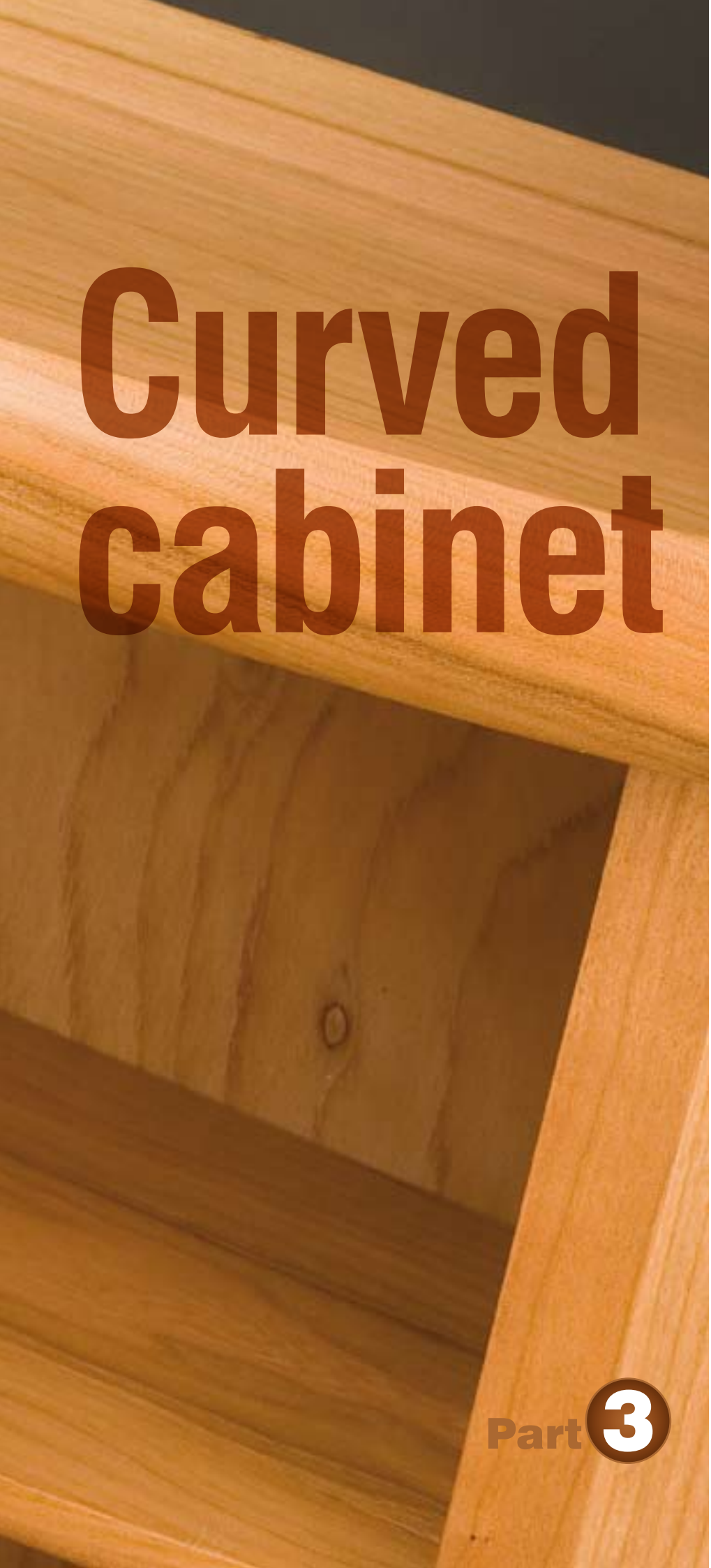
PHOTOGRAPHS BY CHRIS TRIBE



Curved cabinet

Part 3

In the last of this series, Chris Tribe concludes his trio of curved pieces with an elegant wall cabinet in cherry and maple

I previously described the making of a box and a table with curved laminated components in issues 139 and 140. Whilst making the box I realised that a similar, enlarged but simplified design would work well as a wall cabinet. The shaping of the top and bottom gives the impression of the column locating into bosses.

Construction is fairly straightforward. The shaped top and bottom are dowelled to the sides. The door consists of a curved panel laminated from 1.5mm (1/16in) maple (*Acer saccharum)* veneer, with bird's eye maple face veneers. This is housed into a turned cherry *(Prunus serotina)* column which pivots on sprung steel rods engaging with brass sleeves in the top and bottom. The sleeve for the bottom of the column has a 1mm (3/64in) thick flange to give clearance for the bottom of the door. The shelves are adjustable, resting on brass pegs.

I am lucky in having a clock making business locally, with a company called Sinclar Harding (www.clockmakers.com). They occasionally manufacture small pieces of bespoke brassware for me, and I am indebted to them for the production of the pivot mechanisms.

Editor's note *– all makers should try to find a nearby 'clockie'. Historically they used to have workshops near each other and had a symbiotic relationship. A friendly clockie will make your life easier and you might occasionally help him with casework. They can usually help with tempering workshop made cutters as well!*

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DOWELLING JIG

To aid the dowelling of the sides into the top and bottom, a dowelling jig is required. I first came across this method in James Krenov's *The Fine Art of Cabinet Making*. The success of

this piece depends very much on the accuracy of this jig and the drilling of the dowel and door pivot holes. The jig consists of a stock about 35mm (1 3/8in) deep and 24mm (15/16in) wide, and at least as long as the width of the sides. Ensure that the stock is square in all dimensions and mark the datum side. Using a pillar drill, check for accuracy and drill 8mm (5/16in) diameter holes at the dowel positions, about six in all. The centreline for the holes should be half the width

of the cabinet sides, measured from the datum side of the stock. When deciding on the positioning of the front dowels, note that the sides are different widths. Screw a stop to the end of the stock and fix another stop to the datum side.

To drill the sides, the end stop should tightly butt up to the back and the side stop against the outside edge. Ensure that the jig is securely held in place, either by clamping or screwing into the end of the piece.

Top: Krenov-style dowelling jig
Centre: The template for the top and bottom of the cabinet
Bottom: The top ready for assembly

Shaping the cabinet bottom on the router table using a template secured with brass pins

"The direction of this curve is defined by the direction of the annual rings of the piece – if the annual rings curve downwards the curve on the front will be upwards, and vice-versa."

CURVES

Even though construction is fairly simple, start by drawing out a full-size rod to aid the drawing up of the cutting list and templates.

The front edges of the sides need to be profiled to the shape of the door. Machine a concave curve on the column side and angle the other side so that the door will fit neatly against it. Radiuses and angles can be read off the full-size rod. If you don't trust your rod, this could be left until the door is completed and you have the evidence of your own eyes as confirmation!

The top and bottom of the cabinet are shaped using a template and panel trim cutter in the router table. Form the front curve using a router and trammel – the radius around the door post can be done using a trammel, but I found it easier to scribe the line with sharp dividers and then cut by hand with a bandsaw and chisel, then clean up with sandpaper.

The template is also used to position the dowel and door pivot holes in the top and bottom. Remove the side stop from the dowel jig used for drilling the cabinet sides. Mark the position of the sides on the template and position the dowel jig with the end stop tight to the back of the template, fix in place and drill the template on the pillar drill. Determine the position of the pivot sleeve hole from the full-size rod and drill the 7mm (9/32in) hole in the template, on the same centreline as the dowel holes.

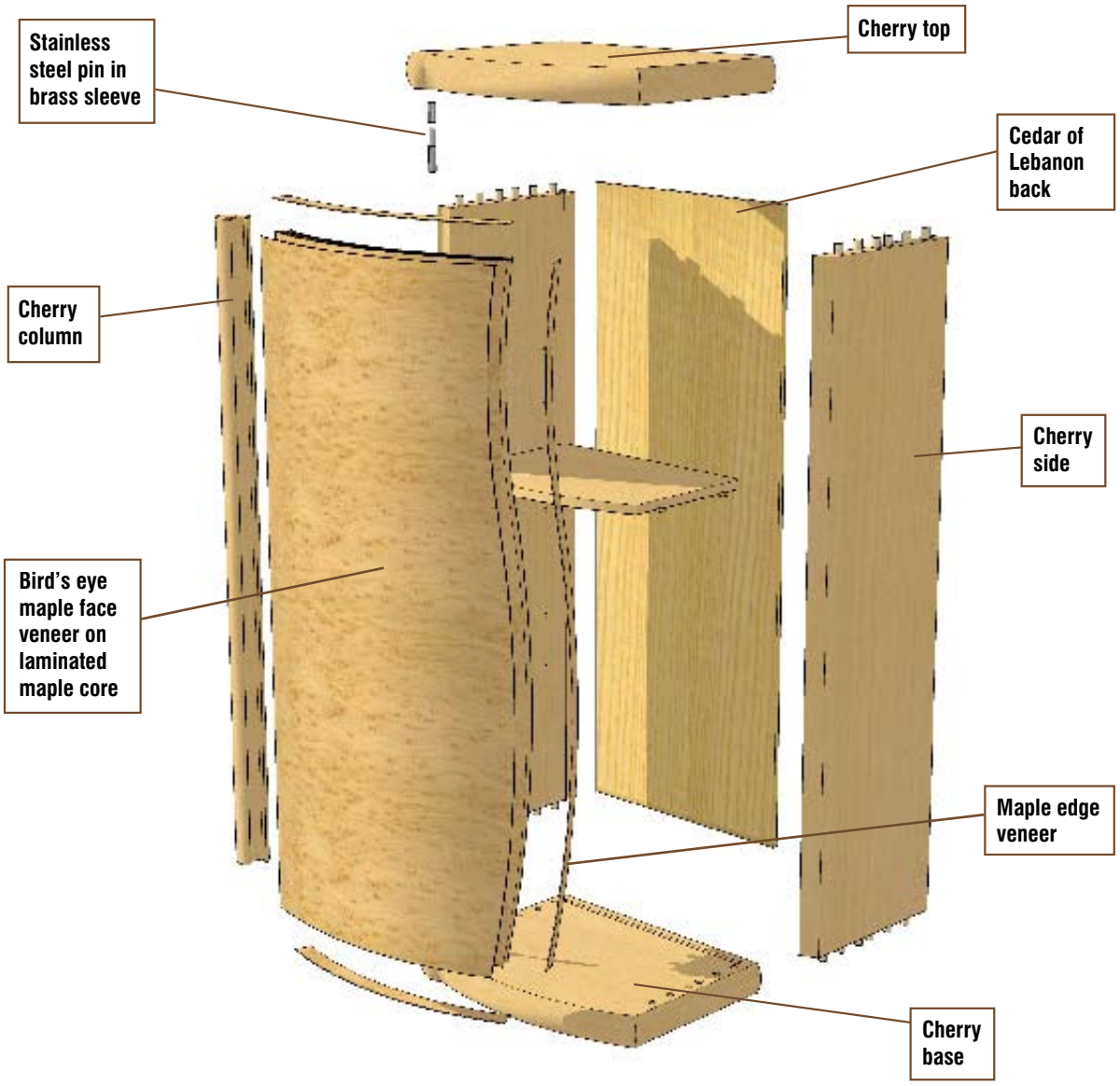
When the curve is formed on the front of the top and bottom pieces, the line of the grain will curve across the front. The direction of this curve is defined by the direction of the annual rings of the piece – if the annual rings curve downwards, the curve on the front will be upwards, and vice-versa.

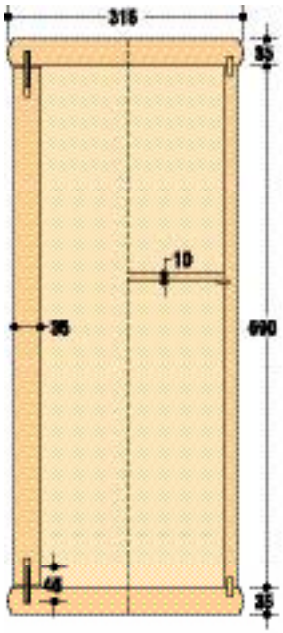
Use the template to mark the shape onto the top and bottom pieces, and cut roughly to shape on the bandsaw. Pin or locate with brass dowels the template to the piece and shape using the panel trim and router table – the less waste you take off now the better, as there can be a tendency for breakout at the top of the curve – a sharp bit also helps. Drill the dowel and pivot sleeve holes while the template is still in place.

Using a 2mm (5/64in) bit, extend the sleeve holes in the top and bottom right through – this enables the sprung pivot pins to be pressed home when later removing or replacing the door.

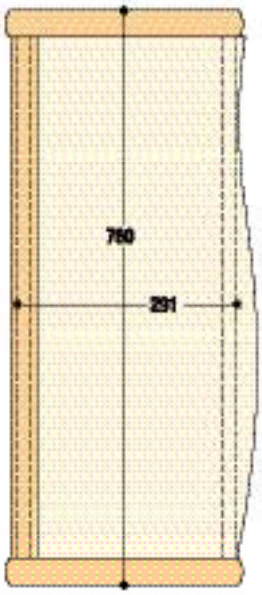
PROFILE

The gentle profile on the edge of the top and bottom can now be created using a bearing guided moulding cutter on the router table. This is not a rounding over cutter but a larger, subtler curve. I used a large glazing bar ovolo cutter. Clean up the moulded

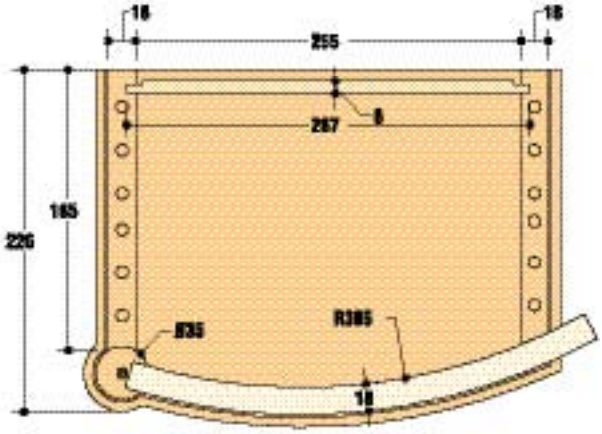




SPLIT SECTION
1 : 10



FRONT ELEVATION
1 : 10



PLAN
1 : 5

DRAWINGS BY SIMON RODWAY

< edge with scraper and abrasive paper. The moulding will have rounded corners where it runs into the round column boss, which needs to be cleaned up and emphasised with a sharp chisel.

Drill the holes in the sides for the 4mm (5/32in) brass dowels that support the adjustable shelves. To ensure the peg holes are level, drill the holes in a strip of 6mm (1/4in) MDF and use this as a drilling guide locating the end on the bottom of the side.

SHELVES

The shelves have a curve to the front, which reflects the curve of the door, however the width of the shelves should be such that they sit behind the door column when fitted. Shape the 10mm (3/8in) shelves either with a 6mm (1/4in) MDF template and panel trim cutter in the router table, or by hand with a bandsaw and spokeshave. The underneath of the shelves can be slotted to fit over the brass dowels – this looks neater and prevents the shelf sliding around. With a stop clamped to the router table fence, the shelf can be pushed onto a 5mm (3/16in) cutter to create a U-shaped slot.

BACK

I have made this cabinet with a frame and panel back and also an 'economy' version with a solid back. In both cases, I used cedar of Lebanon *(Cedrus libani)*, as this gives a beautiful fragrance when the door is opened. Make the solid back panel 8mm (5/16in) thick and field the back of the panel down to fit a 6mm (1/4in) groove in the carcass. For a frame and panel back, make the frame from 12 x 60mm (1/2 x 2 3/8in) material, and joint the corners with 6mm thick mortise and tenons. Rebate the 8mm panel to create a 4mm tongue to fit into a 4mm groove in the frame. Fit the whole assembly into a 10 x 12mm (3/8 x 1/2in) rebate in the carcass. Don't forget to allow a 1.5mm (1/16in) expansion gap round the edge of the panel.

The carcass should not be glued-up yet as the fit of the door needs to be adjusted before. However, repeated dry assembly can lead to slackness in the dowel joints. To avoid this, use slightly thinned-down dowels for dry assembly.

Engineering centre drill used to precisely locate the hole

THE DOOR

The door consists of a lamination of ten 1.5mm maple veneers with birds eye face veneers, curved on a former. This is fitted to a turned column that pivots on sprung pins top and bottom.

I ordered a styrofoam CNC manufactured former with a 385mm (15in) radius from Bagpress (www.bagpress.com). Before use, I marked a centreline down the middle.

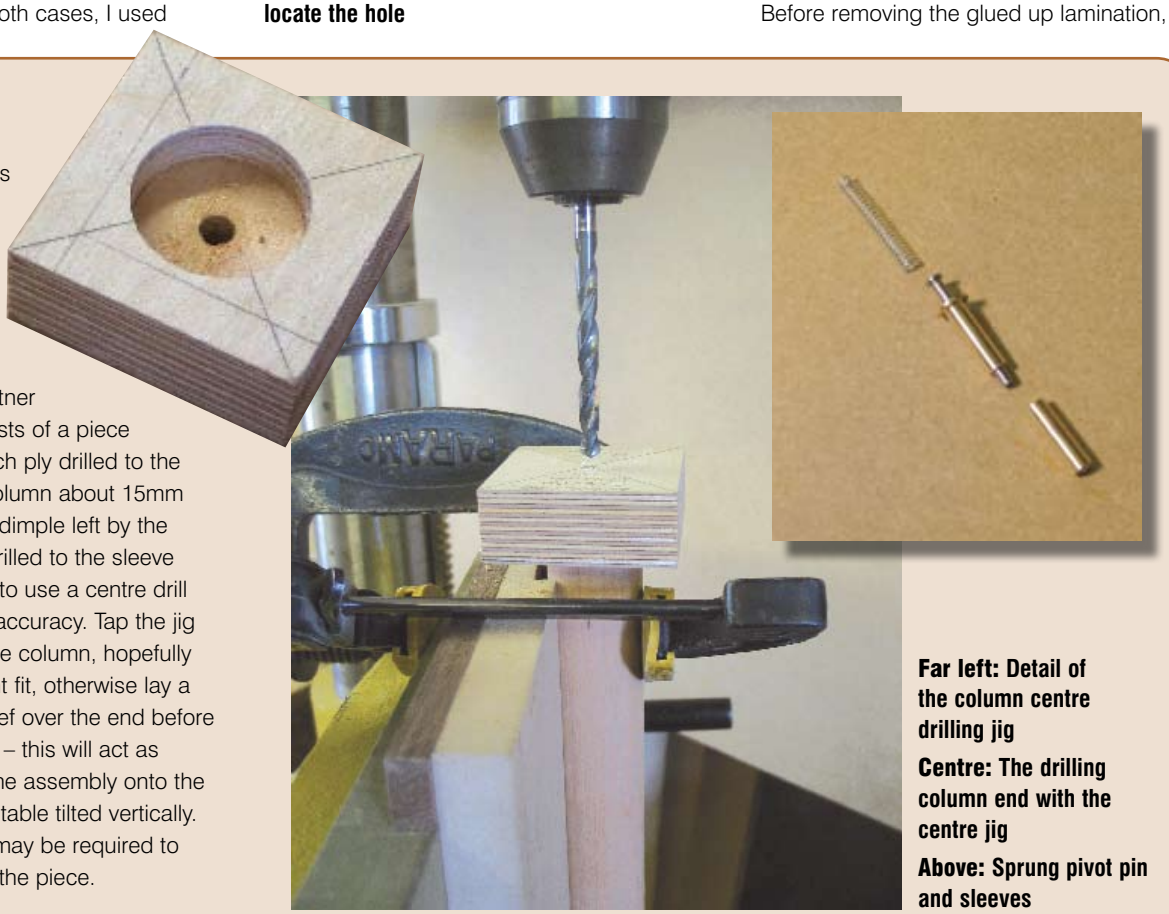
Quarter cut 1.5mm (1/16in) veneer probably gives a more stable result in lamination than crown cut, but this may be a counsel of perfection. Use sequential leaves to ensure grain continuity. Check the veneer for any rough areas of grain created by the knife when the veneer was originally cut. This should be gingerly cut back with course sandpaper or a cabinet scraper otherwise the lamination may be thicker in this area, however don't overdo it else you may have the reverse problem! It's worth checking the thickness of the stack around the edges with a digital Vernier to ensure uniformity.

The outside decorative veneer is included in this lamination process, but the inside veneer will be added later. Use urea formaldehyde adhesive, spreading it with a small foam paint roller. Place a dry cover sheet of 1.5mm ply, or similar, over the top of the stack when pressing.

Before removing the glued up lamination,

USING A JIG

To drill the ends accurately requires a jig, of course! When deciding on the diameter of the column, I ensured that it matched that of one of my Forstner bits. The jig consists of a piece of 25mm (1in) birch ply drilled to the diameter of the column about 15mm (9/16in) deep. The dimple left by the Forstner is then drilled to the sleeve diameter. It helps to use a centre drill initially to ensure accuracy. Tap the jig onto the end of the column, hopefully it should be a tight fit, otherwise lay a paper handkerchief over the end before tapping on the jig – this will act as packing. Clamp the assembly onto the pillar drill with the table tilted vertically. Shaped packing may be required to accurately clamp the piece.



Far left: Detail of the column centre drilling jig

Centre: The drilling column end with the centre jig

Above: Sprung pivot pin and sleeves

Column routing jig

Routing the door column in the jig

mark the centreline from the former onto the piece. Clean up the hinge side edge by marking a line off from the centreline, and cut and plane to that line – this should ensure that the door is not twisted when it is finally fitted. Clean the ends up square to the planed edge – to mark square to the planed edge, place a square sheet of paper onto the planed edge and mark off the end. The length of door should be 2.5mm (3/32in) less than the length of the sides. Check the trueness of the ends by placing it on a machine bed and checking the front and edge are square with the bed.

COLUMN

Turn the door column, approximately 35mm (1 3/8in) in diameter. Accuracy is again important here, as any unevenness in the turning will show when the door panel is fitted. Use a straightedge to check the turning is true. To ensure accuracy, I use a digital Vernier to check diameters during turning.

Part the column the same length as the door panel. Drill the ends to take the brass bushes for the pivot pins. The pivot pins consist of a sprung 4mm (5/32in) stainless steel pin which runs in a 7mm (9/32in) brass sleeve. At the bottom of the column, this sleeve has a 1mm (3/64in) thick flange to ensure clearance of the door. The top sleeve does not have this flange so that the door can be lifted slightly to aid removal. The sprung pin engages with similar sleeves in the top and bottom of the carcass – holes for these sleeves were drilled at the same time as the dowel holes.

"However, repeated dry assembly can lead to slackness in the dowel joints. To avoid this, use slightly thinned-down dowels for dry assembly."

GROOVES

The column should now be grooved to receive the curved door panel. I described the making of a jig for routing turned pieces in the article on the curved box in issue 139. Locate the column in the box using the sleeve holes previously bored – the brass sleeve could be used here to retain the column. Screw through the ends of the box into the ends of the column to stop it twisting during routing. The groove should be the width of the curved panel including the back veneer, which has not yet been laid, with a depth of 10mm (3/8in). Again, accuracy is important, as a slack fit will result in the door dropping off!

A test assembly can now be made to ensure that the column rotates freely without rubbing against the side and that the curve panel sits neatly against the angled cabinet side. Also check that there is at least 1.5mm (1/16in) clearance between the top of the door and the cabinet top – this is necessary for manoeuvring the door when fitting or removing it.

MAGNETS

You may have been wondering why we have refrained from laying the back veneer? The reason is that the door catch consists of rare >

The magnet fixed in the cabinet side with epoxy, then cleaned up

Using square paper to mark the end of the door panel

A sprung pin in the bottom of the column

< earth magnets concealed under the veneer on the door and the cabinet side. I did not want to locate these magnets until I was able to dry assemble the carcass and door column and offer up the door panel to get an accurate location for the magnets. You can only trust a full-size rod so far!

Drill the cabinet side about midway to receive an 8mm (5/16in) rare earth magnet so that it will sit just below the surface of the edge. Engage the magnet and place a point so that it is held in the centre of the magnet. Dry assemble the cabinet and offer up the door panel. When you are happy that the configuration is correct, press the panel onto the point to get a location for the door magnet. Drill the door panel, but avoid drilling right through! The magnets can now be glued in using epoxy adhesive.

The magnet in the cabinet side is hidden by a strip of veneer laid on the edge. As the edge is angled this could be a tricky clamping job, so use a PVA and iron the veneer on. Dampen the back of the veneer first to prevent curling, and use a low setting on the iron followed by pressure from a veneer hammer. The back veneer on the curved panel can now be laid using the vacuum press and former.

GLUING & FINISHING

I was unsure whether to cut the curved edge on the door panel before or after gluing on the column. I decided that keeping the panel rectangular made it easier to check for accuracy when gluing.

After gluing-up the panel and column, fit them to the dry assembled cabinet and mark the curve of the door edge – this is a rather imprecise matter of bending steel rules etc, until you have a pleasing shape. You may have to grow an extra arm, or ask for assistance for this operation. Cut the curve on the bandsaw and then clean up with a spokeshave.

Apply finish before assembly as this allows you to get into the corners more easily. Leave the cedar of Lebanon back unfinished to retain its fragrance. I used MD Finneys Microporous Hard Wax Oil. Apply four coats with a cloth rubber, dilute the first 20% with white spirit, and denib between coats with 400grit paper. Cut back the final coat with 0000 grade steel wool and wax.

ASSEMBLY

The cabinet can now be fully assembled, using full thickness dowels. I found it useful to lay the door onto the assembly to check it is square and not in wind.

Now that the cabinet is assembled, the door can only be fitted using the sprung pins, aided by using a piece of card or thin acrylic sheet. Press the card onto the sprung pins and with the pins pressed home, offer up the door and then remove the card. The pins should spring into the brass sleeves top and bottom, however a little manoeuvring may be required. Using this method prevents the pins scratching the top and bottom of the cabinet as the door is fitted.

To remove the door, insert a 1.5 (1/16in) or 2mm (5/64in) rod into the holes in the top and bottom of the cabinet to push the pins back into the door, insert the card to retain them, and slide the door out.

The cabinet is hung using brass plates screwed to the back: two at the top and one centrally at the bottom. Upside down keyhole shaped holes in the plates allows the cabinet to be lowered onto accurately positioned screws in the wall.

The trio of curved box (FC139), table (FC140) and cabinet is now complete. F&C

The cabinet on the wall