

Design Yourself A Bookcase

'So I say our furniture should be good citizen's furniture, solid and well made in workmanship, and in design should have nothing about it that is not easily defensible.....' William Morris, 1882

A Few Design Rules

Whatever shapes you design, avoid introducing short grain.

Never join more than two curves without a break of some kind!

If mixing hardwoods, use woods having similar textures.

Give careful thought creating overall good proportions, but also ensure that the individual parts are in good proportion to the whole.

Have regard to the limitations of your time, your tool collection and maybe your present level of experience.

Restraint is generally a virtue!

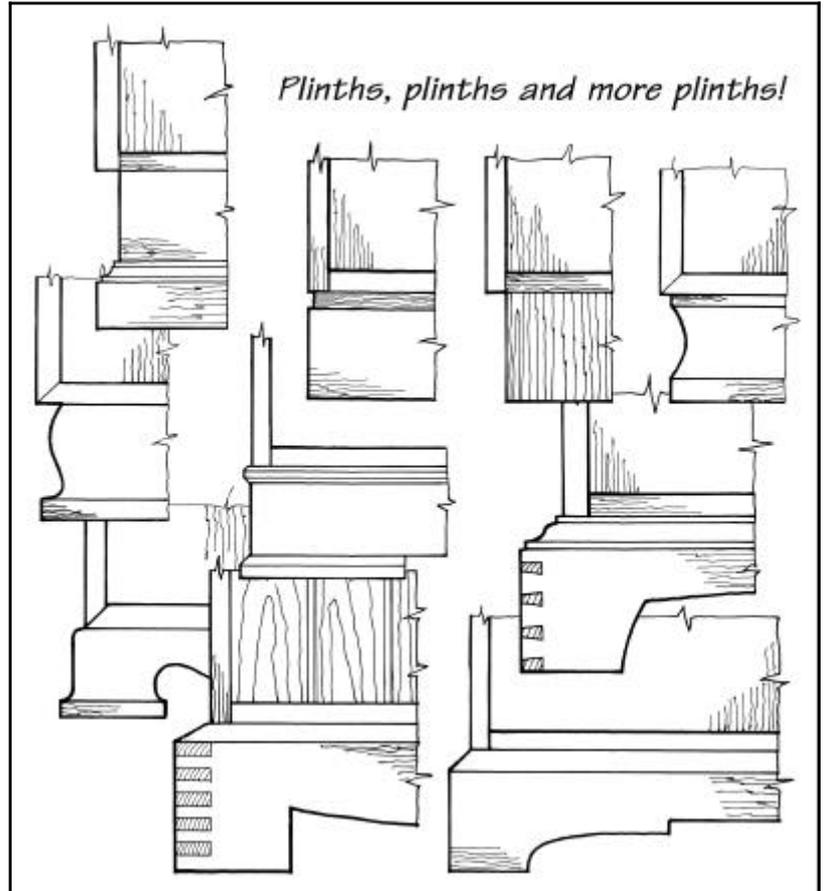
If you were to undertake a formal design course, you might be asked to tackle your project by working this way:

- Try to banish from your mind any existing solutions to your problem.
- Throw practicality out of the window and brainstorm with all your might.
- Produce a variety of possibilities. The more the merrier!
- Consider the more feasible possibilities..
- Investigate the aesthetic constructional and financial aspects of each.
- Settle for the most appropriate.

A Designer's Vocabulary

Certainly, some people regard such a system as good training for a professional designer; someone who will need to 'make his mark'. Here, however, the modest aim is to try to help readers to produce straightforward designs that qualify as 'good citizens furniture'. The thinking is that just as you need a verbal vocabulary to express ideas, so it helps to have a design vocabulary when figuring out a design.

Perhaps you will have been building this vocabulary when browsing the public library or 'casing' a furniture store for



ideas. Perhaps you've assembled a scrapbook of cuttings and sketches? Perhaps our sketches could add to your real or virtual notebook?

From the possible range of customary constructions (shelves tenoned into the sides; framed & panelled sides; dovetails at each corner and so on), I've opted (for the time being) to sketch the main components of an open shelved case mounted on a plinth. I fear that lack of space means that some details need to be left for you to investigate.

A Basic Strategy

• Do a functional audit. Record the sizes and quantity of your books/items for display and work out the overall dimensions. Look at the available space and general character of the surroundings, and so on.

• Draw to a scale of one-tenth full size, a front elevation.

• Taking a few sheets of tracing paper, and using the detail sketches as starting points, make a series of elevations, each adding to each a plinth that looks promising.

• Having settled on one or two possibilities, try varying these drawings, for example by using different plinth heights. (When drawing the plinths, bear in mind that when you look down on the finished job, the perspective will make them appear narrower than your drawing suggests).

• Try 'logical variations' as suggested. Experiment by using mouldings instead of chamfers.

• The remaining design opportunities are mainly limited to treatment of the front edges, so off

you go again!

•I should now advise you to make a final scale drawing that helps you to work out the fine detail. I could also suggest making a coloured and shaded perspective drawing or a scale model. There's nothing like such exercises for confidence-

your aim is a piece whose design is defensible, you should settle for dovetail or similar joints for the case corners. You might have seen allegedly easier-to-make joints, including stretched-out versions of the keyed mitre joint here suggested for the plinth. How-

Sizes & Material

Books are heavy, weighing about 30/36kg per metre run of shelf, and can cause undersized shelves to visibly sag. The author of a computer program, the 'Sagulator', indicates that the eye will notice a deflection of 2.6mm for each metre of shelf, which for a 1050mm long shelf works out at 2.75mm. Looking through some of the timbers described, I note that only American Chestnut and Limba bend this much on a shelf made 230mm wide by 22mm thick when loaded with a spread of 39kg of books. However, you might find that your timber supplier limits you to ready-planed (PBS) stuff at 22mm. Planer ripple will show when the job is polished, so the visible surfaces will need to be skimmed with a smoothing plane. If, after skimming you think this still looks a bit thick, make a wide bevel under the front of the shelf to reduce the apparent thickness. If compelled to use thinner material, the shelf can be stiffened with a batten fixed to the underside of the shelf front, albeit making it more difficult to get at the books.

To prevent undue deflection of longer spans, you will need to incorporate vertical dividers that can, for the sake of a bit of visual fun, be staggered.

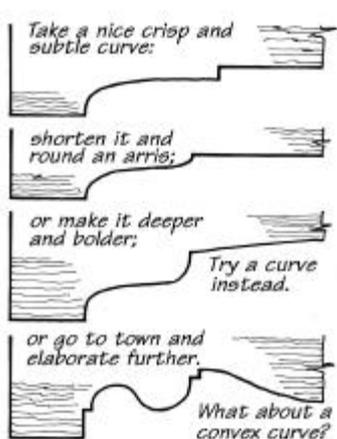
Should you fancy a countrified look, choose ready-prepared matched boards for the back and, of course, use a pine for the carcass. Strength-wise, 22mm shelves would be the best bet.

building by making one think about the fine details of the job. However, some experienced GWers might be quite happy to work out the dovetail spacing and suchlike on the actual workpieces.

•Draw up a cutting list, including extra material for practice pieces, and dare I say it — allowing for disasters?

Corner Joints

I respectfully suggest that if



Varying a design by logically looking at the possibilities.

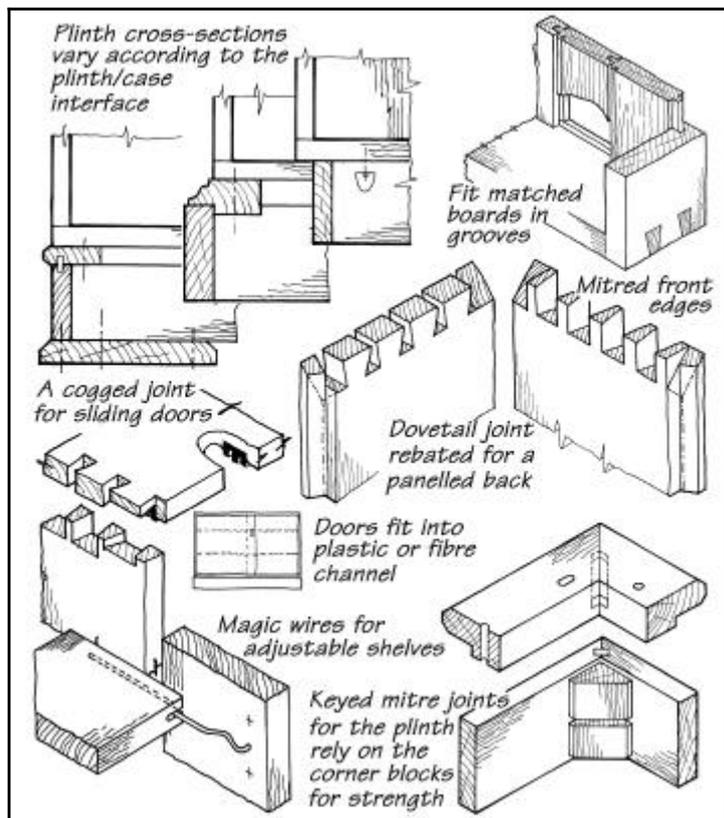
ever, the mitres offer little in the way of adequate gluing surface, and the situation is little improved by the key slips whose true job is just to ensure alignment during assembly. It is really essential that this joint is reinforced by traditional glue blocks, which apart from being rather unsightly, would get in the way of the books.

Providing you can safely machine them in workpieces of bookcase dimensions, finger joints can make an attractive choice, as also could inserted keys.

You might decide to use 'through' dovetails for each corner, or follow the practice of some workers by using lap (ie concealed) dovetails for the lower corners. The feeling is that the pattern of the pins/tails disrupts the visual interface between the plinth and the case.

Shelf Joints

If you are certain of the actual shelf spacings, a simple



stopped housing (in which the joint does not show on the case's front edges) will fit the bill. Note that since there is little effective gluing area, the joint does little to strengthen the case. Providing you can safely machine the stopped grooves in the shelf ends, 'magic wires' offer an unobtrusive support to adjustable shelves. Woodturners can have some fun in turning nice delicate but strong pegs, or you can probably find bookshelf studs in woodworker's stores.

The Back

Whether you decide to make this a feature might depend on the use and location of your design. If you are cer-

tain that it will be more or less completely full of books, the back will not be very visible. You might then think that a veneered plywood or MDF back would be pleasantly adequate.

However if some of the space is to be shared with pieces of favourite pottery, you might want a good background for the display. In some rooms, a bookcase might find itself serving as a space divider, hence extra work on a nice back will be well rewarded. For these reasons I've offered some hints about panel designs for a deluxe back. Where both the front surface and rear surfaces are open to inspection, you might prefer mouldings

Rebates, Grooves, Mouldings and Suchlike.

In preparing the cogged or mitred dovetail drawings I've anticipated the needs of the worker who relies entirely on planes. Compared with the high-speed router, these planes do have the disadvantage that they require a stroke running from the beginning to the very end of the workpiece. Unless the joint is modified to account for the rebates and grooves, unwanted gaps can appear in the joints.

However the machine router can start and stop just short of the very end of these features, simplifying life somewhat, even though you'll have to knock up some device to stop a fatal accidental overrun beyond the stop point.

If you should fancy running a chamfer or small moulding round the inside of the case's edges the router will, at the price of making your job look machine-made, let you avoid mitring the corners.

on both inside and outside faces of the stiles and rails.

Matched boards for the back should be 100mm wide by 12mm thick. You could fit them (without glue) directly into grooves, at the cost of more fiddle and anxiety at glue-up time.

I've sketched the kind of rebate you should use for a framed and panelled back. Since this feature would otherwise be vulnerable to damage during the tricky job of fitting a large and heavy panel, the rebate wall is tapered for strength.

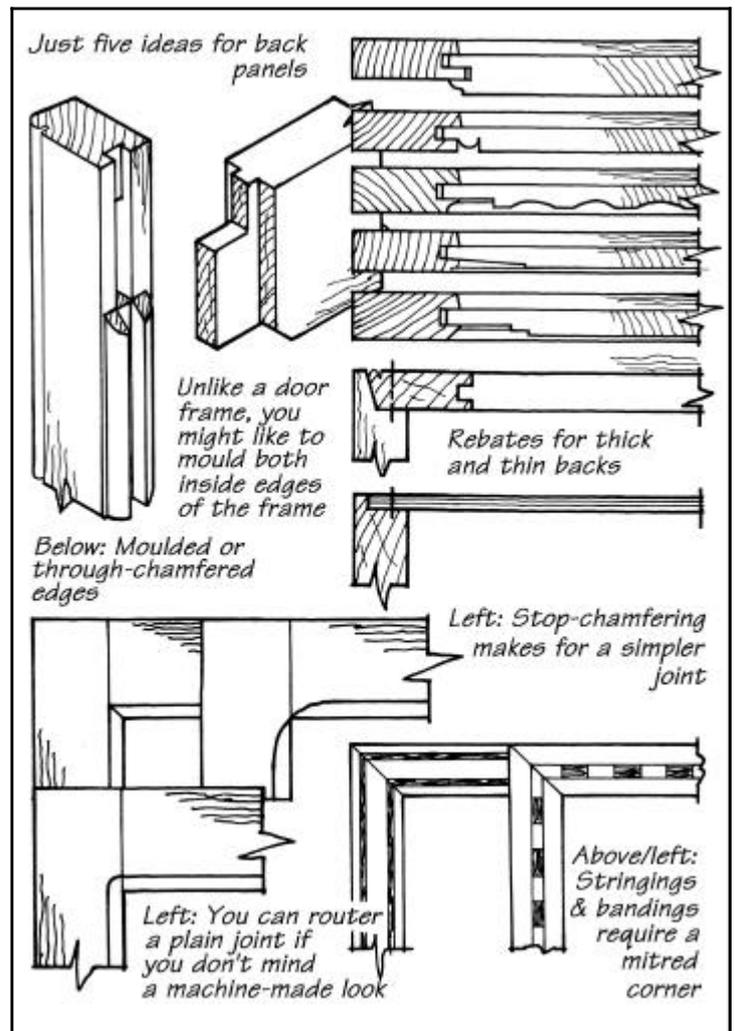
The Plinth Joints

Although I have disparaged mitred joints for the case corners, in this situation corner blocks will be hidden, hence mitres will be suitable.

A blocked and lapped butt joint could serve for the back corners though you could indulge in a lapped dovetail. This would not need a block and would, in reasonably experienced hands, be just as easy to make and fit.

One plinth detail shows

should be able to move with the wood, specify good-quality bright mild steel (or brass) washers under round-headed screws.



Tails On the Top Or the Side?

Once glued up, I don't think the unit's strength is affected by the arrangement. Of course, there's a decorative aspect to the decision, but also a very practical one.

Holes in the workshop floor (or scaffolding) have, tongue in cheek, been suggested as way reaching and sawing fiddly bits on the ends of long boards. To comfortably work on the end of such a board, you really need it to be either horizontal or inclined in a wide-open vice.

Since it is somewhat easier to saw the tails in this position, settle for tails on top. (A good bandsaw does ease this problem).

Work 'tails first'. Unless you are making a tall case, it should not be too difficult to saw the pins with the workpiece fixed vertically in the vice, though vibration could be a bit of a problem.

that through-dovetailed front corners make a striking feature. The decorative qualities of finger joints (a machine job) and hand or machine-made keyed mitres might also appeal to some people.

Sectional sketches show how the plinth's structure depends on the interface with the case. Since the case's sides will need to shrink and swell with atmospheric changes, I've indicated elongated holes for some screws. Because the screw heads

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 Email: Sales@woodfit.com
<http://www.woodfit.com>
Isaac Lord
 Phone 0800 783 5790
<http://www.isaaclord.co.uk/>

Hints & Tips

Since the rear of the plinth will need to be inset to clear the skirting, the plinth might need to be as high as the skirting.

For uneven floors, you might consider fitting levellers—see the suppliers list.

If fitting a veneered back, try to keep the screws as far from the edges as possible.

The Sagulator

At the time of writing, this was available at:
<http://www.woodbin.com/calcs/sagulator.htm>

Squared Paper

Print your own by going to <http://www.incompetech.com/beta/plainGraphPaper>

Dovetailing Detailed

For some help, you might like to look at my web site: <http://www.amgron.clara.net>

Planing Wide Mitres

Your may have heard about the Donkey's ear shooting board for this job, but it is not a convenient tool for handling long workpieces.

