



Making templates

**Dave Mackenzie shows
how to make easy work
of repeat curves**



If you want to make a template in which a number of curves are drawn to make up a complex shape such as a shaker style tripod table leg, then drawing it manually will require some way of drawing neat curves. The method that I use requires a set of clear plastic 'French' curves. It's also possible to buy a flexible plastic rule (called a flexi-rule) that can be bent to follow any curve as long as the radius is not too tight, which is equally suitable for this job.

To draw a tripod table leg, start by deciding on the overall width and height of the leg. Draw a rectangle on a piece of cartridge paper to this size. With a soft pencil very lightly sketch the shape you want onto the paper. It doesn't matter if there are lots of sketch lines as long as you eventually produce the shape you want. When the shape looks

correct but the outline looks like a hairy caterpillar, use a black felt tipped pen and the 'French' curves to firm up the shape (Pic 1).

Unless you are very lucky you will not find a single curve that corresponds to an entire side of the leg. The technique to use is to try several different parts of the curves until you find the one that enables you to follow

your sketched line for part of the shape, then draw it in with pen. Repeat this on another part of the line until gradually all of the shape will be outlined with the pen. Rub out the original pencil sketch, cut out the shape and paste it onto a piece of plywood from which the template will be cut.

Templates for routing

Using templates with a router vastly increases the number of jobs that can be tackled, and speeds up the work. It makes a great tool even more useful.

There are at least two methods of using a template to guide a router. The first uses a self-guided profile cutter and the second uses a straight cutter and a guide bush fitted to the router base plate. Both methods require an edge following template.





HOW TO USE WORD TO DRAW CURVES

As we saw last month 'Word for Windows' can be used for drawing straight line templates but it can also be used for drawing a curved template. The following example builds on some of the commands used when the dovetail template was made. A traditional style bathroom cabinet (Pic 2) has a complex ovolo shape in the lower part of the sides, we will draw a template for these.

1 Start up the 'Word' program and if the drawing toolbar is not on the screen get the with the menu command: view>toolbars>drawing. Next get the grid on the screen with the command: Draw>grid, which is on the draw toolbar at the base of the screen. On the grid dialogue box that appears, tick the box next to 'Display grid line on screen' and set the horizontal and vertical spacing to 0.5' (Screen 1).

2 The sides of the cabinet are 5½in (140mm) wide. Choose the line tool from the 'Draw' toolbar and using the grid to line them up, draw horizontal and vertical lines that show

the width and height of the area that encompasses the shape you're drawing (Screen 2).

3 Draw an arc for the curved part of the design. To do this on the draw tool bar select: Autoshapes>Basic Shapes> then find the 'arc' shape in the lower left hand corner (Screen 3). With the arc selected place the cursor on the screen, hold down the mouse button and drag and an arc will appear. Use the grid to line up the arc (Screen 4). The direction of the curve of the arc depends on the direction the mouse is dragged when the arc is drawn. When the arc is selected the nodes that are coloured yellow will alter the length of the arc and the white nodes will alter the shape i.e. make it wider and fatter.

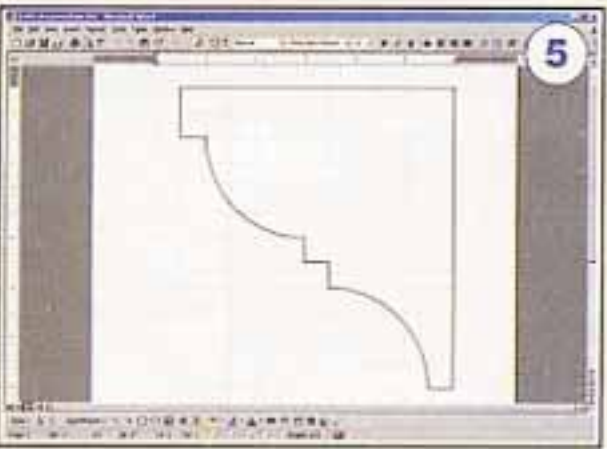
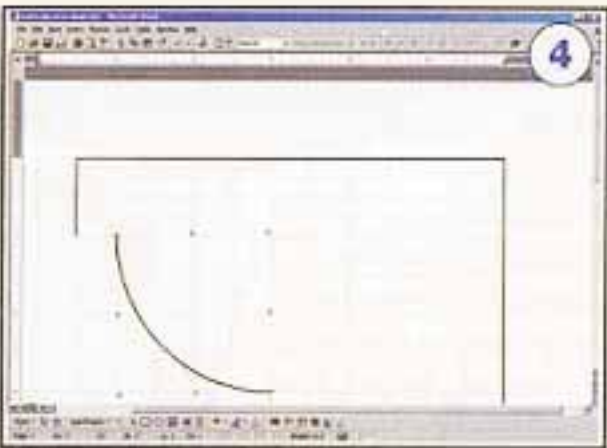
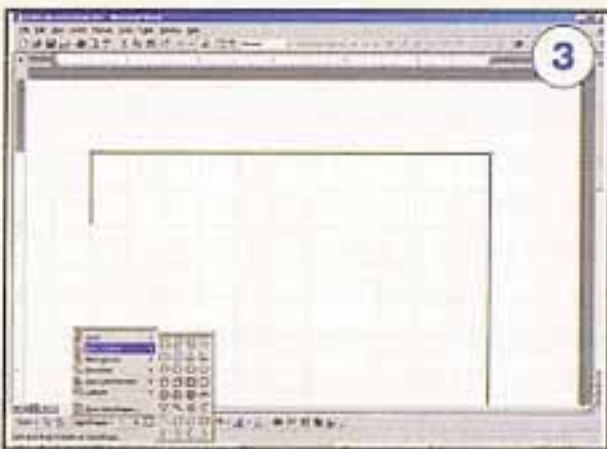
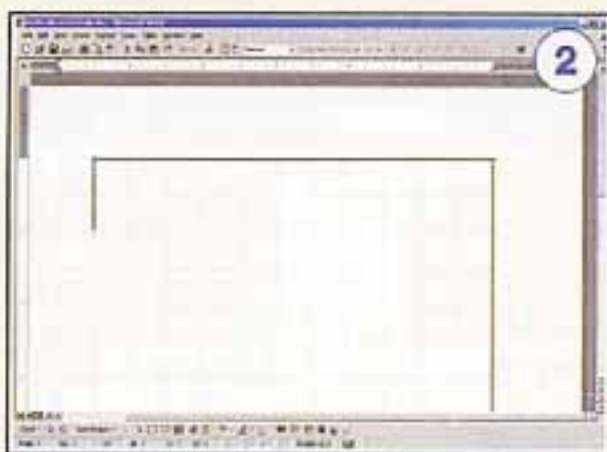
4 Continue drawing lines and curves until you make the shape you require for your drawing (Screen 5). Save the drawing, print it onto card, cut out the shape with scissors and use it to mark out the wood that is used for the sides.

Method 1 (Fig 1)

This method requires a self-guided trimmer cutter to fit in the router. This is a straight cutter with a bearing mounted at the top of the cutter, which follows the MDF or plywood template. To use it the template is made the exact size of the finished piece. It is called a trimmer

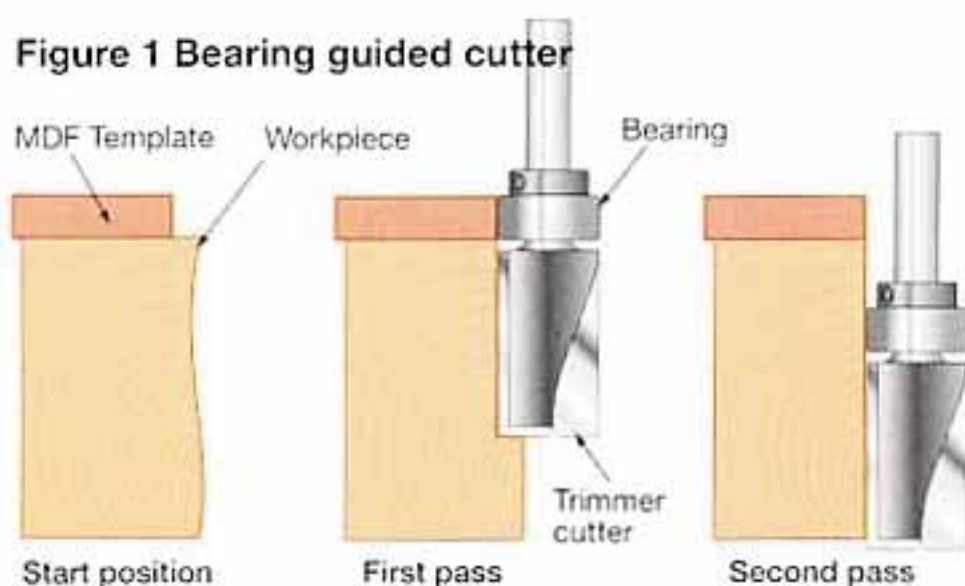
cutter because it is not used to remove large quantities of wood but simply to trim the edges of a piece that has already been cut roughly to shape with a bandsaw or jigsaw.

To use it, make a template the exact size and shape of the finished piece. Make sure that the template has a



smooth good quality edge because lumps or hollows will be transferred to the workpiece. After the template is made, place the template onto the board you are going to cut and draw around it with a pencil. Take it to the bandsaw and cut around the profile to within approximately ⅛in (3mm). Next stick the

Figure 1 Bearing guided cutter



template in place on the workpiece using double-sided sticky tape, lower the cutter so that the bearing runs against the template, and trim around the edge with the router.

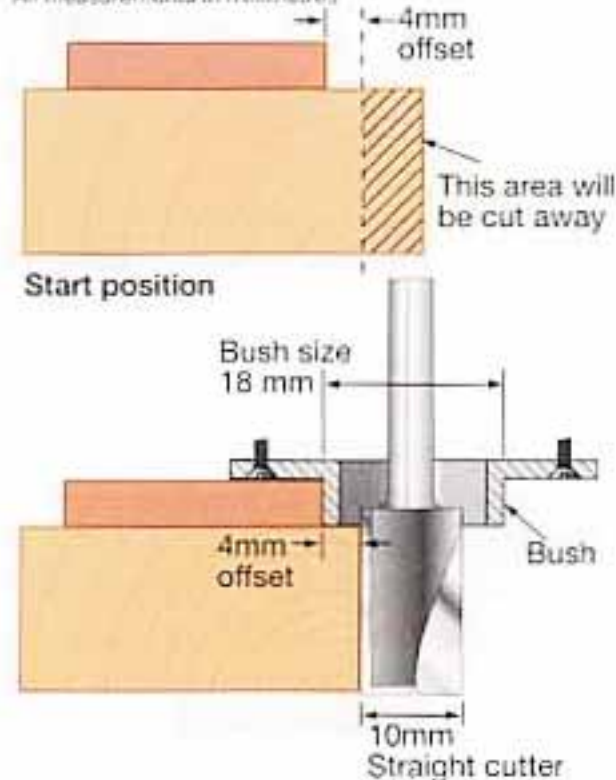
If the wood being cut out is thicker than the length of the cutter make the first pass as described above then lower the cutter so that the bearing runs on the part already trimmed.

Method 2 (Fig 2)

This is probably the most versatile method because the wood does not always require trimming before the router is used and nearly any cutter can

Figure 2 Bush guided cutter

All measurements in millimetres



be used. Firstly a guide bush is fitted inside the hole in the centre of the base plate (Pic 3). The cutter rotates inside, but not touching the bush and the outside of the bush follows around the edge of the template.

The template is cut out of plywood or MDF, which is thick enough for the guide bush to bear against, usually between 1/2in and 3/4in. Because the outside edge of the bush is slightly offset from the cutter the template shape is made slightly

smaller than the final cut out requires.

Guide bushes come in a range of sizes and a few are shown in Pic 4.

They range from 10mm up to 60mm or 70mm;

this is to accommodate different sized cutters. The dimensions refer to the outside diameter of the short tube in the centre of the plate. The small diameter bushes are mainly used with straight cutters for cutting straight edges. The large diameter bushes are used, for example, to accommodate an ovolo cutter. You would use this to make an ovolo moulding that follows the edge of the template.

To find the amount of offset that must be built into the template, measure from the largest diameter of the cutter to the outside edge of the bush. Subtract the outside diameter of the cutter e.g. 10mm from the outside diameter to the bush e.g. 18mm and divide by two you get the amount of offset for the template, which

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in drawing 2 is 4mm. If you are making a template for recessing a hinge with a leaf size of 20mm x 60mm then the hole in the template would be 28 x 68mm for this cutter/bush combination.

Making the template for both methods

The shape is drawn onto paper by hand or with a computer and the paper is pasted onto the template material. Cut around the shape with a scroll saw then use a file followed by sandpaper to get a smooth edge. The paper pattern can be left in place but it is probably best to remove it with glasspaper as the surface might be stuck down with double-sided tape when it is used.

Factory-made templates

Many useful templates are available from manufacturers such as Trend. Pic 5 shows a jig and a replacement router base plate for stair making. It's strongly made from plastic and is used for cutting the housings for the treads and risers in the stair strings. It requires a large dovetail shaped cutter and a powerful router.

Pic 6 shows a timber repair jig. If you have a nice piece of timber but it is rendered useless because of a large

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ugly knot or some other type of flaw in the middle this jig can solve the problem. It is used with a flat cutter and a couple of different sized bushes to remove the knot and cut the same shape out of a good piece of timber to replace it with.

Example 1: Cutting a recessed pattern on a cupboard door

This is a simple pattern that doesn't require drawing on paper before making the template (Fig 3), just work straight onto a piece of $\frac{3}{8}$ in plywood. Start by drawing a rectangle on a piece of ply that is approximately 5in (127mm) smaller than the door, which means it has a $\frac{2}{8}$ in (64mm) clearance all round. This size



will vary according to the size of the door, a large door will need a larger distance between the pattern and the edge to look correct. In each corner, drill a hole and use a hole saw to cut out a circular shape (Pic 7). Cut along the lines of the original rectangle and sand.

Fix the template to the stock with

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double sided tape or small panel pins. Set up the router with a 20mm guide bush and a chamfer 'V' groove cutter with a diameter of 16mm, and run the router around the template (Pics 8 and 9).

Example 2: Cutting a repeat pattern

This is done by making a small template and using it several times along a strip of wood (Fig 4). For example a dentil moulding can be used to accentuate a moulded cornice (Pic 10).

The template is a short length of the required pattern, made in plywood. So that the final pattern has teeth that are same size as the gap between them, the template is made with the teeth smaller than the gaps. This is because of the offset of 3mm between the outside diameter of the 11mm bush and the diameter of the straight cutter, which is 8mm in diameter. So that the pattern can be repeated a number of times the template will be fixed to the top of an open ended box and the strip of wood to be worked on is placed in a box.

The box is made from any pieces of scrap and is made to fit exactly the width and height of the stock. It has a plywood base upon which are two pieces of softwood that form the sides of the box. These are the same thickness as the workpiece. They are glued to the base and on top of these sides are fitted the template and also another piece of ply

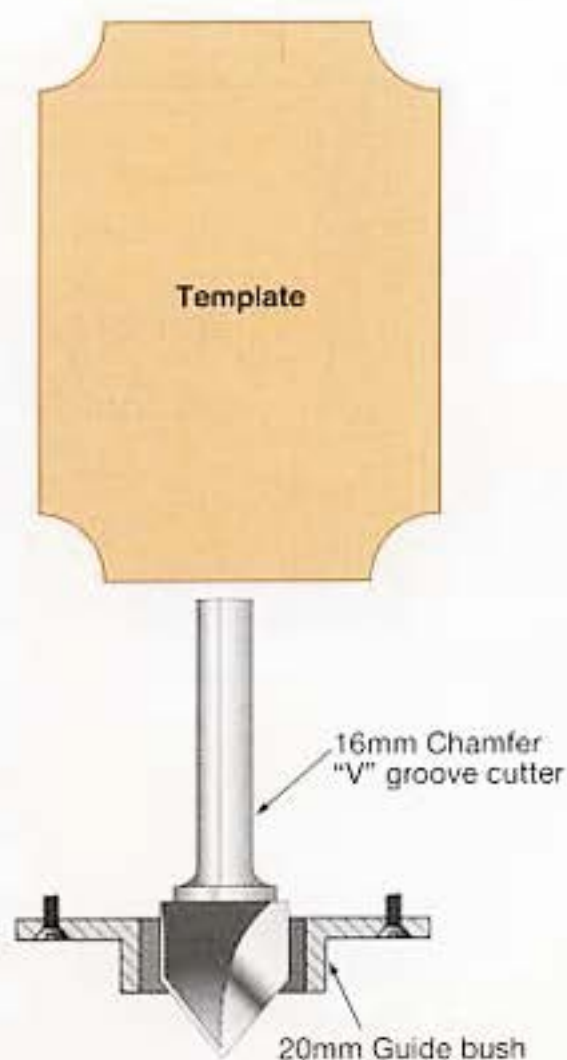


Figure 3 Routing a pattern in a cupboard door

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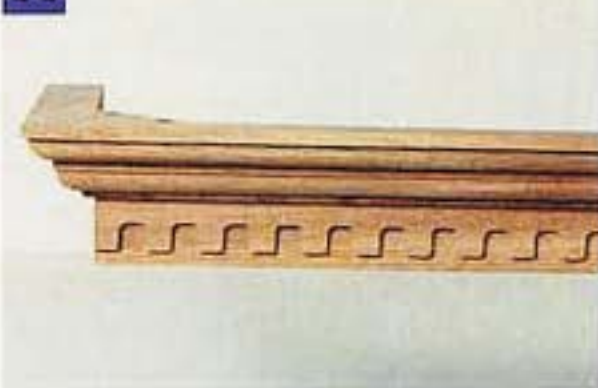


Figure 4 Making a strip of traditional dentil relief pattern to fit under a moulded portico



the same thickness as the template to support the router base plate.

In use, one end of the workpiece is pushed into the box and the router cuts the dentil pattern. When this is done the wood is pushed along and the pattern is repeated (Pic 11). This continues until the entire strip has been worked. The strip is attached to the moulding. The moulding is made by using the same ovolo cutter on the edges of a couple of different pieces of wood and then joining them.

