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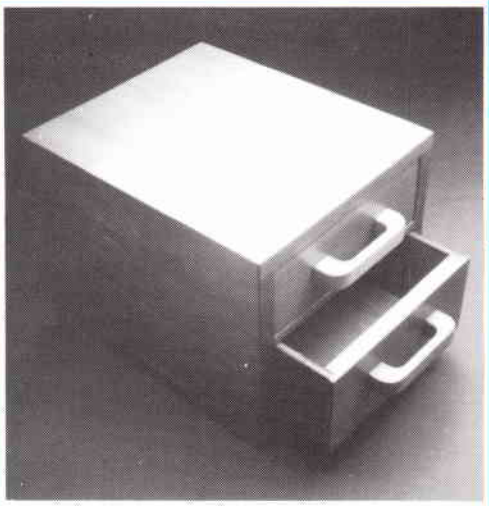
INTERMEDIATE
PROJECT NO. 2

Japanese Pen Box



This pen box is a modern copy of an antique Japanese pen box (used by Japanese scribes to store their pens and inks for their specialized craft) and as such provides the opportunity to construct an attractive small cabinet with two drawers.

The cabinet will function just as well as a jewellery box, or a small file for bills or stationery. The dimensions can be altered if required without great complication, but if you plan to scale up significantly you may want to use mechanical drawer slides.

When you choose the material for the cabinet, you may find that 290mm wide material is available from your local supplier. If so, the tongue-and-grooving for the edge joining of the planks for the cabinet is obviously unnecessary. Our instructions, and the material shopping list, are based on the assumption that narrow, good quality wood is generally easier to obtain.

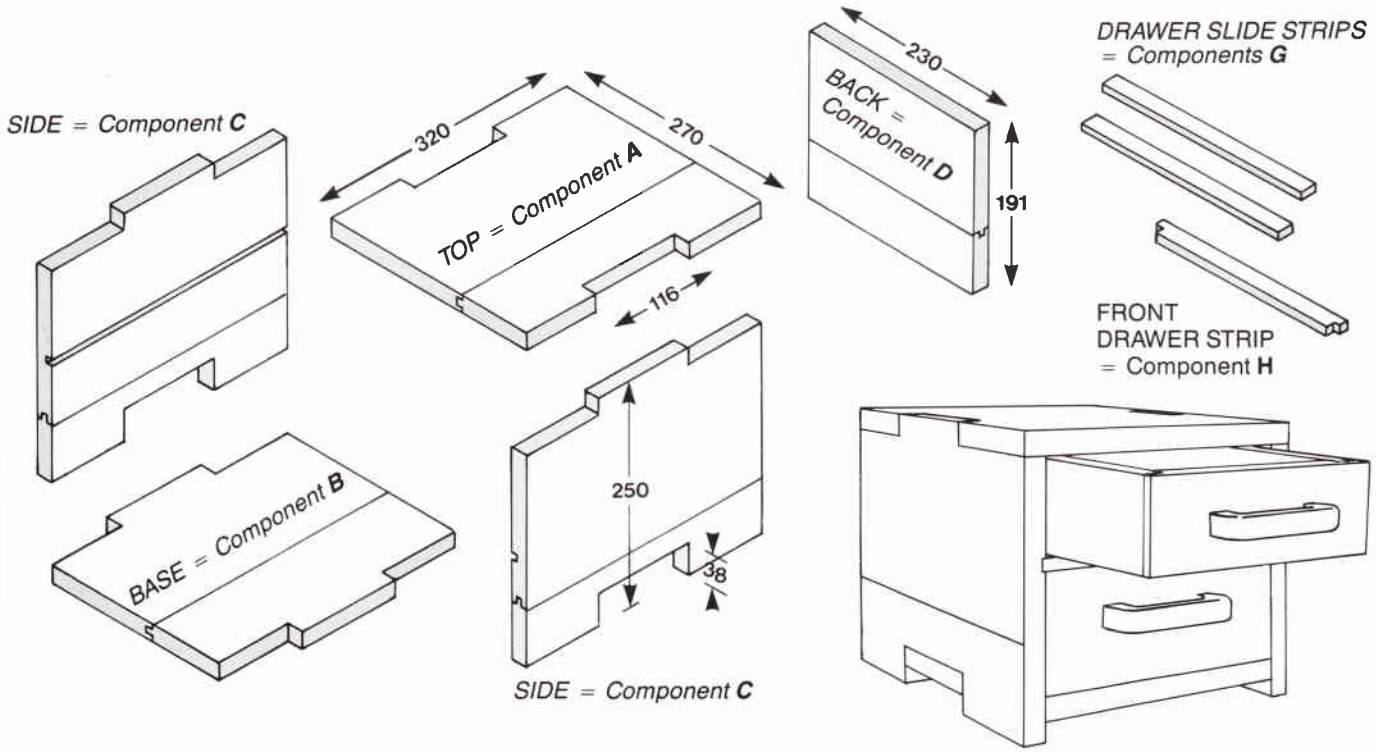
Component Specifications

All dimensions are in mm

Part No.	Description	Quantity	Width		Thickness		Length
Softwood / Hardwood							
A	Cabinet Top	1	270	×	19	×	320
B	Cabinet Base	1	270	×	19	×	320
C	Cabinet Sides	2	250	×	19	×	320
D	Cabinet Back	1	191	×	19	×	230*
E	Upper Drawer Front	1	80	×	19	×	230*
F	Lower Drawer Front	1	101	×	19	×	230*
G	Drawer Slide Strips	2	19	×	10	×	275
H	Front Drawer Strip	1	19	×	10	×	252

Part No.	Description	Quantity	Width		Thickness		Length
Plywood 10 mm (5 ply)							
I	Upper Drawer Back	1	80	×	10	×	230*
J	Lower Drawer Back	1	101	×	10	×	230*
K	Upper Drawer Sides	2	80	×	10	×	290*
L	Lower Drawer Sides	2	101	×	10	×	290*
Plywood 3 mm (3 ply)							
M	Drawer Bottoms	2	217	×	3	×	281*
Veneer Strips (Optional)							
	Horizontal Veneers	2	19	×	2	×	250*
	Vertical Veneers	2	19	×	2	×	230*

* ***Cut accurately to size once cabinet is made.***



Tool Requirements

1. ESSENTIAL Triton Workcentre and your power saw. Measuring tape, hammer, medium and fine sandpaper, drill plus drill bits to suit handle screws and dowels (if used), screwdriver.

2. USEFUL Square, chisel, and gluing clamps.

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Construction Details

Material Shopping List

1. WOOD Any close-grained furniture material is suitable such as Western Red Cedar, Douglas Fir (Oregon), Oak or Ash.

Cabinet and drawer fronts: **170 × 19mm** — 2 @ 2.1m (or 290 × 19mm — 1 @ 2.1m)

Drawer sides and backs: **10mm plywood (5 ply)** — 600 × 300mm

Drawer bottoms: **3mm ply (3 ply)** — 600 × 450 mm)

(**Note:** Ply offcuts could well be suitable. Check Component Specification list for exact sizing.)

2. FASTENING

* PVA, or equivalent wood glue
* 15mm long, or similar, cabinet nails
* (Optional) 3-4 mm diameter bamboo or hardwood dowels (for decorative effect).

3. OTHER Two small handles for drawers.

General Points

1. The sequence of construction is important for both ease of construction and accuracy of fit. Make the cabinet first and then cut the drawers for an exact fit.

2. One mm clearance has been left between the cabinet and the drawer sides and tops in the given dimensions, to allow for the expansion of the wood at times of high humidity.

3. We assume that you are familiar with tongue-and-grooving, as this operation will not be covered in detail. If you are unsure about the procedure, you should refer to "**Bread Board**" project **(Beginners, No. 2)** which details this type of joint.

1 Cut to length the 19mm material for the top, sides, base and back of the cabinet. For ease and accuracy cut these in the cross-cut mode, using a stop-block on a length gauge. Cut **8** lengths to 320mm, and two lengths to 230mm (for the back), plus two offcuts (200mm will do) for testing the tongue-and-groove settings.

2 Convert to the table-saw mode to tongue-and-groove (T & G) your material, joining two pieces together for the top, the sides, the bottom, and the back, in each case by gluing and clamping.
(Note: Use a high extension on the rip fence for the T&G)

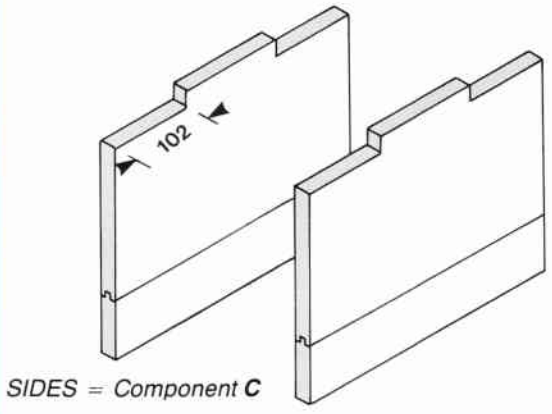
3 Now rip the components for the top, sides and base of the cabinet to width. (Components **A, B and C.** See specification list for dimensions). Make the join lines of the T&G components reasonably central.

4 The next step is to notch out the top, sides and base for the keying joints. This is done by passing your workpiece, on its edge, over the saw blade. The procedure is as follows . . .
Set the blade height to 19mm by laying a piece of your material next to the blade, and adjusting the saw up or down. Set the rip fence at 99mm to define the limits of your cut. (99mm plus 3mm kerf = 102mm.)

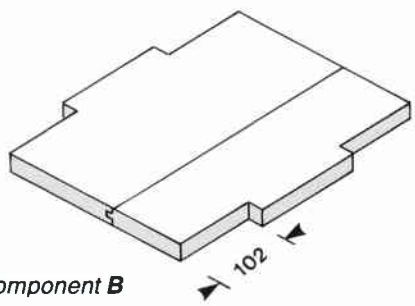
You will need an extension fence mounted onto the protractor. Ideally this fence should be about 60mm high, and extend past your blade by no more than 99mm (to clear the rip fence). Note that your first pass over the blade will make a cut through the extension fence — this will help you sight the cuts on your workpiece.

Safety Notes

The cutting procedure prevents use of the safety guard. Keep your hands well clear of the saw blade. Hold the workpiece down firmly on the table and against the protractor extension fence.



*SIDES = Component **C***



*BASE = Component **B***

FIGURE 1

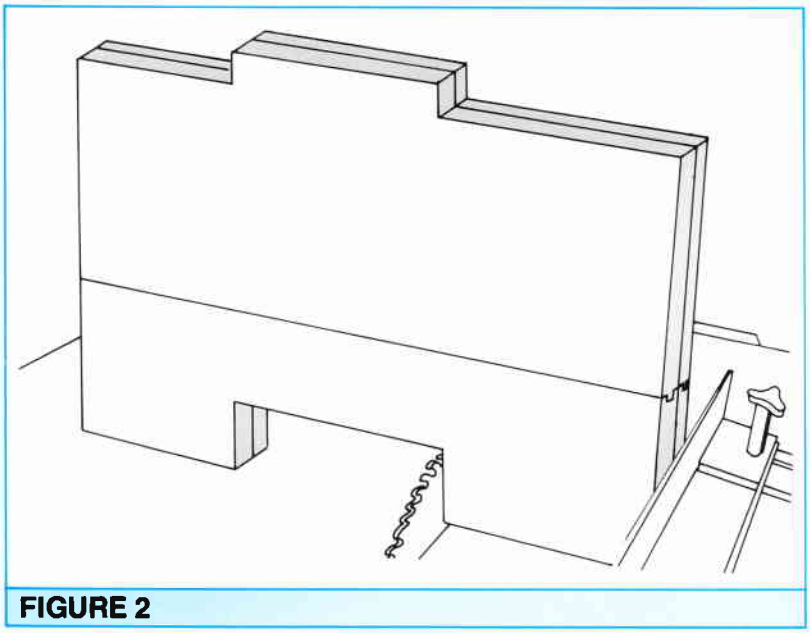


FIGURE 2

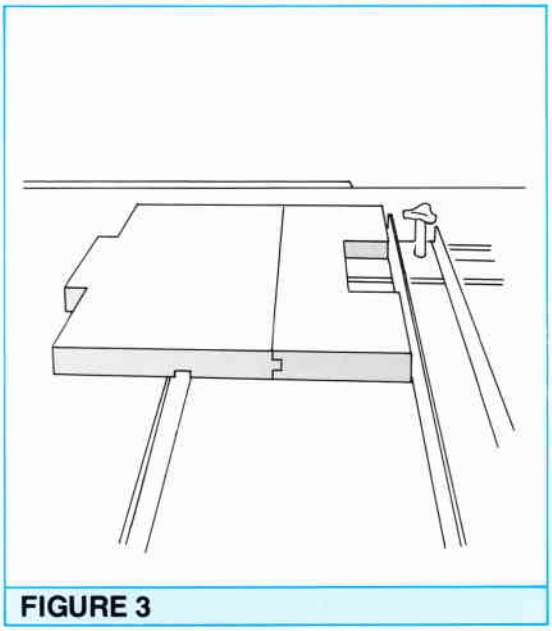


FIGURE 3

You can now begin to cut the notches for the base **(B)** and the **top** of the sides. You can make both sides separately but it is best to clamp both **(C)** pieces together for this notching operation. It will ensure greater accuracy, speed and workpiece stability. Make a series of cuts, moving the workpiece away from the fence at each cut.

Continue until you have totally removed the waste on all the sections that require this notching. When you finish, your components should look as shown in **Figure 1.** You may have to clean up with a chisel or sandpaper, or you can use the saw blade to clean up your cuts. Hold the protractor alongside the highest point of the blade, and slide the workpiece **sideways** across the tip of the spinning blade.

After each sideways pass, move the protractor slightly forwards or backwards and make another pass.

5 Reset your fence at 102mm for notching the top **(A)**. The fence now defines the outer limit of these notches. You will need to make four of these defining cuts, turning your wood around and then over and butting up against the fence each time. Remove the fence and make cuts to remove the remaining waste. Reverse the workpiece when you reach halfway to ensure satisfactory support against your protractor.

The bottom notches for the sides are made by doubling the depth of cut (use two pieces of your material stacked next to the blade) and then repeating the procedures outlined above **(Figure 2).**

Your parts should now look as pictured in the component drawings. Do a trial fit of the sides, top and bottom and if everything is satisfactory clamp temporarily together, check the measurements for the back, and cut the back **(D)** to suit.

6 The drawer slide strips **(G)** and front drawer strip **(H)** are made next. Take an offcut of 19mm material at least 275mm long, and rip three 10mm strips off it. Remember not to trap the narrow offcut strips between the fence and the blade. Either use a narrow ripping jig (refer to the Jig Guide) or reset your fence each time keeping the main piece of wood between the fence and blade.

The slide strips are fixed in trenches in the cabinet sides. These trenches are made by passing the sides over a lowered saw blade (about 10mm deep is fine), setting the fence initially at 140mm, and moving the fence outwards by one kerf until you have the required 10mm wide trench. Make sure that you run the **bottom** edges of the sides **(C)** against the fence and take care when the notch reaches the end of the fence not to lose control of your workpiece **(Figure 3).**

Note: If you are concerned that the trenching will be visible from the back of the cabinet you may wish to stop your trenches just before you have cut all the way through. This can be done by pencilling a reference line on the work-table, and stopping the workpiece at the line each time. Turn your power off once your workpiece reaches the reference line.

Reassemble the cabinet and cut the front drawer strip **(H)** to length. If you plan to veneer the front of the box **(see directions 8 and 11)** you will need to fit this strip 2mm proud of the cabinet and later trim the ends with a chisel to allow for the vertical veneer strips **(Figure 4).**

Now cut the side strips **(G)** to length and glue in position.

7 Check your measurements and cut the drawer components to size, making sure you have approximately 1mm clearance for the sides and tops of each drawer.

Construction Details

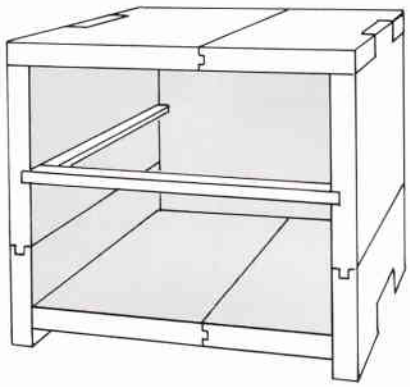


FIGURE 4

The drawer components can be easily cut in the table saw mode,using your protractor for the crosscutting, and the rip fence for the rip cuts. Rip the width of the front, side and back of each drawer using the same fence setting, and then crosscut the front and back of each to length. Don't cut the sides to exact length at this point. Accurate length will be determined once rebates are done for the front and back of each drawer.

8 For the drawer backs cut these rebates by setting the blade at 5mm and the fence at 7mm for a rebate 10mm×5mm deep. Three passes over the blade are necessary with the workpiece held against the protractor. Raise the blade height to 12mm for the rebates for the drawer fronts. These rebates should be 10×12mm deep.

The exact length of the sides can now be gauged. They should be 290mm, but check by test fitting them inside the cabinet (placed on its back). These measurements allow for the drawer fronts to be 2mm proud, to ensure a flush fit once the veneer strips are placed on the cabinet front. If you don't wish to veneer the front edges of the cabinet reduce the length of sides **(K&L)** by 2mm

9 Now make the grooves for the drawer bottoms. Set the saw blade height at 4mm, and the fence at 5mm. If a single saw cut isn't wide enough for the 3 ply bottom you may need to move the fence out slightly and make a second cut (test on scrap).

10 You should now be able to cut the drawer bottoms **(M)** to size, using the wide rip position if required. Assemble drawers using glue and nailing thru the sides into the front and back of each drawer. You can now attach the handles. **(Figure 5).**

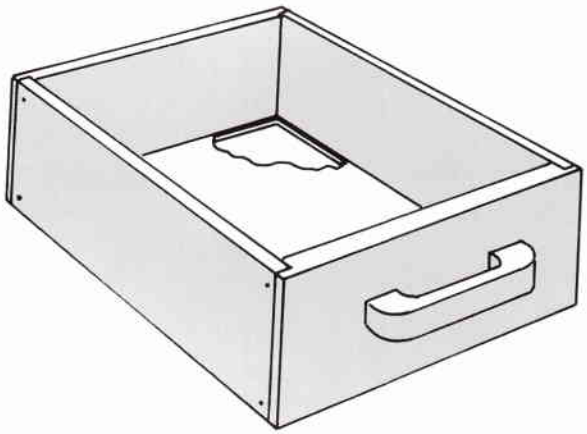


FIGURE 5

11 If you wish to veneer the face of the cabinet cut 2mm thick strips from an offcut of your 19mm material.

Safety Notes

Take care when ripping these thin veneer strips. **Don't** set the rip fence at 2mm. Make your 2mm strips as offcuts, but prevent them from falling down between the spinning blade and the slot in the worktable by switching the power off before completing the cut. When the blade has stopped spinning withdraw the workpiece and break off the veneer strips.

12 Now assemble and glue the cabinet together, clamping if possible. Use the 3mm diameter or similar bamboo dowels (skewers from a kitchen supply shop) as a decorative feature which adds further strength. Drill slightly undersize holes (position these carefully for best appearance), cut the dowels approximately to length, tap home (glue if you wish) and sand flush.

Finally the veneer facing strips are glued on, after being carefully trimmed to size — a sharp chisel or knife is useful for this.

13 Sand cabinet and drawers smooth and protect with an appropriate finish. We began by oiling the cabinet with a thin linseed oil/turpentine mixture and finished with a couple of coats of satin polyurethane. A final coat of furniture wax was applied and gave it the soft sheen that looked right for this copy of a Japanese pen box.