods, adjustable cheeks	Fine Adj on rod. Sliding cheeks	Pressed steel
Fine height adj	None. T5 fits	Built-in	No (T5/Elu fit)		No (T5 fits)
Plunge limiter				Yes	
Guide bush Flange					
Guide bush standard	30mm	30mm	30mm	None	17mm
Guide bush available	Trend compatible		T5 compatible	Trend 96 type	Trend range
Dust extraction	Clear clip-on spout	Clear screw-on spout	Clear clip-on plastic spout	Plastic spout	Clear plastic
Take off diameter			40mm	25/35mm	
Table fix points	None except GB holes	3 x 6mm tapped holes. Not Elu std	None except GB holes	Guide bush 5mm plain holes	GB holes & 4x4mm base holes
Maker's accessories					
Weight (kg)	2.8	5.6	2.7	5.2	3.8
List price (Incl. VAT)	120	220	165	195	43
Package available					
Storage					
Comments			Many Trend/Elu accessories will fit this machine		

Router Guide

Where to Buy Routers

FREUD

Freud Tooling UK
Limited, Unit 3,
Emmanuelle Trading
Estate,
Springwell Road,
Leeds,
Yorkshire LS12 1AT

Tel: 01132 453737

Fax: 01132 438883

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HITACHI

Hitachi Power Tools,
Precedent Drive,
Rooksley,
Milton Keynes,
Buckinghamshire
MK13 8PJ

Tel: 01908 660663

Fax: 01908 232868

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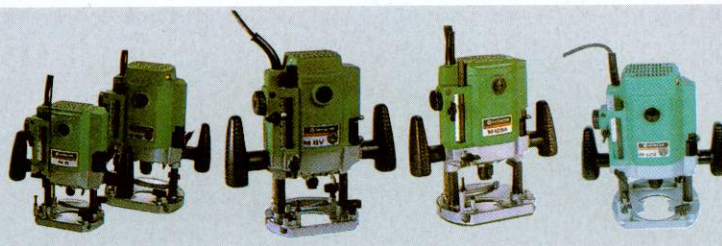
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f —



Make	Festo/Festool	Festo/Festool	Freud	Freud	Hitachi
Model	OF 1000 EB	OF 2000	FT 1000 E	FT 2000 E	ZK 2008
Serial number	8330/1998	486977	229085	552754	Y030038
Input Watts	900	1800	900	1900	550
230/240 Volts	Yes	Yes	Yes	Yes	Yes
110/115 Volts	No				No
Fixed RPM	No	No	No	No	27,000
Variable RPM	10,000 - 22,000	12,000 - 22,000	20,000 - 30,000	8,000 - 22,000	No
Spindle lock	Yes	Yes	Yes	Yes	Two spanners
Switch	Trigger	Lever	Slider	Toggle	Slider
Collet type	Multi-slit	Multi-slit	One-piece slit cone	Multi-slit EC	One-piece cone
Collet standard	1/4in, 8mm	1/2in	1/4in, 8mm	1/4 sleeved, 1/2in	1/4in
Collets available	6mm	1/4in, 8mm			8mm
Collet plunge	+ 7mm	- 3mm	- 15mm	- 2mm	- 10mm
Base aperture	49mm	77mm	60mm	60mm	50mm
Visibility	Fair	Good	Good	Good	Good
Plunge lock	Twist knob	Plastic lever	Lever	Lever	Twist knob
Side fence	Non-removable plastic faces	Large with long rods	Fine adj. Fixed rods, metal cheeks	Fine adj. Fixed rods, metal cheeks	Crude metal fixed rods
Fine height adj	No	No	No	Built-in	
Plunge limiter		Yes			
Guide bush Flange					
Guide bush standard	None supplied	30mm	30mm	30mm	18mm
Guide bush available	10.8 - 40mm	24, 27, 40mm			9.5 - 40mm
Dust extraction	Built-in to router base. Very good.	Trans clip-on spout	Trans screw-on spout	Trans screw-on spout	Trans screw-on spout
Take off diameter			35mm		
Table fix points	Only guide bush holes 5mm tapped	3 x 5mm & 6 x 4mm tapped holes	3 x 5mm tapped holes	3 x 6mm tapped holes	Only guide bush holes 5mm tapped
Maker's accessories	Many including some specialised	Many including some specialised	Two separate trimmer bases		
Weight (kg)	5.1	5.1	1.45		2.3
List price (Incl. VAT)	512	538	206	341	143
Package available					
Storage	Systainer case	Systainer case	Plastic case	Plastic case	Plastic case
Comments	Can be fitted into Veritas type table or home-made one with toggle clamps	Supplied in Systainer, 12mm arbor for screw-on cutters	High speed router/trimmer. Not suitable for large dia. cutters	Almost identical to Atlas Copco, but not quite	Easy to make fine adj. Base same as Elu 96, but not holes

f – h



Make	Hitachi	Hitachi	Hitachi	Hitachi	Hitachi
Model	M6 SB	M8	M8 V	M12 SA	M12 V
Serial number	3900 36		DN 30054		D 740092
Input Watts	440	800	800	1600	1850
230/240 Volts	Yes	Yes	Yes	Yes	Yes
110/115 Volts	Yes	Yes	Yes	Yes	Yes
Fixed RPM	30,000	25,000	No	22,000	No
Variable RPM	No	No	10,000 - 25,000	No	8,000 - 20,000
Spindle lock	Button/pin	Yes	Yes	Yes	Yes
Switch	Simple on/off		Slider		Slider
Collet type	Shallow cone		One-piece cone		One-piece cone
Collet standard	1/4in	1/4in	1/4in	1/4, 1/2, 3/8in	1/2, 3/8, 1/4in
Collets available	6mm	6, 8mm	8mm	6, 8mm	10mm sleeved
Collet plunge	Non-plunging		- 1mm		+ 1mm
Base aperture	35mm		52mm		52mm
Visibility	Poor		Good		Excellent
Plunge lock	N/A		Lever		Lever
Side fence	Small metal screws on		Fine adj. Short rods		Fine adj. Short rods
Fine height adj	N/A				
Plunge limiter	N/A				
Guide bush Flange					
Guide bush standard	10mm		18mm		18mm
Guide bush available			9.5 - 40mm		9.5 - 40mm
Dust extraction	No	No	Trans screw-on spout	No	Trans screw-on spout
Take off diameter					
Table fix points	None		Can use 4 face-plate 5mm holes		Can use 4 face-plate 5mm holes
Maker's accessories					
Weight (kg)	1.4	2.7	2.8	5.2	5.3
List price (Incl. VAT)	194	253	320	390	469
Package available					
Storage					
Comments			Easy to make fine height adjuster		Easy to make fine height adjuster

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h – m



Make	Holzher	Holzher	Holzher	Mafell	Mafell
Model	2355	2356	2365	LO 50E	LO 65E
Serial number		025945/772	8001		533814Z
Input Watts	720	1010	1800	900	1800
230/240 Volts	Yes	Yes	Yes	Yes	Yes
110/115 Volts	Yes	Yes			
Fixed RPM	25,000	No	No	No	No
Variable RPM	No	8,000 - 25,000	10,000 - 25,000	10,000 - 22,000	8,000 - 20,000
Spindle lock	Yes	Metal slide	Button/pin	Button	Yes
Switch		Toggle LH	Lever	Trigger with latch	Rocker
Collet type		Multi-slit	Multi-slit	Multi-slit	Multi-slit EC
Collet standard	1/4in	1/4in	1/2in	1/4in	1/2in, 8mm
Collets available		6, 8mm	Elu compatible	8mm	
Collet plunge		+ 8mm	+ 1mm	- 3mm	+ 2mm
Base aperture		40mm	66mm	62mm	66mm
Visibility		Good	Fair	Fair	Fair
Plunge lock		Plastic lever	Plastic lever	Twist knob	Twist knob
Side fence		Non-adj plastic facings. Fine adj.	Fine adj. Sliding cheeks. Long rods	Removable short rods. Fine adj	Large with long rods. Fine adj
Fine height adj		Accessory	No	No	No
Plunge limiter			Yes	Yes	Yes
Guide bush Flange					
Guide bush standard		None	30mm	20mm	30mm
Guide bush available		17,24,27,30,40mm			
Dust extraction		Plastic spout held by fence rods	Clear plastic clip-on spout	Clear spout. Bayonet fitting	Clear clip-on spout
Take off diameter		36mm			
Table fix points		2 x 6mm tapped holes in base	5mm tapped guide bush holes	2 x 6mm tapped holes. Non-Elu std	5mm tapped guide bush holes
Maker's accessories				Guide rail	Guide rail
Weight (kg)	2.7	2.7	5.5	TBC	5.5
List price (Incl. VAT)	268	310	750	199	504
Package available					
Storage					
Comments			Speeds on adjusting wheel		Had steel base, now plastic. Only big router with twist knob plunge

m —



Make	Makita	Makita	Makita	Makita	Makita
Model	3620	3612	3612 C	RP 0910	RP 1110C
Serial number	374160E		30163E	1042E	1209E
Input Watts	860	1650	1850	900	1100
230/240 Volts	Yes	Yes	Yes	Yes	Yes
110/115 Volts	No	Yes		Available	Available
Fixed RPM	24,000	22,000	No	27,000	No
Variable RPM	No	No	9,000 - 23,000	No	8,000 - 24,000
Spindle lock	No	Yes	Button/pin	Button/pin	Button/pin
Switch	Press button		Safety lock	Safety/latching	Safety/latching
Collet type	Simple cone		Multi-slit	Multi-slit	Multi-slit
Collet standard	1/4, 8mm	1/2in	1/2in	1/4in, 8mm	1/4in, 8mm
Collets available	8mm		1/4, 3/8in, 8mm	6mm	6mm
Collet plunge	0		+ 1mm	- 1mm	- 1mm
Base aperture	62mm		62mm	63mm	63mm
Visibility	Good		Fair	Good	Good
Plunge lock	Plastic lever LH		Metal lever (LH)	Twist knob LH	Twist knob LH
Side fence	Plain metal, welded on rods		Fine adj on rod. 10mm rods	Metal pressing, fixed rods	Metal pressing, fixed rods
Fine height adj	No		No	No	No
Plunge limiter			Yes		
Guide bush Flange					
Guide bush standard	None supplied		No	12mm	12mm
Guide bush available				DW621 compat.	DW621 compat.
Dust extraction	Clear plastic screw-on spout	Yes	Clear plastic clip- on spout	Built-in	Built-in
Take off diameter			37mm		
Table fix points	Guide bush holes only		None except guide bush	2 x 6mm tapped holes Elu std.	2 x 6mm tapped holes Elu std.
Maker's accessories					
Weight (kg)	2.4	5.8	6	3.3	3.4
List price (Incl. VAT)	203	385	432	294	364
Package available					
Storage					
Comments	Not table friendly. Short plunge stroke. Cutters stick through base		Very easy plunge. Round base & quick release guide bush		

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m —



Make	Metabo	Metabo	Metabo	Perles	Perles
Model	OF 528	OFE 1229 Signal	OFE 1812	OF 808	OF 808 E
Serial number		01229381	61046797 380	4-088-0029	E-5-1080111
Input Watts	500	1200	1800	850	850
230/240 Volts	Yes	Yes	Yes	Yes	Yes
110/115 Volts	Yes				
Fixed RPM	27,000	No	No	25,000	No
Variable RPM	No	5,000 - 25,500	8,000 - 22,000	No	9,500 - 26,000
Spindle lock	Yes	Metal slide	Button/pin	Metal slide	Yes
Switch		Toggle LH	Safety squeeze	Slider	Slider
Collet type		Multi-slit	Multi-slit	Multi-slit	Multi-slit
Collet standard	1/4in	1/4in	1/2in	1/4in	1/4in
Collets available	3, 6, 8mm, 1/8in	3, 6, 8mm, 1/8in	6, 8mm, 1/4, 3/8in	6, 8mm	6, 8mm
Collet plunge		+ 6mm	- 4mm	+ 2mm	+ 2mm
Base aperture		46mm	50mm	40mm	40mm
Visibility		Good	Fair	Good	Good
Plunge lock		Twist knob	Plastic lever	Twist knob RH	Twist knob
Side fence		Non-adj. removable faces	Fine adj on rod. 10mm rods	Fine adj. Sliding cheeks	Fine adj. Sliding cheeks
Fine height adj		None	No	Accessory	Accessory
Plunge limiter			Yes		
Guide bush Flange					
Guide bush standard		None		30mm	30mm
Guide bush available		9,11,17,24,27,30	17,24,27,30,40mm	20, 27mm	20, 27mm
Dust extraction	Yes	Clip and screw plastic spout	Clear plastic screw-on spout	Clear clip-on spout	Clear clip-on spout
Take off diameter					
Table fix points		None. GB holes 5mm plain	Guide bush. 5mm plain holes	2 x 6mm tapped holes. Elu std	2 x 6mm tapped holes. Elu std
Maker's accessories					
Weight (kg)	3	3.4	5.1	2.7	2.7
List price (Incl. VAT)	367	400	570	100	130
Package available					
Storage					
Comments				An Elu clone with same base, but stuck-on sole plate	An Elu clone which takes most Elu 96 accessories

p – r



Make	Porter Cable	Porter Cable	Power Devil	Ryobi	Ryobi
Model	7529	7539	PDW 5027	TR 50	RE 120
Serial number	010171A9903		05279011326		
Input Watts	1300	2423	850	500	570
230/240 Volts	Yes	No	Yes	Yes	Yes
110/115 Volts	Yes	Yes		No	No
Fixed RPM	No	No	No	33,000	No
Variable RPM	8,000 - 23,000	10,000 - 21,000	9,000 - 28,000	No	16,000 - 26,000
Spindle lock	Yes	No	Yes	No	No
Switch	Safety/latching		Slider		
Collet type	Multi-slit/capt. nut		Simple cone		
Collet standard	1/4in & 1/2in	1/2in	1/4in, 6, 8mm	1/4in	1/4in
Collets available	1/4, 3/8, 6, 8, 10, 12				
Collet plunge	0mm		- 1mm		
Base aperture	89mm		40mm		
Visibility	Good		Fair		
Plunge lock	Sprung clamp lever		Plastic lever LH		
Side fence	Alloy		Stamped metal. Rods bolt on		
Fine height adj	Yes		No (T5 fits)		
Plunge limiter					
Guide bush Flange	Yes				
Guide bush standard	None		17mm		
Guide bush available			T5 compatible		
Dust extraction	Yes	No	Clear plastic.	No	Yes
	Screws to GB holes				
Take off diameter	25mm				
Table fix points	4mm & 5mm		GB holes & 4 x 4mm base holes		
Maker's accessories					
Weight (kg)	5	7.8	3.75	1.4	2.2
List price (Incl. VAT)	494	604	50	199	187
Package available					
Storage					
Comments					

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r - s



Make	Ryobi	Ryobi	Ryobi	Ryobi	Skil
Model	RE 155	R 502	R 600	RE 601	1875 U1
Serial number	3389			7514	
Input Watts	800	1600	2050	2050	1400
230/240 Volts	Yes	Yes	Yes	Yes	Yes
110/115 Volts		Yes	Yes	Yes	No
Fixed RPM		24,000	22,000	No	No
Variable RPM	16,000 - 27,000	No	No	10,000 - 23,000	8,000 - 22,000
Spindle lock	Metal slide	No	Yes	Button	Yes
Switch	DMH			DMH	
Collet type	One-piece cone			Multi-slit	
Collet standard	8mm, 1/4in sleeve	1/4, 3/8, 1/2, 8mm	1/4, 3/8, 1/2in	1/2in & sleeves	1/4, 1/2in
Collets available	6mm sleeve			6, 8mm, 1/4, 3/8in	
Collet plunge	- 2mm			- 2mm	
Base aperture	50mm			64mm	
Visibility	Good			Good	
Plunge lock	Metal lever RH			Lever RH	
Side fence	Plain metal. Short screw-on rod			Plain metal, short rods. Fine adjuster	
Fine height adj	No			Built-in	
Plunge limiter					
Guide bush Flange					
Guide bush standard	18mm			18mm	
Guide bush available	Same as Hitachi				
Dust extraction	Clear plastic screw-on spout	Yes	Yes	Clear plastic screw-on spout	No
Take off diameter					
Table fix points	2 x 5mm tapped holes			Nothing substantial	
Maker's accessories					
Weight (kg)	3	5	6.2	6.2	4.5
List price (Incl. VAT)	298	387	398	469	316
Package available					
Storage					
Comments	Supplied in plastic fitted case				

t - w



Make	Trend	Trend	Virutex	Virutex	Woodcut
Model	T5	T9	FR 77 C	FR 78 C	PRO 1800 E
Serial number	5-088-0382	101115			039827 5120136
Input Watts	850	1800	850	850	1800
230/240 Volts	Yes	Yes	Yes	Yes	Yes
110/115 Volts	Yes	Yes	Yes	Yes	
Fixed RPM	No	No	24,000	No	No
Variable RPM	9,000 - 27,000	8,000 - 22,000	No	8,000 - 24,000	8,000 - 22,000
Spindle lock	Metal slide	Button/pin	No	No	Button/pin
Switch	Slider LH	Safety squeeze			Safety squeeze
Collet type	Multi-slit	Multi-slit			Multi-slit
Collet standard	1/4in, 8mm	1/2, 1/4in	1/4, 3/8in	1/4, 3/8in	1/2in
Collets available	3, 6mm, 1/8in	6,8,12mm, 3/8in			1/4in, 8mm
Collet plunge	+ 2mm	- 5mm			- 4mm
Base aperture	40mm	76mm			50mm
Visibility	Good	Fair			Fair
Plunge lock	Twist knob RH	Plastic lever			Plastic lever
Side fence	Removable rods, sliding cheeks	Fine adj on rod, Sliding cheeks			Fine adj on rod, Sliding cheeks
Fine height adj	Accessory	Accessory			No
Plunge limiter		Yes			Yes
Guide bush Flange					
Guide bush standard	20mm	30mm			27mm
Guide bush available	10 - 40mm	10,40,50,60,70mm			On request
Dust extraction	Clear clip-on spout	Clear plastic screw-on spout	Yes	Yes	Clear plastic screw-on spout
Take off diameter	40mm	35mm			
Table fix points	2 x 6mm tapped holes. Elu std.	3 x 6mm tapped holes. Elu std.			Guide bush 5mm plain holes
Maker's accessories	Many Trend accessories	Many Trend accessories			
Weight (kg)	2.7	5.2	3.1	3.1	5.2
List price (Incl. VAT)	199	351	182	223	260
Package available		Yes			
Storage		Tin case with EK			
Comments		Best range of guide bushes. Trend's answer to Elu 177			Router price includes 12-piece Chinese cutter set

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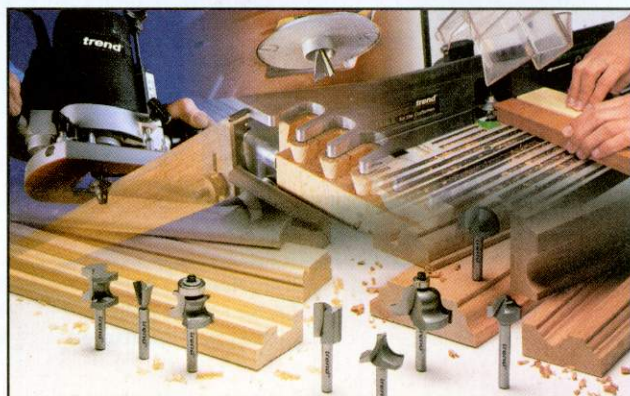


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Stockist Guide

Address for Sourcing	Craft Range Router Cutters	Professional Router Cutters	Routing Accessories & Jigs	Routing Publications & Videos	Diamond Sharpening Stones	Additional Information
ENGLAND						
Bedford Fixings, 1A Deans Street, Bedford BEDFORDSHIRE MK40 2EQ Tel: 01234 360747						Elu, Bosch, Metabo power tools. Hand tools stocked. Trade counter open Monday-Friday. Free delivery 40 mile radius of Bedford.
Shaws Electrical Ltd., 353 Purley Way, Waddon, Croydon, SURREY CR0 4NM Tel: 020 8688 0491 Fax: 020 8688 0492						We carry the largest range of professional router cutters in South East England with a service second to none.
John Boddy Fine Wood & Tool Store Ltd., Riverside Sawmills, Boroughbridge, YORKSHIRE NORTH YO51 9LJ Tel: 01423 322370 Fax: 01423 323810						Mail Order Catalogue, 264 full colour pages, £3 (£3 voucher against first purchase). Self Service Store, 10,000 products, 200 types/species of timber. Courses and Free demonstrations.
Little Sheffield, 32 Darwen Street, Blackburn, LANCASHIRE BB2 2BY Tel: 01254 57282						We stock full range of Elu, Bosch & Makita. Routers, jigs, stands, and full repair service and parts department. Mail order service available.
Johnsons of Rainham, 202-204 Station Road, Rainham, KENT ME8 7PR Tel: 01634 231609 Fax: 01634 261523						Family run traditional ironmongery and tool specialists, est. 1945. Extensive range of portable routers stocked inc. Bosch, Elu and Hitachi.
Crown Tools & Fixings Ltd Watermill House, Restmor Way, Hackbridge Road, Wallington SURREY SM6 7AH Tel: 020 8733 3993 Fax: 020 8669 5889						Hand power tools, engineer tools, woodworking m/cs, worktop jigs, saw blades, abrasives, adhesives, fixings, screws. Large showroom, repairs & sharpenings. Mail order, UK delivery.
Les K. Power Tools, Unit 15, The Idas, Pontefract Road, Stourton, Leeds YORKSHIRE WEST LS10 1SP Tel: 01132 714808 Fax: 01132 706328						Stockists of Elu power tools, TCT saw blades, planer blades, band saws, HSS saws, complete sharpening service.
Harry Neill Woodworking Tools and Machinery 66 St Johns Lane, Bedminster BRISTOL BS3 5AF Tel: 01179 778076 Fax: 01179 717991 Web Site - www.harryneill.com. FREEPHONE: 0800 652 3787 Opening Times: Mon-Fri 8.30-5.00 Sat 9-12						We are: Bristol's Biggest Display of power tools and woodworking machinery. Distributors for: Record, Startrite, Delta, Scheppach, Elektra, Beckum, Draper, Freud, Etc, etc.
Jaycee Tools, 521c Yeading Lane, Northolt, MIDDLESEX UB5 6LN Tel: 0181 841 1099 Fax: 0181 842 4966						Mail order sales, repair service. Large stocks of power tools, hand tools and woodworking machinery. Central London 12 miles, A40 2 miles.
CBS (Power Tools) Ltd., Trend Router Centre, V.P. Square, Storeys Bar Road, Fengate, Peterborough, CAMBRIDGESHIRE PE1 5YS Tel: 01733 343031 Fax: 01733 897151						Power tool specialists - good selection of Routers from leading manufacturers for professional and enthusiast. Phone for advice and best prices.
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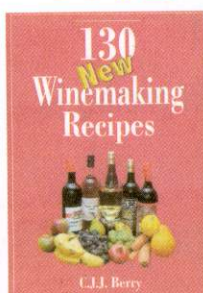
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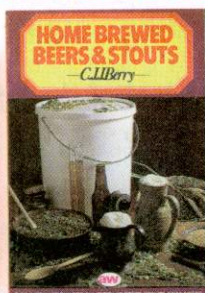
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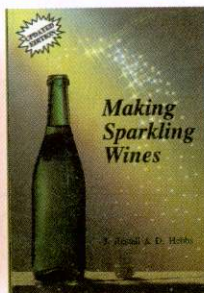
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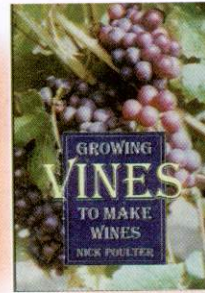
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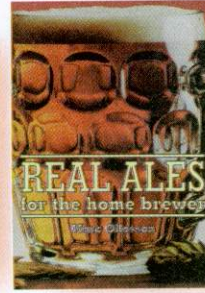
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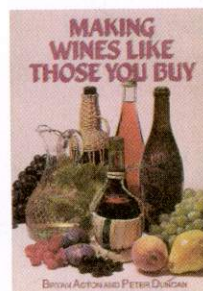
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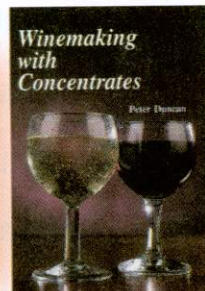
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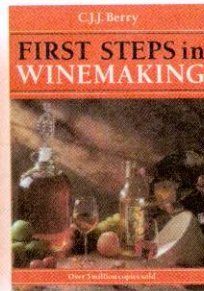
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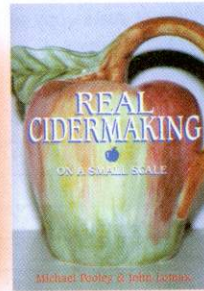
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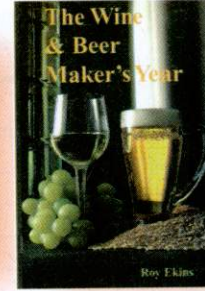
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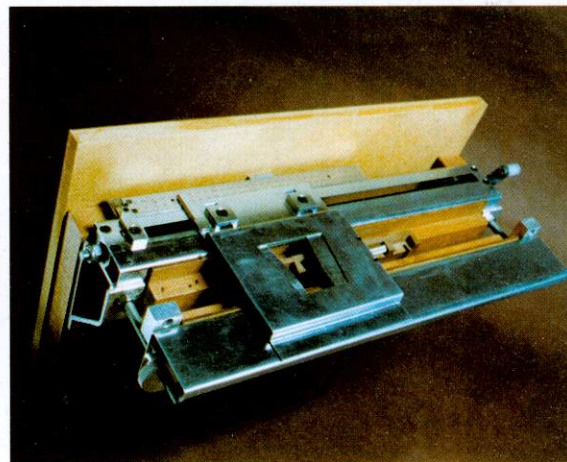


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