

NEW!

April/May 1998, No 4

The Router

ROUTING IDEAS & PROJECTS FOR THE WOODWORKER

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Make joints with a router!

DIY PROJECTS

Radiator cover
Staircase handrail
Display cabinet
Kitchen drainer

TESTS

Powered dust hoods
Rout-R-Slide
2 Mafell routers

FEATURES

CMT factory visit
Drawing with CAD
Trend Routerlathe

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Makita
routers
worth
£1500!

*Plus: techniques, tips,
specifications, contacts and much more !!!*

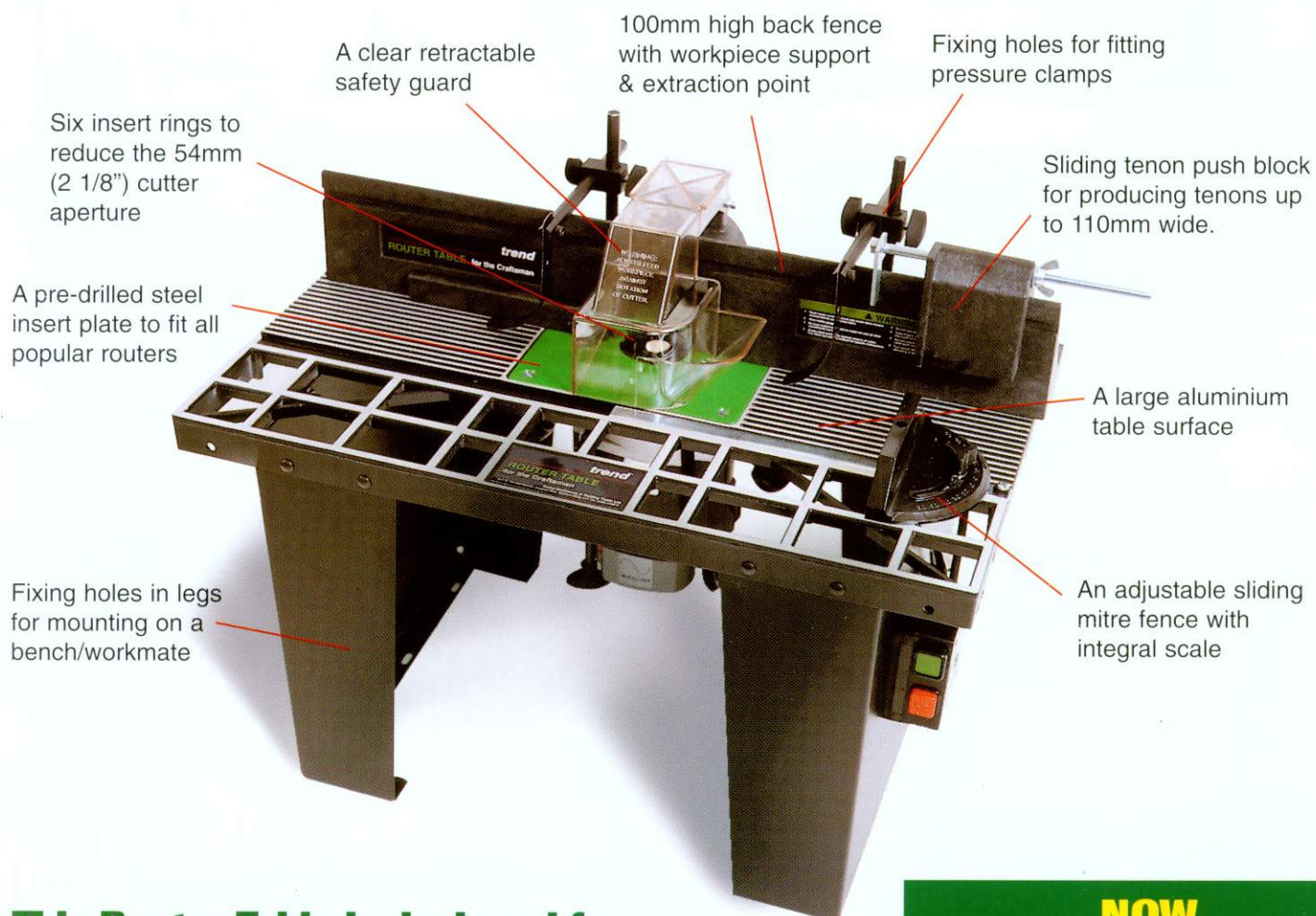


OFFICIAL JOURNAL OF THE GUILD OF MASTER CRAFTSMEN



ROUTER TABLE

for the *CRAFTSMAN*



This Router Table is designed for the woodworking enthusiast and especially for those new to the art of routing. It is packed with the necessary features to maximise the versatility of all portable routers.

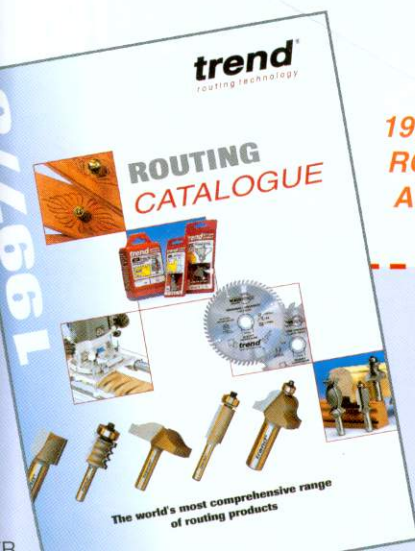
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The Router

Issue Number Four — April/May 98

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Quality Router Cutters From Axminster

A superb range of premium quality router cutters manufactured in America by Jesada Tools. Produced from the finest materials available using LaSalle Stressproof™ steel, renowned for its consistent hardness and strength, together with a micrograin carbide tip which, when combined with the unequalled mirror finish, ensures a durable, fine cutter capable of holding a sharp, clean edge.



Jesada Three Piece Doormaker's Sets

Our Doormaker's Sets let you start making raised panel doors as soon as you open the box. Each set includes a Rail & Style Set and a Raised Panel Bit in a choice of four styles.

600509 OGEE DOORMAKER'S SET WITH OGEE RAISED PANEL

600510 OVOLO DOORMAKER'S SET WITH STANDARD RAISED PANEL

600514 OVOLO DOORMAKER'S SET WITH COVED RAISED PANEL

600511 STEPPED OVOLO DOORMAKER'S SET WITH BEVELLED RAISED PANEL **£129.16** inc VAT & Carriage

Jesada Six Piece Straight Sets

Each set includes six of our top quality straight bits in your choice of 1/4" or 1/2" shank. They include cutters with 1/4", 3/8", 1/2", 5/8", 3/4" and 1" cutting diameters.

800716 SIX BIT 1/4" ROUTER BIT SET **£66.10** inc VAT & Carriage

800717 SIX BIT 1/2" ROUTER BIT SET **£76.29** inc VAT & Carriage

Jesada Six Piece Roundover Set

Our six piece 1/2" shank Roundover Set includes cutters with radii of 1/4", 3/8", 1/2", 3/4", 7/8" and 1". Also included in the set is a 3/8" bearing to convert cutters to beading profiles.

800616 SIX BIT 1/2" ROUNDROVER SET **£156.15** inc VAT & Carriage

Jesada Five Piece Kitchen Set

We offer four differing complete Kitchen Sets. Each set includes Raised Panel, Glue Joint, Drawer Lock and Rail and Stile cutters.

600559 OGEE DOORMAKER'S SET WITH OGEE RAISED PANEL

600560 OVOLO DOORMAKER'S SET WITH STANDARD RAISED PANEL

600562 OVOLO DOORMAKER'S SET WITH COVED RAISED PANEL

600561 STEPPED OVOLO DOORMAKER'S SET WITH BEVELLED RAISED PANEL **£171.55** inc VAT & Carriage

Jesada Multi Purpose Professional Sets

Our comprehensive 1/2" and 1/4" sets contain a variety of the most popular cutters used in the workshop. The 1/2" set comprises thirteen cutters whilst the 1/4" set has twelve cutters.

800503 TWELVE PIECE 1/4" PROFESSIONAL SET **£117.03** inc VAT & Carriage

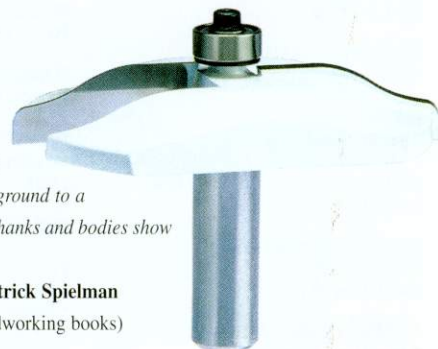
800505 THIRTEEN PIECE 1/2" PROFESSIONAL SET **£155.87** inc VAT & Carriage



"... I've used bits from virtually every manufacturer in the business, and I can state unequivocally that I have never seen a better bit ... The carbide is ground to a remarkably high polish finish, while the shanks and bodies show an unmistakable attention to detail."

Patrick Spielman

(Author of more than 50 woodworking books)



Instant rebates on all Jesada router cutter orders

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£11.75 off orders over £117.50

£23.50 off orders over £200.00

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American made router cutters at American prices!
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Foreword

“ WITH THIS ISSUE of The Router you get even more value for your money!!! Due to popular demand we have now increased the number of pages in the magazine to give much more routing information. I only hope there are enough hours in the day for you to digest and try them all out; if not, put your issues of The Router to one side and return to them when a previously overlooked project becomes a sought-after solution.

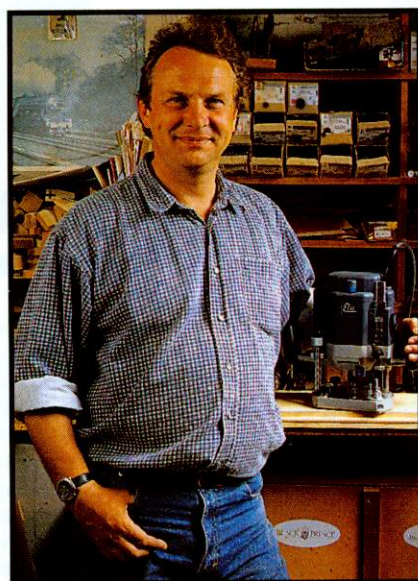
To give your home a facelift and hide those unsightly radiators, Anthony Bailey shows how to create some attractive radiator covers, while Ian Hall builds an unusual display cabinet to protect his wife's thimble collection from gathering a dust fur coat. Bob Adsett routs unique handrailing, completing his look at staircases.

The Router is, of course, dedicated to your interests, and I would like to hear from you if there are any projects you would like to see built by any of our expert makers. Then I will endeavour to gently persuade one of them to comply – or maybe you are embarking on a project yourself that would be of interest to your fellow readers.

An area of intrigue to all of us router users is exactly how router cutters are made; I am certainly able to fill you in on the way that CMT do it as they invited me to their factory in Pesaro, Italy for a full guided tour of their works – it's a tough life being an Editor.

To help you with designing projects Roger Ley shows the advantages of using a CAD (computer aided design) program on a computer, to eliminate as many constructional problems as possible before introducing cutters to wood. Breathe easy with David Tippey as he tests a selection of powered respirators, and check out the unusual sliding router table from Everglades.

When you have finished reading that lot I have every confidence that you will rush out, select some wood and then turn it into something wonderful with your router.



”

Competition winners

In the future, for those who would rather not cut up their treasured copy of The Router an entry on a photocopy of the competition form is acceptable.

The 25 lucky winners of Trend four-piece cutter featured in the competition in TR2, are:

Mr R. Blanchard, Worcs, J. Morrissey, Devon, Tim Thomas, Leicester, Mrs D. M. Stoddarts, Northumberland, E. A. Clayton, Cheshire, Mr T. Elsdon, Kent, S. D. Humpston, S. Yorks, Tom Billingham, Sheffield, R. W. Farrant, Staffs, Mr C. F. Bateman, W. Yorks, P. Woodfield, Surrey, Mr S. D. Albon, Essex, P. A. Collins, Northants, Mr P. R. Hollington, W.

Midlands, Gary Luff, Sussex, Edward Penn, London, D. Camfield, N. Yorks, Mr W. A. Orr, Scotland, Paul Beesley, Dorset, Mr G. Grindrod, Wiltshire, Mr A. C. Macpherson, Suffolk, Mrs S. A. Moreland, Northants, E. Parkin, Yorks, M. D. Cook, Essex, Mr R. Richards, Kent.

Congratulations! Your prizes will be with you shortly.

New Titman CNC routers

CNC ROUTING could be the way forward for the small professional workshop, enabling wooden or composite material components to be mass produced repetitively.

The new Titman 600 CNC router launched at Hirex in January is designed for first-time CNC users as well as more experienced operators.

It incorporates an inverter-driven, 1.2kW router head which delivers a smooth, constant torque over speeds varying from 12,000 to 24,000rpm, making it capable of routing and milling all types of woods, plastics and most metals.

It moves in all three

axes on precision-ground screw drives and will take 3 to 10mm shank cutters.

The vacuum bed integrated into the robust steel frame holds workpieces up to 60mm-thick firmly, allowing precise cutting over the entire surface.

Dust or swarf is removed with the built-in extraction system.

The machine is controlled with easy to use, dedicated software on a standard IBM-compatible PC using Windows 95. This accepts design data from any CAD or drawing package. Although simple to operate, it includes automatic cutter compensation off-set as well as many other



▲ Into the future with the new Titman 600 CNC router

advanced features.

Costing £15,662 including VAT, the 600 by 700mm bed 600CNC is the smallest model. The machines are also available with a range

of larger beds.

Contact: **Titman Tip Tools Ltd**, Kennedy Way, Valley Road, Clacton-on-Sea, Essex CO15 4AB, tel 01255 220123, fax 01255 221422.

Liberon Bison Fine Paste Wax

Give your furniture the stripped pine look



ONCE YOU have created a piece of pine furniture with your router it is then time to decide on its final finish.

This new wax from Liberon is worth serious consideration. It provides new pine furniture with a stripped pine finish; a shade of grey mimics the look of driftwood.

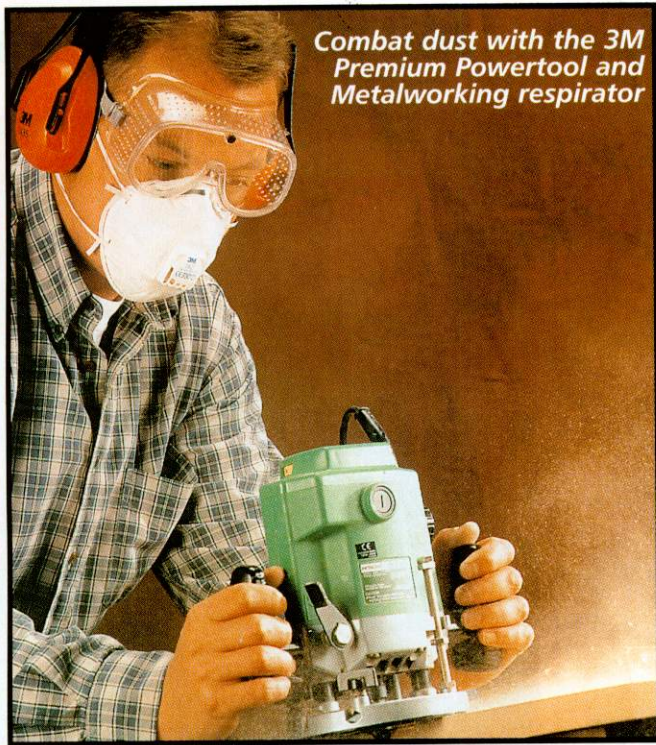
The balanced blend of waxes is chosen for the individual qualities of each to revive wood, enhance its colour and cover scratches, marks and blemishes.

The stripped pine finish is one of 15 shades in the Bison range of Fine Paste Waxes.

They are available nation-wide from Liberon outlets in 500 and 5000ml tins costing from £5.99 including VAT.

Contact: **Liberon Waxes Ltd**, Mountfield Industrial Estate, New Romney, Kent TN28 8XU, tel 01797 367555, fax 01797 367575.

● Contact the Editor, Alan Goodsell, with news and product information. Items must be sent to him at The Router, GMC Publications Ltd, 86 High Street, Lewes, East Sussex BN7 1XN at least 10 weeks before publication



Combat dust with the 3M Premium Powertool and Metalworking respirator

Protection with 3M

RECENT REPORTS about the potential dangers of working with MDF have signalled the importance of personal protection, but power-drilling, sanding and routing of any woods put the operator at risk of inhaling the resultant fine-particled dust.

3M's Premium Powertool and Metalworking respirator is specially designed to protect lungs from the fine dusts created by powertool work. It is CE-marked to European

standard EN 149FF12 which, according to the Health & Safety Executive, makes it suitable for working with MDF.

The new 3M mask is light and comfortable to wear and incorporates a comfort valve to overcome heat build up. Twin straps and a soft, pliable steel and foam nose clip ensure proper fitting.

The respirator comes with detailed fitting instructions and costs £4.99 from B&Q stores.

Contact: Call 01344 858617

Mixed pack of biscuits

TREND HAVE recently introduced a pack of mixed-size, compressed laminate beech jointing biscuits comprising Nos. 0, 10 and 20. These expand when used with PVA adhesive to create an exceptionally strong joint.

Grooves for the biscuits can be routed using a purpose-made biscuit-jointing tool or in conjunction with a Trend biscuit-jointing cutter set, Ref. 342, available on a 1/4 or 1/2in shank.

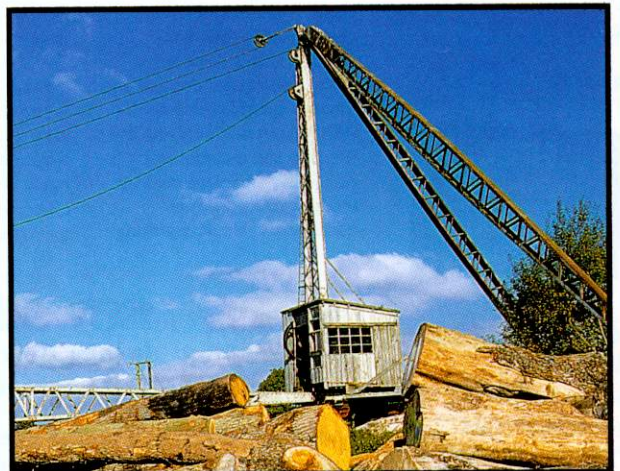
The packs cost £4.05 including VAT, and are available from Trend stockists around the UK.

Contact: Trend Machinery & Cutting Tools Ltd, Freeport, Penfold Works, Imperial Way, Watford WD2 4WD, tel 01923 249911, fax 01923 236879.



◀ Mixed pack of biscuits from Trend

Diary dates



▲ The distinctive crane at Yandles overlooks their woodworking show

April

3 and 4 Yandles Show Hurst Works, Martock, Somerset. Tel 01935 822207.

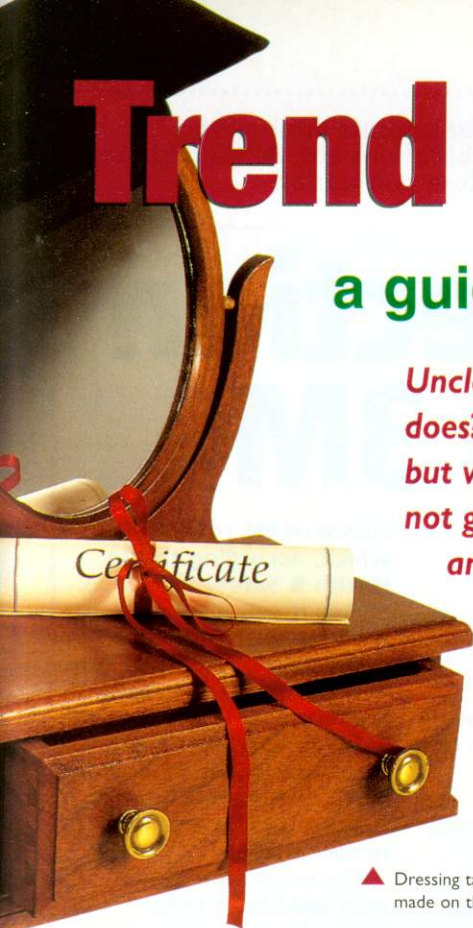
25 Poolewood Machinery Show, Pett Farm, Stockbury, Nr. Sittingbourne, Kent ME9 7RS. Tel 01622 232651.

May

9 John Boddy's Fine Wood Store routing demo Riverside Sawmills, Boroughbridge, North Yorkshire YO5 9LJ, 10am - 3.30pm. Tel 01423 322370.

Trend puts you on Course

a guide to their sponsored routing courses



Unclear about what a router does? Do you know a little but want to know more? Why not go on a routing course and release those hidden woodworking talents. Here is a quick guide to Trend's sponsored routing courses.

▲ Dressing table top drawer and mirror made on the Craft Supplies course

COURSE DATES 1998

Two Day Courses

April 6-7, 20-21, 27-28

May 4-5

June 1-2, 8-9, 15-16, 21-22, 29-30

Course Prices

Two Day **£150**

FREE

£25 voucher

for all course students

Redeemable towards the cost of any products sold by Northern Craft & Power Tool Co. Ltd



NORTHERN CRAFTS & POWER TOOL CO.

214, Waterloo Road, Blackpool, Lancs, FY4 3AB

Tel: 01253 400066 Contact: Alan Goodwin

Course Details: Located close to Blackpool town centre and British Rail stations, this 2 day course deals with router control and discipline, highlighting all the safety aspects, identifying the features and includes in-class videos. The project involves the construction of an occasional table, acquainting

students with the use of the Router Table to produce grooves and tenons and the Trend Routerlathe for turning the legs. Accommodation can be arranged by the course organiser who also provides lunch and refreshments. Other courses also available. **Lecturer:** Paul Wenlock



ROY SUTTON'S Routing Courses at the Apple Craft Centre

Selling Road, Macknade, Faversham, Kent ME13 8XF Tel: 01227 373297

Contacts: Roy Sutton/John Farrington

Course Content: Set amongst the farmlands and oasthouses of Faversham Kent, this renowned and respected one-day course has returned by popular demand, continuing its traditional format of router use and safety, encouraging confidence in students. A combination of expert lectures, videos, slideshows and practical router use enables the students to produce a bread board using the router table as well as

basic router applications. Personal tuition is available as well as on site turning courses. The showroom is well stocked with machinery, cutters, jigs, timber and all types of woodworking accessories. Gallery, restaurant and farm shop are on site. **Lecturer:** Wayne Crickmore



FREE VIDEO

for all course students

◀ Routing the bread board with a beam trammel



CRAFT SUPPLIES ACADEMY

Craft
SUPPLIES

The Mill, Millers Lane, Dale, Nr Buxton, Derbyshire SK17 8SN

Tel: 01298 871636 Contact: Eve Middleton

Course Content: Situated in the heart of the Peak district, this two day course features an introduction to the router; associated safety aspects, features and accessories. The project involves the construction of a dressing-table top drawer with elliptical pivot-hung mirror (see picture top left). It incorporates hand-held operations, tenoning, dovetailing, rebating and moulding techniques. The course also introduces the use of the dovetail jig, the

ellipse jig and table routing. Accommodation is available on site. Other courses are also available and students can take advantage of the book and video library, the crafts gallery and showroom. **Lecturer:** Bob Lambert

COURSE DATES 1998

Two Day Courses

June 2-3

July 1-2

Aug 12-13

Course Prices

Two Day **£150**

▼ Using the Trend Mini Ellipse Jig



Course in the UK



**EDINBURGH'S
TELFORD COLLEGE**

EDINBURGH'S TELFORD COLLEGE

Crewe Toll, Edinburgh, EH4 2NZ Tel: 0131 332 2491 Ext. 2229
Contacts: Stuart Telford/Derek Brown

Course Content:

Edinburgh's Telford College have 3 different one-day courses. 'Basic Routing' describes the versatility and accuracy of the hand-held portable router, covering basic principles, uses, features and safety. The second course takes routing to a more advanced level and

introduces the router table and the various multi-functional jigs. The third course, designed for tradespeople, demonstrates commercial jigs manufactured for trade and industry i.e. the stair jig, hinge jig and kitchen worktop jig.
Lecturers: Stuart Telford & Gregor Allen

COURSE DATES 98

Dates to be arranged,
please phone for details

Course Prices

One Day:

Basic	£75
Advanced	£75
Trade	£75



OAKLANDS COLLEGE School of Construction

St Peters Road, St Albans AL1 3RX
Tel: 01727 737213 Contact: Jeanne O'Reilly

Course Content: Situated in the town centre of St Albans, close to British Rail station, Oaklands routing course has been running successfully for 6 years and provides a one-day elementary course designed for the beginner and deals with router safety, its uses and cutters available. The project for the one-day course is to produce a bread board. The two-day course, targeted at the professional and the ambitious amateur, takes the art of routing a

stage further giving a broader look at the advantages of table routing, the benefits and precision of the dovetail jig and takes the student through the stages of making a drawer and raised panelled door. All students can expect a full day of lectures, videos and practical router use.

Lecturers:
Ken Moorton
& Bruce Marsh

Panelled door made
on the advanced
course



**FREE
VIDEO**
for all course students

COURSE DATES 1998

One Day Courses	Two Day Courses
April 24	April 30- May 1
May 8	June 11-12
June 5 & 19	July 2-3, 16-17

Course Prices

One Day	£67
Two Day	£125



TEESSIDE COLLEGE

Douglas Street, Middlesbrough TS24 2JW
Tel: 01642 300100 Contacts: Andy Batty/Julie Dodds

Course Content: The Longlands Campus is an exclusive building college who have added one-day and two-day routing courses to their comprehensive list of short courses. The one-day course includes basic routing principles, fitting and setting cutters, care and maintenance with emphasis on safety, techniques and cutter care. The one-day course is repeated on the two-day with the inclusion of table routing and jig/template making. Future courses will include a tradesmans course to incorporate the use of

proprietary jigs and fixtures, and a jig making course. Refreshments available.
Lecturer: Ian Coning

COURSE DATES 1998

One Day	Two Day
May 1 & 22	April 23-24
June 12 & 27	May 14-15
July 9 & 24	June 4-5, 18-19
	July 2-3, 16-17

Course Prices

One Day	£54.95
Two Day	£109.95



◀ Honing a cutter
using a DMT
whetstone

One-to-one courses with Ian Coning are also available through Eaglescliffe Woodcrafts, Tel. 01642 786449 for details.



NEATH COLLEGE

Dwr-y-felin Road, Neath, Wales

Tel: 01639 634271

Contacts: Dylan Wyn James, Wyn Pritchard

Course Content:

Continuing their long running success and as part of their endeavour to increase their short courses, the college are including a one-day routing course aimed to meet the demands of public interest. The course deals with router safety and discipline, increasing the confidence of the user with detailed

instruction on the use of jigs and templates. Other courses are also available.

Lecturer: Dylan Wyn James

COURSE DATES 98

Dates to be arranged,
please phone for details

Course Prices

Two Day	TBA
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YANDLES of Martock

Course Content: Yandles woodworking centre is running two routing courses. The Basic Course is designed for those new to routing and takes students through general router uses and step by step working procedures introducing cutters and their uses as well as cutter care. The Advanced

Course, is for those wishing to benefit from purpose designed routing jigs and template work and experience the advantages of table routing. Turning course also available. Lunch is included in the course price.

Lecturers: John Parslow & Robbie Farrance

Prices correct at time of going to press, but are subject to change. Please contact individual colleges for current prices, dates of courses and further information.

AUSTIN EAMES

NEW

Plas Acton Precinct, Pandy Lane,
Wrexham, Clwyd, LL11 2UB
Tel: 01978 261095

Contacts: Peter/Richard Eames

Course Content: Located in North Wales the courses attract novices to routing, the basic user and those wishing to learn more. The courses deal with health and safety, types of cutters and jigs, template work and maintenance.

Lecturer: Emrys Owen

COURSE DATES 98

Dates to be arranged,
please phone for details



▲ Emphasis on safety and cutter care

Martock, Somerset Tel: 01935 822207
Contacts: Beverley Mansfield/
David Mounstephen

COURSE DATES 1998

One Day	Two Day
April 8, 25 & 29	May 9, 13, 16 & 20
June 3, 6, 13 & 17	

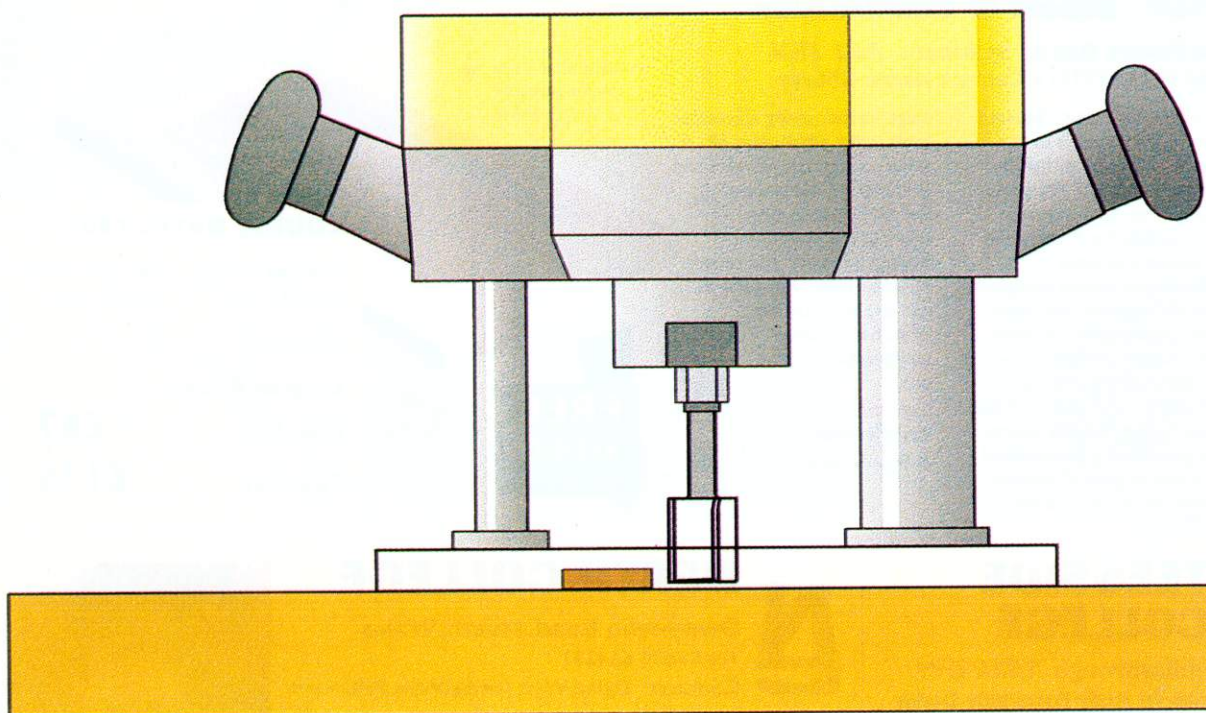
Course Prices

Basic (One day)	£60
Advanced (One day)	£60

All courses sponsored by
trend
routing technology

Router tips

Alan Goodsell has some more ideas designed to help you get the most out of your router



Set-up guides

This tip ensures a consistent setting-up process without the use of a ruler.

Router enthusiasts who regularly use their favourite cutters for a housing, rebating or similar joint will welcome guides designed for easy setting of a straight-edge the correct distance between any particular diameter cutter and the edge of the router baseplate.

Take a piece of board – scrap material will do – and attach a straight-edge to the top of one edge. Then place on the board a reasonably sized offcut of 6mm ply or MDF and, keeping the router baseplate firmly against the straight-edge, cut off strips. Create varying widths of strip by using different sizes of cutter.

▲ A router is easily set up to cut plugs flush

Mark each strip with the cutter size used, so giving various strips that are the exact distance between the router base and outside cutting edge of your cutters.

When setting up a fence for routing a housing for example, mark the joint's position on the board with a line. Select the cutter to be used and place the matching size strip for the cutter against the line.

Butt the end of a straight-edge against the guide strip and clamp it tight, repeating for the other end. If two strips are made, both ends of the straight-edge can be set at the same time.

*A. Palfreeman
Billingham, Teeside*

Dust collector

A plastic bucket fixed to the underside of a router table makes a good dust extraction collector.

Take a bucket of a suitable size, cut a hole in the bottom and then pop rivet it to a flanged 100mm (4in) standard PVC soil pipe fitting.

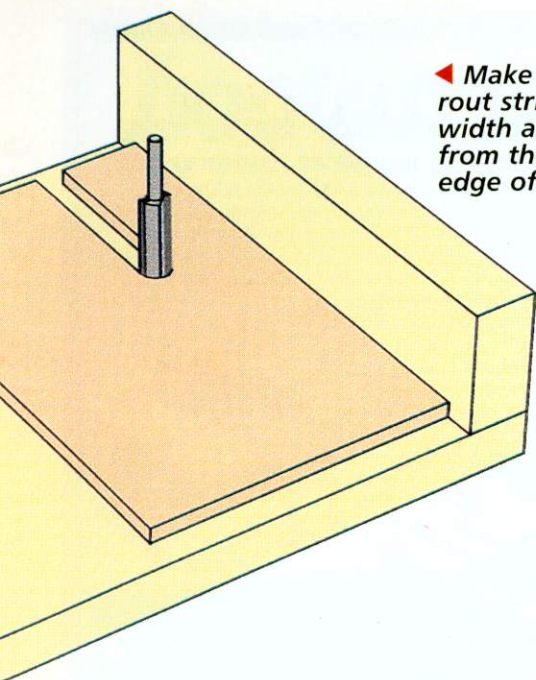
Before screwing the bucket to the underneath of the router table, cut a hole to take the plug cable; this is because the switch on the router will be covered. Cutting a few ventilation holes around the rim of the bucket helps the airflow over the router.

Attach flexible hose to the pipe fitting and link up to your dust extractor. Now screw an

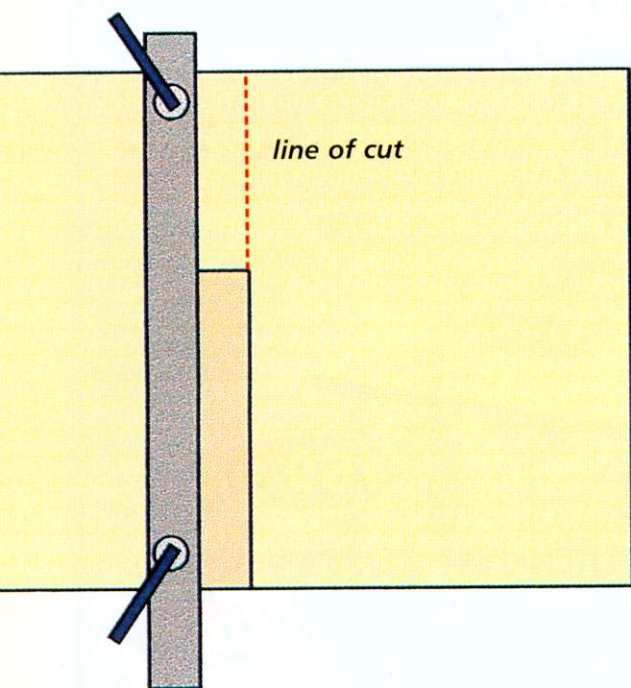
The strips are placed on the line of cut and a straight-edge butted up to them

NVR switch to the table and plug the router in.

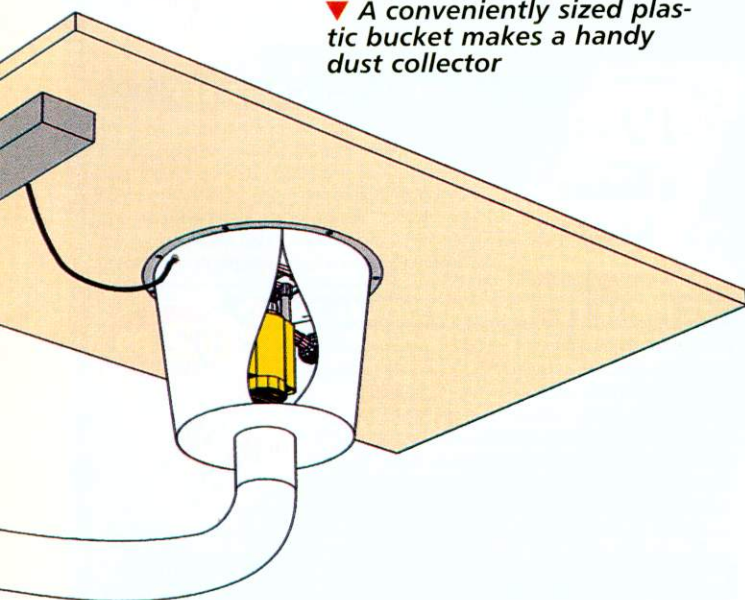
*S. Piper
Liverpool*



◀ **Make a simple jig to rout strips the exact width as the distance from the cutter to the edge of the baseplate**



line of cut



▼ **A conveniently sized plastic bucket makes a handy dust collector**

Plug trimming

If you find yourself in the position of having to cut and clean off a lot of plugs, consider using a router for the job. The alternative of sawing them carefully by hand and avoiding damage to the workpiece can be time-consuming.

Use an appropriately sized cutter with a bottom cut – most straight-fluted cutters are so designed.

Set the depth stop so that the cutter is ever so slightly above the surface of the workpiece, and place the router over the plug.

Take light cuts until the stop is reached and the remains of the plug are just proud of the surface. Finish off by sanding the plug flush.

*B. M. Redgrave
Chelmsford, Essex*

Safety first

Boxed sets of cutters are often packaged in very tight-fitting plastic holders, and it is all too easy to cut your fingers, especially when removing straight cutters.

To avoid this, wear an old gardening glove or wrap a piece of rag around the cutter when first removing it from its housing.

The same technique can be used when removing the Allen bolt holding the bearings on bearing-guided cutters. They are often tightened excessively, and without protection lumps can easily be taken out of finger ends.

*Ron Fox
Horsham, West Sussex*



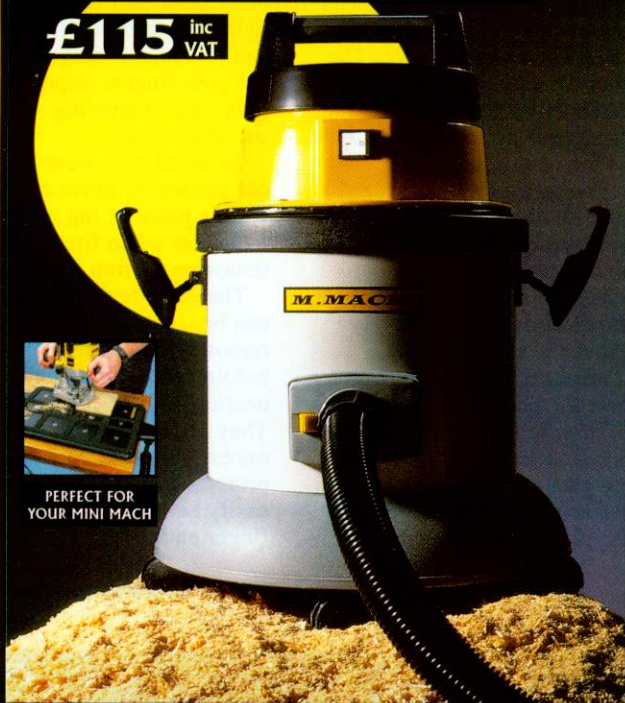
▲ **Gardening gloves protect hands when removing cutters from their box for the first time**

▼ **Undoing a tight Allen bolt on bearing-guided cutters can cut unprotected fingers**



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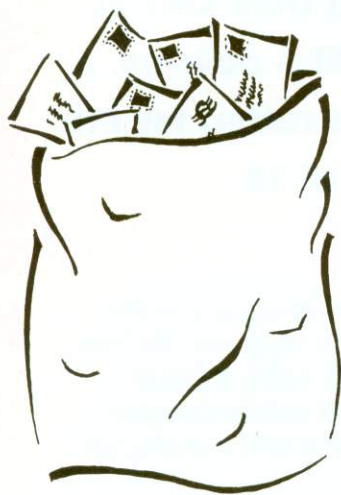
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Letters to Router



Editor **Alan Goodsell** welcomes letters on anything to do with routing, and wants to know what you think about the projects featured in the magazine, along with your tips and technical points.

Write to him at:

The Router, GMC Publications Ltd,
86 High Street, Lewes, East Sussex BN7 1XN
or e-mail Routermag@aol.com

Router for all reasons

I am considering buying a router for my own use at home. I would use it for a varied range of work, on the house, furniture, toys and small boat building, but it would not get the constant use of a commercial one.

On the other hand, I don't want a cheap DIY item and I am prepared to pay £200 or more for a serious quality tool but which one? I would welcome any advice, particularly in respect of watts and collet capacity.

George M Russell, Fife

Given the variety of work you are going to undertake, it would seem to me that a mid-range router would suit your needs best. This type of router will give you enough power – between 720W and 1100W – to do some table work but will still be small enough not to be too bulky for freehand work.

Many of these routers also take 8mm cutters as well as $\frac{1}{8}$ in, which will increase the range and strength of the cutters available to you. Ron Fox, see TR1, writes about

exactly your dilemma and Anthony Bailey reviews 10 mid-range routers.

Alan Goodsell

Craftsman is the answer

In TR3 R. Wesson wrote to ask whether it is possible to fit a Makita 3600B router to a Trend Craftsmen table.

A reader replies:

I fitted a Makita 3600B to my Trend Craftsman router table using a Trend insert plate CRT/C. No drilling was required, but I found I had to file the base plate of the router to bring it up against the underside of the insert plate. It also requires the fitting of a no volt switch rated at 115V to enable the router to run without the start button being continuously held.

This cost me £40 from the local Trend dealer and some delay whilst delivery from Trend was arranged; so, to save extra time and cost, these parts should be specified when ordering.

S. Whittaker, Newark, Nottinghamshire

Mathematical curiosity

In TR 2 Router tips there is the curious statement that one should only groove to the diameter of the cutter or even $\frac{1}{2}$ the diameter with small cutters. I can never understand this because a $\frac{1}{8}$ in cutter at $\frac{1}{8}$ in deep cuts out 0.0078 cubic inch per inch grooved while the $\frac{1}{4}$ in cutter cuts 0.25 cubic inch per inch grooved, which is about 32 times the volume. If one is using the same power of router the load is massively different. I would be interested in your comments.

John H Neame, Salisbury, Wiltshire

The tip about safe depth of cut for router cutters is not a scientifically worked out formula but a general rule of thumb that is intended as a simple guide. Something also to bear in mind is that larger cutters have more mass, therefore giving them more inertia in the form of flywheel effect, which makes them capable of coping with the extra volume.

Alan Goodsell

Slow down a bit

As a beginner to routing I often find that I get a ripply effect when I am edge-moulding. I first thought that this may be the fault of blunt cutters but even after sharpening them I still seem to get the problem, but not quite so badly. Please could you tell me what is causing this.

E. Palmer, Essex

The solution to your problem is that you are feeding the cutter too fast over the wood, causing it to vibrate. A blunt cutter will increase the effect but it is not the cause.

So work at a slower rate but try not to stop as this may cause burning on the workpiece.

Alan Goodsell

Save £37 on Complete Kitchen Cutter Sets

also featuring an Inlay Kit for £15

READER OFFER



The Router is this month offering readers the chance to own a Complete Kitchen Cutter Set from CMT at the special price of £175 including VAT + delivery, a saving of £37, or an Inlay Kit (without cutter) for £15 including VAT + delivery, a saving of £4.38.

Ask most woodworkers' partners and spouses what they would most like improved in their homes and the answer is likely to be the kitchen. The sort of work this entails is most effectively tackled with a router fitted with suitable cutters.

Specialist cutters are the key to making doors and drawers fit accurately. Joint problems could occur if cutters are bought separately.

The Complete Kitchen Cutter Set from CMT offers total compatibility for making professional quality cabinets, along with the assurance that all the cutters in the set are made to the same high quality.

The sets are available with a 1/2in shank, and must be used with a router table and fence. When using the panel-raising cutter the router must be set to a maximum of 12,000rpm.

The offer represents a healthy saving for the router-user, the Inlay Kits normally selling at £19.38 including VAT and the Complete Kitchen Sets at £212 including VAT.

To take advantage of this offer, simply fill in the coupon below.

The cutters are distributed by: CMT Tools, 8 Wainwright Road, Bexhill-on-Sea, East Sussex TN39 3UR



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"THE WORLDS MOST ADVANCED
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▲ The Wealden four-wing biscuit-jointing cutter

Routing aids – No 4



Bob Wearing describes the biscuit jointer and how this useful tool can be used with a router

THE biscuit jointer, costing between £120 and £470, is now firmly established as a power tool.

Although it is often found in busy professional workshops, many smaller concerns and skilled amateurs may have reservations about it, however, being uncertain whether they will have either the use for it, or the funds to buy one.

By far the most common use for biscuit-jointing is in forming an edge joint when joining boards together to create a wider one.

Not much more is required than the

accurate lining up of edges. Perfect joints can then be made with a router fitted with a biscuit-jointing cutter.

Biscuit-jointing cutters are available with either two or four wings, depending on the manufacturer. Different sized bearings can be fitted to the arbor for setting the depth of cut. On some cutters the bearing can be set either above the cutter, for thin workpieces, or below it for thicker ones.

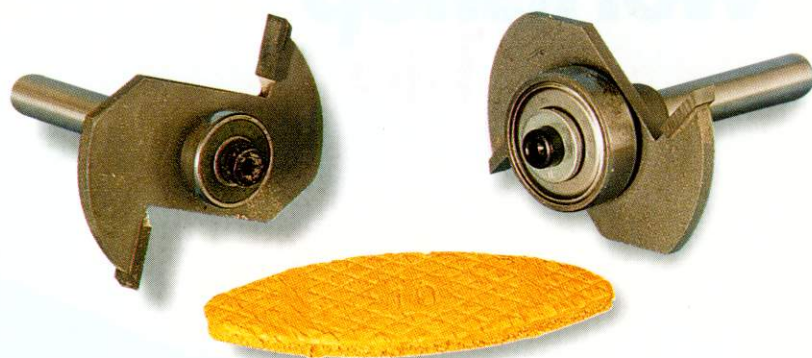
I use The Wealden Tool Company's biscuit-jointing cutter kit. Well thought out, it consists of a 4-wing 4mm-thick cutter,

spacing washers to locate the cutter accurately and three bearings matching the three sizes of biscuit – small, 0, medium, 10 and large, 20.

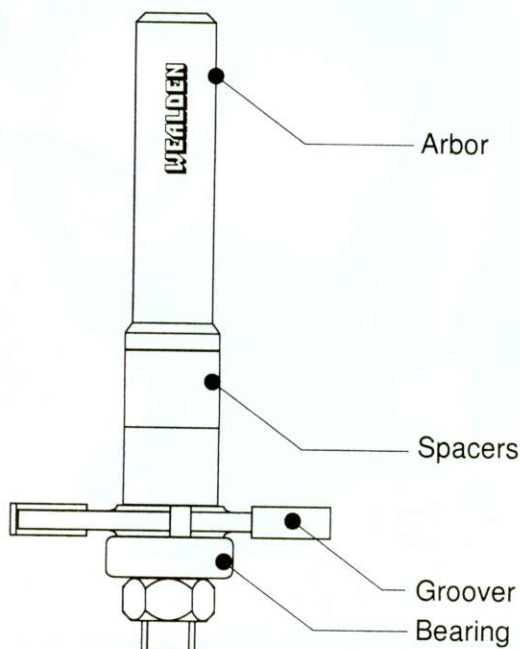
Arbors are available with $\frac{1}{4}$, $\frac{3}{8}$ or $\frac{1}{2}$ in shanks. You do not have to buy the complete set as all the items can be bought separately.

My biscuits come from **Axminster Power Tools Centre**, Chard Street, Axminster, Devon EX13 5DZ, Freephone 0800 371822. A small assorted pack of 500 costs £16. One-size packs of 1000 are also available. ▀

Workshop Tips



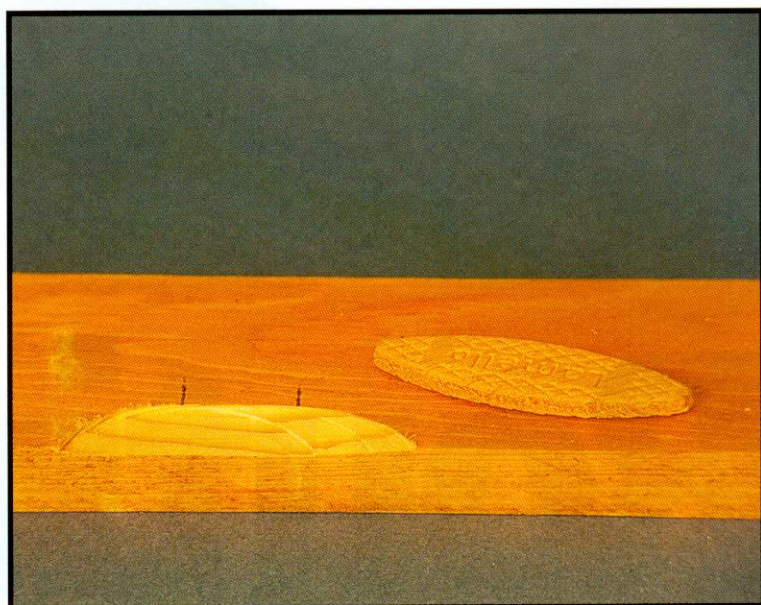
▲ Two wing cutters with different sized bearings fitted

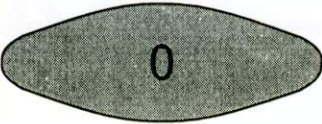
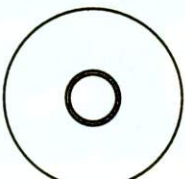
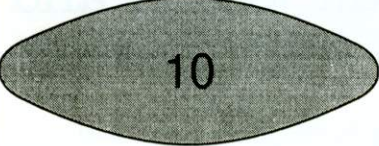
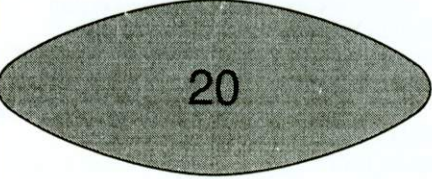


▲ Anatomy of a router biscuit-jointing cutter

► Note the two pencil marks. The cutter is moved from one to the other to obtain the correct slot length

▼ Biscuits come in three sizes. Various bearings fitted to the arbor enable the correct depth for each biscuit slot to be cut



BISCUIT	BEARING
	 TB880
	 TB748
	 TB625

Illustrations are full size

"An accurate length of slot is not really important, but being of a pedantic nature I mark further lines 10mm ($\frac{3}{8}$ in) on each side of the centre line"

Alternative techniques

It occurred to me that the router could be used in one of three ways: overhead routing, in a routing table or freehand, *see below*.

With any type of biscuit-jointing, marking out is simple. Having created good joint faces on the boards, lay the two together and mark the centre line of the slot across both.

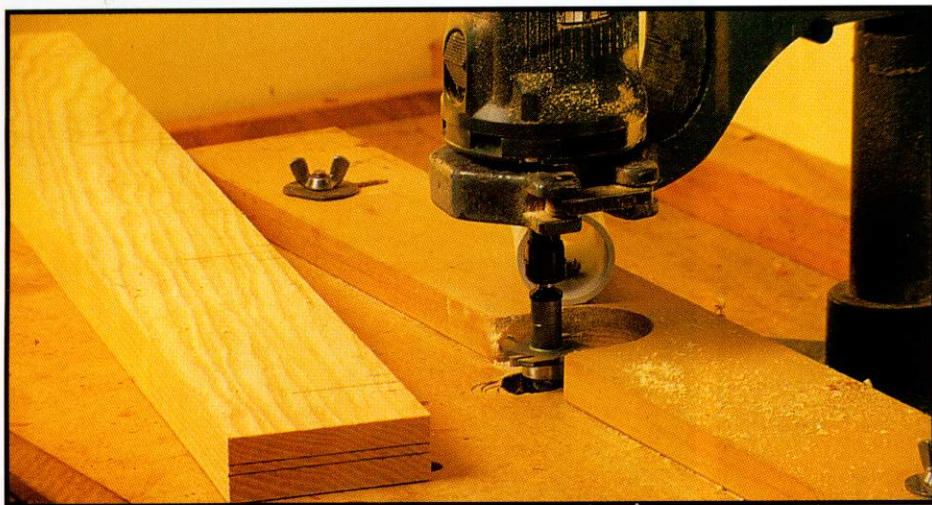
An accurate length of slot is not really important, but being of a pedantic nature I mark further lines 10mm ($\frac{3}{8}$ in) on each side of the centre line, i.e. 19mm ($\frac{3}{4}$ in) included. This is for the No. 10 biscuit, so will differ for Nos. 0 and 20.

Overhead routing

This calls for a wooden base plate with a hole bored and elongated to accept the end of the arbor. Set up the cutter on the arbor, locating the spacers to position it conveniently for the thickness of the job.

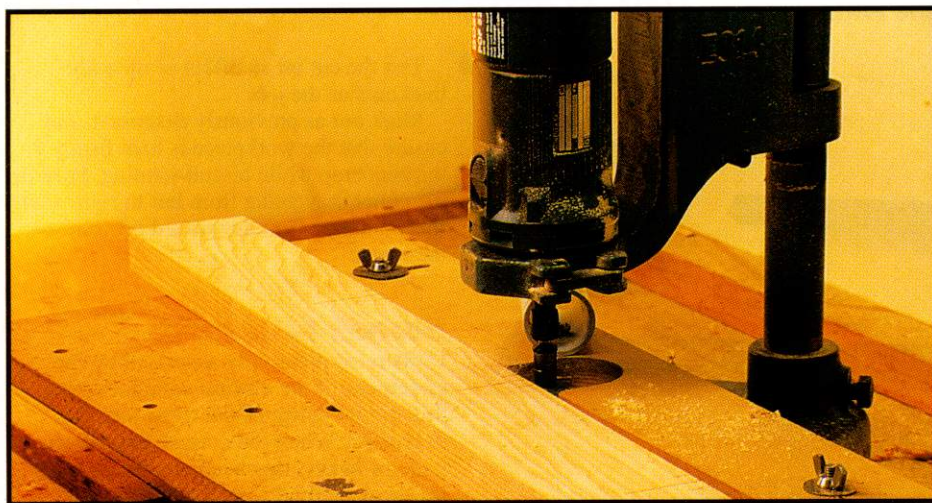
Gluing tip

Glue the joint first and the biscuits last. If biscuits are permitted to stand about wet for any appreciable length of time they will swell and be difficult to insert.



▲ Overhead biscuit-jointing with a small Bosch router set up in drill stand

"Adjust the cutter height to the centre of the workpiece. This position is not critical but, being a niggler, I have to have it truly central"



▲ With the router mounted overhead, feed the workpiece from left to right



▲ The router inverted in a workshop-built routing table means the feed direction is right to left

Though possibly not essential, I find it convenient to fix a fence, with a notch cut out for the cutter. The fence is cramped so that the chosen bearing projects minutely in front of its working face.

Make sure that the router's base-plate, fence and cutter in its collet are all firmly held.

Adjust the cutter height to the centre of the workpiece. This position is not critical but, being a niggler, I have to have it truly central. Really, as long as all the 'true' faces of the timber are placed either up or down, a level joint will be obtained.

Feed in the workpiece with one line pointing to the centre of the arbor. The traverse must be made against the rotation of the cutter. Looking from above, the direction of the cutter is clockwise, so the movement of the workpiece is from left to right.

Keeping fingers well away from the cutter, maintain a firm downward pressure on the workpiece. Withdraw it when the second line is reached.

Router table

The hole in the table plate must be large enough for the cutter to pass through.

Make sure that the cutter is very firmly held in the collet and the router solidly mounted in the table.

The gap in the table's fence should be set to support the work while providing the cutter with some clearance.

Set the fence so that the bearing projects very slightly in front of its working face, and adjust the cutter height to the centre of the workpiece.

Mark out the biscuit positions and feed in as described for the overhead router. Feed the workpiece against the cutter's direction of rotation. Looked at from above, this is anti-clockwise, so feed from right to left.

With care, biscuit slots can be cut in the end-grain on, for example, the rails of a flat frame. The close gap in the fence will help to support the workpiece.

They can also be machined on mitres in a wide, flat frame. In both cases, use the largest biscuit possible. If the workpiece is thick enough, a pair of biscuits can be fitted.

Freehand routing

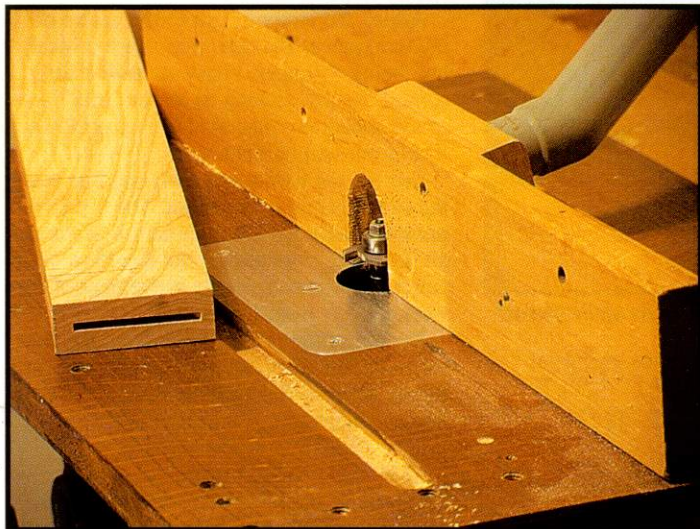
Using a router freehand for biscuit-jointing can be somewhat precarious because less than half of the router base bears on the workpiece.

This stability problem is overcome by adding a Levelling Foot to the router, see TR1.

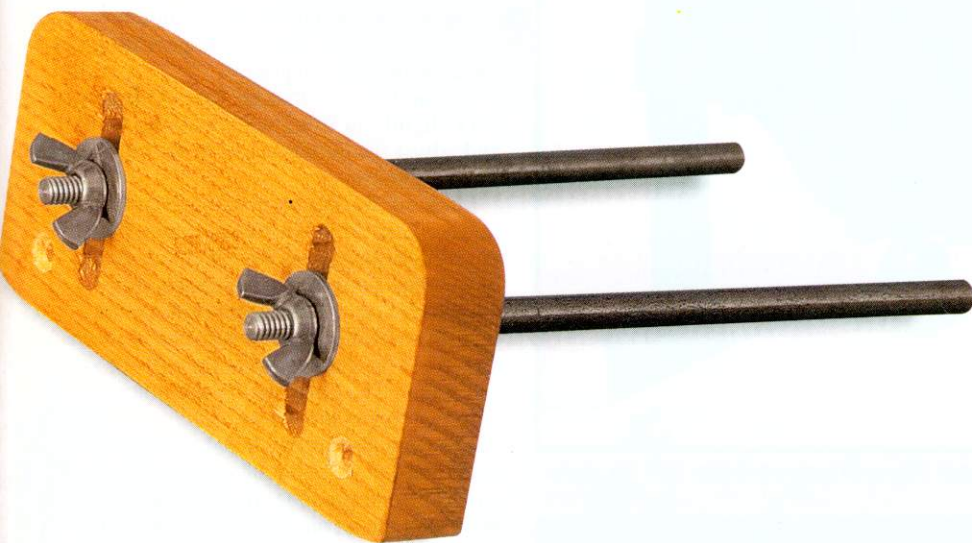
Fit the bars on the router and clamp them tightly. Stand the router on the workpiece, drop the Levelling Foot to the benchtop and clamp it in place, then slide the foot close to the baseplate and clamp it tight.

Fit the biscuit-jointing cutter into the router and plunge it down so it is positioned in the centre of the workpiece, then lock the plunge. If the tip of the arbor hits the benchtop, lift the workpiece by inserting a scrap of plywood or multi-ply under it, and re-adjust the Levelling Foot.

Workshop Tips



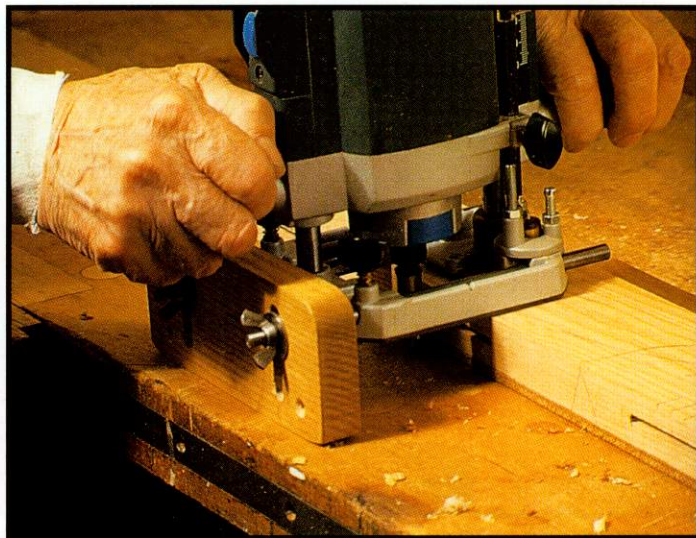
▲ The close gap in the fence helps to support narrow workpieces when jointed on the ends



▲ Levelling Foot, see TR1, will permit safe freehand biscuit-jointing



▲ Inserting biscuits into mitre joints is also possible with care



▲ Freehand routing with the Levelling Foot

"With care, biscuit slots can be cut in the end-grain on, for example, the rails of a flat frame"

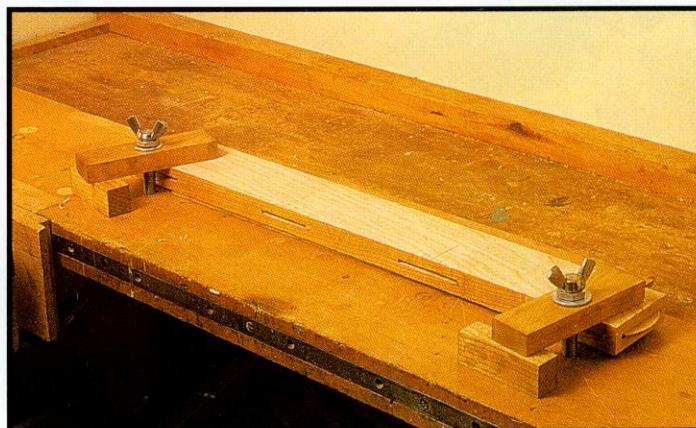
Test the cut on an offcut of the same thickness as the job.

Mark out as previously described, and ensure that the workpiece is held firmly to the benchtop while biscuit-jointing. Feed in the cutter, traversing from left to right while maintaining a firm downward pressure on the router.

Sweet favourite

I was most pleasantly surprised by the sweetness of the cutting action, making this my favourite of the three methods described. When the components are long, wide or heavy, this becomes the most practical method

Levelling Foot bars are now manufactured to my specification by **Vanguard Cutting Tools**, 102 Harvest Lane, Sheffield S3 8EG. Router Rods cost £4.85 for the 8mm ($\frac{5}{16}$ in) size and £5.50 for the 10mm size, including VAT, postage and packing. ●



▲ Clamp workpieces down securely before jointing

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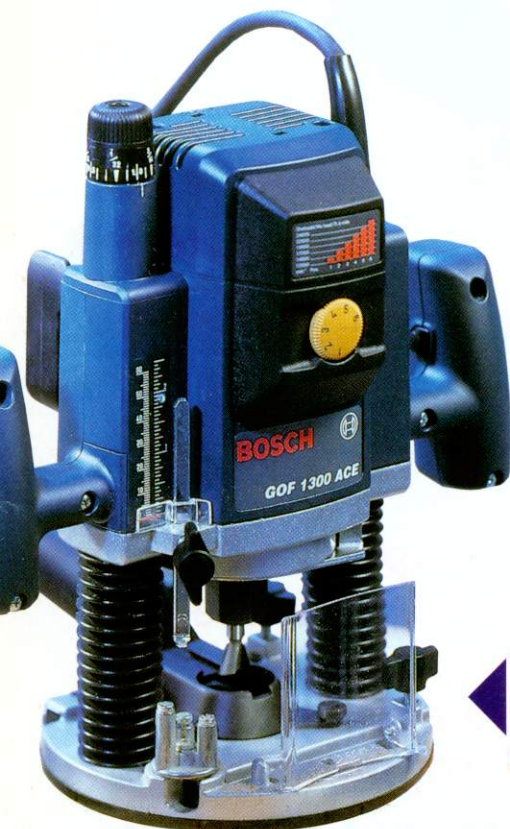
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Router Test

Mafell LO 50E and



Anthony Bailey tests two Mafell routers – and finds welcome similarities to Festo models and some good features of their own



MAFELL LO 50E

THE top cover of the LO 50E is flattened, and while 'palm-gripping' onto its slightly ridged pattern is not so comfortable, the machine can be inverted when cutter changing.

A fine adjuster tip is located at the bottom end of the depth stop rod which sets against a metric scale. The turret

stop turns easily but is mounted on a base that lacks built-in extraction.

There is, however, an add-on spout as well as a screw-in guide bush. The on/off trigger switch favours right-handers, and a wheel has six speed wheel settings that range from 10,000 to 22,000rpm.

The rather large scalloped plunge lock knob resembles that of its big brother, and has an anti-vibration spring, as do the other angular-shaped fence lock knobs.

The simple side fence has neither extraction bowl nor adjustable faces, but does have a workable fine adjuster.

On test

At 2.7kg, this model is heavy but is well balanced, with a comfortable grip. I expected it

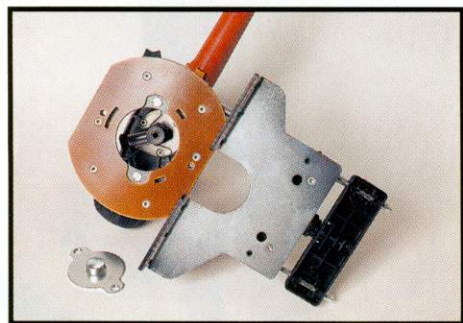
▲ *The Mafell LO 50E looks familiar*
 ▲ *The side fence on the LO 50E has an effective fine adjuster*

"I expected it to behave like a Festo on power up and wasn't disappointed"

to behave like a Festo on power up and wasn't disappointed. These 900W machines are pleasant to use because the motors are so smooth and quiet, and speed-changing is instantaneous – a joy indeed.

The plunge stroke is 50mm (2in), but the action is a little less than silky although the springing appears to have been upped to counteract this.

The extraction spout works properly on what is a well-behaved machine.



d LO 65E routers



MAFELL LO 65E

THE speed change wheel on this bigger machine scales from 8 to 20, representing 8,000 to 20,000rpm rather than a single number scale as on the small machine. The rock-type on/off switch has taken an ergonomic step backwards, and is located on the front where it is just a little hard to reach, especially as the on-position is shielded for safety.

Instead of a plunge lock lever the right-hand knob is turned; this has a better feel, and is aided by the scalloping of the comfortable knobs.

The depth stop rod is identical to the smaller model, but the turret stop is unaccountably stiff to turn – although it will probably loosen up after use.

The return rod on the top right has a single thumbwheel to set the stop and could do with another to lock it in place.

The baseplate lacks a smooth top surface, so providing plenty of dust traps. The underside, however, has a shiny stainless steel facing rather than the more usual phenolic resin sheet.

A protective plastic coating is hard to remove, and reveals a nice-looking surface

which is a bit vulnerable to scratching.

Guide bushes can be fitted to the baseplate. Its two long, flat sides are useful for working against a straight-edge. Usefully long fence rods are supplied, and the side fence has a proper fine adjuster.

Cutter changing requires the use of one spanner and depression of a small domed lock button; the supplied 8mm collet is a high quality item.

On test

The LO 65E is heavy at 5.5kg and tall, but it is very stable. Like the small machine it is quiet and smooth, with even speed changing. The plunge stroke is 65mm (2½in), its action being very efficient, with good springing and comfortable grip knobs. There is plenty of power at the cutting edge for heavy duty working.

▲ *The Mafell LO 65E is tall but very stable*

► *The LO 65E has an unusual stainless steel facing on the baseplate*

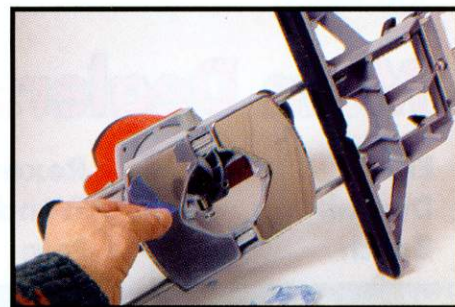
Conclusion

This brace of Mafells are essentially 'down engineered' Festos, providing the chassis and engine of a Mercedes, but finished off to Volkswagen Beetle standard.

Mafell have added their own input to produce two routers with world-class motors for a distinctly down-engineered price.

For router specifications see page 76 and for contact details see page 78

Prices are recommended retail and include VAT ●





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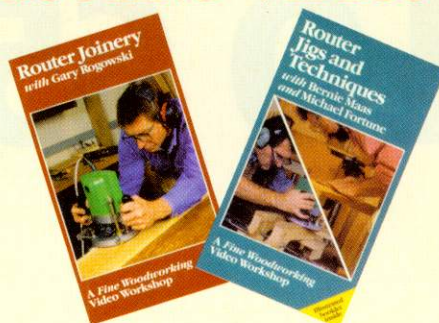
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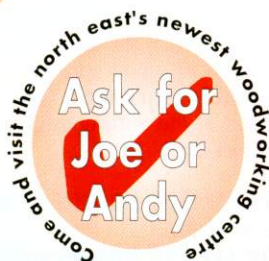
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MAKER

Anthony Bailey with some hot tips on making radiator covers

Router Project

Radiating style

RADIATOR covers – once the province of posh clubs for the rich and famous – are now playing a stylish part in many home decoration schemes. They are relatively simple to make with router and cutters – and can represent a profitable little sideline for professionals.

Design factors

They must be wide enough to allow for the radiator valves to be operated, and not so shallow that, should a hot radiator move away from the wall, the grille panel would be pushed off.

The proportions of the cover can be changed to suit, perhaps by increasing its height or length or by upping the number of grille panels from two to three. Where possible, all radiator covers in one room should be set at the same height.

I build mine from 18mm (¾in) thick MDF because it is cheap and stable enough to cope with heat variations. Making from solid wood isn't a realistic option as it tends to move a lot with extreme changes of heat, although the same effect can be obtained by using veneered MDF with thin solid wood mouldings around the edges.

On a sheet of paper, and to a convenient scale, sketch out the board size 2440 by 1220mm (8 by 4ft). Draw on this the width and number of strips of all the components required in order to devise the most economical cutting plan.

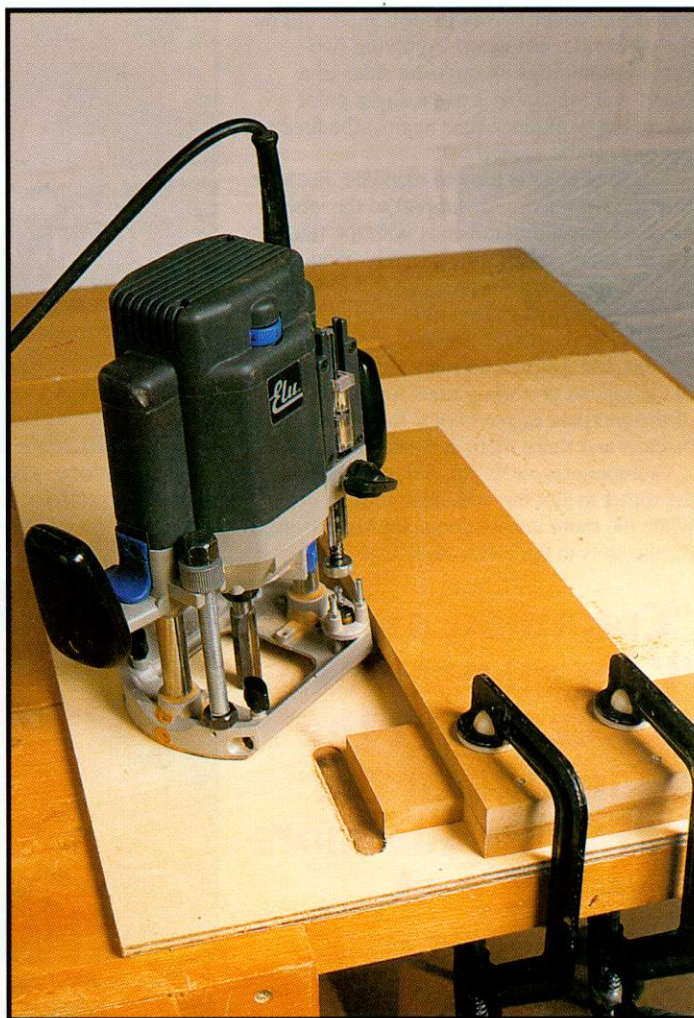
Carcass construction

A portable circular saw and a straight-edge does for ripping everything slightly over-size. Then plane all the edges smooth with a router, *see photo*.

Cross-cut components to length with the exception of the plinth and grille frame parts, which are dealt with later, *see photo*.



▲ The sheet of MDF is trimmed to size and edges cleaned up with a router



▲ Small components need a jig to aid with dimensioning

Router Project

"I machined the top's edge moulding with the router inverted in a table, but free-hand routing it is also possible"

▲ A short strip jointed onto the base of the carcass ends creates a step to accommodate the grille frame, *see photo*. This is achieved with a biscuit-slotting cutter used in the router. For safety's sake, leave these strips long for the slotting process, cutting them to length afterwards, *see photo*.

Note that each slot is marked in the centre and on either side. This enables the router to be moved along so that a slot long enough to accept a '20' biscuit can be created.

Glue these pieces in place and leave to dry.

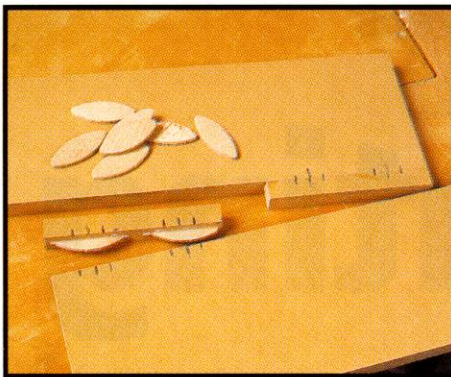
I machined the top's edge moulding with the router inverted in a table, but free-hand routing it is also possible.

First, produce the major curve by routing a largish roundover, then use a 6mm diameter roundover cutter to rout the top again, but on the other side, *see photo*. Applying two curved mouldings on opposite sides of a board will inevitably leave a slight point where the workpiece runs against the fence, but this can be sanded out.

The long edge is easy to machine, but take care to give maximum support to the workpiece when routing the ends with the fence gap set small, *see photo*. A steady hand while pushing the board past the cutter will help, with any slight deviation in cut being sanded smooth afterwards.

Next, use a square to mark the underside of the top, so providing lines for the outside of the end panels, *see photo*. Joint these with biscuits and mark them accordingly.

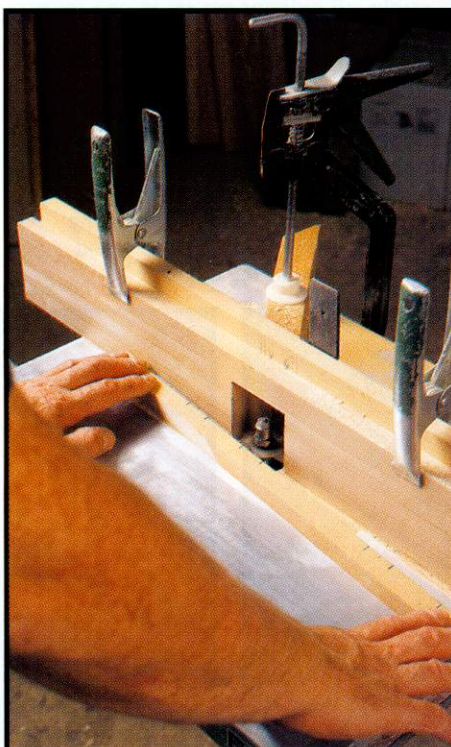
Cramping on an 'L' jig, *see photo*, allows the router to slot the underside of the top while the more conventional approach is used for the slots in the panel ends. Dry-fit the



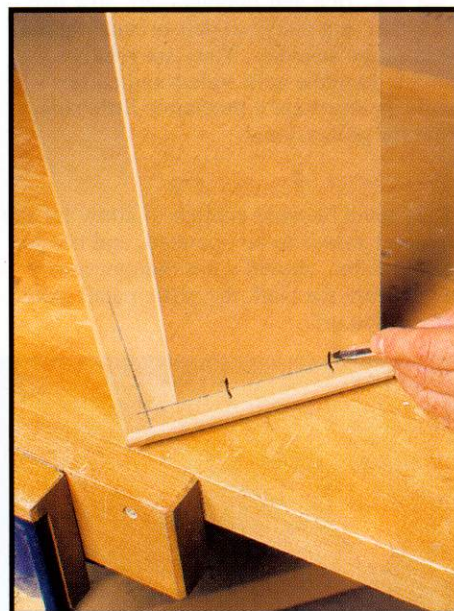
▲ Short blocks are biscuit-jointed to the base of the carcass ends to accommodate the grille panel



▲ Use a false fence with a small gap to support the workpiece when routing the ends



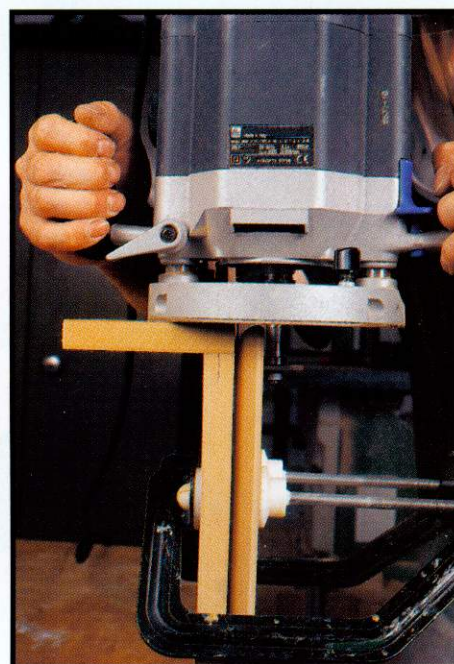
▲ For safety, rout the biscuit slots before cutting the blocks short, feeding in at the far end first to avoid kick-back



▲ Mark the positions for the biscuit-jointing slots

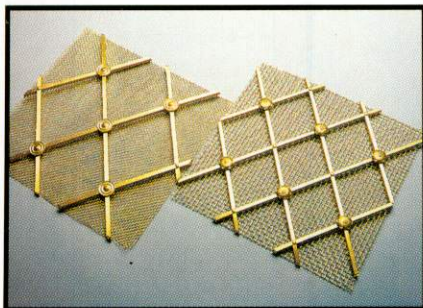


▲ The moulding on the top is formed using a large roundover cutter followed by a smaller one on the other side



▲ A right-angle jig aids biscuit slotting inside the ends of the top

"Cramping on an 'L' jig allows the router to slot the underside of the top while the more conventional approach is used for the slots in the panel ends"

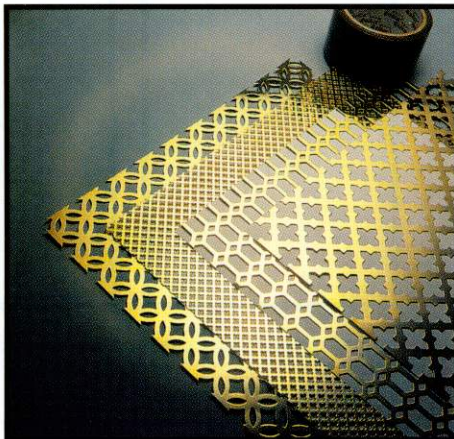


Grille choices

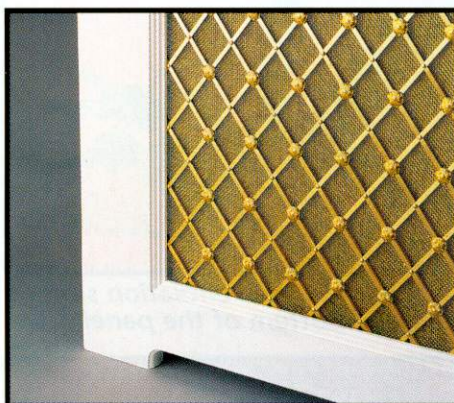
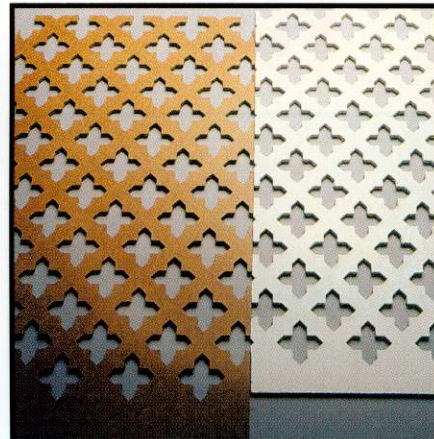
Grille possibilities vary from expensive brass in diamond, rosette and mesh patterns, to cheap punched hardboard obtainable in a number of patterns ready for painting. Any of these can be fitted in place, using panel pins or a tiny wooden fillet, after finishing the cover.

If using a paint finish, ensure the cover and any hardboard grilling is primed. Denib between coats before applying a top coat of gloss, satin or decorative paint effect.

► The grille fitted into the panel



▲ Various grilles types can be used according to budget, brass from the most expensive brass diamond, rosette and mesh pattern, punched through polished brass to punched hardboard



Tooling up

- Biscuit-slotting cutter
- Straight-fluted cutter
- Large roundover cutter
- 6mm diameter roundover cutter
- Moulding cutter – any classical profile, for example Grecian ogee or Victorian torus
- 45° V-cutter
- Profile and scribe cutter set
- Bearing-guided rebating cutter
- Titan 3mm roundover bit

ends and measure across at the top to arrive at the correct width for mitring the plinth.

Plinth

The plinth moulding can be a Grecian ogee, see photo, a Victorian torus or any suitable classical profile. Run the moulding on enough stock to go round the cover, allowing extra for mitres and mistakes.

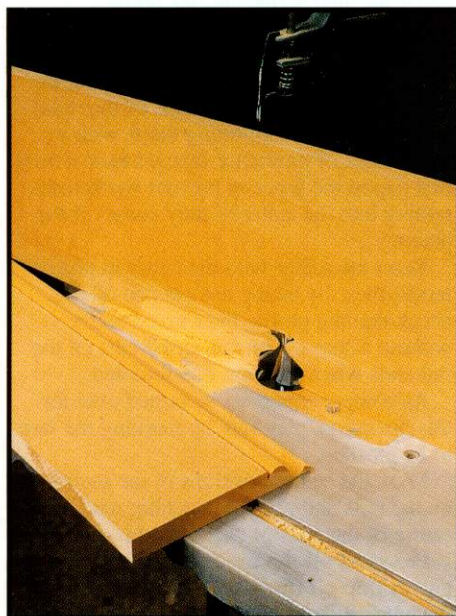
The mitres can be cut either with a mitre saw or, preferably, with a router fitted with a large 45° V-cutter, the work being run against a T-square fence.

Trim the ends of the long piece of plinth so that the distance between the internal mitre corners is the same as the previously taken measurement, see photo.

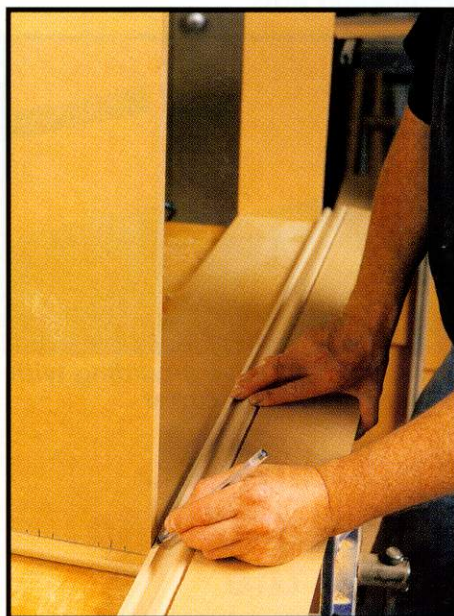
Now butt-glue this plinth piece in place,

cramp and check the cover for square by measuring the diagonals from corner to corner, see photo.

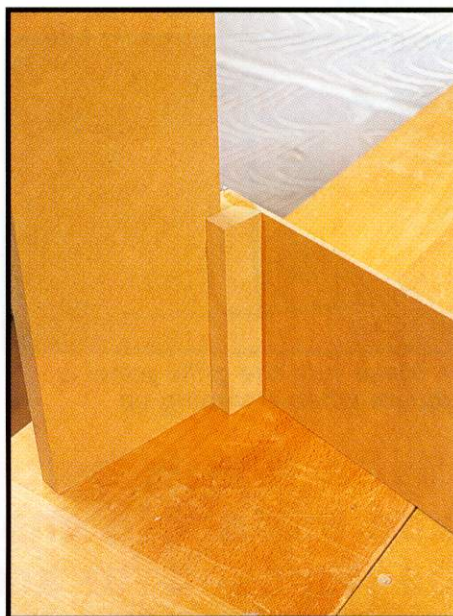
Cut two small blocks of MDF, apply glue to two of their faces and rub them into the internal corners between the plinth and the end panels. The blocks will back up and strengthen the plinth's butt-glue joints, see photo.



▲ The plinth looks good with a Grecian ogee moulding



▲ Carefully mark the inside edges of the mitres

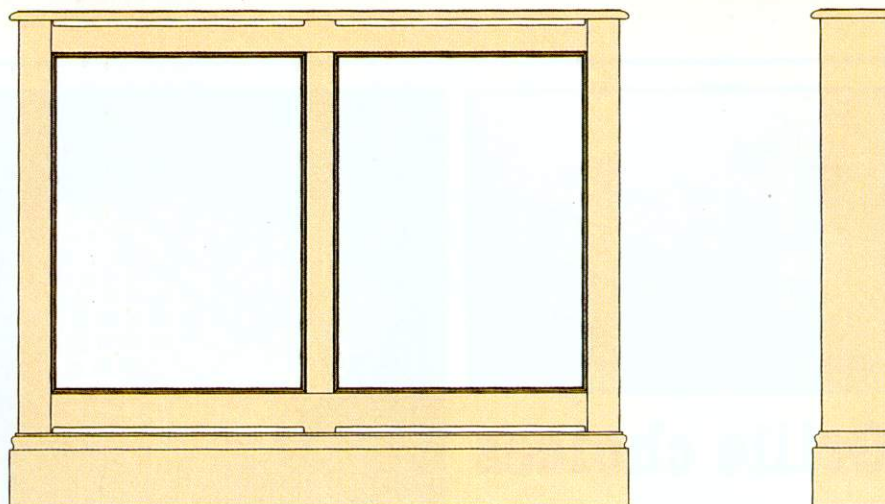


▲ Firmly clamp the plinth in place until the glue is dry

Router Project



▲ Glue blocks inside the cover to help hold the plinth in place



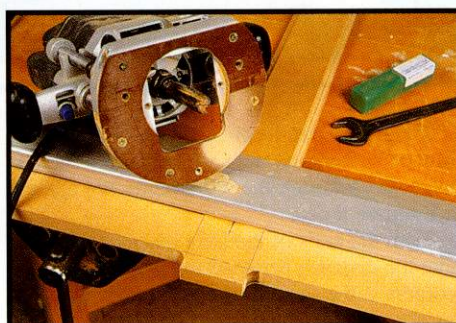
▲ Front and side elevations



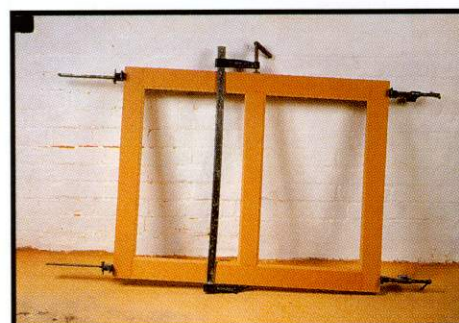
▲ The grille panel frame is easily made using a profile and scribe cutter set



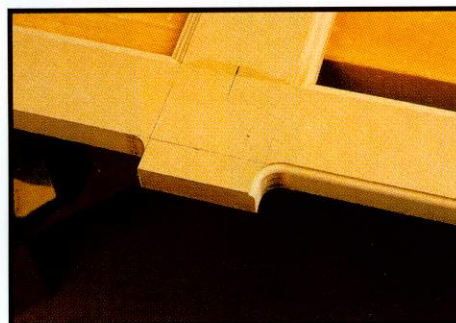
▲ Mark out the ventilation slots top and bottom of the panel



▲ Using a straight-edge, rout the ventilation slots



▲ Make sure the grille panel is square when cramping-up



▲ Add a decorative moulding with a 3mm roundover cutter

"Fit it tightly before planing top and bottom to enable the panel to be removed for access to the radiator taps"

Cut and mitre two short lengths of plinth, one for the right-hand end and one for the left. Glue them in place, butting them up tight to the existing mitres, and cramp up.

The top edge of the long plinth must be backed up with a 30mm (1 $\frac{1}{4}$ in) strip of MDF, glued in place to strengthen the narrow edge of the moulding. Ensure no gap shows below the grille panel.

Glue the top in place. When dry, fill and sand any gaps or blemishes.

Grille panels

The grille panel is the same width as the cover, and the height is the distance between the top of the plinth and the underside of the top. Fit it tightly before planing top and bottom to enable the panel to be removed for access to the radiator taps.

The side rails, top rail and intermediate uprights – muntins – are 75mm (3in) wide. Perspective effect means the bottom rail looks better if it is about 15mm ($\frac{1}{2}$ in) wider than the other components.

Use a profile and scribe cutter set to make the frame, adding 19mm ($\frac{3}{4}$ in) to the length of the top rails, bottom rails and muntins to allow for their scribe cut, *see photo*.

Leave the stiles overlength for trimming after assembly.

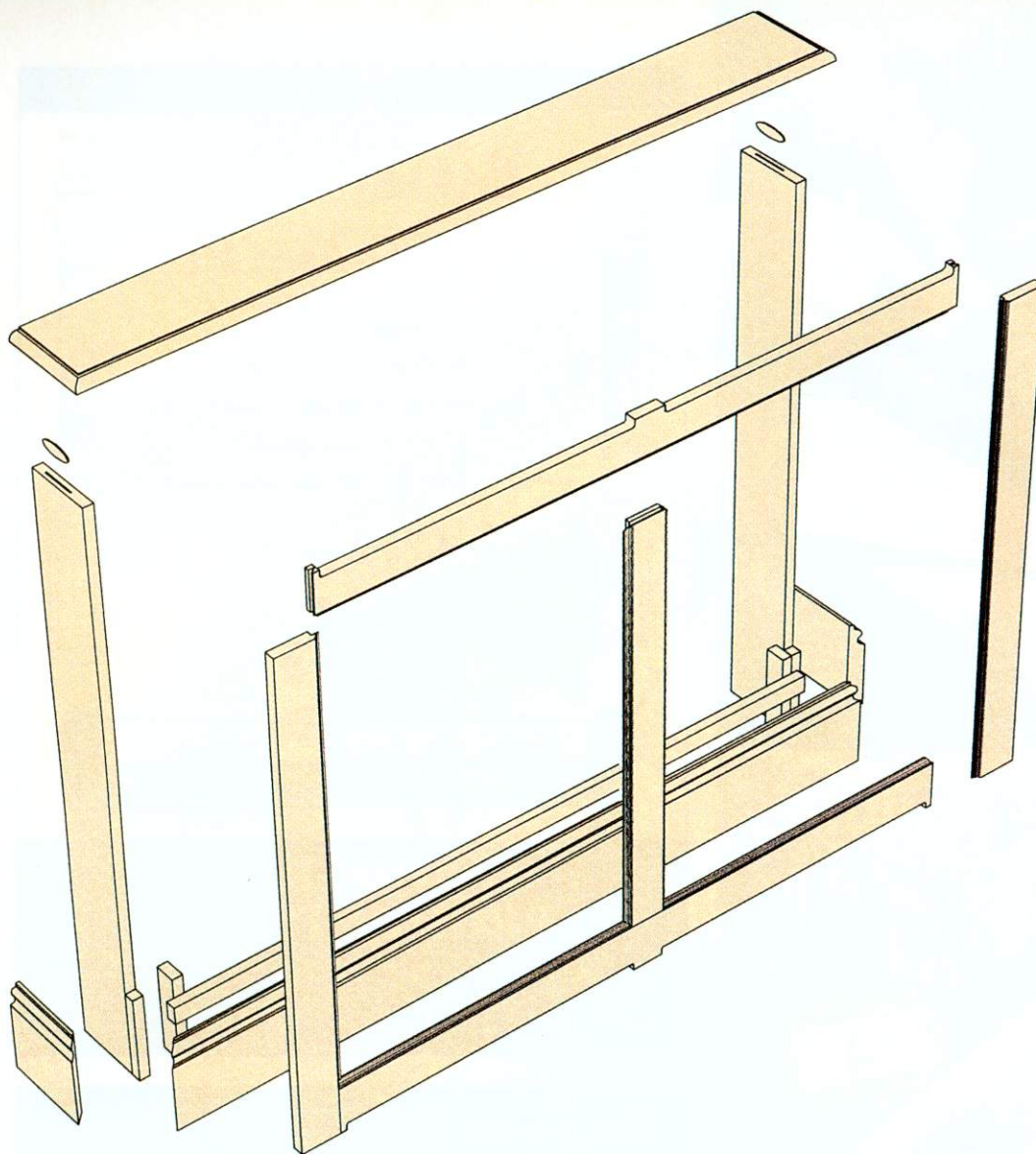
Set up the router table with the cutter in scribe mode, and rout the ends of the rails, and the muntins supporting them, with a push-block or protractor fence. Leave a minimal gap in the fence to prevent workpieces pulling into the cutter as they come off the bearing.

Reset the router with the cutter in profile mode, then, by taking test cuts on offcuts, check that the profile lines up correctly – without a step – with the scribe-cuts on the rail ends when the joint is assembled.

As components must be turned over for this operation, play safe by marking the face to be profiled.

Mark the centre positions of the muntins on the rails and place a matching mark in the centre of the ends of each muntin.

Pre-sand all the moulded edges, glue and cramp all the frame parts together, measuring from corner to corner to ensure squareness, *see photo*.



◀ Exploded drawing of a radiator cover

▼ Radiator covers look good with a painted finish

"The radiator cover must be scribed along its back edge to fit as closely as possible around the skirting board and accommodate any unevenness in the walls"

Once dry, trim the panel frame to a loose fit in the carcass, using a straight cutter in the router and running it along a straight-edge, starting with the two long edges. When sized correctly, sand all round.

Use a bearing-guided rebating cutter to achieve a 10mm rebate for the grille.

For the ventilation slots at the top and bottom of the panel, *see photo*, mark them out and then make successive stopped cuts so they line up with the muntins, *see photo*. A 3mm Titan roundover bit, set to make a slight step, achieves a nice moulded finish to the slots, *see photo*.

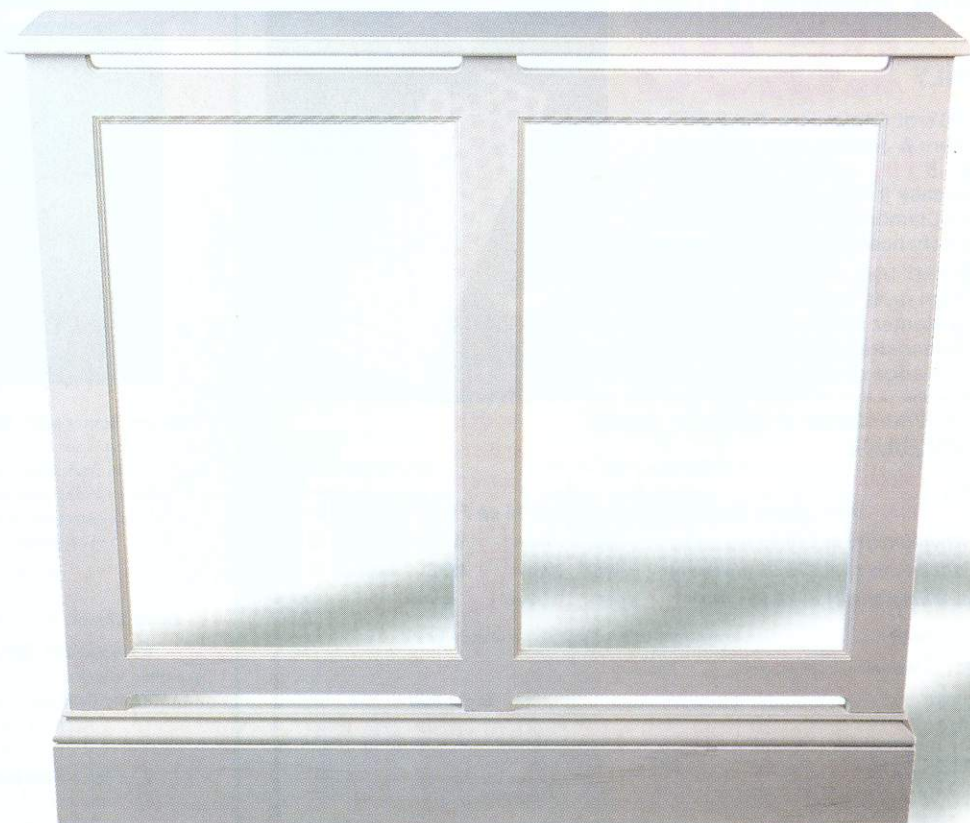
Finishing, fitting

The radiator cover must be scribed along its back edge to fit as closely as possible around the skirting board and accommodate any unevenness in the walls. Place a level on its front and tilt the cover accordingly.

Open a pair of compasses up to the widest gap between the wall and the cover and mark a line all round the cover, keeping the point of the compasses in contact with the wall and skirting.

Jigsaw along this line to achieve a tight fit that may still need a bit of tweaking.

Fix the cover with screws and masonry plugs, first checking for pipes and wiring. ●



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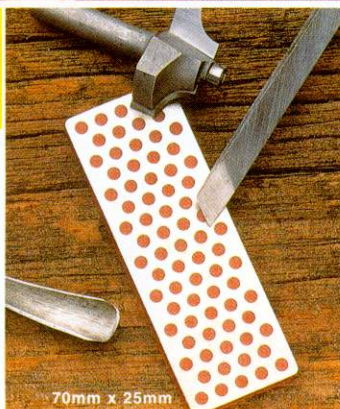
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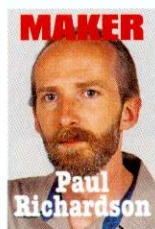
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Sitting on the fence

Router Project



In our continuing router table project, **Paul Richardson** makes the fence

ROUTER table fences are always a bit of a compromise. The ideal would probably be close to the type found on a spindle moulder: a split fence, each side independently adjustable left-to-right and fore-and-aft, made of cast-iron and weighing a ton.

There are commercial fences which aim to provide these features on a more router-like scale, and some are quite good. They can be over-complicated and seriously expensive, though, and I can generally think of better things to do with a couple of hundred quid than spend it on a cardboard box full of aluminium.

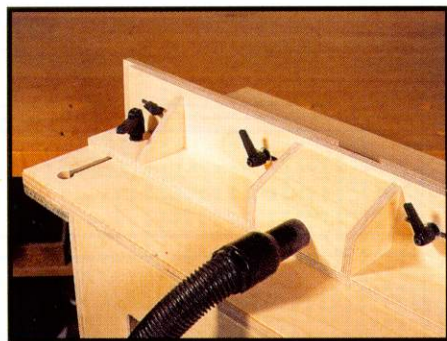
The other end of the scale is represented by that familiar piece of appropriate technology – the bit of wood. A straight offset clamped across the router table often outperforms the commercial alloy-fest by virtue of its sheer simplicity – what can go wrong with a stick? However, sticks don't come with extraction ports.

Good enough

Somewhere between these two options lies a useful fence which is simple but adjustable, and has provision for dust extraction.

This is what I have attempted to make here – it still isn't perfect, but I did say it was a compromise!

L-shaped in cross-section, the main body is



"The other end of the scale is represented by that familiar piece of appropriate technology – the bit of wood"

held at 90° with fillets, two of which are linked to form a dust extraction port. Slots are routed in the face through which two cheeks are mounted – these provide the lateral adjustment and a limited degree of offset capability.

To adjust the fence gap, four toggle levers (ahem – see below) are loosened, enabling each cheek to be slid into the desired position and the levers tightened. To offset the cheeks – useful when routing away an edge, as otherwise the outfeed side is unsupported – just slacken the levers' bolts enough to insert a shim of the offset's thickness between the main fence and the cheek.

Overall fore-and-aft setting is made by the two main fixing coachbolts which ride in keyways cut into the router table's top. I made a planning error here – when fitted, the toggle levers for these bolts fouled those on the outer ends of the sliding cheeks, so I had to use smaller knobs for the latter.

Using the fittings listed and working to the drawing's annotated sizes will work

◀ **Showing the extractor hood and the various toggle levers – also note keyway in table top**



fine, but if using anything else then check for clearances.

Main body

First cut the components from your chosen material – 12mm birch ply in my case – making sure that all cuts are square and dimensions are precise. An out-of-square fence is no use to anyone.

Next rout the slots in the main fence using a 6mm two-flute cutter and a side fence, working off the bottom edge. Then, without altering the fence setting, fit a 10mm cutter and counterbore 2mm deep for the threaded inserts in the adjustable cheeks, working from their bottom edge. Finally, complete these holes with an 8mm cutter. As all this is done from the same fence setting, everything will line up perfectly.

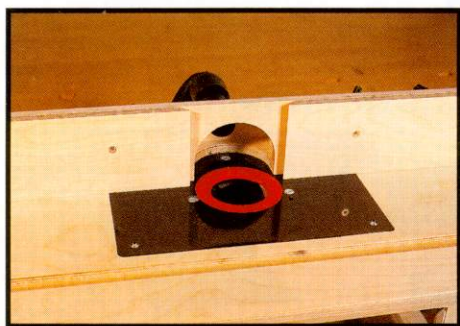
Now the main fence can be jointed and glued up – don't cut the cutter aperture yet; this would allow the fence to twist when clamped.

I used biscuit joints throughout, although woodscrews could be used with care if you prefer.

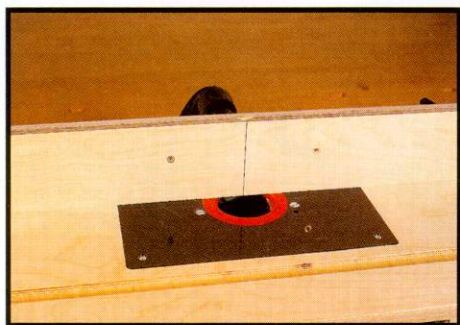
After the last issue's table project, some readers asked how biscuit joints are cut with a router away from an edge, as with the fillets' joints. The answer is to use a 4mm straight, two-flute cutter, grooving vertically.

Glue and clamp, taking care not to distort the assembly.

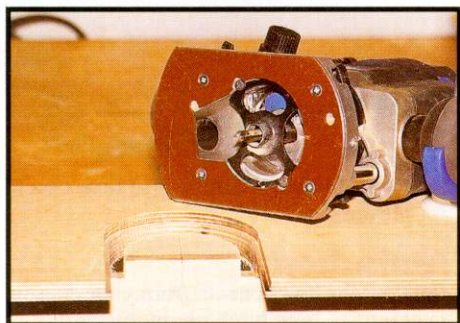
Router Project



▲ Fence cheeks in fully open position...



▲ ...and fully closed



▲ Routing the cutter aperture

Keyways

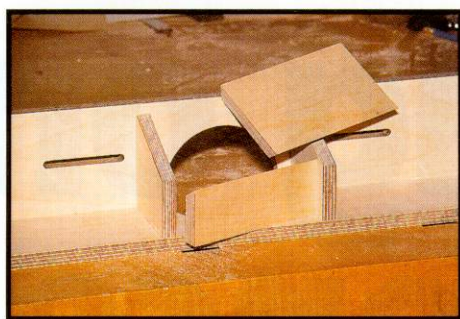
While waiting for the glue to dry, the keyways can be cut in the router table.

Install a 10mm cutter and set your side fence so that the cut is centred at 50mm – this leaves 45mm between fence and cutter.

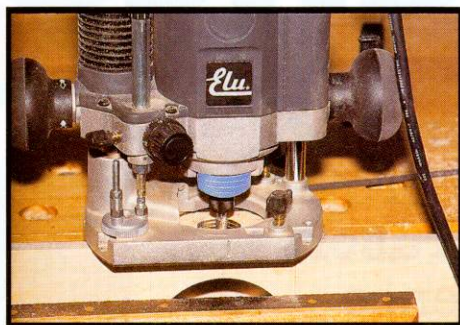
Rout the slots as shown on the drawing, going just deep enough to cut into the end support plates beneath.

Do not adjust the side fence setting! Fit a 22mm or larger straight cutter, and, using the side fence for position, plunge at the back of the freshly-cut slots to provide an entry-point for the bolts' heads. Leave the cutter and side fence as they are.

Now, do you remember the end support plates were screwed, not glued, in position? That's because they are now taken off. The 10mm slotting has cut a shallow groove in the upper faces of these pieces, which neatly marks out for a 7 to 8mm deep



▲ Making the extractor hood – mitres are optional



▲ Freehand routing a hole for the extractor hose

groove for the coachbolts' heads which we can now cut with the 22mm cutter that is still in the router, using the side fence which is still set correctly. Time and motion is a wonderful thing.

After this is cut the plates can be re-fitted to the table – don't glue them, they'll be coming off again in a future issue!

Aperture

When the main fence is dry, the cutter aperture can be cut.

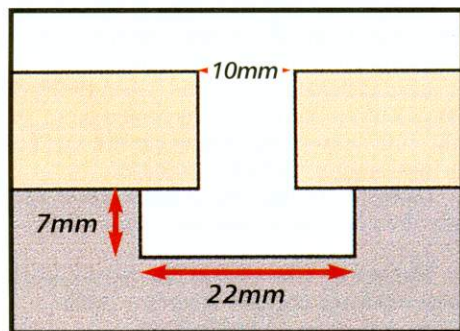
Make up a template – using the mini trammel, see TR1 – that will produce a 50mm radius semi-circle with a tangential lead in at each end, see photo. For my set up, a 10mm cutter and 17mm guide bush, the template's radius was 53.5mm.

The template is simply clamped to the fence; cut the aperture first in what will be the base, then the face.

Next make up the extractor hood behind

Position of keyways ►

▼ Cross-section through router table keyway



Tooling up

■ Cutters:

Biscuit jointing set and the following two-flute TCT:

- 22mm dia. or larger
- 10mm dia.
- 8mm dia.
- 6mm dia.
- 4mm dia.

■ Hardware:

- 2 off 10mm coachbolts
- 2 off Trend toggle levers KB16/F/10
- 4 off Trend toggle levers KB11/M/6
- 4 off Trend threaded inserts INS/P6/10
- Washers to suit

Cutting list

Front	1 off	760 x 100mm
Base	1 off	760 x 78mm
Cheeks	2 off	380 x 100mm
Fillets	4 off ex	88 x 78mm
Hood top	1 off ex	130 x 90mm
Hood back	1 off ex	130 x 50mm

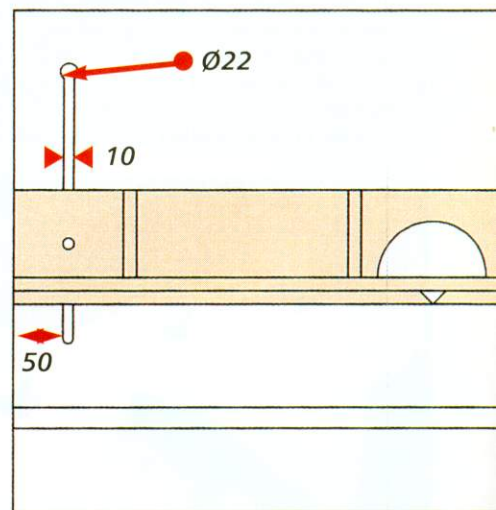
the aperture. I mitred the long edges of these components because I was in that kind of mood; however, simple butt joints would do. Pin in place.

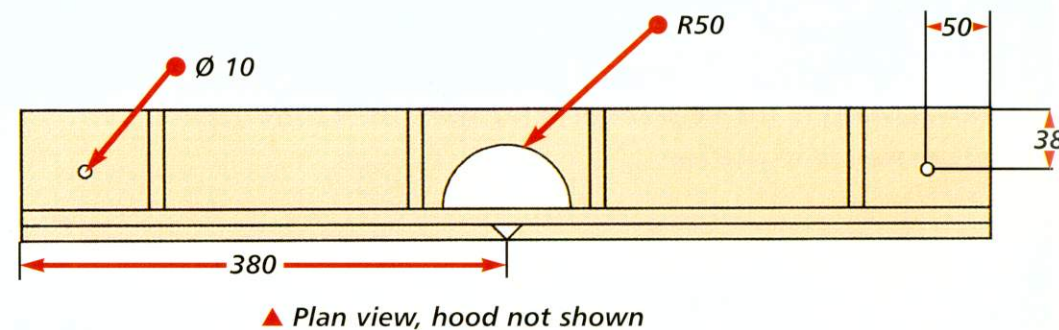
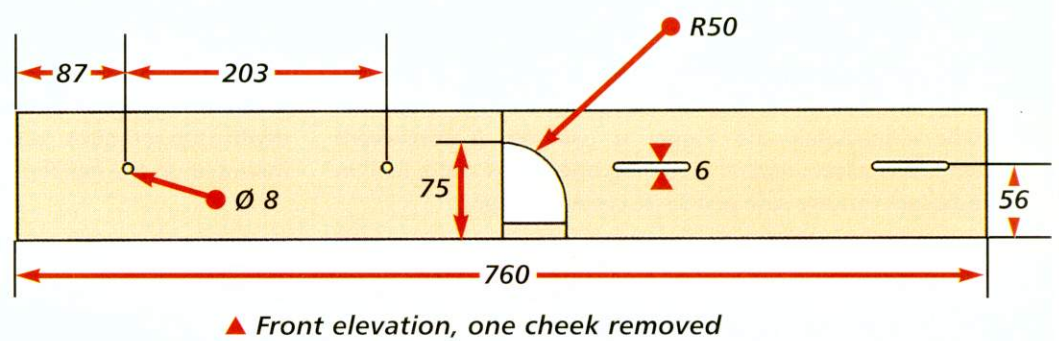
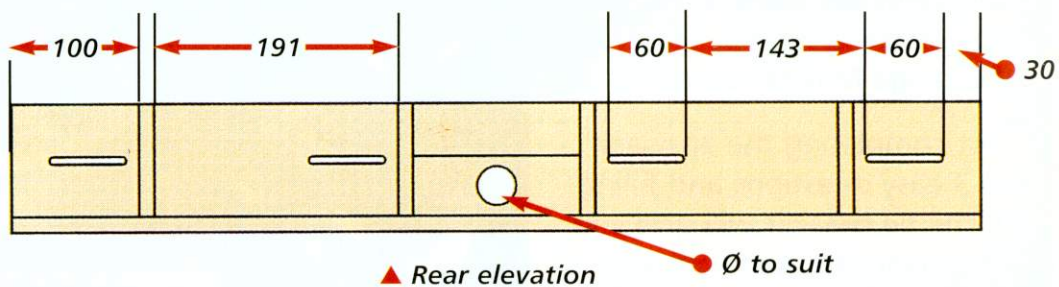
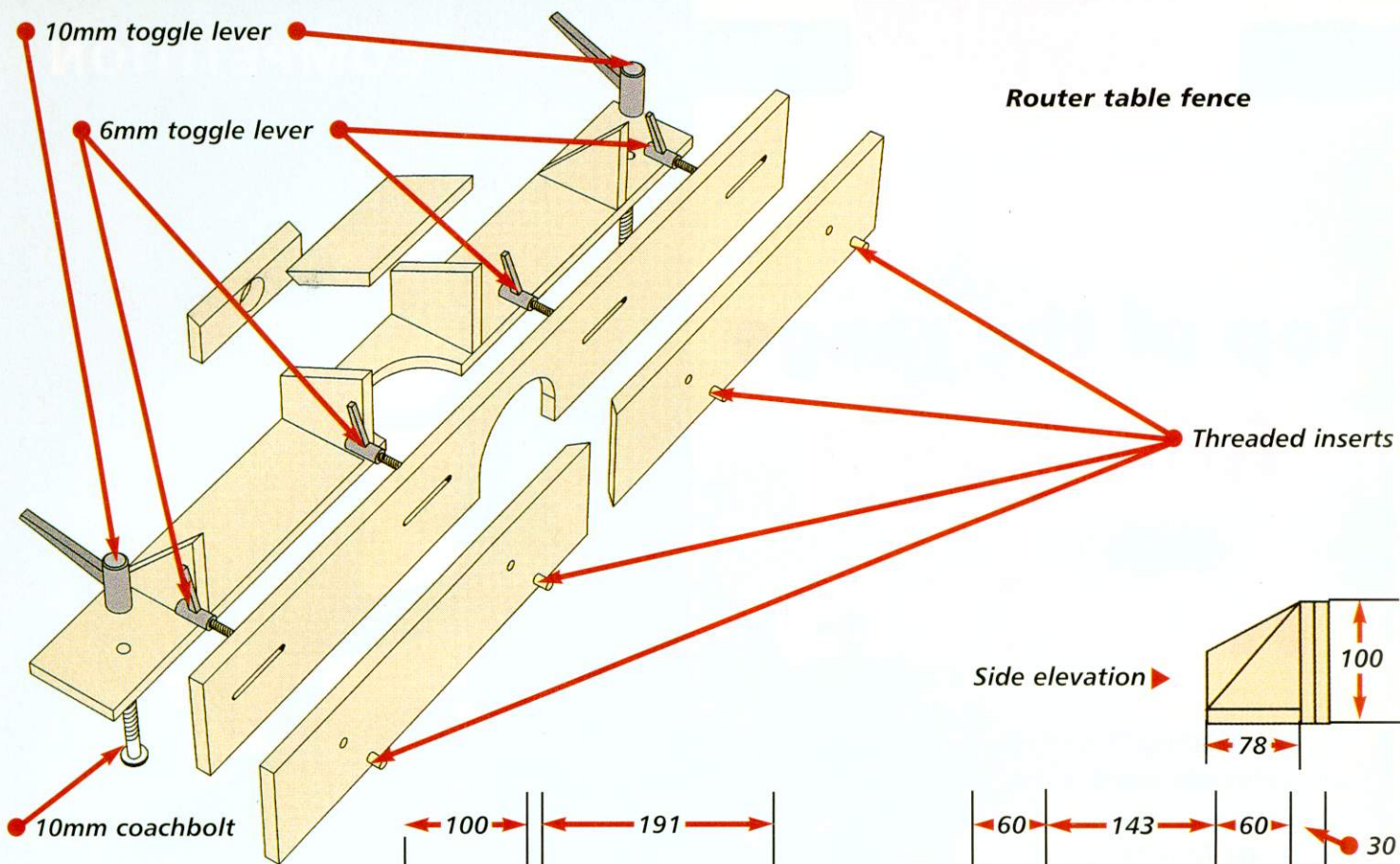
Unless you have a drill to suit the diameter of your extractor hose or feel like making a template, draw round its end and rout the hole freehand, see photo, checking for fit as you go.

Done

Drill 10mm holes for the main sliding bolts – check the distance between the table's slots before drilling these – fit the hardware and mount to the table.

As with the table itself, modify this design to suit your equipment and work – this is my compromise, yours may be different. ●





* N.B All material 12mm thick, all dimensions in millimetres

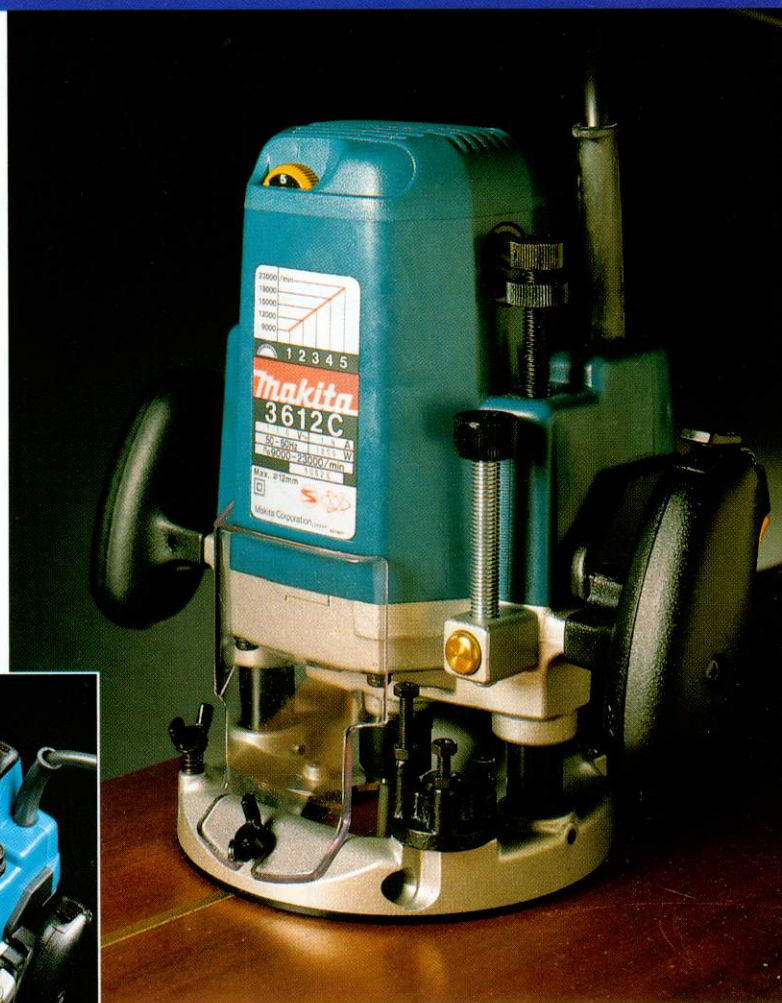
Makita

COMPETITION

WIN 4 Top of the range Makita Routers

Anyone reading this magazine will definitely want to win one of these superb, top of the range Makita routers.

Just completing the answers to 3 easy questions and filling in the tie breaker will give you the chance to own your very own Makita 3612C router.



This 1/2in collet plunge router features a powerful 1850W motor that can be set to any speed with the variable speed dial. Starting kick has been eliminated by the use of a soft start facility, and the router has an electric brake that stops the spindle immediately the trigger is released. A convenient locking lever allows repetitive routing operations and a built in spindle lock ensures safe and swift cutter changing.

The Makita has a 160mm diameter round baseplate that can be fitted with either the supplied guide-bush or side-fence, as well as transparent guards for deflecting dust and wood chips. A three-stage turret along with a lockable threaded screw-on depth-stop rod gives complete depth control and switches are mounted on the handles for safety.

HOW TO ENTER

ANSWER THESE THREE QUESTIONS:

- 1 What size is the baseplate?
- 2 How many watts is the motor?
- 3 What feature eliminates starting kick?

NOW COMPLETE THE TIE-BREAKER IN NO MORE THAN 20 WORDS

If I won a Makita 3612C I would make

.....

.....

.....

Name

Address

Postcode

All entries will be forwarded to Makita. By entering the competition the winners agree that their names may be used in future marketing by either GMC Publications or Makita (UK) Ltd. If you do not want to receive further information, tick the box indicated: ☐

All completed entries received by 27 May 1998 will be eligible. No entries received after that date will be considered. No cash alternatives will be offered for any prize. The judge's decision is final and no correspondence will be entered into. Photocopied entries are acceptable.

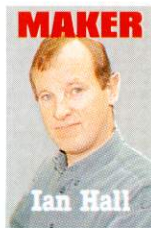
Send your completed entry by 27 May, 1998, to:
Makita Competition, The Router, 86 High Street, Lewes,
East Sussex BN7 1XN UK.

Under the thumb

Router Project

Ian Hall engineers an element of mystique into a display cabinet

ILLUSTRATIONS BY IAN HALL



MY wife was becoming increasingly frustrated at the way her collection of porcelain thimbles, ornaments and Chinese vases was growing a fur coat while displayed on open shelving and pigeon-holes, so I made this small wall-mounted cabinet with shallow shelves and glass front.

Design, planning

The cabinet is in pearwood (*Pyrus communis*), and the construction is essentially an exercise in mitring, with three frames mounted concentrically one on top of the other.

The front assembly lifts up, clear of the rear wall-mounted frame, leaving the bottom of the middle frame behind, so exposing the shelves.

This movement is achieved by guide slots machined respectively into the middle and rear wall frame. When the unit is closed the front comes down to rest, locating on the false-bottomed middle section as though it is part of the complete frame.

This not only provides some mystery to its opening, but false tenons add to the secret. There are of course no hinges or catches. The spacing and type of shelving are completely optional, with my example showing lipped glass shelves.

The lipping was an incredibly laborious task and I admit that the next cabinet would have plain polished edged glass epoxy-glued into the side slots.

The plan, *see diagram*, gives the cross-section of all the frame parts to the exact sizes of the cabinet and, because the cross-section of each frame is the same all round, they can be routed in one length to the finished section before mitring.

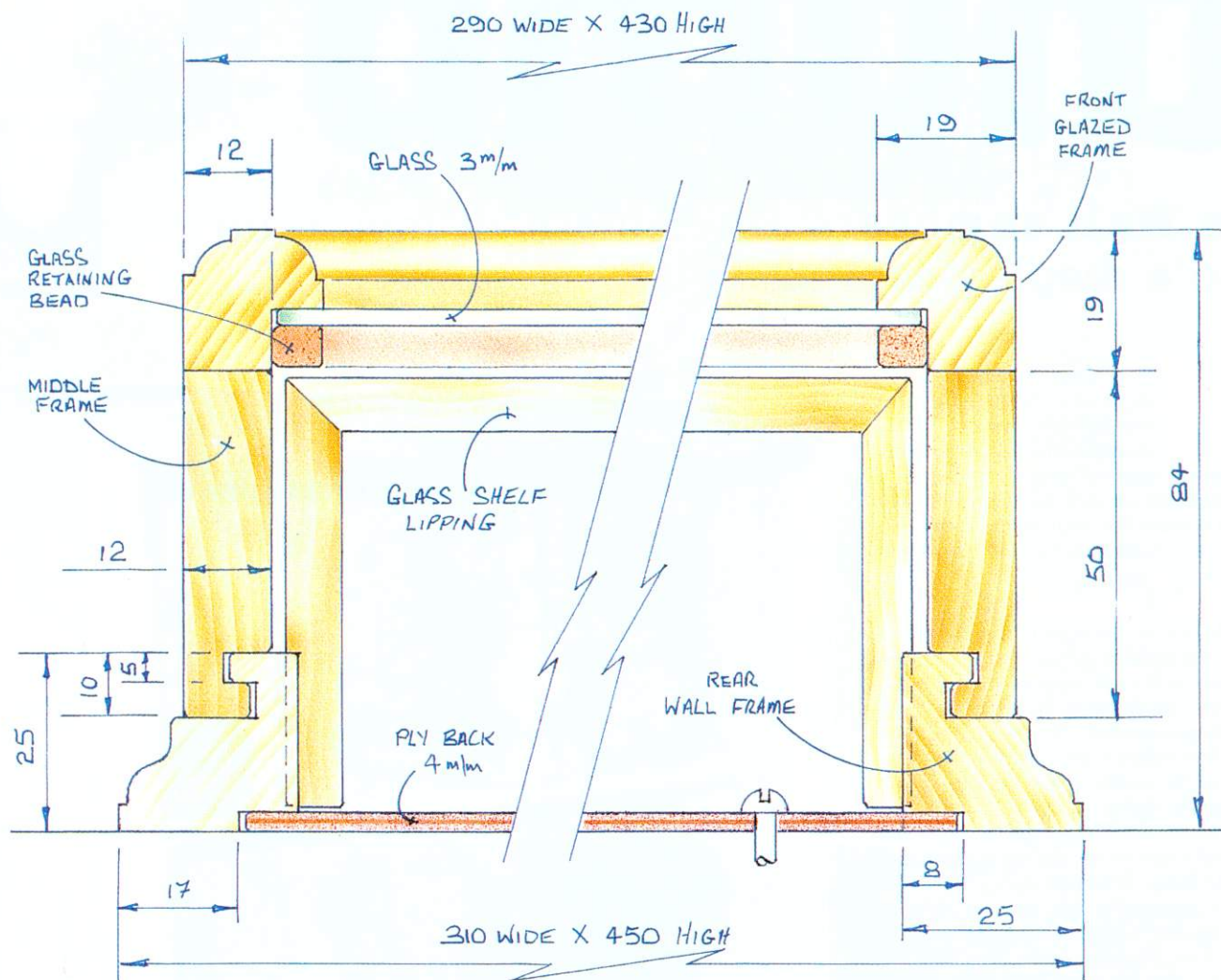
Note that the front glazed and middle frames are finished completely before starting the rear wall frame. This cabinet is about as big as it can go due to the weight of the glass.

Front frame

Start by making the front glazed and middle frames. Their side lengths are all the same, which means fewer set-ups when it comes to mitring. I prefer through, loose tenons for jointing – 6mm ($\frac{1}{4}$ in) cut from scrap pieces of the pear.



▲ A thimble display cabinet



◆ The front frame consists of a rebate to take the glass – a beading is added later to secure the glass – and a moulding formed by two passes of the same cutter. I used a 22mm diameter ovolo cutter.

The stock can be machined using either a table-mounted router, a side-fence or bearing-guided cutter. However, with these small sections a router table has the added advantage of requiring no jig-making.

Failing that, machine the moulding onto a wider piece of wood, then cut off in strips.

The slots for the loose tenons in the end frame were cut using a 6mm double-fluted cutter with the end of the workpiece against the router table fence and a stop to set the position of the cut.

After machining, clean up the round end of the slots with a chisel and, to avoid breakout, cut the mitres before the slots.

The loose tenons can be cut out on a saw from 6mm (1/4in) planed stock and tried for fit before final gluing up. This front frame is butt-glued to the middle frame later on.

▲ Full-scale horizontal section

◆ Details of the bottom of the rear wall frame

► Cutaway of the front frame and bottom of the rear wall frame

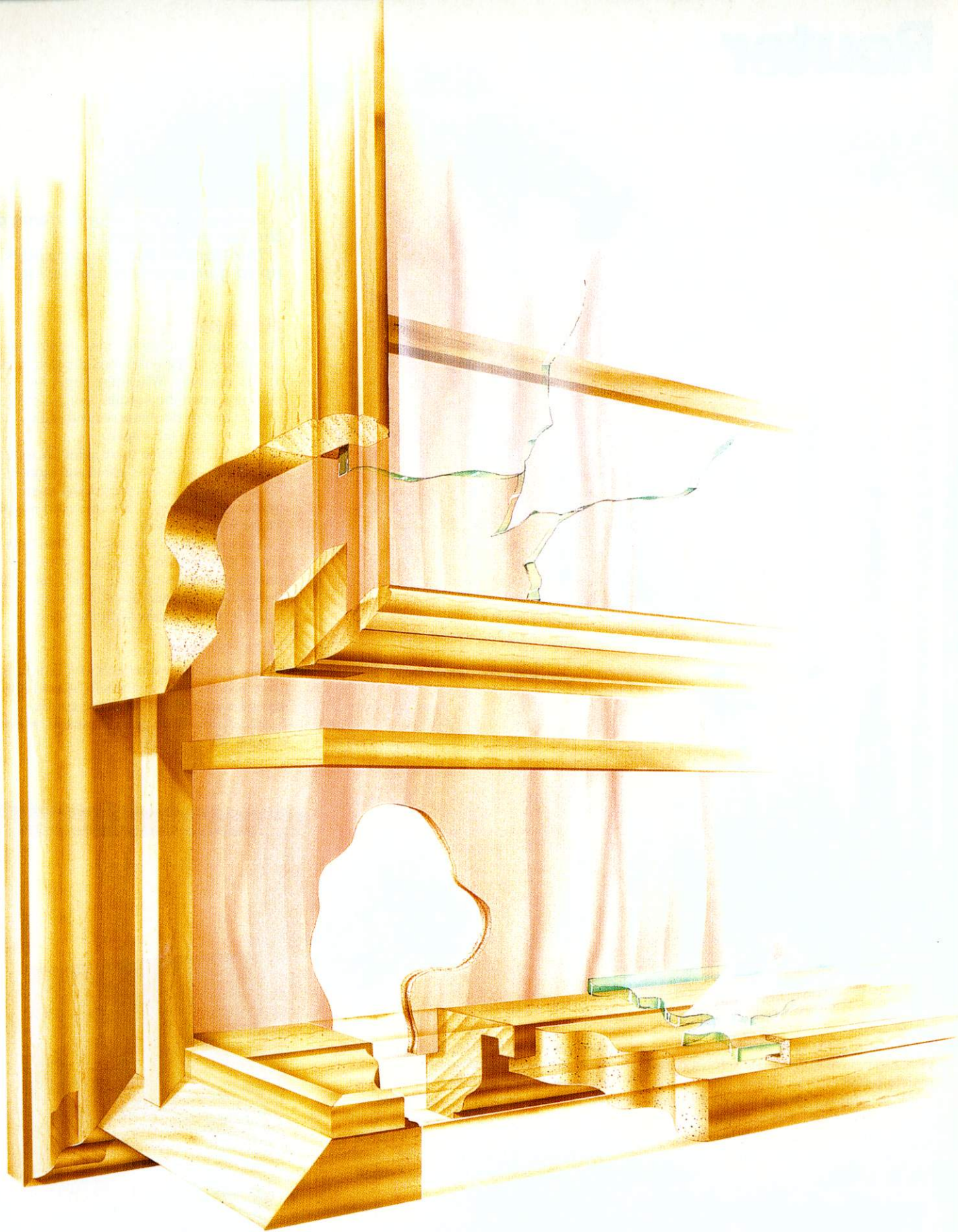
Middle frame

The middle frame is jointed in the same way, with one edge housing the first groove which forms the sliding joint.

The 5mm guide slot and tongue in the middle frame are not compulsory dimensions. You may choose to alter the size slightly to suit your own cutter availability. In reality, the 5mm slot should be slightly oversize and the tongue in the rear frame slightly undersize to prevent the sliding action from binding.

Once the middle frame is glued you are committed to size, but the rear wall frame can be adjusted to fit it.

Cut to length and mitre the ends of the sides. Machine the 6mm slots for joints and decide at this time whether



to add the false tenons as they are better fitted and flushed off now rather than after assembly.

Then produce tenons to fit snugly and long-grain across the slots.

Decide which is to be the top and bottom of the middle frame, then put the bottom piece to one side until ready for

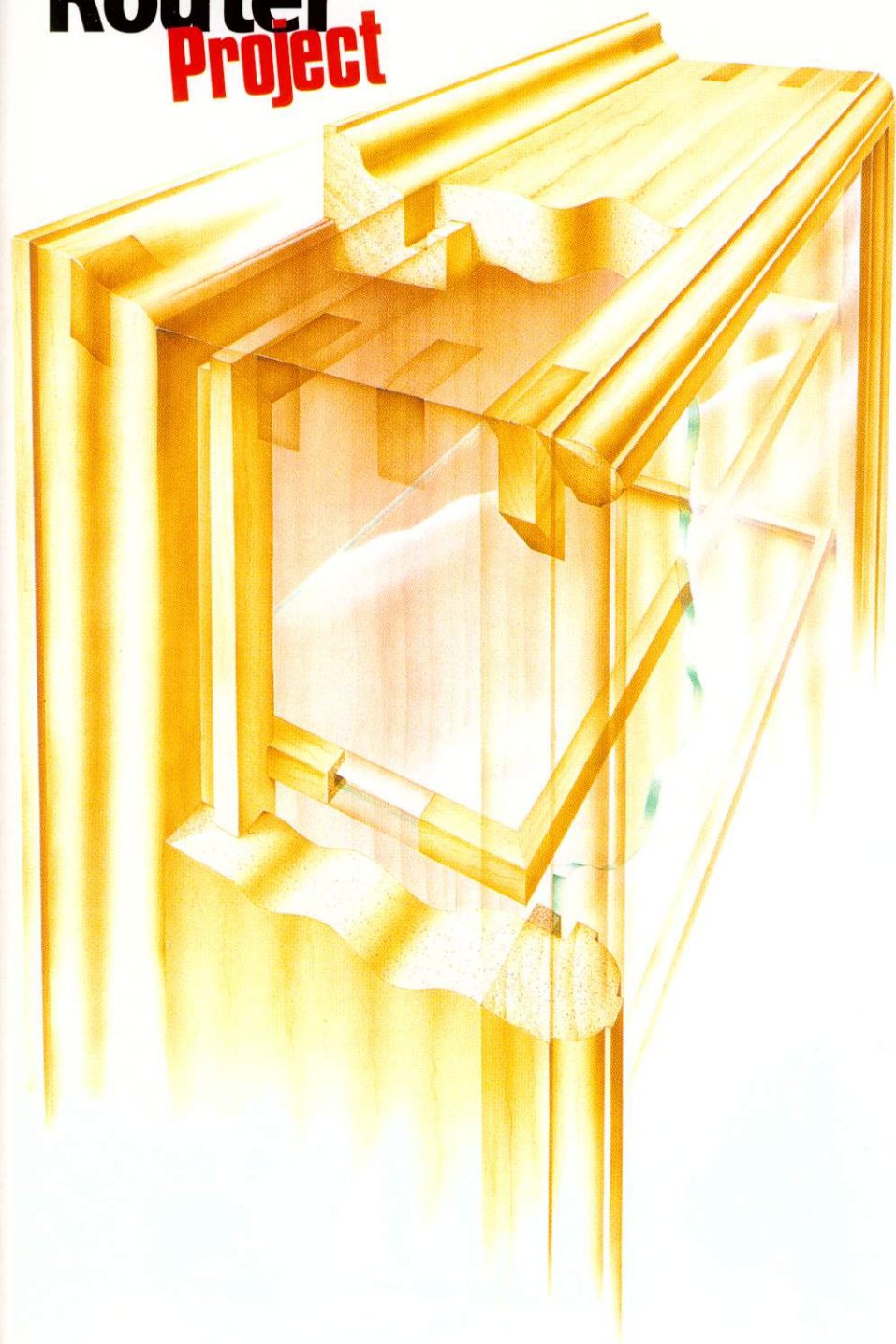
final fitting. After a few dry runs to ensure an accurate fit, assemble the middle frame.

Glue the front frame together, then, with its face down, carefully place the three-sided middle frame on its back, without glue, while the glue in the mitres dries. When dry, butt-glue the two frames together.

Rear wall frame

A close look at the scale plan shows very little clearance for the shelves – totally self-inflicted on my part. I suggest that the 25mm (1in) wide moulding is 'beefed' up to, say, 30mm (1³/₄in) in width to give more room for manoeuvre, especially if you've chosen to fit solid glass shelves. ▶

Router Project



◀ Cutaway of the middle frame on the top of the cabinet

▼ The front of the cabinet slides up to gain access to the inside

Assembly

Plan to run the loose tenon slots through the middle of the outer moulding, then glue up the assembly. When dry, begin the routing around the outside, using a piece of scrap wood of the same section as the frame to set up the router.

To make the frame more solid for routing, the ply back should be glued and pinned.

Rough off excess material and then nibble away around the frame until it will fit the front assembly.

Allow the front assembly to slide fully home, then glue the false bottom of the middle section to the rear wall frame. A little sanding here will avoid binding and cause a snug meeting with the mitres.

Finishing

I gave my case several coats of Danish oil over several days, and finally waxed it to ensure a smooth action in the guides.

Finally, the front glass is pinned in with a bead. ●

Plan your outer ogee moulding – I gave mine gave a 10mm step down to the middle frame.

For several reasons, it is easier to rout the ogee moulding and the other sliding groove once this frame is glued up: firstly, because the 6mm loose tenons pass

through the middle of the outer moulding, the router cutter will automatically flush them off as they are created; secondly, you would be very lucky to get a satisfactory fit of the guide slot in the middle frame if it were machined before mitring; thirdly, the frame is easily hand-held when applied to your router.

First, rout only the rebate for the plywood back. Then, having decided the side lengths of the frame components, cut and mitre them.

The spacing for the shelves must be decided, and the appropriate width slots run into inner edges of the vertical frames; alternatively the shelf spacing can be given total flexibility by inserting slots every 20mm (3/4in), and the shelves positioned as need be.

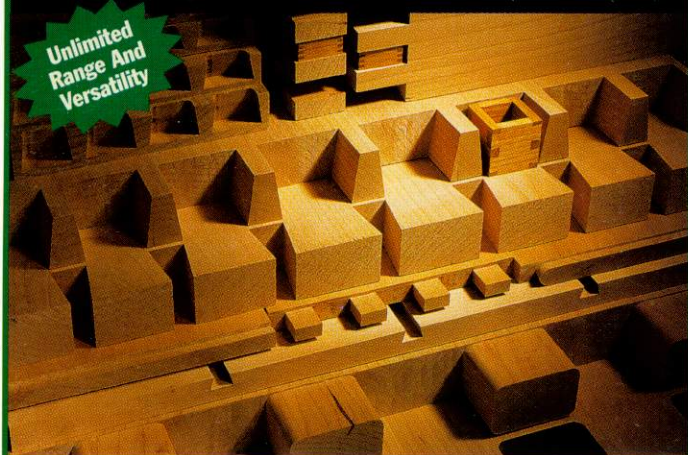
Tooling up

- 5 and 6mm double-flute straight cutters
- 10mm double-flute or rebate cutter
- 22mm diameter ovolo cutter
- 19mm diameter Roman ogee cutter



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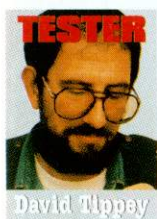
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▲ Powered hoods will protect your health

Breathing easy



David Tippey turns Darth Vader to test three self-contained powered respirators

FEW people these days would try to argue against the necessity of protection for eyes and lungs when performing wood machining tasks, but many home woodworkers feel that money spent on safety equipment gives little or no return and would be better spent on tooling.

I maintain that such devices are an excellent investment for the regular woodworker, offering both convenience and

assured levels of protection. Self-contained powered respirators combine eye, face and respiratory protection in one convenient easy-to-use package, and are the only real safety solution if, like me, you have a beard and wear glasses.

I have looked at three models, the Racal Airlite, the Purelite Airshield and the Pulsafe MV. Dalloz Safety Ltd, who manufacture the Pulsafe unit, also produce a similar version for Record Power.

"In most models the visor will instantly flip out of the way when you feel the need for a mug of tea"



▲ The Racal Airlite



▲ The Purelite Airshield



▲ The Pulsafe MV

Common features

Powered respirators work off a rechargeable battery to run a small fan which blows filtered air into a partially sealed full-face mask, causing a slight positive pressure within the mask.

The flow of air into the mask keeps the wearer cool, and in most models the visor will instantly flip out of the way when you feel the need for a mug of tea.

The respiratory protection offered by the units is expressed as Nominal Protection Factor (NPF). A value of NP20 lets one particle through in every 20 and NP100 one in every 100; so the higher the number, the greater the protection offered by the respirator, although most filters will perform better than specified.

Cheap pre-filters, which can be changed frequently to increase the main filter's life, are fitted to most models. Visors are protected with replaceable thin, clear visor covers to prevent damage by scratching.

They are all supplied complete with battery pack and charger, and airflow meter or airflow check disc. All units satisfy the requirements for respiratory protection (European standard EN146 class THP2) and eye protection (BS2092 and EN166).

All three models were comfortable to wear for several hours, although weight distribution is better on the Dalloz units.

Changing filters and pre-filters is fairly straightforward on all the units tested, but the Dalloz/Record units are the quickest to access and change.

Racal Airlite

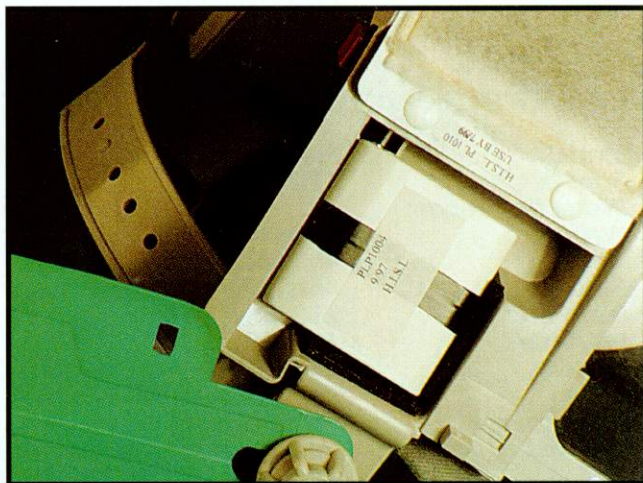
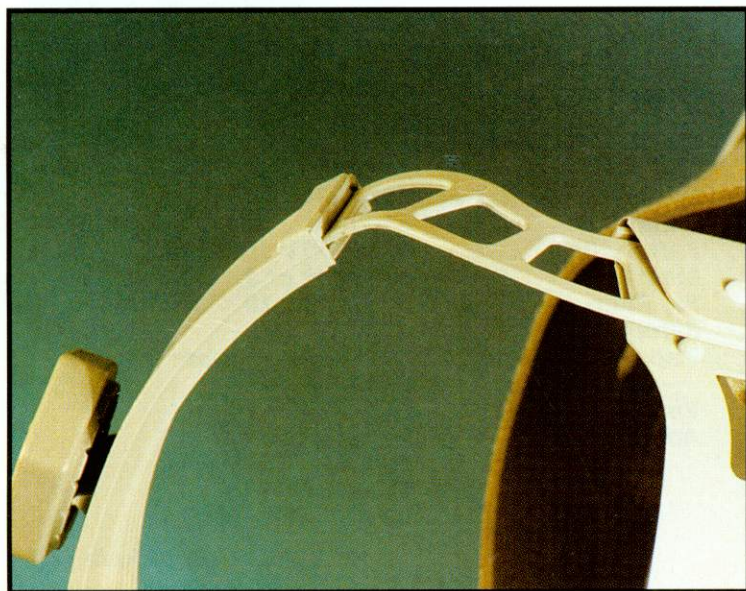
The Racal Airlite unit will appeal to many people on price alone, especially if you can find it discounted.

The adjustable head strap is a little flimsy, but its main problem is that you cannot flip the visor up out of your way temporarily, to sneeze (yuck!) or drink your coffee.

It has the most expensive main filter of the units tested, and no cheap pre-filter is available to prolong its working life.

All the fans tested produced similar levels of noise, but the higher pitched sound of the Airlite was a bit irritating – after a while I found myself listening to it, even when using a noisy machine.

The Racal is a fair bit lighter than the others and, although a mite front-heavy, is a bonus for use in long sessions.



▲ Batteries and filters are easily changed

◀ All headbands adjust to fit different head sizes

Router Test

"Its main problem is that you cannot flip the visor up out of your way temporarily, to sneeze (yuck!) or drink your coffee"

◆ Purelite airshield

The Purelite respirator is well made for the price, and comes with a comprehensive user manual. Compared with other makes, the battery packs are very cheap. This means that turning it into an 8hr duration unit is a viable proposition.

Having two batteries will also allow you to drain the battery fully before re-charging, preventing the 'memory effect' which shortens the amount of charge a NiCad battery will hold.

The large area of opaque plastic chin guard fitted across the bottom of the visor is rather obtrusive when looking straight down. Standing at the bench, I could only see its edge by bending my neck much more than would usually be necessary, or by stepping back.

Pulsafe MV

The Pulsafe MV respirator sports a visor supported by a plastic frame

which the replaceable face seals clip onto. This model is the most expensive of the units tested, but is very well built and styled.

Dalloz still manufacture the original version TVK-6004 with a foam face seal permanently fixed to the visor. It is similar to the models they make for Record Power.

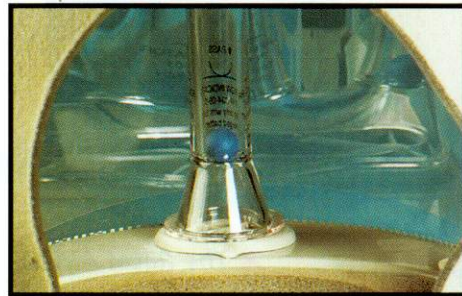
In fact, except for colour and a couple of accessories included with the Pulsafe unit, it is identical to the Record RPTV 100 respirator.

The cheaper Record RPTV 20 unit is also similar, but supplied without the cloth hair cover and with a 4hr battery pack and an NPF 20 filter. It will, however, take replacement NPF 100 filters.

Their airflow test disc is simpler and quicker to use than other airflow meters, and the pre-filters are cheap to buy and replaceable in seconds, both adding considerably to the unit's convenience. ●

Safety note

The Health and Safety Executive states that not using a respirator for five minutes in an 8-hour shift effectively reduces the protection factor by 40%.



▲ It's important to check the efficiency of filter with a flow meter

Facts and figures

PULSAFE SAFETY PRODUCTS

Model	Turbovisor model TMV-1 001
Price	£308
Protection Factor	100 (NPF 20 filters available)
Weight	700gms without a battery, 6hr pack weighs 250gms
Battery life	6hrs (8hr waist-mounted battery option)
Main filter	£18 for pack of 2
Pre-filters	£4 for pack of 10
Battery	£95
Visor	£10 and £7 for foam face seals
Visor covers	£13 pack of 10
Address	Dalloz Safety Ltd, Fountain House, High Street, Odiham, nr Hook, RG29 1LP, tel 01256 703581

HELMET INTEGRATED SYSTEMS

Model	Purelite Airshield
Price	£159
Protection Factor	20
Weight	625gms without batteries, 4hr pack weighs 80gms
Battery life	4hrs (8hr available)
Main filter	£30 pack of 3
Pre-filters	£4 pack of 3
Battery	£19
Visor	£9, face seal £6
Visor covers	£8 pack of 10
Address	Helmet Integrated Systems Ltd, Commerce Road, Stranraer, DG9 7DX, tel 01776 704421

Stockists include Craft Supplies, tel 01298 871636

RACAL (3M GROUP)

Model	Airlite
Price	£158
Protection Factor	20
Weight	475gms without battery pack, 4hr pack weighs 80gms
Battery life	4hrs
Main filter	£15
Pre-filters	Doesn't use a pre-filter
Battery	£42
Visor	£18 pack of 2
Visor covers	£13 pack of 10
Address	Racal Health & Safety Ltd, 12-16 Bristol Road, Greenford, Middlesex, UB6 8XT, tel 0800 722257

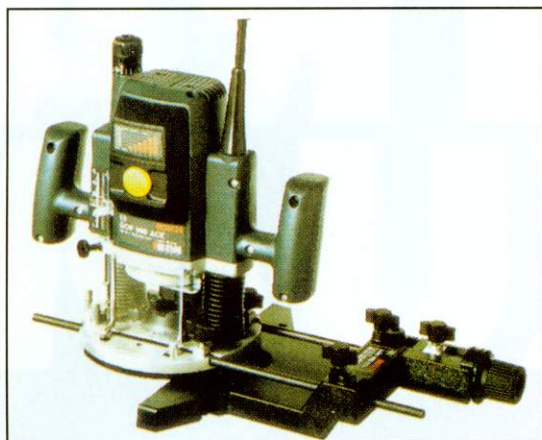
RECORD POWER

Models	Turbo Visor RPTV 100 and RPTV 20
Price	£225 (RPTV 100) £199 (RPTV 20)
Protection Factor	100 (RPTV 100) 20 (RPTV 20)
Weight	600gms
Battery life	6hrs (RPTV 100) 4hrs (RPTV 20)
Main filter	£18 pack of 2
Pre filters	£8 pack of 10
Battery	£80
Visor	£25 (polycarbonate with foam face seal)
Visor covers	£15 pack of 10
Address	Record Power Ltd, Parkway Works, Sheffield, S9 3BL, tel 0114 2449066

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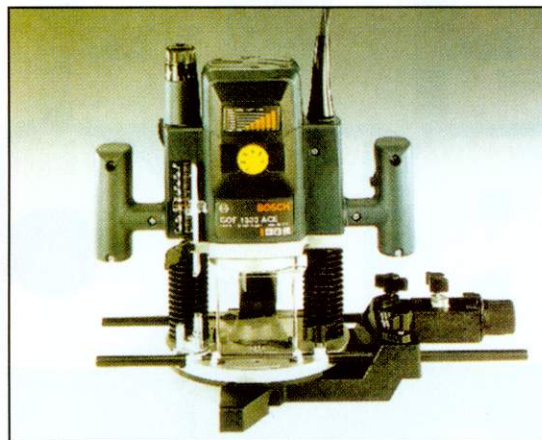
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The Italian Job

Alan Goodsell visits CMT Utensili in Italy

One of my greatest passions is to check out top quality machinery and tooling, so when Paul Merry of CMT (UK) invited me to inspect the CMT Utensili factory in Pesaro, Italy I jumped at the chance.

CMT (Costruzioni Meccaniche Tommassini) started life in 1964, founded by Mr Tommassini senior whose aim was to make their products the best possible, and available to woodworkers all over the world. This has been achieved by heavily involving his two sons Stefano and Marcello in running the business and the continued support of their time served staff.

A short flight from Heathrow took us to Bologna, where a car was hired for the rest of the journey. When in Pesaro a full day was set aside for the visit which began with International Sales Manager, Massimo Ricci (Max) driving us the short distance to their brand new plant a few kilometres away from CMT's head office.

Turning the cutter blank

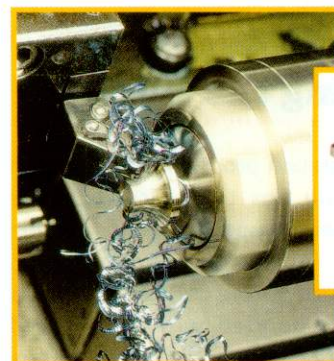
The process starts by turning the fatigue proof steel-bar, numbered ETG 100 and manufactured by Blankag Von Moos in Switzerland, into router cutter-blanks.

The various diameters are loaded into hoppers, which feed into CNC lathes that spit out cutter-blanks 24 hours a day, overseen by just five operators. Production runs are set for between 200 and 3000 pieces before each lathe is re-set to produce a new cutter profile. All CMT cutter profiles are stored on computer disk for quickly reprogramming the CNC lathes, reducing down-time. Blanks have a centre-hole machined in both ends to ensure concentricity at every machining process.

I spotted one hand-operated lathe and noted that its purpose is to turn short offcuts from the CNC lathes into shafts for solid tungsten cutters, reducing waste to a minimum.

Their two main sites are linked by computer to keep a check on stock levels; this is soon to be extended to every machine in both factories, so the whole manufacturing process can be fully monitored.

The new premises looked a little empty but Max



Cutter blanks are turned in batches of 300 pieces



informed me that the following day it was due to be filled with some machinery from their main factory in Pesaro, then topped up with brand new equipment that forms part of CMT's \$4,000,000 expansion scheme.

Machining the flutes

The freshly machined cutter blanks are taken to the Pesaro plant to machine flutes that seat the carbide tips. These are cut at a shear angle so



"The speed they work at is a sight to behold"



Flutes are machined to seat the carbide tips



Fatigue proof steel-bar is fed into CNC lathes



Router

Advertising Feature

the router bit's cutting-edge produces a cleaner finish as it remains in continuous contact with the workpiece.

All CMT cutters are machined on automatically-loading CNC milling machines programmed to mill as small a space as possible between cutting edges, thereby reducing kickback when cutters are first introduced to a workpiece. On cutters larger than 18mm (3/4in) diameter, even more efficient anti-kickback flutes can be machined.

Brazing the tips

The next step in production is to attach the carbide tips to the cutters. The homogeneous superfine grain, carbide tips are made at Céramétal in Luxembourg where carbon powder is chemically bonded with cobalt and tungsten then compressed into unique moulds designed by CMT.

A minimum order of at least 5000 of each tip shape is required, resulting in large numbers of carbide tips held in stock which make them CMT's largest investment in materials.

Two methods are used for brazing on the tips.

Induction brazing involves an operator assembling a cutter blank and its carbide tips together, then electrically heating them. An infra red heat control monitor senses the exact temperature for brazing, at which point the brazing wire is inducted into the joint.

Open flame brazing is carried out on automated carousel devices. The cutter-blanks and carbide tips are assembled into a jig with a slice of silver solder between them, the carousel turns moving the cutter assembly into the path of a fixed flame monitored by an infra red sensor. After either brazing process the cutters are

put into normalising ovens initially set to between 400° to 450°C (750° to 845°F). They are then gradually

brought down to room temperature, relieving the stress that occurs as a result of the high brazing heat.

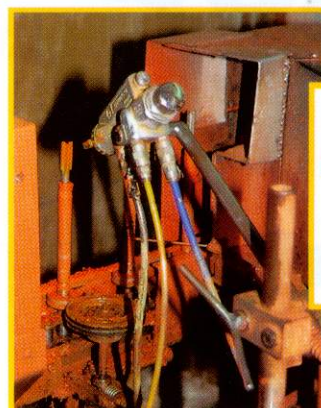
After brazing, skilled workers grind off hardened, excess flux by hand – the speed they work at is a sight to behold. They closely inspect the cutters and any that don't make the grade are rejected.

Spray coating

We returned to the car and Max sped off in typically Italian fashion to the coating plant in the next town; their experience gained applying DuPont's product, Teflon, to cooking equipment is now transferred to coating router cutters.

Until recently CMT's cutters were coated with PTFE, but now an environmentally friendly dye has been developed so the distinctive CMT orange can be applied using a superior Teflon coating.

Cutters are first de-greased, then loaded into an automated spraying machine that stands in front of a water curtain to catch overspray.



An automated spray system applies Teflon coating



"CMT cutters are ground on the most advanced 6 axis CNC grinding machines used by any router cutter manufacturer"

The cutters rotate as a spray head moves up and down, giving them an even coat of Teflon. The machine then moves the cutter to the second spray head where the process is repeated. Any cutters that haven't received the correct amount of coating are finished by hand.

They are then loaded into an oven, pre-heated to 400°C (750°F), and left for 15 to 20 minutes. The temperature is then reduced, taking 30 minutes, to 200°C (375°F) when the coated cutters are taken out to air cool.



Excess flux is removed by hand

Spray coating

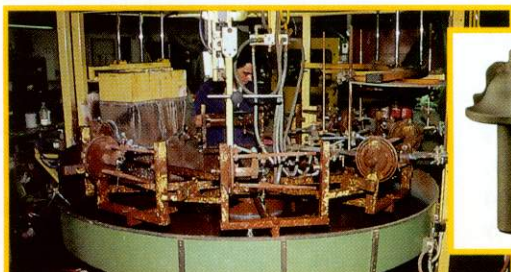
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Any cutters that need it are finish-sprayed by hand



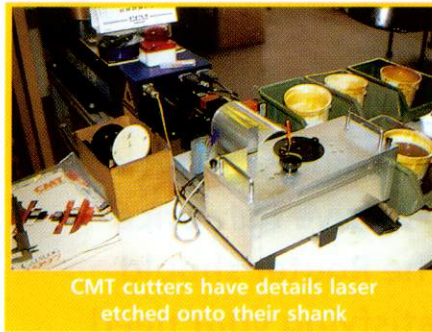
A unique carousel system accurately positions and brazes carbide tips to cutters



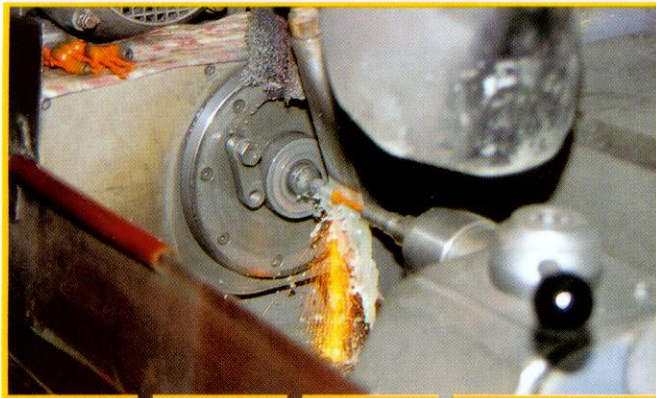
Grinding and assembling

Batches of Teflon coated cutters return to Pesaro for grinding.

Their first grind reduces the shanks to exactly the right diameter and to an extremely fine finish, ensuring a perfect grip in your router's collet.



CMT cutters have details laser etched onto their shank



Grinding of the shank, cutter edge and bearing seat is carried out on the most advanced CNC machines in the router cutter industry



Skilled operators assemble the cutters



The second grind is to form the profile where the cutting-edges are ground — not only to shape, but with a curved (radial) grind on the bevel to give them extra mass and more strength.

The third grind is to seat the bearing, if fitted, and as with every machining process the cutters are located by their centre-holes to ensure perfect concentricity.

CMT cutters are ground on the most advanced 6 axis CNC grinding machines used by any router cutter manufacturer.

The carbide dust is filtered through oil, collected and is then reconstituted to make SDS drill bits — an ecological bonus that also ensures minimum waste.

Cutters are individually laser etched with company and serial number details then the ones that require it are carefully assembled, all are finally packaged either individually or in wooden boxes ready for delivery.



Finished cutters are packed into sturdy wooden or plastic cases



Packing and delivery

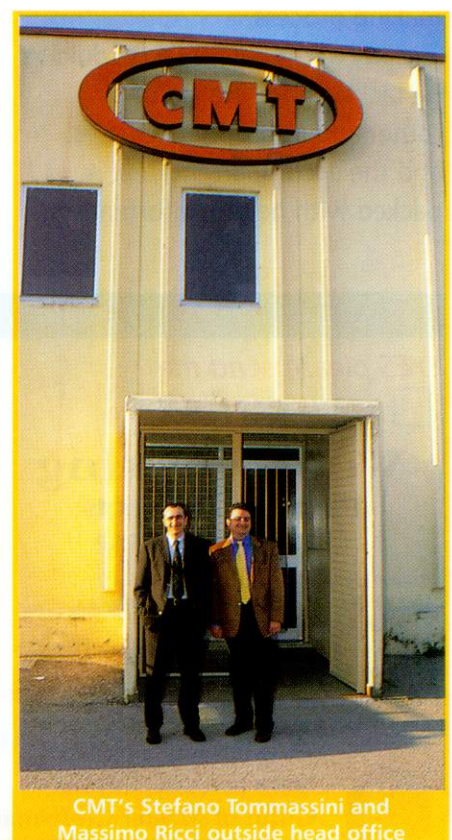
Each stage of manufacture is carefully monitored and any cutters that don't come up to scratch are ruthlessly weeded out.

Quality cutters

After the hectic schedule of the day, splendidly hosted by Max and Stefano, I was left with the knowledge that CMT

cutters are superbly made with the best of materials to exacting tolerances.

Thanks to Stefano, Max and Paul for allowing me a free rein to look at every stage of the CMT production line.



CMT's Stefano Tommassini and Massimo Ricci outside head office

BOOK of the month

If a set of plans is all that's holding you back from creative genius, the exclusive half price book offer in this issue of The Router should go a considerable way to satisfying your need

Woodworking Plans and Projects

This book addresses practical needs, and it would be quite possible to go some way towards furnishing a home by following its carefully laid out plans and drawings.

Precise cutting lists and scale plans guide you through the making process.

Many of the 30 projects could be tackled with the aid of a router and appropriate cutters, and the accompanying text is packed with helpful information

which not only describes how the pieces are made but tells you the reason why.

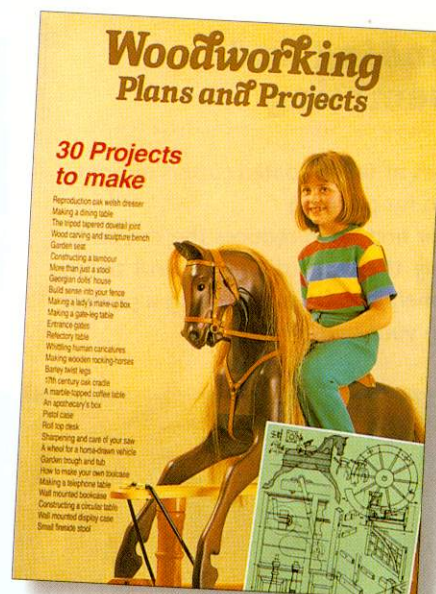
Makers, for example, are advised not to make a reproduction oak Welsh dresser look too perfect - a few knots and splits, so long as they don't weaken the piece, are all to the good. The same project includes hints on ageing brassware and on distressing with caution.

Other projects include making tripod tapered dovetail joints, a garden seat, how to construct a

tambour and building a Georgian dolls' house.

With a copy of this book there's no excuse for neglecting your garden fence. A particularly useful section has plenty of advice for the guilt-ridden. And still with the great outdoors, plans for some imposing entrance gates are given.

Look out too for barley twist legs, an oak cradle, a marble-topped coffee table, a roll-top desk, a wall-mounted display case and lots more.



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A guiding hand



Ron Fox advises beginners to make friends with their guide bushes

A GUIDE bush is one of the standard accessories supplied with virtually all routers, but reaction from my course students suggests that in many cases it remains undiscovered and unused. This is a great pity because guide bushes, used with templates, open up a whole area of creative routing, *see photo 1*.

The guide bush is essentially a circular flange, usually between 10mm and 40mm, projecting from the router base. 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.

Because the cutter is smaller in diameter than the bush, the cut in the workpiece is offset some distance from

the edge of the template. This offset has to be allowed for when making the template and is calculated as: $\frac{1}{2}$ (outside diameter of guide bush minus the diameter of cutter). Thus, with a guide bush of 24mm diameter and a cutter of 8mm, the offset will be $\frac{1}{2}$ (24 - 8) = 8mm. The *Trend Routing Catalogue* contains, on page 113, a ready-reckoner table showing the offsets for various combinations of guide bush and cutter, and *see fig 1 for the essentials of guide bush theory*.

Example

As an example of guide bush work we shall rout a hand-hold in a piece of MDF. The template is made of 9mm MDF which is comfortably deeper than the 96E guide bush flange.

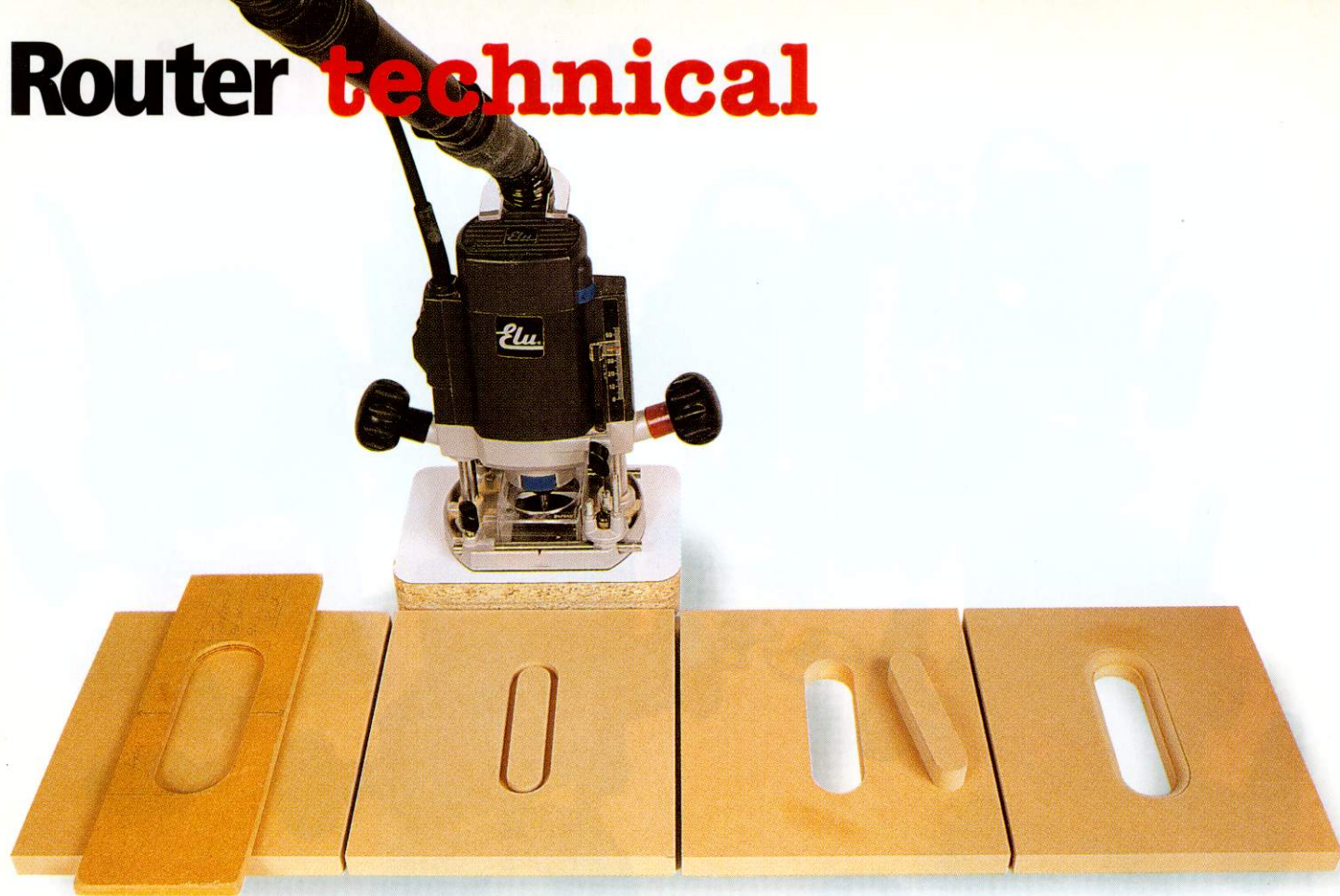
▲ Photo 1 Array of routers and guide bushes

A 24mm guide bush is used with a $\frac{1}{2}$ in straight cutter, giving an offset of 8.8mm. The template should therefore be 8.8mm bigger all round than the required hole.

The workpiece is taped to the cutting table with heavy-duty double-sided carpet tape and the template taped to the workpiece. A piece of tape under the centre of the workpiece helps prevent the waste jumping around as the final cut is made, *see photo 2*.

After cutting the hole, its top edge is decorated, a small bearing-guided ovolo giving a finished look.

Router technical



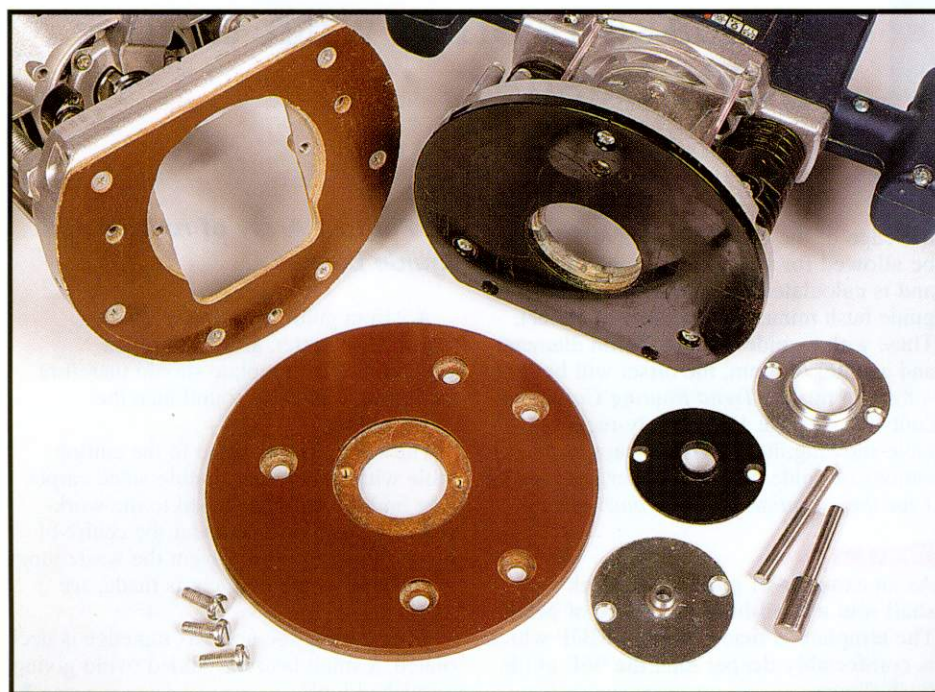
▲ *Photo 2 Sequence, from left – Ready to cut hand-hold workpiece and template taped to cutting table, 96E with guide bush and cutter in, dust extraction fitted; making the cut, half-way through; the finished cut, scrap lifted out and placed on top of workpiece; the final hand-hold decorated with a small ovolo cutter*

Templates

◆ Making templates need not be difficult. For the simple template described above I just laid my hand on the MDF to judge how big the hole should be, then cut two circles with the appropriate size of hole saw.

I then joined the circles with two straight cuts with the router and straight edge.

"To reduce the size of the hole, just increase the diameter of the guide bush, so that the offset becomes larger and the hole smaller"



Hand-hold sizes

By way of a simple introduction to the creative use of guide bushes, note that one of my mounting boards is so narrow that the combination of guide bush and cutter used above would have produced a hole longer than the width of the board.

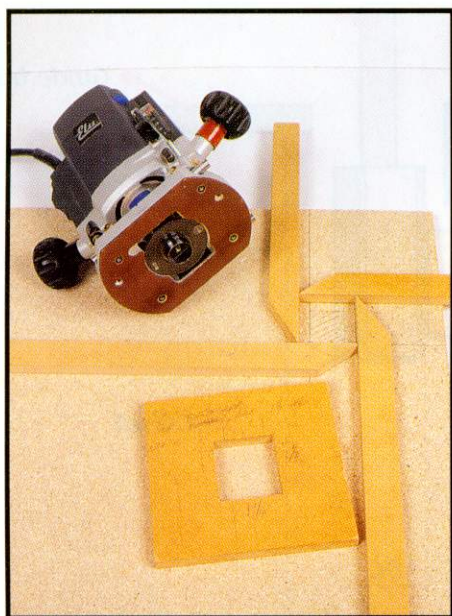
To reduce the size of the hole, just increase the diameter of the guide bush, so that the offset becomes larger and the hole smaller.

I cut two hand-holds cut in a board with two different guide bushes, the same template and $\frac{1}{4}$ in cutter – demonstrating the value of having a range of guide bush sizes, see photo 3.

Availability

The biggest choice of guide bush is found in the Elu 96 and 97 and Hitachi ranges. The Elu 97 and the Bosch 900 and 1300 have state of the art bushes.

◀ *Photo 4 Trend sub-base kit for adapting routers to use the Trend Elu 96 range of guide bushes*



▲ **Photo 5** Straight edges used as a template to cut holes in cutting table. The template, made with these straight edges, is also shown

Elu 97 bushes are made in skeleton form to maintain the high standard of dust extraction that comes with this model. Bosch 900 and 1300 bushes have a quick-release bayonet fitting, but the range is not as wide as that of Elu and Hitachi models.

False router base

If your router manufacturer does not offer a comprehensive set of guide bushes, a sub-base can be bought or made to take, say, the Elu 96 range of bushes.

A commercial sub-base available from Trend comes ready drilled to fit the Elu 177 routers, which also cover the Bosch 1600 and 1700 models.

► **Photo 3** Two different size hand-holds cut with the same template and cutter but using different guide bushes

"If your router manufacturer does not offer a comprehensive set of guide bushes, a sub-base can be bought or made"

For those with other routers, specify the model when ordering and Trend will drill the appropriate holes and supply the fixings.

The sub-base takes Elu 96 guide bushes. These are available in 12 different sizes, from 12mm outside diameter to 40mm. A 13th, of 10mm OD, is supplied as part of a cutter centring kit.

The sub-base takes another 8mm of your depth of cut away, but is useful if you need a range of guide bushes not supplied by your router manufacturer.

The Trend sub-base, *see photo 4*, is drilled for the Elu 177E and the Bosch 900 ACE, together with the centring kit.



Long cutters

The thickness of the template and the use of a sub-base reduce depth of cut. This can be a serious problem with some routers, but fortunately much template work involves cutting with straight cutters; Titman and Trend supply special long shank cutters for the purpose, Titman calling them 'long reach cutters' and Trend naming theirs 'pocket cutters'.

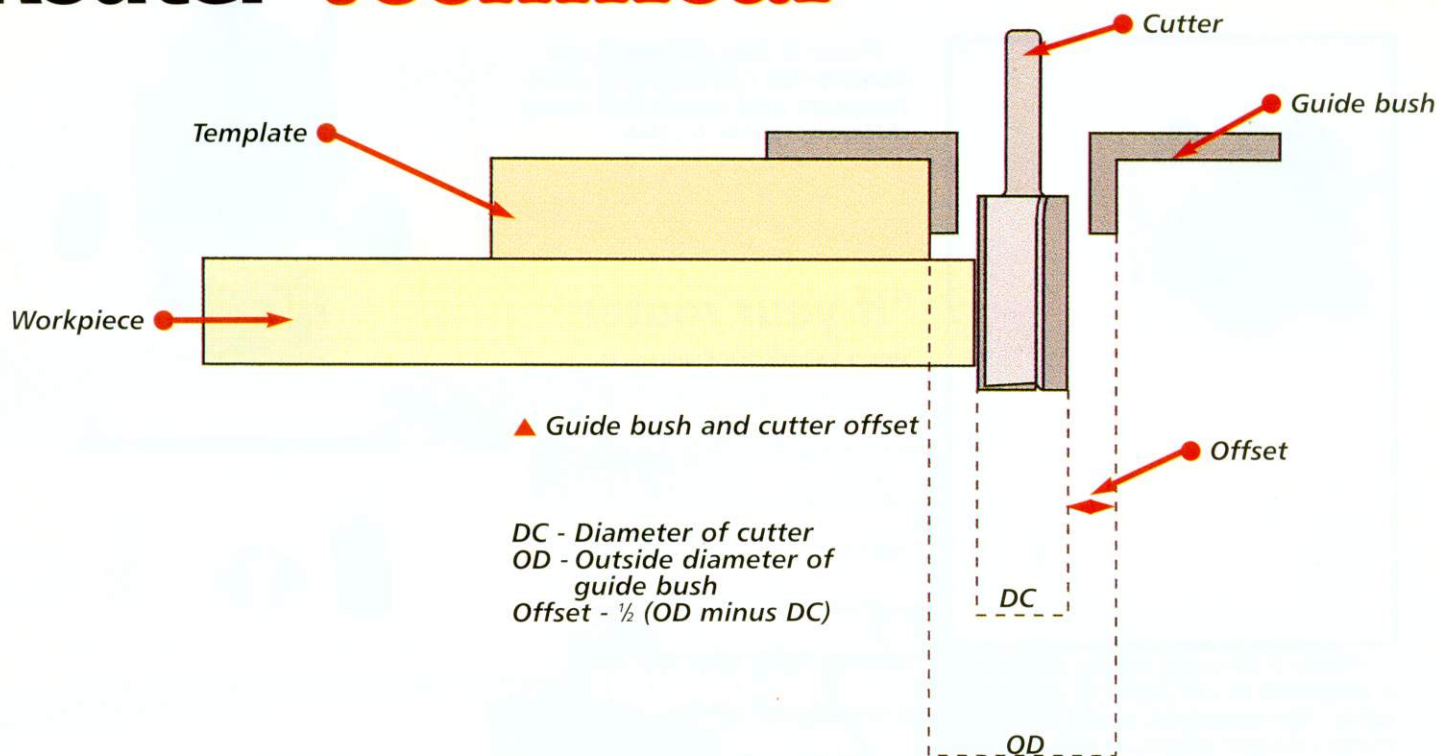
Alternatively, buy the straight cutters made for the Leigh Dovetail Jig. Their extra long shanks cater for the thickness of the Leigh dovetail comb, and can be obtained from most cutter suppliers.

"Any straight-sided figure, internal or external, can be cut by using a number of straight edges"



◀ **Photo 6** Stopped housing being cut with a simple jig using a guide bush, plus hinge sinking jig with example of hole

Router technical



More on templates

Many guide bush applications do not require a specific template. Any straight-sided figure, internal or external, can be cut by using a number of straight edges, one for each side of the figure.

A set of four MDF straight edges are shown used as a template for the fixing holes in my sacrificial cutting table, *see photo 5*. The rectangle for each hole is marked on the table and a second rectangle drawn around the first with the particular offset required by the bush/cutter combination.

The straight edges are tacked or taped along the perimeter of this outer rectangle and the cut made with several passes. The chisel-shaped ends of the straight edges allow a wide swing of angle, *see photo 5*.

After you have cut one or two figures with the above set-up it will dawn on you that the straight edges can equally be used to make a template.

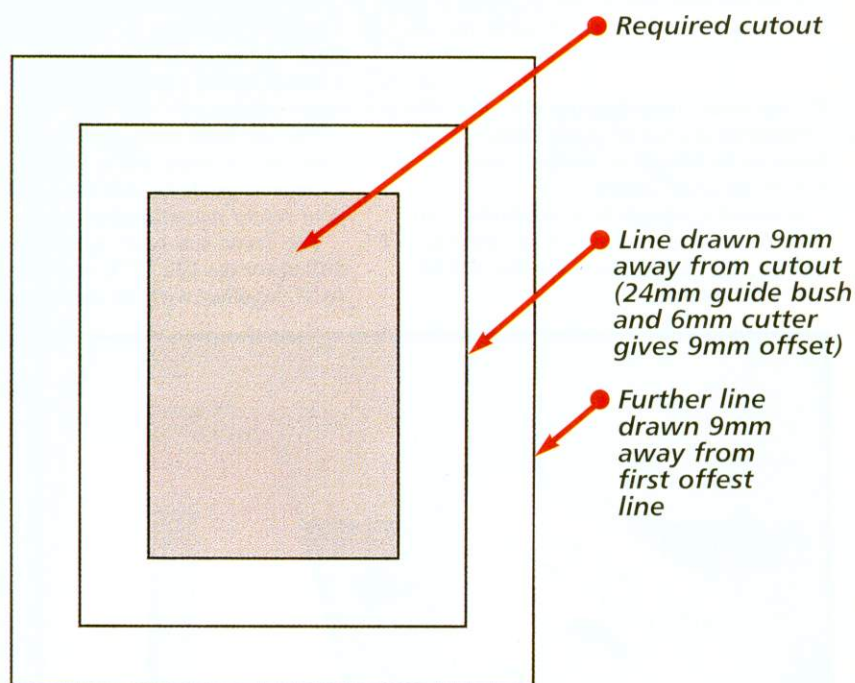
My sacrificial tables are actually cut with the template shown, *see photo 5*. To make it, take a piece of 9mm or 12mm MDF and mark on it the two rectangles, *see above*.

Now draw a third rectangle outside the second, offset by the same distance as the second from the first. Tape your straight edges to this outer rectangle, make your cut and the result is a template to provide the desired size of hole.

There is no need to square the rounded inside corners. Use of a $\frac{1}{4}$ in cutter will ensure that their radius will be smaller than that of the smallest guide bush, *see fig 2*.

Similar tricks can be used to carefully make more elaborate templates – but remember to write on each template its purpose and what guide bushes and cutters it is used with.

Using straight edges to make a template



Other uses

Guide bushes also have an important role in cutting housings. A simple housing jig, in which the router is guided by a guide bush running in a groove, not only enables the cut to be positioned accurately but also prevents the router deviating from the cut.

A further simple application is sinking concealed hinges in cabinet doors. A jig consisting of an accurately cut circle is used

with a guide bush and straight cutter. The diameter of the circle is dependent on the guide bush and cutter to be used. A batten fixes the distance of the hole from the edge of the door, *see photo 6*.

A simple housing jig with a stop taped to it will satisfactorily cut a stopped housing, but for a more sophisticated version, refer to Roy Sutton's jig, *see TR No. 2*. ●

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"When I first saw the VB36 demonstrated I knew it would surpass anything available in the US market. Presently, 24 well-known American turners have the VB36 and find it to be exceeding even my expectations. Pure perfection in concept, engineering, construction, power delivery and lack of vibration. It is a **GREAT** lathe. Nothing else in its class" ● **JOHANNES REIBER:** "Marvellously stable and smooth – even with the biggest loads. It is an exciting machine to work with. I recommend it most highly."

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Router **technical** Unashame



Roger Ley explains on-screen design using AutoSketch

FOUR years ago, when my designer-maker big brother Kevin – who writes for sister magazine *Furniture & Cabinetmaking* – told me he planned to computerise his business I was delighted.

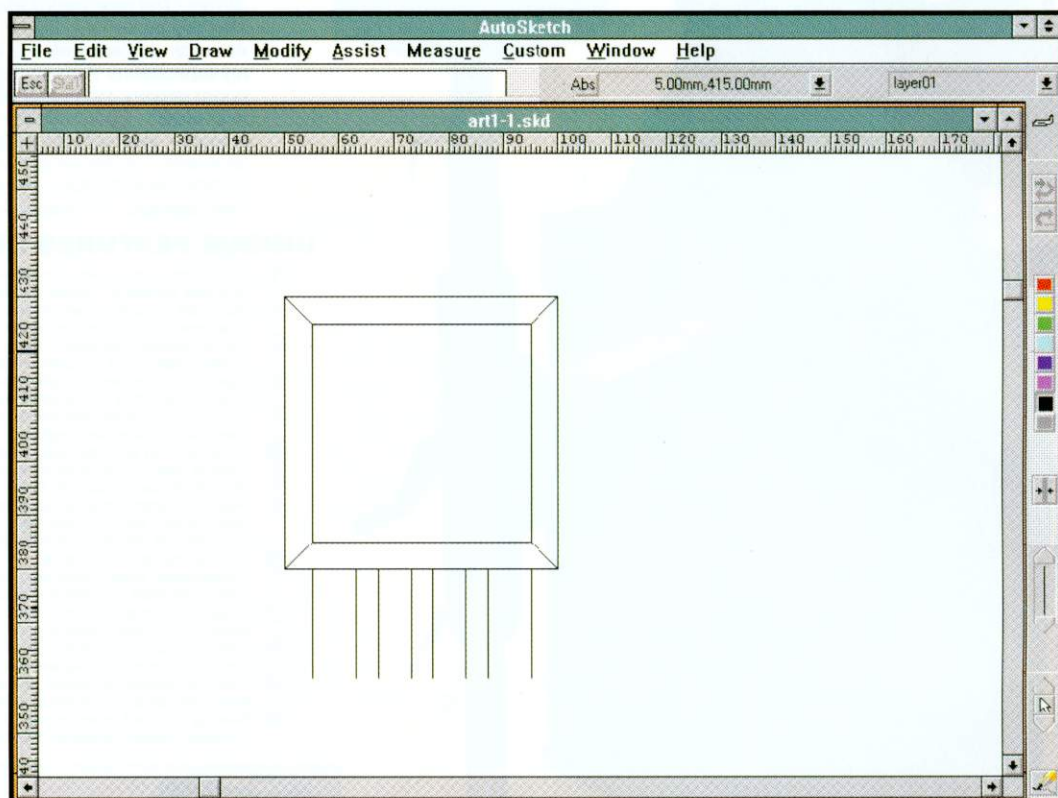
For, beside the cheering fact that at last I would know more than him about something, the best use of computers for bespoke furniture is in the design process – and CAD (Computer Aided Drawing) happens to be my area of interest.

In the event, however, Kevin would only use his computer for word-processing his business correspondence, spread-sheeting his accounts and storing names and addresses.

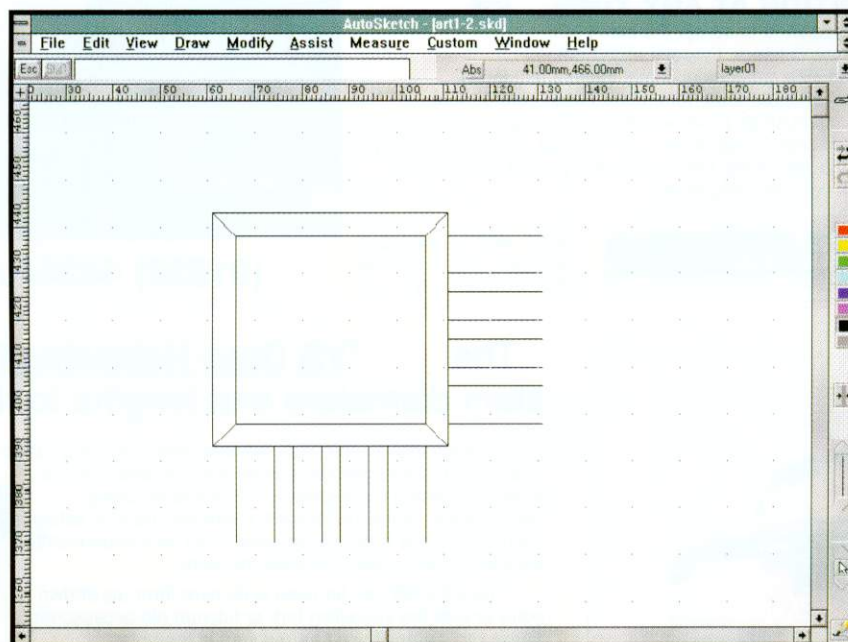
He took a lot of convincing before he would give CAD a try, but now, having mastered AutoSketch, he is using it to produce both presentation and working drawings.

Reasons why

So why should a woodworker need to use a CAD package, and why AutoSketch in particular? I suppose the simple answer is that CAD is to drawing what word-processing is to text.

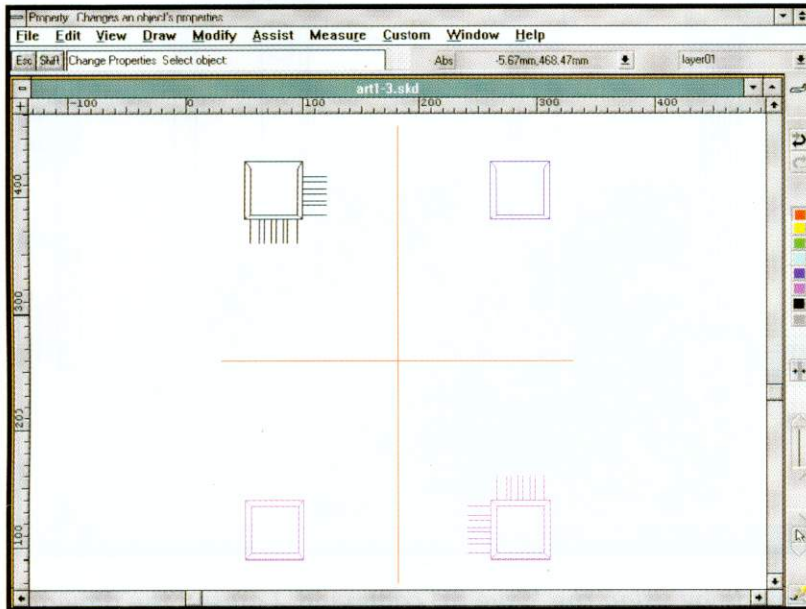


▲ This first drawing shows a front view of the top left corner block. I drew it using the 'Box' command, then drew the eight short lines defining the edges of the rail and the flutes to complete the major part of the drawing process, most of the rest coming down to editing.



◀ This drawing shows the eight lines after 'Copying, Rotating and Moving' them into position. There is no point in drawing these lines again when you have gone to all the trouble of drawing them the first time.

dly CADish

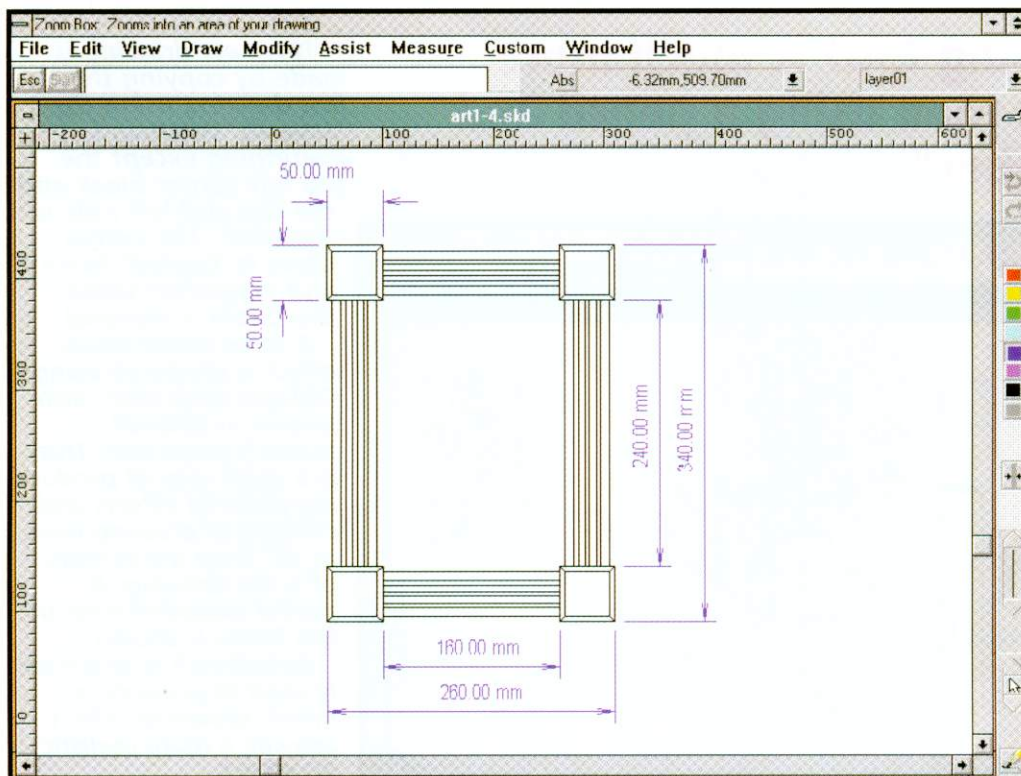


◀ The next job is to set up two 'Mirror' lines. These define the final size of the frame so it is probably best to use the 'Grid' set to a convenient size. The grid is a set of dots set at regular intervals both horizontally and vertically. It is used as a drawing aid and does not print.

I used a spacing of 10mm in each direction. The first corner is 'Mirrored' to the right. The two top corners are then 'Mirrored' to produce the bottom corners.

I then removed the eight lines on the top right and bottom left corners as they are superfluous.

"You can design the complete project in full detail, on-screen, in the warm, before you set foot in the workshop and get all covered in sawdust"



The side and flute lines are 'Extended' to complete the drawing. At this stage the major vertical and horizontal 'Dimensions' can be drawn. You may already know how big everything is. On the other hand, if you have been designing 'on-the-fly', now is the time to find out what the major dimensions are. You can think about changing anything you do not like, safe in the knowledge that the CAD package automatically generates dimensions from your design. You do not type the numbers in – AutoSketch does this for you when you point to the ends of the lines to be dimensioned.

If you find that sizes are not convenient then you stretch or scale the drawing to suit. Think of the drawing process as a quick and cheap method of prototyping designs.

Router technical

Most people know the advantages of word-processing over typing straight onto a sheet of paper. You can make alterations easily, correct mistakes, use one document as the basis of another document – for mail-shots for example – and try different styles and layouts.

All of this and more applies to CAD. You can also develop libraries of parts – drawer handles, say, or fancy legs – and use them in different drawings. Previous designs can be stretched or compressed, and used as the basis for new designs.

Once a design is complete, you can produce dimensions automatically and accurately, allowing cutting lists to be easily generated and presentation drawings produced for customers.

Most of all, however, using CAD is much more fun than using a pencil and rubber – and you can design the complete project in full detail, on-screen, in the warm, before you set foot in the workshop and get all covered in sawdust.

I recommend AutoSketch as a CAD package because it is commonly used by small businesses and schools. It has a long history and has been written by a very large and well-known company (AutoDesk), which also offers more extensive professional-level packages to progress to.

AutoSketch costs only £50 or so, will probably be useful to your children and runs on any computer with Microsoft Windows installed.

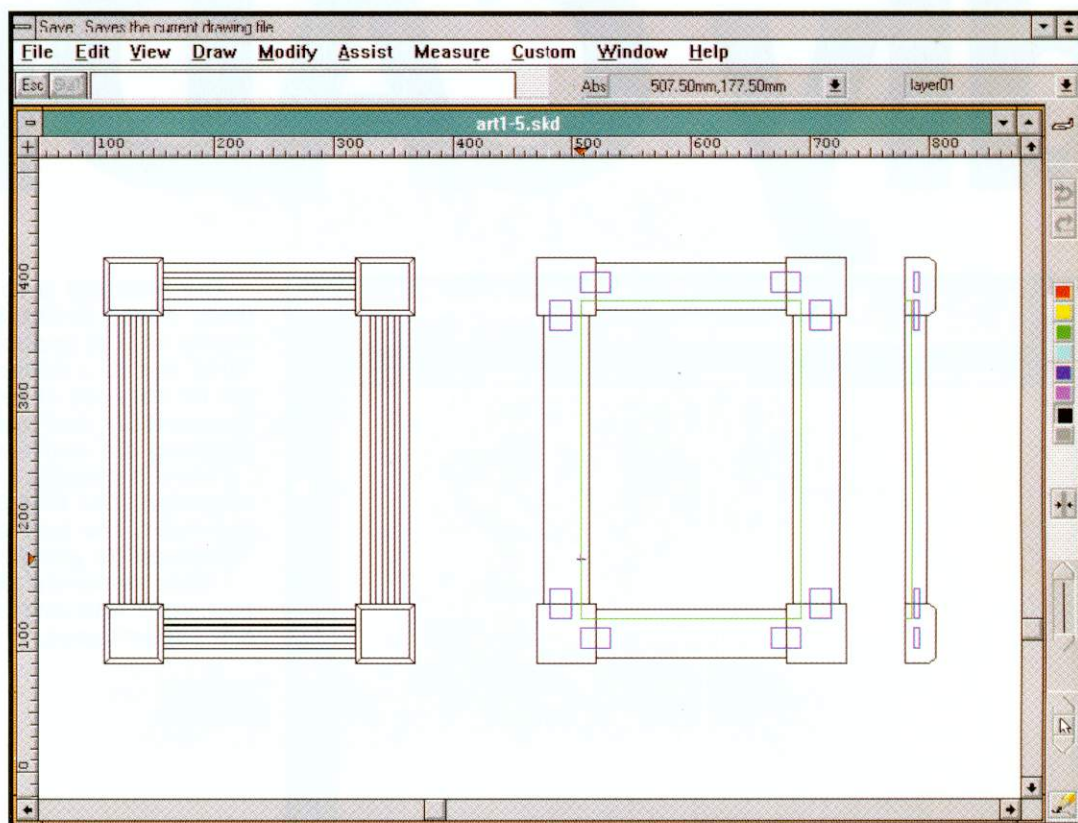
What it can do

While I don't intend giving an AutoSketch tutorial, some examples culled from Roger Smith's picture/mirror frame project, *see TRI*, should be helpful in showing what the package can do.

When using CAD, bear the following two points in mind:

One – If you're not making mistakes then you're not working fast enough;

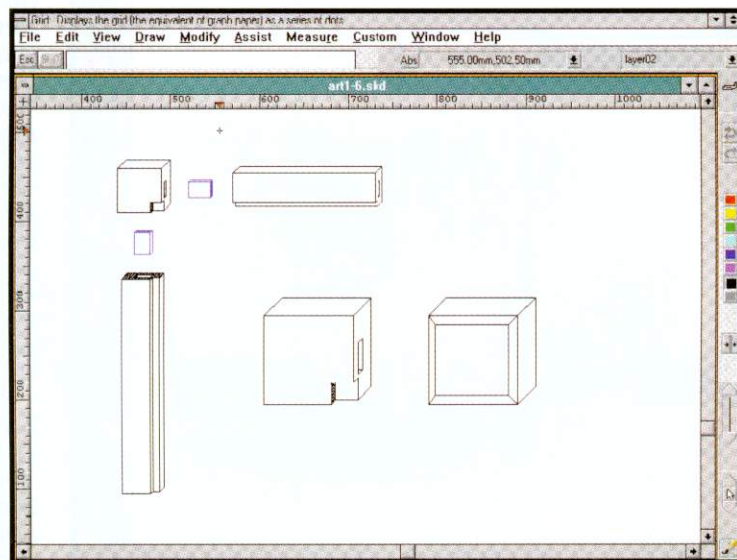
Two – Never draw anything twice. ●



▲ This new drawing is made by using the 'Save as' command. I erased the dimensioning. The frame is 'Copied' to the right and the fluting 'Deleted'. I drew the rebate using the 'Box' command again, this producing, with little trouble, a rear view of the frame.

Mindful of the Never Draw Anything Twice rule, I drew details of the loose tenons with the help of the 'Grid' set to 1mm in each direction. Use of the 'Dimension' command discloses the size of the tenons, but I saved this for the next drawing. I drew a side view of the frame projected from the rear view.

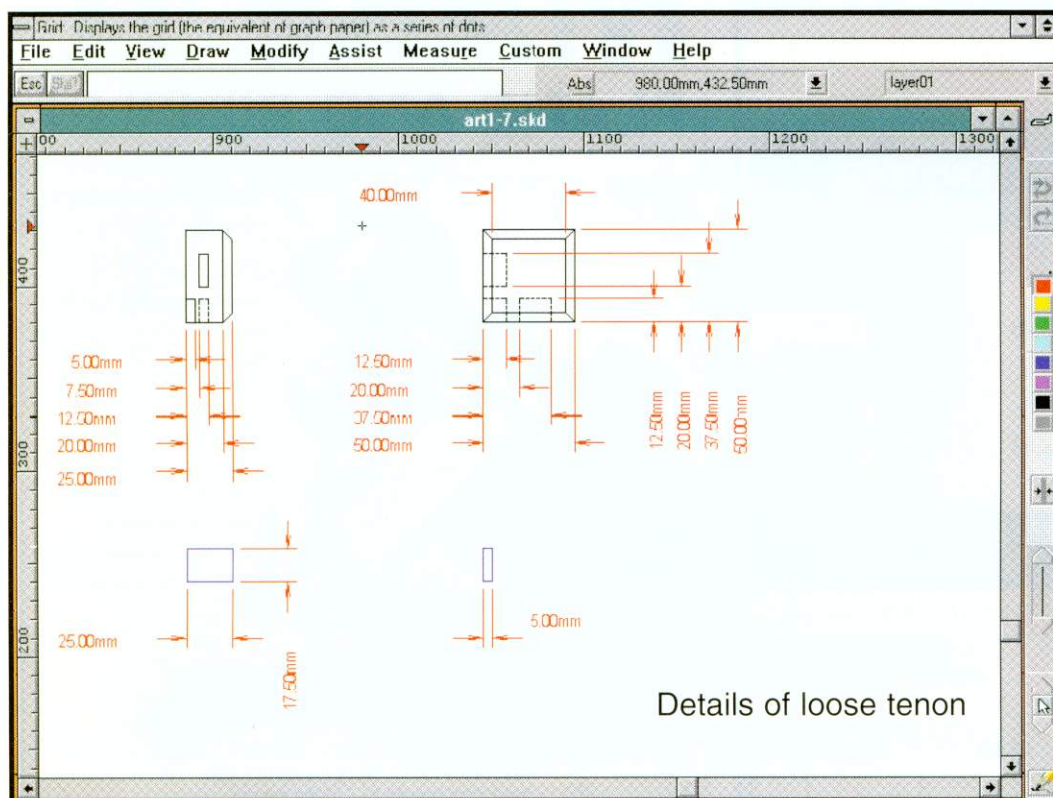
"Using CAD is much more fun than using a pencil and rubber"



▼ This new drawing is made by copying the last drawing using the 'Save As' command. Everything except the top left corner block and the top and left rails is 'Deleted'. The corner block is 'Copied' twice and magnified using the 'Scale' command.

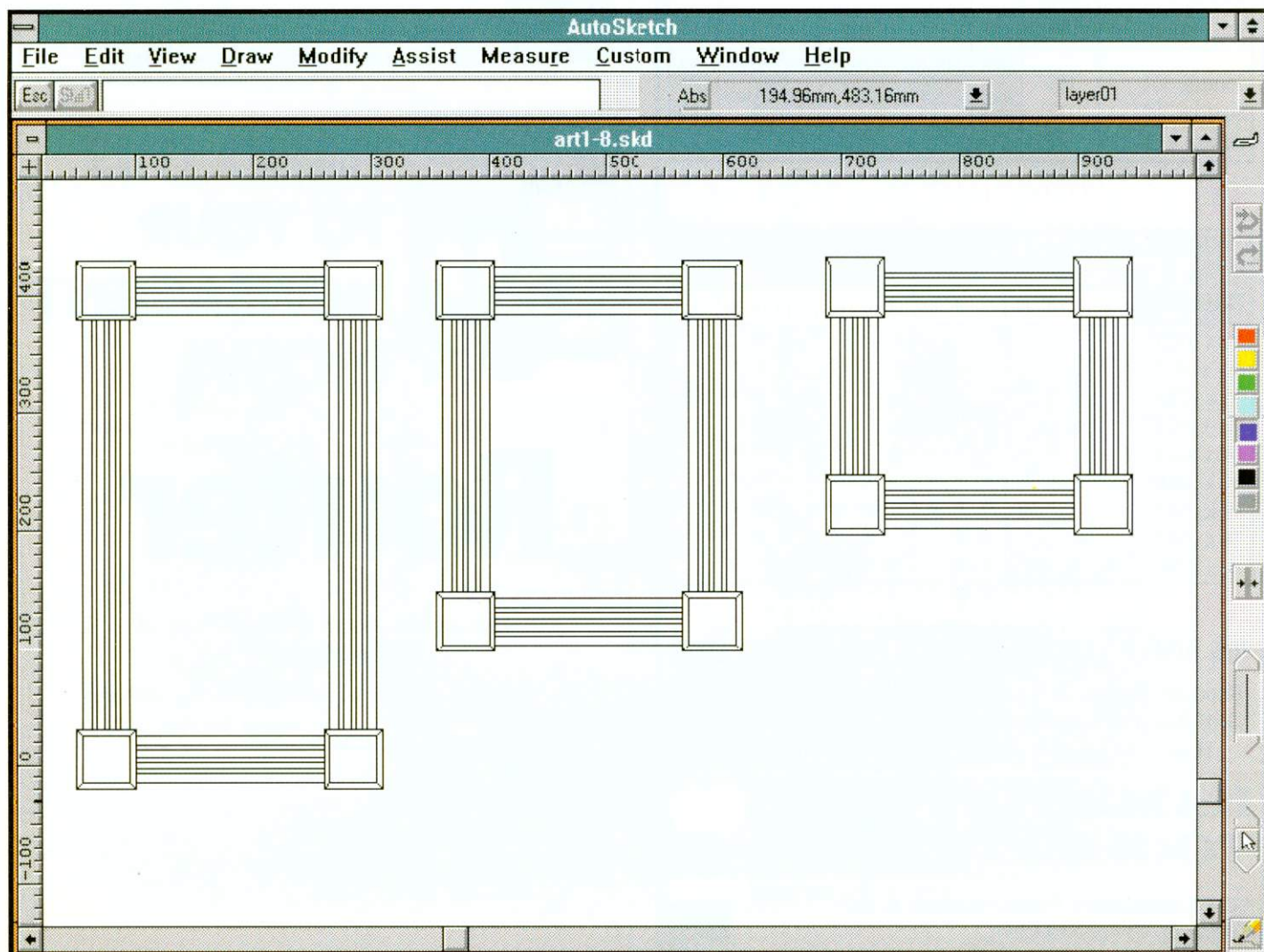
A three-dimensional effect is produced using Oblique projection, also known as Cabinet maker's projection. This is a quick way of producing pictorial effects and consists of drawing lines at 45° from the corners of a flat drawing. A partial exploded view of the frame is shown.

AutoSketch is also easily used to produce isometric drawings which provide a more realistic 3D effect.



◀ To demonstrate the real power of CAD, I copied the corner block and loose tenon to a new drawing. 'Dimension' can be used to manufacture easily as many details as you need, and I've put in more dimensions than are necessary to make the parts, just to illustrate the point.

▼ Using the 'Stretch' command produces several different designs of frame. The only features to change are the rails. The size of the corner blocks could be changed by using the 'Scale' command.





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1/8 x .025"												*	*		
3/16 x .025"												*	*	*	
1/4 x .025"				*			*	*			*	*	*	*	
5/16 x .025"											*	*	*		
3/8 x .025"				*	*		*	*	*		*	*	*	*	
1/2 x .025"		*	*	*		*	*	*		*	*	*	*	*	
5/8 x .032"				*		*	*	*		*	*	*	*	*	
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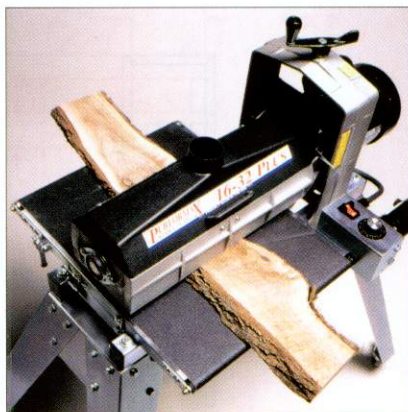
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Rout-R-slide table



Anthony Bailey puts
TESTER a router table
offering a new
approach to
familiar problems
through its paces



A NEW type of router table, claimed to be a revolutionary design and the complete router table system, is being imported from Jessum Products of Canada. Its North American origins show in the sort of precision engineering and gold anodising seen on other products from across the Atlantic.

Assembly

The ash underframe is fairly easy to put together, although having acquired a splinter when handling the components, I smoothed off the corners with sandpaper to make them

nicer to handle.

Checking the base after assembly, I realised that adding a little glue to the joints would have been a good idea as only one barrel bolt and nut fix each piece together. They could work loose with the stresses of a routing session.

The table top and its sliding components are not too tricky to work out, and the accompanying photos are easy to understand.

How it works

Having successfully assembled the Rout-R-Slide, I watched the instructional video which shows the various joint-making possibilities.

The quality of the tape is rather poor, although a new one is apparently in the pipeline, but the presenter, who clearly knows the Rout-R-Slide inside out, imparted the gist of this tricky gadget.

The basic concept is that the work is held still while the router is pulled forward on rails under the table. This means that the workpiece can be held securely while cutting a range of joints; the fence swivels, allowing dovetails to be easily formed.

The sliding router and swivelling fence enable a whole series of other operations to

◀ **Once the router is fixed to the mounting plate the assembly is slid into the table**



▲ *The unusual Rout-R-Slide table*

be carried out, such as finger joints, housings, mortice and tenons, biscuit jointing – even board trimming.

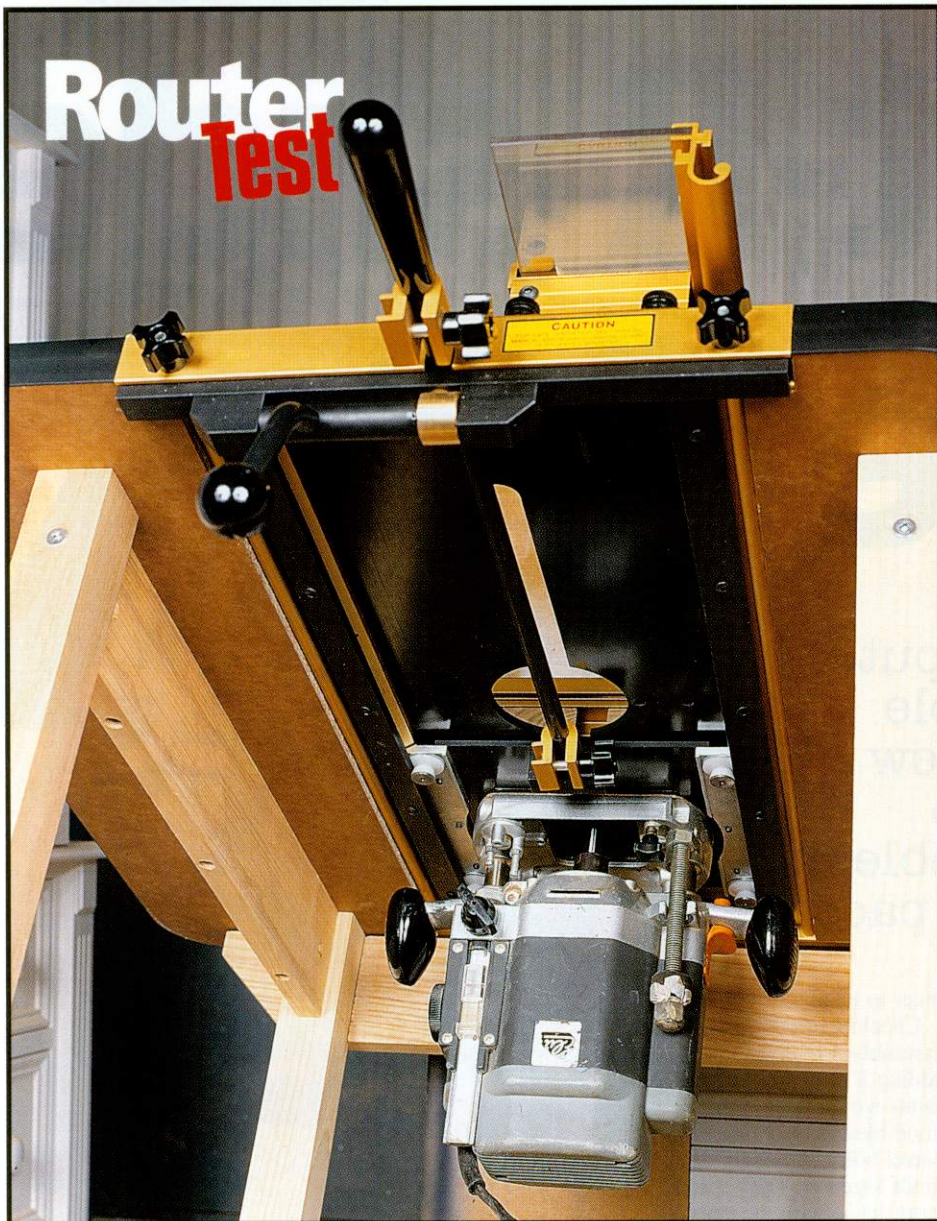
Essentially the table is meant for jointing, although the router can be locked in position when mouldings are more conventionally run.

The sliding, phenolic resin mounting plate must be carefully drilled to take your router. This is then fixed to it with counter-sunk machine screws. Once attached, the plate, rollers and pull arm are lifted and slid into position under the table top; an aluminium extrusion on the front is fitted to hold all in place.

Two sliding and lockable collars on the pull arm determine backward and forward travel, and a strong lock lever on the front of the table allows the router to be fixed in position and remain static for certain operations.

The fence swivels about a fixed point in the bed and two bolts slide in channels running from front to back of the table.

Router Test



▲ Travel can be limited with two sliding and lockable collars; a strong lock lever fixes the router in position

Two knobs on top tighten the fence at the angle set. A scale at the back of the fence gives precise degree settings and two adjustable nylon stops ensure repeatable settings.

There is some degree of forward and backward adjustment on the fence, and its facings can be adjusted or replaced with a through fence.

Handily, the black finished alloy stop is set with a pin locating in one of the holes on top of the left-hand half fence at 25mm (1in) intervals.

Its built-in fine adjusting wheel is extremely useful for in-between settings. The stop determines the spacings between pins and tails on joints, although for some, their spacings may be rather far apart.

A downside for we metricated Europeans is that the fence's scale is in imperial only.

Slotted extrusions at front and back of the table allow the fence to be swapped around so that the router runs lengthways

with the workpiece – making it ideal for mortice and tenons.

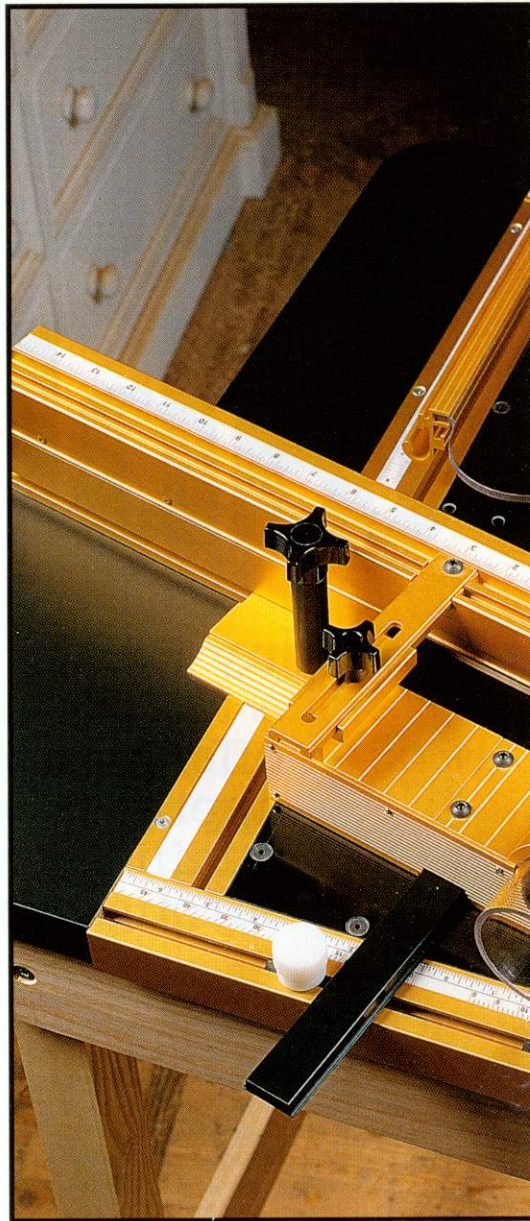
On test

When the fence is set at 15° the extraction port clashes with one of the nylon angle setting knobs – a pity as greater angles present no problem. I like the speed at which the fence can be set using all the scales provided.

The stop and pin for joint cutting are good, but the fine adjuster is a little awkward to turn. A perspex guard running almost the full length of the table is mounted at the front, and adjusts easily for safe but clear working.

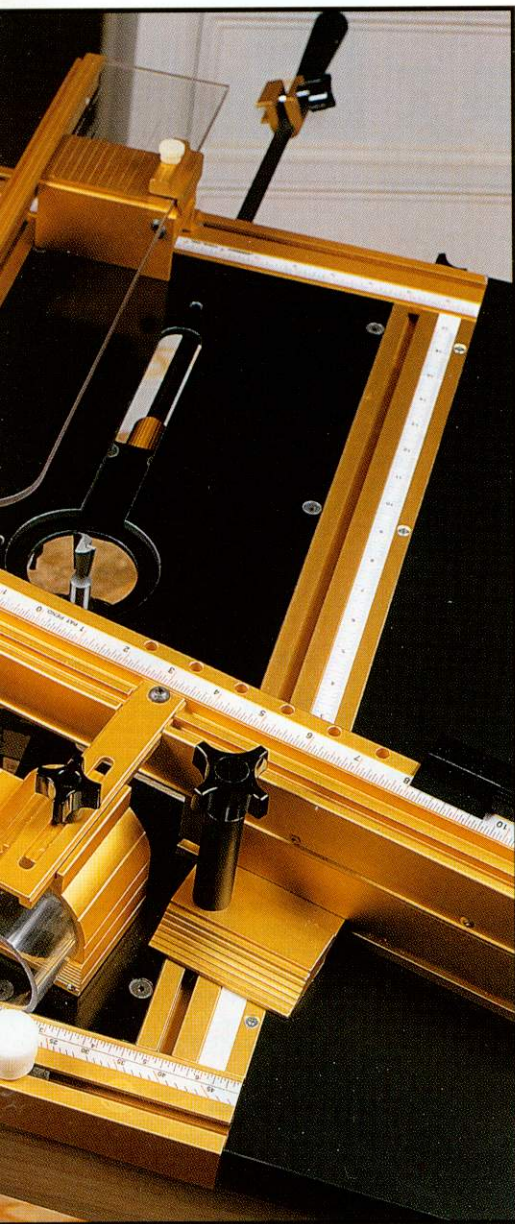
The 'push me-pull you' cut action seems a little alarming, but the big guy on the video holds the work with one hand while moving the router with the other, so it must be OK.

In fact the rotation and pressure of the advancing cutter not only holds the work-



"The 'push me-pull you' cut action seems a little alarming, but the big guy on the video holds the work with one hand while moving the router with the other, so it must be OK"

piece in place but also pushes it against the stop – so don't set stops at positions to the right of the cutter as the work would pull away from them and possibly fly off the table!



Facts and figures

Price	£425 including VAT plus delivery
Supplier	Everglades International Ltd.
Overall dimensions	700 by 762 by 844mm (27 $\frac{1}{2}$ by 30 by 33 $\frac{1}{4}$ in)
Stroke capacity	340mm (13 $\frac{1}{2}$ in)
Weight	34kg (75lb)



▲ A handy feature is the alloy stop which can be set at 25mm (1in) intervals

▲ The fence swivels about a fixed point in the bed and a scale at the back of the fence gives precise degree settings

The dovetail cutter was sharp, and both the push and return passes leave the wood in a neat, unsplintered condition, with successive passes giving a nice even result.

It goes without saying that a fine depth adjuster is needed in this or any table. Without one I was unable to cut joints like a mortice and tenon easily as the cutter has to be precisely wound up into the workpiece.

Conclusion

I liked this table a lot considering I'm not a gadget nut. I feel the lack of fine pitch spacing for dovetails and finger joints is a minus, although use of a packing piece may allow more options.

The Rout-R-Slide does offer a new approach to old problems, right down to cleanly trimming boards which, even with a good dimensioning saw, is difficult because of splashing.

The whole assembly takes up a pleasingly



▲ The fence can be turned around so that the router runs lengthways, making it ideal for mortice and tenons

small amount of space, yet offers a useful working table area with the capability of cutting many types of joint.

The video provides a good insight into the full potential of this unusual device. The only thing that might hurt a bit is the price, but for those of us who really want to explore the full potential of our routers its purchase would be worth it.



▲ The 'push me-pull you' cut action initially seems a little alarming, but holding the work with one hand while moving the router with the other feels OK

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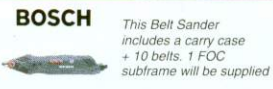


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Spacing for both fluting and spiral work is aided by the use of an integral dividing head.

Centre to centre

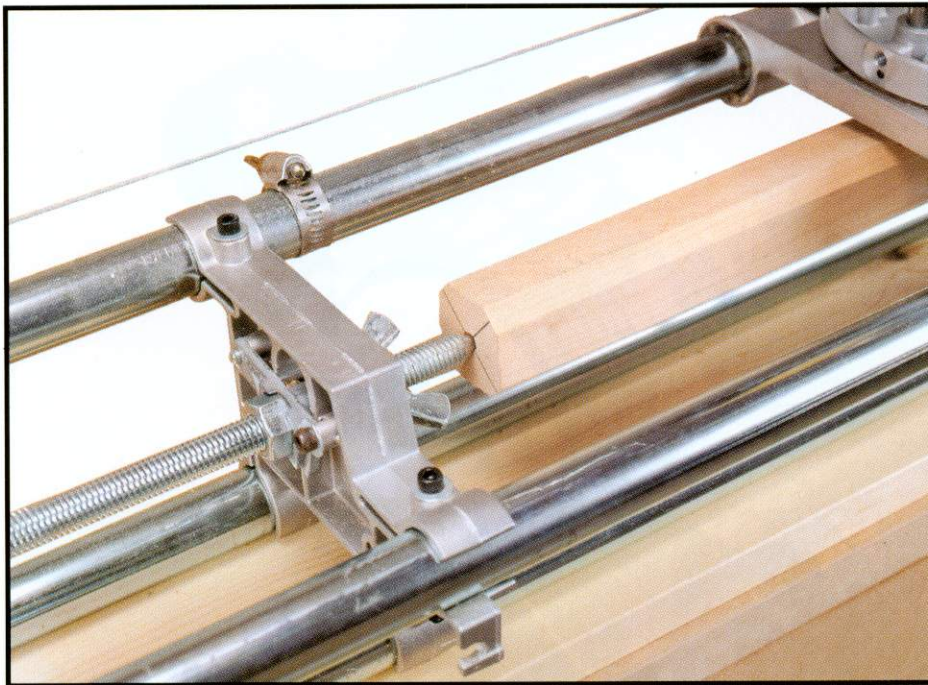
As with a conventional lathe, the workpiece is held between two centres. The maximum timber length that can be used is 930mm (36½in) and the maximum spiral length that can be cut is 630mm (24¾in). The minimum square section that can be used is 26mm (1½in) and the maximum is 79mm (3⅛in).

Tailstock

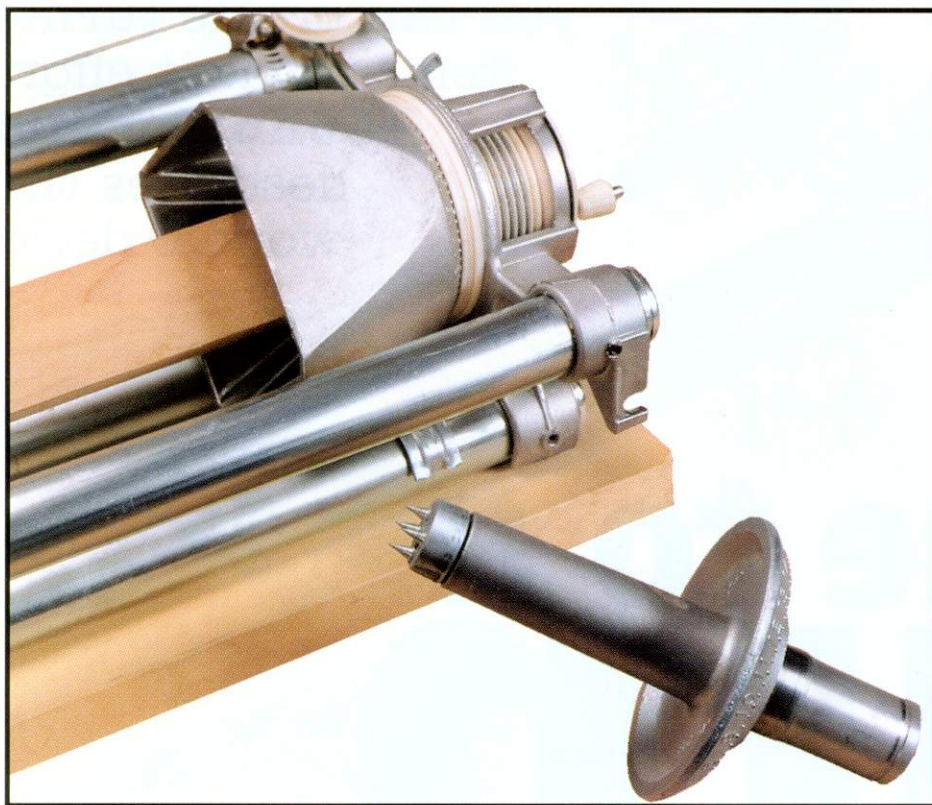
The tailstock bracket carries a threaded centre mounted on a pivoted plate. This allows the workpiece to be tightened between centres, and the height adjusted for cutting or fluting tapered components.

Clamped to the Routerlathe bed bars, the tailstock can be positioned anywhere along the bed tubes to accommodate different length workpieces.

◀ **Tailstock**



Router **technical**



▲ Headstock

Headstock

The standard headstock is fitted with an internal square cup which accepts and centres square section material. An alternative 4-prong centre is available as an optional extra, for use when the workpiece is turned to the round on a conventional lathe or planed to a hexagon prior to further machining on the Routerlathe.

The headstock is rotated by hand using a cranked handle fitted into the dividing head. Each rotation of the handle moves the cutter 175mm (6⁷/₁₆in) along the workpiece.

A sprung indexing pin allows the dividing head, and therefore the workpiece, to be set at any position from 1 to 24, and locks the dividing head to the cable drum/drive centre. With the pin withdrawn, the workpiece can be rotated free of the feed cable.

Cable drive

The feed cable is wound from its drum via guide pulleys fitted to each end of the top rear guide rail. By alternatively connecting the router carriage to the infeed or outfeed section of cable, both right- and left-hand spirals can be cut. Cable tension is maintained by a spring fitted in the cable length.

Two sliding clamps on the top rail act as adjustable stops to limit the carriage travel, determining the length or position of the routing operation.

► A cranked handle drives the cable drum

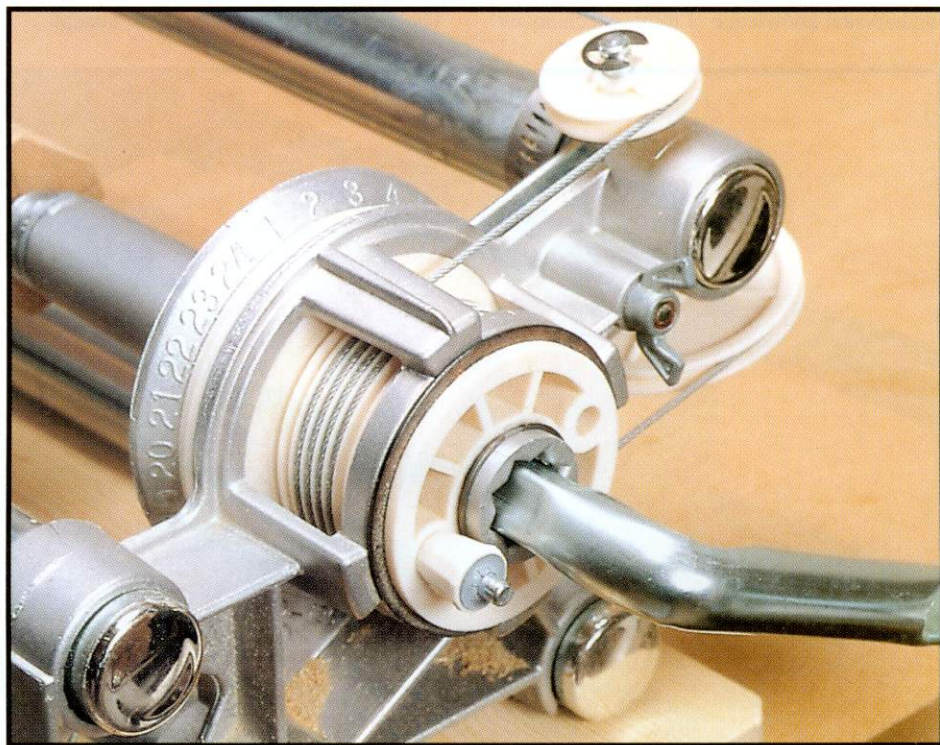
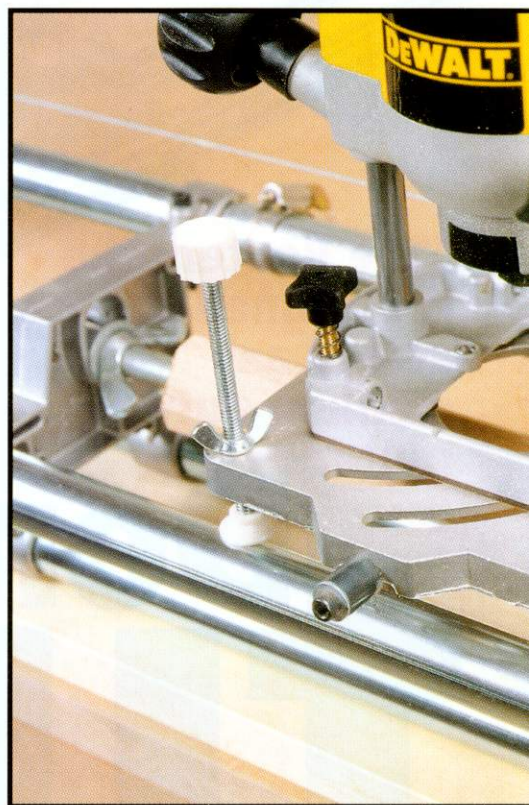
Router carriage

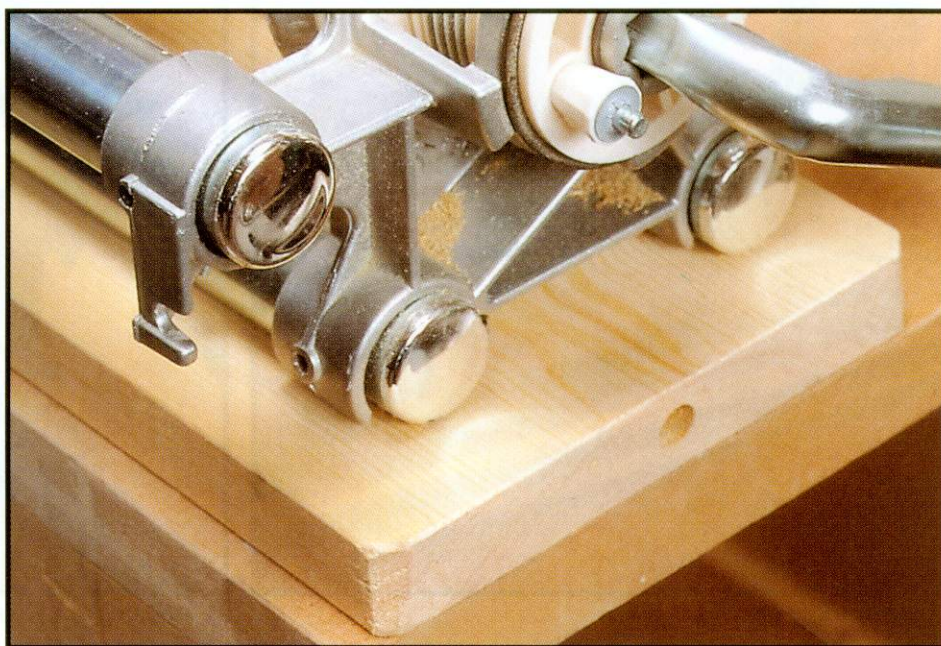
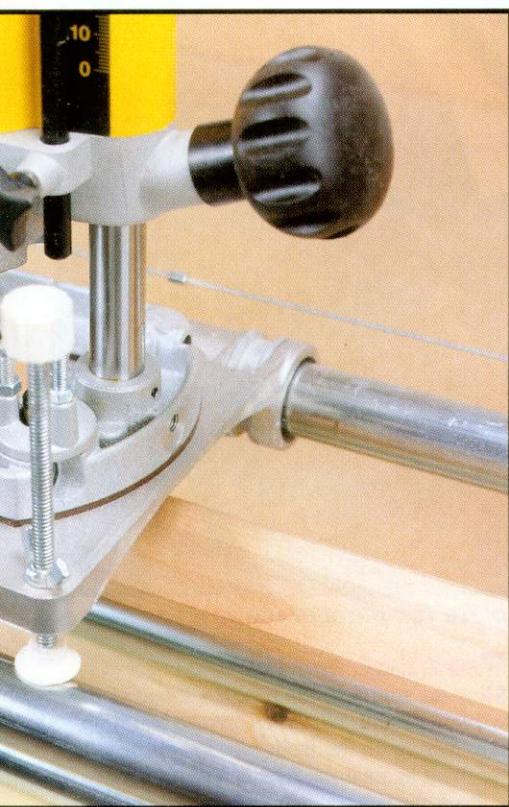
The die-cast aluminium router carriage is slotted to accommodate the fixing centres found on most popular routers. Alternatively, the router base plate can be secured to the carriage with the clamps that are provided.

The carriage both slides and pivots on the top rear rail, its height above the workpiece

being set by adjustable levelling feet sliding on the bottom front rail. The depth of cut is set using the router's own depth gauge and turret stop.

A template follower is mounted on the front of the carriage for use with pre-cut templates fitted to the front of the Routerlathe.





▲ Fix the Routerlathe to a base board

Ensure that at least three-quarters of the shank length is held in the collet. Do not be tempted to hang the cutter further out.

Always allow the router to reach full speed before entering the cutter into the wood. Set variable speed routers at their maximum for virtually all Routerlathe operations.

In order to reach deep enough for cutting through spirals, long-reach cutters are required.

Setting up

The Trend Routerlathe is supplied ready assembled, requiring only to be fastened to a baseboard or bench top, and the router to be mounted on its sliding carriage.

Using the clips supplied with the

Routerlathe, screw it to an 18mm ($\frac{3}{4}$ in) thick baseboard. Position the handle clear of the board end and/or table edge. As an alternative to clamping, the board can be screwed to a suitable bench or to a thick batten held in the jaws of a portable bench or vice.

▲ Router carriage

"In theory, the majority of plunge-cutting, non-self-guiding router cutters can be used with the Routerlathe"

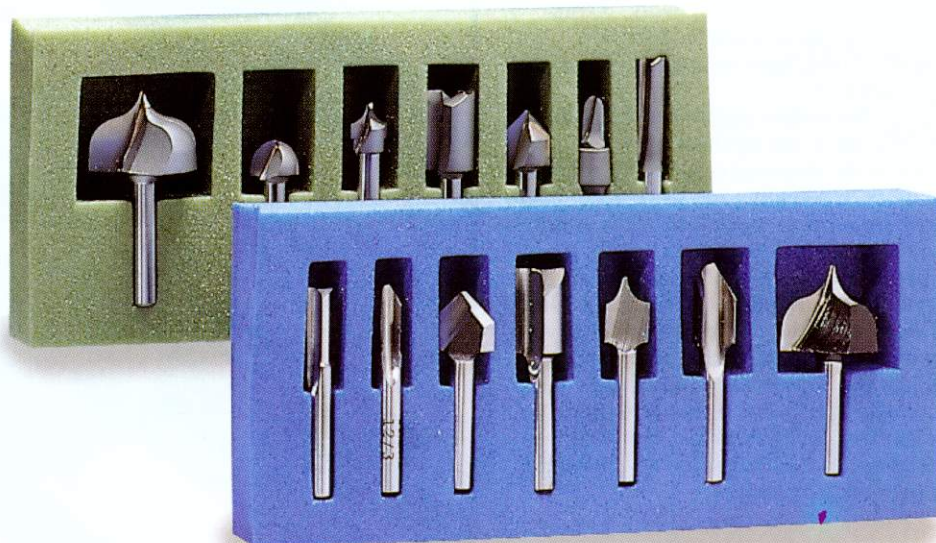
Routerlathe cutters

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

Two sets of cutters available from Trend have been specially selected for use with the Routerlathe. These consist of seven tungsten-tipped (TCT) or seven similar profile high speed steel (HSS) cutters. Both sets are available with either $\frac{1}{2}$ in or 8mm diameter shanks.

► HSS and TCT Routerlathe cutter sets

"For freedom of travel, ensure that the power lead to the router is clear of the Routerlathe"



Router **technical**



▲ **Rounding the workpiece**



▲ **Adjusting taper plate for parallel work**

Fitting router

Position the router against the carriage plate, with the collet centred over the cutter aperture. Check the positioning of the fixing slots.

If the router base has threaded locating points, it is generally better to mount the router using these. Alternatively, use the clamps supplied with the Routerlathe. If necessary when centring the router, drill through the carriage plate to take the fixing bolts.

For freedom of travel, ensure that the power lead to the router is clear of the Routerlathe, ideally going to a ceiling-mounted swivel fitting. When machining use a dust extractor, leading its hose above the Routerlathe along with the power lead.

Timber preparation

Close- and straight-grained timber is best suited to Routerlathe work. Avoid woolly-grained material and timber that is cracked, split or contains large or loose knots.

Plane the timber square and mark the centre at each end by drawing a line between the diagonal corners. To speed up the work of rounding the workpiece, plane equal amounts of stock from each edge to form a hexagonal section.

To use the alternative pronged centre, locate the centre point on the crossed lines on one end of the timber. Gently tap the centre to mark the wood, and enlarge the holes with a fine bradawl. Tap the centre gently but firmly into the wood.

Drill and countersink the centre of the workpiece at one end to locate positively on the tailstock centre.

► **Fitting timber onto tailstock**

Fitting timber

Unscrew the tailstock centre, leaving 12mm ($\frac{1}{2}$ in) clearance between the tip of the centre and the wing nut.

Locate the timber in the headstock cup, or on the alternative pronged centre, and adjust the position of the tailstock bracket to suit the length of the workpiece. Tighten the tailstock set screws.

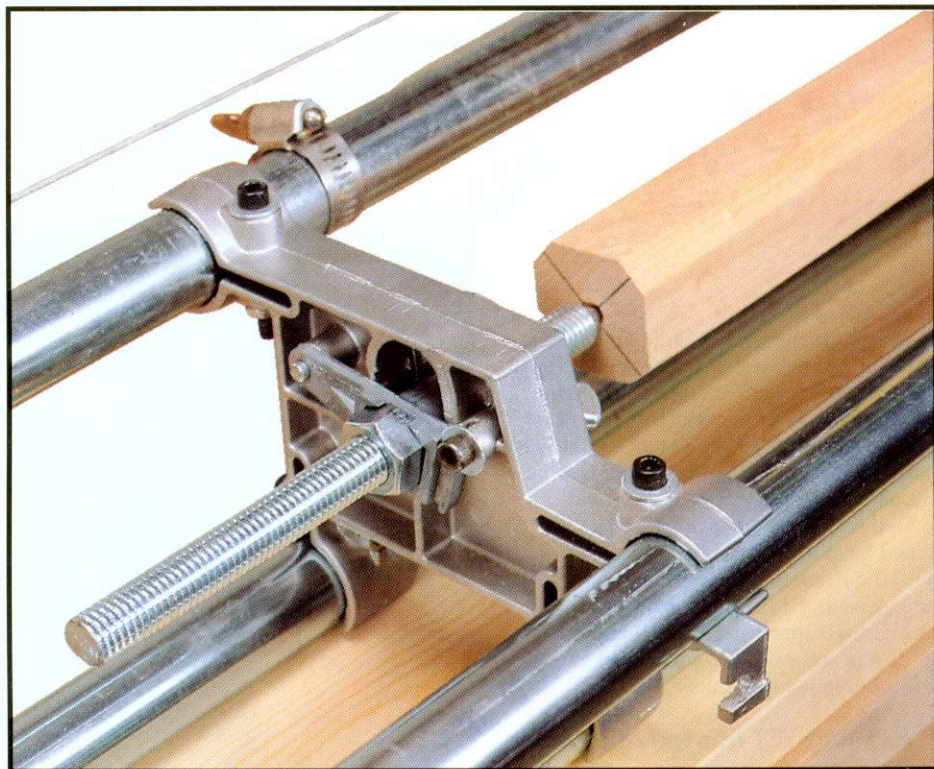
Without exerting excessive pressure on the headstock, screw in the tailstock until the workpiece is held firmly between centres. Tighten the tailstock wing nut, checking that the back nut locates in its housing.

Parallel work

Slide the router to the headstock end of the workpiece and, with the carriage levelling feet resting on the front rail, lower the cutter to sit against the face of the timber.

Lock the cutter depth and slide the router carriage to the tailstock end. Check that the cutter touches the face of the timber. If not, release the tailstock centre bushing plate bolt and lift or drop the workpiece to bring the cutter tip against it. This ensures that the cutter runs parallel to the face of the workpiece. ●

Next issue: Routerlathe techniques



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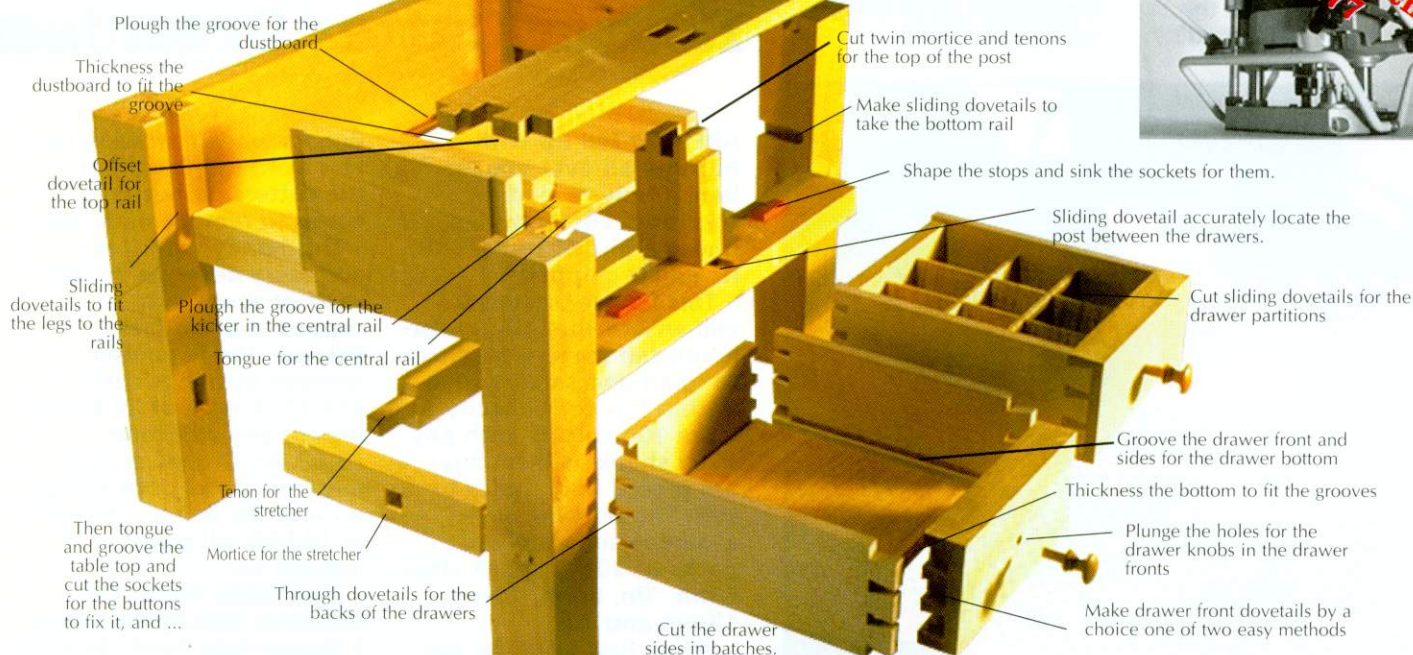
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Router STUFF

Router Mat

WHEN SANDING the face or moulding around the edge of small flat panels, for example drawer fronts, holding the workpiece is always difficult. Clamping to the bench not only creates dead spots but is time-consuming too; and routing shouldn't even be attempted without some means of holding the work.

So Craft Supplies' Router Mat is to be welcomed even if this 610 by 910mm, 24 by 36in mat does look and feel like a clammy string vest.

Lay it on a clean, flat surface and place the item to be machined

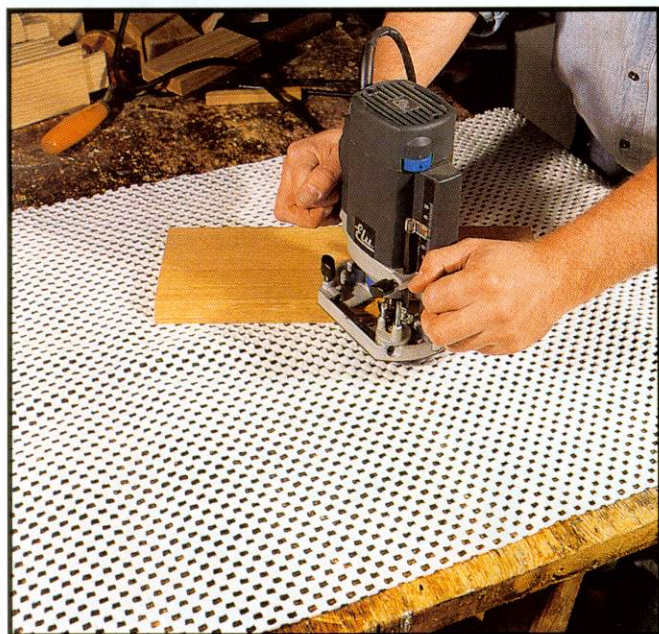
near the centre of the mat; as long as downward pressure is applied by the router it will stay in place. A surprising amount of effort is then required to shift the workpiece laterally.

Dust drops straight through and a quick shake keeps the mat clean.

As long as safety precautions are taken this mat is quick and easy to use.

Price: £8.95 including VAT.

■ **Available from:** Craft Supplies Ltd, The Mill, Millers' Dale, Buxton, Derbyshire SK17 8SN, tel 01298 871636



"Clammy string vest" router mat ▲

Alan Goodsell tries "a clammy string vest" for size, gets organised, plugs in to an industrial-sized vacuum cleaner and finds some guide bars



Keep router cutters handy and safe ▲

Router Cutter Organiser

ARE YOU fed up with hunting all over your bench only to find a treasured cutter buried under a pile of tools with its edges chipped?

This Cutter Organiser will ensure that all regularly needed cutters are close to hand and safely organised. It has the capacity to store 100 cutters with any sized shank as bushings are placed in its holes to suit. The bushings are available separately in packs of 20 for shank sizes 6mm, 1/4in, 8mm, 10mm, 12mm and 1/2in.

When first used the cutter shanks are a tight fit in the bushings, so care must be taken not to cut

fingers when removing cutters from the Organiser; the cutters do become easier to remove with use.

This handy workshop accessory deserves its own shelf or space in a cupboard or drawer.

Prices: The Organiser without bushings costs £14.10. A pack of 20 bushings of any size costs £3.52. An Organiser plus any four packs of bushings is currently being offered at £23.50. All prices include VAT.

■ **Available from:** The Woodcut Trading Company, 8 Wainwright Road, Bexhill-on-Sea, East Sussex TN3 3UR, tel 01424 214233, fax 01424 730674.



◀ Back up your Mini-Mach with a Power Vac

Power Vac

FOLLOWING THE resounding success of their V-Mach and Mini-Mach vacuum worktables, Wiltshire-based LoTec Pieman have introduced a new product, the Power Vac. This powerful and hard-wearing industrial vacuum cleaner is optimised to work with the Mini Mach which requires an external vacuum source to function.

While the Mini Mach could be used with any vacuum cleaner, the Power Vac has a remarkable degree of suction with its two stage 1000W motor and a low noise level of 66db.

Additionally, it operates as a normal vacuum cleaner for dealing with workshop dust.

The motor is protected by a microporous polyester filter and has a 10-litre tank accessed by two snap-down latches.

The Power Vac comes with a dustbag, a snapfit/swivel 2m flexible hose and an 8.5m flex and plug. A set of cleaning tools will also be available.

Price: £115.15 including VAT; next day delivery £9.50 including VAT.

■ **Available from:** for more details or credit card ordering, phone 01960 629526.

Bob's Guide Bars

ANY JIG or accessory to aid setting up a router is most welcome – especially if it is an inexpensive one.

Regular *The Router* contributor Bob Wearing, has designed a set of bars to fit most router baseplates with either 8mm ($\frac{5}{16}$ in) or 10mm holes. The black-finished steel Guide Bars are slid into the baseplate in place of the side-fence.

A variety of wooden attachments or feet can be bolted onto the ends of the bars, sandwiched between two washers and held in place with a wingnut.

A classic example of

their use is the Levelling Foot, see *Routing Aids in TR2*, which supports the router when carrying out tasks like tenoning or biscuit jointing.

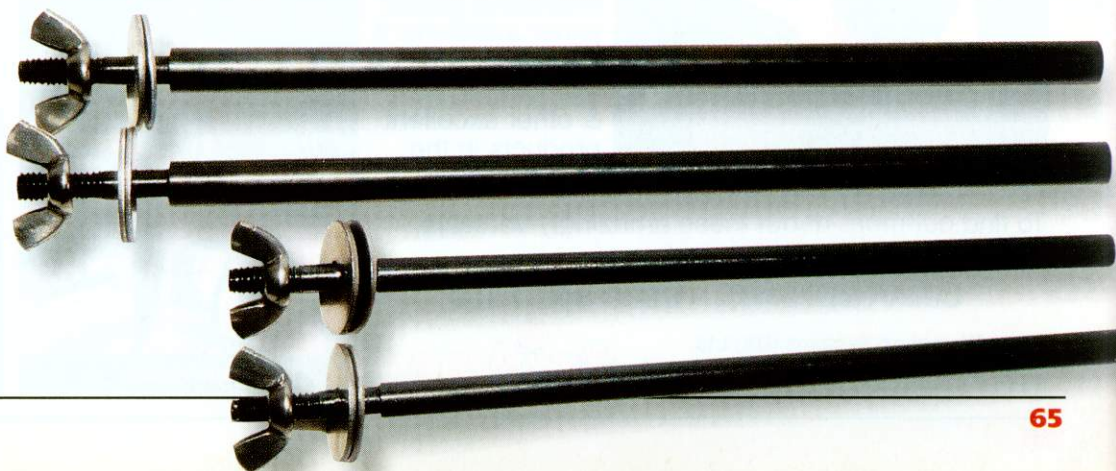
This is only one of the bars' uses and all who own a pair will find a

different purpose for them or a new solution to a routing challenge.

Price: £4.85 per pair for the 8mm ($\frac{5}{16}$ in) size and £5.50 per pair for the 10mm size, including VAT. See also *Workshop tips*, page 13.

■ **Available from:** Vanguard Cutting Tools Ltd, 102 Harvest Lane, Sheffield S3 8EG, tel 0114 273 7677, fax 0114 273 7692.

▼ *Bob's Guide Bars in 8 or 10mm*



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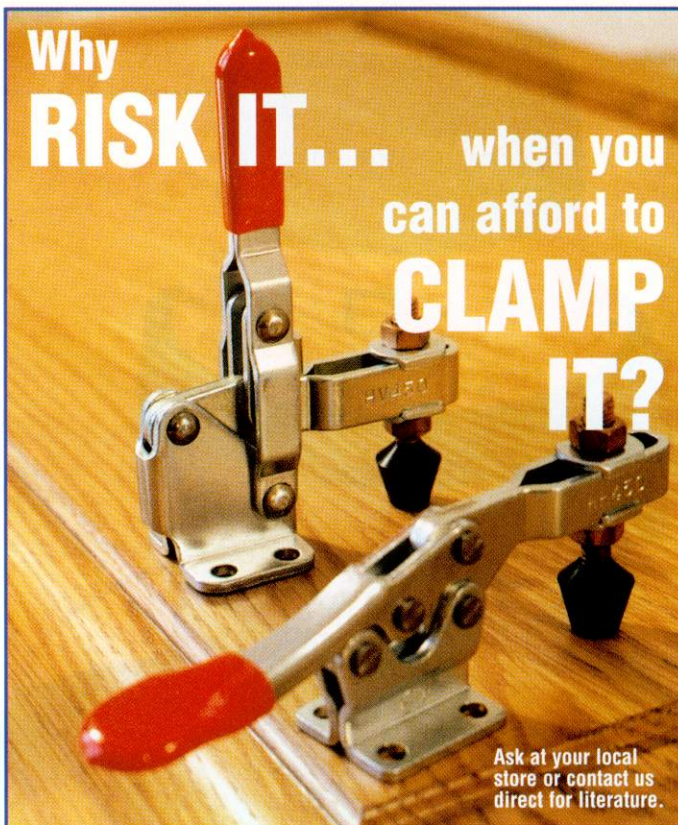
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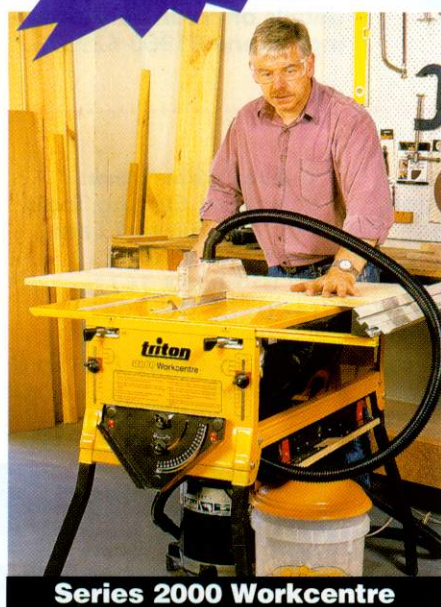


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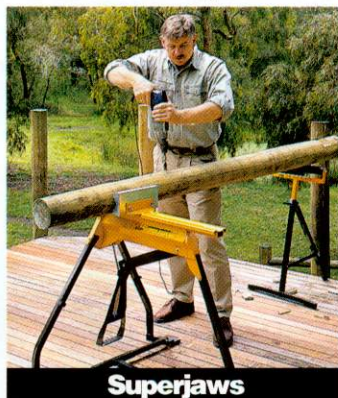
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Stairs with flair

Bob Adsett follows his lesson on making stairs with suggestions on routing an individual look to

handrails and balusters



MOST people make do with readily available, purpose-made, turned newel posts, spindles and standard hand- and baserails to adorn their stairs, with the result that most staircases look similar.

Armed with just a router and saw, however, you could ensure that yours will not be the same as everyone else's in your street. A little imagination, coupled with the right tools, is enough to produce totally non-standard items of your own design.

"A little imagination, coupled with the right tools, is enough to produce totally non-standard items of your own design"

Planning

Careful planning is essential, however. Building regulations state that the distance from the top of the nose of the stair and the top of the handrail must not be less than 900mm (35 $\frac{1}{16}$ in) for domestic dwellings.

So first, roughly work out the length of the newel post – the height of the handrail from the top of the nose of the stair tread – then allow extra for the newel cap plus sufficient timber at the base for fitting.

With these figures added together, the newel should start off at about 1800mm (70 $\frac{1}{16}$ in) long; the spindles, if cut to 900mm

(35 $\frac{1}{16}$ in) long, will also leave enough timber to allow for fitting.

The lengths of the hand- and baserails are also easily calculated by simply measuring the length of the stringers and allowing extra for cutting to length.



▲ The end cap and cross-mouldings are created using the router mounted on a Eumenia



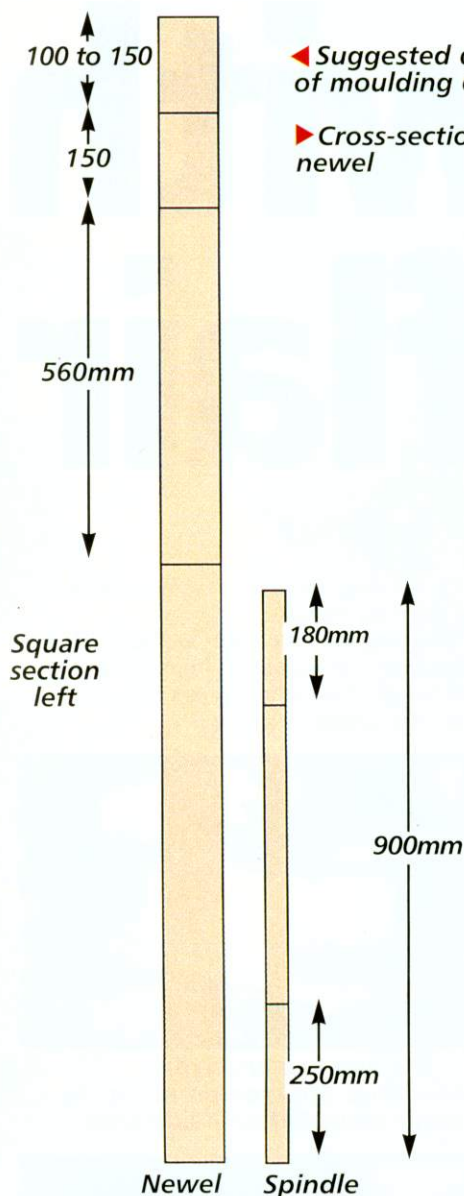
▲ Use a side-fence to rout the flutes



▲ A bearing-guided beading cutter finishes the corner

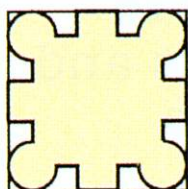
◀ Routers can create a unique design on newels, spindles and handrail

Router **technical**

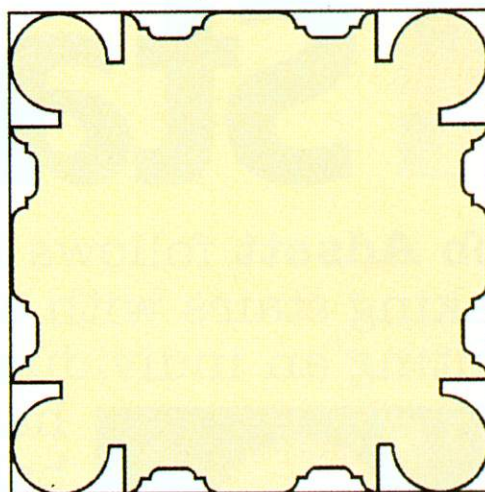


◀ Suggested dimensions for the length of moulding on the newels and spindles

▶ Cross-section of the spindle and newel



Spindle



Newel

"Anything less than 32mm (1 $\frac{5}{16}$ in) square, finished size is unlikely to be strong enough, should children or old people fall"



▲ Sand the finished newel post



▲ Mark the moulding lengths across the spindles



▲ Set up the cutter on an off-cut

Tooling up

Routers used:

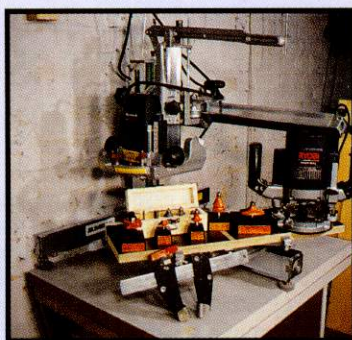
- Einhell EOF850SP fitted onto Eumenia M504/300 cross-cut saw with router mounting carriage fitter;
- Ryobi RE-600N mounted onto home-made floor-standing router table.

CMT cutters used for handrail and baserail:

- 856-601 Table and Handrail Bit;
- 856-701 Hand Rail Bit;
- 800-506 3-Wing Slot Cutter Set.

For moulding and shapes on newel and spindles:

- 861-548 Corner Beading Cutter;
- P27-000 Ovolo Cutter;
- 848-191 Plunge Ogee Cutter;
- Various cutters from the Titan MMSETB set.



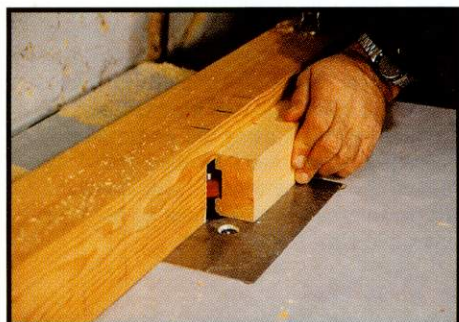
▲ Tooling up



▲ Feed the workpiece carefully onto the cutter when starting the moulding



▲ Alternative but more complicated spindle design



▲ Machine the grooves in the handrail and baserails

Timber

The timber used for this example is standard joinery quality softwood from the local timber merchant, as knot-free as possible and planed-all-round (PAR).

Other types of timber, like mahogany (*Swietenia macrophylla*), oak (*Quercus sp*) and ash (*Fraxinus sp*), can also be used, depending on the style of house or its staircase.

"Building regulations state that a 100mm (4in) ball must not be able to pass between the spindles"

The timber size for newels is commonly 100mm (4in) square. This finishes at approximately 94mm (3 7/8in) square after planing.

For the spindles, use timber 38mm (1 1/2in) square, which finishes at approximately 35mm (1 3/8in) square.

It is possible to use stock up to 45mm (1 3/4in) square, finished size, but anything less than 32mm (1 1/4in) square, finished size is unlikely to be strong enough, should children or old people fall onto them.

Allow two spindles per step plus five extra to allow for errors.

Building regulations state that a 100mm (4in) ball must not be able to pass between the spindles when assembled in the staircase, so keep this in mind when designing their profile.



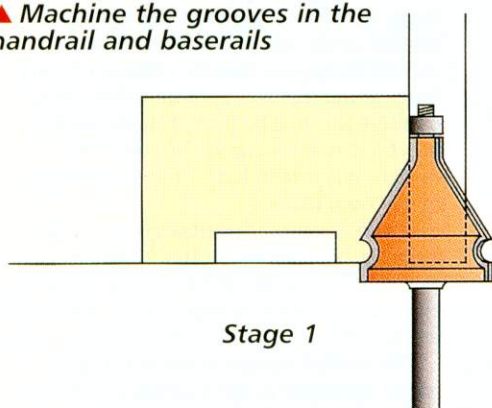
▲ Check the groove for fit



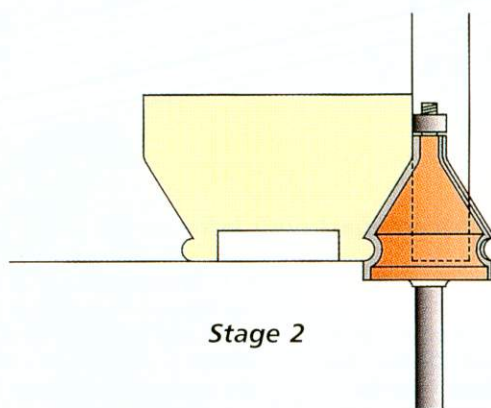
▲ Finished handrail



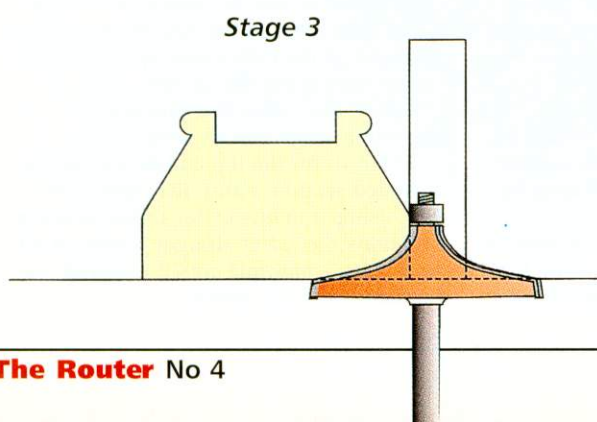
▲ The baserail uses the same cutter as the handrail



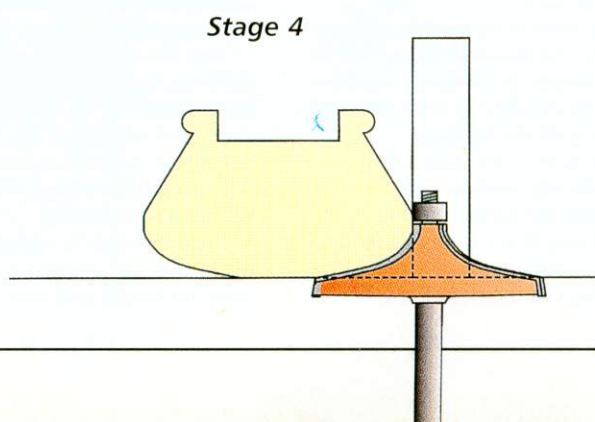
Stage 1



Stage 2



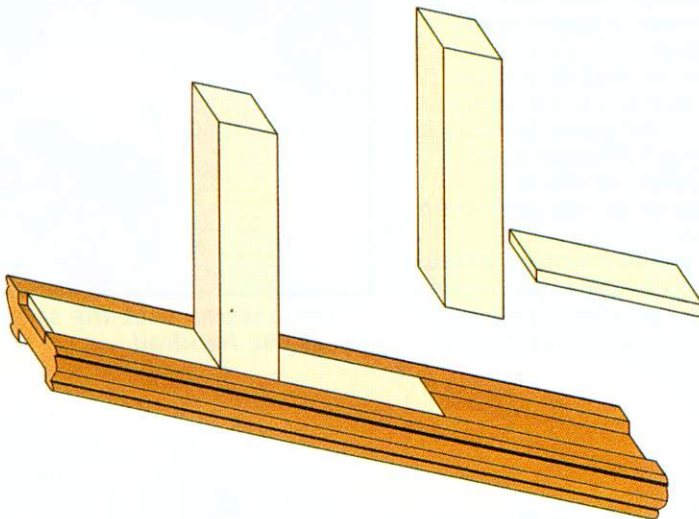
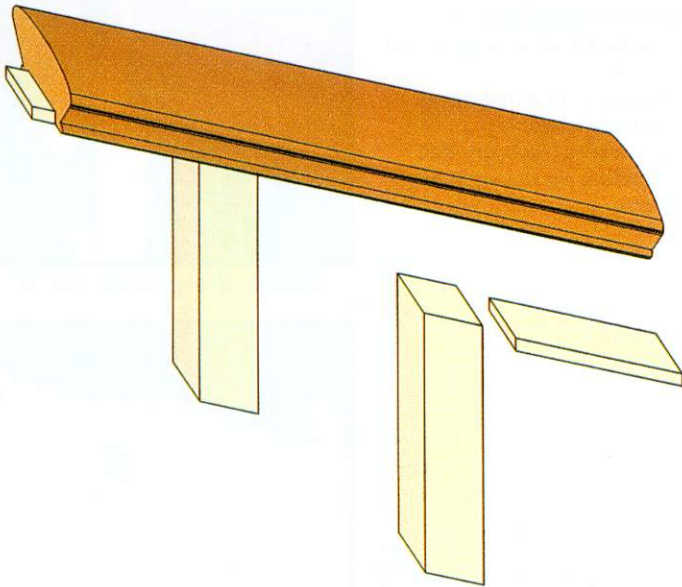
Stage 3



Stage 4

◀ Sequence for routing the handrail

Router **technical**



▲ *The spindles are spaced apart with infill pieces*

Newels

For the newel at the bottom of the stairs allow between 100mm and 150mm (4in and 6in) for the cap, 150mm (6in) for handrail fitting and 560mm (22 $\frac{1}{2}$ in) of moulded section. The remaining square can be cut to length later.

When fitting newels on half-landings and landing returns, the handrail fitting section may differ in length. In all cases, measurements should be checked in relation to the height of the top of the handrail.

If a through post is used on a half-landing then the top section will probably remain the same, but the overall newel length must be checked and altered accordingly.

After marking out the newel, the first cut

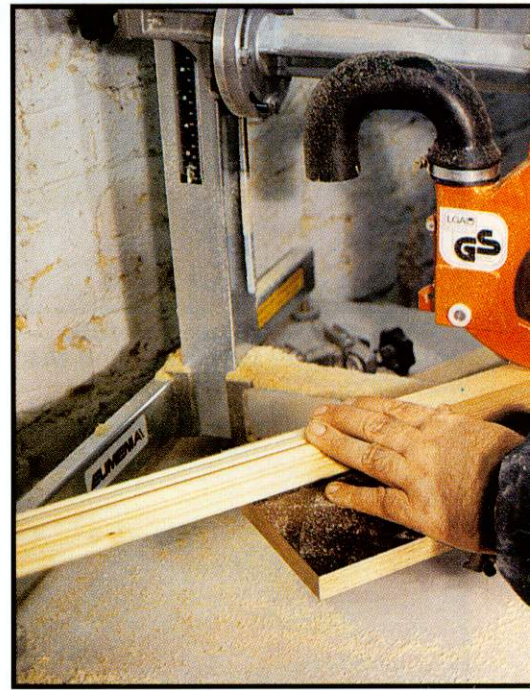
is to produce the top of the cap using the cross-cut saw set at 20° to achieve a flat-top pyramid. This now acts as a datum to set the fence stop to, so that the repeated mouldings across the newel can be accomplished.

Using the plunge ogee cutter in the carriage-mounted Eumenia saw, I created cross-mouldings at the marked out sections.

This can be done by multiple passes, different depth settings producing a multi-profile.

At each setting all the newels should be machined. As well as being much quicker, this discipline reduces the risk of error by setting and re-setting.

Once this task is completed, moulding on the newel cap can be machined, using the same technique and whichever profile of



▲ *Cut the angle on the ends of the spindles and infill pieces*

cutter suits your design best.

When planning the design, don't leave too thick a piece between profiles, as this could cause pieces of wood to break away.

Then machine the moulded sections along the newels, using the router with bearing-guided cutters for the edge mouldings and the router's side fence for the internal ones; jigs can be used for repetitive cuts.

Spindles

After cutting the spindles 900mm (35 $\frac{1}{2}$ in) long, mark the lengths of the square section at the top and bottom. These should be approximately 180mm (7 $\frac{1}{8}$ in) long on the top and 250mm (9 $\frac{7}{8}$ in) long on the bottom. The design of the middle moulded section can be of your own design, but just to help I have shown two of my own ideas.

One is a simple lengthways cut using a corner bead mould cutter. Starting and stopping at the marks on the spindle produces a corner to match the corners of the newel.

The second design is made using a router mounted in the Eumenia with the table set to 40°. A square barley twist is produced by using a stop and drawing the ogee cutter across the timber on all four sides, then moving the stop by the diameter of the cutter and repeating continually along the spindle.

Again, any cutter that produces an appealing shape can be used.

To finish off the top and bottom of the moulded section, return the table to 90° and, using stop blocks for repeat positioning, draw the cutter straight across on all four sides – multiple cuts if required – to produce a distinct profile.



"The infill pieces which space the spindles must be the same width as the thickness of the spindles"

Hand, baserails

The timber size used for the handrail and baserail should be about 75 by 50mm (3in by 2in) or 75 by 75mm (3in by 3in) to finish at 68 by 45mm (2¾ by 1¾in) or 68 by 68mm (2¾ by 2¾in).

Both the handrail and the baserail require a groove for the spindles to sit in. Machine them using the 3-wing groover set or a rebate cutter. With the router mounted under a table, set the fence to give the required depth of cut, then set the cutter approximately to the centre of the underside of the handrail.

Using a piece of scrap timber the same width and thickness, machine a groove along its length, turn it over and run through again.

Check it to see how close the groove width is to the thickness of the spindle, adjust the cutter by half the difference and repeat the cut – fine adjusting until the spindle fits.

Once set up, the handrail and baserail grooves can all be machined. If the baserail is to be fitted over the string instead of just sitting on top, repeat the operation on the underside of the baserail.

The side and top of the handrail can then be machined. First, run a cut on both sides using the handrail bit, then machine the top with the table and handrail bit, *see drawing and panel*.

This sequence of cuts is used so that as much as possible of the workpiece's flat area keeps contact with the router table and fence at any given time.

The baserail sides can be moulded with the same cutter, turning the timber over to achieve a balanced cut.

Assembly

The infill pieces which space the spindles must be the same width as the thickness of the spindles and 10 to 12mm (¾ to ½in)

Minimum 900mm (35½in)
handrail height

Maximum
100mm (4in) dia.

▲ Minimum height for handrail and maximum gap for spindles

thick. When you have decided on the size of timber to be used, mark out the working lines on the newels and spindles.

The infill pieces should be cut – remembering the 100mm (4in) ball rule – about 90mm (3½in) long. Cutting the ends at the same angle as the stair pitch allows the assembly to line up vertically.

To assemble the handrails to the newels, normal mortice and tenon joints can be used – although cutting them on the angle can be tricky – with through bored dowels to pull

the joints together.

Alternatively, handrail-fixing brackets – complete with assembly instructions – can be obtained from your local DIY store.

The result will be a unique staircase to make your friends and neighbours green with envy.

SAFETY NOTE: for ease of view, guards and protective covers were removed while this project was photographed. They should, of course, be used at all times. ●

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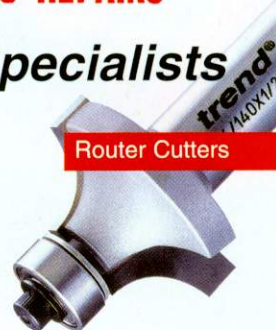
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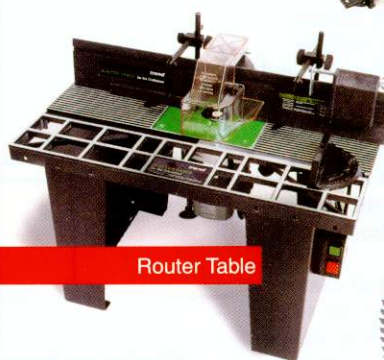


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▲ A draining board fit for a router project

Drained and bored

MAKER



Colin Eden-Eadon dispels that sinking feeling by making his own draining board

HAVING had a butler sink fitted, I needed a draining board pretty swiftly – but a brief and depressing look at the prices for a bought one had me breaking out the router.

Draining boards are traditionally made from maple, but as beech and sycamore are also suitable for kitchen use I opted for easily obtainable sycamore.

The board consists of a main draining centre piece with six tapered grooves, a shallow cutlery well and a simple screwed and plugged frame.

Preparing blank

Plane the wood to size, the main board being 30mm (1 $\frac{1}{8}$ in) thick and made up to width with two pieces of wood. Overall sizes are 350mm (13 $\frac{3}{4}$ in) by 585mm (23in).

Ensure their meeting faces are flat and true, ready for biscuit-jointing with the

router, *see Routing aids, page 13*. Place the boards joint sides together and mark the biscuit positions across both, using four or five biscuits.

So as not to expose the biscuits, allow enough distance from the ends of the boards for trimming off. Glue and cramp the pieces together, and when dry cut the glued up board to size and clamp it to the bench. To allow water to run off, rout a curve on the front end of the board with a bearing-guided roundover cutter.

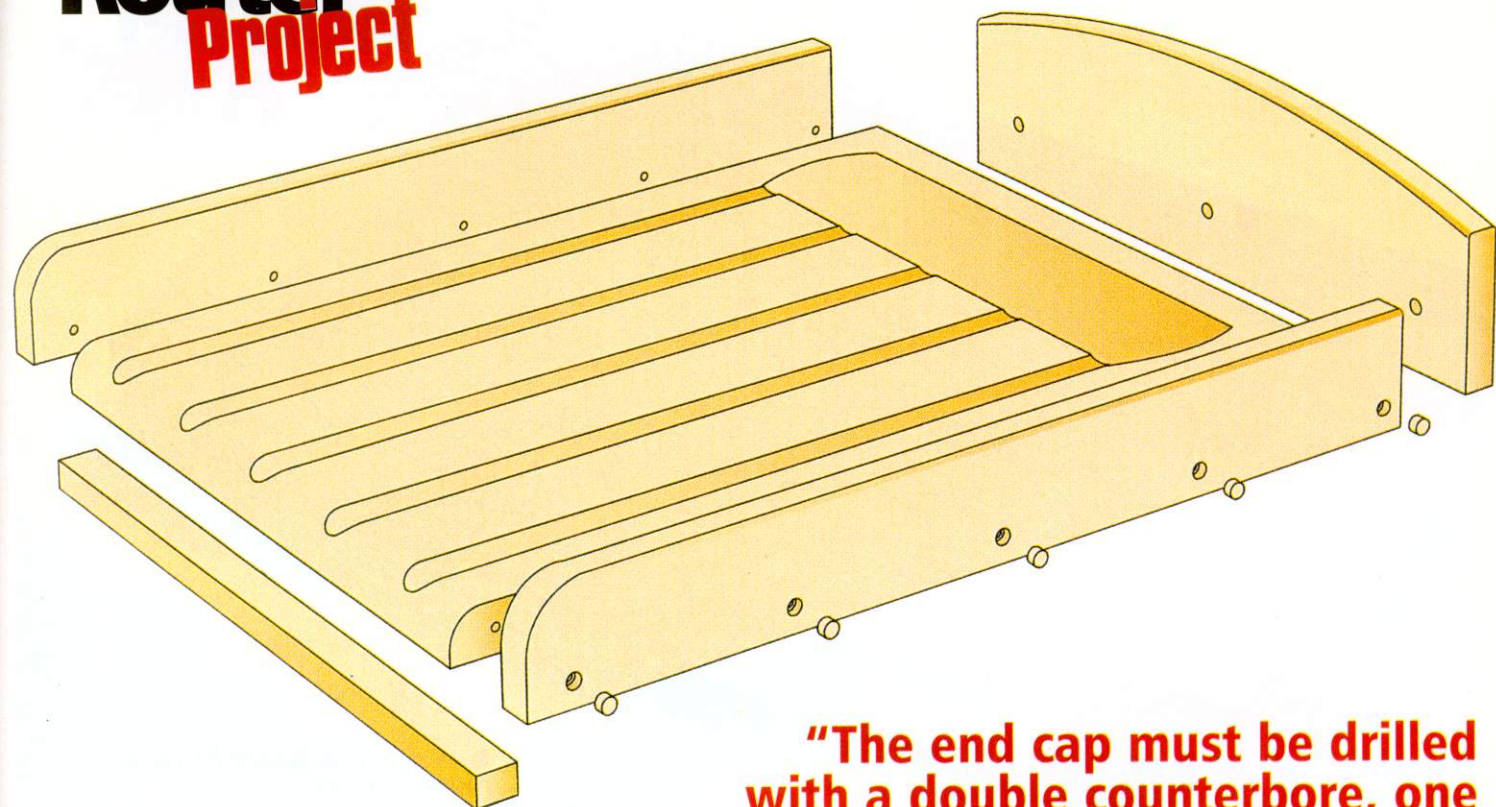
Cutlery well

The well is the same 6mm ($\frac{1}{4}$ in) depth as the start of the grooves; remember that the grooves deepen at the other end, and that if they are started too deep it may not be possible to achieve the final depth with the short core box cutter; note, too, that if the well is too deep the biscuits may be exposed.



▲ Counterbore and plug cutters make a neat job of screwed joints

Router Project



▲ Exploded view of draining board

"The end cap must be drilled with a double counterbore, one on each side to allow for movement"

With a 13mm diameter straight cutter used with a side fence, rout the long cross-grain edges first, and then rout in steps to clean out the bottom. Clean up the ends of the well by routing the short sides.

Produce a rounded edge with the core box cutter.

Cutting grooves

The tapered grooves for the main board are created with a core box cutter and a jig, *see diagram*, made from 6mm ply or MDF. Ply is less likely to bend under the weight of the router, but to be on the safe side fit a small fillet underneath the jig.

Cut a slot in the ply to fit a 17mm diameter guide bush. Allowing for the difference between the cutter and guide bush diameters, carefully mark out the groove positions. Practise on scrap wood first.

▼ Jig for routing grooves

Frame

The side pieces are 22 by 55mm ($\frac{7}{8}$ by $2\frac{1}{4}$ in), cut to the same length as the board. The end cap is 100mm (4in) wide and the same thickness.

As a router cannot be plunged at angles other than 90°, it is a natural drilling machine. Cutters are available for drilling and counterboring in one; plug cutters are matched to suit. Adjust the side fence to position the holes.

Cut the curved corners on the side pieces with a bandsaw and clean up. A roundover cutter achieves the rounded edges of the side pieces.

End cap

Cut the curved end cap to length – the board width plus the thickness of the two sides – and make a template from MDF or ply.

Bend a steel rule to mark out the curve, then cut on a bandsaw and clean up. With

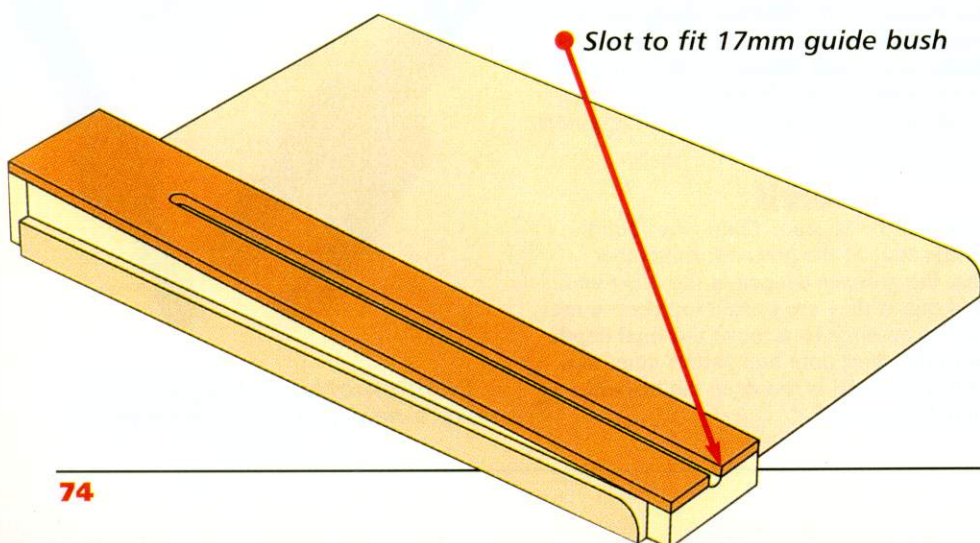
the template, mark out the curve on the end cap and cut it out a couple of millimetres oversize, then screw it to the template.

Using a template profiling cutter on a table, clean up the curve. Make sure a holding device for the workpiece is attached to the template, and for added safety use a feed on/off pin.

Round the edges with the bearing-guided cutter. The end cap must be drilled with a double counterbore, one on each side to allow for movement.

If you need to raise the board above the lip of a sink you can attach a double counterbored foot to the underside of the front, which will also help with movement.

Sand everything and apply at least five coats of Danish oil to all surfaces, fine sanding between each coat. Screw the assembly together. Glue in the plugs and cut off the excess, *see Router tips*, page 8. Sand flush and apply a finish. ●



● Slot to fit 17mm guide bush

Tooling up

- Trend biscuit jointer set
- Trend drill and counterbore 9.5mm diameter
- Trend plug maker 9.5mm diameter
- Wealden roundover/ ovolo cutter with bearing
- Wealden core box bit
- Wealden double-flute straight cutter

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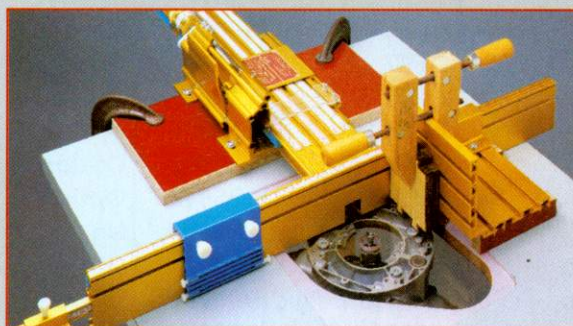
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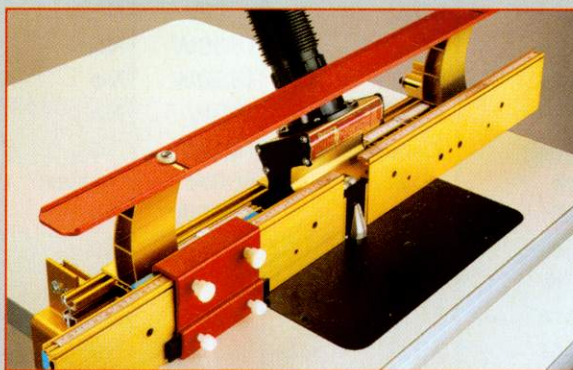
Reply to: Wealden Tool Company, Dept TR,
 Replies from UK: FREEPOST TN2385, Tonbridge, Kent TN12 5BR.
 Overseas replies to: 31 Branbridges Industrial Estate, East Peckham, Kent TN12 5HF.



The Incra range of unique and innovative products from the USA are all set to pep up your woodworking! The Incra Jig, pictured below, utilises a series of interlocking saw-tooth racks to precisely and instantly position the workpiece, thus transforming the accuracy of a router table, table saw etc. This enables a variety of joints, such as dovetail, box or hinge to be cut, at equal or variable spacing; and also allows complex laminated projects, such as the chopping board above, to be created. Please request the full colour leaflet.



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Router specifications

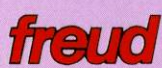
Brand name	Model	Wattage	6mm collet	¹ / ₄ in collet	8mm collet	³ / ₈ in collet	12mm collet	¹ / ₂ in collet
AEG	OFE 630	630W	No	Yes	No	No	No	No
Atlas Copco	OFSE720	720W	Yes	Yes	Yes	No	No	No
Atlas Copco	OFSE 850	850W	Yes	Yes	Yes	No	No	No
Atlas Copco	OFSE 2000	2000W	No	No	Yes	No	Yes	Yes
Black & Decker	KW 780	600W	Yes	Yes	Yes	No	No	No
Black & Decker	KW 780E	600W	Yes	Yes	Yes	No	No	No
Bosch	POF 400A	400W	Option	Yes	Option	No	No	No
Bosch	POF 500 A	500W	Option	Yes	Option	No	No	No
Bosch	POF 600 ACE	600W	Option	Yes	Option	No	No	No
Bosch	GOF 900 ACE	900W	Option	Yes	Option	No	No	No
Bosch	GOF 1300 ACE	1300W	Option	Yes	Option	Option	Option	Yes
Bosch	GOF 1600 A	1600W	Option	Yes	Option	Option	Option	Yes
Bosch	GOF 1700 ACE	1700W	Option	Yes	Option	Option	Option	Yes
De Walt*	DW613	800W	Option	Yes	Option	No	No	No
De Walt*	DW621	1100W	Option	Yes	Option	No	No	No
De Walt*	DW625	1850W	Option	Yes	Option	No	Option	Yes
Einhell	EOF 850SP	850W	No	Yes	Yes	No	No	No
Elu*	MOF 96	750W	Option	Yes	Option	No	No	No
Elu*	MOF96E	900W	Option	Yes	Option	No	No	No
Elu*	OF97	900W	Option	Yes	Option	No	No	No
Elu*	OF97EK	1100W	Option	Yes	Option	No	No	No
Elu*	MOF 131	1300W	Option	Yes	Option	No	Option	No
Elu*	MOF 177	1600W	Option	Yes	Option	No	Option	Yes
Elu*	MOF 177EK	1850W	Option	Yes	Option	No	Option	Yes
Elu*	MOF 112	2000W	No	No	No	No	Yes	No
Festo	OF 900 Plus	900W	Option	Yes	Yes	No	No	No
Festo	OF 900 E Plus	900W	Option	Yes	Yes	No	No	No
Festo	OF2000 Plus	1800W	Option	Option	Yes	Option	Yes	Option
Festo	OF2000 E Plus	1800W	Option	Option	Yes	Option	Yes	Option
Freud	FT200E	1900W	No	Yes	No	Option	No	Yes
Hitachi	ZK 2008	550W	No	Yes	No	No	No	No
Hitachi	M8	800W	no	Yes	No	No	No	No
Hitachi	M8V	800W	No	Yes	No	No	No	No
Hitachi	M12SA	1600W	No	Yes	No	Option	No	Yes
Hitachi	M12V	1850W	No	Yes	No	Option	No	Yes
Holz Her	2355	800W	No	Yes	No	No	No	No
Holz Her	2356	1010W	No	Yes	No	No	No	No
Mafell	LO 50E	900W	Option	Option	Yes	No	No	No
Mafell	LO 65E	1800W	Option	Option	Yes	No	Option	No
Makita	3620	860W	No	Yes	No	Yes	No	No
Makita	3612BR	1600W	No	Yes	No	Yes	No	Yes
Makita	3612C	1850W	Option	Yes	Option	Yes	Option	Yes
Makita	3612	1650W	No	Yes	No	Yes	No	Yes
Metabo	OFE 1229 Signal	1200W	Option	Yes	Option	No	No	No
Metabo	OFE 1812	1800W	Option	Option	Option	Option	Option	Yes
Perles	OF 808	850W	No	No	Yes	No	No	No
Ryobi	RE 120	570W	No	Yes	No	No	No	No
Ryobi	R151	750W	Yes	Yes	Option	No	No	No
Ryobi	RE155K	800W	No	Yes	Option	No	No	No
Ryobi	R 502	1600W	Yes	Yes	Yes	Yes	No	Yes
Ryobi	R 600N	2050W	Yes	Yes	Yes	Yes	No	Yes
Ryobi	RE 600N	2050W	Yes	Yes	Yes	Yes	No	Yes
Skil	1875U1	1400W	No	Yes	No	No	No	Yes
Virutex	FR77C	850W	Option	Option	Yes	No	No	No
Virutex	FR78C	850W	Option	Option	Yes	No	No	No

Information is correct at time of going to press as supplied by manufacturers. If any new models become available please let us know.

Key: TR# = The Router issue tested; NYT = not yet tested by The Router; * = all Elu routers are to be replaced by new DeWalt equivalents — contact Black & Decker on 01753 576717; ** = tested as DeWalt 621.

Max. plunge	RPM	Soft start	Voltage	Spindle lock	Dust extraction	Weight	Test	Price
50mm (2in)	10,000 — 27,500	Yes	240V	No	No	3.3kg	NYT	£236
50mm (2in)	25,000	No	240V	Yes	No	2.5kg	TR1	£270
50mm (2in)	8,000 — 24,000	Yes	240V	Yes	No	2.7kg	NYT	£344
75mm (3in)	8,000 — 24,000	Yes	240V	Yes	Yes	5.2kg	TR3	£462
55mm (2 ¹ / ₄ in)	30,000	No	240V	No	Yes	3.0kg	NYT	£134
55mm (2 ¹ / ₄ in)	8,000 — 30,000	Yes	240V	No	Yes	3kg	TR2	£166
48mm (2in)	27000	No	240V	No	Yes	1.8kg	NYT	£123
52mm (2in)	27,000	No	240V	No	Yes	2.4kg	NYT	£132
52mm (2in)	12,000 — 27,000	Yes	240V	No	Yes	2kg	NYT	£184
50mm (2in)	12,000 — 24,000	Yes	240/110V	Yes	Yes	3.5kg	TR1	£327
60mm (2 ³ / ₈ in)	12,000	Yes	240/110V	Yes	Yes	4.8kg	NYT	£386
75mm (3in)	25,000	No	240/110V	Yes	Yes	5.7kg	TR2	£398
75mm (3in)	8,000 — 23,000	Yes	240/110V	Yes	Yes	5.8kg	NYT	£464
35mm (1 ³ / ₈ in)	27,000	No	240/110V	Yes	Yes	2.7kg	TR1	£233
55mm (2 ¹ / ₄ in)	8,000 — 24,000	Yes	240/110V	Yes	Yes	3.3kg	TR1**	£364
65mm (2 ¹ / ₄ in)	20,000	No	240/110V	Yes	Yes	5.1kg	TR3	£535
50mm (2in)	24, 000	No	240V	No	Yes	n/a	TR1	£152
55mm (2 ¹ / ₄ in)	24,000	No	240V	No	No	2.8kg	NYT	£270
55mm (2 ¹ / ₄ in)	8,000 — 24,000	Yes	240/110V	Yes	Yes	2.9kg	NYT	£329
55mm (2 ¹ / ₄ in)	24,000	No	240/110V	Yes	Yes	3.3kg	NYT	£282
55mm (2 ¹ / ₄ in)	8,000 — 24,000	Yes	240/110V	Yes	Yes	3.3kg	TR1**	£364
65mm (2 ¹ / ₂ in)	22,000	No	240/110V	No	No	4.8kg	NYT	£411
65mm (2 ¹ / ₂ in)	20,000	No	240/110V	Yes	No	5.1kg	NYT	£493
65mm (2 ¹ / ₂ in)	20,000	No	240/110V	Yes	Yes	5.1kg	NYT	£535
65mm (2 ¹ / ₂ in)	18,000	No	240/110V	No	No	7.3kg	NYT	£535
50mm (2in)	26,500	Yes	240V	Yes	Yes	2.7kg	NYT	£260
50mm (2in)	10,000 — 22,000	Yes	240V	Yes	Yes	2.7kg	TR1	£312
65mm (2 ¹ / ₂ in)	25,000	Yes	240V	Yes	Yes	5.1kg	NYT	£434
65mm (2 ¹ / ₂ in)	12,000 — 22,000	Yes	240V	Yes	Yes	5.1kg	TR3	£512
70mm (2 ³ / ₄ in)	8,000 — 22,000	Yes	240/110V	Yes	Yes	6.0kg	TR2	£340
52mm (2in)	27,000	No	240V	No	No	2.3kg	NYT	£143
50mm (2in)	25000	No	240V	Yes	No	2.7kg	TR1	£252
50mm (2in)	10,000 — 25,000	Yes	240V	Yes	No	2.8kg	NYT	£319
62mm (2 ³ / ₈ in)	22,000	No	240V	Yes	No	5.2kg	TR2	£390
62mm (2 ³ / ₈ in)	8,000 — 20,000	Yes	240V	Yes	No	5.3kg	TR3	£457
50mm (2 in)	25,000	No	240/110V	Yes	No	2.7kg	NYT	£267
50mm (2in)	8,000 — 25,000	Yes	240V	Yes	No	2.7kg	NYT	£329
50mm (2in)	10,000 — 22,000	Yes	240V	Yes	Yes	2.7kg	TR4	£229
65mm (2 ¹ / ₂ in)	8,000 — 20,000	Yes	240V/110V	Yes	Yes	5.5kg	TR4	£435
35mm (1 ³ / ₈ in)	24,000	No	240V	No	No	2.4kg	NYT	£203
65mm (2 ³ / ₈ in)	23,000	No	240/110V	No	No	5.7kg	TR2	£397
60mm (2 ³ / ₈ in)	9,000 — 23,000	Yes	240/110V	Yes	Yes	1.3kg	NYT	£467
60mm (2 ³ / ₈)	22,000	No	240/110V	Yes	Yes	5.8kg	NYT	£385
50mm (2in)	27,000	No	240/110V	Yes	Yes	3.4kg	TR1	£448
80mm (3 ¹ / ₂)	8,000 — 24,000	Yes	240/110V	Yes	Yes	5.1kg	TR3	£601
50mm (2in)	25,000	No	240V	No	No	n/a	NYT	£185
55mm (2 ¹ / ₄ in)	17,000 — 28,000	Yes	240V	Yes	Yes	2.2kg	NYT	£186
50mm (2in)	27,000	No	240/110V	No	Yes	2.8kg	NYT	£264
50mm (2 in)	10,000 — 27,000	Yes	240V	Yes	Yes	3.0kg	TR1	£292
60mm (2 ³ / ₈ in)	25,000	No	240/110V	No	Yes	5.0kg	NYT	£374
60mm (2 ³ / ₈ in)	23,000	No	240/110V	Yes	Yes	6.2kg	NYT	£398
60mm (2 ³ / ₈ in)	10,000 — 23,000	Yes	240/110V	Yes	Yes	6.2kg	TR2	£428
63.5mm (2 ³ / ₈ in)	8,000 — 22,000	Yes	240V	No	No	4.5kg	NYT	£316
50mm (2in)	24,000	No	240V	Yes	Yes	3.1kg	NYT	£182
50mm (2in)	8,000 — 24,000	Yes	240V	Yes	Yes	3.1kg	NYT	£223

Router contacts

Product	Company	Address	Tel	Fax
 AEG routers	Atlas Copco Tools Ltd	PO Box 79, Swallowdale Lane, Hemel Hempstead, Herts HP2 7HA	01442 61201	01442 240596
 Atlas Copco routers	Atlas Copco Tools Ltd	PO Box 79, Swallowdale Lane, Hemel Hempstead, Herts HP2 7HA	01442 61201	01442 240596
 Black & Decker routers	Black & Decker Power Tools Ltd	210 Bath Road, Slough, Berkshire SL1 1YD	01753 511234	01753 500843
 Bosch routers, cutters & accessories	Robert Bosch Ltd	PO Box 98, Broadwater Park, North Orbital Road, Denham, Uxbridge, Middlesex UB9 5HT	01895 834466	01895 838388
 CMT cutters & accessories	CMT Tools (UK)	8 Wainwright Road, Bexhill, Sussex TN39 3UR	01424 216897	01424 730674
 DeWalt routers & accessories	DeWalt Power Tools Ltd	210 Bath Road, Slough, Berkshire SL1 3YD	01753 567055	01753 521312
 Einhell routers	Blades	271 Botley Road, Burridge, Southampton, SO31 1BS	01489 885221	01489 885221
 Elu routers & accessories	Elu Power Tools Ltd	210 Bath Road, Slough, Berkshire SL1 3YD	01753 576717	01753 521312
 Festo routers, cutters & accessories	Minden Industrial Ltd	16 Greyfriars Road, Moreton Hall, Bury St Edmunds, Suffolk IP32 7DX	01284 760791	01284 702156
 Freud routers & cutters	Freud Tooling UK Ltd	Unit 3 Emmanuel, Trading Estate, Springwell Road, Leeds LS12 1AT	0113 245 3737	0113 243 8883
 Hitachi routers, cutters & accessories	Hitachi Power Tools	Precedent Drive, Rooksley, Milton Keynes, Buckinghamshire MK13 8PJ	01908 291166	01908 232868
 Holz Her routers	Toolpak (UK) distributor	Rhosddu Industrial Estate, Wrexham LL11 4YL	01978 291166	01978 290068

Product	Company	Address	Tel	Fax
 Mafell routers	NMA Agencies	34 Elmfield Road, Birkby, Huddersfield, West Yorkshire HD2 2XH	01484 531446	01484 432906
 Makita routers, cutters & accessories	Makita (UK) Ltd	Mitchigan Drive, Tongwell, Milton Keynes MK15 8JD	01908 211678	01908 211400
 Metabo routers & accessories	Draper Tools Ltd	Hursley Road, Chandlers Ford, Eastleigh, Hampshire SO5 5YF	01703 266355	01703 260784
 PERLES OF SWITZERLAND Perles routers & accessories	Toolpak (UK) distributor	Rhosddu Industrial Estate, Wrexham LL11 4YL	01978 291166	01978 290068
 RYOBI Ryobi routers & accessories	Ryobi Power Equipment (UK) Ltd	Pavillion 1, Olympus Park Business Centre, Quedgeley, Gloucestershire GL2 6NF	01452 724777	01452 727400
 SKIL POWER TOOLS Skil routers	Skil Power Tools	PO Box 98, Broadwater Park, North Orbital Road, Denham, Uxbridge, Middlesex UB9 5HT	01895 838743	01895 838802
 Titan Titan cutters & accessories	M & M Tools (UK)	8 Wainwright Road, Bexhill, Sussex, TN39 3UR	01424 216897	01424 730674
 Titman Titman cutters & accessories	Titman Tip Tools Ltd	Kennedy Way, Valley Road, Clacton-on-Sea, Essex CO15 4AB	01255 220123	01255 221422
 trend Trend cutters & accessories	Trend Machinery & Cutting Tools Ltd	Freepost, Penfold Works, Imperial Way, Watford WD2 4WD	01923 249911	01923 236879
 Virutex Virutex routers & accessories	Ney Ltd	Falkland Close, Charter Avenue Industrial Estate, Tile Hill, Coventry CV4 8UA	01203 694794	01203 695005
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BITS & PIECES

Company Name & Address	Telephone & Facsimile Numbers	Routers	Router Cutters	Jigs & Accessories	Sharpening	Extra Details
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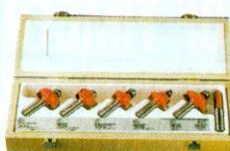
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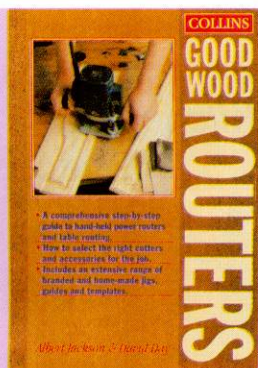
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Good Wood Routers

by Albert Jackson & David Day
HarperCollins, 1996
£14.95 Hardback, 128pp
450 colour illustrations and photographs

ISBN 0 00 412782 X

■ THE AUTHORS start with a brief introduction to a range of routers, covering what their components are called, how they work and what is needed to maintain them properly. This logically leads into a similar chapter on router cutters, with well laid out diagrams demonstrating their correct usage.

The pair have plenty of ideas on how to hold workpieces safely when routing them, and a chapter on guiding the router first covers how to use the side-fence properly. It follows this with two subjects which are often confusing to the beginner, the use of guide-bushes and bearing-guided cutters.

Useful advice on what to look for when buying or making router tables and lathes is also offered.

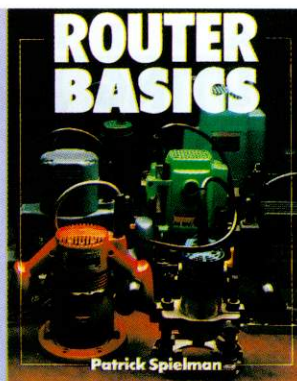
The authors delve competently into the use of home-made and bought-in jigs for cutting joints including housings, mortice and tenon, biscuit and dovetail, and also how to make templates for routing profiles.

Finally there is a chapter for applying these techniques for constructing simple unit furniture, and the subject of safety is well covered throughout.

The book is clearly laid out, with more than 450 colour diagrams and photographs. The text is well written and easy to understand, both for the beginner and the more seasoned router user looking for new ideas.

Just about every routing subject is covered in this book which could almost be titled 'Everything you wanted to know about routing but were afraid to ask'.

Alan Goodsell



Router Basics

by Patrick Spielman
Sterling, 1990
£8.99 Softback,
128pp, b&w

ISBN 0 8069 7222 X

■ IT'S JUST possible that you might not have heard of Patrick Spielman.

If this is the case, I should tell you that his first routing book, *Router Handbook*, sold about 600,000,000,000 copies – all right, I exaggerate, but it was a lot – in America alone, and pretty much established the tool and its use there, so he knows his stuff.

To save time, here's what this book isn't – it isn't colourful, glossy, well-photographed or illustrated.

Other than that, it's fine. The pages are packed with useful stuff for the beginner, and Spielman really does answer most of the questions that the newcomer is likely to ask about routers, cutters, joints, safety and so on, as well as throwing in a few instructional projects like a workbench – teaching mortice and tenons – a bookcase – teaching rebates, grooves and rounding-over – and a dead simple router table.

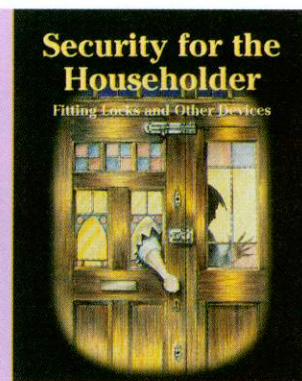
I would expect this book to be covered in workshop tea stains and dust for most of its life, so the dingy production isn't the issue.

Where it scores is as a good, affordable, basic tutor to be kept by the bench.

Paul Richardson

■ All books can be ordered through:

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Security for the Householder

Fitting Locks and Other Devices
by Eddie Phillips
GMC Publications, 1977
£12.95 Softback, full colour, 128pp

ISBN 1 86108 060 3

■ EVERY NOW and again the thought must have crossed most people's minds of coming home to a burgled house or workshop. Never mind the mess and loss of property, but the traumatic experience of invasion of personal space is a horrible contemplation.

I suspect that all of us ought to fit at least some of the hardware covered here, especially in workshops full of essential tools and expensive equipment.

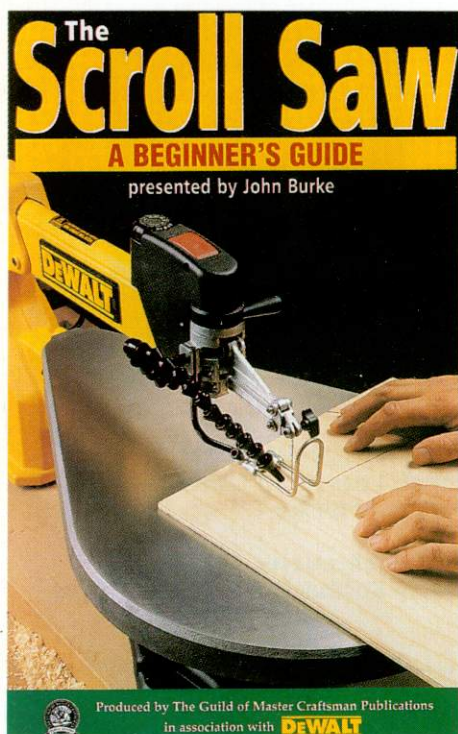
This is a book for everyone and could at least offer some peace of mind. Many people might think that improving the security of their homes would be an expensive operation that could only be undertaken by professionals. This handy little book proves that, with a basic kit of tools, this simple task need not cost an arm and a leg.

Commendably it looks at what to fit where and why, covering the construction strengths and weaknesses of different types of doors and windows. It starts with a basic range of simple bolts and window locks and devotes a whole chapter on fitting a mortice lock.

The author provides step-by-step clear, well thought out instructions and drawings for the fitting of the many different types of hardware covered.

The photography is all colour, clear and explicit. The book successfully debunks the mystery of fitting locks and security items for the beginner as well as offering some useful tips for the more experienced.

Colin Eden-Eadon



The Scroll Saw A Beginner's Guide Presented by John Burke

GMC Publications, 1998
£17.60 including VAT,
VHS or NTSC, 56 minutes

ISBN 1 86108 073 5

■ THE USER-FRIENDLINESS of the scroll saw makes it immediately accessible to those who are not necessarily woodworkers and who might find other machines a little daunting.

It has the added attraction of not needing much space, and enabling a project to be finished speedily.

Also of use to the professional, the scroll saw can be used for some types of marquetry. The range of things it can help you accomplish is really only limited by users' imagination and experience.

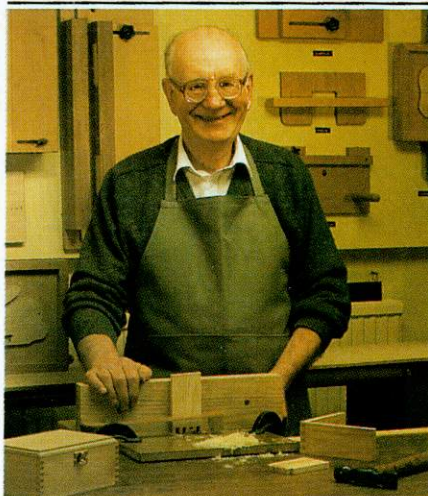
John Burke guides beginners from setting up and blade choice through to making a variety of projects.

The close up shots are particularly good in demonstrating blade-break avoidance. The five projects start from simply cutting out an outline of a plywood letter of the alphabet and include making a small box.

This video achieves exactly what it sets out to do - explaining to the novice, with the help of some examples, the basic techniques to be adopted and safety to be observed - with simplicity and clarity.

Colin Eden-Eadon

VIDEO 5 MAKING ROUTING JIGS AND GADGETS BY ROY SUTTON



Making Routing Joints and Jigs Presented by Roy Sutton

Produced by Fine Grain
Productions Ltd, 1991
£19.90 including VAT,
55 minutes, VHS
ISBN 1 86108 004 2

■ IN THIS, Roy's fifth video in his woodworking series and the third on the subject of routing, he tells you how to make your own jigs, including a cross-grain housing or grooving jig, a tenoning jig and a combing jig - and his famous router table.

A small booklet enclosed in the video case with drawings and instructions backs up Roy's clear demonstrations, and avoids the need to nip back to the living-room for a re-cap.

He shows the hand tools required to make the jigs along with the powered alternatives he favours, and a selection of gadgets, including centre finder, base-plate extension and pushblocks; as their construction is self-explanatory they make only a briefly appearance.

I liked this video as it addresses what I feel is the fundamental appeal of routing: the ability to make a router achieve an incredible variety of tasks by creating simple, cheap and easy to make jigs for it.

For even more jigs check-out Roy's book *Jig Making for the Router*, published by Fine Grain Productions.

Alan Goodsell

Joining Kitchen Worktops



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trend
routing technology

Joining kitchen worktops Trend Machinery & Cutting Tools, 1997

£2.95 VHS, 15 minutes

■ I WAS impressed with some of the 3D computer modelling and animation in this video. I know that the boys at Trend have a particular interest in this subject, and it shows.

Shame about the music - Kraftwerk meets '70s children's television - but otherwise production standards are high.

I mention this because it matters. Woodworking videos still tend to the 'let the subject speak for itself' school, and the sooner they improve the better.

It could be said that this subject would be hard pushed to speak for itself, though. I've joined a few kitchen worktops in my time, using self-made jigs, but don't try to entertain visitors with anecdotes about it.

Here we see the principle clearly illustrated: 90° corner and peninsular joints, double-45° corners and out-of-square joints are all covered briefly, using Trend jigs and other products, including biscuit joint cutters and pull-together connectors.

Don't hold this against the video, for £2.95 and 15 minutes it's no rip off.

Paul Richardson

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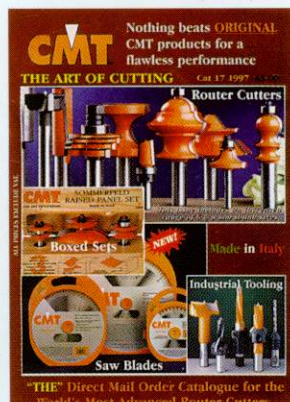
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