



# BAILEY'S ROUTER CLASS

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# Arched top doors



**Anthony Bailey** takes a peek through the arched window



## THE PROJECT

My inspiration for this project wasn't the need for a door, but an excuse to see if I could use cutters without bearings, as if they were guided. As so often, it was something I hadn't tried before, but it seemed to make sense and made use of a cutter so old and unused, it was a dark green colour - not the company's latest red brand livery. It looked like a panel raiser but lacked the essential bearing for doing an arch top door. Unsurprisingly, I suppose,

it worked better than expected and the result is an attractive door. This method could also be applied to other shaped work.

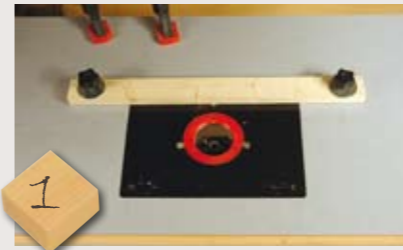
All the door will need are hinge recesses, a catch, and a knob to enable it to fit in a door opening, such as in a kitchen unit or similar



PHOTOGRAPHS BY GMCANTHONY BAILEY

**T**he router is still the most versatile power tool there is. Along with a vast range of cutters, jigs and gadgets - many of which you can also make for yourself - it can help produce high-quality woodwork. This series is intended to show you what the router can do, while assuming the reader has a general level of woodworking knowledge. We hope to show you the aspects of each project that specifically involve the router and how this great bit of kit can expand your woodworking skills. Each month we will highlight the jigs, cutters and gadgets you will need to help you get more from this incredible machine. Feel free to send us pictures of your routing endeavours, or post them on the WPP forum at: [www.woodworkersinstitute.com](http://www.woodworkersinstitute.com)

## THE JIG



**1** You need a reasonable size router table with suitable fixing points behind the cutter opening to make the most of this jig. Alternatively, you could clamp a piece of board onto the table. In this case, I fixed a batten down using star knobs screwed into the two table fixing holes. If you use a board, the clamps need to be able to fix on the table back edge, and the point board that has the bearing attached, can then be screwed to this



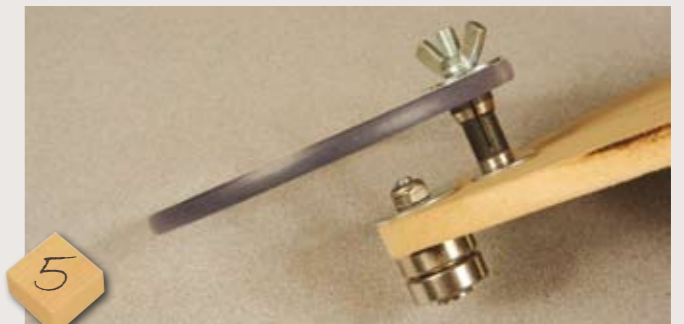
**2** When I went looking for a bearing, I raided the cutter box where I keep lots of different sizes - I just needed a suitable bolt that was a close fit in the bore. I also found a bearing on an arm from a router table, a nylon wheel, a bearing mounted on a short rod, a wooden point fence, and a couple of roller bearings with brackets from roller bearing guide fences that come with cheap routers. All of these have potential for making a working set-up



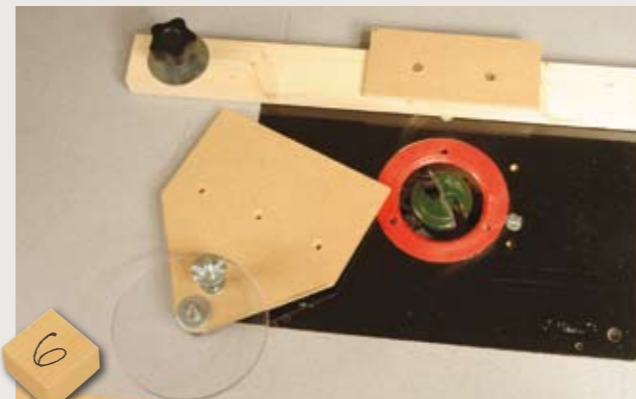
**3** I chose a fairly large bearing so the fixing point was not too small, otherwise the MDF or ply that holds the bearing in place would have to get shaped away so much, that the bearing would break out of the board when put under machining pressure



**4** The point board is drilled to take a bolt for the bearing, and a piece of clear Perspex as a guard. The board is screwed down to the batten, which is already fixed to the table

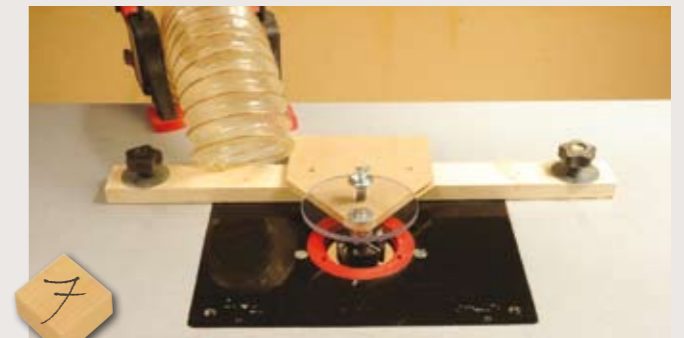


**5** Find and fit a suitable bolt and washers to hold the bearing tightly, so that a spacer washer will still let the bearing rotate freely. Use a nyloc nut to ensure the assembly cannot come loose with vibration. Note - you need to ensure the bearing is clear of the cutter, but rubs against what will be the unmachined part of the panel edge, thus the bearing could be either above or below the point shaped board it is fixed to, depending on what works best. In the end, I decided to have two same size bearings stacked together and a packer under the point board, as it gives more height adjustment options



**6** For safe working, use a ready made or homemade piece of thick Perspex fixed to the point board. It needs to rotate on a bolt with a sleeve to raise it up a bit - in this case, a redundant small collet served the purpose. A wing nut on top makes it easy to remove and to make critical adjustments.

The point board is ready to screw on to the packer. The position should be checked by looking down on top of it and ensuring the correct amount of cutter is showing in front of the bearing



**7** The finished jig is quite simple in concept and execution, but sturdy and safe to use, provided the bolt holding the bearing or bearings themselves do not contact the cutter. Extraction is an absolute must, and is best placed on the outfeed side where most dust is ejected from the cutter. A drum extractor with a large bore pipe rigged to the table is my favourite solution



## THE CUTTERS

To make this door, I used a Titman unguided panel raiser with classical detail. After that, my standard **bottom-guided profiling cutter** was used with a template to create the arched door top rail. The frame needed a **one-part Wealden profile and scribe cutter**, again a classical mould, which is raised or lowered depending on whether you are scribing (cross grain) or profiling (long grain). **The big Wealden tenon cutter** was



used with my homemade bearing guidance system to shape the back of the door panel and thus create a tongue – there are probably plenty of other non-bearing cutter styles that would work this way

## MAKING IT



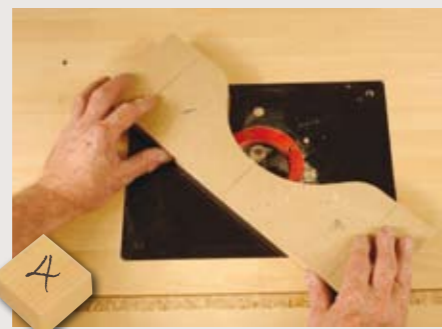
1 Firstly, you need to measure the intended door opening. Because the design includes a curved top rail which is the subject of this Routerclass technique, you need to draw out the door full-size on a clean piece of board. You can then work out what looks best – I always have the bottom rail deeper than the stiles (vertical components) because it looks visually correct. The top rail will be quite deep to allow for the curved shape. You can also draw the width of the frame edge moulding which, if you use a profile and scribe cutter set, is also the depth that the rail joints plug into the stiles. You can then take measurements directly off this board and write out the cutting list, and even do so next to the drawing. A full-size drawn template like this is known as a rod



2 I was able to buy ready prepared oak, but it needed cutting overlength and width, and then re-planed to ensure the boards were flat, square, to exact width and thickness, and the rails to length. They all need to be marked during this process to show the good face and edge to thickness, and a letter to denote each component type. The first routing operation is to scribe cut the rail ends with the one part profile and scribe cutter with a square push block behind, and a through fence for good support



3 A template for the arch top rail is drawn using the original rod to copy from. The shading helps avoid mistakes when trying to cut to a line. The shape was cut out on a bandsaw with a narrow blade, and the edge cleaned up carefully with a spokeshave and abrasive paper



4 The template is used to mark the shape on the top rail, which is then bandsawn out close to the line, about 2mm away from it. The template is then pinned to the rough shaped rail and then profiled to the template shape. Note the lead-in pin to help start the cut – and make sure you stop halfway around the curve



5 Unpin the template and turn the rail over and re-pin it ready to cut from the left-hand end again. The reason is evident in this photo – you can clearly see the wood has torn away quite badly. This is because the cutter is going uphill into the grain of the second part of the arch shape. Profile the second half so the cutter overruns the first neatly



6 Mark up all edges to be profiled, bearing in mind the components need to be turned over for machining. Start with the arched rail – note the clear guard and extraction is a must. Start and stop the cut just where the joint meets the main body of wood, or the ends will be damaged. The uphill problem should not occur this time as the cutter shape is different



7 When all components are profiled, dry assemble them and mark the centre panel to fit. This panel will be made from two or more boards edge jointed together, and must be planed flat. Use the bandsaw to shape the top end and keep dropping it onto the frame until it sits neatly in the outermost part of the moulding. Now smooth the curve with a spokeshave and abrasives, ready for fielding



8 Set the cutter at the desired height with the bearing just above it, with no contact whatsoever. Swing the Perspex guard into place, ready for machining. The extraction pipe must be held in place as well



9 Using our special bearing-guided table set-up, run the panel top against the preset bearing – if necessary using more than one pass – but check that there is no contact between the bearing and the cutter. Use a lead-in pin for initial guidance – I found as I reached the last section, I had to stop and remove the pin because the cutter couldn't fully contact the job. I then restarted against a section that was already moulded. Undo the entire bearing assembly and refit the fence to machine the bottom panel end, and then the panel sides. Use the tenoning cutter to form the tongue, starting with bearing guidance, then use the fence as before



10 The very neat-looking finished panel after machining both the front and back. The tongue thickness should be a good fit in the frame grooves. Now sand all moulded edges and the panel faces, and glue and assemble the whole door. Check for square, wipe off surplus glue, and leave to dry. And there's your arch-top door

## Router torque

**Q** I enjoy woodworking, and routing in particular, but it isn't just noisy – its dusty, even unpleasantly so. I use an extractor but it doesn't seem to do the trick really. Any advice?

**A** I'm going to cover extraction in the near future but in the meantime, we need to consider a number of things. First, the dust you can see won't harm you unless a bit lands in your eye. The harmful dust is pretty much invisible, at around one micron

in size as it penetrates tissue – that means skin or lungs. You need decent extraction, but also suitable workshop clothing which you can clean off when you've finished. An ambient air filter fixed to the ceiling will filter out a tremendous amount of fine dust and lastly, wear a suitable facemask or airfed respirator. I try to clean up at source so I can use a facemask, but not the cheapest 'monkey mask' which won't hold much dust back. When I leave the workshop I not only remove my outer clothing, I wash my face, ears, neck, hands and arms – I hate the feeling of dust, and my wife won't let me in the house till I've done this anyway! ■



With localised extraction, Anthony uses a face mask too

Email your router questions to: [anthonyb@thegmcgroup.com](mailto:anthonyb@thegmcgroup.com)