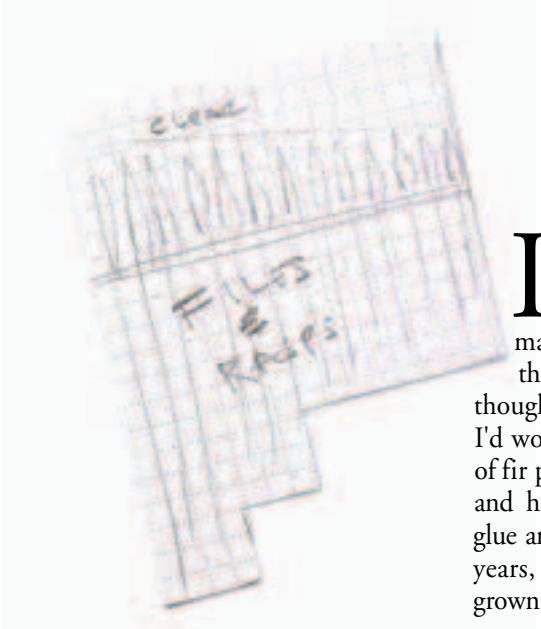
Tool-Cabinet Design

Every shop has specific needs, but the strategies for storing hand tools are universal

BY CHRIS BECKSVOORT



I built my toolboxes right when I got out of high school, with only the materials at hand, no thought to joinery and little thought to layout. So for years I'd worked out of boxes made of fir plywood and knotty pine and held together with nails, glue and barn hinges. Over the years, my tool collection had grown until I had planes, chisels and saws sitting on top of, next to and underneath the boxes. I needed a new toolbox.

Having 30 years' experience, I knew what I wanted and didn't want. Like most woodworkers, I'd developed habits and preferences, I am a furniture maker, not an itinerant carpenter. I don't take tools to job sites, and I'm definitely not going to sea. For my purposes a tool chest was useless, I didn't want to take out three trays to reach the fourth. Like a chest freezer, the items in the bottom get lost and forgotten. I wanted to see my tools and be able to reach them with a minimum of contortions and movement of other tools. I didn't want a rolling tool cabinet, nor did I want one that looks like a piece of furniture or a building. I wanted a wall-hung

Photos: Michael Pekovich

box behind my workbench: simple, accessible, open and totally utilitarian.

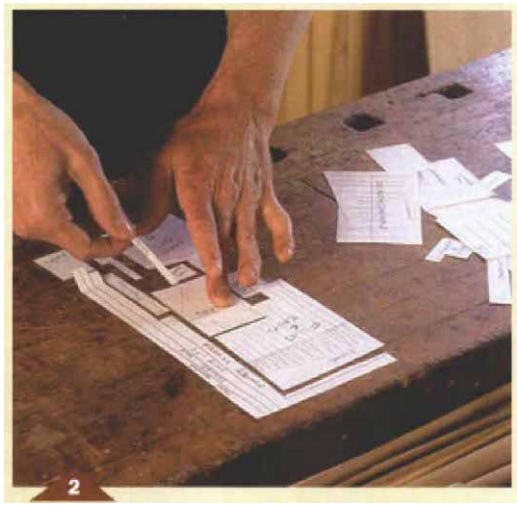
Your needs and preferences are likely to be different, but the process of planning and layout will be similar to what I went through when building the cabinet shown here. My point in this article is to help you through the planning process and layout. The actual dimensions and building decisions—such as materials and joinery—are yours to make as you see fit.

My design is based on a Shaker toolbox at Sabbathday Lake, Maine. It's a large, relatively shallow, wall-mounted box with framed doors for additional storage. With the design in mind, the first order of business was to determine the layout of the tools for the most efficient use of space and size. I could have placed my tools all over the shop floor and regrouped them until I found the most efficient layout. That would have been pretty time-consuming, so I opted for graph paper instead (¼ in. = 1 in.). When possible, I grouped the tools into a single cutout. Drill and brace bits fit into a 10-in. by 12-in. area, while my multitudes of chisels required a space 18 in. by 21 in. For the cutouts to be accurate, I had to start thinking about methods of hanging or storing the tools.

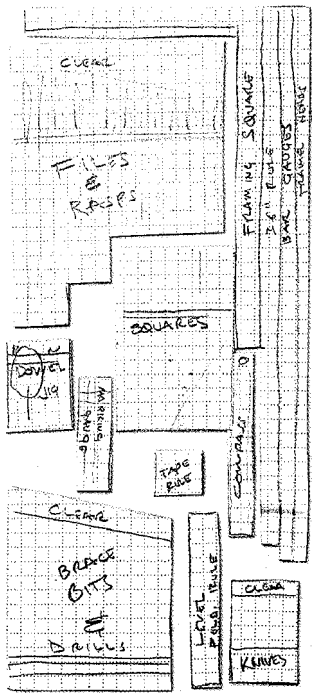
For example, if the chisels were to sit on a rail and be held with magnets, they could be removed straight out. However, if they were to fit in a slotted block, I would need 2 in. to 3 in. of clearance above the chisels

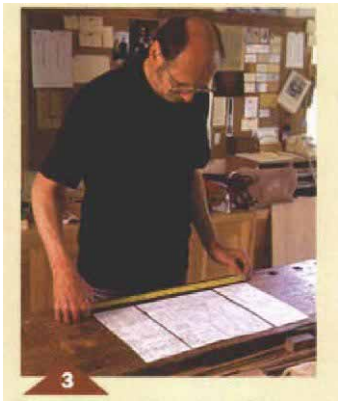
DRAW ALL OF YOUR TOOLS TO SCALE

Measure the tools. *Begin by measuring all of the tools to be housed and draw them to scale on graph paper.*

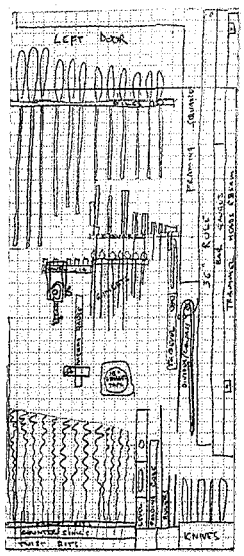


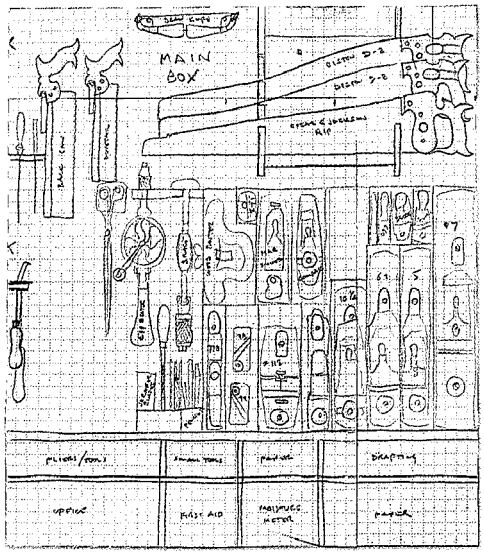
Arrange cutouts. *Sort tools by type and begin to lay them out in the imaginary toolbox.*

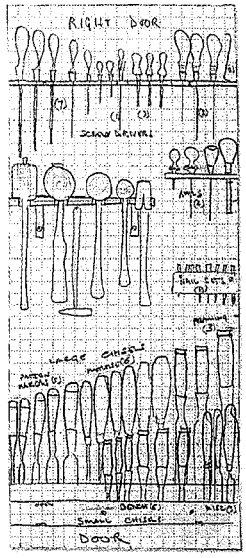




Determine the size of the box. *Once tools are laid out, overall dimensions are determined, and the box begins to take shape.*







so that I could remove them from the block. So the cutouts had to include clearance space above the tools, where needed.

It was pretty easy to group chisels, files, knives, squares and drill bits—even planes and most saws—together on the cutouts. However, some tools, such as the brace, drawknife, scissors, straightedge and framing square, needed individual cutouts. When designing the cabinet, you should consider saving room for tools you plan to get. Are you a chisel junkie? Would you really like to have that new Lie-Nielsen No. 10¼ rabbet plane? If so, make allowances in the chisel- or plane-group cutouts.

Once I had a little stack of odd-shaped, labeled pieces of graph paper, I started sliding them around to see how things fit. I kept related tools close to one another: chisels and mallets together, all saws and planes together and all of the diverse measuring and layout tools near each other. More shifting of patterns. I arranged the tools into a rough rectangular form and started visualizing the main box in the center, with the doors on both sides. Planes and saws, as well as other heavy, bulky tools, got moved into the main box. Layout tools, chisels, files, bits and shallow and lightweight tools fit best in the shallow doors.

At this point, overall size became a consideration. I had my tools arranged in an acceptable manner. The chisels, slated to go into the door, were the widest group at 21 in. So with a

little fudging and two ¾-in.-thick frames, I made the doors 22 in. wide. That meant that the main box would be 44 in. wide and a whopping 88 in. overall when open.

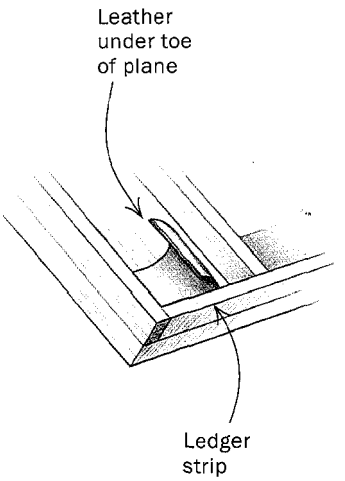
The height was more difficult to pin down. From my layout, I had one door at 44 in. high, the other at 48 in. high and the box at 35 in. high. I wanted a few drawers at the bottom of the box for pliers, punches, glass cutters, papers, drafting supplies, moisture meter, carving tools and other little-used tools. The overall height of your cabinet will depend on your own height. The taller you are, the higher you can reach. I can easily reach 7 ft. into the toolbox. I also wanted 10 in. of clearance between the counter and the toolbox. With a little more fudging and rearranging, I settled on a height of 47 in. It accommodated the drawers and tools in both doors, was slightly taller than wide and seemed to allow for a bit more tool collecting.

Determining the depth of the box and the doors took a little work. Decisions needed to be made on how the tools would be stored. I also needed to visualize drawer depth and how far certain groups would stick out from the surface of the doors or box. The shelf for my small squares was only 7 in. wide but protruded 6 in. from the inside of the door. I estimated the drawer depth and the angle of the plane tray and settled on a box depth of 11 in. and a door depth of 4 in., both including ⅝-in.-thick panels.

It helped me to visualize in three dimensions, so I redrew the arrangement of the tools on three sheets of graph paper: the two doors and the main box, with all of the tools and drawers in place. I knew I wanted the drawers to be flush, with ½-in. protrusions for the pulls. So the bottom 10 in. of both doors needed to have ½ in. of clear-

Storage solutions for tools

HANDPLANES

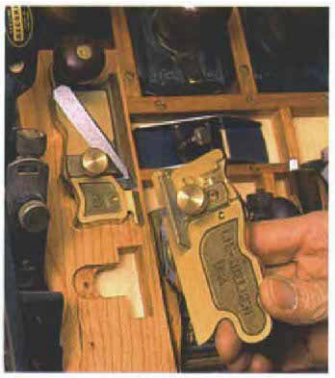


Planes within easy reach. *Ledger strips locate planes on the shelf, and small pieces of leather are used to protect the blades.*

Planes take up a fair amount of space, no matter how you store them. But you have several options to make them accessible.

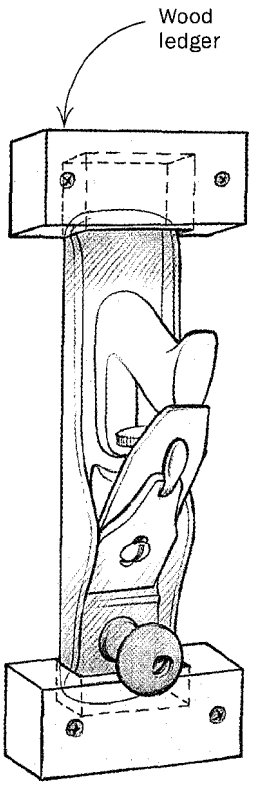
Believe it or not, many woodworkers like to hang planes vertically. A wooden plane can be fitted with a screw eye in the end and hung from a hook. For a metal plane, a fitted ledger strip will support the weight at the bottom. A similar strip with extra clearance is fitted at the top end. To remove, slide the plane upward (hence the clearance) until the nose comes out of the bottom ledger, pull the plane forward and down to clear the bottom and then the top ledger. Or you may opt for a fitted ledger on the bottom only and a high-power rare-earth magnet near the top. Of course, this won't work for wood or bronze planes.

To save space you can also store planes on their sides, on fitted shelves. With the judicious use of dividers, the planes can be fitted into the appropriately sized rectangular shelf case. Short planes will fit front to back, and longer ones go in sideways.



Fitting a tool. *Odd-shaped tools, such as this side rabbet plane, fit into french cutouts in the shelf.*

I chose to store my planes on an angled tray with small (½-in. by ⅝-in.) ledger strips between them. The tray is angled at 60° so that a strip in front of each plane is all that's needed to keep the tools in place. The tray is hinged at the top and has three shelves inside. I don't like to waste space, so I store seldom-used items in there: spare parts, blades and fences. The tray needs to be emptied to gain access, because the 17 planes stored on it probably weigh close to 40 lbs.



VERTICAL OPTION

Clearance in the top ledger allows you to lift up and remove the plane easily. The bottom ledger supports the plane.

Drawings: Michael Gellatly

ance. Above that, most of the interior of the box was empty, allowing mallet heads, squares and chisel handles to stick out into space.

Once I had a layout that worked well, I built the toolbox with drawers and doors. Then I made the tool racks and hangers. As I assembled the racks and actually hung the tools, I noticed that a few had to be shifted a bit to allow for easier access. A few items were moved once or twice, until they felt right in place. The first time I tried to close the doors, I discovered that they wouldn't. The compass plane stuck out right where the two door frames came together. I shifted the planes until I got the layout I liked, then screwed the dividers into place.

The layout took about 11 hours, and the case, doors and drawers took an additional 48 hours. The almost 40 racks, holders, shelves and trays took 60 hours, and the finishing, hanging, placing and rearranging took another 10 hours.

All things considered, the box turned out well. It works! Of course, it was months before I got used to the new arrangements. Thirty years of reaching for the tape measure on the right-hand door doesn't change overnight. A few of the lesser-used tools are, in fact, in out-of-the-way places. The gimlets, for example, live behind the hanging blades of the squares. But they are easy to reach, with good clearances.

Once I got everything placed and made the necessary changes, the cabinet became the centerpiece of the shop. And although the fine-tuning may still take a few more weeks, the time spent planning, laying out and anticipating paid off handsomely. □

Chris Becksvoort is a contributing editor.

Storage solutions for tools (continued)

CHISELS

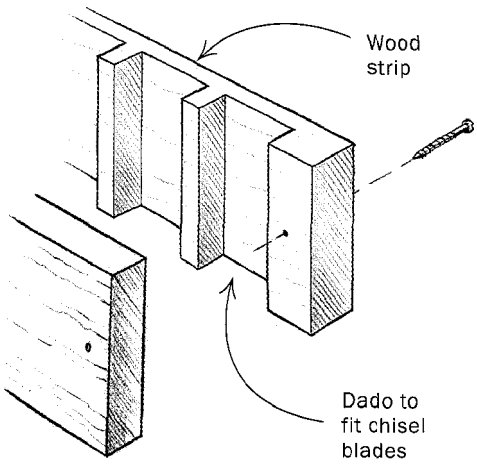
Tiered chisels. *Inside the door, chisels are stored in dadoed strips to protect their cutting edges.*

Chisel storage devices are easy and relatively quick to build. Chisels are all the same shape but different in width and thickness. Sets can be stored together, graduated from the shortest to the tallest. Here are three commonly used alternatives.

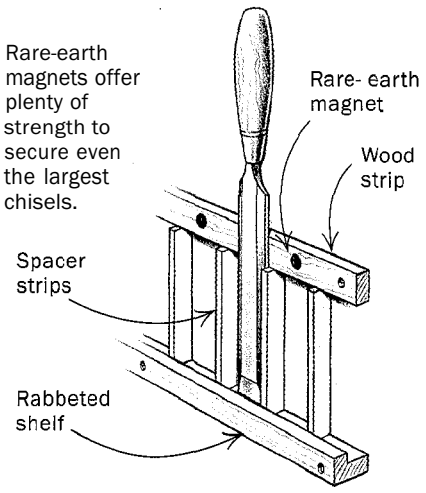
Many woodworkers hang their chisels, but I'm not in favor of this method. I don't like to have razor-sharp edges exposed to fingers or other nearby tools. My current favorite method for chisel holding is a wood strip dadoed to accept chisels of various widths. Vary the spacing between narrow chisels, to allow clearance for the handles. As the chisel blades become wider than the handles, the spaces get narrower. All chisel slots are a bit wider than the blades. A 1½-in. to 2-in. strip is all that's required to hold the chisels upright. That requires only 2 in. to 2½ in. of clearance over the tops of the chisels to pull them out.

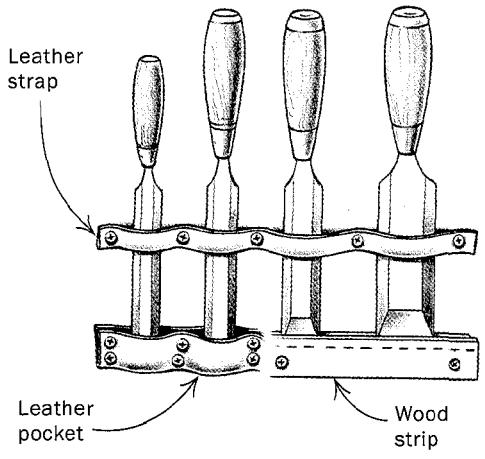
Another option is to use a rabbeted wood shelf at the bottom to support and protect the blades. Vertical divider strips determine the spacing of the chisels. High-power rare-earth magnets hold the chisels upright and in place. The magnets will have to be drilled into a horizontal strip to allow clearance for the chisel handle against the panel.

In my previous toolbox I used leather straps to hold the chisels. They can be used above and below or with leather on top and a wood strip below.



TWO ALTERNATIVES





Leather straps will hold chisels in place, but a wood strip might last longer against the sharp edges.

SCREWDRIVERS, FILES AND AWLS

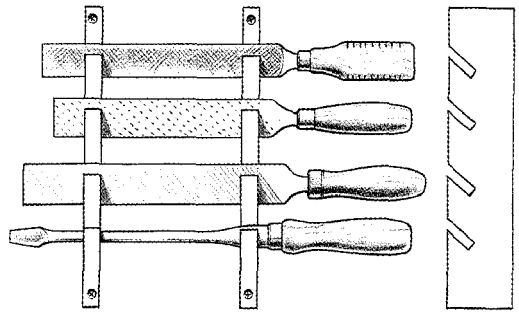
Simple is often best. *Awls and screwdrivers rest in holes drilled into a small shelf.*

Screwdrivers, files and awls can be stored like hammers. After all, they are nothing more than metal rods or bars stuck into wood handles.

My favorite method is to hang these tools. A ¾-in. by 2-in. strip of the correct length will suffice. Measure the ferrules or the base diameters of the tools, space them as needed and drill slightly oversized holes partway into the strip. Then locate the hole centers and saw a slot to the back of the hole. This yields a small shoulder on both sides of the cut, which supports the ferrule. The slot allows for easy removal. Simply lift the tool a mere ½ in.

Files and screwdrivers with large flats on the upper shaft can be stored horizontally on racks or trees, consisting of two parallel uprights with 45° slots cut into them. Trees are merely uprights with holes drilled through the sides.

Like chisels, screwdrivers and files can be stored with leather retainer straps.



OPTION FOR HORIZONTAL STORAGE
A few passes over the tablesaw will make a quick horizontal storage rack.

LAYOUT TOOLS

Layout and measuring tools are an odd bunch, because there are so many different individual shapes. A framing square can be hung by the short leg either on a 16-in.-long strip with a groove for the edge or on two small ledger blocks—one at the end and the other right at the inner corner. The ledger strips should have small lips.

Long rulers and straightedges are most easily hung from a round-head screw through a hole in the end. Remember to hang the ruler at least ⅜ in. proud of the surface or carve finger-relief holes to make grabbing the ruler easier. The same method can be used for story sticks, trammel heads on a beam and winding sticks.

Small squares can be stored in a variety of ways. The best-looking but most time-consuming method for any tool is the french cutout. Trace the tool onto an oversized board, then cut out the tracing with a coping saw. The tool can then be placed into its own custom-cut hole. Much faster and easier is to let the head of the square rest on a ledger strip, similar to the one used on the framing square. The method I prefer, especially with an assortment of squares, is to mount them on a 6-in.-deep shelf with slots in the front to accept the blades of each square.

Shelved squares. *Becksvoort's squares slide into sawkerfs cut on a small shelf, which takes up much less space than laying them out flat.*

HANDSAWS

An aesthetic choice. *Becksvoort prefers to store saws so that their shapes and engravings can be seen.*

Handsaws are fairly easy to store. What method you choose depends on how many saws you have, how much space you have and whether you want to see the handles. The easiest method, which also takes up the most room, is to hang the saw flat, either vertically or horizontally. Make a cutout to fit exactly inside the handle hole and then screw it into place. A spinner can be added if you're worried about earthquakes or if the saw will be stored in the door of the tool cabinet. A saw can be hung horizontally from a peg, set onto a ledger or fitted to a shelf, as I did.

TRADITIONAL APPROACH