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AUGUST 1993 ISSUE 10 £1.95

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(See below for details)

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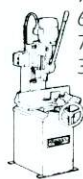
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(Send for Catalogue showing full range)	

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MHB90 4" Belt Sander	232.00
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Black & Decker P7505 6"	53.00
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Record 6" with 1" wide wheels	59.95
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Nutool SDC2042 2hp	328.00
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GVW386 90ltr 2 motor	399.00
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Saturday 28th August

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FB-005 3/4" Forstner Bit	6.30
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FB-007 1" Forstner Bit	8.00
FB-008 1 1/8" Forstner Bit	8.80
FB-009 1 1/4" Forstner Bit	9.00
FB-010 1 3/8" Forstner Bit	11.40
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FB-013 1 3/4" Forstner Bit	15.00
FB-014 1 7/8" Forstner Bit	16.00
FB-015 2" Forstner Bit	17.50
FB-016 2 1/8" Forstner Bit	19.90
FB-100 16 Piece Forstner Bit Set	149.00
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BOSCH DIY

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PS208V Orbital sander 1/2 sheet	69.95

MISCELLANEOUS

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Find out which router cutters will be of use in your workshop, with our guide



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Table tennis 44

How to make a table tennis table and optional trestles

COMPETITION

WIN A 320-page book of world woods – 24

CONTACT US

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☎ 0458 74011

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Your chance to pick up a bargain or sell off something you no longer use



If you took a straw poll of woodworkers I'd guess the majority have, like myself, little or no formal training with wood. Most of us have learned by scouring books and magazines, and by considerable trial and error at the bench.

I concluded once that the best way to find out how to work with wood is to visit a junk yard, buy some run-down pieces and take them home for repair. You soon learn the principles of good and bad making. I continue to believe that it is a valid method, and our in-depth study of a country chair (p.41) is a step in that direction.

However, after visiting a short course recently, I can see the benefits of spending a few days with a skilled woodworker, sharing the experiences of others. The range of short courses is growing fast, and has reached bewildering proportions. So we have produced a guide on p.51 that will take you through the vital stages of choosing which course to attend.

Nick Gibbs

ON TEST

7 Minitests

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What do you get for less than £100 when you buy a drill? Which is the best? We answer your questions and more



DUST MASKS ON TEST

HELPING YOU BUY THE BEST



News

News editor Rob Ashton reports on the world of woodworking today

Why I built a 32ft guitar

THE biggest guitar in the world – it is 32 feet long and weighs three-quarters of a ton – has been completed and is now on show.

The giant guitar is part of the Stradivarium, a museum of music and sound in Bristol. It was delivered by crane and is so big that visitors can climb inside and explore the way it vibrates when it is played.

It took a group of five

musical instrument specialists two months to build, using plywood, MDF, 32 sheets of hardboard and some 25 litres of PVA glue. The guitar strings are made of high-tensile steel ship's rigging.

Although the guitar is 1000 times bigger than the Stradivarian instrument on which it is based, it is quite faithful to the original, which is in the Ashmolean Museum

in Oxford. While the original instrument's bridge is glued on, that of its giant cousin is secured with coachbolts. And the pull of the strings on the guitar's neck is around two tons.

Despite this, Chris Challen, whose brainchild it is, says there is nothing crude about the massive music-maker. "It is



Musical instrument maker Chris Challen's giant guitar weighs three-quarters of a ton and is 32 feet long. It had to be hoisted into the Exploratory's third floor using a Balfour Beatty road construction crane

quite a sensitive instrument," says Chris. Like the original, which was built in 1680, the guitar has five strings, which was the preferred number at

that time. Chris wanted to build something that would give visitors to the museum a sensation of the energy involved when a musical instrument is played.

By standing inside and plucking the steel strings, museum visitors can feel the vibration of the front and back of the guitar's body, while the sides stay still.

It is so big that a whole classroom of children can

Woodworker opens gallery of his own

WOODWORKERS in west Dorset will soon have a new gallery to visit that is devoted to high-calibre crafts.

Parnham-trained Ronald Emmett is opening a workshop and showroom on 30th July in the Square in Beaminster, after converting it from an 18th century house and shop. Ronald's gallery will concentrate on the upper end of the crafts market.

As well as housing displays of his own pieces, the new gallery will provide somewhere for craftspeople to exhibit and sell their



Ronald Emmett's graceful table uses contrasting timbers to achieve an elegant overall effect

own work and a venue for the occasional one-person exhibitions.

Initially it will be open from 10.30 to 5.30 on Fridays and Saturdays only, although these times may be extended if the demand is sufficient.

Trade ban could timber shortage

A TIMBER trade dispute between Canada and the European Community could lead to a shortage of some wood in Britain.

The EC recently banned imports of timber from Canada that had not been kiln-dried, in an attempt to control a parasitic worm that is native to north America and eats wood. Although the worm does not harm trees in America, when it was accidentally introduced to Japan in the 1980s it caused a disease called pine wilt, killing many trees.

The Canadians say that stripping the bark from the trees before they are exported is enough to control the beetle that transmits the disease. But the EC

disagrees and has banned the import of pine that has not been heat-treated to 56°C for thirty minutes to kill the beetles.

Timber importers in Britain deny that this will have any impact on the cost of timber, blaming any price increases in a fall in the value of the pound against the dollar. "As soon as a producer has to do something extra, people will shout from the rooftops," said Charles Norman of the Timber Trades Federation. He added that currency fluctuations meant that it was now cheaper to buy Scandinavian timber anyway.

Michael Clarke of the Canadian High Commission disagrees, claiming that



Fine high-backed chair is among Ronald's work on show



The world's biggest guitar is 1,000 times larger than the 300-year-old Stradivarius on which it is based. A whole class of children can stand inside

stand inside. The guitar's designer describes it as "like looking at an instrument through a magnifying glass."

The Stradivarius is part of the Exploratory hands-on science centre. For more details, contact the museum on 0272 252008.

cause in UK

shipping kiln-dried timber below decks to keep it dry cost UK manufacturers an extra £17million last year.

"Why, after shipping timber for 250 years, is it suddenly a problem?" he said, adding that Canada is the only exporter of long lengths of hemlock, Douglas fir and spruce, and that many producers do not have access to kilns.

Collector calls for old tool enthusiasts

A TOOL collector is setting up an informal group for woodworkers who share his enthusiasm for tools.

Clwyd-based Chris Pollard is forming Antique Tool Collectors, a free organisation for woodworking tools enthusiasts nationwide.

"There are an awful lot of collectors in Britain," Chris says. "Someone in, say, Cornwall, may not realise that there are people all over the country who share

his interest in old woodworking tools."

Chris's new group will be independent of the Tools and Trades History Society, and it aims to concentrate more on collecting antique tools than on researching their history.

Regular meetings for swapping tools are planned once a directory of collectors' addresses has been built up. For more details call Chris Pollard on 0745 833876.

GARDEN SHED CULTURE IS "ALIVE AND WELL"

WHEN Auntie went down to the bottom of the garden last month – in a BBC survey of sheds – she discovered many men still retreat there from their wives.

The tongue-in-cheek workshop census for Radio 4's *This Island Now* programme hoped to lift the lid off Britain's wooden hideaways. In the absence of a national sheds council, and any form of government statistics, the programme aimed to discover just what type of people regularly run away to a wooden cubbyhole... and what they get up to while they are there.

What the Radio 4 survey found was that the traditional British garden shed remains mostly the preserve of men, especially in the north west of England. A whole sub-culture is thriving at the bottom of the nation's gardens, with the shed at its centre. Garden sheds were found to be used for anything from woodworking to playing with model trains and raising guinea pigs.

Ray Gosling, the programme's presenter, described the shed as: "The working man's laboratory, the place of germination, preparation and craft."

Not that there's anything trendy about the garden shed culture, which Mr Gosling describes as being, "as unfashionable as a pint of mild and an ounce of shag."

Younger shed enthusiasts are a little more liberally minded, and their workshops are not such a male preserve. But, though they may swap brogues for trainers and a cardigan for a sweatshirt, they can still be found in their dens in the morning and at night.

But the garden shed recluses are in good company. The writers Dylan Thomas and George Bernard Shaw are both said to have regularly hidden away at the foot of their respective vegetable patches, seeking some creative inspiration in their solitude.

New standard for handsaws

THE British Standard for handsaws has been updated to include advice against resharpening hardpoint teeth.

Beginners often make the mistake of trying to set and sharpen the teeth of hardpoint saws, despite the danger

of the teeth snapping off and potentially causing injuries. The standard also includes advice on saw selection and now requires makers to protect saws against corrosion. For details contact BSI 0908 220022.

DIARY

Edessia Aghajanian
Until 25th July
Model House Craft and Design



Edessia Aghajanian's painted lime 'dragon on a swizzle stick'

Centre, Bull Ring, Llantrisant, Mid Glamorgan. First exhibition in Wales of hand carved and painted automata by the award-winning woodcarver.

Open 10-5 every day except Mondays. Admission free. 0443 237758

Jeff Soan, Toymaker

Until 21st August
Aberystwyth Art Centre, Penglais, Aberystwyth, Dyfed.
Now woodworkers in west Wales have a chance to see the articulated toys of this talented craftsman.
Open 10-5, Monday-Saturday and on nights of arts performances. Admission free. 0970 622822

New Designers in Business

15th-18th July 1993
Business Design Centre, Islington, London. Includes *One Year On* – work by more than 20 new designers who exhibited last year and have since set up in business.
Open Thursday 10-6.30, Friday and Saturday 10-6, and Sunday 10-4. Admission £6, OAPs and children £4.50. Trade entrants free. 071 359 3535

Made to Commission – Parnham at Sotheby's

21st-28th July
Sotheby's, 34/35 New Bond St, London W1.
Exhibition of work by John Makepeace, incorporating the debut of the latest crop of graduates from his Parnham College.
Open 9.30-4.30
Monday-Friday, late opening until 7.30 on Wednesday. Admission free. 071 493 8080

Fifth Craft and Cider Country Fayre

24th and 25th July
Sheppy's Cider Farm, Bradford-on-Tone, Somerset.
Includes work by woodturner Derek Bateman and a demonstration by pole-lathe turner Dick Apps, as well as entertainment, including not just one but two Appalachian clog-dancing groups!
Open 10.30-6. Admission £2.50, children £1 and families £6. 0984 23053

Crafts at Springtime

30th July-2nd August
Earshall Castle, St. Andrews, Fife.
Includes work by the woodturner Jules Tattershall, who uses mostly burr wood from Britain and Australia, and the furniture-maker Colin Pearce.
Open 10-6 daily. Admission £2, concessions for OAPs and children. 0427 753040

Sculptree '93

8th-14th August
Longleat House, Maiden Bradley, Wiltshire.
Demonstration of carving 3x1m (10x3ft) redwood blocks by a group of 10 sculptors. More than 40 other carvings will also be on display. Auction of work on 15th August, with some proceeds going to TreeAid to promote tree planting in sub-Saharan Africa.
Open daily 10-6, admission £2. 0594 822275

Woodturning Seminar

13th-15th August
Loughborough College of Art and Design, Loughborough, Leicestershire. International event organised by the Association of Woodturners of Great Britain, featuring a variety of turners including Good Woodworking's Tobias Kaye. Only a few places left when we went to press but 'phone in case of cancellations.
AWGB members £150, others £220, including accommodation and meals. 0620 4555

Chris Stott

21st August-5th September
Apple Craft Centre, Macknade, Selling Road, Faversham, Kent. First ever one-man show of work by the well-known woodturner, featuring more than 60 items.
Open daily 10-5, admission free. 0795 590504



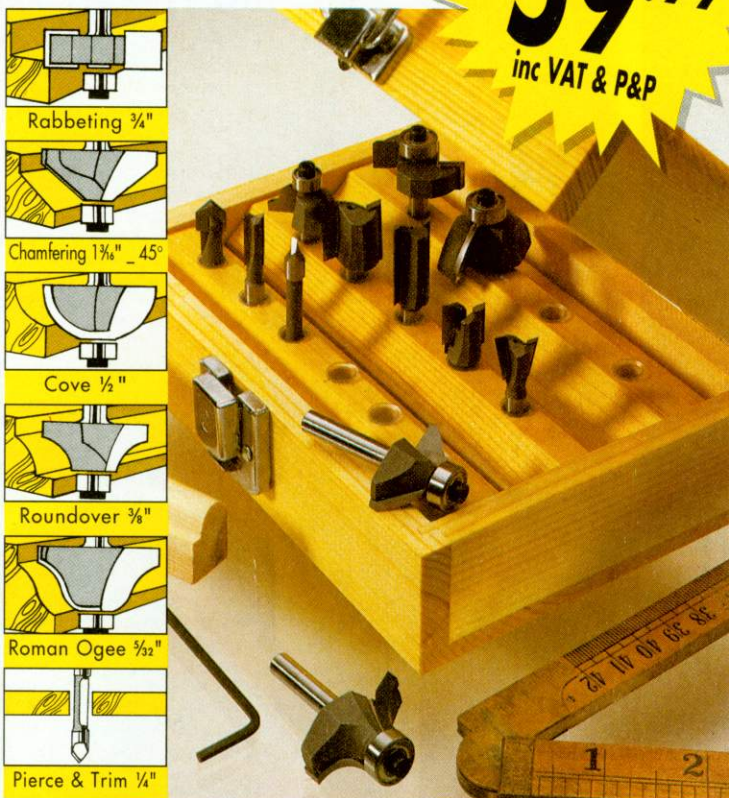
Toymaker Jeff Soan's articulated pieces are on show in Aberystwyth Art Centre until 21 August

Although all details were correct when we went to press, it is always advisable to make a quick telephone call before you set off for an exhibition or an event, to check that the dates and opening times have not changed

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GW

perfick

Not long ago it would have taken a seven year apprenticeship with a first class firm of printers for one to come up with the galley proof for an advert such as this. Now it can be done on an AppleMac after an afternoon's headscratching. Logical, Easy to set, Versatile, Accurate, and Quick, with a huge range of capabilities. There's little you can't do with it.

Things have moved on in the workshop too. Now you don't need a seven year apprenticeship to do superb Cabinet-making either. With a bench and good hand tools, a Router and a

WOODRAT

you can make dovetailed drawers and panelled doors as well as anyone, Oh! It's sad to see the old order going, but that's the price of progress. Mind you, if you have a well equipped workshop and a seven year apprenticeship....That's quite another story.

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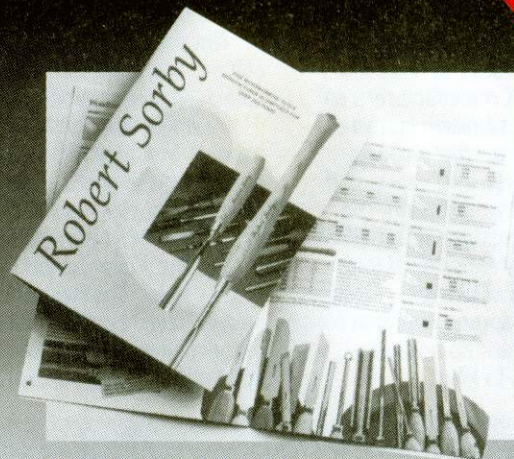
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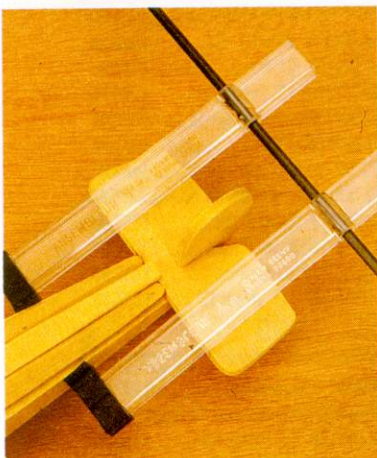
- Woodworking tools.
- Woodturning tools.
- Woodcarving tools.

For NEW literature contact:

Robert Sorby Ltd

Athol Road. Sheffield S8 0PA. England.
Telephone: 0742 554231 Fax: 0742 500675

Berna clamps



MADE in France, Berna Assembler clamps are quite unlike traditional woodworking tools. They are made of plastic and carbon fibre and come in a variety of sizes and weights. I tried the lightweight Hobby clamps, the smallest in the range.

A pair of polycarbonate jaws slide freely on the 2mm (1/16in) carbon fibre rod. Unlike a G or F clamp there is no screw thread or lever tightening mechanism. The jaws are simply slid into place on the work with one hand and tightened by applying finger pressure. It is the bending of the rod that creates the pressure.

Flexible rubber pads protect the work and allow clamping of uneven and curved surfaces. You can remove and reverse these pads easily so the clamp can act as a spreading tool. Length capacity is 152mm (6in) and a maximum throat depth of 76mm (3in) possible. Included are connectors for extending the rods.

Berna Assemblers are not intended to replace conventional clamps – they are far too lightweight. The carbon fibre will only withstand a certain amount of flexing, as I discovered when I managed to snap one in half. When they do break the fibre rod splinters into a mass of needles. We were, however, testing them to the limit, and failure is unlikely to happen normally.

These clamps are ideal for dolls' house and musical instrument makers, and for modellers for whom light pressure is often required on delicate objects. You can only use a certain amount of pressure before the jaws slip apart, so you should not be able to damage small items.

Restorers will find them invaluable for awkward shapes and small bits of veneer and inlay. With the connectors the cramps can be combined for complex clamping jobs. The rubber pads are soft, and will not mark the wood, nor will they react with PVA. They do not stick to PVA, so you do not need a paper gasket. I can imagine them being used for holding small items when soldering, but insulate the pads from the heat.

The large ones are of limited use, as pressure is just as light, though the throat and length are greater and they will be stronger. But they also cost much more.

Performance ●●●●○
Value for money ●●●●○
RRP inc VAT: £9.95 for three
Contact: Hardi ☎ 0923 774134

Minitest



Phil Davy opens all our parcels of new products, and tests them for performance and value for money

Our policy at Good Woodworking is to rigorously test all products sent to us and not to reprint press releases

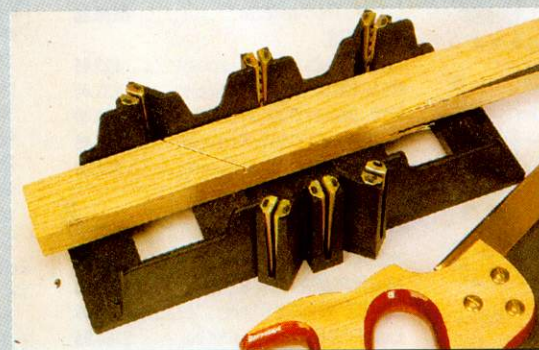
Betacraft Mitre Box

THE French-built Betacraft mitre box is designed to overcome inaccurate saw cuts due to wear in the slots of conventional mitre boxes. Many people make their own box and either recut the slots further along the edge, or throw it away and make another when the slots are worn.

A lip on the rigid plastic frame allows you to hold the box simply in place against the edge of a bench. Holes are provided for screwing it to a base.

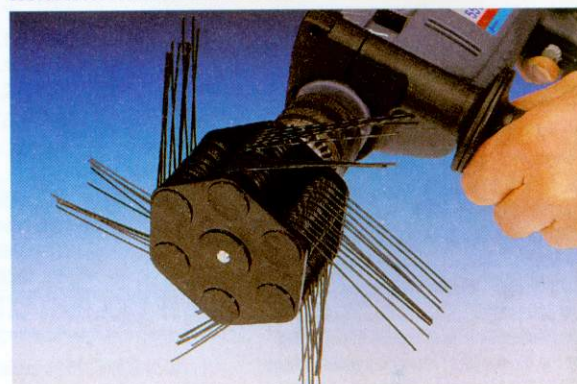
The Betacraft differs from other products in that it has 10 metal ball bearings in each slot, offering free movement but no side play. I tried several different saws with the box and reached the conclusion that a cheap hardpoint saw is best. Teeth could become dulled as the saw is placed in

Performance ●●●●○
Value for money ●●●●○
RRP inc VAT: £14.69
Contact: ICS ☎ 0494 681772



the slot, and the ball bearings scratch the sides of the blade. This is an interesting, innovative device.

Easy Stripper



WE were intrigued by an advertisement in one of the Sunday papers for this sanding device. Made in America, the Easy Stripper is designed to strip paint and descale rust and is available in coarse and fine grades. It consists of a hexagonal drum that is mounted in a power drill, with banks of thin, slightly flexible steel rods protruding from each of the corners.

We tested it on old pews covered in layers of paint, but you have to deburr it on concrete for a couple of seconds before use on wood. Once deburred, the tool works very efficiently. It stripped off several layers of paint faster than any other method I have tried. A major disadvantage, however, is not being able to see the end of the rods when they are rotating at speed.

On flat and convex surfaces the fine grade produced a finish that needed some final sanding. It was more difficult to control on concave curves, and is not for faint-hearted woodworkers!

Performance ●●●●○
Value for money ●●●●○
RRP inc VAT: £22.90 each
Contact: Interwood ☎ 0245 491611

Black & Decker BD780 router



BLACK and Decker have added two new routers to their range, the BD780 single speed and the BD780E variable speed model. Both have guide templates and fence rods interchangeable with the small Elu routers.

I tried the single speed version which has a 600W (input) motor. Like the Black and Decker BD66 router (GW 5:69), the BD780 has a detachable motor housing and a 43mm (1 1/16in) diameter collar. The base is diecast aluminium and has a plastic laminate surface to prevent scratching of the work surface.

You depress a plastic thumb lever for plunge locking. This is well placed alongside one of the handles and is easily flicked up to withdraw the cutter. A single spanner and spindle locking button are used for cutter changing.

You rotate a plastic three-position

turret located on the base for pre-determined depths. This is spring-loaded and easy to set. The solid hexagonal depth rod is tightened with a thumb screw and is clearly graduated, but only imperial, and is easily dented.

A dust take-off spout is provided as well as a copy follower, straight fence, circle pin, guide template and three collets: 6mm, 1/8in and 8mm, but you will have to search the box to find them!

The BD780 is easy to operate and cutter visibility is good. The slider switch is fairly easy to reach in an emergency, but not as good as some.

Performance ●●●●○
Value for money ●●●●○
RRP inc VAT: £79.95
Contact: Black & Decker ☎ 0753 500805

AXMINSTER POWER TOOL CENTRE

ROUTERS

Our Price inc VAT

Elu MOF 96 1/4" 700W.....	£134.95
Elu MOF 96E 1/4" 900W.....	£164.95
Elu MOF 131 1/4" 1300W.....	£219.95
Elu MOF 177 1/4" 1/2" 1600W.....	£259.95
Elu MOF 177E 1/4" 1/2" 1850W.....	£289.95
Hitachi M8 1/4" 800W.....	£137.19
Hitachi MBV 1/4" 800W var / speed.....	£168.27
Hitachi M12SA 1/4" 3/8" 1/2" 1600W.....	£199.00
Hitachi M12V 1/4" 3/8" 1/2" V/S.....	£258.01
Ryobi R150 1/4" 750W.....	£114.95
Ryobi R500 1/4" 3/8" 1/2" 1600W.....	£189.95
Ryobi RE600 1/4" 3/8" 1/2" V/S.....	£229.95
Bosch POF500A 1/4" 500W.....	£83.17
Bosch GOF1600A1/4" 1/2" 1600W.....	£242.34
Bosch GOF1700ACE 1/4" 1/2" 1700W.....	£271.42

ROUTER ACCESSORIES

Our Price inc VAT

Height Adjuster MOF 96 / 96E.....	£7.93
Side Fence Adjuster Short Reach 96 / 96E.....	£7.93
Elu Height Adjuster 131 / 177.....	£24.05
Elu Dovetail Kit c/w TCT Cutter.....	£87.24
New Elu 24" Dovetail Jig.....	£149.95
Elu Accessory Kit 96 / 96E.....	£92.53
Elu 551 Router Combi Bench.....	£187.06
Luna Router Table.....	£210.44
Record RPR60T Router Table.....	£242.04
Trend Routerack.....	£133.24
Trend Router Lathe (carriage £6.50).....	£119.95

For the full range of router accessories and spares see our new 208 page catalogue

ROUTER CUTTERS

Axminster Power Tool Centre Router Catalogue including our new range of low cost economy tungsten carbide router cutters. Available Now with the lowest prices around, send for your FREE copy.

SPECIAL OFFER 12 piece TCT

Router bit set £59.95 **APTC**

Inc VAT P&P as currently advertised in Woodworker

BORING BITS

Our Price inc VAT

Size	APTC 6" Sawtooth	CLICO Sawtooth	Freud style 4" Forstner
1/4" 3/8".....	-	-	£3.95
1/2".....	£6.76	£12.00	£3.95
5/8".....	£7.31	£13.16	£6.20
3/4".....	£8.16	£14.33	£6.20
7/8".....	£8.57	£16.20	£7.40
1".....	£9.63	£17.66	£7.40
1 1/8".....	£10.67	£19.30	£8.40
1 1/4".....	£11.64	£23.53	£8.40
1 3/8".....	£14.95	£24.64	£12.50
1 1/2".....	£16.55	£25.91	£12.50
1 5/8".....	£18.11	£29.87	£13.50
1 3/4".....	£19.07	£33.95	£16.00
1 7/8".....	£21.15	£37.54	£16.00
2".....	£21.84	£39.81	£16.00

Imported Forstner Bit sets .. 7pce £42.00 16pce £125.00

APTC Saw Tooth Sets 1/2" 3/4" 1".....

APTC Saw Tooth Sets 1/2" 3/4" 1" 1/4" 1 1/2".....

APTC Saw Tooth Sets 1/2" 3/4" 1" 1/4" 1 1/2" 2".....

APTC Saw Tooth Sets 13 Piece Set.....

Adjustable Forstner Bits

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Heavy Duty 7/8"-2".....

APTC 8 Piece Forstner / plug cutter set.....

25 Piece Drum sander kit in box

Only £15.95 Inc VAT P&P

SPECIAL OFFER

DUST EXTRACTORS

Our Price inc VAT

APTC APW1000DE 1HP 1000M³/Hr.....	£159.95
APTC APW2000DE 2HP 2000M³/Hr.....	£299.95
APTC APW3000DE 3000M³/Hr 2 Bag.....	£449.95
Elektra DMX1000 1/2HP 1000 M³/Hr.....	£169.95
DeWalt DW501 Chip Extractor.....	£269.95
DeWalt DW611 Dust Extractor.....	£360.87
Record Power DX500 1000M³/Hr.....	£179.95
Record Power DX750 1300M³/Hr.....	£209.95
WV2 Fine Dust Extractor.....	£379.95
WV3 Fine Dust Extractor.....	£551.00
WV4 Fine Dust Extractor.....	£684.00
WV2000 Fine Dust Extractor.....	£475.00

DUST EXTRACTION ACCESSORIES

Our Price inc VAT

Hose / Metre	3"	4"	4.5"	5"
Clear.....	£8.40	£11.40	-	-
Grey (General Purpose).....	£8.20	£11.20	£13.30	£15.30
Heavy Rubber.....	£9.45	£12.75	-	£17.50
4"-2" Reducer.....	£4.50	4"-3" Reducer.....	£4.50	
4" Pipe to Soil Pipe Adaptor.....	£7.99			
Alloy Blast Gates 4".....	£8.95			
Plastic Blast Gate 3".....	£6.95	4".....	£6.95	
Flanged Spigots to make hoods 4".....	£9.86			
Hose Clips 3".....	£0.66	4".....	£0.72	
5".....	£0.90	6".....	£1.07	

POWER TOOL DUST EXTRACTORS

Our Price inc VAT

Numatic XP380 15 Ltr capacity.....	£199.00
Numatic XP750 35 Ltr capacity.....	£277.00
Numatic XP750D 35 Ltr capacity.....	£326.00
Elu 928 30 Ltr capacity.....	£230.00
Elu 938 38 Ltr capacity.....	£371.00
Elu 948 48 Ltr capacity.....	£515.53

Full range of power tool extractor spouts in stock

APOLLO SPRAY UNITS

Our Price inc VAT

Apollo DIY 400 spray unit.....	£111.03
Apollo DIY 600 spray unit.....	£177.66
Apollo 700 Professional spray unit.....	£300.33
Apollo 800 Professional spray unit.....	£399.73

TCT CIRCULAR SAW BLADES

OMAS QUALITY Our Price inc VAT

Size of Blade	Rip	G/P	Fine	ExFine
8" 200mm	16T £25	32T £23	48T £28	64T £34
9" 225mm	-	36T £25	56T £33	72T £38
10" 250mm	20T £28	40T £29	60T £35	80T £42
12" 300mm	24T £26	48T £31	72T £41	96T £48
14" 350mm	28T £32	56T £36	84T £48	108T £56
16" 400mm	32T £39	64T £46	96T £56	128T £72

State bore size when ordering

CIRCULAR SAWS

Our Price inc VAT

Hitachi C7U 7" TCT 1150W.....	£155.32
Hitachi C9U 9" TCT 1750W.....	£186.39
Elu MH151 6" TCT 850W.....	£132.45
MH85 9" TCT 1600W.....	£233.95
Ryobi W6402C 7" 1450W.....	£134.95
Ryobi W8402C 9" 1750W.....	£185.06
B&D P3703 7" 1020W.....	£79.95

For suitable replacement power tool TCT blades contact APTC Sales Office or see new catalogue

PALM SANDERS

Our Price inc VAT

Elu MVS500 135W 80 x 132 mm.....	£74.55
Hitachi SV12SA 180W 110 x 100 mm.....	£76.39
Makita B04510 160W 112 x 100mm.....	£61.69

FINISHING SANDERS

Our Price inc VAT

Elu MVS94 1/2 Sheet fine orbit.....	£158.62
Elu MVS47 1/2 Sheet large orbit.....	£202.25
Bosch GSS 28 1/2 Sheet.....	£128.66
Bosch GSS 28A 1/2 Sheet.....	£147.17
Hitachi SV12SE 300W 1/2 Sheet.....	£119.95
Hitachi SV12SD 300W c/w dust bag.....	£137.20
Makita 9045N 520W 1/2 Sheet.....	£145.58
Makita 9036 180W 1/3 Sheet.....	£62.51

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AS406 4" belt 6" disc 1/3 HP.....	£79.95
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AS612 6" belt 12" disc 2HP Bch Mtg.....	£425.60

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Elu Inversion stand for 157 sander.....	£46.94
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Elu MHB90K 4" sander c/w frame.....	£279.95
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Hitachi SB10T 4" 950W sander.....	£206.24
Bosch PBS75 3" 620W sander.....	£110.59
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SPECIAL OFFER Freud JS1000 500W	
Jointer C/W 500 mixed biscuits (P&P 95).....	£129.00
Ryobi JM100K 600W Jointer.....	£199.95
Elu DS140 600W Jointer.....	£239.95
Lamello Junior 650W.....	£316.19
Lamello Top Ten 650W.....	£446.26

BISCUITS

No 20 Biscuits (1000 off Lamello).....	£22.45
No 10 Biscuits (1000 off Lamello).....	£21.46
No 0 Biscuits (1000 off Lamello).....	£20.40
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Mixed Biscuits (500 off Lamello).....	£14.50

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Hitachi P20SA 720W 82mm.....	£142.38
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Elu MFF80K as above in kit box.....	£164.95
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Hitachi CJ65 V2 570W.....	£176.85
Elu ST152E 420W Variable speed.....	£146.78
Bosch GST60 PBE 550W.....	(P.O.A)

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NEW APTC FS16B 16" (double pivot) & blower £134.95

APTC FS400 16" Fretsaw (double pivot).....	£134.50
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Scheppach HF33 3 speed.....

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DeWalt DW8101 12" Radial saw 24"CC.....	£916.14

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Multico PM12C Bench Morticer.....	£255.00
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Genuine Japanese Chisels & Bits

1/4" £23 3/8" £25 1/2" £28 5/8" £33 3/4" £47

All Bits & Chisels in stock phone for details

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Startrite Super 260 Combination.....

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Record DML 24 24" Ctrs	£159.95
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Coronet No 1 36" Ctrs	£455.00
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Graduate 42" Ctrs	£2133.00
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Kity 664 42" Ctrs Vari-Speed	£840.12
Coronet CLB22 Bowl Lathe	£299.00
Carbidec Mini Lathe 240v	£229.00
Tyme Little Gem	£225.00
Tyme Cub 20" 3/4HP	£480.00
Tyme Cub 30" 3/4HP	£499.00
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Tyme Avon 36" 1HP	£699.00
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WOODTURNING AIDS

	Our Price inc VAT
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CLB22A Floor Standing Tripod Rest	£66.97

To suit all makes of lathe unless specified

1 1/2" Woodscrew Chuck	£31.95
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4" Steel Faceplate (Not Mystro or Graduate)	£17.73
6" Steel Faceplate (Not Mystro or Graduate)	£23.50
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The above RH/LH Face plates will only suit the Graduate, Jubilee & Rockwell Delta Lathes

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2MT Revolving Centre	£23.95
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3/4" Drill Chuck Threaded 3/4" x 16	£29.95
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5/8" 4 Prong Drive Ctr 1MT / 2MT	£10.95
3/8" 4 Prong Drive Ctr 1MT / 2MT	£10.95
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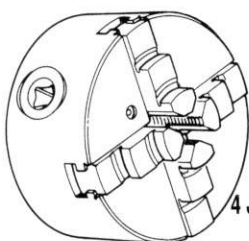
NEW PRODUCT

APTC 5/16" Hollow, cup revolving centre the perfect answer to all long hole boring problems!

1Mt	£29.95
2Mt	£29.95

FOUR JAW CHUCKS

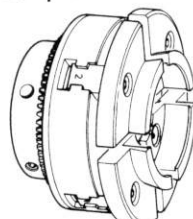
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Kitchen dresser

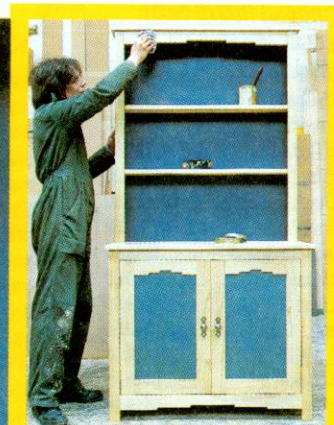
PROJECT GUIDE

DIFFICULTY: Intermediate

TIME: 30 hours

TYPE: Furniture

When we asked Pete Martin to make a dresser he was shocked to discover we wanted him to use poplar. Now you can find out how to make the piece, and how he got on with a rarely used timber with a poor reputation



The shape of the motif on the cornice and skirting is designed to be reduced and repeated on the doors and side panels of Pete Martin's dresser

MATERIALS YOU WILL NEED

■ POPLAR

Pete bought three (4.3m) 14ft lengths of 25mm (1in) thick tulipwood or poplar, 140mm (5½in), 165mm (6½in) and 203mm (8in) wide. The three planks cost £43.

■ MDF

He needed a half sheet of 9mm (¾in) MDF and a full sheet of 6mm (¼in), costing a total of about £17

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Built-in kitchens are nice enough, but I like the idea of some self-standing pieces if you have room. To that end, a small dresser is not only

functional, for holding cookery books and china, but is also decorative, and takes up little wall space.

When Good Woodworking first asked me to make such a piece I suggested cherry, which is widely available and can be bought as veneered board for the panels. The editor was having none of it. He had decided this was another opportunity to try out one of the less common of woods, and sent me off searching for supplies of poplar.

Sometimes referred to as tulipwood (as it is known in America) poplar is being imported from the States, and is increasingly available at prices that compete with pine. It is fast growing, and is used in Italy – where it grows extensively – particularly for

plywood. Its speed of growth makes it an interesting timber to test

because it may represent a good cash crop for farmers to grow, with a quicker return than other hardwoods. However, it is not highly regarded by furniture-makers, and rumours abound of its instability and hairiness.

Once I started working with the poplar, I realised that its colour and starkness would be complemented by painted MDF panels in the doors, sides and back.

Working on Design

I have to admit that the dimensions of this dresser were taken from another that has served our kitchen well, but without much grace. I wanted to keep it

When using a soft fibrous timber like poplar, use fine abrasives, and experiment with sanding speeds to reduce the tearing of the grain.

TIP

quite low so that it could fit comfortably into a small flat or house. Wall space is usually at a premium in a kitchen, so the dresser is only two doors wide, but you could easily alter the design for more.

I wanted to develop a motif along the top that could be reduced, and repeated, on the doors and side panels. The castellated idea was inspired by one of Mark Wilkinson's kitchens. By making the stiles on the doors and side panels thicker than the rails, that

theme is continued in plan view. That the internal corners of the motif are rounded, and less harsh and angular, was a thankful benefit of using a routing jig for the shaping. It also means there is less fussy finishing to do.

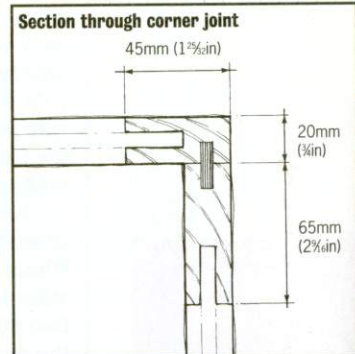
I was not convinced that the poplar would be easy to finish, and wanted to avoid too much sanding and handwork. For that reason, the fact that the stiles on the doors and side panels are thicker than the rails was a great advantage as you do not have to work as hard after assembly to make the joints flush. This follows the principle employed by Jeremy Broun when he used a Danish shoulder on his Scandinavian bed (GW 1:10).

Frames and Panels

Traditionally, the side panels would be made as extensions of the front and back frames, with the rails tenoned into the corner stiles. This is an efficient way of assembling a carcass, but I wanted to use 25mm (1in) thick stock, and felt that the

When making a template for routing, pin strips to MDF if possible. The alternative is to cut out the shape from the MDF with a jigsaw, which is necessary if the shape is curved. But when straight lines are involved you are more likely to achieve a straight edge with strips pinned to the template, than you are with the jigsaw, which tends to produce a rough edge.

TIP



Section through joint of front frame to side panel, showing the use of a loose tongue

Jargon Busting

Spelching

When fibres are crushed instead of being cut. Often happens when chiselling softwood

Panel

A panel can either be a piece of sheet material (or solid timber) that is framed by stiles and rails. This is most commonly found on doors. When a panel is framed and then used as part of a piece, then the frame and panel are often referred to as a panel

The kitchen dresser's door handles are in a mock pewter style, and can be bought from a Homebase store

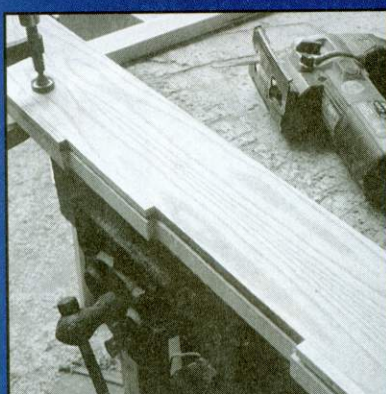


The side panels and doors are the same width, so the motifs are the same, but the sides are longer

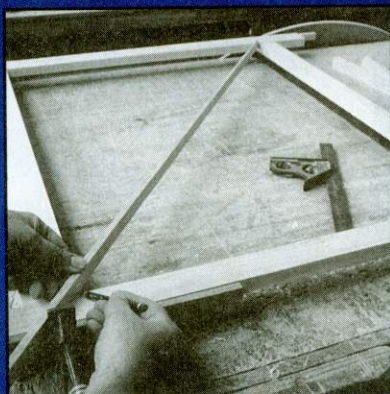


As an added design feature the stiles on the doors and the side panels are thicker than the rails

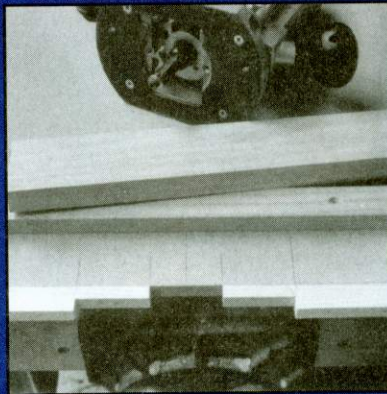
How to make a simple kitchen dresser



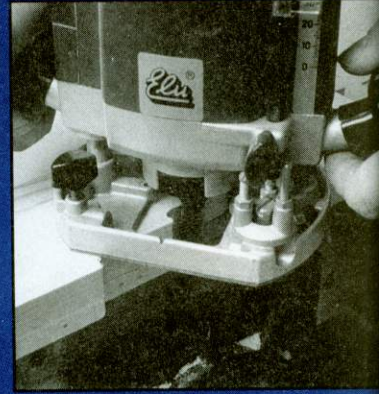
1 If you use a router to shape the motifs on the front frames, chop away the waste with a jigsaw. The jig is built up with softwood strips



2 When gluing up the front frame on the base unit leave waste horns at the top. Measure the diagonals to check that the frame is square



3 Make a jig on which the top rails for the doors and side panels fit. Then use a trimming cutter in your router to shape the motif on the edge



4 The trimming cutter has a bearing below the cutting edges to follow the template or jig. The stops on this jig hold the rail steady while cutting

TOOLS YOU WILL NEED

- **ROUTER**
- **BISCUIT JOINTER** Optional, for fixing side panels to front and back frames
- **RADIAL ARM SAW** Optional for cutting tenons
- **PLANE-THICKNESSER**
- **MORTICER**

If you have one

■ **HAND-TOOLS** This dresser could easily be made by hand. The main problems would be in fitting the panels into the sides and doors. But if you have a combination plane or rebate plane you will be able to make do. Alternatively use applied beading to fix the panels

corner stiles on front and back would be too thin to take two mitred tenons each (GW 9:38, 7:10). I made two side panels, joined between the front and back frames with glue and biscuits.

For the full carcass construction you really need 50mm (2in) section corner stiles to be strong enough for two mortices. You can adapt the design for thicker corner stiles, which you can groove for the side panels. All you need a small quantity of thicker stock, or glue two 25mm (1in) pieces together.

If I chose that technique, I would glue the side panels first, then join them with the front and back rails. This needs careful planning, and marking out. I find it quickest to glue up all the frames and panels individually, then glue these to each other. This saves time, and reduces the chances of mistakes on final assembly. I am sure other

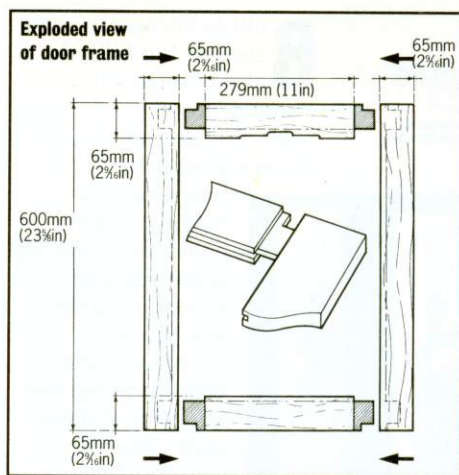
you can. With some woods you have to work right down to 18mm ($\frac{3}{4}$ in) before you achieve a satisfactory finish, but I was able to get 20mm ($\frac{5}{8}$ in) easily enough from the poplar. The exact thickness does not matter much, as long as it is consistent.

2 Make the front and back frames first. The rails (B on the elevations on page 13 and cutting list on page 14) are tenoned into the stiles (A), with blind stub tenons. You can use haunches on the doors, with the haunch fitting in the groove for the MDF panel, but I do feel they are unnecessary for the front and back frames. You could wedge the tenons, but I tend to think that in this sort of situation, where there is less pressure exerted than on a chair, modern glues are strong enough.

3 Once the joints on the frames have been cut and checked, reduce the rails' (B) thickness by just over 2mm ($\frac{1}{8}$ in). Most thicknessers will be able to cope with this on one pass.

Then bevel the front, inner edge of the stiles by hand with a plane, or with a bevelling cutter in a router.

This idea of reducing the thickness after cutting the joints may seem a little unusual. Normally, of course, you would work off

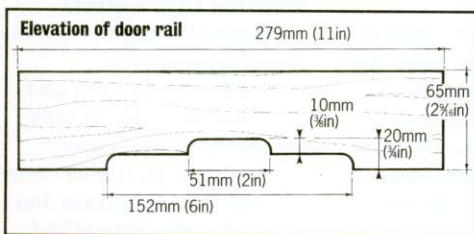


the front face of your components for all marking and cutting, having planed that face and the leading edge, and thickened them off. If you reduce the thickness of the rails before joining, then you will have to do all the marking out from the back face, which will end up flush on the rails and stiles. If you only have limited access to a thicknesser, it is best to do all

your thickening first for consistency. However, if you do that, remember to mark out from the back face on each part so that you do not have to adjust your gauges.

4 At this stage make a jig for routing – with a

guide bush or trimming cutter – the motif on the rail (R) along the bottom of the cupboard unit and along the top of the shelf unit (I). The best way to make this jig is to pin 10mm ($\frac{3}{8}$ in) square section strip along the edge of a piece of MDF. Build up the shape to reflect the castellated motif. The advantage of using strips, rather than jigsawing the shape, is that you are



woodworkers have their opinions on this subject, and we would like to hear them.

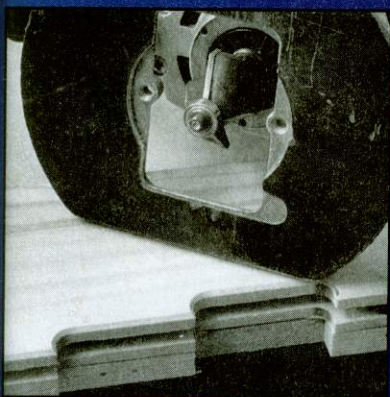
Making the Dresser

1 You can make this dresser entirely from 25mm (1in) sawn timber. Plane and thickness it all to the thickest

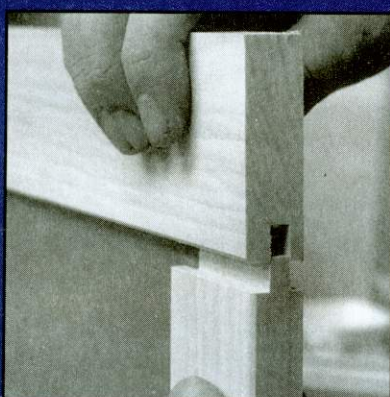
Painting MDF panels

I used an electric blue varnish stain for colouring the MDF panels. This is probably easier to use than a pure stain as the MDF tends to suck in the stain, and the result can be blotchy. You could equally use an eggshell paint, for an even finish, but I wanted to show the subtle grain pattern of the MDF, almost like a ragged effect. If you use a paint you may have to consider what it adds to the thickness of the panel before cutting the grooves on the stiles and rails. I finished the dresser with two coats of Danish oil, brushed on and rubbed off with rag. I apply it liberally, rubbing off after a few minutes, and then apply the second coat on the following day. This oil is inflammable, and can spontaneously combust, so be careful with any rags. Wear rubber gloves when using Danish oil unless you like the smell.

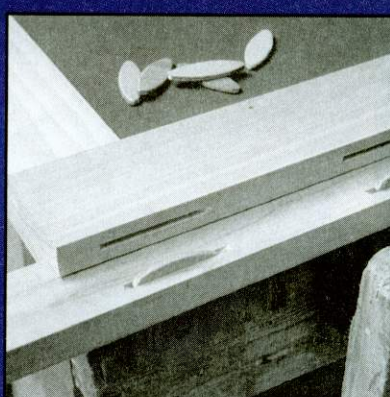
Assembling the base unit and making the shelves



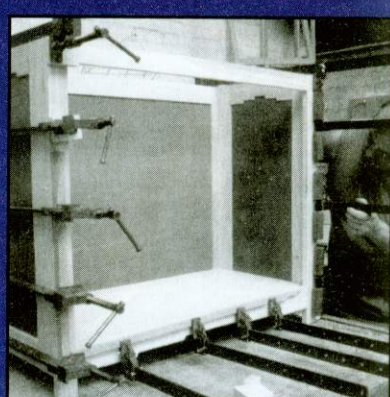
5 If you have a router you can use it to groove the door frames with a slot cutter, and then chamfer the top edge with a chamfering bit



6 The tenons on the back frame of the base unit are the same thickness as the groove for the MDF back. Cut haunches to fit in the groove



7 Pete used biscuits to join the side panels to the front and back frames. You could just as well use dowels or loose tongues in stopped grooves



8 If you do not have masses of cramps available, you can screw the front and back frames to the side panels. Then plug the screw holes

Jargon Busting

Stile

Vertical member of a frame (GW 2:86)

Rail

Horizontal member of a frame or carcass

Carcass

Main parts of a structure or frame

Stopped groove

A cut slot that ends before it reaches the edge of the wood

really sufficient, so I used a biscuit joint for location and strength. The trouble with this is that you need a biscuit joiner, and lots of cramps. There are other methods to suit your equipment:

- Stopped grooves for a loose ply tongue.
- Dowels for location and strength, positioned with a home-made or proprietary jig, or even dowel centres.
- Screws, with counterbored holes plugged (GW 9:63).
- Use screw blocks or a Kreg jig for attaching the sides to the front and back. Kreg's Mini Jig (☎ 0628 822028) is used with a drill to cut an angled pocket in one

Cutting list

	MATERIAL	QTY	LENGTH	WIDTH	THKNS
A Leg	Poplar	4	769mm 30 $\frac{1}{2}$ in	46mm 1 $\frac{1}{2}$ in	20mm $\frac{3}{4}$ in
B Carcase rail	Poplar	2	885mm 34 $\frac{1}{2}$ in	46mm 1 $\frac{1}{2}$ in	18mm $\frac{3}{4}$ in
C Base unit top	Poplar	1	952mm 37 $\frac{1}{2}$ in	465mm 18 $\frac{1}{2}$ in	20mm $\frac{3}{4}$ in
D Side panel stile	Poplar	4	718mm 28 $\frac{1}{2}$ in	65mm 2 $\frac{1}{2}$ in	18mm $\frac{3}{4}$ in
E Side panel rail	Poplar	4	360mm 14 $\frac{1}{2}$ in	65mm 2 $\frac{1}{2}$ in	16mm $\frac{1}{2}$ in
F Door stile	Poplar	4	600mm 23 $\frac{1}{2}$ in	65mm 2 $\frac{1}{2}$ in	18mm $\frac{3}{4}$ in
G Door rail	Poplar	4	360mm 14 $\frac{1}{2}$ in	65mm 2 $\frac{1}{2}$ in	16mm $\frac{1}{2}$ in
H Shelf unit stile	Poplar	2	1053mm 41 $\frac{1}{2}$ in	46mm 1 $\frac{1}{2}$ in	20mm $\frac{3}{4}$ in
I Shelf unit cornice rail	Poplar	1	885mm 34 $\frac{1}{2}$ in	65mm 2 $\frac{1}{2}$ in	18mm $\frac{3}{4}$ in
J Shelf unit side	Poplar	2	1053mm 41 $\frac{1}{2}$ in	118mm 4 $\frac{3}{4}$ in	18mm $\frac{3}{4}$ in
K Shelf unit top	Poplar	1	952mm 37 $\frac{1}{2}$ in	153mm 6 $\frac{1}{2}$ in	20mm $\frac{3}{4}$ in
L Base unit floor	MDF	1	880mm 34 $\frac{1}{2}$ in	410mm 16 $\frac{1}{2}$ in	18mm $\frac{3}{4}$ in
M Base unit back	MDF	1	845mm 33 $\frac{1}{2}$ in	612mm 24 $\frac{1}{2}$ in	6mm $\frac{1}{4}$ in
N Base unit side panel	MDF	2	626mm 24 $\frac{1}{2}$ in	300mm 11 $\frac{1}{2}$ in	6mm $\frac{1}{4}$ in
O Door panel	MDF	2	510mm 20 $\frac{1}{2}$ in	300mm 11 $\frac{1}{2}$ in	6mm $\frac{1}{4}$ in
P Shelf unit shelf	Poplar	2	885mm 34 $\frac{1}{2}$ in	109mm 4 $\frac{3}{4}$ in	20mm $\frac{3}{4}$ in
Q Shelf unit back	MDF	1	1064mm 41 $\frac{1}{2}$ in	896mm 35 $\frac{1}{2}$ in	9mm $\frac{3}{8}$ in
R Skirting	Poplar	1	885mm 41 $\frac{1}{2}$ in	65mm 2 $\frac{1}{2}$ in	18mm $\frac{3}{4}$ in

Cutting lists give the full length of a piece including the joint, but not wastage. Allow at least 25mm (1in) for length and 5mm ($\frac{3}{16}$ in) on the width and thickness of sawn stock

Timber on Test – Poplar

We bought the poplar from Oscar Windebark & Sons (☎ 0225 742929), but it is widely available. You may find it referred to as tulipwood, and seems to be coming from the USA mostly. We decided to test it because it is currently under-used, and is relatively cheap, at about £13 a cubic foot. It is fast-growing, and from what information is available, it seems to be managed on a sustainable basis.

Initially I thought it was horrible. The book said it would not sand well, and tended to be fuzzy. However, it planed and thickened well enough, though it is fairly soft and can be marked by outfeed wheels on the thicknesser. Keep the tables on machinery clear of chips as they can easily be compressed into the wood, denting it. Its softness will make chiselling as difficult as on pine, with a high risk of splashing, though the lack of strong grain structure will make jointing easy, if you can cope with the fibrous nature.

There were also a lot of stick marks on the batch I used, that had to be planed away to some depth. The main problem otherwise is that the planks can be difficult to match due to dark green streaks. This goes dark brown relatively quickly (within a few months we have found) but it tends to be inconsistent on the boards, and not as easy to use as a feature as, say, olive ash. You do not always get enough of the darker wood. Careful selection is needed, but wastage is otherwise

low as there are few knots and defects. Because it is soft it tends to get dirty quickly, and you do need to use abrasives. However, as long as you only use fine ones (150 grit) there is no tearing of the grain and a good finish can be achieved.

In many ways it is similar to pine, and on a cost basis is a reasonable alternative. It has some interesting colouring, but without the crispness and hardness of maple, which is likely to cost you more than £20 a cube. I would certainly use this wood again for hidden, structural work, and for pieces to be painted. With careful sorting, I would try to take advantage of poplar's unpredictable grain and its colour features.

Price:

about £13 a cubic ft

Finishing

Machining

Handwork

Screwing/nailing

Grain/colour

Value for Money

Overall



component to screw that part to another. Inside a cupboard you hardly notice the pocket.

9 Glue the 18mm ($\frac{3}{4}$ in) base (L) to the front, back and sides using the technique you employed to assemble the carcass, but note that you have to do it all at the same time. You can either rebate the back panel (M) into the back frame, or groove it in.

10 Once the glue has set, you can drill the inside of the cupboard for shelves, working from the floor up. I use Woodfit metal pegs (☎ 0257 266421), for which you need a 5mm ($\frac{1}{4}$ in) drill bit. I make a jig for this task, spacing holes at about 38mm (1 $\frac{1}{2}$ in) intervals, using a pillar drill. You can use a portable drill for the peg holes, but make yourself a wooden depth stop, like a collar over the bit, to ensure you do not drill through the side panels.

11 Plank up the top (C), using strips about 89mm

(3 $\frac{1}{2}$ in) wide. You can use biscuits for location, but I did not. Fix the top to the base with metal expansion brackets, making sure they are positioned with the slots under the top. Then you can make the doors, and hang them on butt hinges. I cut the recess only on the doors, double depth, rather than on both door and frame.

Screw battens, top and bottom, as stops behind the doors, and fit catches. You can use brass catches, but I find the Woodfit roller catches (AU155) give an excellent action, even though they are plastic. They are available in white or brown. The pewter-style handles are from Homebase.

Making the Shelf Unit

12 The shelf unit is very simple, with a three-piece front frame and solid sides and top. I housed the shelves (P) into the sides (J), and rebated the back (Q) into the sides. Make the front frame first, with the rail

again thinner than the two uprights (H). Then rebate the sides, 9mm ($\frac{3}{4}$ in) deep to take the MDF back, of that thickness. Cut the rebate half to two-thirds the thickness of the sides, to give you plenty of wood to pin or screw into, through the back, without any chance of splitting.

13 Groove the shelves for plates, using a coving bit, if you intend to display your chinaware, about 25mm (1in) from the back. Cut the housings for the shelves, cutting the shoulders first, then assemble the unit, and fix the frame to the front and back in the rebates. It is best not to succumb to the temptation to slide the shelves in after assembly. You can simply screw the top (K) down to the sides.

I have not used any dowel or biscuit to locate the top unit on the cupboard, because they can be used separately. Alternatively, you can hold them together with a metal plate on the back.

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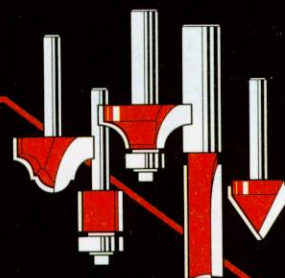
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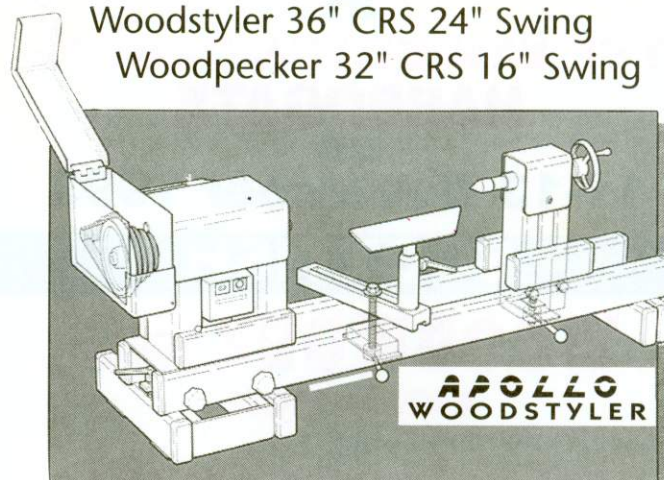
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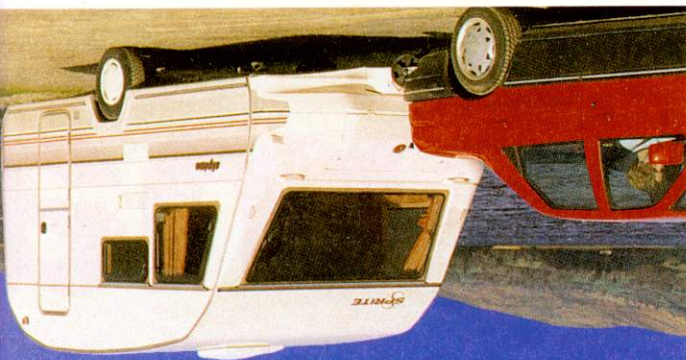
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With teachers asking for inspiration for their pupils, this month we investigate how four Lancashire pupils came up with ideas to make for their GCSE project



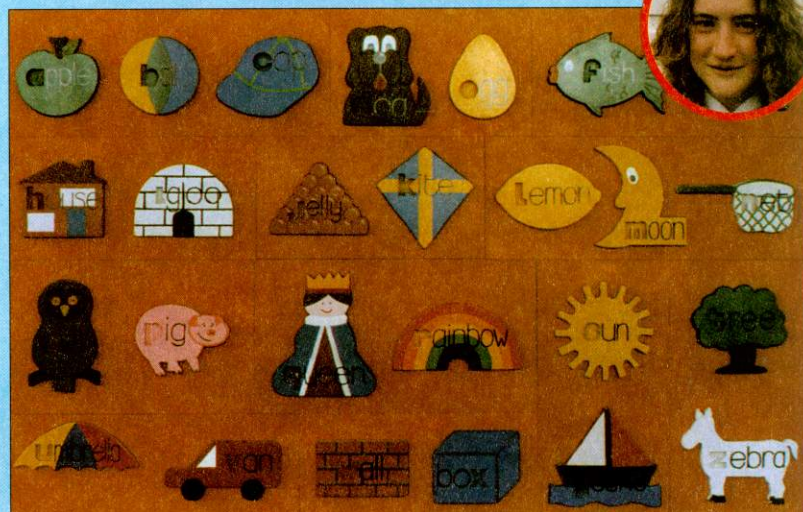
↑ Laura Moores planned her teaching toy after looking at primary school children learning and common materials and colours used



↑ With an interest in theatre, Jade Harrison decided to solve a need for a jewellery box while mimicking the lines of the Octagon Theatre in Bolton. She wanted to give the piece more personality, and continued the theatrical themes inside the box, combining them with the practicalities of making good use of limited space



← First Sarah Gill sketched the oblique sides of her shelves, then she made a scale model as she was unsure they would work



↑ While Christina McGarraghy may not want to become a teacher, as Laura Moores does, she is interested in children, so the idea of an educational toy came to mind. She too visited schools to see what young schoolchildren play with, and what they learn, and decided to make an alphabet jigsaw

TOOLS
ON
TEST

Dust ma

For those of us who cannot justify the cost of a powered respirator, the dust mask is the obvious alternative. Phil Davy finds out which are the best

Whatever you think of face masks, and they do not always receive universal acclaim, bless your battered tenon saw that you're not a Roman woodworker. For, some 2000 years ago the Romans used

animal bladders to stop themselves breathing in dust. Though a more effective measure than tying a cloth around the face, it was doubtless less pleasant.

A protective mask is no substitute for controlling wood dust at its source. If you are using power-tools or machinery it is likely that they throw out a fair amount of chippings and dust. Power-tools such as routers and sanders are increasingly being fitted with take-off points for extractors. In our test of extractors (GW 8:72) we looked at various machines for removing dust when working with these portable tools. The majority of such extractors are designed to be fitted to your power-tools, so that when you turn on the tool the extractor starts up automatically.

Circular saws, spindle moulders, planers and lathes produce relatively large dust particles. Hand and machine sanding generates much finer dust. Because this is often invisible to the naked eye there can be a tendency by some woodworkers to ignore its effects. A face mask will limit the amount of dust breathed in by the woodworker, but this does not mean dust extraction is superfluous.

We tried two types of



Mask tests on test

mask, or respirator, in our test. Both are known as half face respirators, covering the mouth and nose. The first type is disposable and should be thrown away when it is no longer efficient. Just how long this period lasts, however, is debatable. In industry it is usually at the end of a shift of about eight hours.

Many disposable masks are shell-shaped and fit around the nose and mouth, held in place by either one or two pieces of elastic.

Those from Moldex, 3M and Vitrex fall into this category. The Racal Delta and Europa CN98 masks are less rigid, folding flat, which makes them easy to keep in a pocket. Martindale's Flatmate DR500V is particularly soft and strong, again folding flat.

Two of the disposable types, the Draper 12495 and Vitrex 301362, have a thin metal plate that is bent to suit the contours of the face. A tab at each end folds over, holding a fabric filter in place. When no longer effective, the filter is simply replaced with a

circular plastic grille screwed to this holds a filter in place. The advantage of this system is the choice of filters available. Not only can such a mask be worn for woodworking, but, fitted with the correct filter, also for paints, solvents, and gases. Both the Martindale Centor and Racal DM300 fall into this category.

Falling somewhere in between these two types of mask is the Draper 18058. With a plastic shield to cover the nose and mouth, it does not have a rubber seal and is much more basic than the Racal and Martindale models. A grille at the front is hinged and allows filter replacement. No other types of filter, apart from those supplied, are available for the Draper.

How Relevant is COSHH?

If you are a home woodworker as opposed to someone employed in industry there is no legislation to control what safety equipment you wear. However, in the workplace an employer has to comply with the 1988 COSHH regulations (the

follow their recommendations. If you are retired or unemployed it's quite possible that you spend as much time in the workshop as a professional. It is worth noting

be the letters FFP, which stand for Filtering, Facepiece and Particulate. After the FFP will be a number, 1, 2, or 3. This indicates the suitability of the mask for

Masks for solvents

None of the disposable masks in the test will give protection against vapour from solvents, paints, varnishes and some glues. These can be unpleasant and harmful to inhale, especially if you are working in a confined space. Ventilation must be provided, and wearing a non-disposable respirator will make life more comfortable and safer because you can fit it with the correct filter.

Both the Racal DM300 and the Martindale Centor can be fitted with a range of different filters. Unlike those made for dust, filters for vapours must contain charcoal. It is important that the correct type is fitted, and the code on it should include the letters A1. If a combination filter with the letters A1P2 is fitted, the mask can be used for dust and vapours.

that older woodworkers may be more susceptible to dust-related chest infections.

Particulates

Hazards in the atmosphere may be in the form of either particles or gases and vapours. Most of the approved masks we tested are designed to protect against particulates, which means they will restrict dusts, mists and fumes. Fine particles are produced when solid materials, such as timber, are broken down. The particles are tiny enough to float in air and settle under gravity, creating dust. Grouped together, these individual particles become a particulate.

To be hazardous to the body, particulates have to be a certain size in order to be inhaled. The Health and Safety Executive (HSE) approved masks we tested can be used for fine dust down to 0.5 micron in size. The eye can only detect particles larger than around 40 microns, which is the diameter of a very fine human hair.

Why the Numbers?

If a mask is approved by the HSE it will have an identification code stamped on it. A disposable type may be marked on the strap or the front of the mask itself. It will have the letters EN149, the European Standard replacing the old British Standard. Following this code will

woodworking tasks.

An FFP1 mask is appropriate for machine sanding of softwoods and hand sanding of hardwoods for periods of less than an hour. For hardwood hand sanding with intermittent work periods of more than an hour, an FFP2 mask should be used. If you plan to do continuous sanding of hardwood, then an FFP3 mask is best. This type is also recommended when changing dust collection bags on extraction systems. An S at the end of the code denotes use for solids.

The non-disposable masks from Martindale and Racal carry the code EN143. Dust filters are labelled P2 or P3, which relate to the FFP codes.

Unapproved Masks

If a mask is not approved by the HSE and does not meet the relevant European Standard, why bother to include it in our test? Often these types are the only ones available. If you go to a builders merchant or DIY superstore the face masks are often unapproved. Many people buying them will be unaware of the European Standards for safety, and probably tend to buy the cheapest masks available. We decided to include them to see how they fared alongside the approved ones.

One of our testers, Ian Wilkie, no longer uses face masks that do

Clogging up masks

There seems to be no scientific way for a woodworker to judge when it is time to discard a mask. So we asked our expert testers, Jeremy Broun and Ian Wilkie, how they tell if a mask is clogged up. Jeremy, a furniture-maker for 20 years, says that he goes by how dirty the mask looks, and how much dust there is in his mucus. Ian looks inside the mask, since most are white, and if he sees dirt lining the mask he throws it away. He admits that on a couple of occasions he has damaged masks, by sitting on them, and has then tossed them away. We recommend you keep your masks in air-tight containers, with used masks stored individually away from clean ones so as not to contaminate them.



Manufacturers suggest discarding disposables (left) after an eight hour shift, but this may not be true of non-disposables (right)

new one. For many years these masks, under the Martindale banner, were the only choice for woodworkers, with refills in little tear-open boxes.

The other type of mask we tested is the non-disposable type. It consists of a rubber face seal to which is fixed a plastic cylinder. A

Control of Substances Hazardous to Health). This means ensuring that employees are wearing safety equipment to meet certain European standards.

Although most amateur woodworkers do not come within the jurisdiction of the COSHH regulations, it makes sense to

ND-TOOL TEST

st masks

not comply with European Standards. Because of this he declined to test any masks that did not meet these standards.

How Comfortable are They?

We discovered from our tests that a mask may suit one person but be uncomfortable to another. Face geometry obviously is important. The size of a person's nose, for instance, can affect the comfort of a mask. Most masks are made in only one size and can't be expected to fit everyone's face.

A face mask relies on a good seal around the nose and mouth to be effective. If there is a gap then

dust will be able to get through. Without a good seal the usefulness of a mask is greatly against fine dust, and there is a strong likelihood of misting if you wear goggles or glasses.

Many of the disposable masks have a wired strip that is pressed in place over the nose to improve the seal. The 3M masks have a foam pad on the inside of the fabric to increase comfort.

Valves to Reduce Moisture

A problem with many half face masks is the heat generated while wearing them. To help overcome this, several models are fitted with

Jargon Busting

Particulate

Separate particles of a substance grouped together are called a particulate

Powered respirator

A full face helmet that includes a visor to give protection to the eyes. A battery-powered

motor draws in filtered air, past the face to prevent the visor misting up. The battery is belt-mounted or in the helmet.

COSHH regulations

The Control of Substances Hazardous to Health. These safety regulations apply to industry and, although they do not affect the home woodworker, they are a good guide

FFP

Filtering Facepiece Particulate. Stamped on masks meeting the European Standard and approved by the Health and Safety Executive

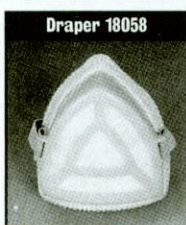
a valve. This allows exhaled air to pass through it, closing when the wearer inhales. In use the masks fitted with a valve are generally cooler to wear than those without.

A frequent complaint we hear from readers is that masks can be

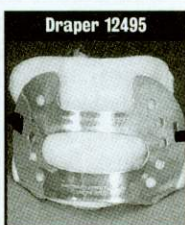
difficult to wear with spectacles and goggles.

Two of us testing wear glasses, and we found some masks are easier to wear than others. I was surprised to find it impossible to wear glasses with the rubber

TOOLS
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Draper 18058



Draper 12495



Flatmate DR500V



Moldex 2365



Moldex 2400



Moldex 2405

Contact	0703 266355	0703 266355	081 450 8561	0602 442130	0602 442130	0602 442130
Manufacturer	Draper	Draper	Martindale	Moldex-Metric	Moldex-Metric	Moldex-Metric
RRP (inc. VAT)	£3.13 each	£1.48 each	£14.97 per 3	£1.41 each	£1.41 each	£1.70 each
Type	non-disposable	disposable	disposable	disposable	disposable	disposable
Classification	not graded	not graded	FFP1S	FFP1	FFP2S	FFP2S
Construction	Flexible plastic with flip-down cover to contain filter. Sanitary face surround and thick elastic strap	Thin metal plate bent to suit face contour. Cotton wool-like filter held by clips. Thin elastic strap	Thick fabric stitched to filter. Pliable nose clip and rubberised twin strap. Exhalation valve	Double design with plastic mesh outer and soft inner shell. Twin rubberised strap and air valve	Double design with plastic mesh outer and soft inner shell. Twin rubberised strap and air valve	Double design with plastic mesh outer and soft inner shell. Twin rubberised strap and air valve
Brown	Rigid moulding causes discomfort. Single strap makes poor seal causing slippage. Cloth irritates mouth	Insufficient nose protection and weak strap. Too flimsy, and uncomfortable over long periods	Elastic clips impair vision slightly: irritating. Old fashioned design gives poor seal to nose and chin	Pressure and seal is where it is needed and gives comfort over long periods. An excellent design	A very simple moulded design, comfortable and effective. No nose clip but this is not a problem	Similar to other Moldex models but with a valve which prevents misting of glasses. An excellent mask
Davy	A comfortable mask but the seal is not good. Some misting of glasses. It comes with five extra filters	A poor seal to the nose, and breathing is difficult. Fluff sticks to the five o'clock shadow	Even with a valve my glasses misted up slightly. Comfortable to wear over a long period, however	Wearing glasses is slightly awkward with this mask but an excellent seal is formed	An excellent fit is obtained with this mask with no nose clip to squeeze. Very comfortable and a good seal	The valve is efficient with no misting of glasses. Comfortable to wear for a long period
Wilkie	Not having a Euro standards rating I would not recommend this mask for serious woodworking	Not having a Euro standards rating I would not recommend this mask for serious woodworking	This is strong, well made and comfortable. Some misting of glasses. It has advantage of folding flat	No misting of glasses with this comfortable mask. Shell is rigid and valve directs exhaled air down	This model does not have a valve, resulting in slight misting of glasses. Comfortable with a strong rigid shell	The valve directs exhaled air downwards with no fogging of glasses. Well made and comfortable
Brown						
Value for money	●●○○○	●●●○○	●○○○○	●●●●●	●●●●●	●●●●●
Overall	●●○○○	●●○○○	●●○○○	●●●●●	●●●●●	●●●●●
Davy						
Value for money	●●○○○	●●○○○	●●○○○	●●●●●	●●●●○	●●●●●
Overall	●●○○○	●○○○○	●●○○○	●●●●●	●●●●○	●●●●●
Wilkie						
Value for money	○○○○○	○○○○○	●●●○○	●●●●●	●●●●●	●●●●○
Overall	○○○○○	○○○○○	●●●○○	●●●●●	●●●●○	●●●●●

replaceable filter masks from Martindale and Racal. The straps on these masks are particularly thick and strong and tend to get in the way of glasses.

If you can't do your woodworking without glasses you have probably experienced them misting up when wearing a mask. This can be annoying and may even be a safety hazard if you can't see the work clearly. The same can be true of goggles, which has sparked a debate regarding the importance of protecting lungs in preference to eyes.

A valve will help to reduce misting, and in some cases

virtually eliminates it. The Moldex 2365 and 2405 models and both 3M masks are particularly good in this respect, reducing mist.

Although the Racal Delta and Moldex 2400 masks do not have valves, only slight misting of glasses was experienced.

Martindale produce 10 masks in the Flatmate series. With five levels of protection, each one is available with or without a valve.

Beards and Masks

Many woodworkers have a beard, and we hope many of them also wear a face mask when working. However, it is very difficult to get a

good seal with any mask if you have a beard. The mask is lifted off the face and dust particles get trapped in the hair.

Most mask manufacturers strongly recommend bearded woodworkers wear a powered respirator. In the form of a helmet with a visor, it will guard your eyes as well as protecting your nose and mouth. These are marketed by A & H Supplies (☎ 081 300 9331) and Racal (☎ 0925 234656).

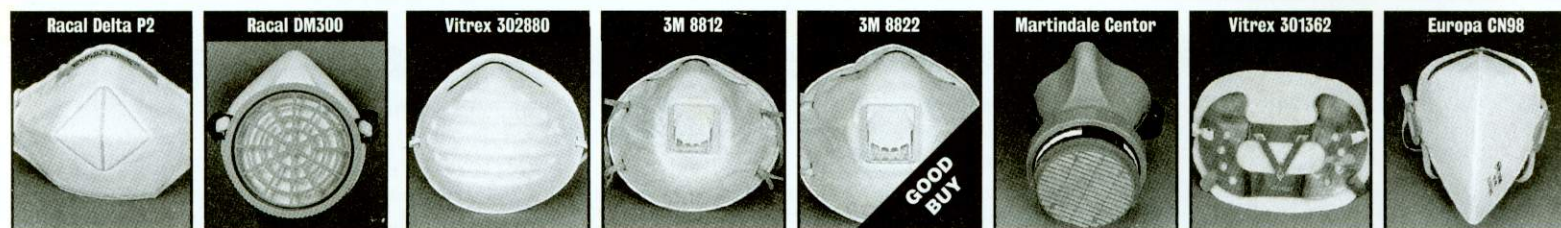
If you favour a five o'clock shadow you may be familiar with pieces of fluff sticking to your chin after using a mask. I found this

happened after wearing the Draper 12495 mask.

How We Tested

Each tester wore the masks for a variety of woodworking tasks. These included turning, routing, hand and machine sanding, and sawing, in both softwoods and hardwoods. All these processes generate different levels and sizes of dust particle.

We considered how effective the straps were – did they cut into the ears, for example? Did the mask pinch the nose too much? Could the smell of the hardwood being sanded be detected through



Racal Delta P2	Racal DM300	Vitrex 302880	3M 8812	3M 8822	Martindale Centor	Vitrex 301362	Europa CN98
0925 234656	0925 234656	0253 721291	081 300 9331	081 300 9331	081 450 8561	0253 721291	081 300 9331
Racal	Racal	Vitrex	3M	3M	Martindale	Vitrex	Europa
£34.08 per 20	£9.45 each	£2.28 per 3	£6.10 per 3	£7.60 per 3	£17 each	£2.61 each	£1.74 each
disposable	non-disposable	disposable	disposable	disposable	non-disposable	disposable	disposable
FFP2S	P2	not graded	FFP1	FFP2S	P2	not graded	FFP2
Filter is sandwiched between soft fabric. Twin rubberised strap and pliable nose clip. Folds flat for storage	Flexible rubber shield. Plastic grille unscrews to drop in filter. Air valve and twin rubber strap	Ribbed fabric cup has metal pliable nose clip. Single elastic strap stapled to mask	Ribbed fabric has metal nose clip and inner foam pad. Plastic grid protects valve. Twin rubber strap	Ribbed fabric has metal nose clip and inner foam pad. Plastic grid protects valve. Twin rubber strap	Flexible rubber shield. Filter drops into threaded holder. Pre-filter behind grille. Valve and twin strap	Thin metal plate fits face contours. Metal clips hold filter. Single elastic strap. Six filters supplied.	Fabric filter is joined vertically in centre. Metal nose clip and twin rubberised strap
An effective mask for sustained use. Twin straps are slightly thin causing minor discomfort over long periods	Irritating squeak when breathing. Strap worked loose after a few minutes defeating an excellent seal	Under-tailored moulding and weak single strap further reduce the effectiveness of this thin mask	This is well made and comfortable with an effective wire clip and nose padding.	Similar to the 8812 with nose clip and foam pad and filter lasting three times longer. An excellent mask	A cumbersome mask for deep sea woodworkers! Friendly to lungs as seal is good at cost of comfort	The aluminium body is not comfortable and minimal filters are questionable. Weak strap	A poor seal around nose despite clip. A good twin strap but poor overall performance
An excellent seal is obtained with this mask, although no valve caused slight steaming up of glasses	It is not possible to wear glasses with this mask. Initially a tight seal but straps worked loose	A weak strap does not help the ineffective seal. A lightweight mask that misted up my glasses	The efficient valve does not allow misting up of glasses. Very comfortable over a long period	A comfortable mask that is not too rigid. Valve protector and foam pad are thoughtful extras	An excellent seal and the advantage of different filters. The pre-filter grille kept falling open on my sample	The face seal was ineffective, particularly around the nose. Rather an insubstantial filter	This unusual design is quite comfortable. Slight misting of glasses
This mask is well made with an improved strap fixing. Slight misting of spectacles. Folds flat for storage	Offering excellent protection, this is not too bulky. Adjustable strap system is good and comfortable	Not having a Euro standards rating I would not recommend this mask for serious woodworking	Cool and comfortable. With a strong moulded body and valve directs exhaled air down	No misting of my glasses with this mask due to the valve. Very comfortable and cool to use.	This is heavy and strong with good adjustable straps. Comfortable, with a wide choice of filters	Not having a Euro standards rating I would not recommend this mask for serious woodworking	A simple but effective design. Particularly good if wearing glasses, but some misting

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the mask? How unpleasant did each mask become when using it in hot weather?

Care of Your Mask

If you use disposable masks you may well have thought of washing them when they start to get grubby. A quick rinse under the tap and they look as good as new. However attractive and economical this idea may seem, don't do it. When the mask starts to clog up throw it away.

Racal say that their tests show that washing a disposable mask removes the filtration qualities. Washing it takes out a static charge of electricity designed to trap the

tiny particles of dust. Racal also say that washing distorts the shape of the mask, and hence the seal. If a disposable mask or the filter of a replaceable type accidentally gets wet, it should be thrown away for the same reason.

Try not to handle the filter itself on non-disposable masks, as this could impair its efficiency.

Non-disposable masks should be cleaned after use each day. The rubber face piece can be washed with soap and warm water. If disinfected it can be worn by someone else. Always follow the manufacturer's instructions on cleaning to be on the safe side.

Final verdict

If buying a disposable face mask you may well find some shops tend to stock only the unapproved types that do not meet the European Standard. You may have to visit a specialist safety equipment stockist for an approved mask. If you are unable to find the mask you want we have supplied all the phone numbers of the makers of the tested masks.

Two disposable masks without valves that are good value are the Racal Delta and the Moldex 2400. The best value masks equipped with valves are the Moldex 2365 and 2405.

The Moldex 2405 just emerges as the best mask overall, closely followed by both the 3M models and the Moldex 2365. Wearing a mask with a valve is an advantage in hot weather.

If you want a more versatile mask a non-disposable type is worth considering. Of the two non-disposable masks, the Martindale Centor is the best overall, with the advantage of a pre-filter as well as a main filter. Racal's DM300 is good value, even though the straps can be a problem.

Fighting dust: one woodworker's experience of breathing easily

Wood dust, writes Ian Wilkie, can cause problems to the respiratory system and to the nose, skin and eyes. However, for the hobby woodworker the risks seem to be limited and should not be exaggerated. For most home woodworkers it is advisable to take common sense precautions.

to remove all traces of wood dust and you should eliminate the chances of skin irritation. An application of hand lotion to replace lost moisture will counteract any dryness you may experience on your hands.

If you know you have a respiratory medical condition then you should seek advice from your GP who will be able to advise you. If you have difficulty in breathing, develop a cough or experience rashes or swelling of the skin, then consult your GP and make a point of telling your doctor that you are a regular woodworker.

- ② It took up too much room because it could not be placed outside of the workshop itself.
- ③ It tended to pump the fine dust back into the workshop space.
- ④ It proved to be really only a chip collector and not for dust.
- ⑤ It was a nightmare changing the bag regularly!

My own experience

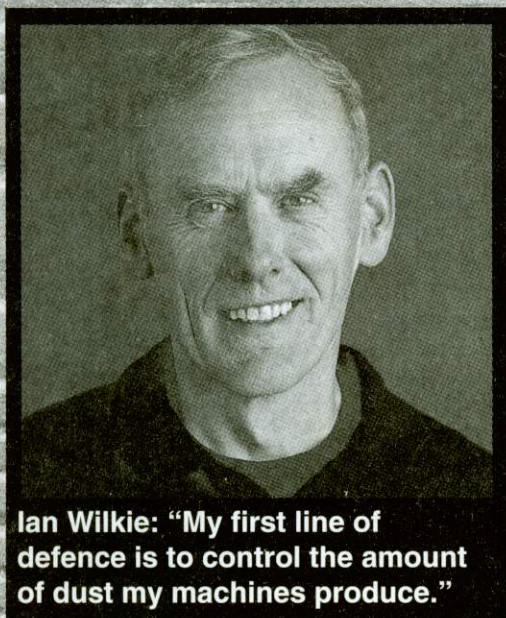
Many years ago I did experience skin irritation, inflamed, puffy eyelids and soreness behind my ears. I discovered that this was caused by fine dust from African walnut (*mansonia*) and West-Indian boxwood. I was only using small quantities in model shipbuilding using a miniature circular saw and a miniature lathe, but it was bad in the summer and caused me much discomfort.

Since taking more care and avoiding these woods altogether I have had no further problems. Some timbers have a bad reputation, but different skins react in different ways and most of us have to find out from our own experience which woods to avoid.

The dust battle

Following my earlier experiences I have learned more about the control of dust, and about the protection of your eyes, nose and ears. When machining wood you must wear a mask or a helmet to avoid breathing in dust. Goggles or a visor will help to reduce eye irritation. Naturally avoid timber that irritates your skin.

After a dusty session in the workshop, change your clothes, shower, and wash your hair



Ian Wilkie: "My first line of defence is to control the amount of dust my machines produce."

I can fit to the bandsaw, router, fretsaw and lathe to remove as much dust at source as I can. I avoid machine sanding indoors and use my circular saw outside under cover. When woodturning I try to get the finest possible finish with cutting tools and this reduces the amount of final sanding necessary. When I sand on the lathe I hand-hold the vacuum cleaner nozzle as close to the work as I can.

My industrial vacuum cleaner has an outlet to which I connect a pipe to pass through the window. This ensures that any fine dust which escapes through the filters is not recirculated in the workshop. I had a dust extractor for two years but it had distinct disadvantages.

- ① It was too noisy and my ears suffered.

Personal protection

Having accepted that a certain amount of dust will still be in the air my second line of defence is to wear a disposable face mask or a Racal Airlite helmet. A visor keeps the dust off the skin on my face as well as giving me protection from flying chips. Any clothing consists of a turning smock, which fits tightly at the neck and wrists to keep the dust out, and washable cotton trousers.

Cleaning up

At the end of a dusty session in the workshop a surprising amount of dust will have settled on all the flat surfaces and in the nooks and crannies. If your workshop is well designed cleaning up will not take long. I sweep up the large shavings and sawdust first and then Hoover up what dust is left. During the cleaning up stage I continue to wear my mask. Finally I change my clothes, shower, and wash my hair to ensure that no dust remains on my skin.

The question

Is it better to use a fresh cheap mask or to wear an expensive helmet which will involve running costs? At about £100 upwards a powered respirator is good value for the full-time woodworker. Some consideration must be paid to inconvenience, and – especially in a large workshop – whether more than one person can use the same powered respirator. The home woodworker will need to be doing a lot of turning, sanding, power carving or routing of MDF to really justify the benefits of combined eye and lung protection against the extra cost. Powered respirators are great, but there is still a place for approved, cared-for dust masks.

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Good Woodworking Letters, 30 Monmouth Street, Bath, Avon BA1 2BW

LETTERS

Overcoming disability

Back in 1964 I had a bad accident that made a mess of my right side, leaving me with a permanently bent right arm. Like Robert le Besque (GW 9:5), I am right handed. I did try to convert myself to becoming left-handed but found it impossible and dealt with the problem by using a cheese knife to cut up my food. (It was horrible having to get someone else to cut up my meals.)

In hospital they checked and found I could exert 115lbs pressure with my left hand and only 25lbs with my right. My surgeon gave his opinion that it would be impossible to carry on with woodworking. Prior to this I had been attending our local college for woodwork and had become quite efficient.

After I got home, one of the senior instructors came to see me and suggested that I forget what the surgeon had said and come back to give it a try. On my first evening it took me two hours to do what used to take me five minutes.

To cut a long story short,

JUNE COMPETITION RESULTS

Name the Grain

The grain on the cover of the June issue of Good Woodworking was EUROPEAN CHERRY. B.G. Gibson of Shanklin, Isle of Wight, knew that and wrote to tell us so, and a copy of World Woods in Colour, published by Stobart Davies, is on its way to him at the moment.

I worked out a way of continuing. I now use dowel joints instead of mortice and tenons, and lap joints where I would have previously used dovetails; incidentally, I cut the lap joints on my small sawbench. I had some jigs made to make it easier for the dowel joints, using different sizes for stools and for tables.

J.G. Stacey, Essex

Your victory of bravery and determination over the doctor's gloomy prognosis is an inspiration to us all. If anyone else can offer advice on jigs, tools and workshop layout for woodworkers with disabilities, please contact us at Good Woodworking. **NG**

French polishing books

In the May issue of Good Woodworking, F. Wynn of Middlesex requests books specifically on French polishing (GW 7:70). The best book on the subject for many years has been *Staining and Polishing* by Charles Hayward, published by Bell and Hyman. It is now difficult to get hold of and in many ways is out of date. For these reasons B.T. Batsford and ourselves felt there was a need for a specialist book on the subject.

Our book, *French Polishing* by Philippa Barstow and Alan Waterhouse (ISBN 0 7134 7077 1) is due out this month and is aimed at anyone with an interest in the subject. In it we only talk about materials which are readily available, and aim to take out much of the mystery to encourage the beginner.

We have also produced a video with the same title, which is produced and distributed by Find a Fact Ltd of Gloucestershire

(☎ 0453 860888). It covers all areas from stripping, through timber preparation to colouring and bodying up.

Philippa Barstow
Cheshire

We will review both of these products soon. **NG**

Renewing subscriptions

I am conscious that my first year's subscription to *Good Woodworking* is fast running out (I took your introductory offer). How do I go about renewing it for a second year?

C.J. Rabey, London

Fear not. A renewal form will

Planing wide boards

Planing a wide board by hand can be an exhausting job, especially if it is badly distorted hardwood. To make things easier and quicker, try planing from side to side, across the grain.

When the board is true, a few shavings taken off with the grain will produce a flat and smooth surface. Your plane must be sharp and not set too coarse. That way breakout on the exit side of the board will be minimal and any damage can soon be removed by taking a couple of shavings off the edge.

L. Stuttle, Southampton

Thank you for the tip, which I hope will help readers. **NG**

be sent to you with the penultimate and last issues of your current subscription. Subscriptions that were paid for by direct debit will be renewed automatically, after we have sent you a warning letter warning.

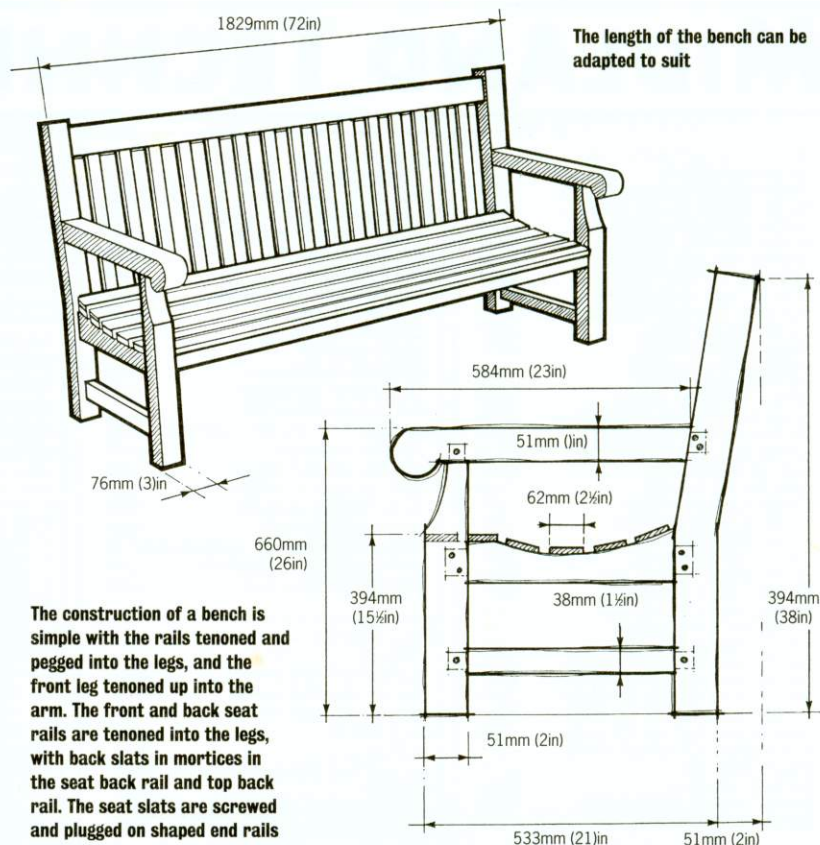
Where are the goggles?

One minor criticism I feel I could make of Good Woodworking is on the subject of health and safety, while using power-tools in particular. In projects, power-tools are often specified as being required but I do not recall seeing safety glasses

or ear defenders mentioned in the list of required equipment. Doesn't the magazine have a responsibility to stress health and safety issues, rather than just drawing the readers' attention to dangerous practices?

Perhaps I am over conscious of H&S issues since I am the Union H&S rep in my college.

I have taken out a subscription to GW, my first ever to a magazine, on the strength of the contents of the first seven issues. I thought the games table (GW 6:10) was over the top.



When Melvyn Clark of Hertfordshire asked us for plans to make a garden bench we sent our illustrator, John Lander, out into

the wilds of his local hamlet to find a suitable example. We hope that these drawings are sufficient for Melvyn.

but otherwise the projects are well designed and well thought out. The demystifying way of writing about woodworking is refreshing, and you keep the thing topical with a fast-moving letters page. Your printers and production staff do a fantastic job. Keep up the Good Woodworking.

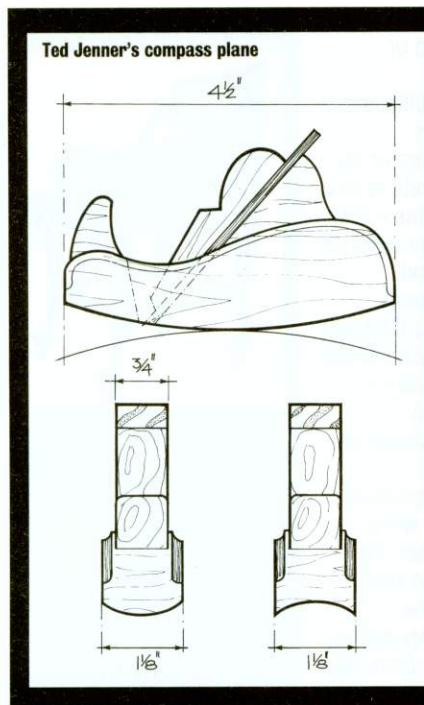
Andrew Womack
Sheffield

It is a good point. We have very little space for showing all the safety equipment you need, and tend to focus on essential tools for the job, but goggles and ear defenders are always important, and we will try to give such safety precautions more prominence. Personally I have always worn ear defenders, probably more often than goggles and dust masks. The majority of our projects can be made without power-tools, but we feel it helps to show where machines will help.

NG

The flat planes?

I read with interest the letter from Kim Cave of Stanley Tools in your June issue (GW 8:23). I have been teaching fine furniture-making for 15 years, and have always bought Stanley 5½ jack planes for my students.



My experience is that the sole is never flat enough for the plane to perform really well. There are always small bumps behind the mouth resulting from stress when the frog is fixed to the main body. These bumps may not be very large (say ¼/1000 in) and may not exceed Stanley or British standards. However, as a fine finishing shaving is of the order of ¼/1000 or ½/1000 in it is clear that they will prevent high performance. (Often when a fine shaving is set,

the only result is the back edge of the mouth scraping the work.)

My main irritation is not that these bumps exist, but that the instructions do not alert users to solutions to the problem. Here are a couple of tips to get the best from such planes:

1 Flatten the sole on belt-sander paper, stretched flat on a suitable machine table, until all areas are equally scratched (marking across the sole first with a felt tip

Home-made palm block plane

Responding to a letter requesting information about my palm block plane (GW 7:73), it is a development of a similar type made and illustrated by that grand old man Charles Hayward many years ago.

The cutter in each case is from a Record or Stanley combination plane selection. The ¾ and 1¼ in hollows and rounds were ground out of 13mm (½ in) and 10mm (¾ in) cutting irons, using emery and a carborundum grinding wheels.

In my case, these wheels were old and worn from the old type of hard grinding wheels, using the edge of these wheels mounted in a B&D grinder attachment (please use goggles), a carborundum garden sharpening stone and slip stones. Hard work and time-consuming, but worth it. The shapes were just hollows and

rounds, there were no standard mouldings. The original cutters were made up from pieces of broken hacksaw blades. The teeth were ground to the required shape. These worked quite well but were inclined to chatter. This was partly cured by using rather longer wedges.

However, the Record irons solved the problem. The hacksaw blade cutters are now used as scrapers in corners. When grinding the Record irons, to keep the end cool, insert the remainder of the iron in a large potato, apple, pear or similar (a very ripe one if possible). This is an old blacksmith's method of years gone by.

Ted Jenner, East Sussex

Thanks for the tip, and for the drawings of a compass plane you made a while ago, following the principles of the palm plane.

NG

pen will help show this up).

2 Rotate the sole on plate glass with 220 grit aluminium oxide powder and water (valve-grinding paste will do).

David Charlesworth
Devon

Thank you for the tips. We will be featuring an article on fine-tuning all planes sometime in the future.

NG

More carving ideas

Thank you for the excellent router cutters received today as a prize for winning the competition in the April issue, and for the excellent articles in Good Woodworking. Could you please include some articles on woodcarving? I don't mean how to do it but suggestions of subjects with plans, front and side elevations and dimensions.

J.W. Burridge, Portsmouth

We will start working on it immediately.

NG

Shoulder turning

My wife bought three jumpers, all with shoulder pads in them, which she decided to remove. Instead of letting her discard them, I claimed them and found them useful on a lathe. If you cover them with cotton, they are ideal for polishing. The knitted ones are ideal for holding fine-grit abrasive paper and the risk of cooking your fingers and hands is greatly reduced.

P. Butler, S. Yorks

This sounds to me like a good tip. I'm sure we've all had our fingers burnt at the lathe at least once.

NG

Write to reply

I refer to Campbell Norman-Smith's criticism of my book *Modern Wood Finishing Techniques*, published by Stobart Davies.

I am no stranger to criticism, but Mr Norman-Smith has missed the whole point of my book, which had the co-operation of the leading suppliers and manufacturers of wood finishes, who contributed to each chapter. His statement that the book only has three chapters on modern finishing methods is nonsense; these chapters comprise the greater part of the book, while other chapters also deal with modern methods of traditional finishing.

As to colour, the printed word is the best propagator of ideas, not set-up colour photographs. If all the reader wants are pretty colour pictures, then why not buy Beano or a gardening book?

Noel Johnson Leach
Dorset

As a writer I too would like to support the premise that words are the best way to communicate ideas. However we have found, through the great response to this magazine, that lively design, with good photographs and

NAME THE GRAIN BOOK COMPETITION

NAME

the grain

Identify the timber on our cover – and you could win a definitive guide to world woods

What is the wood used in the QUESTION MARK on this month's Good Woodworking front cover? If you can name that grain you could win a copy of a classic book of world woods worth £25.

The first correct answer pulled from the bag on the closing date of 10th August will win a copy of *World Woods in Colour* by William Lincoln, published by Stobart Davies, of Priory House, Priory Street, Hertford, Herts SG14 1RN. This is a definitive 320-page hardback encyclopedia of woods, beautifully presented with 273 colour photographs.

Send your answer, with your name and address, on a postcard or the back of a sealed envelope to Good Woodworking, 30 Monmouth Street, Bath BA1 2BW by 10th August 1993

THE ANSWER IS 1 Sycamore 2 Suppazza tree 3 Oak 4 American black walnut

WATCH OUT FOR NEXT MONTH'S NAME THE GRAIN COMPETITION

Name The Grain, Good Woodworking, 30 Monmouth Street, Bath, Avon BA1 2BW.

illustrations, are essential components of modern publishing. A huge amount of information can be passed on by the step-by-step approach we use. We do recognise that finishing is a particularly difficult skill to illustrate well.

NG

They asked me how I knew

When I got home from the Wooden Boat show at Greenwich, Good Woodworking was waiting for me. One of the first things I read was the linseed oil question from Mark Casey (GW 9:56). While at Greenwich I'd been talking to the winner of the Amateur Boat Restoring Competition. He used a mix of raw linseed oil and paraffin on the decks and cockpit of his fishing boat and it looked and felt great. Paraffin is cheaper than white spirit.

The wood was iroko and he'd sprayed a thinner mix of raw linseed oil, using a garden sprayer. In the early

stages, he'd used approximately four gallons of paraffin to one of linseed oil and at the end was thinning it enough to be able to spray it. Now it just needs a repeat dose every year to keep the wood looking nice.

The mix had darkened the wood but it had stood up to life afloat very well, so it should be able to withstand life on a front door.

Ann Sanders, Cheshire
Thanks for the tip. NG

Take my point

In Back to Basics in the July issue, (GW 9:62), it is stated that difficulty can be encountered producing a good countersunk hole. I agree this is so if using a HSS countersink bit – as shown in the illustration – as this is designed for cutting metal. The answer is to use one of the type made by Stanley or Draper which is designed for use with wood. The bit has only one cutting flute, as did the old-style bit

used with a brace, and can be used with a hand or power drill.

In the item on drillstands (GW 9:72), the tests described by your tester do not test the drillstands in any way. Rotating the chuck only tells you whether the point of the drill is central and whether the drill is bent.

W. M. James, Chester
Metal cutting countersink bits tend to be used because they are more widely available. But technically you are correct.

As for the drillstands test you mention, all we were checking was whether the collar was parallel to the base. We used all the drillstands thoroughly before deciding which was best. NG

Handling charge

I would like to say a few words about your article on saws (GW 8:18). Regarding the hardpoint saws, I agree they are most wasteful in the use of materials. A small refund on old saws for new could help this situation.

Also, you did not mention that most saws are unable to stand on their handles when at rest. On site, hanging up from the hole in the blade is not practical and a saw stood on its blade end invariably falls over and blunts teeth.

H. Watson, Durham
We have subsequently checked out the saws, and they all stand on their handles unsupported. NG

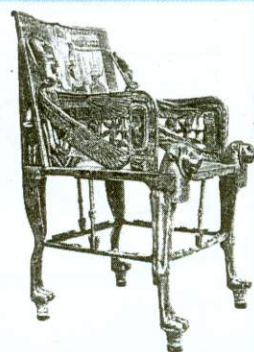
Offer to discount

What an excellent book you are producing compared to other woodworking magazines on offer. Just one criticism, however.

I am in the market for a Delta fretsaw and was heartened to see a coupon in your discount chequebook to save £51 if I made my purchase using your voucher, at the cost of £207. The trouble is that Kendal Tools is offering this same machine for £199 with extra blades and inclusive of VAT.

Calvin Stewart Bournemouth
This is correct, and for a while Kendal were offering that price (which we did not realise) without postage and

Justified Ancients



In response to your continued correspondence about the woodworking skills of the ancient Egyptians, I enclose a copy of a picture of King Tutankhamen's golden throne in the Ashmolean Museum, Oxford.

Jeff Gorman, Yorkshire
Thanks Jeff... but has anyone any pictures of the ancient Egyptians actually doing their woodwork? NG

packaging but they are now charging £8 carriage, which was built into our price in the chequebook. NG

Figure of fun

I've just seen a specialised "builder's calculator" advertised. What on earth does it do – add £5,000 to any given figure?

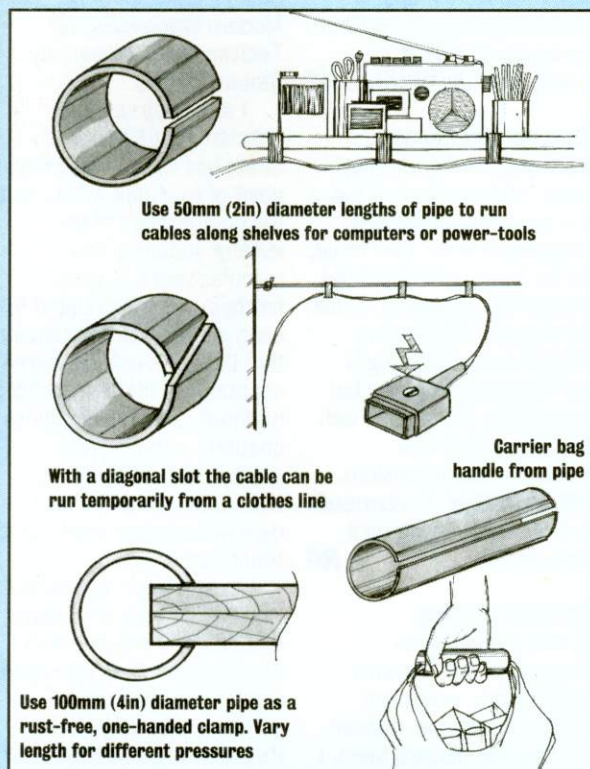
R. Davenport Herts
No, it doesn't. I've got one and it works perfectly, apart from when it's raining. Unfortunately the telephone

number we gave for the Inchmate (GW 9:47) is no longer operating, and we cannot find a distributor for the calculator. If you know how they can be obtained please contact us. A Mr Skarin of London has already rung us to say that Sharp make a calculator called the ELSIMATE EL344A, which converts from metric to imperial, but not in fractions. We have found a calculator in the USA called the Construction Master III which costs \$79.95 from Calculated Industries (☎ 0101 714921 1800). NG

The wrong cut

I really must complain about your illustrations, (GW9:59), purporting to show the differences between the European and American cherry. The European was radially cut and showed the medullary rays that all species of cherry carry; the American was tangentially cut and showed a faint annual ring pattern. Tangential and radial sections of the same piece of timber will look just as different as your two illustrations. To properly show the differences between two similar timbers it is essential to show tangential and radial and also preferably cross sections of both timbers.

Rik Middleton, Coventry
We will try not to let this to happen again. NG



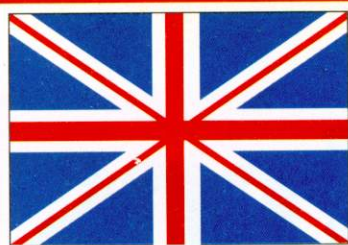
I have been messing about with various sizes of plastic pipe, as used by the plumbing brigade. By cutting the pipe into short lengths, and then making a cut along their length you can use them as clamps, for holding up cables or as an alternative to the carrier bag handle (GW 8:22). By making the slot diagonal you can easily run cables temporarily through them, with the hanger attached to the clothes line outside, or hooks in the workshop.

Charles Smith, Staffs

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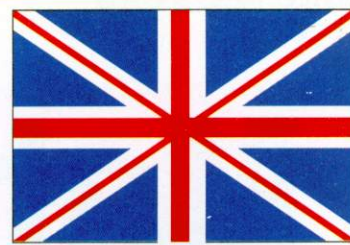
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Good Woodworking
The magazine for the woodworker



BRITCRAFT

BRITISH MADE



TUNGSTEN TIPPED ROUTER CUTTERS

ALL PRICES INCLUDE VAT & POSTAGE

TYPE - SINGLE FLUTE

<u>DIA</u>	<u>SHANK</u>	<u>PRICE</u>
1/8	1/4	£9.50
3/16	1/4	£9.50
7/32	1/4	£9.50
1/4	1/4	£9.50

TYPE - TWO FLUTE IMPERIAL

<u>DIA</u>	<u>SHANK</u>	<u>PRICE</u>
1/8	1/4	£9.50
3/16	1/4	£9.50
1/4	1/4	£9.50
1/4 L	1/4	£10.00
5/16	1/4	£10.50
5/16 L	1/4	£11.00
3/8	1/4	£9.50
3/8 L	1/4	£10.00
7/16	1/4	£10.00
1/2	1/4	£9.50
1/2 L	1/4	£9.50
5/8	1/4	£10.50
5/8 L	1/4	£11.00
3/4	1/4	£11.00
3/4 L	1/4	£13.00
7/8	1/4	£13.50
1	1/4	£15.00
1" L	1/4	£15.50

TYPE - PANEL CUTTERS

<u>DIA</u>	<u>SHANK</u>	<u>PRICE</u>
1/4	1/2	£11.00
3/8	1/2	£10.00
1/2	1/2	£9.00
1/2 L	1/2	£15.00
5/8	1/2	£10.50
3/4	1/2	£12.00

TYPE - V GROOVE CUTTERS

<u>ANGLE</u>	<u>SHANK</u>	<u>PRICE</u>
30°	1/4	£12.00
45°	1/4	£10.00
60°	1/4	£9.50

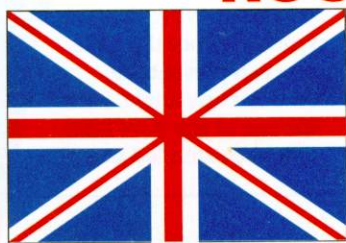
TYPE - DOVETAIL CUTTER FOR DOVETAIL JIG

<u>DIA</u>	<u>SHANK</u>	<u>PRICE</u>
12.7	1/4	£10.00

TYPE - RADIUS CUTTERS

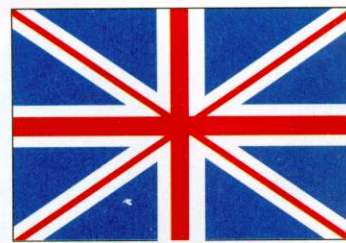
<u>RADIUS</u>	<u>SHANK</u>	<u>PRICE</u>
3mm	1/4	£10.00
5mm	1/4	£11.00
7mm	1/4	£13.00
8mm	1/4	£15.00
9mm	1/4	£16.00
9.5mm	1/2	£18.00
10mm	1/4	£18.00
12.5mm	1/2	£20.00

THIS IS A SMALL EXTRACT FROM A LARGE RANGE. ASK US TO QUOTE ON ANY OF YOUR ROUTER CUTTER REQUIREMENTS



BRITCRAFT

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LEAGRAVE, LUTON, BEDS**
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Material Matters

No.7 Router cutters Peter Billingham helps you equip your workshop

You only have to flick through one of the many catalogues of routing accessories to discover there are now thousands of cutters for sale. And no matter whether you are a seasoned router user or have just bought your first machine, the sheer range can be intimidating, especially with new patterns regularly being produced.

The most fundamental decision will be the choice of shank diameter. If you have already bought your router, the choice will have been made for you, but if you are still trying to make up your mind there are several points to consider.

Dearest Isn't Always Best

Only the heavy-duty routers are made to take bits with 13mm ($\frac{1}{2}$ in) shanks. Most of these come

supplied with a reducing sleeve to enable them to take 6mm ($\frac{1}{4}$ in) bits as well. There is a great temptation to buy one of these large routers since they naturally appear to be the most flexible, offering the range of shank options. This could be a mistake.

Machines range from a mere 400W input to more than 2000W. It is easy to buy a powerful sledgehammer to crack a very delicate walnut. Much of the routing you are likely to do will be using the router hand held. You will find that a 400W version (GW 5:66) will weigh about 2kg (4 $\frac{1}{2}$ lb), but the really powerful brutes weigh up to 8kg (17 $\frac{1}{2}$ lb). Just imagine what it would be like routing a delicate tracery with a monster like that!

Of course, the other side of the coin is that there is a danger of your tool being under-powered for the job you have in mind. Solve this by buying the most powerful tool in the weight range you would like to handle. Unless you are running a commercial workshop and must make heavy cuts in one operation, you can use a light machine to create the most complex profiles by making multiple passes. Incidentally, this dramatically reduces the wear on your bits, and it is usually safer.

Until recently, the range of 6mm ($\frac{1}{4}$ in) shank cutters was more limited than the 13mm ($\frac{1}{2}$ in). Many woodworkers were obliged to buy the larger models for their ability to take the full gamut of profiles, as well as their extra power.

Today, the range of 6mm ($\frac{1}{4}$ in) cutters has grown, and more and more of the smaller routers are supplied with an 8mm ($\frac{5}{16}$ in) collet. The advantage of this is that the security of a slightly larger shank means that cutters that were once only made for 13mm ($\frac{1}{2}$ in) or 10mm ($\frac{3}{8}$ in) collets can now safely be produced with an 8mm ($\frac{5}{16}$ in) shank.

The recent introduction of vertical panel cutters means that you can produce raised panels for doors with a small router, slung under a router table.

What about Router Tables?

If you are intending to buy a router table, so that you can clamp your router under it to make a spindle moulder, weight matters less, and power is more important.

If you are using your router in this fashion, you can adjust the depth of cut – to a degree – by varying the position of the fences in relation to the cutter. Or if you own a radial arm saw, you could mount the router on this and adjust the cutter position very accurately. However, with both these options you will still have to play around with the router plunge action regularly to change cutters and adjust the depth. Large routers can be awkward to work with under a router table because of their weight, and their plunge action springs tend to be as powerful as their motors.

While tables can make cutter changing difficult, they have the great advantage of allowing you to guide the work using fences and jigs (GW 7:46). Because you are moving the work, and not the table, you can present the wood at any angle, with the use of jigs (GW 8:81) to make extended use of

The cutter quandary: (clockwise from top left) insert for Versofix disposable tip cutters (APTC); ovolo cutter (Trend); Rota-tip self-guiding bevel trimmer with disposable cutters (Trend); Multi-mould moulding cutter (Trend); TC boring bit insert (APTC); handrail cutter (Titman); fibreglass and end-grain trimming cutter (Griffiths); and Multi-reeding cutter (Wealden)

Eight ways to get the best from your bits

- 1 A broken bit can result if you take too deep a cut and apply too much pressure when feeding the tool. Always allow the router to reach its full operating speed before applying the cutter to the workpiece.
- 2 Be very careful to see that there are no old nails or other metal objects hidden in the timber. They can chip your cutter. When this has happened, the damage is found all around the bit.
- 3 If the tool burns the wood it often means that a layer of resin has built up on the cutter or that it is in need of sharpening. It can also be caused by too slow a feed rate or too deep a cut.
- 4 The shank may break or bend if less than two-thirds of it is in the collet.
- 5 Cutting plastic laminate when the adhesive has not had time to dry properly can break a cutter's bearing. The correct solution is to remove the bearing and

scrape off the glue. Do not place the bearing in solvent – you will probably remove the lubricant and destroy the bearing altogether. Spraying the cutter with silicone will help avoid this problem.

- 6 Threaded cutters screw directly onto the spindle and give a more stable mounting for heavy routing.

7 If you are cutting a lot of MDF or chipboard, the cutter may acquire a build-up of resin which can cause the bit to overheat and become dull. You can get much longer life from a bit if you make a series of shallow passes rather than one deep one. Move a laminate trimmer up and down to spread the wear. Make sure that only about 3mm ($\frac{1}{8}$ in) is trimmed off at a time.

- 8 Finally, if you keep your bits sharp by dressing them with a diamond stone they will last a lot longer. Blunt router cutters can drag, and it has been known for them to slip out of the collet during use.

TIPS

haped cutters.

However, if you intend to work free-hand you will almost certainly need to consider guided bits. These

You might not think that tightening the shank could have much effect on the cutting power of the bit but, if the collet is over-tightened, it can become distorted into an oval, which in turn can mean that the bit will not run true and may ultimately break.

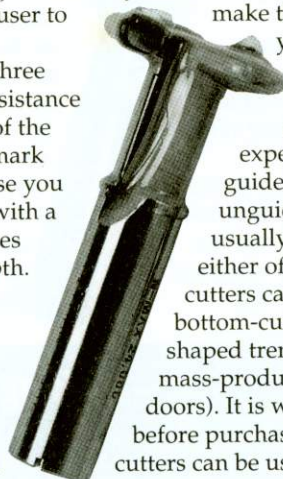
have pins or bearings that rub against the workpiece and help keep the tool cutting an even depth into it. A pin-guided cutter has a polished steel pin concentric with the shaft and this bears against the

workpiece. Pins, because of their smaller diameter, allow a more intricate shape to be followed. A few manufacturers offer adjustable pin diameters to allow the user to alter the depth of cut.

The bearing guide has three advantages: it offers less resistance to the forward movement of the router, it does not tend to mark the workpiece and – because you can buy cutters that come with a range of bearings – it enables you to vary the cutting depth. Depending on the type of cutter, the ball race can be mounted above, below or in the middle of the cutting edge.

The trouble with using guided cutters, hand

held, is that you cannot alter the angle of presentation, and your range of mouldings is determined by the cutters you own. This can make the decoration of your work predictable. Pin (or pilot) guided cutters are less expensive than bearing guided ones, and the unguided ones will usually cost you less than either of them. Pin guided cutters cannot be used for bottom-cutting (to produce a shaped trench as found on mass-produced MDF kitchen doors). It is worth checking before purchase that bearing cutters can be used in that way



Jeremy Broun's cutter selection for creative routing

To find out what cutters other woodworkers use, we asked our Associate Editor, Jeremy Broun, to pick his favourite cutters. Author of *The Incredible Router* (published by Guild of Master Craftsman Publications), Jeremy uses a Trend (☎ 0923 230454) as the basis for his routing. We visited his workshop and discovered that the majority of his cutters are actually straight ones. They tend to be TCT, ranging in size from fine 1.6mm ($\frac{1}{16}$ in) for stringing to long 20mm ($\frac{3}{4}$ in) cutters for trimming to a template shape with the router bolted into a router table.

The Trend set is a seven-piece Craft range. They are all 6mm ($\frac{1}{4}$ in) shank cutters, with four straight cutters, a V-cutter, rounding-over bit and radius bit. To these, Jeremy says he would add the 1.6mm ($\frac{1}{16}$ in) straight and a bearing guided 6mm ($\frac{1}{4}$ in) radius rounding-over bit. He has one that has served him well for years and uses it to remove the arris on all the furniture he makes.

Among his collection of tools we also found some larger, more sophisticated cutters. These included a finger-jointing cutter, which produces a wide gluing

area for edge jointing, and it also can be used for decorative effects.

Jeremy uses the Leigh dovetail jig (☎ 0249 750272), and thus has a number of dovetail cutters. He also has a very large radius cutter for removing a bulk of waste and then bending wood. Jeremy uses a large Hitachi router and has replaced metal collets with fibre ones from Method Tools (☎ 0663 762187).

Jeremy uses a range of 6mm, 10mm and 13mm shank cutters, and has yet to have a shank break on him. We wondered if the larger shank sizes are not only stronger, but the extra friction area may produce a better grip. While not being able to confirm this, he does say that he feels more secure with the larger shanks, even on a 6mm ($\frac{1}{4}$ in) radius rounding-over bit.



Types of router cutter

Straight cutters

- Single flute – fast cutting
- Two flute – cleaner finish
- Extra-long shank – deep grooving and morticing
- Shear cutter – for working veneered material
- Spiral cutter – extra fine finish
- Replaceable tip cutter – take solid carbide blades for low down-time
- Stagger tooth cutter – ideal for chipboard

Trimmers

- Bottom-trimming cutter – three blades for lip trimming
- 90° self-guided trimmer – bearing is mounted on end of cutter
- Replaceable-tip trimmer – takes solid carbide blades for low down-time
- Self-guiding triple flute – for extra-fine trimming
- Double bearing trimmer – trims two faces at once
- Bevel trimmers – with or without bearings and at a variety of angles
- Combi trimmer – trims or bevels top and lip. With or without bearing
- Overlap trimmer – roughs down to 3mm ($\frac{1}{8}$ in) before final trim

Rebaters

- Bearing-guided rebater – better depth control
- Pin-guided rebater – follows complex curves
- Template profile cutter – has a bearing on the shank
- Recess and core-box cutter – for making a channel strip or for fluting

Chamfers

- Pin-guided chamfer – available in a number of angles
- Bearing-guided chamfer – available in a number of angles
- Chamfer 'V' groove – for bevelling
- Three-flute chamfer cutter – for an extra-clean cut
- Three-flute engraver – cuts a groove to a fine point
- Engraving cutter – has a fine tapered point

Edge Moulders

- Rounding-over and ovolo cutters – leave a convex moulding. Various shapes with both pins and bearings



Good Woodworking

TEAR OFF FACT FILE

Guttering and cove cutters – leave a concave moulding. Also available in dozens of variations

Ogee cutter – a combination of ovolo and cove shapes in the form of a shallow S, with or without the little steps known as *quirks*. Very wide range, with or without pins or bearings

Staff bead – leaves a raised half round bead on an edge which, when teamed with a matching sunk bead cut channel, can make a glue joint.

Corner bead – a second pass can cut a full corner bead. Also available in dozens of variations

Drawer pull cutter – cuts the finger grip for doors and drawers

Multi-profile cutter – creates many patterns by making several passes

Panel Raising Cutters

Ogee – S-shape that underlies many panel-raising cutters. Available with pins and bearings, as well as with guides

Panelling bevel – available for use in both vertical and horizontal positions

Radius cutter – cuts a half-round channel

Jointers

Finger jointer set – arbor with a 13mm ($\frac{1}{2}$ in) shank and with up to four cutters

Comb joint set – ideal for small boxes and the like

Fixed-shank finger jointer – non-adjustable

Mitre-lock jointer – also used for glue-jointing flat boards

Offset tongue and groove – a reversible finger jointer

Note: Most of the above need a powerful router with a 13mm ($\frac{1}{2}$ in) collet and the router must be used in a fixed position

Dovetails – for use with dovetail jigs

Dust-bead and jointing cutters – for special display cabinets

Hook joint cutter – self-aligning, self-locking glue joint

Matched Pair Cutters

Reversible profile scribe sets – see box
Matched pairs of profile scribe sets – see box

Mitre-corner cutters – make a lapped-mitre joint

Classic panel – ogee and scribe for corner joints

Bearing-guided double ovolo – makes glazing bars

without the bearing. Prices vary greatly from one supplier to another, so it is worth obtaining all the catalogues.

HSS vs. The Rest

The next consideration may be whether to buy tungsten-carbide tipped (TCT) cutters, solid tungsten carbide, or high-speed steel (HSS). The beauty of HSS is that not only can it be reground, it will also take a sharper edge than other materials. When used on non-abrasive softwood, it cuts more cleanly than tungsten carbide, but it does not hold its edge as well. Router cutters made from HSS are less versatile for the majority of woodworkers.

Tungsten does tend to be brittle and care is needed. It is easy to chip the edge, which is then difficult – and often impossible – to redress. Solid tungsten cutters give a better plunging cut and are less likely to break under stress than their tipped cousins. They are generally only used for fine work because they can be twice as expensive.

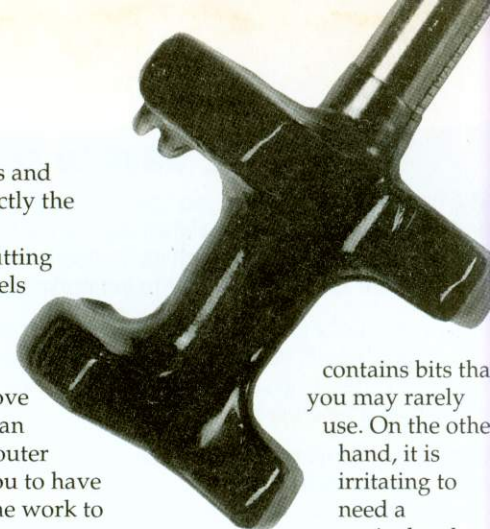
Yet another option is the arbor. This is a spindle that is threaded at its lower end to accept various kinds of cutter, bearings and a securing nut.

Using one allows you to assemble a mix of cutters and bearings to give you exactly the cut you need. These are particularly useful for cutting slots and grooves in panels as the router base works off the face of the piece rather than the thinner edge. If you have to groove with a straight cutter it can be difficult to keep the router even, and it does help you to have a fence on each side of the work to stop the cutter wandering.

Straight Cutters

Despite the availability of a vast number of ornamental and decorative cutters, about 70 per cent of those sold are straight ones. Here too, there are a number of options. The two-flute cutter gives a smoother finish than the single flute, though the latter cuts faster and clears the waste better. Further variations are shear and spiral cutters, which are designed to give a cleaner cut, especially on veneers and laminated boards.

Several firms supply start-up kits to enable the new router owner to buy a selection of cutters. They are often sold at a discount on the single-bit price, but you must be wary about buying a set that

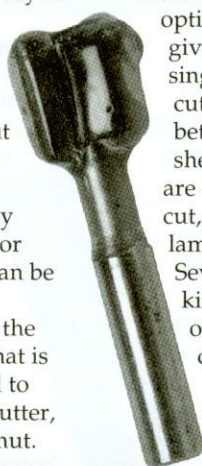


contains bits that you may rarely use. On the other hand, it is irritating to need a particular shape and have no tool

with which to make it. Building up a collection of useful shapes is an important part of owning a router.

Two bits that you will almost certainly need in your workshop are the 6mm ($\frac{1}{4}$ in) and 13mm ($\frac{1}{2}$ in) two-flute straight cutters. I choose the two-flute because of its cleaner cut, and longer life due to less wear on each edge.

What woodworker can resist making dovetail joints? This puts a 13mm ($\frac{1}{2}$ in) dovetail bit next on my suggested shopping list. Two bearing-guided bits come next: a 25mm (1in) diameter corner-rounding bit and a 45° chamfer. If you also buy a smaller bearing for the corner rounder, you can convert it into an ovolo. Finally, I would add a 13mm ($\frac{1}{2}$ in) radius



Making doors and panels

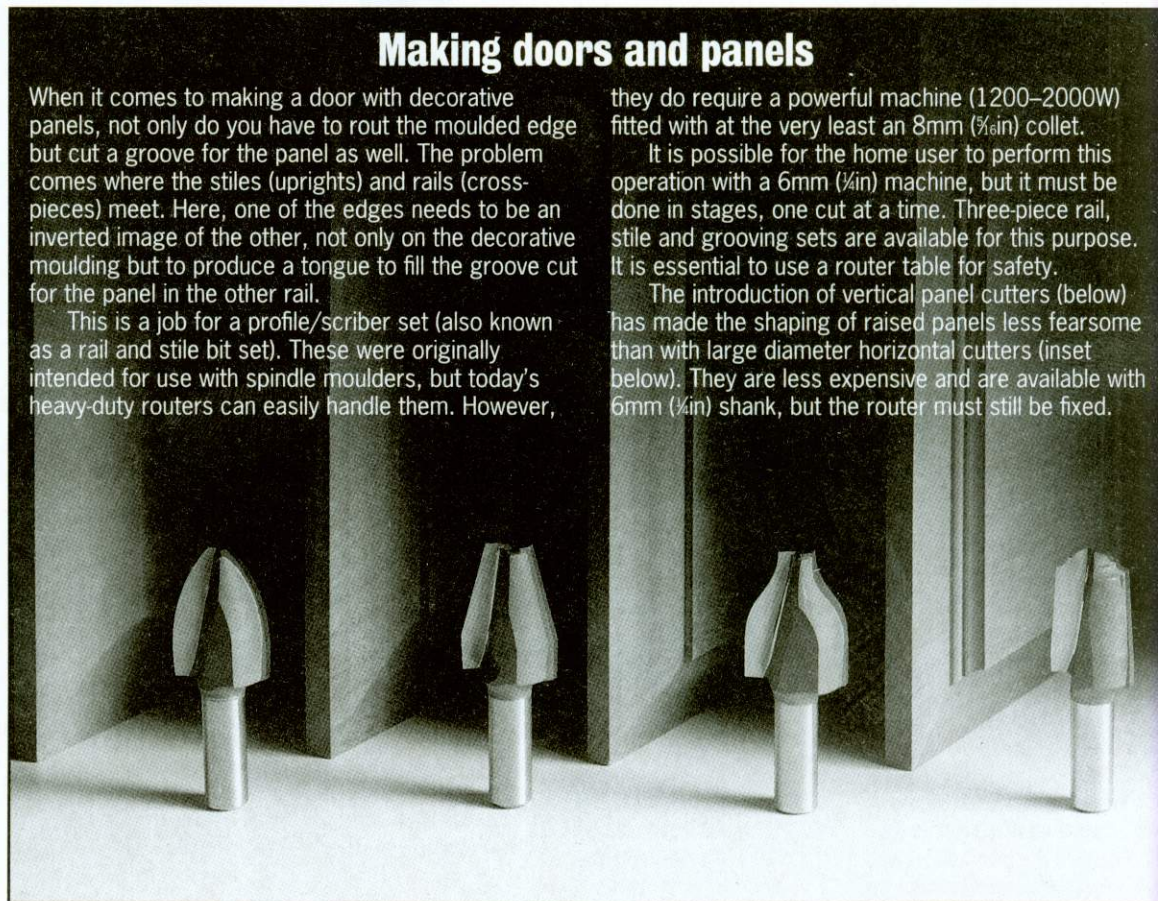
When it comes to making a door with decorative panels, not only do you have to rout the moulded edge but cut a groove for the panel as well. The problem comes where the stiles (uprights) and rails (cross-pieces) meet. Here, one of the edges needs to be an inverted image of the other, not only on the decorative moulding but to produce a tongue to fill the groove cut for the panel in the other rail.

This is a job for a profile/scraper set (also known as a rail and stile bit set). These were originally intended for use with spindle moulders, but today's heavy-duty routers can easily handle them. However,

they do require a powerful machine (1200–2000W) fitted with at the very least an 8mm ($\frac{5}{16}$ in) collet.

It is possible for the home user to perform this operation with a 6mm ($\frac{1}{4}$ in) machine, but it must be done in stages, one cut at a time. Three-piece rail, stile and grooving sets are available for this purpose. It is essential to use a router table for safety.

The introduction of vertical panel cutters (below) has made the shaping of raised panels less fearsome than with large diameter horizontal cutters (inset below). They are less expensive and are available with 6mm ($\frac{1}{4}$ in) shank, but the router must still be fixed.



or core-box cutter which is useful to create decorative finishes, notably flutes.

Looking through my catalogues, I find that these six pieces, bought singly, might cost you between £90 and £150. I was unable to find a boxed set with the same selection, but a similar even-piece set without the bearing cutters is sold for about £70.

There are 12-piece sets being sold at the moment – that include all six of the bits I have selected – for about £60. However, they have no indication of who makes them.

This is rather an important factor in choosing router bits: quality can be influenced by which grade of metal has been used to make them, and by how well the tungsten tips have been brazed in place. Large woodworking companies will try a variety of cutters from several manufacturers and, because they use a great many of them, will be able to

How to store router cutters

When you buy a router cutter it will come in a protective cover or a box with a pre-shaped foam insert. This is often the best place to store them. Tungsten carbide tips – though extremely hard – are brittle. The first rule is that router bits must not be allowed to come in contact with each other. If you throw them all together in the bottom of a box they are likely to chip, after which they will never cut cleanly again.

Always take the bits out of the router and give them a wipe with an oily rag before putting them away. The most popular storage method for cutters is to drill a series of holes in a block of wood and stand the bits upright in it. An early routing project might be to take a matching block of timber and make a lid for the set.

calculate value for money accurately. Hobby woodworkers on the other hand, may prefer to buy the less expensive tools and handle them more carefully.

There is a continual debate within the router cutter industry regarding the source of cutters. Unfortunately, it is very difficult to test router cutters for quality. We would love to be able to check out the various brands, but do not yet have the facilities for the in-depth tests on metal that such a review requires. We will do so in the future, but for now contact us with any experiences you have had regarding the quality of cutters.

Cutter Quandary

The Good Woodworking team's solution to the cutter quandary is a selection six cutters. With these you will be able to make pretty good use of your router.

- ① 18 or 19mm straight cutter
- ② 3mm radius cutter
- ③ Bearing-guided rounding-over cutter
- ④ Arbor for slot cutting, with 6mm cutter and bearings
- ⑤ Bearing-guided bevel cutter

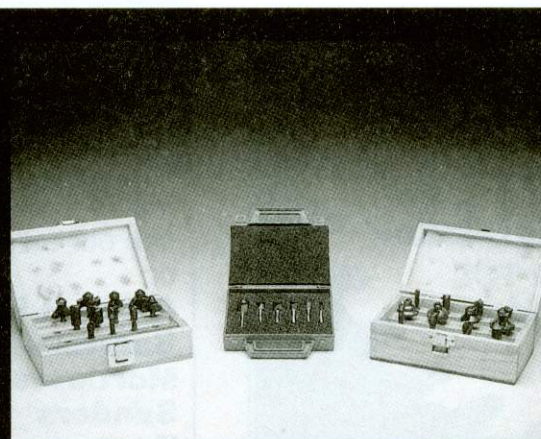
We suggest you check all the catalogues for price, and buy more cutters when required.

What's in a cutter set?

A number of router cutter suppliers sell sets of cutters. Some will make up special ones to meet your needs. The advantage of such sets is that you can often pick up bargains, with all the cutters you need at a fraction of the price of buying them individually. The trouble is that you may end up with cutters that you will never use. There is much to be said for allowing your collection to evolve as you discover what you need and which brand you like.

We had a look at two 12-piece sets of router cutters from Axminster Power Tool Centre (☎ 0297 33656) and BJR International (☎ 0274 626365). Both sets cost just under £60, mail order, in wooden boxes. The BJR set has space for three more cutters as you expand your range. They both have four-bearing guided cutters for rounding-over, bevelling, coving and producing Roman ogees. The BJR set also includes a 10mm (3/8in) horizontal slot cutter with bearing guide. This is a useful addition, absent from the APTC, which can be used for grooving, though is of no use if you are using thin ply panels. The APTC set has a bearing-guided trimming cutter instead, which is possibly more useful if you intend to do shaping work with a template. Otherwise, the sets are made up of three straight cutters, a piercing and trimming cutter for laminate work (cutting out kitchen sink holes), a dovetail cutter, mortice cutter and V-groove cutter. Of the straight cutters, the BJR set has one larger cutter (19mm/3/4in) than APTC which is useful for routing housing joints for (19mm/3/4in) MDF or ply, though thicknesses are terribly inconsistent.

You can buy a router cutter specifically for this



joint (an 18.2mm straight was popular) and then you find the material is too loose or too tight when you buy your next batch.

Of the cutters, we would use the straight cutters, but probably not need four, and rarely use about four of the other cutters in each set. However, four or five cutters would be in constant use. It comes down to whether you prefer the trimming cutter of the APTC set or the BJR slot cutter.

Most of the sets available combine shaped and straight cutters, though Titman offer a set of six beautiful straight cutters (☎ 0255 220123) which also includes one trimming cutter and another with chamfering edges for £67.42inc.VAT. Other suppliers of sets include Freud (☎ 0532 527377), Trend (☎ 0923 230454) and Tyzack (☎ 0279 418338).

Good Woodworking

TEAR OFF FACT FILE

Sash-bar scribe set – scribe and rebate cut together

Sash bar ovolo set – for making window frames

Glazing bar and jointer – produces mould and rebate

Stile and rail cutters – for lightweight panel doors

Note Most of the above need a powerful router with a 13mm (1/2in) collet and must be used with the router mounted in a table

Drill Bits

Fast spiral drill – suitable for particle boards

Slow spiral drill – for drilling end-grain in wood

Hinge-sinking bit – creates the holes to house circular hinges

Disposable-tip boring bit – double-edged insert

Miscellaneous

Biscuit jointer set – swap the bearings and use your router to produce slots for a variety of biscuit sizes

Slot cutter – prepares a recess for edge mouldings

Ball groover – cuts a tubular slot, to conceal cables for example

T-slotter – cuts a square-section slot

Keyhole slotter – cuts a clearance hole with a narrow neck, for picture hanging

Back cutter – designed to undercut the edge of the workpiece

Miniature cutter – designed for producing mouldings for dolls' houses.

Reed cutter – for cutter reeds along edges. Often used for cutting a single bead on the corner of an edge

Handrail cutter – large router cutters used for shaping handrails for stairs. Router must be fixed

Rule joint cutters – often used on desks or folding tables to form the joint where a leaf folds down and up

Suppliers of cutters

APTC	☎ 0297 33656
B&GP Tools	☎ 0752 561297
BJR International	☎ 0274 626805
Freud	☎ 0532 527377
Griffiths	☎ 0633 266481
Method Tools	☎ 0663 762187
Titan	☎ 0424 216897
Titman	☎ 0255 220123
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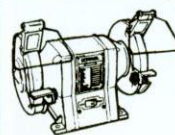
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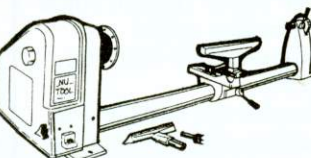
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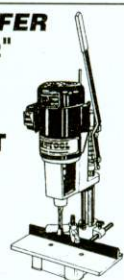
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Back of an envelope design

Workshop storage usually evolves according to your own needs. If you are like me, tidiness is a struggle, and it is difficult to always return tools to the right place.

Even if you have designated homes for all your tools there comes a time when the routine breaks down, and they get sprayed around the workshop.

The flatbit is just the sort of tool you can never find when you need it. They are relatively inexpensive, and though not the most efficient hole cutter, they are useful for occasional drilling. Bearing that in mind, the Good Woodworking team asked me to design, in a few hours, a rack for storing a range of flatbits.

This simple design offers flexible storage where numerous drill bits can be easily supported, identified, reached and returned. And it allows for manufacturers' slight variations in design, particularly in the shank diameter of flatbits.

The smallest flatbits (around 6mm or $\frac{1}{4}$ in) are held by friction in a slightly

undersize groove, using the grain strength of the groove wall to grip them. Larger diameter bits are allocated to slightly oversize grooves and are gravity held. Some people drill holes in shelves for flatbits. That is fine if you have the shelves already, but such a rack needs brackets fixed to the wall to hold it up. The beauty of my simple rack is that it can be screwed straight to the wall.

You can make this rack to whatever size you wish, ranging from a standard

range of eight flatbits, to big enough for the most avid of tool collectors.

Making the Rack

1 First select and prepare a piece of ash, or a hardwood that is as tough. Plane the sides and edges, and check that everything is perfectly square.

2 Square a line across one end, 6mm ($\frac{1}{4}$ in), and mark out the grooves (according to the plan) with a try square and pencil or ballpoint pen.

Remember to shade the waste area, as this clarifies the line to be cut. Extend the lines using a try square resting against the edges and a gauge set to the depth of the grooves.

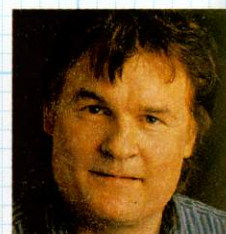
3 The next step depends on whether you want to work by hand or machine.

First, the hand-tools option. Use a tenon saw and bench hook to cut each groove, taking care to cut against the line on the waste side. With the narrow-spaced



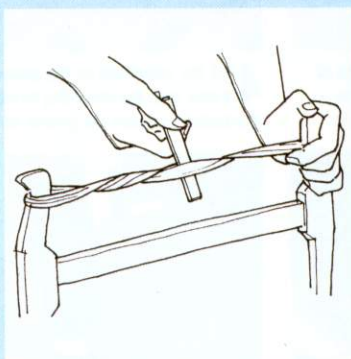
Jeremy Broun's flatbit rack is one simple step towards keeping your workshop tidy, and it can be made in less than an hour

Tidiness is often the first thing to suffer when woodworkers get busy. Resolutions to keep things in order and to hand can go out of the window when enthusiasm gets a grip. Jeremy Broun's simple and versatile flatbit rack is a quick step back to order and efficiency. Make it by hand or use a radial arm saw for results in less than an hour



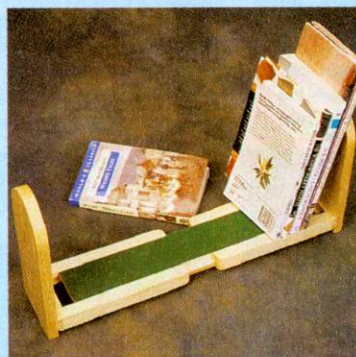
Jeremy Broun has been catching up with some long-overdue fishing this month, in between producing a few small private furniture commissions. He was also interviewed for a regional TV programme about the Furniture Group's exhibition in Bath

WEEKEND WOODWORK



A BOWSAW THAT LASTS 50 YEARS

Readers own projects
Page 35



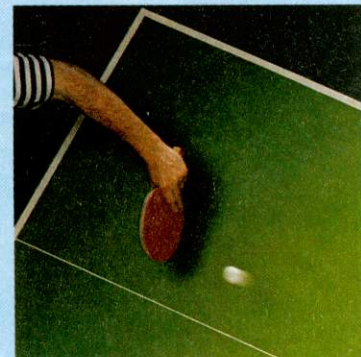
BOOKSTAND

Make a stand that expands along with your book collection
Page 36



HOMAGE TO DOVETAILS

Carve a box for fishing flies
Page 38



PING-PONG DINING TABLE

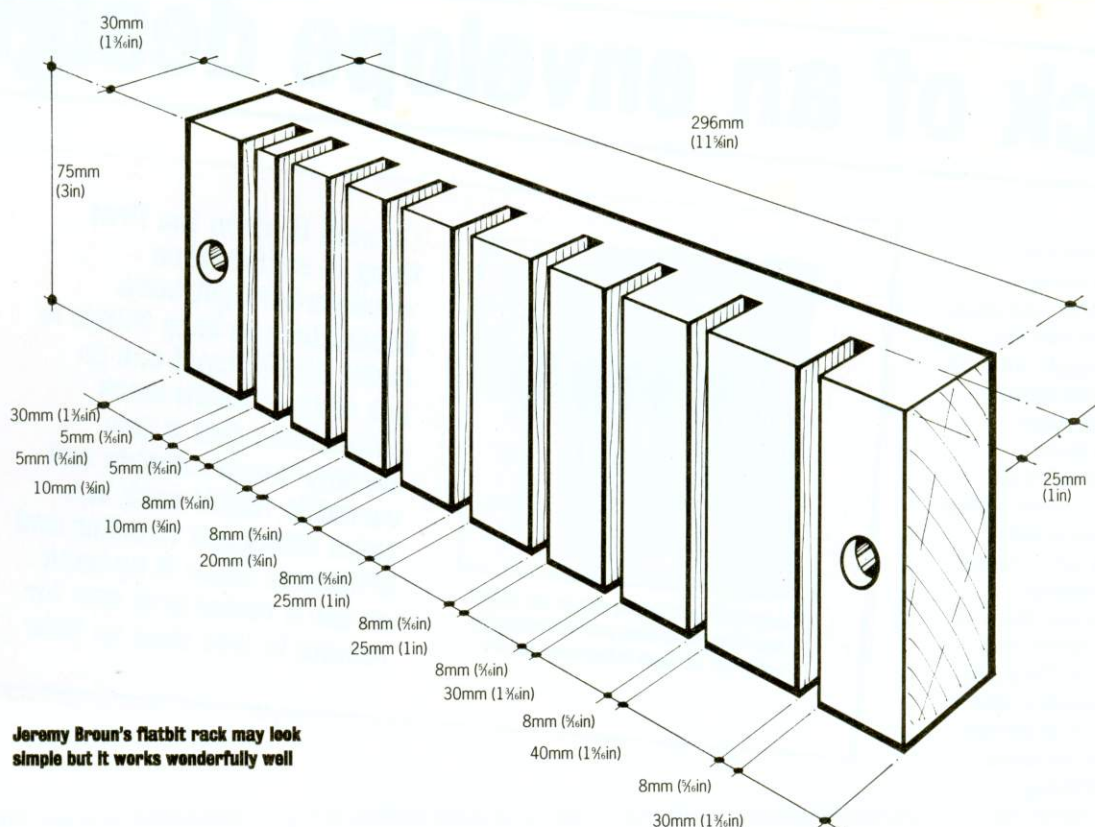
For playing on or eating from
Page 44

OBJECT Flatbit rack

MATERIALS YOU WILL NEED

HARDWOOD

Jeremy used a 305x100x25mm (12x4x1in) piece of ash



Jeremy Broun's flatbit rack may look simple but it works wonderfully well

grooves, be careful not to wrench the saw and accidentally sever the short grain between the grooves.

4 Use a 6mm (1/4 in) chisel and a mallet to chip away

the waste wood carefully from one end of each groove. Work from a groove in the middle of the wood first to avoid splitting the grain on the narrowest grooves. You might find it helps to not

only cut the shoulders of the grooves but also in between to make chiselling easier.

5 Reverse the wood and remove waste from the other side. Do not break

through the ends. Clean up the bottom of the groove by paring with the chisel.

6 The alternative (and much quicker) method is to use a radial arm saw, adjusting

Making a flatbit rack for the workshop



1 Plane up the timber. It is best to use a tough hardwood, like ash, to stop the grain snapping between the grooves



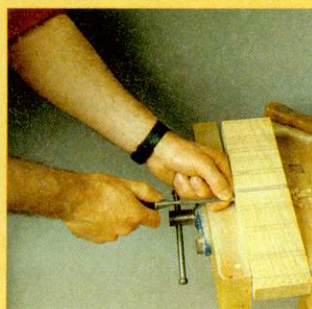
2 Draw the lines for the grooves, making sure that you shade the waste area to help avoid mistakes



3 Use a gauge to mark the depth of the grooves. You will be able to plane away this marking line later



4 Cut the shoulders on the grooves. It may help the chiselling to make a wasting cut down the groove centre



6 Use the chisel on its side to clean up the bottom of the grooves. The flatbits must be able to fit securely



7 The radial arm saw makes quick work of the grooves. Do not hold the rack by the short end when cutting



8 The advantage of a radial arm saw is that it can be used for snipping off the shavings for a better fit



9 Drill and countersink the holes for fitting the rack to the wall. You can do this before cutting off the ends

TOOLS YOU WILL NEED

HAND-TOOLS

Hand-plane, try square, tenon saw, 6mm (1/4 in) bevel edge chisel and mallet

OR

RADIAL ARM SAW

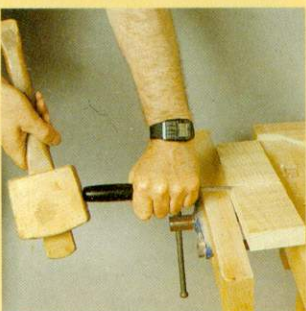
the blade height and working to the lines. This lets you fine tune the widths of grooves, especially ones for smaller flatbits that are friction held.

7 Mark out, drill and countersink holes for attaching the rack to your workshop wall. Carefully cut off the ends to the line, using a tenon saw.

8 Clean up the entire block, using a plane to remove saw burrs and to bevel the edges, then an abrasive paper block to finally clean up. Do be careful, when cleaning up, not to snap off any of the short grain between the grooves.



You may have noticed that the picture of Jeremy's shoe rack went missing last month (GW 9:33). It is a fun design, which is enhanced by the use of contrasting colours for the tiers



5 Chisel out the grooves from both sides, towards the middle so as not to cause breakout along the edges



10 Clean up the edges with a plane, removing any pencil and gauge marks. Take care of short grain

What readers have been making themselves

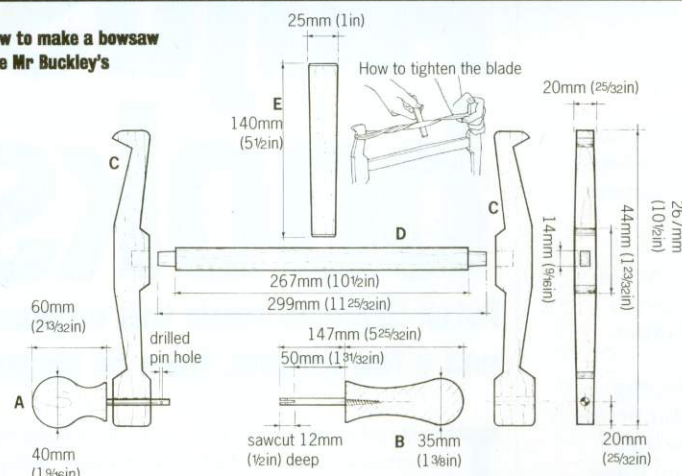
More than 50 years ago, as a boy of 12, A. Buckley of Wigan made himself this bowsaw. Despite its age, it is still serving him well – a reflection of the standard of design and craftsmanship.

The main frame is beech, including the blade-tightening bar (E), while the rear handle (B) and front knob (A) are turned from a suitable piece of oak, drilled to a depth of 19mm (3/4in) to take a 70mm (2 3/4in) No.14 woodscrew.

After each of the woodscrews is driven in, remove its head with a hacksaw and make a 12mm (1/2in) deep sawcut in its plain end. Then drill a small hole at 90° to the slot to take a panel pin or small nail, 43mm (1 1/4in) from the shoulder of the knob or handle. Drill the main frame stiles (C) to take the plain ends of the woodscrews, which must be a push fit. No glues are used in the assembly of the bowsaw, so the mortice and tenons of the main frame must also be a tight push fit.

Assemble the saw by first

How to make a bowsaw like Mr Buckley's



inserting the knob into the stiles and the handle, and then the tenoned middle bar (D).

Line up the blade slots and insert the blade itself, holding it in position with bent-over pins or nails.

Tighten up the blade with a length of strong cord or a builders' line, which is passed in several loops

around the tops of the stiles at the ends that do not hold the blade.

Insert the blade-tightening bar (E) in the middle of the loops made by the cord. Keep on twisting this bar until the saw blade is tight enough. The blade-tightening bar is then locked across the middle frame crossbar, at an angle of 90° to it.



Table is 1219mm (48in) long, 610mm (24in) wide and (16in) high. Legs, frame and lipping are teak

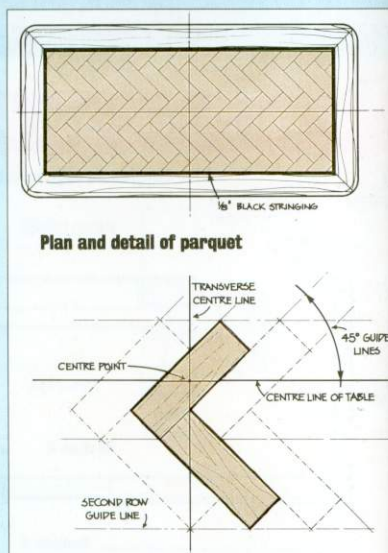
Having made a coffee table for his daughter, David Hodge wanted to veneer the surface in a similar style to a parquet herring-bone design she had seen. He realised this called for accurate preparation of the blocks, errors would accumulate as the design extends. The length of each piece of veneer has to be exactly three times the width.

David made a template using a piece of sheet steel to the proposed size of the blocks. In this case it was 150x50mm (6x2in). He took great care that the ends were square to the sides and the

sides were parallel. Unless you have guillotine, this means careful sawing. Check by cutting four pieces of veneer with the template using a craft knife or scalpel, and see if three short sides really do equal one long side.

The veneer needs to have a distinct straight grain, running parallel to the long edge and making adjacent rows light and dark. For balance, work from a centre line outwards when positioning the pattern. David designed the border so that he could use half blocks (cut at 45°) to fill in the gaps.

The table top was made of blockboard. A trick for holding down the blocks individually while the PVA goes off, is to cut Melamine-faced chipboard blocks 2mm (1/8in) smaller than the veneer blocks. Spread glue and position the veneer with pins round the edges. Place the chipboard block on top, and weigh down for 10 minutes. The further you go, the more blocks you will be laying at each go. Having laid the blocks, trim the edges with a scalpel and straight edge. David



ran 3mm (1/8in) black stringing round the edge, and veneered up to the lipping. He finished with polyurethane.



The lipping is held underneath by glue blocks at the corners

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Adjustable bookstand

Peter Sztencel runs P.S. Fine Woodcraft from his basement workshop in Wakefield, West Yorkshire, making commissioned boxes and other small items. He was a hobby woodworker before he opted to turn professional three years ago. "It was a choice between being a musician, a novelist or a woodworker," he says. Peter hasn't abandoned his musical aspirations playing spare time percussion and flute in the trio *Aardvark*

Peter Sztencel made this unusual bookstand using hand-tools and a few offcuts. Here he shows you how to do the same

This stand is designed for paperbacks, but it could easily be made larger or smaller to take videos, LPs or CDs. I made it by hand in a weekend, just to see if it could be done. Naturally, using machinery – such as a router, bandsaw or thicknesser – would make things easier.

Wood choice comes down to whatever you have lying around. I used an offcut

of 100x50mm (4x2in) softwood. Adapting your plans to suit pre-cut PAR material is a good idea if you don't mind a little more expense. Should you choose to recycle old floorboards, watch out for woodworm!

How to Make the Stand

1 Mark out the components on timber and cut out the end-plates. Plane the other parts to thickness, making

sure that everything is square. A shooting board will help you to trim the ends of the end-plates. Cut the other components to length,

then mark the positions of the cross-pieces.

2 Shape the end-plates, either by cutting a simple clipped diagonal from one of the corners or by using a coping saw to curve the top. Sand smooth. Square off the middle platform block. I used a combination plane to cut the rebates, but a router would have been quicker.

3 Joint the ends of the platform to form the

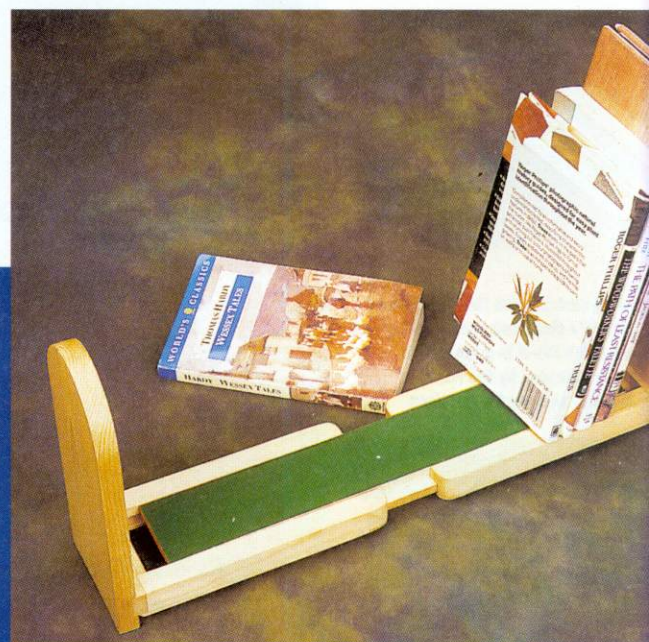
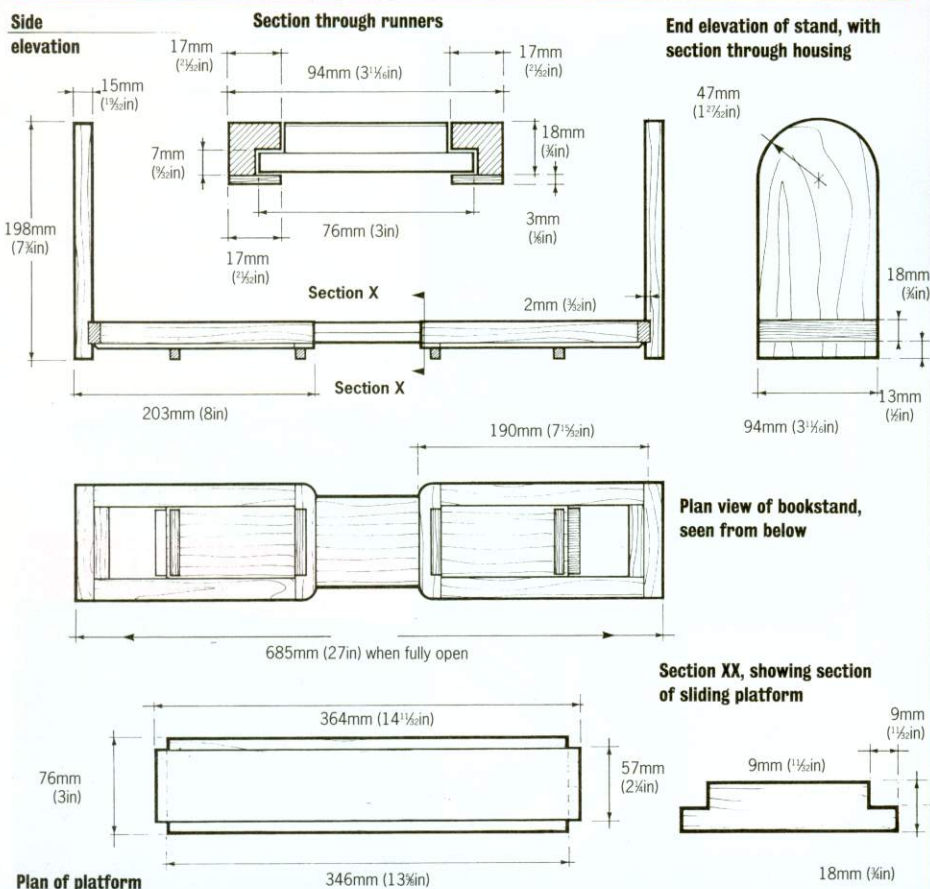
PROJECT GUIDE

DIFFICULTY: Intermediate

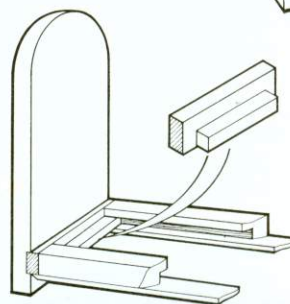
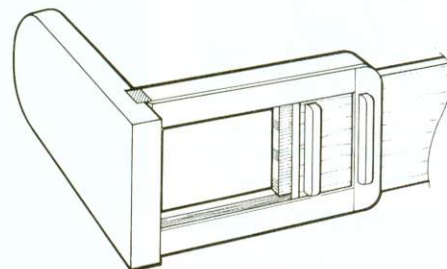
TIME: 10 hours

TYPE: Furniture

Plan, elevations and details to make a bookshelf



From below you can see how the foot on the platform is a stop, and how the rebated runner frame is housed into the end-plates, and how the thin fillet is chamfered



You can adapt the dimensions of the design to suit your requirements, for books, records, videos or CDs

tongue which fills the slot in the cross-rail of the end-plate when the stand is closed.

4 Cut the runners, and rebate by hand or with a router. Clean up, then cut the runners to length. Cross pieces are cut from left-over rebated runner material.

5 The runner components form a U-shape, with the thin fillet below the rebate.

To make rebating small-section material easier, prepare the runners from one edge of wide stock, cut the rebate, and then cut off the narrow runner.

TIP

The ends are jointed by halving, interlocking the rebates to increase the glued area. Fix the runner parts together, using the platform as a guide. Before gluing and clamping, lay a double thickness of paper between the runners and platform for a loose sliding fit when set.

6 Turn the platform over. Mark out lengths of thin

wooden fillets to glue over the bottom of the runners to form the channel. Glue the thin strips across the bottom of the runners and add the longer side strips.

7 Ensure the underside is smooth and flat by rubbing it across a large sheet of abrasive paper. Chamfer the lower edge of the thin strip underneath the runners where they fit into the

housings in the end-plates. Mark and chisel out the end-plate housings. Sand all surfaces smooth and apply a coat of sanding sealer/wax, avoiding the surfaces to be glued. Glue the end-plates to the runner assembly and check for squareness.

8 Check the fit of the runners on the platform, adjusting if necessary. It is

better if they are loose rather than too tight. Even if the rebates are very loose, the feet will prevent any sagging. Fit the small foot across the inner end of each runner assembly and check that it stands squarely.

9 Now you need to cut a foot to fit between the side runners, under the platform. For the assembly to stand flat, this foot's depth has to be that of the small foot plus the thickness of the fillets on the bottom of the rebates. To get this, turn the assembly upside-down and lay a straight edge along the bottom. The distance from the bottom of the platform to the straight edge is the thickness you need for the little foot.

10 Position the foot at the platform's end and glue in place. Repeat this operation for the other side. This foot also acts as a stop for the sliding platform, and therefore it is important to

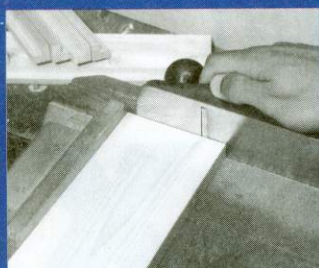
Cutting list					
	MATERIAL	QTY	LENGTH	WIDTH	THKNS
A End-plate	Softwood	2	200mm 7 ⁷ / ₈ in	93mm 3 ⁵ / ₈ in	15mm ¹ / ₂ in
B Middle platform	Softwood	1	365mm 14 ¹ / ₂ in	76mm 3in	17mm ⁷ / ₈ in
C Runner	Softwood	4	180mm 7 ¹ / ₈ in	18mm ³ / ₄ in	18mm ³ / ₄ in
D End runner	Softwood	2	93mm 3 ⁵ / ₈ in	18mm ³ / ₄ in	18mm ³ / ₄ in
E Side fillet	Softwood	4	170mm 6 ⁵ / ₈ in	16mm ⁵ / ₈ in	3mm ¹ / ₈ in
F End fillet	Softwood	2	93mm 3 ⁵ / ₈ in	16mm ⁵ / ₈ in	3mm ¹ / ₈ in
G Platform foot	Softwood	2	59mm 2 ³ / ₈ in	10mm ³ / ₈ in	12mm ¹ / ₂ in
H Foot	Softwood	2	59mm 2 ³ / ₈ in	7mm ¹ / ₈ in	9mm ³ / ₈ in

Cutting lists always give the full length of a piece including the joint, but not wastage. Allow at least 25mm (1in) extra for length and 5mm (3/8in) on the width and thickness of any sawn stock that you use

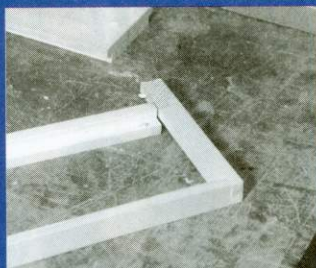
wax and finish the platform and runners first. Cut the baize for the underside of the feet and the end-plates, and also for the top of the platform if you so desire.



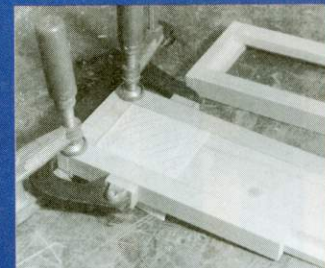
1 Use a combination plane, or router, to rebate the platform, and for the runners, which can be cut off later



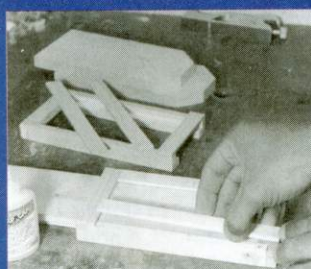
2 Use a plane to clean up the ends of the end-plates. Use the plane on its side, with a shooting board



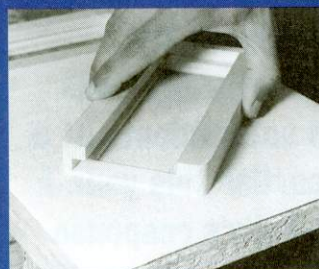
3 The same rebated runner strip is used for the end runners too. Note that the rebates interlock



4 When gluing up the runner frames, use the platform to form them, wrapped in paper so it will still run



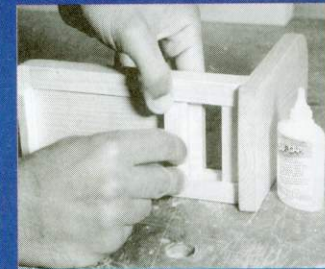
5 Glue fillets underneath the rebated runners to keep the platform in place and hold the runner ends firm



6 Once the fillets have set, clamp a piece of abrasive on a board and sand the whole assembly flat



7 Mark out the housings on the end-plates, cut the shoulders and remove the waste with a chisel



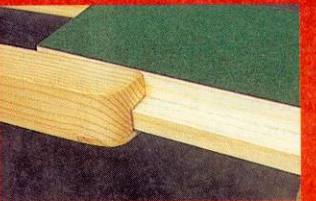
8 Fix the feet to the platform with Superglue. There is no turning back now, so wax the sliding platform first



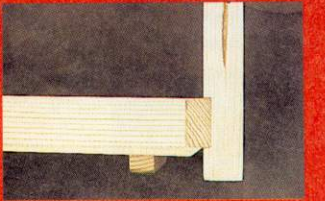
The ends of the runner frame join the sides with an interlocking halving joint and a fillet which is pinned on below



The foot on the platform has to be taller than the foot on the runner frame by the thickness of the fillet



Round the ends of the runners for a professional finish. The runners are joined below by a short length of fillet



From the side you can see how the end runner is housed into the end-plate, the base of which is level with the foot

TOOLS YOU WILL NEED

HAND-TOOLS

Peter limited himself to a selection of hand-tools, including a coping saw for the end-plates and a rebate plane for the runners. You may prefer to replace the latter with a router

MATERIALS YOU WILL NEED

OFFCUTS

Wood choice comes down to whatever you have lying around. Peter used an offcut of 100x50mm (4x2in) softwood

BAIZE

For lining the central platform



PROJECT GUIDE

DIFFICULTY: Intermediate

TIME: 20 hours

TYPE: Furniture

purpose which expresses the concept of the dovetail, both structurally and visually." The 28 students in the first year group were asked to explore the potential of this design brief and get as far away as possible from producing a 'box' with dovetail joints at each corner.

From a variety of solutions to the problem, a fisherman's fly box by 20-year-old Brian Kelly from Castlebar, Co. Mayo, particularly appealed to me.

Being a keen fly fisherman myself, I commissioned Brian to make me a replica fly box. I felt it would be an excellent memento for my project, as it answered the design brief and would be a pleasure for any fisherman to own (especially those of us who tie their own flies). Of course, it is not the sort of fly box you would take down to the river, but a display box for the home or the office.

The Secrets of the Box

Made from solid maple, with three pivoting tiers, the fly box has to be made exquisitely well to work at all, both practically and visually. The grain markings and colour are subtle, and Brian decided to finish with a combination of wax polish and plenty of elbow grease.

Making the Box

1 Prepare accurately to size three pieces of timber 15, 20 and 20mm ($\frac{1}{2}$, $\frac{3}{4}$ and 1in) thick and 300mm (12in) long.

2 Make paper templates for the top and base of the box, and copy or stick them to the top and base surfaces. Remember that the two templates have opposite orientations, which is what gives the box its 'twist'.

3 Hold the three pieces together securely in a vice and start removing the waste at the sides of the box by sawing at intervals down to

Ornamental fly box

"Design a container to express the dovetail visually and structurally" was the task Jeremy Broun set students at a college in Connemara earlier this year. A box for flies was Brian Kelly's response

One of the most enjoyable aspects of my work each year is to be invited to teach for two or three weeks at the Furniture College in Letterfrack, Connemara, on Ireland's Atlantic coast. Every spring I am privileged to work among a handful of Ireland's most talented young woodworkers at a centre of excellence set in the

breathtaking scenery. Sometimes I've stayed long enough for a bit of fishing.

In April this year I presented the students with a favourite project of mine, to introduce the concept of design into their fine woodworking programme. The task I set them was to: "Design and make a small container for a specific



Brian Kelly is a first year student at The Furniture College, Letterfrack. He is 20 years old and comes from Castlebar, Co. Mayo, Eire

MATERIALS YOU WILL NEED

- **HARDWOOD**
300x233x25mm (12x9x1in). Though Brian used maple, cherry, beech or walnut would work well
- **NUT AND BOLT**
60x6mm ($2\frac{3}{4}$ x1in). Brian used an M6 bolt, with insert nut available from Isaac Lord ☎ 0494 462121

TOOLS YOU WILL NEED

- **SPOKESHAVE**
- **SCRAPER**
- **HAND-PLANE**
- **DRILL**
With a csk bit and two bits to match the nut and bolt
- **ROUTER**
And flat-bottomed cutter for recesses

Cutting list

	MATERIAL	QTY	LENGTH	WIDTH	THKNS
A Top tier	Hardwood	1	300mm 12in	75mm 3in	15mm $\frac{1}{2}$ in
B Middle tier	Hardwood	1	300mm 12in	75mm 3in	20mm $\frac{3}{4}$ in
C Lower tier	Hardwood	1	300mm 12in	75mm 3in	20mm $\frac{3}{4}$ in

Allow at least 5mm ($\frac{3}{16}$ in) on the width and thickness of sawn stock

all but 2mm ($\frac{1}{16}$ in) of the line with a tenon saw.

4 Use a mallet and chisel to remove waste carefully to the base of the sawcut line, working from both sides to avoid splitting. Then use the chisel with both hands to take away waste nearly to the line. Finish to the line, using a convex-sole spokeshave with the grain.

5 Cut off the ends at an angle with a tenon saw, holding the piece itself at an angle in the vice so that you actually saw vertically.

6 Now drill a pilot hole to take the central nut and bolt around which the tiers will pivot. Begin with a 3mm ($\frac{1}{8}$ in) pilot hole, then drill through the full 6mm ($\frac{1}{4}$ in) diameter. Cut a bolt to length and countersink its head into the base. Recess the nut into the lid with a 9mm ($\frac{3}{8}$ in) hole and secure it with epoxy resin glue. A piece of tape wrapped around the middle of the bolt will stop it gripping the middle tier. Fix

the three pieces together with this nut and bolt.

7 Clean up the ends with a block plane or a scraper. Mark a line to highlight the dovetail shape on each end and scrape down to the line.

8 The interior partitions are marked out with a pencil and ruler and waste shaded. Remove the bulk of the waste with a router, set to 10mm ($\frac{3}{8}$ in) depth, with the workpiece secured firmly on the bench. Carefully trim the walls of the recesses back to the line using a chisel. Check that the bottom surfaces are perfectly flat.

10 Now put the piece back in the vice and shape the sides to the line with the scraper. Finish off with 60 grit abrasive paper to smooth all surfaces perfectly. Finish with wax polish and burnish rigorously with a soft rag.

All about The Furniture College

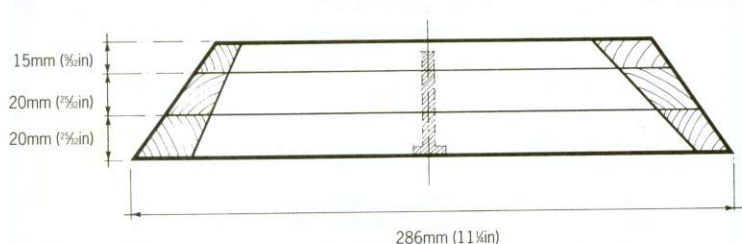
Nestling between the Connemara Mountains and Ireland's Atlantic coast, The Furniture College enjoys one of the most beautiful settings in the British Isles. It is part of the Connemara West Centre, a project funded by the local community. The Designing and Making course, which Brian Kelly is following, lasts for two years and is aimed at young people who want to produce fine furniture and other pieces in wood. Each student has a purpose-built bench and a place to store tools, as well as access to design space.

Minimum age for entry is 17. For course details contact Kieran O'Donohue, The Furniture College, Connemara West Centre, Letterfrack, Co. Galway, ☎ 010 353 95 41044.

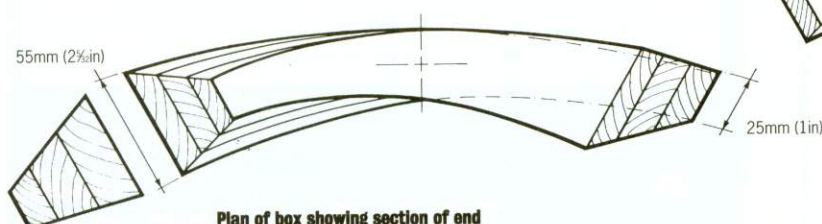


You can either position the tiers so that the grain is continuous, or use the levels for contrast. This elm box shows an interesting use of grain

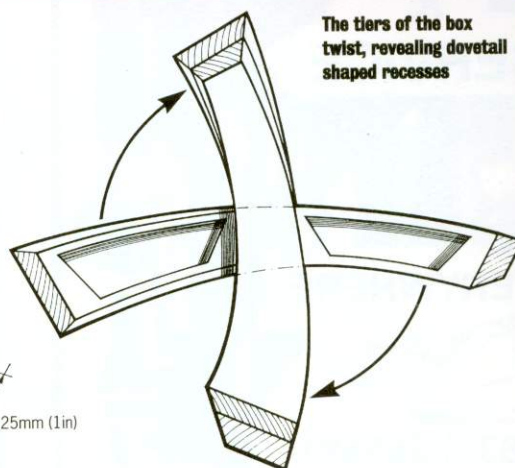
Plans and elevations for making the fly box



Side elevation of box



Plan of box showing section of end

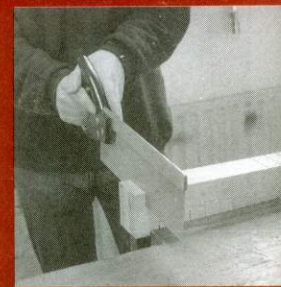


The tiers of the box twist, revealing dovetail shaped recesses

Eight steps to making a box



1 With the three pieces stacked up, mark out the top and bottom shapes from a card template



2 To make waste removal easier, cut down to within 2mm ($\frac{3}{32}$ in) of the lines with a tenon saw



3 Chop away the waste with a chisel and mallet, working from both sides to stop splitting



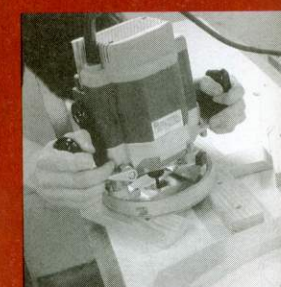
4 Use a flat-bottomed spokeshave on one side, but you will need a convex sole model for the other



5 Clean up the sides of the fly box with a cabinet scraper, before cutting off the ends



6 Cut off the ends at an angle with a tenon saw, positioned so that the saw cuts vertically



7 When routing out the recesses with a straight cutter, screw blocks to the bench as supports



8 Drill a pilot hole first for the central bolt. Brian used a nut that screws into the top tier



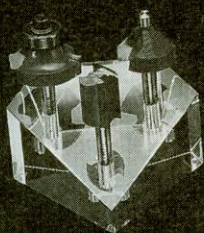
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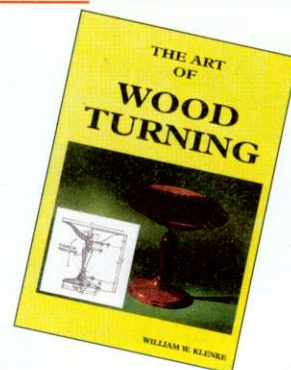


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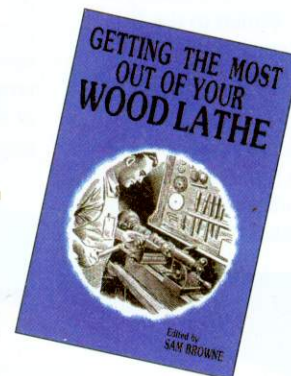


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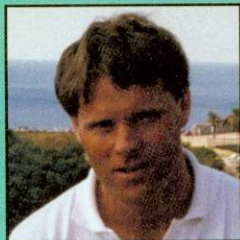
From the front you can see the subtle curves of the rolling pin rail. Over the years, the original black stain has worn off the rail, and from the highlights on the spindles and most of the back



The back legs not only have a rake of about 5° from the shoulder of the turning upwards, but because the timber was turned green it has bent considerably where the grain changes



If you are interested in distressing, notice how the top has lost the black stain from behind. The legs are slightly splayed inwards at the base, making the rails 300mm (12in) at the top



West country furniture restorer Stephen Hill is treasurer of the British Antique Furniture Restorers Association, runs an evening class and works on private commissions. He reckons he "does more chairs than most people" but says he will copy anything to order

in Focus

no:1

In the first of our regular studies of antique furniture, Stephen Hill reveals the secrets of a Lancashire spindle back, with tips for copying it

Of the many things for which we can thank the Industrial Revolution, the Lancashire spindle back chair is perhaps one of the least conspicuous. Yet its production in great numbers, during the early part of the 19th century, was largely due to the need for furniture in the rapidly expanding north of England.

This particular version was made around 1820 in ash, though others were made of birch, alder or fruitwood. They were turned green, and rather than use glue, the chairs were assembled with the timber unseasoned. As the

wood dried, round components changed to an oval shape, and this tension holds the joints together. The chair comes apart easily for restoration since the joints still had no glue, but some chairs of the period were turned from dry wood and needed gluing.

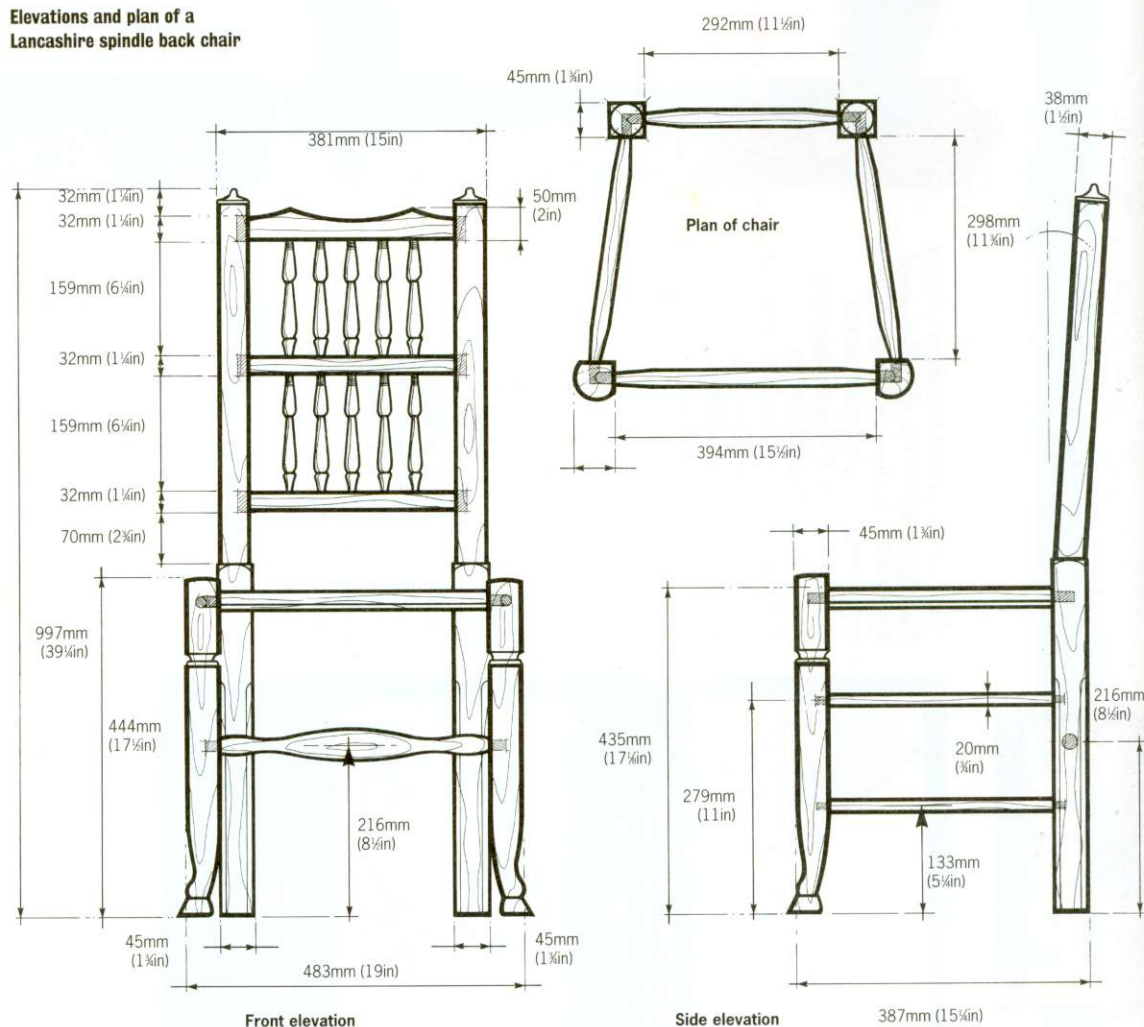
This chair would have been made in a workshop, as was common at that time, rather than in the forest, but the timber was very likely from coppiced woods. The legs do not have turned score marks to show where the rails and stretchers were to be, but there are plenty of examples of inconsistent

work to show that the makers were most interested in function.

The spindles are naturally typical of the location, while the nipple top backs and rolling pin front rail are common of that period. The rake on the back and pads on the front legs were produced by off-centre turning. Sometimes, you can find two centre marks under the pads or on top of the front legs about 12mm ($\frac{1}{2}$ in) apart to show how this has been done. The maker often stamped the top of the leg with his initials, but not in this case.

Note how they only turned the front two faces of the legs, leaving the other two square to maintain the strength. If you want to make a copy, these chairs were usually stained black with only the worn parts showing the wood now. ➤

Elevations and plan of a Lancashire spindle back chair

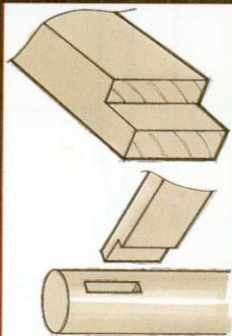


A Lancashire spindle back chair

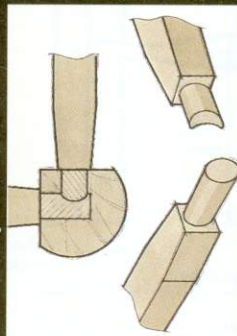
Wear on the spindles is shown by the highlights where the stain they used (probably Vandyke crystals) has been worn away, as is the case on the curved top rail. If you need to take one of these chairs apart for restoration you will have to drill out the pegs on the top rail, but you may find that the rush holds the chair together. If the joints are glued, try to get luke-warm water into them and knock apart with a rubber mallet

The back rails are cut from the solid, preferably on a bandsaw, and joined to the uprights with short tenons. The tenons, which are the full depth of the rails, are bare-faced at the back, with a shoulder at the front that is scribed to match the radius of the turned leg. The tenons are pegged from the back, but only on the top back rail, which is the one which holds the rest together

Spindle backs were generally rushed, and the rushing rails are crudely shaped with a drawknife so that they taper towards the legs. It is important to chamfer the edges of the rushing rails to make rushing easier and reduce wear. The side rails are tenoned into the legs as deep as you can go because they will take the most stress. The ends of the front and back rails are scribed, rather than mitred, over and under the tenons on the side rails



The bare-faced tenons on the back rails have the shoulder towards the front. This makes a tidier joint, but you do have to scribe the shoulder around the leg

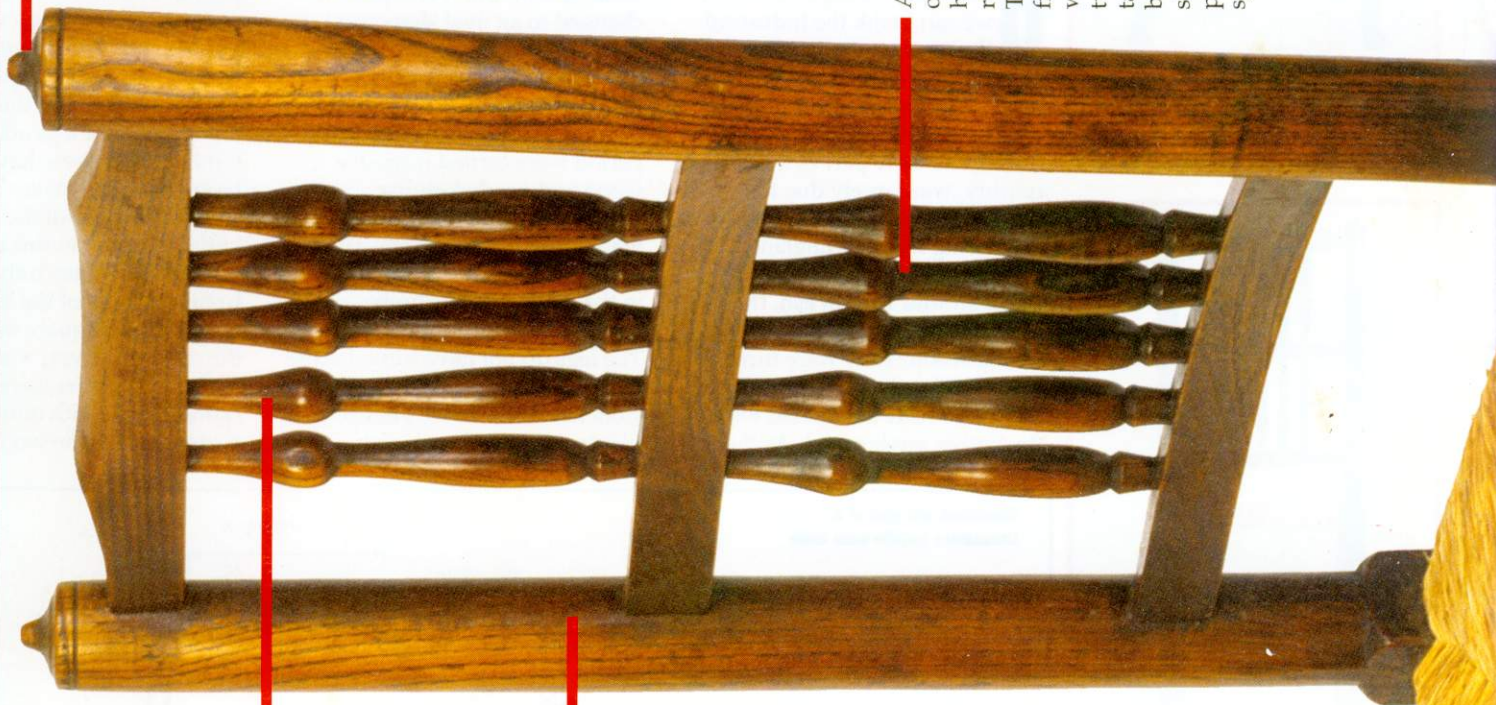


The stress on the rushing rail tenons is greater on the side rails than the front and back rails. For that reason the tenons on the side rails are as long as possible, while the ends of the front and back rails are scribed over the side rail tenons

The tops of the front legs were sometimes stamped with the maker's initials, and on badly finished chairs still have the centre marks from the lathe. Only the front edges of the legs were turned, though Yorkshire ladderbacks often had the whole leg turned

The nipple top is characteristic of these chairs, some with the score mark below the top and some without. The ear back was an alternative, in Chippendale style with the top back rail sitting on top of the back legs, with rounded ears sticking out on either side

Armchair versions of this chair would have had three rows of spindles. The spindles are fixed into the rails with straight turned tenons, not tapered. There will be a slight shoulder at the point where spindle meets rail



The spindles that give the chair its name were rarely even, but these are better examples than crude fatter ones you can find



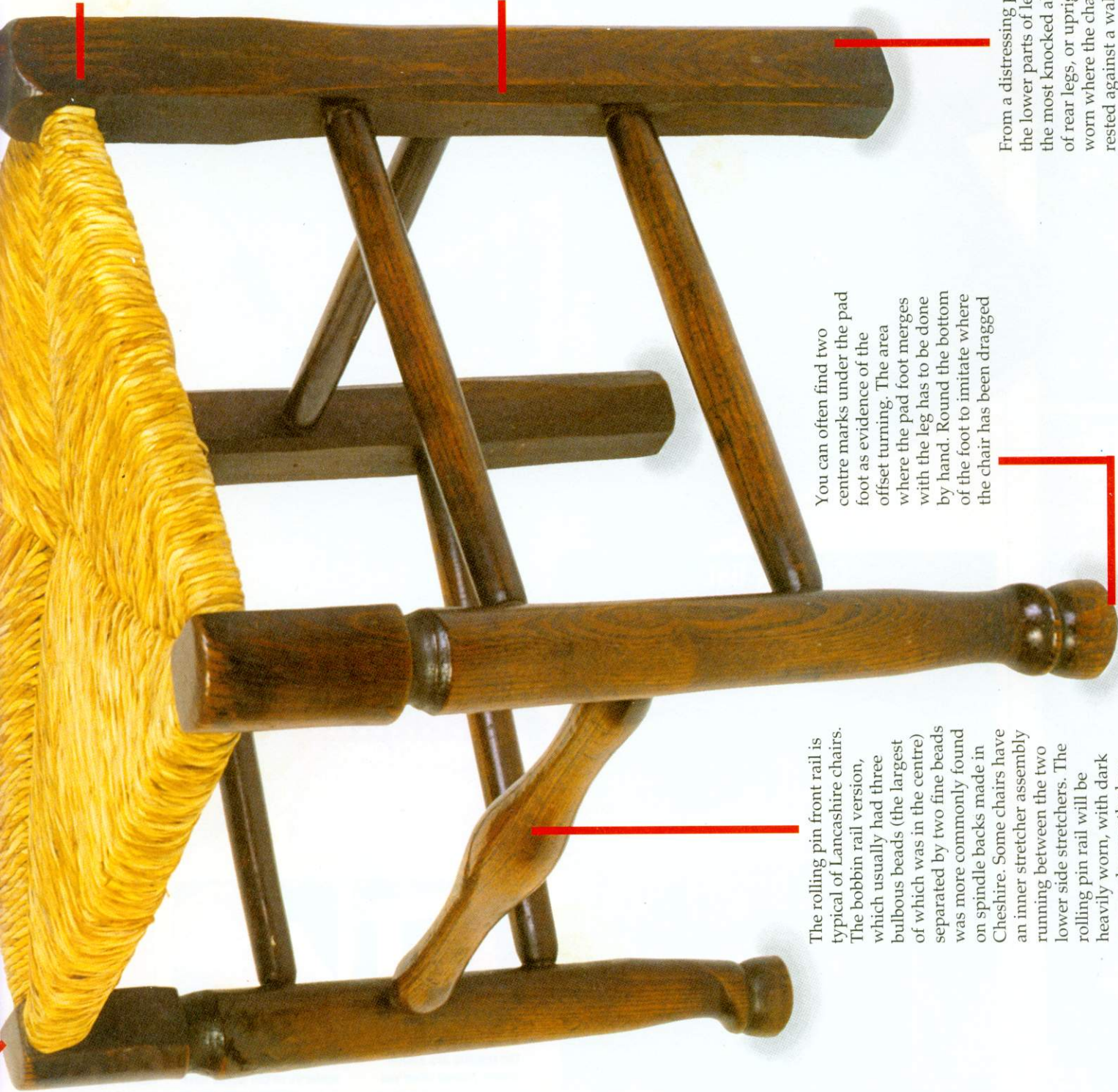
The back leg nipple tops are as typical as the spindles. Only the top back rail needs to be pegged, and then only from the back



Cruder versions have fatter legs and spindles, thinner rails, a more extreme rolling pin and no line below the nipple top



The chamfering around the back legs shows that though these chairs were made in industrial workshops they were still rough



The corners of the shoulder on the back legs, where the turning starts were rounded considerably. This may have to be done by hand after the turning, with the leg off the lathe, because the leg is turned off-centre

The four edges of each back leg are chamfered from the height of the top stretcher down. Notice how the section of leg below the seat is darker than above, where the original stain has been rubbed away

You can often find two centre marks under the pad foot as evidence of the offset turning. The area where the pad foot merges with the leg has to be done by hand. Round the bottom of the foot to imitate where the chair has been dragged

The rolling pin front rail is typical of Lancashire chairs. The bobbin rail version, which usually had three bulbous beads (the largest of which was in the centre) separated by two fine beads was more commonly found on spindle backs made in Cheshire. Some chairs have an inner stretcher assembly running between the two lower side stretchers. The rolling pin rail will be heavily worn, with dark areas only near the legs

From a distressing point of view, the lower parts of legs are always the most knocked about. The tops of rear legs, or uprights, are often worn where the chair has been rested against a wall. The front stretcher, or rail, regularly suffers from people putting their feet on it

The tops on the front legs look as if they have been planed off after taking the leg from the lathe to remove the centre marks

The tenons on the side rushing rails are longer than the ones on the front and back rails, which are scribed over the side tenons

Turn rounded shoulders on the ends of the stretchers. Notice how the valleys have remained black, rather than be worn away

The inside faces of the legs on this type of chair were not turned. This let the maker keep the legs thicker and stronger



Table t

MATERIALS YOU WILL NEED FOR THE TRESTLES

TIMBER
4450x152x25
(15ftx6x1in) for
lower rail, leg
and locking flap.
1530x100x50mm
(60x4x2in) for
top rail: we used
ash for it all

TOOLS YOU WILL NEED FOR THE TRESTLES

MORTICE CHISEL
Alternatives:
morticer,
morticing
attachment in
drillstand or
drill and chisel
ROUTER

If you want to
use a template
for the curves
TENON SAW

For the tenons.
Alternatives:
table saw,
bandsaw or
radial arm saw
SANDER

For cleaning up
the surface of
the frame
BLOCK PLANE

For cleaning up
the top rail.
Alternatives:
spokeshave or
sanding block

Cutting list

	MATERIAL	QTY	LENGTH	WIDTH	THKNS
Trestles	(each)				
A Top rail	Ash	2	762mm 30in	82mm 3¼in	38mm 1½in
B Lower rail	Ash	2	584mm 23in	ex152mm ex6in	18mm ¾in
C Leg	Ash	4	699mm 27¼in	ex152mm ex6in	18mm ¾in
D Locking flap	Ash	2	114mm 4½in	ex152mm ex6in	18mm ¾in
Table					
E Deck	MDF	2	1485mm 58½in	1366mm 53¾in	12mm ½in
F Lipping	Ash	4	1525mm 60in	44mm 1¾in	44mm 1¾in
G Lipping	Ash	4	1370mm 53¾in	44mm 1¾in	44mm 1¾in
H Battening	Softwood		6.1m 20ft	38mm 1½in	20mm ¾in

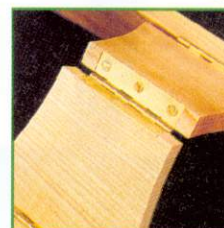
Except where indicated, cutting lists give the full length of a piece including the joint but not including wastage. Allow at least 25mm (1in) extra for length and 5mm (¾in) on the width and thickness of sawn stock. 'Ex' means timber size before planing

PROJECT GUIDE

DIFFICULTY: Intermediate
TIME: 20 hours
TYPE: Games



The trestles are simple square frames when you build them, and the curves are cut after assembly



The flaps on the trestles fold upwards so the hinges have to be positioned with the pin downwards, and leaves up



We used dome-headed rubber tap washers to prevent the table tennis table sliding on the trestles

ennis on trestles

Edward Hopkins explains how to make a table tennis table, which doubles as a dining area, supported by multifunctional trestles

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Ping-pong problem

I wish to make table tennis tables (the effective fold-up leg type). Although I have some ideas, I would be grateful for any proven tips or designs, particularly with regard to an effective hinged or pivoted leg storage system. I also need to know how to stop the deck twisting.

C.A. Webster, Wigan

Table tennis takes up a lot of space. The room around it (for international matches, in case you get really enthusiastic) must be at least 14m (45ft) long, 7m (22ft) wide and 4m (13ft) high. For most people this means the garden, which on a still summer's day will be ideal.

The rule book says that the surface of the table must be dead flat and make a standard ping-pong ball bounce 220–250mm (8¾–10in) high when dropped from 305mm (12in). Marble slabs on stone pillars would do quite well, but unless you own a stately lawn, they might be a bit obtrusive. No timber construction would resist the impact of British weather, being soaked one moment and baked the next. So the table must store away.

The deck itself is 1525x2740mm (5ftx9ft), suspended 760mm (30in) above the floor. If the top is in one piece, it will become unmanageable in most houses or garden sheds, and the only acceptable place for a joint is under the net. This produces two tables which are nevertheless still big, by dining standards.

Make it Multifunctional

This is where the project stops being a standard table tennis table and becomes multifunctional. If you have to make two tables, why not make them useful for something else? Garden furniture for instance? Or even indoor dining, hobbies or writing tables.

It will take little extra work to make both sides of the top useable and reversible. The obvious material for the tennis side is

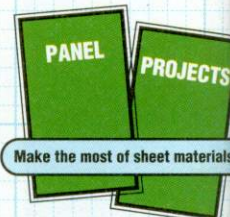
MDF, painted green with the statutory 20mm (¾in) white line around the edge and a 3mm (⅛in) centre line for playing doubles.

Only MDF is so plain, flat and easy to use. Standard sheets from builders' merchants and timberyards are 2400x1220mm (8x4ft) and are therefore too small for even one 1525x1370mm (5x4½ft) half. But if you search around you should be able to find or order 3050x1525mm (10x5ft) sheets, which are just about perfect.

The Dining Side

Although the dining side of the table might look good in solid timber, we were careful with the structure. MDF is reasonably inert and does not expand or contract as humidity changes. Timber, however, will soak up humidity changes and alter size at will (even, to some extent, when it is heavily lacquered). In a composite table, there would be a risk that the timber would pull and warp the MDF and render the tennis side useless, with undulating bunkers. The safest method to ensure a stable table top is to make both the surfaces in the same way.

There is something to be said for making the top from a single sheet of thick MDF, finished for tennis on one side and dining on the other. This would still benefit from being edged in solid timber, because that is more resilient to inevitable knocks and scuffs than

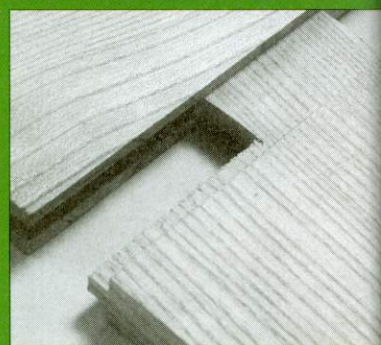


The table tennis table is to be a feature of Edward Hopkins renovated malthouse, now that his family have learnt to play

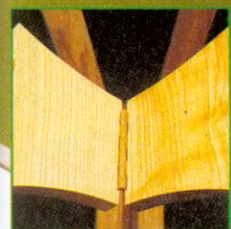


The table was made by Richard Green, who is now busy harvesting the produce of Camilla his wife's small market garden

Making the table



1 Though you can use a long tenon, as shown in the plans, a long haunch is the safest way to join the lower rail to the leg on the trestles



From underneath you can see how the flaps are hinged to the lower rails with the 75mm (3in) brass butt hinges

MATERIALS YOU WILL NEED FOR THE TABLE TOPS

- MDF**
 For the table deck. Two sheets of 3048x1524mm (10x5ft). This is bigger than the standard size but should be available if you order it. Have it delivered.
- ASH**
 For the lipping, about 12m (40ft) of 50x50mm (2x2in).
- SOFTWOOD BATTENING**
 About 6.1m (20ft) of 38x20mm (1½x¾in).

TOOLS YOU WILL NEED FOR THE TABLE TOPS

- SHARP HANDSAW**
 For the MDF. Alternative: panel saw.
- ROUTER**
 For rebating out the MDF.
- MITRE SAW**
 For mitring the lipping. Alternatives: any machine saw or a tenon saw and mitre block.
- G-CRAMPS AND SASH CRAMPS**

end-grain MDF. But the top must resist warping under its own weight and for this, 38mm (1½in) MDF would be the most suitable. Try lifting this though, and you'll be reminded of the marble slab you rejected in the first place.

This is how we arrived at a deck made of a sandwich of two sheets of 12mm (½in) MDF, separated by battening to reinforce it. You could use thinner MDF or even hardboard if you do not want your table to be too heavy. The solid lipping is rebated so that each sheet sits in it and is glued, and the lipping is mitred in the corners. The battening runs diagonally across two halves of each table, strengthening the lines most susceptible to warping. We screwed through the battens into one of the MDF sides, but had to glue on the other two MDF pieces to avoid screw holes.

Although it might have been more satisfying to screw or nail through the MDF, we were conscious that the tennis side particularly should be as near-perfect a surface as possible. Fillers and stoppers boast that they do not shrink, but it is virtually impossible to fill screwheads in MDF without them showing up as saucers in the final, otherwise immaculate surface. Nails or pins are a better bet because

the holes they make as they are punched below the surface are small and more easily filled, but you will need a flat area to work on to hammer home nails or pins.

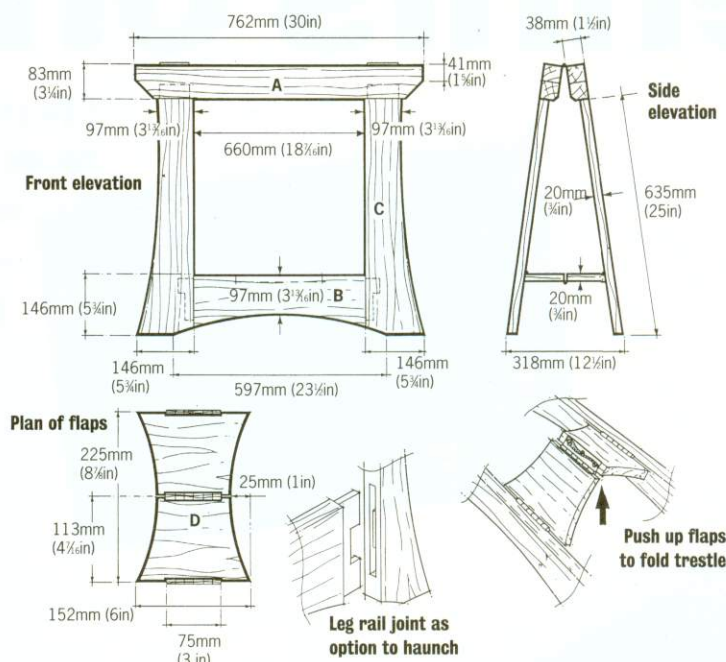
The table tops are too large for most workshops. Probably the easiest place to make them is a garage or perhaps the same, sunny garden, but not on the lawn – you will need a flat surface to assemble the sandwiches. Cramping down and gluing on an irregular surface could well set-in a permanent warp and defeat the whole object.

Suspending the Deck

Trestles are useful objects even if you don't play table tennis. You can use them (carefully) in the workshop as sawing horses, or use them to support other tops such as picnic tables or stalls.

They are designed to fold flat and to lock open. The table must be able to take

Plan and elevations of trestle



knocks and bumps without collapsing, and preferably without even moving. There is no mechanical fixing between the trestles and the tops, or indeed between the two tables. Everything stays together by dead weight. If the ground is bumpy, the individual trestles will need to be raised on blocks until they are level.

Pads of rubber (we used domed tap-washers) on top of the trestles add friction and reduce the risk of scratching the top. The trestles are straightforward frames with large mortice and tenon joints in the four corners. The top rails are stouter than the legs because extra thickness in the folded

trestle is needed to accommodate the folded locking flap. (It is easier to store trestles that fold flat than those which taper.)

The legs are shaped with a few simple curves. You can use different shapes if you wish, but keep the feet as wide apart as possible and leave enough meat around the joints. For timber, we chose ash because it is light and that bit tougher than pine. The lipping around the tops is ash to match, but the battens, which are not seen, can be of anything dry, straight and stable.

Although the trestles are straightforward to make, there are five 75mm (3in) brass butt hinges on each

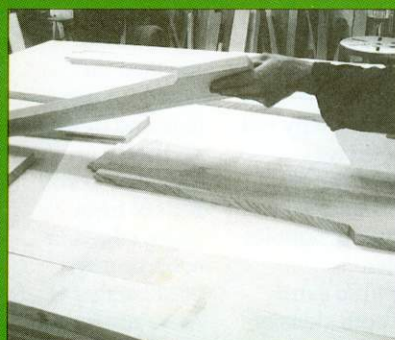
Whenever you are making large, flat assemblies like these tops, the only workshop big enough is the outdoors. Level a patio or drive area with a temporary arrangement of large timbers, lifting them up on blocks as needs be. Sight along them to ensure that they are aligned and then use them as a low-level bench.

TIP

How to make trestles



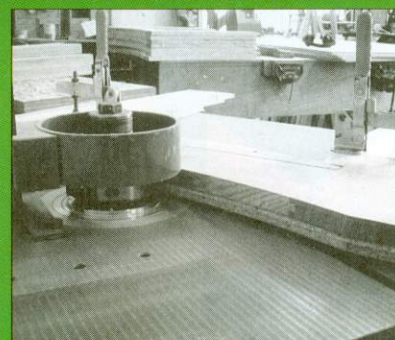
2 As with the legs, the top rail on the trestles have haunched mortices so that there is little short grain at the ends which might snap off



3 If you want you can shape the legs and rails before assembly. This will probably be easier than later, but keep square ends for cramping



4 Use the top rail as a guide when cramping up the lower rail and the legs, but do not glue the top rail till all the rest have completely set



5 Because he was having to make so many trestles, Richard made a spindle moulder and chipboard jig, but you could use a table router

one. Allow a bit of time to fit these carefully. If you have a router, it is well worth making a jig with which to cut the recesses (GW 7:79).

We had thought of completing the game with a set of matching bats, until we saw they only cost £1.99 each

In case of loose or wrongly cut tenons, have some veneer handy. Cut it as packing pieces and glue these well into the joint.

TIP

for the cheapest. We bought bats, a net with fixing brackets and a pack of ping-pong balls all for about £18. You may need to use thin blocks under the net clamp to hold the tables together.

Step by Step

Make the trestles first so that you have something on which to saw and assemble the MDF for the top.

1 The trestles are made as heavy square frames, to be decorated with curves and details later when the joints are done. This makes cramping the frames easier by giving you square edges to work from. Prepare the timber for the legs (C) and lower rails (B) to 18mm (3/4in) thickness, with a bit extra for the locking flaps (D), and the heavier top rails (A) to 36mm (1 1/2in). Plane an edge, and saw the legs and lower rail to width, finishing the sawn edge with a plane. Cross-cut the parts a little overlength.

2 Mark out the mortices on the top rail and the legs. Remember that some wood

will be removed in the final shaping, so allow for that in positioning the joint. The lower joints especially must be as big as possible to give the maximum gluing area.

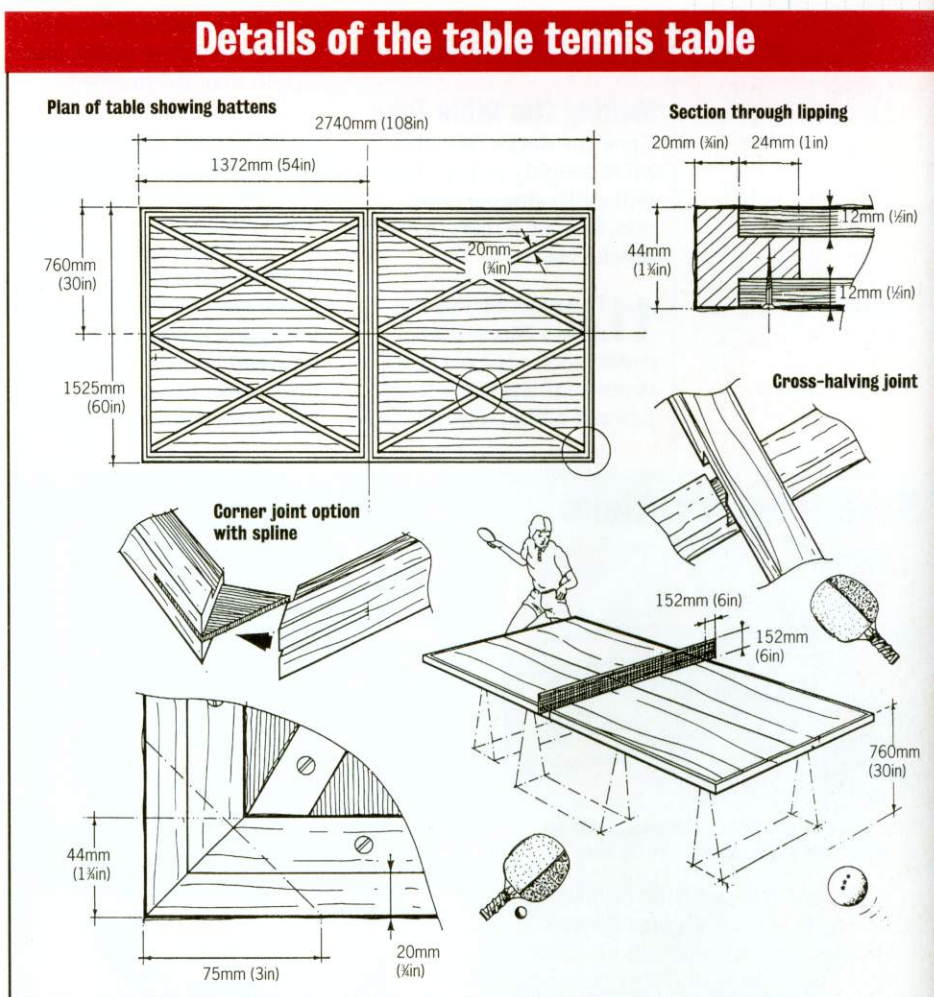
3 Cut the mortices. Drill the waste on a drillstand and finish the mortice with a chisel. Note that the tenon is haunched at the bottom of the lower rail (B).

4 Mark out and cut the tenons. If you are using hand-tools and are out of practice, cut the tenons fat to be pared down to fit later, but it is best in the long run to be able to fit joints straight from the saw. Cut the haunch on the lower rail tenon, and test the joints.

5 Glue the lower rail to the legs, cramping across with a sash cramp. Have the top rail (A) dry-fitted to the legs so that you are sure of the fit of the lower one. Avoid trying to glue up too many joints at one time (GW 4:44), and keep it simple.

6 When that is dry, remove the top rail and clean up the surface of the frame with a belt sander. Saw the lower corners off the top rail. Clean them up with a block plane, spokeshave or sanding block as necessary. Chamfer the inner lower edges, then glue the top rail (A) in place and cramp it up.

7 Mark the curves. Bandsaw them accurately and finish with either a spokeshave or abrasive paper. When using a spokeshave on curves – you will need one with a convex sole for concave curves – you must keep changing



directions so as not to pull up the grain. Four trestles involve making eight frames and 24 curves, so it is worth devising jigs for a router. Use a copying collar mounted under the baseplate, and a thin hardboard template.

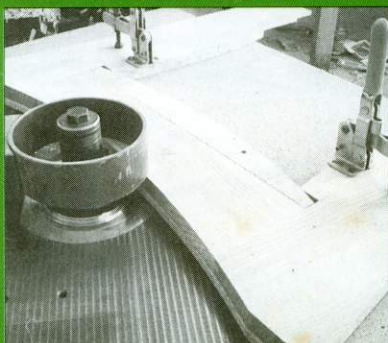
8 Mark out and cut the locking flaps. When open, their outer edges must run together in one smooth curve. Cut the recesses for all the hinges in one go. Note that the hinge that joins the flaps together is below them.

9 Fit the hinges with one screw in each leaf for now, leaving the hinge between the flaps till last. When you know the hinges are correctly positioned, drill and screw their remaining holes.

10 Go over the frames with fine abrasive paper to remove minor scuffs and handling marks. The trestles can be waxed, but varnish or lacquer is more appropriate for outdoor use.

Remove the hinges, then finish and reassemble the

How to play
Table tennis rules are simple. The ball must bounce only once on each side of the net when served, and for other shots only once on the far side of the net. Each player takes turns to serve for five consecutive points, and the first to 21 wins, but must be two points ahead



6 The legs and lower rail assembly are held down on the jig with toggle cramps. The same principle works with a table router



7 Use a router jig (GW 7:79) for cutting the hinge recesses. Alternatively, mark them out, and then remove all the waste with a chisel



8 Assemble the trestles with only one screw (steel) in each of the leaves until you are happy with the fit. Avoid knots if possible!



9 Work the chamfered detail on the legs of the trestles with a spokeshave or a block plane. This is a modest but worthwhile decoration

trestles. Fit rubber studs or strips onto the top rail.

Making the Table Tops

Clear the decks. Saw the MDF roughly in half if that will make storage easier for you, leaving a margin on the finished size.

11 The wooden lipping shows 20mm (¾in) round each edge of the table (three of these will later be painted white). The final size

of board is therefore 40mm (1½in) smaller in width and length than the finished tables (that is 1485x1366mm or 58½x53½in). Cut the board to this size, leaving it proud by a thick pencil line, and trimming later.

Even half such a big sheet of MDF is unwieldy. A sharp handsaw – preferably a handpoint – will cut 12mm (½in) but take care to support the board firmly. The trestles you have just made might

need to be pressed into their first service!

12 Prepare the lipping. First plane up strips 44mm (1½in) square. From these, rebate out for the MDF, that is to a depth of 12mm (½in) and leaving the 20mm (¾in) that will show. If you use thinner MDF, to keep down the weight, then adjust the rebate to suit.

13 Mitre the lipping at their exact lengths, that is 1525 and 1370mm (60 and 53½in). A mitre saw will do this well. If you cut by hand, be prepared to sand and chisel the joint to fit.

14 Lie the lips around one of the sheets, and adjust the size of the sheet with a plane until it is a snug fit. Measure the diagonals as you go; they should be the same. If they are not, you are constructing a parallelogram instead of a rectangle.

15 Drill, glue and screw these lippings to one board taking care that the screws do not penetrate the table surface. Plug the holes in the lipping.

Then cut the re-inforcing battens. The first two pieces on each half of the table go from the corners to the centre of the opposite edge, fitting tightly against the lipping. The second two battens do the same in reverse with a cross halving joint where they cross the first battens.

16 Screw and glue the battens to the lower MDF. Trim the upper MDF to fit. We glued this to the battens, using G-cramps, sash cramps, concrete blocks

For accurate work don't assume that the nominal thicknesses of board are their actual thicknesses. Fit the component up against the board itself to be sure.

TIP

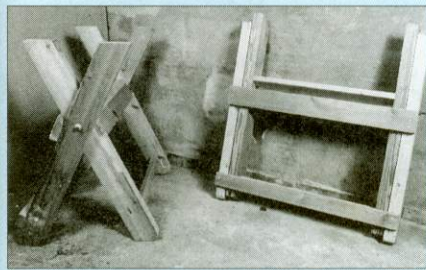
and lumps of tree trunk to hold it down, making sure it was sitting dead flat. If you do not want to use cramps, we suggest you screw down the table tennis side through the battens, and then screw and plug the other side, using contrasting plugs in a geometric pattern.

17 However hard you tried, there are bound to be slight discrepancies between the lippings and the board. Get rid of them with abrasive paper and a block. Round the arrises but resist chamfering the table's edge, especially on the tennis side where you would diminish the playing area and get disqualified.

18 Mask off the white lines with tape and paint the remaining surface on one side with green paint. Richard used a roller to achieve an even finish with vinyl paint. Remove the masking and mask in reverse so that white paint can be brushed on for the lines. This should produce a flat surface rather than the ridges which would occur if you applied white paint on top of green.

19 Wax, varnish or lacquer the remaining timber and the dining surface. You could, of course, give this a paint treatment instead, but we were happy with just the polished MDF.

More trestle options



Michael Burley's trestles are designed to fold flat, and can be used in the workshop or the home

Large section timber can be held securely for sawing in the V of Michael Burley's trestles and the platforms act as a firm base for many forms of timber handling. With a plank resting on the platforms they provide a stable walkway for house decorating and similar tasks. All forms of machining – jigsawing, hand-held circular sawing and even routing – can be done on sheet material up to 2400x1200mm (8x4ft) by resting it on the trestles, which can be manoeuvred to give the necessary support for each cut. The trestles provide an ideal table top support for use outside. When not in use, they can be folded flat and stowed away or hung on the wall.

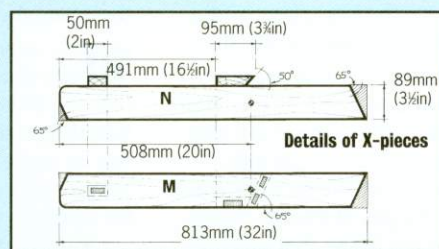
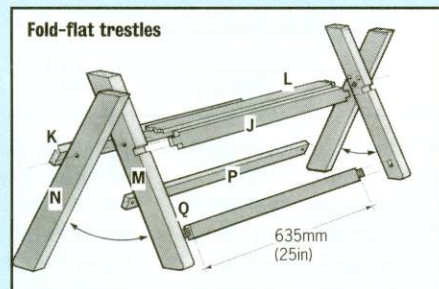
1 Drill all the coachbolt holes making sure they align. Trim the ends of the X-pieces.
2 Chamfer both edges of the platform section in the same direction at an angle of

65°, and chamfer the top edge of the upper stretcher (J) at an angle of 65°.

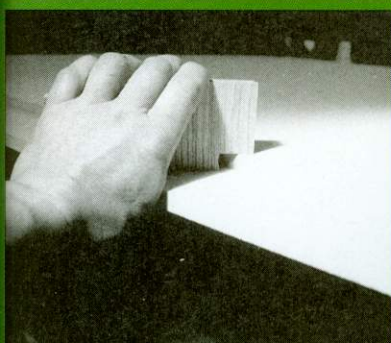
3 Chamfer the top edge of the upper stretcher (K) at an angle of 50°.

4 Mortice and tenon the lower stretcher (Q), and the platform (L) to the inner X-pieces (M), using a double tenon for the platform, and fix the upper stretcher to the inner X-pieces using a T halving joint.

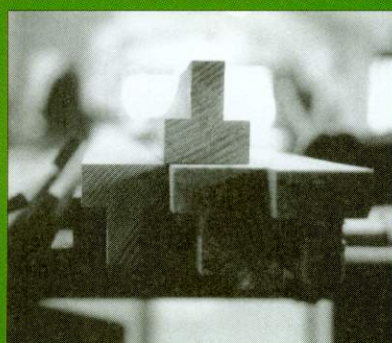
5 Join the two outer X-pieces (N) by locating the upper (K) and lower (P) stretchers with 65mm (2½in) woodscrews, and finally fasten the two frames together with coachbolts.



Making the table tennis deck



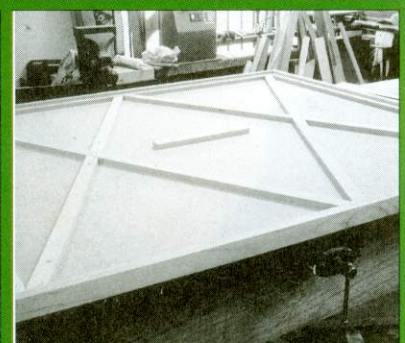
10 Check the depth of rebate you will need on the lipping, not by assuming the nominal thickness of the MDF, but by testing on scrap



11 The lipping is designed to protect the edge of the MDF and provide strength. Alter the depth of the rebate for thinner facing materials



12 Screw the lipping to one of the MDF sides first, and then screw down the reinforcing battens which fit from the corners to the centre



13 Find a wide flat space for screwing down the battens to the first sheet, then screw and plug (GW 9:63) the other MDF sheet down

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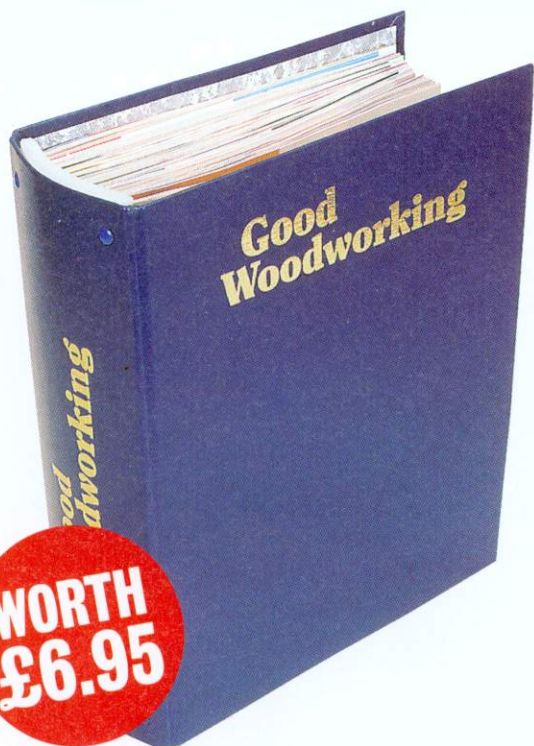
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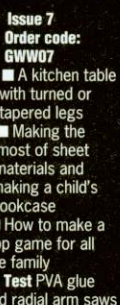
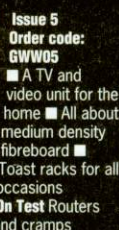
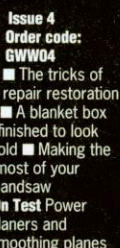
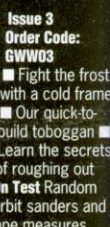
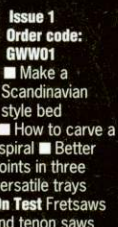
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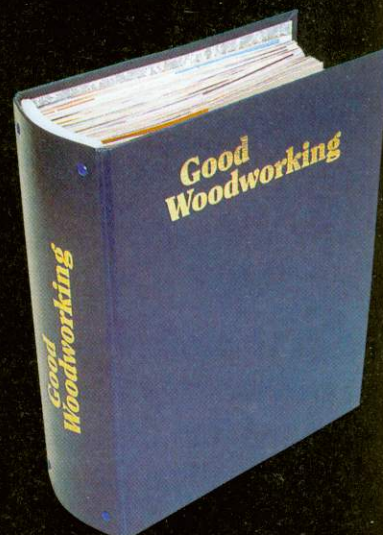
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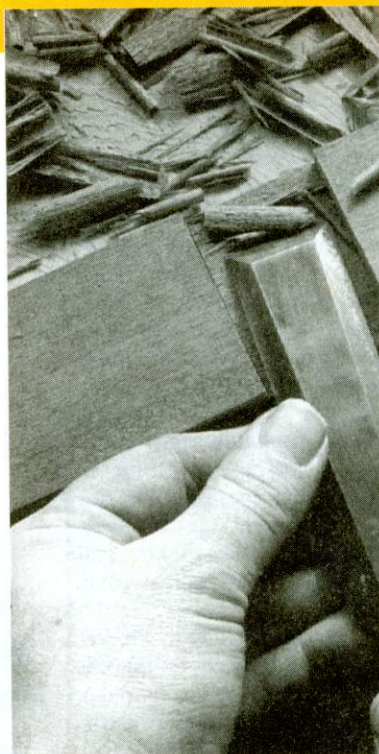
You don't have to go far to find a bewildering selection of short courses, ready to teach you any facet of woodworking. A few days tuition can match the cost of some sophisticated tools, so use our guide to help you make the choice

In the age of video, when you can watch the masters at work in your own sitting room, it is perhaps surprising to discover that attending a short course, away from home, remains so popular. That many students and teachers agree that courses are partly for therapy, goes

somewhere to explaining their continued favour and popularity.

How you feel at the end of your weekend, week or day of tuition will be determined by the content of the course and your relationship with the tutor (and other students).

The aim of this



One of the most important considerations when choosing a course is matching your ability to the content. Ask for a syllabus and discuss what tools you will need to be able to use

guide is to help you find the course that suits you best, so that you join with confidence.

The lack of syllabus and guarantee of content for short courses has generated some concern recently. Courses for woodturners, for instance, have grown in number rapidly. A cynic might suggest that turning is relatively easy to learn, and that with many novices around any moderately talented turner can become an expert and teach. As a result, for the last few years the turning world has been embroiled in a debate over the wrong and right ways to turn, and the wrong and right ways to teach.

While the creation of a syllabus for turning instructors will offer some assurance of quality, the last thing you want to hear from a tutor is that you are doing it all wrong. You want to know how you can improve your techniques, to make pieces so far out of your reach, with

ease, and without having to start from scratch again.

Going Home Presents

Nothing beats completing a course with a project under your arm. It is a measure of your progress, and hopefully a major achievement. However, it is important to consider that the project element varies widely from course to course. Most tutors will have you making something, but you must decide if you want to concentrate on one piece, or focus more on techniques and skills.

There is a chance that the more people sharing the course the more likely you are to be spending your time on the one project. This should have the benefit of lower cost – though never forget materials – and you'll go home with the kind of piece that would take ages to complete in the comfort of your own workshop. It is a fine way of concentrating the mind, away from the distractions of the home. Many people who attend courses say that they get as much from the company and experiences of the other students as they do from the tutor.

Technical courses, with a lower project ratio, and probably fewer students, are aimed to work more on your abilities. If you want to brush up on particular skills, then you'll need to have as much attention as possible, with projects as incidental teaching aids. It is worth asking what you might be able to make in the time allotted, while learning new techniques. You also want to ensure that the bulk of your time is spent at the bench, with short instructional lectures. Some students complain that courses can involve too much talking by the tutor.

Ask for a breakdown of the course by time as well as content. You may want to spend time chatting in the evening, sharing experiences and tips, or you may prefer to be in the workshop



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continually. Find out if the workshop is open after hours, and if there are regular, short breaks for refreshment, and the rest.

Who's There?

You may have noticed that champion golfers rarely seem to be coached by champions. To that end you might find that teaching ability is a more useful quality in a tutor than world-class woodworking skills. However the ideal course is run by an able and experienced woodworker, who can communicate and encourage.

It is probably easier to find out how well a potential tutor works with wood than he or she does with students. You can ask to see examples of their making skills, and look out for their work in magazines and books. Naturally you are most likely to choose a tutor whose pieces you would like to own or aspire to make.

These days many of the woodworkers who run courses have also written articles or even books, and some now have made videos. The words remain a good guide to communication skills, even after the editor's knife has done its deed. Look for ease of explanation, and good visual presentation. Of all the media, video is perhaps the best stage on which potential tutors can be judged.

Another good way to find out how well you will be taught is to think up some sample questions to ask when you first make contact. If you feel that a light has suddenly been turned on, and you hurry home to try out the solution, then

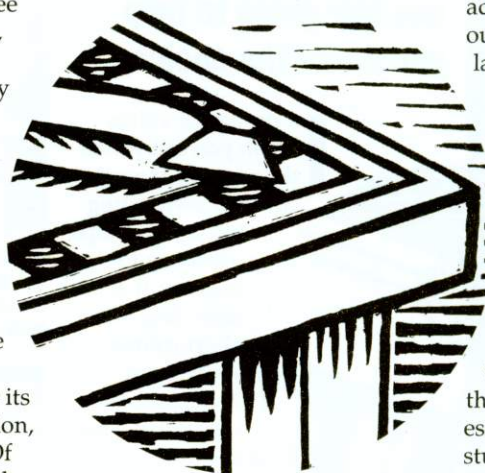
you've probably found your man (or woman). Questions for which you know the answer can be used to judge how well the reply compares with those you have already heard.

Questions to problems you have yet to fathom will test how well the tutor can communicate, and how well you react to his or her style.

A tutor's reaction to examples of your own work – take photographs with you – needs to be enthusiastic, to make you feel relaxed. Constructive criticism must be welcomed, but disinterest does not deserve your business.

What Are You Using?

Woodworking is so much easier when you are using high quality equipment. There is a fair argument that a good course requires good tools and machines for trouble-free learning. However, it is worth considering that if your own kit is limited you may want to use the course to see how you can make more of the



equipment you have. The perfect course workshop has the best of both worlds, with enough identical, professional quality tools to satisfy all the students. There is nothing worse than having to battle for the best lathe, or bench, and feel hard done-by if you lose.

Equally ask up front what machines you will be allowed to use.

Courses will be insured for public liability, but there may still be restrictions on what you can use. Few things are more frustrating than not being able to use machinery you have at home, or gain experience on unfamiliar versions.



Learning options

Alternatives to private, short courses are local authority evening classes, and secondary schools that are opened to the public. It is worth asking around in your area. If you want to learn about carpentry you can do a correspondence course (ICS ☎ 041 221 2926).

Our own technical editor, Phil Davy, who is a qualified machinist, runs an evening class for a local authority, and even he is prohibited by regulations from using the machines.

It is worth asking if you have to bring anything with you for the course. You may want to discuss what tools you are currently using, for advice on sharpening, maintenance and use. A good tutor will not decry your toolkit, but will be able to guide you towards your next purchases, with consideration for the shortage of funds that is common to so many of us.

If you are hoping to receive advice on what to buy, try to find out if your tutor knows about the latest models by asking what he or she thinks of recently launched new products. Woodworkers who stick rigidly to one brand tend to have a narrower view of the market than those who hunt around for the most suitable tool.

The Numbers Game

There is a natural, financial temptation for tutors to pack in the students. It is therefore essential to ask about the student:tutor ratio before booking. You may well find it helps to have a few other students around, for company and to exchange notes – especially if your visit is for therapy rather than for learning – but generally the fewer the students the better. We believe that four per tutor is about right, though project-based courses can cope with more. It is, however, essential to check that you will not have to share too many of the tools.

Female woodworkers may also want to know if other women will be around. One of the features promoted by some courses is their rural setting, which can mean remote, and you must feel secure to make the most of your time.

It's All About Ability

There comes a point when you have to work out how good you are with wood. Most courses are



who have no experience of woodwork, and no knowledge of the jargon. Intermediate woodworkers will have a good grasp of the vocabulary, and be able to use most tools and machines. You've reached the advanced

there is time allocated for travelling around the local area to see the sights and visit the places you have longed to go to for ages.

When it comes to payment you may be asked to send a deposit first. Some courses will take credit cards, and you must find out if materials, meals and accommodation are included in the bill. It is worth asking what notice you need to give if you have to cancel, and if the course is likely to be cancelled if it under-sells. Check how easy it is to reach, ask for a map, and away you go.

One final spot of advice is that it is worth doing some homework before attending the course. Once you know how the syllabus pans out you can do some reading so that the terminology is familiar and you have an idea of what is going on. We hope your choice is good, and that the course is instructive and enjoyable. Do contact us with any comments on courses.

level when you can easily adapt designs, or generate new ideas, to suit your own style and requirements, aided, and not inhibited, by your equipment.

What Are You Getting?

Naturally if you travel to a course you will need accommodation. Find out if this is supplied, and if it is not ensure that you can book somewhere nearby before you pay for the course. Some of the larger organisations, like West Dean and Missenden Abbey, have integrated accommodation and catering, and you can mix with students on a variety of courses. You may want to check up first if all the students can be located within the same accommodation. That way you can socialise in the evenings and discuss tools and techniques over breakfast. You may also want to know if



There are more turning courses available than any others. Woodturning is well suited to a short session of tuition, and you can learn plenty in a day

related in some way to skill levels and you will need to decide whether you are a novice, intermediate or advanced woodworker. In truth there is plenty of grey area between the levels, but you will not want to find yourself out of your depth or hardly challenged.

When you make contact with a course, tell them what tools and equipment you own, and which of them you use with confidence, or trepidation. Explain the woods you have worked with and the types of projects or techniques you have attempted already. Ask the instructor what tools and techniques they expect you to have experienced. These questions are best asked face to face, so a local course does make sense, but if you have to use the telephone use our checklist as a guide.

We count beginners as those

THE GOOD WOODWORKING EIGHT-POINT COURSE CHECKLIST

The aim of our checklist is to give you a guide to follow when checking out courses. We believe that these questions are among the most important you can ask, and will point you towards the course that suits you best. Tick each box when you are satisfied with the reply.

1 How long is the course? ☐

How many hours a day do you spend in the workshop? ☐

Are all the days full? ☐

2 How often is it held? ☐

When is the next one? ☐

Is it full up? ☐

Will it be cancelled if not

enough people join? ☐

3 Where is the course held? ☐

Is it accessible by car? ☐

Or by public transport? ☐

4 Can the tutor supply evidence of good teaching ability? ☐

Do they demonstrate, write articles and books, or make videos? ☐

Have they taught young people, or in challenging circumstances like prisons or schools for people with learning difficulties? ☐

Does he or she seem to communicate well? ☐

5 Can the tutor supply evidence of wood-working skills? ☐

Have you seen his or her work? ☐

Do you like the work? ☐

6 How much does the course cost? ☐

Does that include materials? ☐

Is accommodation offered? ☐

How much does accommodation cost locally? ☐

What is the deposit? ☐

7 What is the content of the course? ☐

How much time is hands on? ☐

Is it dedicated to making one project, or is it skills based? ☐

What new techniques will I

learn on the course? ☐

Is my ability right? ☐

What is the student:tutor ratio? ☐

8 What tools will I use?

Are there enough tools for all the students on the course? ☐

Am I allowed to use all the tools and machines? ☐

Can I smoke? ☐

Are protective clothes, masks, ear defenders and goggles supplied? ☐

Are there facilities for handicapped students? ☐

Can you give advice on buying equipment? ☐

Are you connected to one manufacturer? ☐

Do you have reading to keep me going later? ☐

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Back to basics

No.10 Nailing, by Edward Hopkins

Nails belong to the carpenter. If you add a hammer, a saw and some wood, you might be able to build most types of furniture, but unless you were particularly cunning, it would end up heavy and prone to falling apart. Building a house might be an easier proposition.

Nailing is associated more with construction work than with fine cabinetwork. In a large, heavy, stationary object like the frame of a building there is less likelihood of twisting and flexing than in furniture. A chair, for instance, is put under enormous stress when you sit on it, akin to a hippopotamus squatting on a beach hut. Nailed joints by themselves would quickly give up the struggle and you would end up sitting on the floor.

Nailing Mechanics

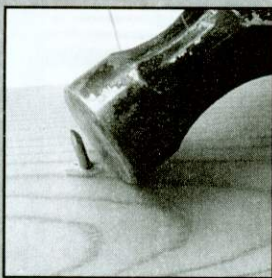
A nail is a crude fixing with simple strengths and weaknesses. It grips pieces of wood together by squeezing in between the fibres and being held by them. Unlike a screw, (which threads itself into the fibres) it can be pulled out almost as easily. Lever a nailed joint, however slightly, and eventually it

will work loose and fail. A nail is more useful for resisting sideways pressure. To understand why, think of a tent peg that seems insecure when

Cleating

One solution to the problem of nails pulling out is cleating. It is useful, for instance, in making garden trellis and lattice fencing. And it was a method used on ancient doors made with crossed boards.

An over-long nail is driven through both components and hammered over to lie flat on the other side, effectively stapling them together. A refinement of this – though the nails have



to be sharp – is to double the tip over after knocking it through so that when you tap it down for the stapling action the tip bites into the piece to be held.

pushed into the ground by hand (and pulled out just as easily). As soon as the sideways tension of the rope is put on it, it has all the strength it needs.

Nailed joints on a roof, for instance, are more often in compression than tension, but the nails driven in obliquely are just as strong. They will also locate and hold the parts in place while the components themselves take the strain. Nothing more complicated is needed than a metal spike which can be quickly, easily and cheaply whacked into place.

Until, of course, a nail hits a knot in softwood, when it might simply refuse to go any further, and you will bend it if you try persuasion.

The harder the timber, the less likely you are to achieve successful nailing. A nail might start off well enough, but it will seize up halfway through. This is not often a problem because, as mentioned, only softwoods are normally nailed. Fine and heavier cabinet timbers are not.

Sometimes you're getting on famously. Then the wood splits and the joint is destroyed. A nail can put great sideways pressure on the fibres of



Old tobacco tins make excellent storage for nails

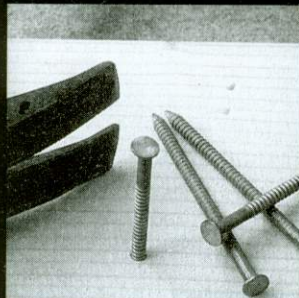
timber and split the wood as easily as an axe.

Some timbers, like elm, have an interlocking grain which resists splitting.

Others, like straight-grained ash, split readily, with the fibres cleaving apart only too easily. But all wood will, of course, split

Wood that grows in your garden

Sycamore (*Acer pseudoplatanus*) is considered a weed by many gardeners. It self-seeds and grows easily and fast almost anywhere. The timber is a creamy white colour and is fairly tough, although a blue hue can spoil the wood if it is not felled in winter and not stored upright to drain the sap quickly. It turns well and is odourless, so it is used for spoons, bowls and platters. Rippled sycamore has a wavy pattern in the grain and is prized by furniture-makers despite being hard to work. An extreme form of this is fiddle-back sycamore which is, not surprisingly, used for violins.



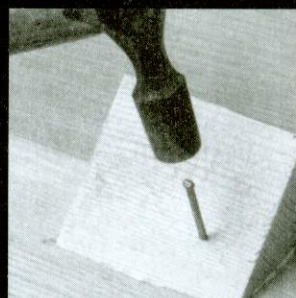
Annular nails, that are ringed, are a good alternative to traditional cut nail for flooring as they grip the wood well, and tend not to lever out easily



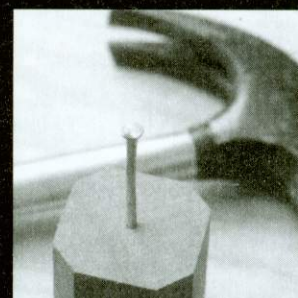
Carpenters spike the nail at an angle for butt jointing. In cabinet work it is best to pre-drill the first component otherwise the grain will split



Nails are often used for holding the backs of chests onto the sides and top. If you use a solid wood back, instead of ply, pre-drill the back



When glueblocks are being used it helps to pin them in place while the glue sets. Use them to strengthen simple joints where not seen



Often nails are more efficient into end-grain than screws. Nails can force their way between the fibres, while screws tend to break the fibres

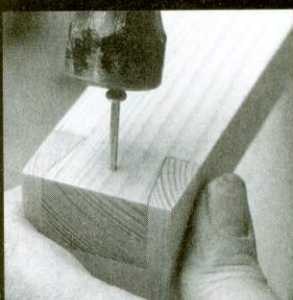


eventually if it is nailed without due care.

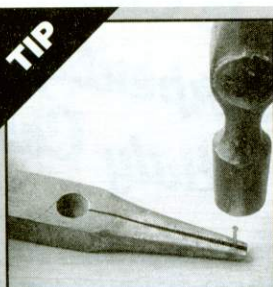
Which Nails to Use

Only in extreme circumstances does a carpenter wield the proverbial six-inch nail: 100mm (4in) and 75mm (3in) are more usual. Boarding and battening call for 64mm (2½in) and 50mm (2in) nails. Very fine moulding might need 25mm (1in).

There are a few places where a cabinetmaker might use a nail. The carcass of a chest of drawers might consist of softwood framing. The top



Strengthen a dovetail joint in the hidden softwood frame of a chest of drawers by nailing through a pre-drilled pilot hole



Hold small nails and pins with long-nosed pliers while tapping them in.

● Use ring shank nails (slender, brittle, grey nails with sharp rings around the shank) for nailing chipboard floors. They will resist being pulled out, even to the point of preferring to break.

frame is often dovetailed into the solid sides. A judicious nail through this dovetail into the side will pin the joint down tightly. On a chest small blocks (glueblocks) are often used behind feet, pinned in position while the glue dries. If man-made boards are being used, nails will hold them together while a glued joint dries. Backboards can be nailed onto the same chest of drawers with 25mm (1in) round-headed nails, into a rebate around the back.

All these sizes of nails are available in round or oval section with corresponding round or lost heads (GW 4:76, and page 42 of *The Woodworker's Pocket Book*, which was free with the first issue of *Good Woodworking*). Many can be found galvanised for outdoor or potentially damp conditions. There are many variations of large building nails.

When is a Nail a Pin?

Pins are small nails and vary over a whole range of designs and materials. The 12mm (½in) versions can be useful for attaching small mouldings. If they are made of brass, they can be sanded and polished as part of the design. Copper pins are useful in small oak pieces, where ferrous metals would be attacked by the tannic acid. Veneer pins are tiny and are used

to hold veneer in place while it is being laid; they are removed later.

Tacks are sharp with big heads and brads are flat with no heads. Chair nails are domed to grip finishing leather. Escutcheon pins have fine solid heads to hold and blend in with fittings. Always be on the lookout for old boxes of interesting pins and nails. You never know when they will be indispensable.

Stopping the bend

1 Tap the nail squarely with the hammer. Flex the hammer hand at the wrist, keeping the forearm still. Nailing is not easy and needs practice. 'Aim' the hammer with a light tap before a heavy blow, like a blacksmith wrying iron, for those familiar double clicks.

Benchmarks in furniture making

Ernest Gimson (pronounced "Jimson"; 1864–1919) brought furniture back down to earth. He was a trained architect and draughtsman and a hands-on maker who understood timber, wrought iron, painted decoration and plasterwork. From his workshop in Sapperton in the Cotswolds,

and in partnership with Ernest and Sidney Barnsley, he constructed simple, honest furniture that was accessible to ordinary people. Previous to this, the only furniture available to him was mass-produced and shoddy. Gimson reversed the trend and began a true craft revival.

2 Pilot drill stubborn timber (GW 9:42).

3 Use a small pin hammer for pins: you will have more control than with a coal hammer.

4 Tap the nail hard enough. At best, drive it home in several sharp punches before it has chance to think of rebelling.

When Nails Score Most

The one place where pins and nails score over all other fixings is end-grain. A screw cannot operate in end-grain because the sides of the fibres are too tough to cut into (it can only bite between them sideways). It might appear to hold but will only have scored the sides of its pilot hole and will pull out under pressure. A nail however can often be driven a long



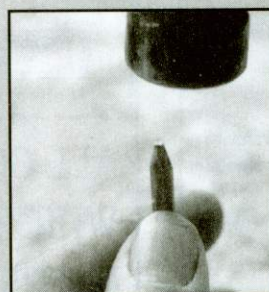
Hammering two nails into the same joint at opposing angles will lock the joint so that it resists pulling apart. This a common trick called 'dovetail nailing', used for lap, butt or halving joints.

way into end-grain without splitting it, with the fibres gripping it securely like a dart in a dartboard. And, unlike a dowel, you do not have remove a large amount of wood to begin with, creating an area of potential weakness.

How to stop a nail splitting the wood



Do not use a nail too close to the edge, especially where the grain curves out towards the edge



By tapping the head of a pin or nail you produce a flat that forces it way in, without splitting

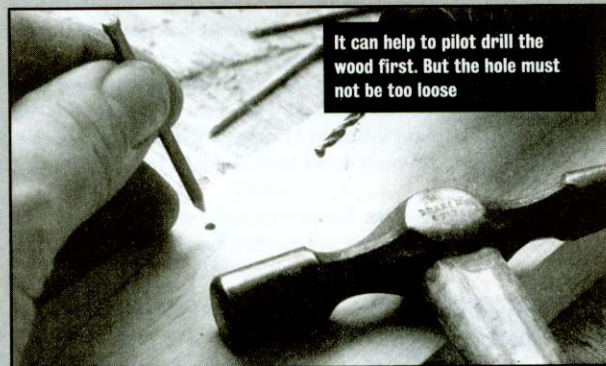
1 Don't use a nail which is bigger than is absolutely necessary for the job.

2 Don't nail close to the edge, or close to the end of your piece, where the fibres part most easily.

3 Pilot drill stubborn timber (GW 9:42). Remember though that the nail relies on a tight fit for its strength. Don't over-drill. The nail might begin by making a musical twang but it must finish its trip with a solid thud to tell you it is holding firm.

4 Tap the point of the nail to dull it. Then it will sever some fibres rather than squeezing between them.

5 If the grains of both components are aligned, use an oval nail (GW 4:76) with its fullest width across the grain, so that it tends to sever fibres.



It can help to pilot drill the wood first. But the hole must not be too loose



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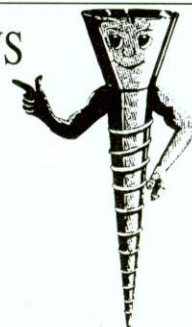
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When replicating a Mendlesham chair, Philip uses original tools and techniques



An open door to workshops and their owners. No.10 Philip Hawkins

workshop angles

Philip Hawkins specialises in replicating and restoring period furniture. But his quest for authenticity goes a few steps further than the majority of restorers, most

notably with the frequent use of a pole lathe.

Philip is no bodger from the backwoods though. Indeed he trained at the London College of Furniture for four years. He gained experience in

WORKSHOP ANGLES

Philip Hawkins

two antique restoration workshops, before moving to the Bath area to set up on his own.

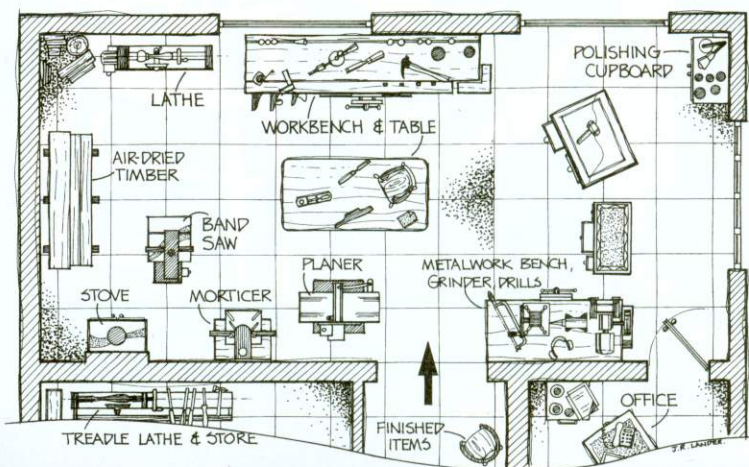
He now operates from Maiden Bradley, where his workshop is in a former village schoolroom, nearly 100 years old. (Elderly ex-pupils of the school have even been known to poke their heads round the door.)

One of Philip's specialities is early-English oak furniture, although he tackles a wide range of designs. He was making a Mendlesham chair when we visited, combining the seat and

support structure of a Windsor chair with the graceful back in Sheraton style. It was made using old techniques and old tools.

Indeed many of his tools have been obtained at relatively low cost, or made by Philip from old designs. One example is the chest bib – inspired by an old photograph in a woodworking book – which he uses for extra support when drilling with a brace and bit. He finds that his low-speed, low-cost whetstone grinder serves him better than the high-speed, dry versions.

Plan of Philip Hawkins' workshop



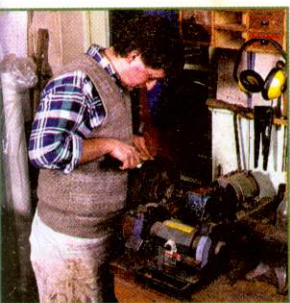
Yew is a common wood for bending. Philip displays the stages of production, as branch and plank, and just out of the steamer (by the window boxes)



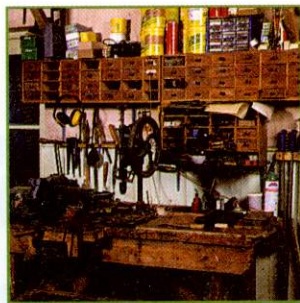
A boxwood scratchstock and pattern-making chisels are used regularly



The 19th century treadle lathe gives the marks found on old chairs



Philip made his grinder from old bicycle parts, with a wooden bath



Philip uses one bench for metal, with vice, grinder and drill



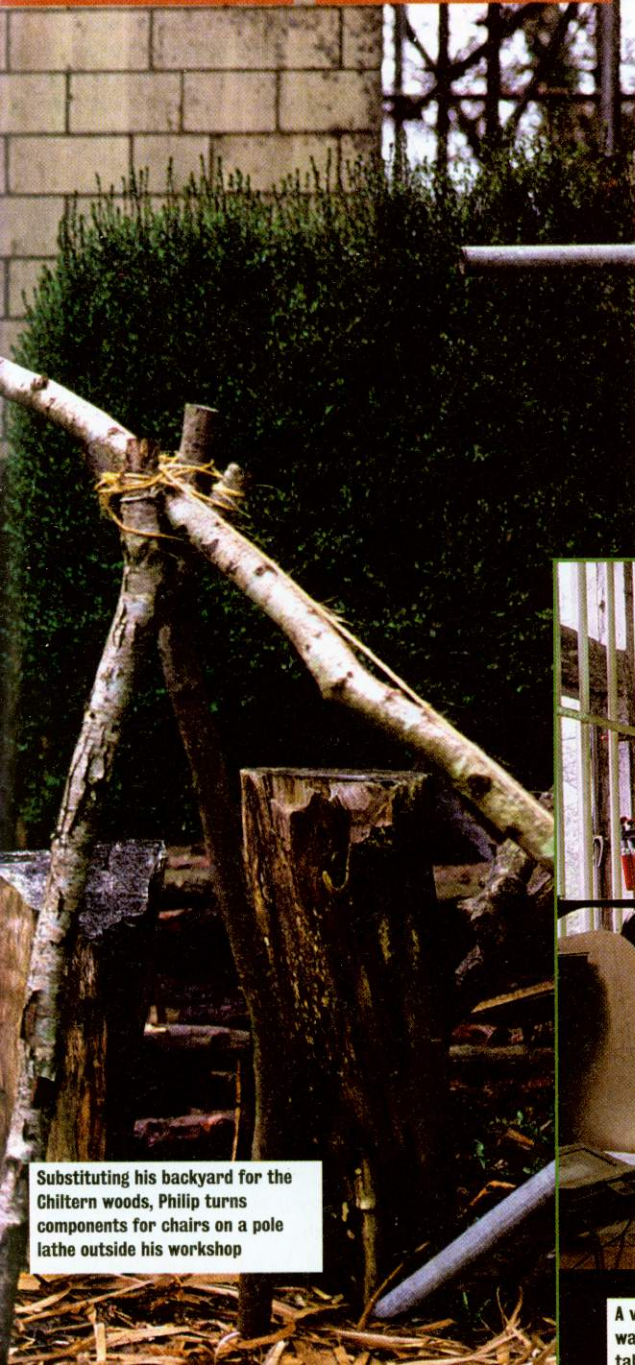
A long row of spring clamps, which are always useful to have ready



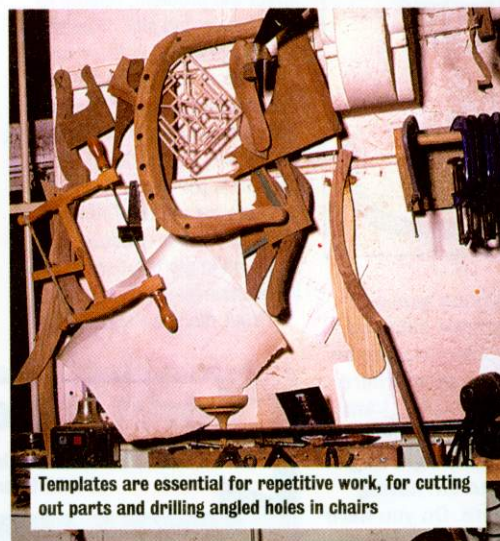
The Bradston No.1 hand-powered pillar drill has automatic feed



As in many chair-making workshops, finished pieces are stored out of the way on pegs



Substituting his backyard for the Chiltern woods, Philip turns components for chairs on a pole lathe outside his workshop



Templates are essential for repetitive work, for cutting out parts and drilling angled holes in chairs



Original breast bibs were used by the Windsor chair framers, but Philip first learnt of the idea from a picture of such woodworkers from the 1850s

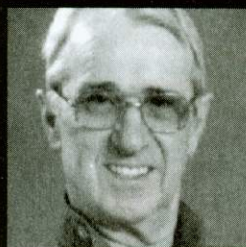


A view of Philip's workshop shows how he has used the wall space, while lack of machines allows him to position a table in the centre for working on assembled chairs

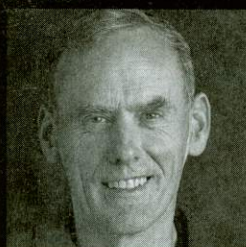
**Ask the Good
Woodworking
expert team**



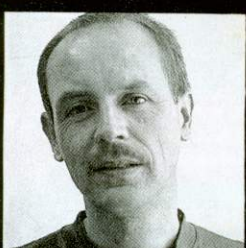
Tobias Kaye
Woodturning



Jeff Gorman
Techniques



Ian Wilkie
Workshops



Phil Davy
Suppliers



Jeremy Broun
Furniture

PLUS: Our other specialists in every woodworking field from timber to finishing are available to answer your queries as required

Woodworking Answers

Find out how to solve furry grain on bowls, deal with excess glue, veneer curves, and mark out ellipses and arches

Breaking grain

 I am trying my hand at turning some luan plates and bowls, but am finding that the end-grain pulls out on the outer curve. I have tried hardening the

you have indicated. I would mount the bowl twice, once by the inside while the outside is being turned, with the gouge moving from the foot up to the rim, and then by the rim, for following the inside.

There are other factors that affect the problem, related to experience and skill. How sharp are your gouges? Is there any vibration of tool against the wood during the cut? Have you tried different parts of the cutting edge, with the handle at different angles? Is the bevel sweeping over the cut surface? Answers to these and other questions can be found in my treatise on bowls in the June issue (GW 8:65).

Your question about chucks

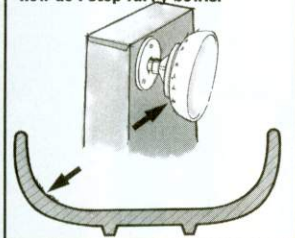
is a good one, and you need to assess the uses you may give a chuck, and the quality of your machine. The Multistar chuck (0206 549944) is very versatile, and has a wide range of jaw sizes which expand or contract to fit many sizes of dovetail recess or spigot, without needing to mark out. However the section of the steel in the jaws is, in my opinion, not thick enough for the long distance that the jaws project from the body. The result is vibration in the workpiece, particularly noticeable in bowls over 300x75mm (12x3in). If your lathe is one of the Taiwanese imports sold by NuTools, Draper, Tool Mart or Poolewood, costing

less than £200, then you probably will not be able to tell the difference as that bowl size is near the limits of your lathe.

The Nova Scroll chuck (0423 322370) is heavily constructed with short jaws, not prone to vibration. On this chuck one jaw size moves to fit spigots or dovetail recesses, with as much as 25mm (1in) travel. Thus the steel of the jaws is usually not in contact over a complete arc, as there are gaps, and it tends to dig into the wood.

If you lean towards the Multistar you might also like to consider the Craft Supplies PCC2000 (0298 871636), which is not prone to vibration. The alloy jaws of this chuck will

How do I stop furry bowls?



grain with sanding sealer, with some variable success. The same problem occurs on the inside at the point where the walls join the base. I am trying to make high-sided bowls with a fairly tight angle at the base, but am having difficulties there. Do you have any advice? I am also about to invest in a chuck unit, for my Mistro lathe. I quite like the Nova Scroll, but am impressed by the Multistar, which is slightly cheaper. Have you any preference?

I. Welford, Co. Durham

Rough broken end-grain on bowls is a common problem. There is no one easy solution. A number of different remedies may be combined to improve the situation. Two factors are making things difficult. First is your choice of timber: luan is soft and easily broken. You may have reasons for using luan, but it is not a timber from which I would choose to make bowls.

Your second problem is that you may be making the bowl in one stage, with the faceplate fixed to the foot. The effect of this is that during the exterior cuts the gouge is cutting against the layers of grain, directly into the end-grain fibres in the patch

Joint of the Month

No. 3 Common mortice and tenon with Jeff Gorman

Uses

- 1 Often used as a framing joint for parts meeting some distance from the end of the stile. A haunched tenon would be used at the top or bottom of the stile. Mortices are cut in stiles, and tenons on the rail.
- 2 Window and door frames.
- 3 Where end-grain of tenon does not matter being seen, or can be used for visual effect.

Advantages

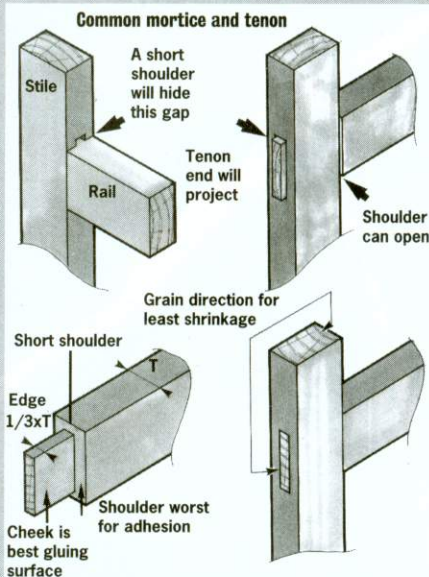
- 1 Strength.
- 2 You only need one clamp per rail for gluing.

Disadvantages

- 1 Stiles are likely to shrink so that the tenon will project after a time, getting dirty and potentially catching on clothing.
- 2 Gaps can appear at the top of the tenon, so it can be good to cut short shoulders on the top and bottom edges of the tenon.

Hints for cutting

- 1 Cut the tenon cheeks, and then the edges.
- 2 Cut the long shoulder and the short shoulder.
- 3 Mark out which joint meets which, adjusting for any local variations, and cut mortice.



Alternatives

- 1 KD (Scan - Woodfit 0257 266421) fittings such as metal cross dowels and threaded bolts combined with locating dowels. Note the shrinkage of stile can loosen screwed fittings.

Elaborations

- 1 Mitred shoulders for mouldings or bevels. Long and short shoulders for rebates (GW 9:53). Twin tenons for extra gluing area. Blind tenons.

not react with wet woods to leave black stain as happens with the steel jaws of other chucks. If you are about to buy the Nova Scroll it is worth looking at the Axminster Power Tool Carlton chuck (☎ 0297 33656), which is slightly larger and has a wide choice of jaws and one-handed operation. Other woodturning chucks on the market include the Masterchuck (☎ 0787 237291), Robot chucks (☎ 0705 527579) and Coronet chuck (☎ 0742 449066).

Tobias Kaye

Patina recreation

If it is necessary to strip a piece of antique furniture or replace a section with new wood, how would I best recreate the patina and distressed look?

C. Woodward, Staffs

Restorers of antique furniture avoid stripping like the plague. They try at all costs to preserve the patina, which has often taken several hundred years to create. If a section has to be replaced with new wood, only the minimum is used. If, for instance, a leg has rotted at the bottom, only that part of the leg needs to be replaced. It is best to use old wood, of similar colour and matching grain. Recreating the patina, and attempting to distress a piece is an art in itself, and I recommend *The Complete Manual of Wood Finishing*, by Frederick Oughton (ISBN 0854420304). There are also courses that will help you to learn these skills, and Ronseal are currently offering a free advisory service on all aspects of wood finishes (Ronseal Advisory Bureau, Roncraft, Chapelton, Sheffield S30 4YP).

Ian Wilkie

Too much excess

Once the gluing up is done and the clamps are on, the glue starts oozing out. However hard I clean off the glue there is always some left in the corner of mouldings and the like. Is there any trick you know? Might masking tape, a nail, varnish or a wet rag and less glue be the answer?

D. Robinson, Pembroke

The quick answer is in the question: "wet rag, less glue", but there is more to gluing up than that (GW 4:44). It is a curiously neglected stage in the making process, and yet, as we all know, is crucial to good

woodworking. The trouble is that time is against you when gluing up, so choose an adhesive with a setting time to match the job in hand. If there are numerous components, such as a complex carcase, use Cascamite or similar, which you can use for about 20 minutes at 60°F. In contrast PVA has to be worked within a couple of minutes or so and would be disastrous for the same kind of job, as the water is immediately absorbed into the wood fibres.

Experience counts when gluing up, especially knowing how much glue to apply. A serrated spatula, as supplied with tile adhesive, but narrower, can help to spread the glue evenly when gluing large surfaces. Woodworkers tend to apply too much adhesive. I

regard gluing as an art, and often taper off the adhesive towards the edge so that the cramping pressure spreads it outwards. But this is fine tuning, and less glue dries more quickly.

Much woodworking practice is steeped in tradition, which is often adhered to with far too much rigidity. An example is the lacquering of internal surfaces prior to gluing. This makes sense on tiny boxes which cannot easily be lacquered afterwards, but in the main I would finish later. I simply clean up the inside surfaces with an abrasive block before gluing up, then use a sharp wooden spatula, or even a chisel wrapped in wet rag, and meticulously clean off the excess glue. This can be scraped or sanded back later. I thoroughly wet the surface around the joint

to ensure glue stain does not occur when lacquering. The wet cloth and spatula method has to be repeated until the glue stops oozing. The secret is to custom-shape (on a disc sander) a sharp spatula which will go right into the corner.

If you are restoring an old piece which is already lacquered I would still use the spatula method. Sticking on masking tape is all very well, but the tape has a thickness and will often leave a ridge where the glue has oozed against it. Here again, let the excess glue come out, and wait a little before using the spatula. The advantage of a shaped wooden spatula is that it is soft and will not damage the workpiece. A little moistness from the cloth will not harm French polish if done quickly and

carefully. Indeed on lacquered work the glue will obviously not absorb into the grain.

I might add that gluing up is a vital consideration in my own design work, and some of the more complex pieces are designed to be built and glued in stages (as is the case for Pete Martin's dresser this month) to make it easy. Whatever methods you use, it goes without saying that you must not allow the excess glue to harden, and then chisel it off later. This is especially true when working with bare wood.

Jeremy Broun

Eucalyptus turn

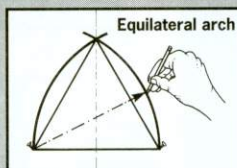
Could Tobias Kaye advise me on turning some green rounds

Four ways to mark out a Gothic arch

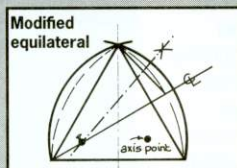
How do I mark out a Gothic arch?

There is a range of shapes for a Gothic arch depending on how sharp you want it to be. It is worth looking around to see shapes you like, which you can copy.

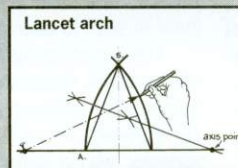
Ray Cooch



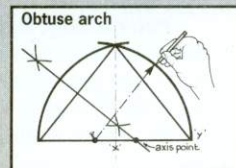
1 For the equilateral arch construct an equilateral triangle within the area you want an arch. Use a piece of string or wood the length of one side as a home-made compass



2 On the modified equilateral, mark out an equilateral arch. Draw a centre line, and a line from the top to the intersection with original curve. Use same string, but change axis point



3 For an acute or lancet arch join points A and S and bisect that line. Then extend the stringing line to produce the degree of curve you require to mark out the arch you want



4 A similar technique is used to produce the drop or obtuse arch as is used on the lancet. This time the axis point can be anywhere between the two points X and Y

Good Woodworking's Anything Planned

I would like to know where I can obtain plans for a round pedestal table for four people. What type of wood do I use, and how do I protect the surface from heat?

W. Lewis, Shrewsbury

The table we featured last month (GW 9:10) had a top 787mm (31in) in diameter. We feel that this would be adequate for three people, but for four to sit, in comfort, the top needs to be about 1220mm (48in) in diameter. You therefore need to enlarge those plans to suit. To be safe each leg must be at least 150mm (6in) longer along the horizontal plane. In our table the three legs were each 318mm (12½in) from the pedestal to the toe. On yours they must really be more like 480mm (19in). The height can stay the same. Indeed you need not change many of the dimensions to suit.

Traditionally these tables would have been made from oak or mahogany, and even in yew, walnut or fruitwood. We used a lesser known timber, called chontaquiro, from a sustainable source in Peru, and sold here by The Working Tree (☎ 0428 76505). You could just as well use pine. As a finish, if you want to seal the wood so that it can be washed clean leaving no marks, you could use a precatylised finish from one of the suppliers mentioned in the

Supply Service on page 62, or Rustins Plastic Coating, which gives a very strong finish. Alternatively you could just oil and wax the table with Danish oil, and accept the marks of age.

Please can anyone offer ideas on making a high chair without turning?

Paul Butcher, Berks

Please be patient, a project is already in the pipeline, but if anyone has any ideas please will they contact us. Thanks.

I want to make a swing boat to go with an activity centre for my children. Any ideas?

George Patterson, Merseyside

Can you recommend a book for a beginning woodworker, wanting to make items for the garden?

Neil Birkin, S.Yorks

We know of two books for garden furniture: *Woodworker's Garden Projects*, by Richard Blizard (Harper Collins) and *Garden Furniture* by George Buchanan (Ward Lock). Of them we prefer the Buchanan book.

I have noticed some references to snooker tables in Good Woodworking. I want to make a revolving billiard cue

stand, with turned base possible mounted on a lazy Susan bearing. Do you know a supplier of the spring clips for holding up the cues?

George Boyd, Co. Down

The turntable is not a problem, as Woodfit supply one (☎ 0257 266421), but as yet we have had no luck with snooker fittings. When we do we will tell the world.

I recently saw a very clever design for a bench that converts into a table with seats on either side. Can anyone show me how to make this?

K. Robinson, Dorset

I want to make a TV-video unit. Does anyone have any plans?

Michael Brizzlari, Lincs

In response to A. Macaulay's request for plans for a roll-top desk Jeff Gorman contacted us to say that the technique is described in Ernest Joyce's book *Techniques of Furniture Making*, published by Batsford. J. Hughes of Clwyd wrote in explaining that plans can be found in Rosario Capotosto's book *Woodworking Projects for the Home Workshop*, (published by Stirling).

of eucalyptus wood, which have recently been given to me? I must say how much I enjoy your publication.

Peter Bradly, Bristol

Eucalyptus warps more than any other wood I have encountered. This means that if it is left in the block for long, serious splitting will occur.

Whatever you decide to make from this wood, make it thin. I recently saw some vases turned from eucalyptus varying from 4-6mm ($\frac{1}{2}$ - $\frac{1}{4}$ in) in thickness. They had left the lathe about 125mm (5in) in diameter, but had distorted to an egg shape, about 146x108mm (5 $\frac{3}{4}$ x4 $\frac{1}{4}$ in) in section. Every annual growth ring had become a pronounced ridge giving the piece a remarkable and unique shape. If this grade of distortion is not to your taste use your time turning a more user-friendly timber.

That said this timber is as amenable to your imagination as any other wood. It will respond well to natural-edged bowls, traditional bowls (until they warp) or vases. Perhaps you had better avoid boxes with fitting lids (they will not fit for long) or spindle turnings more than 6x6mm ($\frac{1}{4}$ x $\frac{1}{4}$ in) in section.

Tobias Kaye

Curved veneer

I am at present constructing a wall cabinet with a semi-circular curved top, made up from small wooden bricks. I intend to veneer the inside and outside of the top, and am hoping I can use the iron-on type of veneers. In what way could I use a smoothing iron to veneer the concave (inside) face of the curved top? Alternatively, would Evo-Stik Time Bond (a contact adhesive similar to Dunlop Thixofix) be a suitable adhesive to apply over the veneer and groundwork if I do not iron it on?

Eric Turner, Co. Armagh

I can foresee quite a few problems with an iron-on technique for surfaces as strongly curved as the top of your cabinet. For this demanding job, I suggest that your alternative of a solvent-based contact adhesive would offer a process that can be employed with greater confidence.

For this kind of job you will not be able to rely on the 'slideability' aspect of an adhesive which allows you to move the veneer around before it sets. As you suggest you need

a contact adhesive. Use the well-proven 'slip-sheet' technique which keeps the two coated surfaces apart until you need them to stick to each other.

The non-stringing properties will be useful, though normal contact type adhesives will serve. Avoid the non-flammable varieties, whose water content will swell the veneer and cause problems when the veneer attempts to shrink.

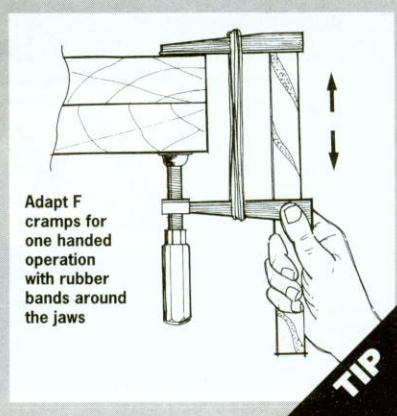
Solvent contact adhesives carry one significant snag. Methylated spirit-based finishes such as French polish, and possibly even some catalysed lacquers, can affect the adhesive. We are not certain that this is the case, but have heard of cases of the veneer lifting when such finishes are used.

Your best bet is to experiment, but I suggest you use the two-part lacquer, Rustin's Plastic Coating (☎ 081 450 4666), simply because I happen to have long experience of it and have taken advice that confirms its suitability for this purpose. When using this finish make sure your finishing area is very well

One hand clamping

Though F-cramps are great to have around because they are so quick to adjust, the trouble is that they are difficult to use one-handed. So I put rubber bands around mine for one-handed work.

Charles Smith



ventilated, as it gives off unpleasant fumes. It can also react with stains so make sure you do a trial run first.

In the course of time the wood forming the brick-built groundwork is bound to shrink a little, and the brickwork can eventually ghost through the veneer. This risk can be reduced if a counter veneer is first applied, at right angles to the direction of the face veneer.

For a curve as steep as a semi-circle, lengthwise veneer joints will need to be taped

together before laying. First separately trim each sheet of veneer with a straight edge and veneer saw or a knife. Then use a length of wood to hold down the veneer and use a finely set plane to shoot the edge true.

The veneer must not be damp if this kind of adhesive is to work properly. Remember that veneer is fragile stuff. Take precautions against the possible effects of the extra handling caused by working on curves. Order the veneer a couple of inches longer than strictly

necessary and bind each end of the veneer across the grain to hinder splitting. Self-adhesive tape can only be used to protect the unglued, overlapping ends. Such tapes act fiercely enough to strip fibres from the veneer, so prevent cracking of the main body of the veneer by only using veneer tape, or stationer's gummed, brown paper tape, across the grain at intervals on the outside surface.

It will be a good idea to start with the groundwork securely propped in a position which enables you to comfortably reach the starting end, and to work away from yourself, thereby keeping out of the way of the floating end of the veneer. Do not have too much overlap hanging over the ends.

Using a flat, not serrated spreader, apply a thin even film of adhesive to both veneer and ground, and allow to harden. Evenness is important, since thick bands of glue, or the stripes from a serrated spreader, can eventually shadow through the veneer.

Repeat on the other surface,

The Good Woodworking Supply Service

R. Howorth asked about miniature router cutters in the July issue (GW 9:55), writes John Walker, of Birmingham. In their current catalogue Titman (☎ 0255 220123) feature a selection of 6mm ($\frac{1}{4}$ in) shank cutters with miniature profiles, suitable for dolls' house mouldings. Regarding wheels for a bench (GW 9:54) Practical Woodworking produced a plan for a bench with spring-loaded, retractable undercarriage in 1969, by A.W. Bovill.

Parade of York, Engravers (☎ 0904 654387) contacted us to explain that we were quite correct to say that acid etching is better for short runs of labels, rather than pressed aluminium (GW 9:55). They can offer this service for single labels.

I need small quantities of 1/16in dowel for twelfth scale miniature work, but I cannot trace a supplier of this. Can you help?

Gerald Jarrett, Devon

Albert Miller of N. Yorks has written to us to say that another agent for Alko products (GW 9:55) is Roger Bentley of Driffild, Yorks (☎ 0377 24007).

In July's Woodworking Answers (GW 9:55) R. Galley sought information on tack cloths. I was disappointed that your team of experts could do no more than provide him with commercial suppliers. I have mixed my own solution for years, and buy linen offcuts from my local haberdashers. Mix

one teaspoonful of powdered rosin (chemical name colophony) to one pint of methylated spirit. Add half a teaspoonful of linseed oil and shake well before lightly damping a clean, lint-free linen cloth. The pint lasts me for months, and the cloth can be stored in an air-tight bag for re-use.

J. Walker, Lancs

Thank you to J. Young of Doncaster who has kindly offered a redundant Drilsquare to J. Ferguson, who requested information about them in the June issue (GW 8:61).

Charles Meek was asking about Stanley Bridges stockists in the July issue (GW 9:55). As a result S. Pick of N. Yorks has sent us a full list of such stockists, which can be supplied by us if you send us a stamped, addressed envelope.

In the May issue there was an article about making a kitchen table, made to look old with potassium bichromate. Can you tell me of a supplier of this substance?

Ken Burgess, Liverpool
Bichromate of potash is sold by M.D. Finney (☎ 0742 755817), Liberon (☎ 0679 67555), and Mylands (☎ 081 670 9161). Technically speaking we were wrong to call it potassium bichromate, as a chemist would refer to it as potassium dichromate, but bichromate of potash is right. You learn something new every day.

Can you please suggest a supplier of brass cabinet locks to replace those

on a Victorian sideboard I am restoring?

Brian Elliot, Surrey

You could try:

- Bath Knob Shop, Avon ☎ 0225 462090
- Beardmore's, London ☎ 071 637 7041
- Woodfit, Lancs ☎ 0257 266421
- Comyn Ching, London ☎ 071 253 8414
- Martins, Birmingham ☎ 021 233 2111
- Universal Fittings ☎ 071 739 6639

I am currently making a Georgian style table, and need some PVC imitation leather for the table top. Do you know of any suppliers?

Paul Robinson, Luton

This type of PVC imitation leather is available from J.A. Milton, Shropshire (☎ 0691 623143). They are most helpful, with good advice, and offer a restoration and upholstery service with DIY supplies and mail order catalogue.

Ian Wilkie

Can anyone tell me where I can buy dowel pegs for holding on wheels on toys, with a diameter of 6mm ($\frac{1}{4}$ in), ready-turned people (20mm/ $\frac{3}{4}$ in diameter and 56mm/ $\frac{1}{2}$ in long), and 30mm (1 $\frac{1}{4}$ in) and 56mm (2 $\frac{1}{4}$ in) diameter wheels? I need to be able to buy these by the hundred.

Stephen Chisholm, Cleveland

Hobbies (☎ 0362 692985), Fred Aldous (☎ 061 236 2477) and W. Hobby's (☎ 081 761 4244) all sell some wheels and axles but you will be able to obtain almost all the parts you need from K Toys and Products (☎ 0272 424980).

and wait until both are touch dry. You can test for this by lightly touching the adhesive surfaces with a knuckle. The adhesive is ready when it fails to transfer to the skin. The adhesive must not be allowed to harden. Cover the ground with a sheet of strong brown wrapping paper and accurately locate the veneer. Once you are happy with the set-up, withdraw the slip sheet lengthwise for about an inch, and carefully rub down to bond the veneer to the ground. Take care to exclude any air. Repeat a few inches at a time until the entire veneer is bonded.

A helper could ensure that the slip sheet stays in place and moves only when you want it to be moved. Rehearse the operation beforehand. The main irrevocable disaster that I can foresee is premature adhesion caused by accidental contact (apart from falling out with the helper if anything goes wrong).

Once the starting end is fixed, it would be a good idea to trim the surplus veneer and thereby reduce the risk of veneer damage as the position of the set-up is changed. Make haste carefully; you have about half and hour to complete the job.

Tap the surface with your fingers to check for loose patches. Providing there is adhesive under the bad patch, it can be re-activated by heat.

Veneering the interior, concave surface will be much easier if your design can allow the grain to lie along the axis of the semi-cylinder.

Finish with the lacquer as recommended on the instructions. It is worth having special thinners to hand in case of spills and for cleaning brushes. If you wish to try other finishes, in view of the hard work that must have already gone into such a demanding job, it will be well worthwhile to test the entire technique, including the finish, on a flat surface first. Allow a few days for the adhesive to thoroughly harden before testing the finish.

Jeff Gorman

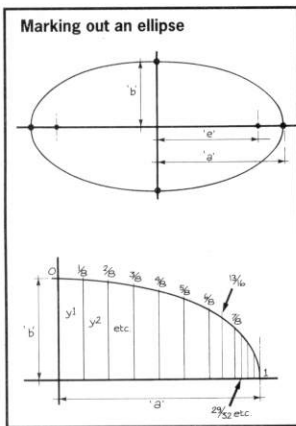
Ellipse by formula

I wish to make an oval tray, but want to use a mathematical formula for marking out the ellipse. How is this done?

C. Badcock, Surrey

You may be interested in two observations on the drawing of ellipses, as discussed in the May issue (GW 7:73). With regards

the pins and string method, it is possible to use simple mathematical formulae to determine the positions of the nails for the string (F1 and F2 in the illustration) and the loop-length of string. Given the semi-axis distances (half the length of the major and minor axes) **a** and **b**, the distance to the nail position (**e**) is given by



$e = \sqrt{a^2 - b^2}$. The string loop-length equals $2a + 2e$. Drive a pair of pins into a piece of scrap timber a distance of **a+e** apart, and tie a loop of string tightly around these to find the right length.

The trouble with the pin method is that you have to make holes in a piece of timber destined to become furniture. When you do not want to do this a simple rectangular-ordinate system might be of use. The following method will draw one-quarter of a desired ellipse, and may, of course, be repeated or traced over for the remainder.

1 Draw the major and minor axes, and mark the distances **a**

Steps	Y _{1/8}	Y _{1/16}	Y _{1/32}
0	1.000	1.000	1.000
		0.998	0.996
1	0.992	0.992	0.992
		0.982	0.988
2	0.968	0.968	0.968
		0.950	0.960
3	0.927	0.927	0.939
		0.899	0.927
4	0.866	0.866	0.914
		0.827	0.899
5	0.781	0.781	0.883
		0.726	0.866
6	0.661	0.661	0.847
		0.583	0.827
7	0.484	0.484	0.805
		0.348	0.781
8	0.000	0.000	0.755
			0.726
			0.695
			0.661
			0.624
			0.583
			0.537
			0.484
			0.423
			0.348
			0.248
			0.000

Use this chart to work out the shape of an ellipse using Jack Cox's formula. Multiply the minor semi-axis (**b**) by the values above, with the major semi-axis divided into eight, 16 or 32 equal divisions

and **b** (half the required major and minor axis dimensions).

2 Divide the distance **a** into eight equal parts, with vertical lines drawn at these points. The values **Y1, Y2** etc... are obtained by multiplying the value **b** by the one-eighth value in the accompanying table, and transferring them to their ordinates with compasses or a rule. Where greater accuracy is required (at the ends of the major axis) the further subdivisions 1/16th and 1/32nd may be used as necessary.

Jack Cox

Storage problems

I was recently given a wooden cabinet for my workshop which has a lot of small compartments. Do you know where I can obtain some small square tins with lids, less than 100mm (4in) long.

Donald Mitchell, Bucks

I was rather shocked to read a letter to a woodworking magazine asking where one can buy tins for your wooden cabinet. I strongly urge you to makes boxes from good quality ply so that they can be made exactly to the dimensions you require. The editor put me on a piece rate for this question, offering me a small sum for each idea. My first suggestion is that you become a pipe smoker, and I notice that some tobaccos are still available in rectangular tins. Chemists no longer seem to sell lozenges or cough pastilles in tins (so you don't get paid, Ian, for that suggestion. NG), but if you felt in the mood you could eat a lot of toffees. Rather than damage your lungs or teeth I suggest you use plastic fridge boxes, which you might be able to find in the right size. Remember that it is not good safety practice to store finishes in old food containers. Anyone with further ideas, please contact Good Woodworking.

Ian Wilkie

Barley twists

I am producing a barley twist pedestal table, but it seems to be a long, drawn-out process. Can the barley twist be machined, or is the only way to cut the material by hand?

G. Donaghy, Cleveland

The main problem with barley twists, or spirals, is the removal of the waste, which is a time-consuming task by hand. In the first issue of Good Woodworking

Michael Burley showed five ways to carve a spiral (for back issues turn to page 50).

The principle of cutting the spiral is to use some form of machine cutter with the leg held in a sliding cradle. You then revolve the leg while moving the cradle under the cutter. The speed of revolution related to the speed of slide determines the angle of the spiral. We have also been asked by Richard Hough of Warks about the Sears Router

Craftsman, designed for cutting spirals and flutes. It is being sold as the Routerlathe by Trend (0923 249911), and we tested it in the May issue (GW 7:6). It works along the same lines as Michael Burley's suggestions for using a router in a drillstand above a home-made sliding carriage.

I hope you find Edward Hopkins' pedestal table in last month's issue of use (GW 9:10).

Nick Gibbs

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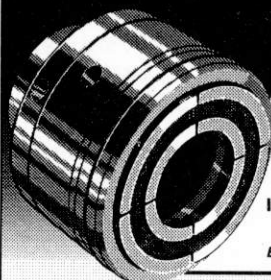
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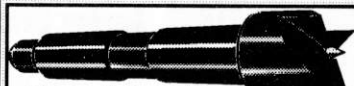
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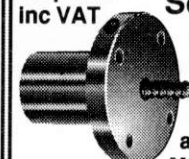
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LEARNING WITH THE EXPERTS TO MAKE MORE OUT OF WOOD

TOOL TESTS
Comparing
turning setsPROJECTS
Buttons and
sewing kitsTECHNIQUES
How to make
special toolsMINIATURES
Tobias Kaye
looks at tiny
turningTECHNIQUES
Using larger
lathesTIPS
Keep tool
edges smoothTIMBER
What wood to
use?

The turning column

WITH
TOBIAS KAYE

People are taking to turning miniatures in a big way. Tobias Kaye tells you how to do the same, tests tools for the job, and also takes a look at the work of John Hunnex

Whether it be dolls' house furniture or merely an obsession with fiddly detail that drives them, many people are into turning tiny. The big thing about miniature turning is that the investment is also small scale. For around £220 most makes of mini lathe do what they are made for better than similarly priced larger lathes do their work. The cost of timber and cutting tools is also lower: you can get away without a bandsaw. If you do decide to buy a bandsaw you can use a cheaper, three-wheel type that won't cost as much as a two-wheeler.

Small Workshops

Not least in economies is a workshop. The Tyme Little Gem lathes come mounted on a rubber-footed board so that the kitchen table becomes the workshop and

TECHNIQUE



Just because you are turning miniature items does not mean you cannot use normal tools. The parting tool is especially useful, not only for cutting to depth as on the bobbin for the hussef project, but also as a small skew

the broom cupboard hides the lot between sessions.

Miniature turning can, of course, be done equally

well on maxi equipment. Small gouges, skews and parting tools are an advantage but standard

spindle tools will do. For really tiny work, tools may be ground from masonry nails or Supascrew,

hardened woodscrews. Large lathes such as the Harrison Graduate are no hindrance, because their steady bearings and smooth moving rests are equally well suited to miniature work as to large.

What Wood do I Use?

Choice of timber for small work is wide. Those that have a coarse grain like oak and ash are less satisfying than others, and softer woods require more care, but there is nothing to stop you using pine if you find one with a close grain.

Reclaimed timber from demolition sites is sometimes of the highest quality. Particularly well suited to miniature work are the very fine-grained woods like apple, plum, yew, laburnum and

How to make a sewing kit, the perfect gift

PROJECT



When I first made one of these sewing kits, which the Victorians called a housewife (pronounced hussef), it took me three and a half hours to turn. Now, eight years later, it takes less than two and three-quarters. It is designed to take 'size eight between needles'. These are very small, and none of the self-respecting Victorian sailors who owned hussefs, would have been seen with such dainty needles. If you want to make your hussef seriously practical then you will need to start with a sensible needle size and scale the whole thing up. You will also be able to make a larger bobbin for more colours of cotton.



1 Rough out the blank for the body and lid of the hussef. The blank needs to be about 100mm (4in) long

TURNING

Miniature project

boxwood (GW 10:62). Many imported exotics are suitable and produce

highly suitable ones such as lilac, hazel hawthorn and ivy can often be had

wide range of projects to choose from. Lace bobbins are a classic and once you've got your hand in, the local lacemakers' circle or guild might provide customers for simple and fancy designs.

Another project with endless variety is dolls' house furniture. One-twelfth scale tableware – from plates and candlesticks right down to the designer bark edge fruit bowls – offers hours of fun.

If one-twelfth scale is too coarse for your taste you may like to join those who compete to see how small they can make a recognisable object. Goblets with a free, captive ring or two on the shank down to 3mm ($\frac{1}{8}$ in) long, or less, might become your target.

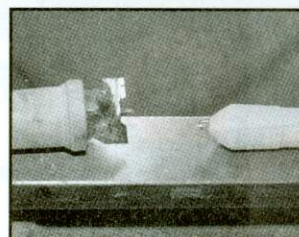
All types of jewellery from earrings to necklaces and brooches can be designed and turned from coloured woods.

You can laminate thin pieces of contrasting timber or colour the wood after turning with food dyes, silk paints or with Indian drawing inks. Jewellery boxes come into the category of small turning, as do needle cases and the strangely named housewives (hussefs), or sewing kits.

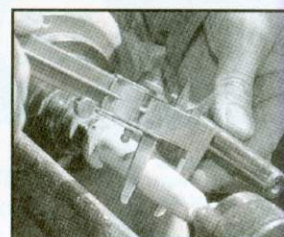
Getting a Grip

For very small work holding the wood to turn it can be as tricky as the tool control. First among useful devices is the three-jaw drill type chuck. Fixed to a morse taper arbor, this can

Making your own centres



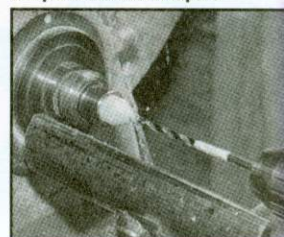
1 You can make your own two-prong drive and tailstock centre to match miniature work



2 When making any centre turn the taper first to fit the lathe. Compare with metal tapers



3 For the tailstock centre we started by turning the point, but this is best left till later



4 Drill the blank, which is held here in a conical drive, with a pilot hole for the screw



5 Screw a woodscrew into the point. As you can see the point split because we turned it too early



6 Cut off the screw head and turn the shank to a ring and point for the most stable centre

be used in the headstock to hold small diameter spigots on the workpiece. Fixed into the tailstock, it can be used to hold drills for hollowing or boring.

Next among techniques is driving by conical friction. This means turning a piece to fit directly into the morse taper of the headstock (a short type of taper will hold most things). Alternatively you

can turn a conical hold into a piece of wood held already by one of the above methods. Push the workpiece into this friction drive with the tailstock.

Various conical drive systems are available (Coronet, for example ☎ 0742 449066). However, unless you are doing a lot of work of a similar size the wooden version made of a dense timber like boxwood

If you have problems stopping a centre from spinning on the work, it may help to cut down the centre point a bit thinner. This can be done with a high-speed steel parting tool or skew-ended scraper. Sharpening the wings with a fine or slip stone also helps.

TOOL TIP

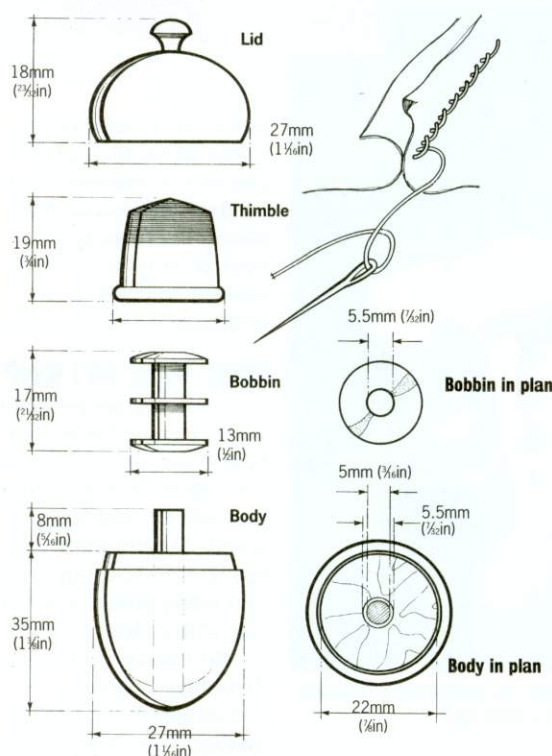
satisfying finishes easily, but you may wish to wonder if some place, or someone, is being exploited for your enjoyment before buying these. Species mentioned above and other

from neighbour's gardens or firewood merchants' yards for next to nothing.

What Can I Make?

Once you have tools and timber to hand there are a

How to make a hussef



The sewing kit, or hussef, is a classic miniature turning project. You will need to glue the needle case into a shallow mortice at the base of the body

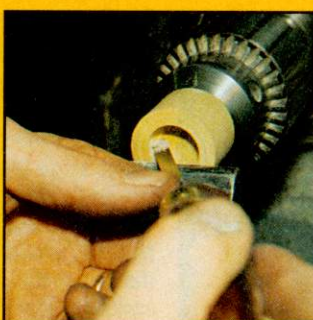
Shaping the body and lid



2 Parting off between centres can be dangerous, so complete parting when the blank is in a chuck



3 Drill into the lid to reduce the hollowing needed. Use Sellotape as a depth stop on the drill bit



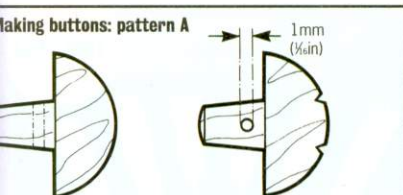
4 Hold the scraper like a pen when hollowing the lid. The lid rim needs to be undercut for a pop fit (GW 9:65)



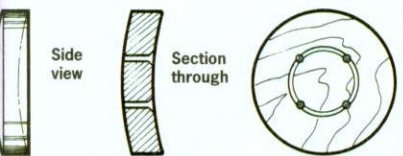
5 Having rounded the rim for a good pop fit, shape the outside of the lid down to the handle



6 Sand and polish the lid, and shape the handle, before parting it off with the long point of a skew



Pattern B for flat buttons



Buttons are a fun miniature project to upgrade your favourite shirt. Pattern A are the simplest, and can be decorated if the timber is plain. For pattern B, turn a groove to guide the placing of two or four holes

a considerable saving of space. More powerful forms of drive for square-sawn work are the tapered square drive or lace bobbin drive. Both these will drive round or square work, the

tailstock accurately in one end and graze the corners off with a tool while the piece spins. Turn the work end for end and it will be running true.

For rough sawn work

Jargon Busting

Bevel on cutting

Technique whereby the bevel on a turning tool rubs against the workpiece while the edge is cutting. This reduces vibration and helps to achieve a good cut

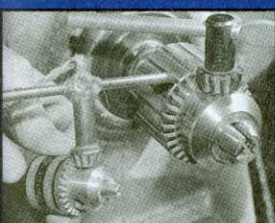
conical taper being the most versatile. Off-square, roughly sawn work will run out of true in such a drive. To true it up, centre the

use a drive centre. So long as you don't have problems with the work splitting, the drive centre is very useful.

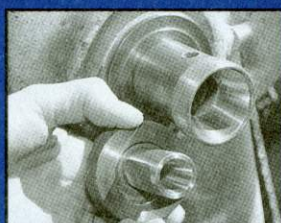
Using Larger Lathes

If you are working on a larger lathe, mini drive centres can be bought to fit from many tool shops and turning supply companies (Peter Childs, for example ☎ 0787 237291). You can make both drive and tail centres by turning wooden Morse tapers fitted with brass or steel screws or

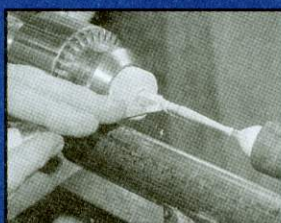
Six ways to turn better miniatures



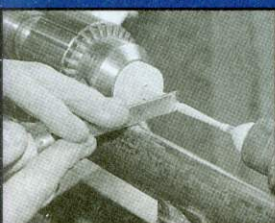
1 The 20mm (3/4 in) Jacobs chuck will take no less than 5mm (1/4 in). Chuck key flags show up in shavings



2 The conical friction drive is useful but you may want to make your own from boxwood



3 Use the parting tool as a miniature skew for shaping and finishing beads



4 Use the short point of the skew for getting into tight valleys, for a better finish than the long point



5 The spindle is held in a home-made conical drive, supported by the hand to reduce vibration



6 For hollowing put the tool rest across the end of the workpiece with the tool hand low and across

Turning book review

BOOK
REVIEW

Woodturning Step by Step

BY DAVID REGESTER

Publisher: Batsford

ISBN 0 7134 7162 X

Price: £14.99

(Hardback)

WOODTURNING STEP-BY-STEP

DAVID REGESTER



David Regester has written plenty of articles for turning magazines. If you like his approach there you will like his book, as it is mainly an extension of that work. His approach is highly detailed. David's intention seems to be to leave no stone unturned in explaining the basics

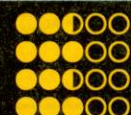
carefully. I find this approach a bit tedious, and I can always find another stone under the first that needs turning. While many simple items and procedures are explained in great detail in this book, others are not explained at all. Sometimes a great many words are used where one photo and a caption would do.

On the plus side, the techniques the book describes are mostly either good or excellent. David has made every effort to describe them thoroughly. Anyone really working through this book must surely develop a good way with tools. Some 75 pages are devoted to technique alone, with many black and white photos illustrating progressive stages of the cut or the tool-grinding process. The first quarter of the book concentrates on the lathe, five pages the workshop, and six pages on other equipment. Much of this information would suit someone determined to jump in at the deep end with a lot of money and space available. David describes his own best lathe in detail but does not name it. Why not?

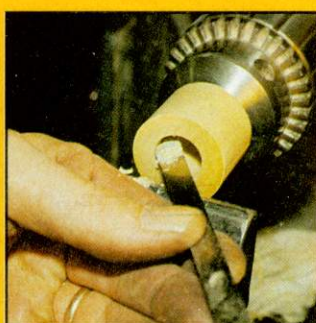
Though the cover shows a number of turned items, none are described as projects. The book is the first of a series being written by David which will add up to a complete description of his craft. The price for this volume is the same as for books covering three times as

much. But the detail of description and the stage-by-stage photos are three times more copious than in some other books.

Words
Photos
Drawings
Overall



7 Drill the body with a 16mm (5/8 in) bit, 6mm (1/4 in) deep. The bit has been attached to that depth



8 When hollowing the body you may find that a larger radius of scraper helps to produce a better cut



9 Partially shape the outside of the body. This is only to give you an idea of how the lid will fit



10 Taper the rim, to check the lid-fit with lathe revolving. Cut back behind polished mark to make a ridge



11 Drill a shallow mortice in the base of the body for the needle case, using a 5mm (1/4 in) bit

bolts which are then turned and filed to shape.

The miniature tail centre that I made from pear wood and a brass No.10 screw has worked for years on pieces as big as 990x50x50mm (39x2x2in).

The centre prong and supporting cup helps stop work both from splitting and from burning on the centre. This shape can be easily turned with a parting tool once the head of the screw has been sawn off.

Glue Chucking

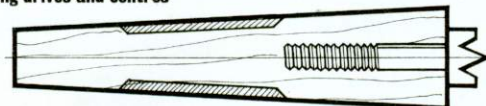
Lastly, mounting pieces with a dab of hot glue is quick and easy, especially for faceplate type work.

Polished surfaces hold well enough for careful turning and peel off easily. On unpolished surfaces, you may need to soften the glue with a light bulb or heat gun and roll it off like blue tack (GW 8:27).

Miniature Techniques

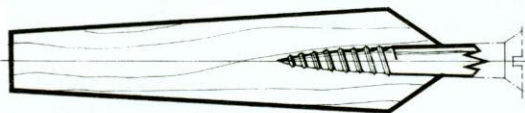
Techniques for turning miniature work are just the same as for larger work. I have had people come on a Foundation in Skills turning course with me specifically to learn good technique so that their skill and enjoyment of miniature turning could advance in one jump. As with larger work, the best finish and

Making drives and centres

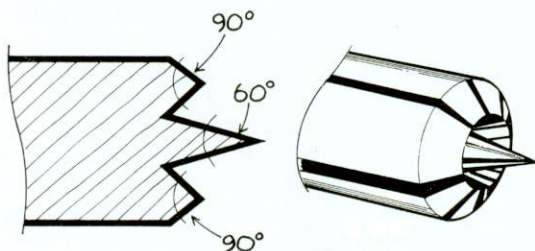


Copy taper of steel taper on fine-grained timber for two-prong drive. Finish with scraper as fluffy finish produces better grip

Fit a brass, or steel, bolt in the centre and file or grind the wings. Glue in place with epoxy resin



On the tailstock centre fit a brass screw into a fine-grained taper, and then turn to ring and prong



Drive prongs and tailstock centres are often too large for turning miniatures, so it is worth making your own. You can relieve the taper for a better fit

Turning tool test

TOOL TEST

Ashley Iles H45 Set

Henry Taylor HSMT Set

Both these sets are for small or miniature turning. Ashley Iles call theirs *miniature tools*, not to be confused with small turning tools. Henry Taylor call theirs *small turning tools*. The tools in both sets are similar in size, though Taylor's are slightly longer and narrower. There are five tools in the Henry Taylor set and six in the Ashley Iles set, the extra one being a square-ended scraper (the least useful of the set for my techniques). Price per tool is similar in both cases.

The scraper in the Henry Taylor set is slightly wider (6mm/1/4in) than those in the Ashley Iles set (4mm/1/8in). I find the 6mm more useful for the projects on these pages but obviously the smaller your work the smaller your tools will want to be. Besides, the cutting tip of a scraper is fairly easy to grind to a smaller size.

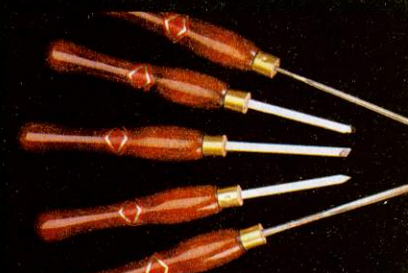
The skew chisels are just the opposite, in that the Ashley Iles is much larger at 11mm (7/8in) than the HT is at 6mm (1/4in). Again, I prefer the larger one as I am doing a relatively large piece of work at 28mm (1 1/4in) diameter. Skew chisels again are easily made smaller.

Another slight difference is between the fine gouges. The Ashley Iles is 4.5mm (3/16in), the Henry Taylor 3.8mm (1/8in). The Henry Taylor also has a slightly shallower flute, which I find more suitable for getting into tight corners like that of the handle on the acorn hussef project. The trouble is you cannot adjust a gouge.

Finish is also important. Ashley Iles have gone to a great deal of trouble to put a nice finish on their tools. Important in this respect are the arrises (sharp edges)



The Ashley Iles set has six tools, all high speed steel



The HSS Henry Taylor set are described as small tools

up the length of the tool. These can cause a tool to catch on the rest, making control difficult. Ashley Iles have ground all these away, even on the top surfaces of the scrapers. Scrapers need sharp corners on their top surfaces to reach into corners. This is a fault on this tool. Henry Taylor have removed the arrises on the skew but not on the parting tool or the scraper. This can easily be done with abrasive.

Both parting tools are 3.25mm thick (1/8in). This is a bit gross for miniature turning. I prefer 2mm (1/16in), which Iles say their next batch will be. I liked their set. The tools feel more responsive and balanced in use, but their set was badly let down by the rounded top edges of the scrapers. Ashley Iles do offer a satisfaction guarantee and will replace tools with these arrises removed.

Ashley Iles H45 £54.75incVAT

Value for Money



Overall



Contact: Ashley Iles ☎ 0790 3372

Henry Taylor HSMT £46.87incVAT

Value for Money



Overall



Contact: Henry Taylor ☎ 0742 340282

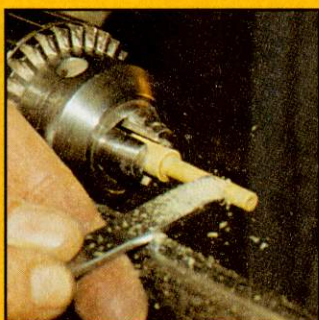
Finishing the body and turning the needle case and bobbin



12 Reverse the body so that you can refinish the outside and remove any parting off marks



13 Hold an 8mm (5/16in) square blank for the case in a drill chuck, as it holds off-square work accurately



14 Having roughed the work, reverse it in the drill chuck, turn to 5.5mm (1/4in) and sand for bobbin to fit

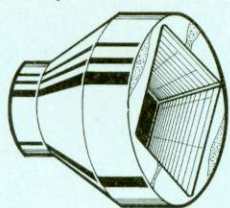


15 Drill the needle case gradually to avoid runout and splits. Stop short of bottom for base for needles

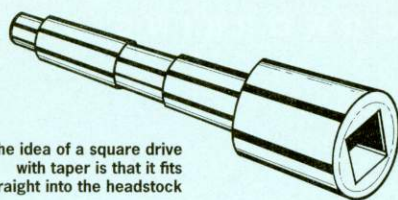


16 To aid hollowing of the thimble have ground a 40.5mm (1 9/16in) bit to the shape of a finger

Making a wooden square drive

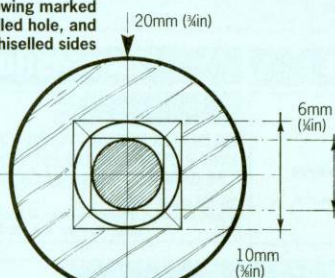


The idea of a square drive with taper is that it fits straight into the headstock



Square drives are produced to fit on threads or chucks, and have tapered interior sides

End view showing marked circle and drilled hole, and chiselled sides



Side elevation of square drive

Turn a length of close-grained timber to fit in chuck or taper. Mark the end with a circle and drill the centre, to a depth just less than the diameter of the drill bit. Use a drill bit a little smaller than the circle. Then draw a square around the circle and chisel down to the bottom of the drilled hole to square out the hole. This will take 10mm (3/4in) to 6mm (1/4in) section blanks

The most satisfaction are got from bevel on cutting, with edges oblique to the wood.

A few timbers are so dense that they prefer to be scraped, but even here if the cutting edge is slanted the wood will generally protest less (create less vibration) and finish better. The shape to which a tool is ground is important, again as with larger turning. No tool likes to cut with much more than a third of its width of cutting edge, so the greater the curve on the edge, the easier the cut is to control.

I have ground mini-tools from the shapes they come with, so that the gouges have long fingernail ends, the skewers have tightly radiused tips, the scrapers are rounded right

around the side cutting edge and the square-nosed scraper is slightly skewed. I have also rounded smooth all under-surface arrises.

Design for Small

Design considerations on smaller work are particularly easy to fudge. Getting a good flow of curvature and balanced foot-to-bowl proportions on a goblet 150–180mm (6–7in) high is tricky enough. Doing the same on one that is only 12mm (1/2in) high is a

very delicate task indeed. Many people are content to be impressed with the size and will not question the design. Whether you are happy with that approach is another matter.

Tobias Kaye runs regular courses for all levels of woodturners, including a Skill Foundation course and one on sounding bowls. Tobias can be contacted on 0364 42837.

When using any tool for delicate work, large or small, make sure that the edges that slide on the rest are very smooth. Even where the manufacturers have ground off the corners, the tool will benefit from having the corners smoothed over against a piece of medium or fine aluminium oxide abrasive cloth, held in the palm of your hand.

TOOL TIP

Tobias Kaye's monthly look at shape and form

Turning by design

No.5 John Hunnux

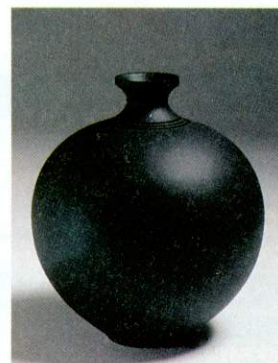
DESIGN

These pieces show a real mastery of curvature. See how the whole form has a feeling both of fullness and of elegance. The ability to combine such opposites only comes with a great deal of practice. The eye to produce such a piece will develop if the artist is willing to criticise his or her work minutely while it is on the lathe.

As the eye develops so does a great reverence for what is subtly and truly beautiful in simple forms. Without this reverence only passing beauty is possible. That John Hunnux has developed his eye and his feeling for the subtly beautiful is evident in these forms. Each piece invites the hands to cradle it. The perfectly graduating convexity of the body blends without suddenness into the concave neck.

John has elected to spray some of the vessels black. This is a bold gesture: removing grain pattern leaves the eye only the form to follow. I prefer the contrast of bold grain and fine form, but can see how the pure form is important for some people.

John is not fixated on vessels of purely bottle form: some of his pieces have bands of other wood and crisp changes of line to create interesting contrasts of line and texture. Some have large parts cut away to give directional flow to otherwise round objects. The achievement of this degree of mastery of the sculptural form does not come easily. Both heart and eye have to be trained over a period of years.



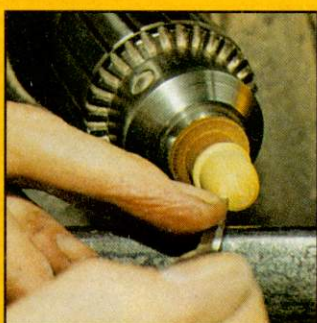
The sprayed ash bottle (7x6in) shows form but little contrast



Crisp lines on this burr elm and boxwood piece (4½x5in) benefit line



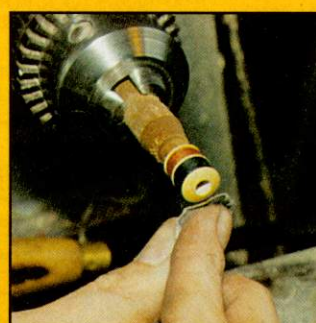
7 Shape the outside of the thimble with your finger controlling the shape. It must not be too large



18 Remount the thimble on a wooden mandrel of softer wood to turn the needle grip rings on the end



19 Having turned the bobbin, and drilled it to fit over the needle case, wind on the cotton



20 Remount the bobbin for final cleaning up. It may be better to leave the cotton winding till later



21 Glue the needle case into the body. If the case is open at both ends the needles will stick in the glue

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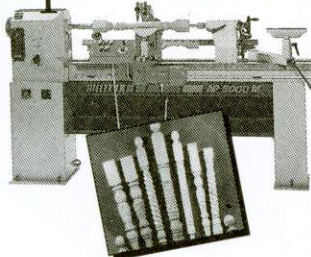
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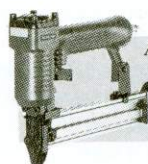
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Sharpen up

No.5 The hollow mortice chisel with Mark Corke

The hollow mortice chisel works by boring a hole with an auger, while the chisel cuts the straight edges forcing the waste into the middle, where it is taken away by the auger. I am very keen on keeping tools sharp and in good condition, and it is as

special sharpening set for the chisel. The chisel sharpener looks like a large countersink. You can buy a set with interchangeable guides to suit a variety of sizes of chisel, so saving money.

Making it Sharp

1 Clean away all the gum and muck from the chisel and auger with white spirit to see the state of the tool.

2 Place the chisel in an engineer's vice, so that the chisel is level and at a convenient working height. Mount the sharpener in a brace and remove the minimum amount of metal from the chisel. You are just aiming to remove any burnt metal, and bring up a bright, sharp edge.

3 Sharpen the auger with a fine file. A needle file will do for small sizes of bit, and a 150mm (6in) saw file for diameters of 25mm (1in) and more. Take no metal from the outside of the auger, but lightly touch up the spurs and the back of the cutting edges. Make sure you take the same amount from each edge.

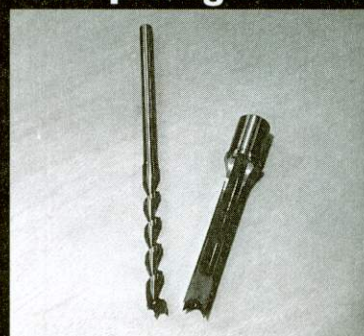
Hollow mortice chisels heat up quickly in use and some burning is inevitable, especially on hardwoods. Do not be surprised if a freshly sharpened chisel soon loses its shine. This does not mean that it has become blunt, but more likely the resins in the wood are reacting with hot metal. A well sharpened chisel and auger will hopefully stay sharp for months.

WARNING

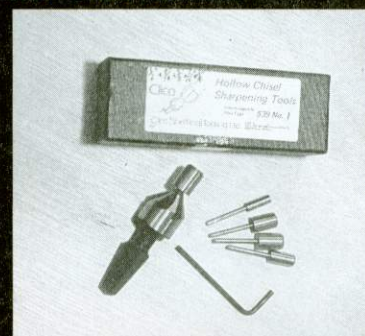
important to do so with the hollow chisel as it is with the mortice chisel for handwork (GW 9:57). Do not be tempted to let machine tools go blunt just because you can use more welly with them.

The auger and chisel must be sharpened at the same time, using a small fine file for the auger, but a

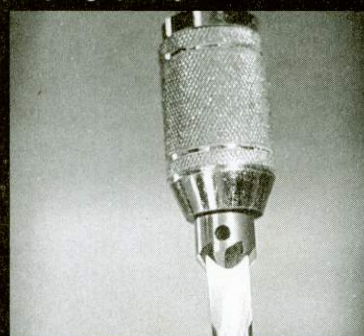
Sharpening a hollow mortice chisel



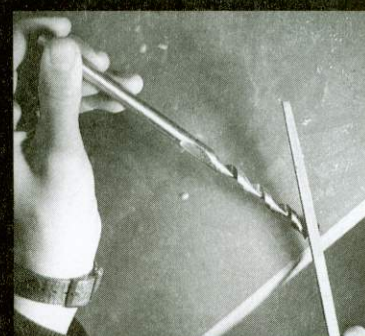
The chisel and auger come apart for sharpening separately



The sharpening set consists of guides that fix to the 'countersink' and fit inside the chisel



Sharpen the chisel with the sharpener in a brace, only touching the inner bevel



Use a small file for sharpening the auger, but again only from the inside of the edges



Impac

There was a time when you could buy a power drill for next to nothing. Now they are sophisticated power-tools, with price tags to suit. Technical Editor Phil Davy set out to discover what you can buy for £100 when choosing an hammer-action drill, and which is the best

Electric drills are more popular than any other portable power-tool. In fact, Black and Decker claim that over 80 per cent of all holes drilled are carried out using a powered drill. That may not sound surprising, but it shows that such drills are now versatile tools, used by all manner of woodworkers and DIYers.

That's not to say that the hand-drill is redundant. Often, a power-tool is inappropriate for some tasks. Small diameter holes in delicate woodwork, for instance, are best drilled by hand.

However, the power drill is

likely to serve a number of functions in the woodworker's workshop. We decided that the drills on test needed to have a hammer action, for fitting brackets and shelves to walls, and two speeds for a variety of materials. While single-speed drills are available for £45, the extra features and power costs more, and we chose a £100 ceiling.

The only drill Skil produce for that price is a variable-speed model. Some of the other manufacturers produce such drills within the price range, but we decided at this stage not to test for



HITACHI FDV15T
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B&D BD162
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t drills

The Good Woodworking Workbench Test

Impact drills on test

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variable speed. While that feature is an advantage with the Skil, it is not something we wanted to consider in this test, but we will certainly do so in the future.

We did, however, feel it is important that a power drill can be used comfortably with one hand. This may not be essential for the DIY enthusiast, drilling holes in walls. We have all, at some time, needed to use a drill while holding the workpiece; nothing is worse than the point of the bit flailing around because the drill is so cumbersome. While a detachable handle is important – and only the

Skil was not supplied with a second handle – for work that needs a bit of welly the strength of two hands on the tool helps. When drilling large holes in some materials the torque effect can be considerable. A side handle helps to tame the drill and keep it under control. It also helps steady the tool for accurate drilling perpendicular to the work surface.

What Else Does a Drill Do?

As well as drilling holes, power drills are ideal for disc sanding. A rubber backing pad is inserted in the chuck and abrasive or tungsten



SKIL 60441HI
£86.95



discs attached. Stock removal is fast but it can be difficult to avoid swirls in the work surface.

Wire brushes can be mounted in a drill for rust and paint removal, as well as polishing bonnets and buffing finished work. Mounted in a drillstand, (GW 9:72), precision vertical drilling can be done with a power drill, and companies like Wolfcraft (☎ 0787 880776) produce all manner of jigs and gadgets to harness the power of a drill. There are special attachments that can turn your drill into a lathe (GW 4:80), while Black and Decker produce a stand

for horizontal work. There are a number of sharpening systems for tools that can be powered by a drill.

By way of extras, we expected to find a depth stop, detachable handle and chuck key with each drill. Only the Skil disappointed us with no handle, but at least it was supplied in a plastic carrying case. Otherwise, none of the drills arrived with anything but the few accessories we had hoped for.

How Fast?

An electric drill is simpler in design than most portable power-tools. The brush motor is geared to a shaft that is directly in line with the drill bit. Motor sizes can be anything from 250W input on a DIY tool to over 1000W on professional heavy-duty models. The simplest drills are single speed, rotating at a no-load speed of about 2500rpm. Two-speed drills have a selector switch to electronically change the speed. The slower speed is from around 2100 to 2600rpm, the faster speed nearer 3000rpm.

The AEG and Peugeot models have a rotary switch built into the trigger to select the speed. I found it impossible to tell visibly which

Most power drills have a rubber holder for the chuck key to prevent it getting lost. This is attached to the cable where it enters the plastic casing. If your drill has no such device, tape both ends of the chuck key handle to the cable itself. Attaching this alongside the mains plug means that you have to tighten the chuck and remove the key before the drill is plugged in. Unplugging the drill when changing the bit may seem a waste of time, but it is a good habit to get into. Isolating any power-tool when changing a cutter, bit, disc or belt is strongly advised for safety reasons.

TIP

PEUGEOT PC552P

Made in France, the Peugeot is heavier than the rest and is angular in appearance. A dial built into the trigger is rotated to select speeds. When drilling, it is not possible to tell visually which speed is in use. Hammer action is easily selected by pushing in a button on one side of the housing, normal drilling by moving it from the other side. Both positions are clearly visible. The rubberised side handle is one of the most comfortable to use. It twists to unlock, and can be positioned at stepped intervals around the collar of the drill. A steel depth rod is supplied as standard.

In our timed tests, the Peugeot was slightly faster than the other drills and in hammer mode was efficient and workmanlike. It was quieter than the rest, but rather bulky for someone with small hands.



BEST BUY

VERDICT

Selector switches ●●●○○	Ease of use ●●●○○
Speed dial built into trigger, push button for hammer action	Bulky for small hands, but it has an excellent side handle
Safety & instruction ●●●○○	Extra & accessories ●●●●●
No mains plug fitted, but this drill is the quietest	Side handle and steel depth stop standard
Construction quality ●●●●○	Value for money ●●●●○
Angular, solid construction. The heaviest in the test	
OVERALL ●●●●○	

SKIL 60441H

This is the only variable-speed drill in the test, Skil not producing a two-speed drill under £100. It is built in Holland and is the smallest in size. Speed is governed by the amount of pressure applied to the trigger. With the slow-start trigger, you can drill at similar speeds to a hand-tool. Hammer action is selected by pressing a green push button on the motor housing, which I found difficult to read.

No side handle is provided which means that if using both hands, air vents could get obscured. When hammer drilling, I found the lack of a second handle a disadvantage. I would salvage a handle from an old drill or buy one as a spare part. With a 43mm (1½in) collar, most makes will fit. The Skil can be used in reverse, selected by a slider switch on the housing. This facility is designed for withdrawing screws at slow speed.



VERDICT

Selector switches ●●●●○	Ease of use ●●○○○
Variable speed by squeezing trigger, hammer action button	Hammer drilling feels uncomfortable with no side handle
Safety & instruction ●●●●●	Extra & accessories ●●○○○
Excellent, easy to follow and plenty of safety tips	Neat chuck key storage in the handle. Supplied with carry case
Construction quality ●●●●○	Value for money ●●●●○
Reverse function for screwdriving. A compact drill for one hand use	
OVERALL ●●●●○	

speed I was using with this method. Much easier to see is the small rocker switch on the Black and Decker. Bosch use a

two-position trigger for controlling speed. Squeezing the trigger halfway operates the slow speed, pulling it completely the faster one.

B+D BD162

The Black and Decker BD162 is the cheapest drill we tested and is made in Britain. A small rocker switch at the top rear of the motor housing chooses between the two speeds. This is easy to see at a glance when drilling. A substantial slide lever on top of the drill is used to select hammer action. This could be more clearly marked, although it is simple to operate.

A side handle twists to unlock and can be positioned anywhere around the collar. However, I found that this handle could be moved, even when fully tightened. Possibly a small point, but it may become irritating. A steel depth rod is clamped through a hole in the side handle.

The Black and Decker performed well in both hammer and conventional drilling modes, and is comfortable to use.



VALUE FOR MONEY

VERDICT

Selector switches ●●●●○	Ease of use ●●●●○
Rocker switch speed selector and slider for hammer action	Both the selector switches are easy to operate
Safety & instruction ●●●●○	Extra & accessories ●●●●○
No fitted mains plug. Clear safety tips and instructions	Side handle and steel depth rod are standard
Construction quality ●●●●○	Value for money ●●●●○
The side handle can slip, even when fully tightened	
OVERALL ●●●●○	

All you need to know about drills

Make	RRP inc.VAT	Weight Kg.	Motor input	Plug fitted	Speeds rpm	Side handle	Warranty	Noise db(A)
Skil 60441H	£86.95	1.61	450W	✓	0 to 2700	✗	1 year	90
Peugeot PC552P	£89.30	2.01	550W	✗	2400, 2900	✓	1 year	83
Hitachi FDV15T	£87.94	1.64	520W	✓	2300, 2900	✓	1 year	87
Bosch CSB5502	£89.10	1.86	550W	✓	2500, 3000	✓	1 year	86
B+D BD162	£54.95	1.83	550W	✗	2600, 3000	✓	1 year	87
AEG SB2500	£89.26	1.77	500W	✓	2100, 2800	✓	1 year	89

Drilling small diameter holes in wood and sheet materials is usually done at the faster speed. Large holes and harder materials need a slower speed to prevent overheating of the tip of the bit.

For drilling metals, brick and other hard materials, a variable speed drill is better, as well as offering screwdriving potential. But they tend to be more expensive, and, if you are doing little repetitive screwdriving that needs power, the variable speed is not necessarily a great advantage.

On such drills, finger pressure governs the speed. This does allow accurate starting of holes, without the drill bit slipping across the surface of the work.

Chucks and Jaws

Attached to the threaded end of the motor shaft is the chuck, which can be removed from the drill. This allows you to use threaded arbors for sanding.

The chuck contains three self-centring jaws which grip the drill bit. The self-centring jaws on

conventional chucks are tightened with a toothed key. It's important that all three jaws tighten on the drill bit equally.

All the drills tested have a chuck capacity of 13mm ($\frac{1}{2}$ in), which is more useful than the cheaper 10mm ($\frac{3}{8}$ in) drills available. Many drill bits for larger diameters need the larger chuck. Most of the manufacturers say that their drills will work in wood for holes up to 25mm (1in) in diameter, though Peugeot and Skil claim that theirs can cope with

30mm (1 $\frac{1}{8}$ in). We feel that they can all do that occasionally, but we cannot prove they will, or will not be able to do so for prolonged use.

Hammers for Wood?

Why bother to test hammer drills for woodwork? You might well ask. From looking around workshops we have seen that most woodworkers use drills for a variety of tasks, including the fitting of Rawl plugs. The hammer-action drills tested are also known as impact or percussion drills.

More expensive tools may have a pneumatic hammer action which is particularly powerful in concrete.

On the drills we tested, about 48,000 blows per minute are delivered by the tool to the drill bit. The percussion is operated by a switch on the motor housing. The AEG has a rotary lever while the Hitachi, Skil and Peugeot have a push button for selection. Bosch and Black & Decker use a slider for

Who to contact

AEG	0442 61201
B&D	0753 511234
Bosch	0895 838546
Hitachi	0908 660663
Skil	0784 470784
Peugeot	0384 459577

AEG SB2500

From Germany, the AEG SB2500 is a compact two-speed tool. Speeds are selected using a dial built into the power trigger. It is not possible to see which speed has been chosen when drilling. A lever on top of the housing is swivelled for hammer drilling. Although moving the lever is a positive action, it is difficult to see at a glance which mode has been selected. The red locking button alongside the trigger stands out and is easy to use.

The side handle is locked by a plastic thumbscrew, and can be positioned anywhere on the drill's collar. A plastic depth rod is clamped by a second thumbscrew.

Because of its compact size, the AEG is comfortable to use in one hand and performs well no matter what sort of drilling is required.



VERDICT

Selector switches ●●○○○	Ease of use ●●○○○
Swivel lever for hammer action, and speed dial built into trigger	A confusing hammer action lever
Safety & instruction ●●○○○	Extra & accessories ●●●○○
Basic instructions do not include safety tips	Side handle and plastic depth stop are standard
Construction quality ●●●○○	Value for money ●●●○○
A compact but solidly-built drill that is comfortable in one hand	OVERALL ●●●○○

BOSCH CSB5502

Made in Switzerland, the Bosch CSB5502 differs from the other two-speed drills tested as it has no speed selector switch. Instead, the power trigger operates in two stages. Pulling the trigger halfway selects the slow speed, while squeezing it fully switches to the faster one. This means that switching between the two is fast.

However, when hammer drilling you must remember not to pull the trigger all the way. A sliding lever on top of the motor housing selects hammer or normal drilling, and is easy to read.

A side handle is locked with a plastic thumbscrew and can be positioned anywhere on the collar. The depth rod clamp is located on top of this handle and tends to obscure the view of the drill bit.

The Bosch CSB5502 is a comfortable-to-use, sturdy power drill.



VERDICT

Selector switches ●●●●○	Ease of use ●●●●○
Two-position trigger to govern speed, slider switch for hammer	Speed selection is simple with the stepped trigger
Safety & instruction ●●●●○	Extra & accessories ●●●●○
Excellent instruction and safety manual	Side handle and plastic depth rod are standard
Construction quality ●●●●○	Value for money ●●●●○
The depth stop mounting tends to obscure the view of the drill bit	OVERALL ●●●●○

mode selection. The selected mode is easier to see on some drills, at a glance, than on others. The last thing you want to do is snap a thin twist bit by starting the drill with the hammer action active.

How We Tested Drills

Each drill was fitted with a new 13mm (½in) flat bit. Working on 67mm (2½in) thick hardwood and 25mm (1in) pine, we used a stopwatch to see how fast each tool drilled a hole.

On wood, doing the test several times with each drill, a consistent pattern emerged. The Peugeot was slightly faster than the rest, at four seconds for drilling into the pine. In the hardwood, the Black and Decker and the Peugeot were the best, at 4.5 seconds. Both these drills have a 550W motor. To try

out each drill's hammer action, they were all fitted with new 6.5mm (¼in) TCT masonry bits. But the results of drilling into a concrete block were not as consistent as the timed test on timber had been.

It was hardly surprising to discover that a high sound reading was obtained for each drill in the hammer mode. Over 103db(A) was reached when drilling concrete, which is louder than a disco (GW 3:70). Always wear a pair of ear defenders when hammer drilling.

All of the drills performed well, but we cannot say how they will stand up to prolonged use. However, the motor casing of the Peugeot was cooler than the others after 15 minutes' continuous work.



Final verdict

If you want an economical two-speed power drill with 13mm (½in) chuck, the Black and Decker is excellent value for money. Its selector switches are both easy to read and operate.

In terms of overall performance, no drill stood head and shoulders above the rest. Every drill did what was expected of it with no serious shortcomings. It was down to switch design, balance and ease of use. The Skil 60441H is a very good tool, but to be fair on the rest it is a variable-speed drill. Just emerging as the winner is the Hitachi FDV15T, which is a simple and well-designed drill. Jeremy Broun voted the Bosch CSB5502 the best overall tool, the two position trigger a useful feature.

HITACHI FDV15T

Made in Japan, the Hitachi FDV15T is one of the lighter drills tested. A small, orange slider switch is built into the power trigger for speed choice. Although it is not possible to see which speed is selected, the switch is easy and quick to use. Hammer action is operated by pressing in a square black button on the side of the casing. Normal drilling is by moving the button from the other side. In either position the selector is easy to read.



Twisting the side handle locks it at any point on the collar. A plastic depth stop is provided and clamps into the handle.

The Hitachi is light enough for sustained one-handed use, ideal for overhead work. It is simple and uncluttered, although chuck key storage is not provided. Interestingly, it has a British-made Jacobs chuck.

VERDICT

Selector switches ●●●●○	Ease of use ●●●●○
Speed switch in the trigger, push button hammer action	Selector switches easy to reach
Safety & instruction ●●●●○	Extra & accessories ●●●●○
Plenty of safety information in the manual	Side handle and plastic depth rod are standard
Construction quality ●●●●○	Value for money ●●●●○
No chuck key storage, but simple and uncluttered in design	
OVERALL ●●●●○	

Second opinion by Jeremy Broun

Hitachi FDV15T

This drill is compact and easy to use, offering reasonable comfort and adequate performance. The detachable handle is well designed with its strong grip and simple tightening system for grip lock and depth stop. The tiny gear change switch is mounted on the trigger, which could grime up in time. The push-pull hammer/drill change is simple to operate, although the symbols for impact and normal drilling are faint. I did find the lack of provision for securing the chuck key to the drill irksome.

Value for money ●●●●○
Overall ●●●●○

Bosch CSB5502

I found this drill immediately comfortable to use: it's a good weight and not unduly noisy. The pressure-activated two-speed trigger grip is easy to use, although I noticed the trigger lock only functions at the higher speed position. Performance is reasonable and the slider mode change is clear. The detachable handle is firm and comfortable, with a clear white calibrated plastic depth stop. The speed range seems rather close. The massive chuck key is well supported and accessed in its cable sleeve. Altogether, it is an attractive drill.

Value for money ●●●●○
Overall ●●●●○

AEG SB2500

This is a fairly heavy and noisy drill, offering good performance and reasonable comfort with an average grip. Over a period of use, I have doubts about gear selectors mounted on the trigger because of the build-up of grime and grease. The speed range is good and the general build quality is good. The detachable handle (if you need to use it) is well designed, although the plastic depth stop has minimal calibrations and can foul the mode selector switch positioned on the front of the drill at the top. The chuck is robust, so too is its key which is easily located in the drill end of the cable.

Value for money ●●●●○
Overall ●●●●○

B+D BD162

This is the longest drill in the test and is quite heavy and noisy but offers good performance and

comfort. The trigger is plain and effective and the rocker switch gear change well positioned on top of the drill body. The slider mode change is equally clear and effective. The detachable handle, although delightfully simple in its single screw, twist grip design, which also secures the steel depth stop, does slip on full turn. This drill performed well in both modes. Its build quality is adequate and so too its general design.

Value for money ●●●●○
Overall ●●●●○

Peugeot PC552P

This drill is on the heavy side making single-handed operation slightly awkward, but acceptable. The performance is excellent and the drill is reasonably quiet. The detachable handle offers the nicest grip in the test but I found the metal depth stop a little sticky in its adjustment. The speed selector on the switch is clear, with its 'Hi' and 'Lo' symbols, although the speed range is quite close. The push pin mode selector is clear and easy to operate. I didn't like the flimsy plastic loop chuck key holder which I found slow to access. The quality of this drill is quite good.

Value for money ●●●●○
Overall ●●●●○

Skil 60441H

This drill is compact, comfortable and easy to use. Although it was the only one in the test without a detachable handle, I find it natural to wrap my other hand around a drill if I need to, so there is no problem. But the depth-stop would have been useful. The trigger is simple and easy to use although the pressure-operated variable speed can be awkward for repeat drilling at the same desired speed. The mode-changing push pin is clear and the general performance on my test quite acceptable. Although somewhat noisy, the appeal of this drill is its versatility and the performance is good for its wattage.

Value for money ●●●●○
Overall ●●●●○

Jeremy Broun is a furniture-maker and author who has written extensively about power-tools and is a regular tester for Good Woodworking

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Bosch POF 500A router, £50. Mr A.J. Tanner, 40 Heath Row, Bishop's Stortford CM23 5DE. ☎ 0279 655466

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Record DML 24 lathe, as new, two months old, complete with extras, ie. faceplate, screwchuck, tools, video. Cost £200, will accept £135. Ian Hart, 123 Victoria Street, Mansfield, Notts NG18 5SB. ☎ 0623 25277

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T-bar sash cramps, 5ft 6in or longer.

Mr A. Baugh, 18 Pendennis Avenue, Lostock,

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Mr P. McKenny, 8 Oakwood Avenue, Woodlands Park, North Gosforth, Newcastle upon Tyne NE13 6QE. ☎ 091 236 6173 after 5pm

Power tools

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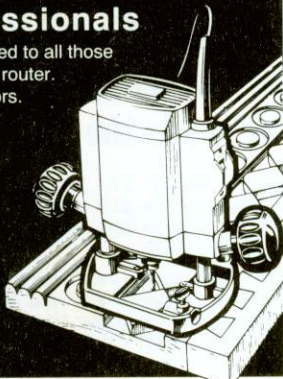
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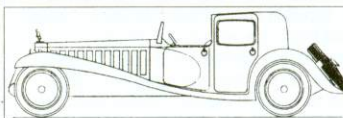
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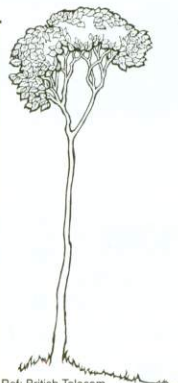
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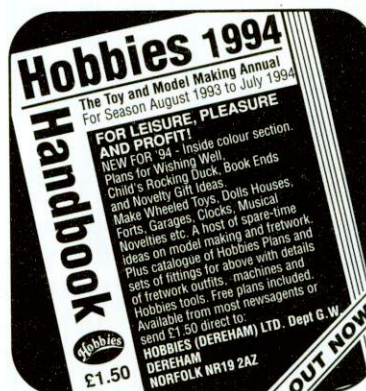
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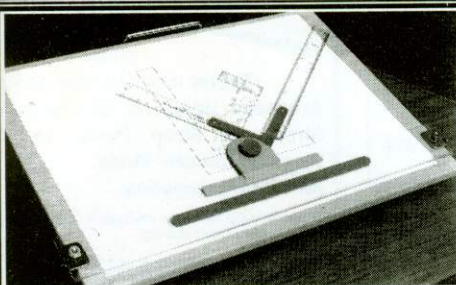
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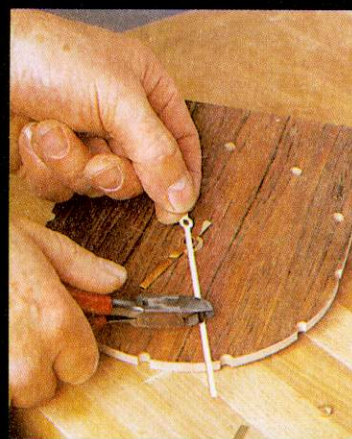
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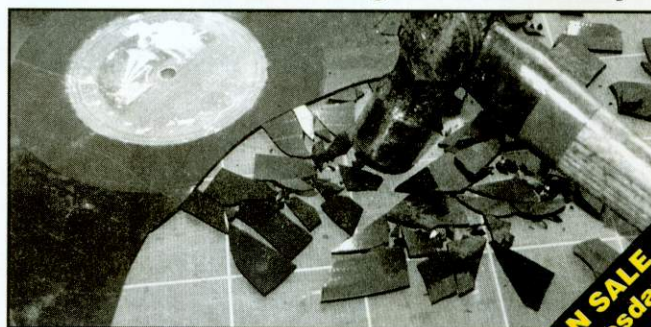
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MAG*SAVE

No.1 Water-based varnishes on test with Alastair McNeill

Finishing touches

interesting special effect.

We tried applying them with a brush, but found that the viscosity and speed of drying stops them levelling out, and brush marks are conspicuous.

Another problem we have discovered, is that metal filings on oak can leave black marks when a water-based varnish is applied.

We tested the varnishes on oak, American black walnut, maple and Southern yellow pine. I found that

Due to the environmental lobby and health concerns there is now a growing demand for, and supply of, water-based varnishes. An added bonus is that in many ways they are easier to use than solvent-based varnishes. However we had heard that they do not always produce a high quality finish (GW 3:76, 6:14), with brush marks and a milky colour often present, so we decided to test them for ourselves.

The benefits of acrylic varnishes are that they are easy to handle, with the brushes washable in water. They give off no harmful fumes and odours, and dry as rapidly as cellulose lacquers without the need of sophisticated spraying and extraction facilities.

Unfortunately the results do not match the solvent-based varnishes in most ways. We compared them with a Ronseal polyurethane, and found two main problems. The acrylic varnishes tended to raise the grain on some woods, which can, admittedly, by flattened down after the first coat. A more serious problem is the milkiness of some of the products, sometimes to the point of obscurity, which on oak was an

the best results are achieved by applying two or three thin coats using a Liberon sponge, or the fine brush supplied by Westcountry.

Westcountry Finishes

The small screw top on the plastic container makes stirring difficult, and you have to decant for use. The instructions are clear, and though the varnish is thick it spreads easily and smoothly. The finishes give good depth and clarity, with the gloss clearest. The satin and matt were particularly good on oak and walnut, bringing out the

grain. Do not shake the bottle as bubbles affect the finish.

Price per litre (inc.VAT): £8.23

Types: gloss, satin and matt

Contact: ☎ 0626 833209

Value for Money: ●●●●●

Quality of Finish: ●●●●●

Liberon Wood Decor



The lid is difficult to remove from the square container, and stirring is difficult, but the instructions are clear. As the colour was that of cocoa, rather than milk, I suspect this V33 was mistakenly labelled natural, and gives a light brown tint to lighter woods. Otherwise the clarity and depth of finish is fairly good.

Price per litre (inc.VAT): £13.66

Types: satin

Contact: ☎ 0679 67555

Value for Money: ●●●●●

Quality of Finish: ●●●●●



More and more manufacturers are producing water-based finishes, and they are widely available. However Alastair found that they do not yet compete with polyurethane for quality of finish, though they can be easier and quicker to use

Cuprinol Enhance



The instructions are adequate and clearly written, on the conventional round tin. The consistency of the gloss and satin is fairly thick, and they add some depth of colour, bringing out the grain fairly well with reasonable clarity. However there is little difference in lustre between the satin and gloss varieties.

Price per litre (inc.VAT): £11.38

Types: gloss and satin

Contact: ☎ 0373 465151

Value for Money: ●●●●●

Quality of Finish: ●●●●●

Dulux



This Quick-Drying Varnish has comprehensive instructions, and is of fairly thin

consistency. There was a thick film under the lid of the gloss, which fell into the varnish and had to be recovered. Its is milky. The walnut came out bland, with no depth of colour, and the variations of grain and tone were obscured. On light-coloured wood the milkiness made it look untreated.

Price per litre (inc.VAT): £11.32

Types: gloss, satin and matt

Contact: ☎ 0753 550000

Value for Money: ●●●●●

Quality of Finish: ●●●●●

Ronseal



The square container gave me some problems, with the round lid difficult to remove, squirting varnish everywhere when it finally opened. The instructions are clear and consistency moderate. The satin is particularly uninteresting and synthetic, especially on the walnut. Both satin and gloss are fairly dull, and did not enhance any of the woods we used, though they did give that untreated feel. The gloss had just a hint of a shine.

Price per litre (inc.VAT): £11.98

Types: gloss and satin

Contact: ☎ 0742 467171

Value for Money: ●●●●●

Quality of Finish: ●●●●●

Rustins



The instructions are clear, but the print tiny on the 250ml square tin. These finishes are thick, the matt particularly so, and it needs lots of stirring, with a film of solidified varnish around the rim. Slight milkiness reduced clarity, but they deepened the colour of oak and walnut, without bringing out the grain. The gloss is not very bright, with little between the matt and satin.

Price per litre (inc.VAT): £10.28

Types: gloss, satin and matt

Contact: ☎ 081 450 4666

Value for Money: ●●●●●

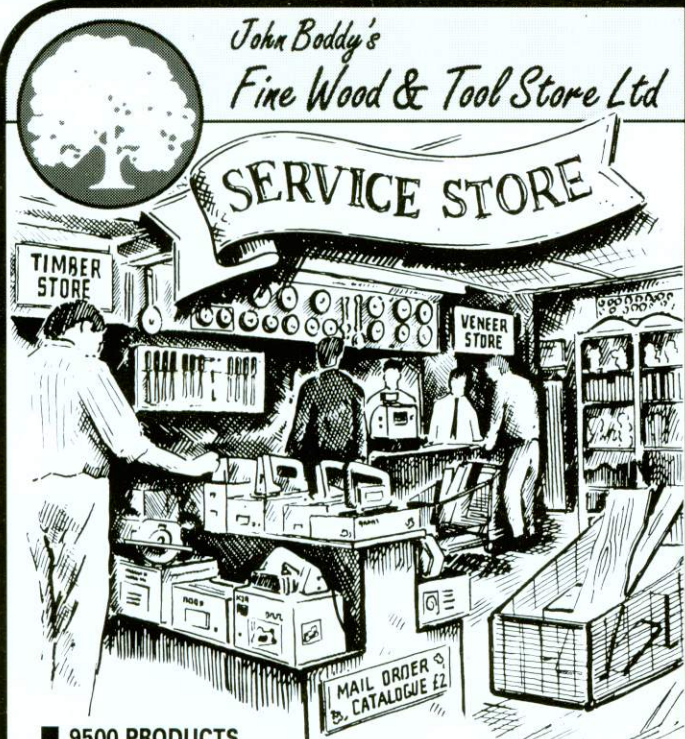
Quality of Finish: ●●●●●

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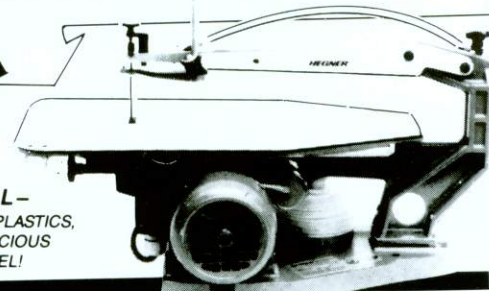
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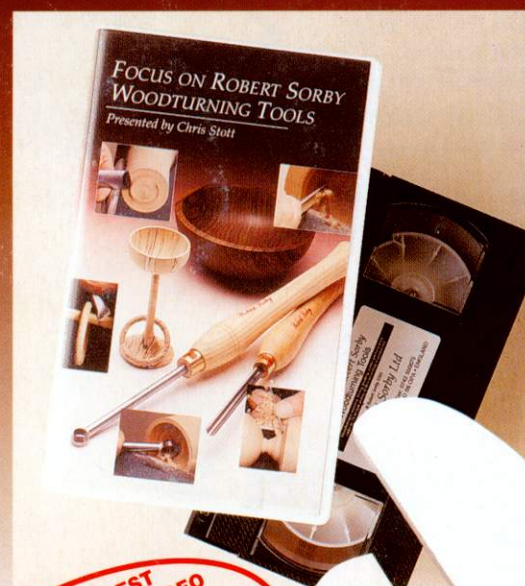
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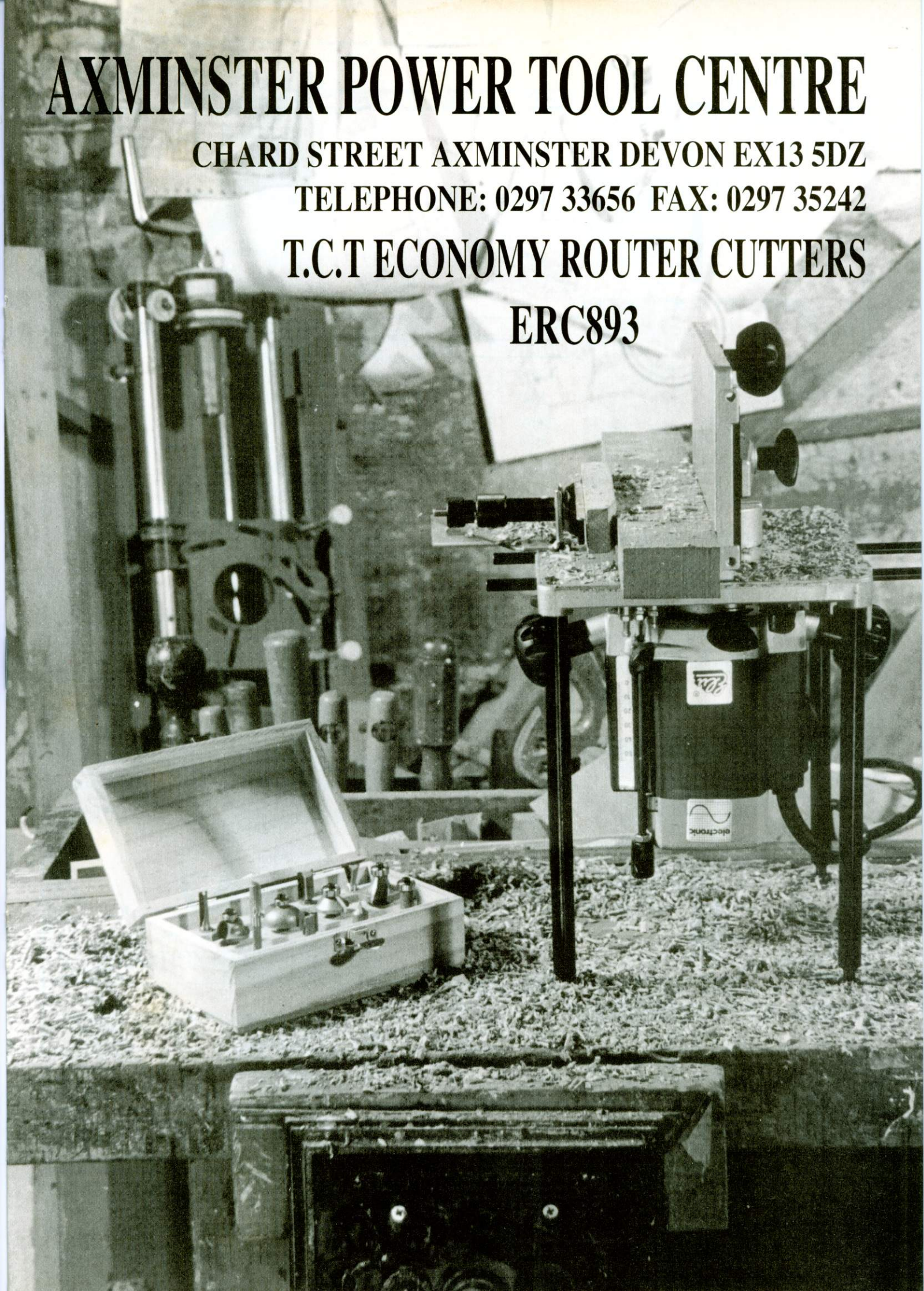
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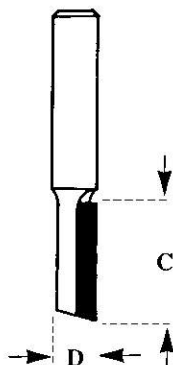
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SINGLE FLUTE CUTTERS WITH BOTTOM CUT

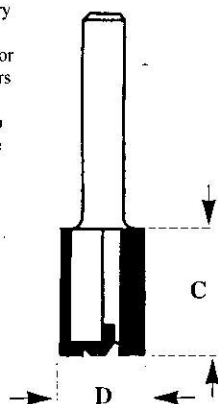
Single flute cutters are chosen for fast free cutting, profiling and grooving etc.



D"	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
1/8"	3.2	12.7	A78/1	£7.07	—
3/16"	4.8	16	A78/2	£6.25	—
1/4"	6.3	19	A78/3	£6.25	—

TWO FLUTE CUTTERS WITH BOTTOM CUT

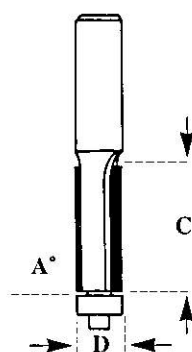
Two flute cutters are used to obtain a very clean cut when grooving, rebating or morticing. All cutters have an additional tungsten carbide tip at the bottom of the cutter to enable plunge cuts to be made.



D"	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
15/64"	6	12	A79/0	£5.25	—
1/4"	6.3	12	A79/1	£5.25	—
5/16"	8	19	A79/2	£5.25	—
3/8"	9.5	25.4	A79/3	£5.25	—
25/64"	10	19	A79/30	£5.25	—
7/16"	11.1	19	A79/4	£5.25	—
15/32"	12	19	A79/40	£5.95	—
1/2"	12.7	19	A79/5	£6.42	—
1/2"	12.7	40	A79/51	—	£8.09
1/2"	12.7	50	A79/52	—	£8.64
5/8"	16	19	A79/6	£7.11	—
5/8"	16	31	A79/61	—	£8.00
3/4"	19	19	A79/7	£8.12	—
3/4"	19	31	A79/71	—	£7.97
1"	25.4	31	A79/8	—	£9.75

90° SELF GUIDED TRIMMER

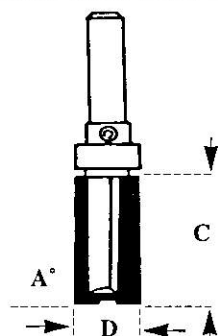
Used for trimming laminates after bonding. Invaluable for copy profiling either with or without a template.



A°	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
90°	12.7	25.4	A82/1	£6.75	—

TEMPLATE PROFILE CUTTER

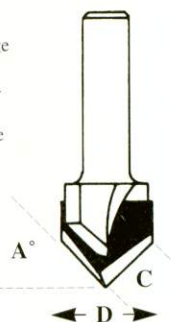
With the bearing mounted at the top of the cutter these cutters are especially useful for all copywork and trimming applications.



A°	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
90°	16	25	A85/7	£9.92	—

VEE GROOVING CUTTER

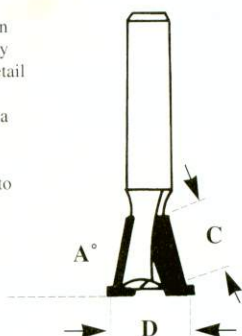
May be used for edge moulding, engraving, bevelling, chamfering or to enhance any panel. It must be noted that a slight flat at the bottom of the cut will occur.



A°	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
45°	16	11.3	A80/1	£7.95	—

DOVETAILING CUTTER

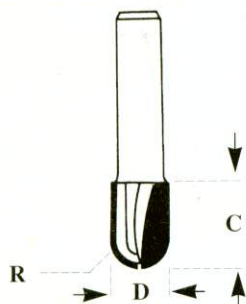
This cutter can be used on any standard dovetail jig, the two wings ensure a clean cut and that glue can pass freely into the joint.



A°	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
105°	12.7	12.7	A81/1	£5.27	—

TWO FLUTE RADIUS CUTTERS

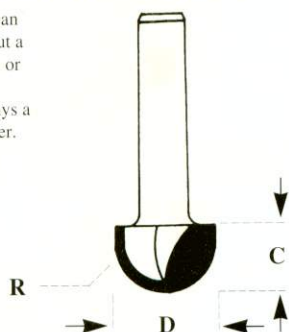
Excellent cutter for any radius work, finger pulls or water drips.



Rmm	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
3.2	6.3	8	A84/1	£7.20	—
6.3	12.7	16	A84/2	£9.98	—
9.5	19	19	A84/3	£13.02	—

COREBOX CUTTERS

This cutter can be used to cut a cove section or a full half round. Always a popular cutter.

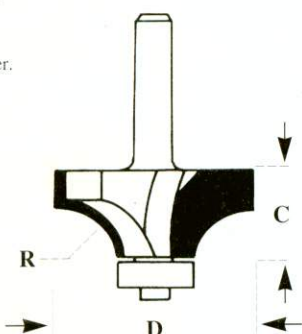


Rmm	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
3.2	6.3	3.2	A83/1	£7.20	—
4.8	9.5	4.8	A83/2	£8.25	—
6.3	12.7	6.3	A83/3	£9.46	—
8	16	8	A83/4	£11.54	—
9.5	19	9.5	A83/5	£13.95	—
12.7	25.4	12.7	A83/6	£16.50	—

COMBINATION OVOLO CUTTERS

WITH BEARING

The most versatile ovolo/rounding over cutter. By changing the bearing either mould can be achieved.

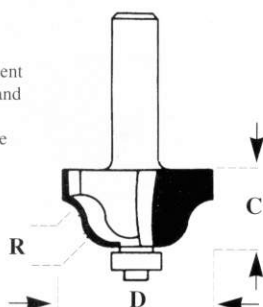


Rmm	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
4.8	22	12.7	A70/316	£11.45	—
6.3	25.4	12.7	A70/14	£12.64	—
9.5	31	12.7	A70/38	£15.76	—
12.7	37	19	A70/12	£18.08	—
Smaller Bearing			AB11	£3.25	—
Standard Bearing (spare)			AB127A	£3.25	—

ROMAN OGEE CUTTER SETS

WITH BEARING

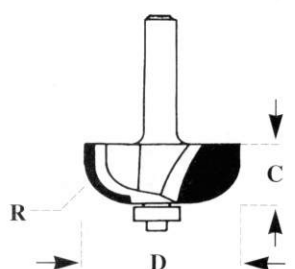
Perfect cutter for excellent finish on cabinet, table and mantel tops. The ball bearing guide avoids the possibility of burning.



Rmm	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
4	28.5	12.7	A76/4	£20.60	—
6.3	38.2	19	A76/5	£23.75	—
Replacement bearing			AB127A	£3.25	—

COVE CUTTERS

Ideal for edge mouldings on square sections.

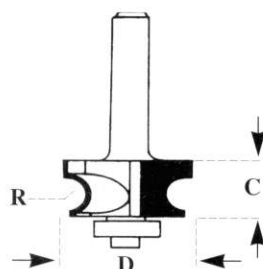


Rmm	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
6.3	22	14	A71/14	£12.96	—
9.5	28.6	14	A71/38	£15.79	—
12.7	35	19	A71/12	—	£18.08

EDGE BEADING CUTTERS

WITH BEARING

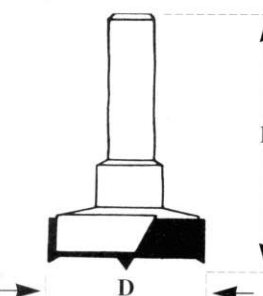
A very common cutter for use on reproduction work, often used to edge one door when a pair close edge to edge.



Rmm	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
3.2	28.6	20	A74/18	£18.95	—
4.8	28.6	20	A74/316	£19.95	—

HINGE BORING BIT

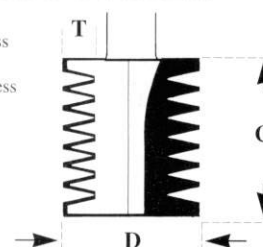
Used by kitchen fitters for recessing circular hinges.



Dmm	Lmm	Order Reference	Tungsten Carbide	
			3/8"	1/2"
35	60	A73/35	£19.43	—

FINGER JOINT CUTTER

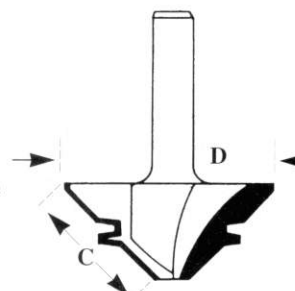
Minimum wood thickness approx 15mm
Maximum wood thickness approx 30mm.



Tmm	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
8	35	40	A72/94	—	£49.35

MITRE LOCK JOINT CUTTER

Used to produce a 90° corner joint

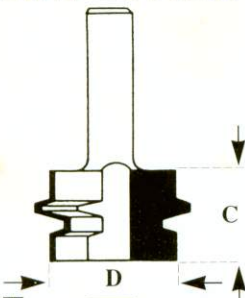


NOTE:-
We recommend this cutter should only be used with the router fixed.

A°	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
45°	41	88	A72/45	—	£30.40

90° LOCK JOINT CUTTER

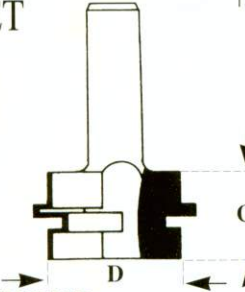
Simple but effective tongue & groove set. Especially useful when joining long boards such as chip-board flooring.



A°	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
90°	41.4	25.4	A72/90	—	£23.03

90° T&G SET

A strong and quick method of joining boards. Ideal for panels etc.

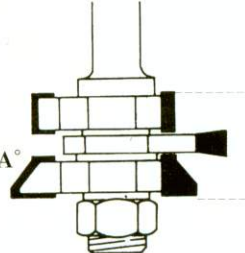


A°	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
90°	41.4	25.4	A72/91	—	£23.03

T.G & V CUTTER

N.B. Drawing shows cutter with groove removed on LH to produce tongued section, and groove in place on RH to produce grooved section.

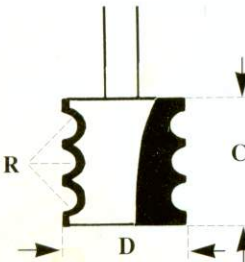
Suitable for timber 1/2" - 3/4"



Dmm	Cmm	Order Reference	Tungsten Carbide	
			1/4"	1/2"
41	25.4	A72/93	—	£39.35

MULTI BEAD CUTTER

A very popular edge moulding cutter giving a very pleasing finished mould.

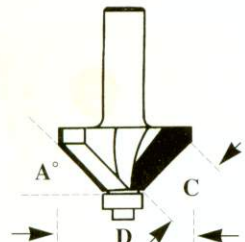


Rmm	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
3	22	25	A74/01	£17.72	—

CHAMFER CUTTER

WITH BEARING

A most useful cutter fitted with a bearing to eliminate burning when used without a side fence.

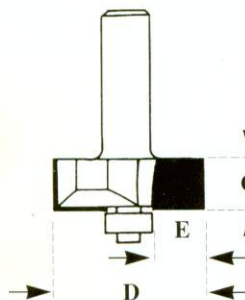


A°	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
45°	25.4	9.5	A77/45	£15.20	—

REBATE CUTTER

WITH BEARING

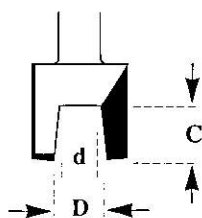
An exceptionally versatile cutter for producing various size rebates. Alternative depth rebates can be achieved by simply exchanging the bearing.



Dmm	Cmm	Emm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
32	12.7	9.5	A78/01	£14.95	—
Additional bearings to cut rebate:-		8	AB16A	£3.25	—
		6.3	AB19A	£3.25	—
		11.5	AB95A	£3.25	—

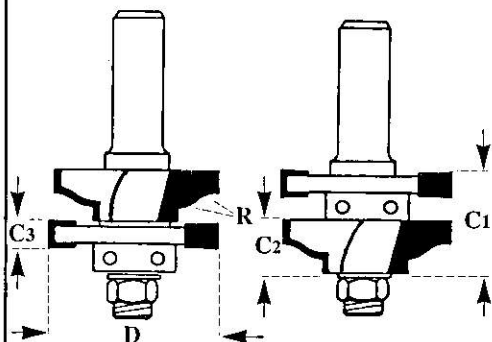
TAPERED PLUG CUTTERS

For the manufacture of tight fitting tapered plugs that can be driven into a pre-bored hole for a perfect fit. Designed for a drill press or stand.



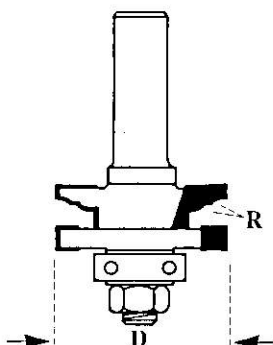
D max	d min	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
12.7	12	15	A92/10	—	£26.95
16	15	15	A92/20	—	£28.55

REVERSIBLE PROFILE STYLE & RAIL SETS

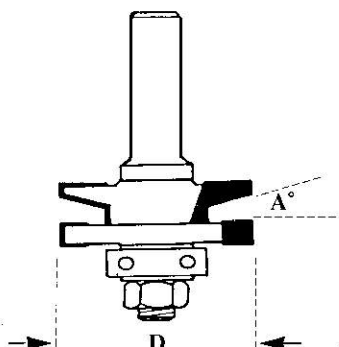


Rmm	C1/C2mm	C3/Dmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
4	22/11	6.3/41	APSC1	£41.70	£39.70

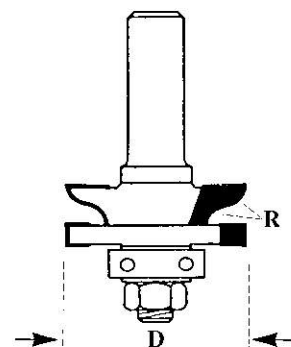
A single cutter, bearing and groover assembled on an arbor. With the cutter mounted above the groover the standard profile moulding can be produced. Removing the cutters from the arbor by undoing the retaining nut and replacing the groover first, then the bearing and finally the profile cutter the assembly is then ready to cut the counterprofiled tenons.



Rmm	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
5.9	41	24.6 max	A73/01	£38.10	£34.72



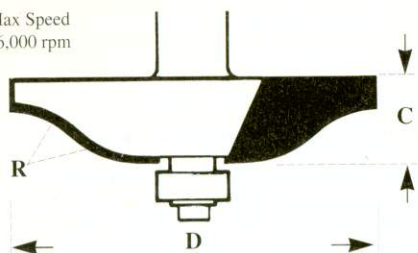
A°	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
10°	41	24.6 max	A73/02	£38.10	£34.72



Rmm	Dmm	Cmm	Order Reference	Tungsten Carbide	
				1/4"	1/2"
5.9	41	24.6 max	A73/03	£38.10	£34.72

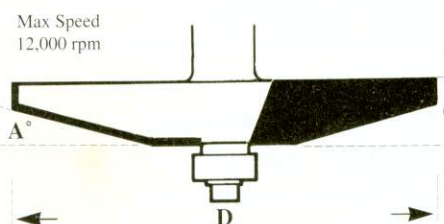
RAISED PANEL CUTTERS

Max Speed
16,000 rpm



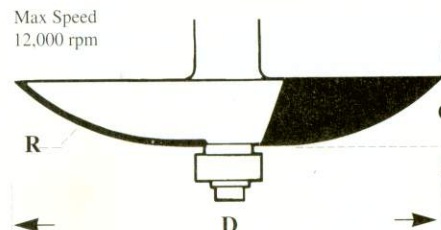
Rmm	Dmm	Cmm	Order Reference	Tungsten Carbide	
				3/8"	1/2"
18	67	16	A75/01	—	£24.67

Max Speed
12,000 rpm



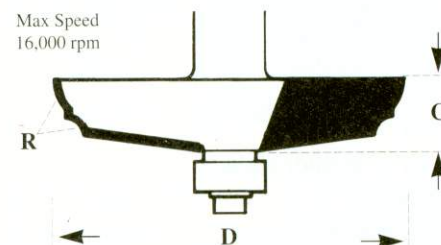
A°	Dmm	Cmm	Order Reference	Tungsten Carbide	
				3/8"	1/2"
15°	86	12.7	A75/03	—	£37.87

Max Speed
12,000 rpm



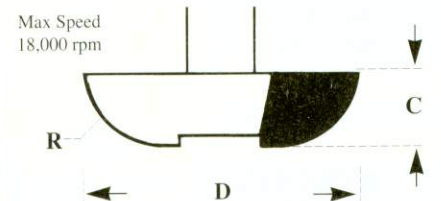
Rmm	Dmm	Cmm	Order Reference	Tungsten Carbide	
				3/8"	1/2"
40	86	12.7	A75/02	—	£37.87

Max Speed
16,000 rpm



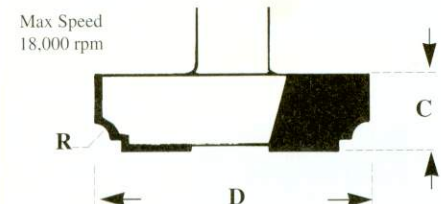
Rmm	Dmm	Cmm	Order Reference	Tungsten Carbide	
				3/8"	1/2"
8+3	63	12.7	A75/07	—	£35.90

Max Speed
18,000 rpm

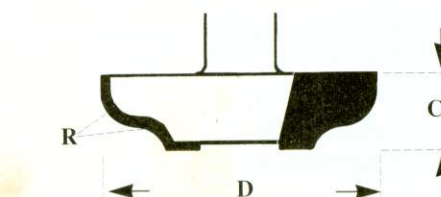


Rmm	Dmm	Cmm	Order Reference	Tungsten Carbide	
				3/8"	1/2"
14	50	14	A75/05	—	£31.25

Max Speed
18,000 rpm



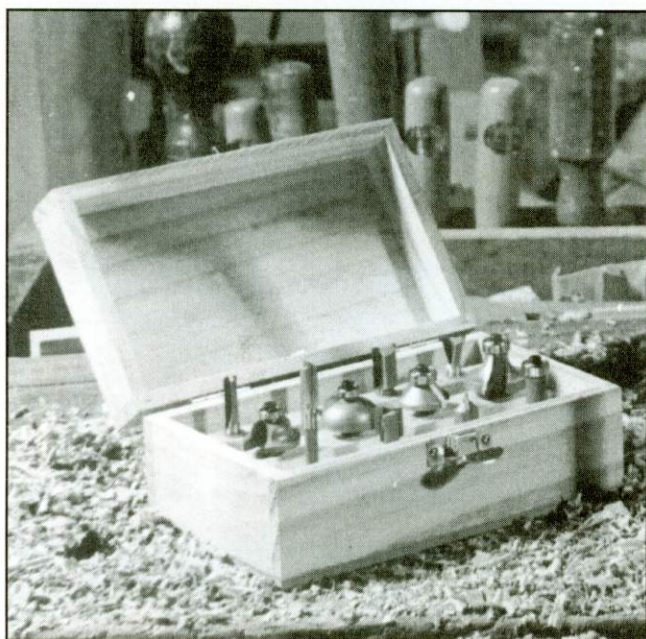
Rmm	Dmm	Cmm	Order Reference	Tungsten Carbide	
				3/8"	1/2"
3	50	14	A75/06	—	£31.25



Rmm	Dmm	Cmm	Order Reference	Tungsten Carbide	
				3/8"	1/2"
6+6	40	14	A75/04	—	£24.67

All cutters on this page should be used on fixed machines only.

12 PIECE TCT ROUTER CUTTER SET



The APTC 12 piece TCT router cutter set must represent unrivalled value for money, whether just starting routing or an experienced hand. These 12 cutters have been carefully selected from the most popular of our complete range. All are 1/4" shank cutters from the same quality manufacturer as the other cutters in this catalogue. The set comprises of 3 two flute straight cutters of 1/4, 3/8, and 1/2" diameter, a 3/8" radius rounding over cutter with bearing, a 5/32" radius roman ogee cutter with bearing, a 45° chamfer cutter with bearing, a 3/8" radius cove cutter with bearing, a 1/2" diameter vee grooving cutter, a 5/8" diameter morticing bit, a 3/8" dovetail cutter, a 1/2" diameter flush trim cutter with bearing and a 1/4" pierce and trim cutter.

Supplied in a wooden presentation box to store and protect the cutters when not in use.

Description	Order Reference	Price Including Vat
12 Pc Cutter Set	RBSET12	£59.95

DMT[®] DIAMOND WHETSTONES

These superb sharpening stones are made by embedding precisely graded diamonds in nickel plating on a sheet of perforated steel with a glass fibre reinforced plastic backing. Diamond is the only material which will sharpen T.C.T. bits quickly and effectively. The hones are available in various sizes and grades (for a more complete range see A.P.T.C. full catalogue).

EXTRA COARSE 220 mesh for heavy stock removal, COARSE 325 mesh for general use, FINE 600 mesh for honing and generally touching up cutters and a new EXTRA FINE 1200 mesh for a superior edge. The diamonds on the 1200 mesh measure only 9 microns and will produce a finer edge than that of most manufacturers. A 9 micron edge is far less prone to pick up fibres and resin, prolonging the cutter's life and making routing more efficient.

At around £3.00 a time to sharpen cutters these D.M.T. hones very soon pay for themselves.

HOW TO ORDER

Telephone or fax your order stating clearly the items and quantities required, your name, address, postcode, telephone number and method of payment. Alternatively, orders may be placed by post with your remittance enclosed. All items are post paid and delivered by 1st class post.



Pocket Whetstones in leather sheath

Description	Order Reference	Price Including Vat
3" Coarse	DMTW3C	£17.50
3" Fine	DMTW3F	£17.50
3" Extra Fine	DMTW3E	£17.50

Machinists Whetstones in leather sheath 4" x 7/8" with 1" continuous diamond for small tools.

Description	Order Reference	Price Including Vat
4" Coarse	DMTWMC	£22.50
4" Fine	DMTWMF	£22.50
4" Extra Fine	DMTWME	£22.50

Diafold Whetstone with folding handle 4" x 7/8"

Description	Order Reference	Price Including Vat
Extra Coarse	DMTFWX	£22.95
Coarse	DMTFWC	£22.95
Fine	DMTFWF	£22.95
Extra Fine	DMTFWE	£22.95

Diamond Cone-A small round tapered file from 1/8" to 3/8" diameter with handle

Description	Order Reference	Price Including Vat
Fine	DMTDCSFH	£24.95

Diamond Bench Stones 6" x 2" in Plastic case

Description	Order Reference	Price Including Vat
Extra Coarse	DMTW6XP	£43.95
Coarse	DMTW6CP	£43.95
Fine	DMTW6FP	£43.95
Extra Fine	DMTW6EP	£43.95