A Small-Shop Survival Guide

With mobile machines, smart storage, ample lighting, and plenty of power, even a one-car garage can be a first-rate workshop

BY TIM SNYDER

he ultimate workshop. It doesn't exist, of course. But if you're a perpetual remodeler or an aspiring woodworker who happens to move frequently, you keep getting opportunities to make your next workshop better than the previous one. That's pretty much the position I've been in over the years. Basements, garages, outbuildings: I've had my shot at exploiting the advantages and overcoming the limitations of all these workshop venues ("The best place for a small shop," p. 50). While I've (usually) learned from my mistakes, I've also learned from visiting the workshops of cabinetmakers, contractors, and friends all over the country. And I've read books by workshop experts like Scott Gibson, Paul Anthony, and Sandor Nagyszalanczy ("Sources," p. 54). Workshop wisdom contributed at "Breaktime," FHB's online discussion forum, is another source for smallshop survival skills. (A sampling of "Break-

time" advice begins at right.) No matter how big or small your space happens to be, I hope this collection of tips, strategies, and guidelines helps to make your shop a safe, efficient, and enjoyable place to work.

Stationary machines are a luxury you can't afford

In a cabinet shop, major machines don't have to move to a job site. Most of the time, they don't even need to move out of the way. But in a small garage, you get a central open area that's occupied by one machine or workstation at a time.

If you're building a bookcase, for example, your first workstation probably will be a handheld circular saw and a pair of sawhorses with some 2x4s on top: a platform for rough-cutting sides and shelves from full sheets of plywood. When that's done, a tablesaw moves into position so that face-frame members, shelf edging, and plywood parts



WORKSHOP WISDOM TIPS FROM breaktime FINE HOMEBUILDING'S ONLINE FORUM

You'll find "Breaktime" on our Web site at www.FineHomebuilding.com.

ONE SPACE FOR SEVERAL WORKSTATIONS

Tackling big projects in a small workshop is possible if you make good use of a central open space. Moving machines or worktables into place as they're needed gets you from one phase of the project to the next.







First cuts happen close to the door. Sheet goods get cut to rough size before they get too far into the shop. Several sacrificial 2x4s placed across a pair of long sawhorses make a good cutting platform that sets up and stows easily.

Mobility means versatility. Even a heavy saw can move into position quickly when it's equipped with a mobile base. I also mobilized my workbench by trimming the legs and screwing casters to mounting blocks.

Look for casters with solid-rubber wheels that swivel, lock, and are rated to support at least 150 lb. A low assembly table puts the work at a com-

A low assembly table puts the work at a comfortable height. Light, dead flat, and easily replaceable, a hollow-core door makes a good worksurface that's ready as soon as you set up a pair of low sawhorses. A good working height is 18 in. to 20 in.

"Identify the tool that you use most (tablesaw? router?), and build your shop around it; otherwise, you'll constantly be moving stuff (and cussing) as you try to clear a workspace around the primary tool." **Tom16** "If you check with suppliers of used business furniture, you can sometimes find storage cabinets at reasonable prices." DaveRicheson "I've got a 3-ft. by 4-ft. multipurpose bench that rolls wherever I need it. I built it with a melamine top, the same height as my tablesaw. It does duty as an outfeed support, assembly station, and so much more. I routed a 12-in. by 12-in. recess that allows me to drop in my router or my pocket-hole jig." JDRHI

The best place for a small shop



GARAGE

Pros: You start off with a solid floor, a big overhead door, and plenty of expansion space outdoors (when the

Photo: Mike Pekovich weather allows).

Cons: Cars either intrude from time to time or lose their parking spot entirely. The concrete floor isn't comfortable to stand on. Natural light can be limited. If the garage is attached to the house, machine noise can be an issue.

BASEMENT



Pros: Supplementary heating might not be necessary, and wiring expenses will be minimal, especially if the existing service panel has sufficient

Photo: Krysta S. Doerfler

capacity for shop circuits. Cons: You're in tough shape if the basement doesn't have an outside entrance. The concrete floor isn't comfortable to stand on. Machine noise, sawdust, and excess humidity can be problems.



SEPARATE BUILDING

Pros: You can design it the way you want it, incorporating features like high ceilings,

Photo: Mike Pekovich in-floor dust collection, and big doors. A fire in the shop won't destroy the house.

Cons: A separate building costs more to build, heat, and power, so it's the most expensive option. It also can steal valuable space in the backyard. can be cut to final widths. Assembling the case also takes place in the center of the shop, and the same is true for finishing, unless you can move outdoors.

Small-shop choreography—performing different operations in the same space—demands good project planning, a well-organized work area, and tools that move around easily. Fortunately, mobile bases and stands are widely available for just about any machine you find in a workshop. I have my tablesaw, dust collector, thickness planer, and two workbenches on mobile bases or on locking casters. Overkill, perhaps, but there's no pressure to get my workshop layout exactly right because changes are easy. Prices for aftermarket mobile bases begin around \$70. For about \$30, you can buy a set of four heavy-duty casters to build your own base or turn a stationary workbench into a mobile one ("Sources," p. 54).

Lumber and materials can overwhelm any shop

Smart storage improves workshop efficiency, and building materials usually present the most troublesome storage challenge. The major players here are sheet goods, long lengths of solid wood or molding, and the offcuts that accumulate with every project.

Remodeling contractor Chris Green takes a tough-love approach with scrap lumber. "Sure, I know that someday I might be able to use a few of those leftover pieces," he explains, "but before I know it, I've got scrap piles everywhere. So I try to dispose of wood that I don't need right away."

As for sheet goods and long boards, the best storage solution may be to keep these space hogs out of the shop entirely. An attached or freestanding shed devoted to lumber storage requires no heat, minimal illumination, and just enough roofing and siding to keep materials dry and out of direct sunlight.

If panels, molding, and lumber need to come inside the shop, store them close to the main entry. Keep the offload path short so that you don't have to move big stuff through a maze of machines and workbenches before storing it. The best compact, all-purpose lumber rack I've seen is the one in Paul Anthony's shop (photo bottom right, p. 53). His rack has a center section for storing panels and outer arms that hold plenty of lumber and also make sorting through boards easy.

A small shop gets larger when it moves outdoors

One of the best things about a garage workshop is what's right outside: a flat, open work area on the same level as the garage floor. When the weather's nice, it doesn't take much time to move outside and enjoy some extra elbow room, especially if you've got mobile machinery and workbenches.

A garage has another feature that's great in any workshop: an overhead door. Just lift the door and back up the truck; it doesn't get any easier to move stuff in and out. In my current garage shop, I paid a little more than \$300 to replace an old wooden overhead door with



Portable tablesaw. It's the hardest-working machine in most shops. That's why it's good to buy the best saw you can afford and to make sure it's easy to move out of the way when you've finished using it. The best job-site tablesaws are designed for use with mobile bases and even can be folded into a more compact size for transport in a pickup or van. (See FHB #172, pp. 66-71, for a review of popular models.)

WORKSHOP WISDOM Tips from breaktime continued "There are three things that you can never overdo in a shop: lighting, power (lots of 20-amp outlets fed on 12-ga. wire), and bench size." Andy at AAHandyman Services

"I have a low ceiling in my shop, just 7 ft. I put outlets in the ceiling on a 4-ft. by 6-ft. grid. Unless you fall down, you are never more than 5 ft. from an outlet." Donpapenburg

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SMART TOOL CHOICES IMPROVE EFFICIENCY

Mobility and versatility are just as important as power, precision, and ease of use when choosing the major tools for a small shop.

Shop vacuum or dust collector? A dust collector is the better choice if your planer and router table get lots of use. Shop vacs have a big edge in portability, and bigger vacs with large-diameter hoses can handle the volume of shavings produced by planers and router tables. Make sure to get the fittings that allow your vac to hook up to the dust ports on major machines.

Compact compressor. For use in a workshop,

get the quietest model you can afford, with enough capacity so that the motor won't have to cycle on and off constantly. (See FHB #178, pp. 48-53, for tips on choosing a portable compressor.)





Work dollies. A rolling platform can be your best friend on a big project. Size the dolly to fit the job; build it with 2x4s, plywood sheathing, and heavy-duty casters that swivel and lock. I use drywall screws for assembly so that the dolly can come apart easily when the job is done.





Router/tablesaw combo. Compact router tables are available from several manufacturers. The most effective space-saving strategy, though, is to incorporate a router table into one of your tablesaw's extension wings ("Sources," p. 54).

Sliding compound-miter saw.

Of all the power tools in a shop, this one deserves a dedicated location when it's not on a job site. Woodworker Chris Gochnour built a lumber rack that incorporates an SCM workstation, enabling him to cut wood right where it's stored.

"I have a garbage can at each end of my workbench. I just sweep everything off into the cans, and when they are full, I pull them out and dump them." Gunner "To save space, I hang pipe clamps over a window opening. This still lets light through and frees up space that the clamps would eat up elsewhere." riverman "My shop is in the basement. I have a lot of clamps and just clamp them to the floor joists above. Always handy, and no floor space used. Clamp to only one joist. Do not span joists. The reason is because you'll put on the first clamp, then the second. When you give it that last snugging turn, the first clamp will fall on your head." **peteduffy**





 If possible, install a subpanel in the workshop.
A nearby subpanel makes it easy to turn off power, reset tripped breakers, and add more circuits.

• Lay out the shop before locating receptacles. Put

most receptacles 50 in. to 52 in. above the floor to clear benchtops or 4-ft.-wide panels that are leaning against a wall.

• Install shock protection. Ground-fault circuit interrupter (GFCI) protection is required by code on all garage and basement receptacles, and it's recommended for any workshop. Installing a GFCI circuit breaker (about \$40) at the panel protects the entire circuit. Alternatively, you can install a GFCI receptacle (about \$6) at the start of the circuit to protect the entire circuit.

• Give big motors their own circuits. One or two dedicated circuits enable you to run two tools at once (a tablesaw and a dust collector, for example) without tripping a breaker.

• Have at least one 240v circuit. Induction motors (used on most stationary machines) and electric heaters run more efficiently on 240v. Most manufacturers provide instructions for wiring induction motors to run at 115v or 240v.

• Plan for expansion. Before closing in walls and ceilings, run cables for possible future circuits to a junction box in an accessible location. an insulated one. It has been a good investment. The weather seal around the new door does a good job of keeping out rain and cold drafts. The insulation between the steel-door skins reduces heat loss in cold weather and noise transmission at all times of year.

Big doors and outdoor work areas aren't just for garage workshops. Woodworker and freelance writer Bill Duckworth enjoys both features in his walkout basement shop (photo center left, p. 50). "Although I don't have a big area outside the shop, there's enough room to set up some sawhorses and a worksurface," Duckworth says. "It's my preferred location for sanding and finishing work."

Shop layout begins with good tool choices

The first step in planning a workshop layout is a tough one, according to Scott Gibson, a woodworker, a freelance writer, and the author of *The Workshop* (The Taunton Press, 2003). "Get rid of all the tools you don't need," Gibson advises. "I'm talking about spares, things you rarely use, and boxes of stuff you haven't sorted through in the past five years. Get real and pare down your stuff to the essentials."

The type of work you do will determine how you equip your shop. But the tools that get the most use and take up the most space deserve careful selection. (See "Smart tool choices improve efficiency," p. 51.)

Of course, workshops have to accommodate more than machines and workstations. Shelving, cabinets, supplies, heating units, electrical outlets, and lighting all factor into the plan. To figure out where everything goes, I like the low-tech approach used by Andy Beasley, a retired Air Force pilot (and *Fine Homebuilding* author) whose frequent moves have provided many lessons in shop setup. "I draw up a floor plan, then make paper cutouts at the same scale to represent machines, workbenches, and other items," he says. "For an easy way to create a floor plan, use ¼-in.-grid graph paper. A scale of ½ in. (two squares) to 1 ft. works well."

Electronic alternatives to the graph-paper technique can be found online at www.grizzly.com and www.porter-cable.com. Both tool manufacturers have free software that can help you to generate a floor plan based on dimensions for various tools and other elements.

Don't scrimp on power, light, or dust collection

When it comes to electrical outlets and light fixtures in a workshop, the "more is better" rule applies. Fortunately, it's not expensive to get ample power and light in a workshop ("Get the light right," p. 54). The cost of electrical cable, outlet boxes, and receptacles won't break your budget. Fluorescent fixtures also are priced affordably, but don't expect to find a complete selection at The Home Depot or Lowe's. You're better off going to a local electrical- or lighting-supply outlet that deals with a large number of manufacturers.

Dust collection deserves special mention because it's often overlooked, and it can be a big problem in a small shop. Whether you rely primarily on a large shop vacuum or on a small dust collector



Steel drawers are designed for speedy construction. The miter-saw stand in Matthew Teague's shop includes two banks of shallow steel drawers that slide in saw kerfs. The drawers are available in different depths from Lee Valley Tools ("Sources," p. 54). Five 2-in.-deep drawers cost around \$35.

WORKSHOP WISDOM Tips from breaktime continued "Install big pullout trays in the cabinets under the workbench. This is a great way to store heavy stuff but still get to it." **Paul42** "Use cheap 3/0 hollow-core doors spray-finished with polyurethane as assembly tables. Put them on folding horses. Lean the doors against the wall for storage." TomT226

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CUBBYHOLES AND CABINETS CAN PROVIDE CUSTOMIZED STORAGE SPACE

Shopmade storage solutions save space and money. You can size cubbyholes and cabinets to match the stuff you're storing. Medium-density fiberboard (MDF) and utility grades of plywood are the most economical material choices, but MDF shouldn't be used in moist conditions or in lumber racks, where load-bearing capacity is important.



Making a case for bits. Sized like a medicine cabinet, this case keeps router bits organized and protected. Drilled to accept ¼-in.dia. and ½-in.-dia. bits, plywood shelves are easy to reposition in the slotted sides of the cabinet.



Kerfs make cubbies adjustable. By building a rectangular case with matching ¹/₄-in. kerfs cut in the top and bottom, Matthew Teague created a set of adjustable cubbyholes.



Photo: Matthew Teague

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Separate spaces keep portable power tools organized. Made from ¾-in.-thick pine, this basic set of cubbyholes includes a battery-charging station on its bottom level.





Rollers and racks aid lumber storage. Heavy-duty steel rollers from Lee Valley (around \$17 apiece; see "Sources," p. 54) make it easy to slide panels in and out of their storage space (top photo). To store panels as well as boards, it's hard to beat Paul Anthony's lumber rack (bottom photo). It holds full sheets of plywood and plenty of long boards in a space about 40 in. wide and 8 ft. long. The rack is made from 2x4s, 3/4-in. plywood, and drywall screws.

"Be fussy about picking up scraps, offcuts, etc. There's no room in a small shop for a mess. It's aggravating, and it's not safe." **Tom16** "Put lighting and power tools on different circuits so that if you pop a breaker, you're not left in the dark." **peteduffy** "I made a couple of four-wheel dollies to be my helper when I move things from inside the shop to my truck, or from the truck into the shop. When not in use, they are propped up vertically, out of my way." **DaveRicheson**

Get the light right

• Keep the lighting circuit separate. In a small shop, a single 15-amp circuit can handle lighting needs.

 Buy fluorescent fixtures, but avoid the cheap 4-ft. shop lights that buzz and flicker.
Look for commercial-grade, 8-ft.-long fixtures that have electronic ballasts.

• Mount light fixtures directly to the ceiling. Hanging fixtures collect dust on their top surfaces and are more likely to be hit when lumber is moved around.

• Use the spacing guidelines shown in the drawing below to ensure even light throughout the shop.



• Add task lights where you need them. Even with good ambient light, you still need task lighting for certain closeup operations. An adjustablearm light enables you to get the brightness right where it's needed. You can find these lights at office-supply stores; budget-priced models cost less than \$20.

• Paint the walls and ceiling white. To make the most of the light fixtures you install, take advantage of the reflective qualities of light-colored wall and ceiling surfaces. depends on the type of work you do. Either way, capturing particles right at the dust port of your tablesaw, planer, or random-orbit sander is worlds better than sweeping up a mess of dust and shavings, and wiping layers of dust from every horizontal surface.

Safety can be simple

Good lighting and GFCI-protected receptacles are sure ways to enhance shop safety. But you'll also want to have a first-aid kit and a fire extinguisher in accessible spots. A good first-aid kit costs less than \$20, and a fire extinguisher suitable for a small workshop costs about \$40 ("Sources," right). The best extinguisher for a workshop has an ABC rating, which means it's effective on a broad range of combustibles (wood, paper, flammable liquids, and electrical equipment).

Keep hearing protection, safety goggles, and dust masks within easy reach. Having a cordless phone in the workshop means that an emergency call won't demand a trip to the house.

Shop layout, tool storage, and even the location of electrical outlets can affect safety. If push sticks and featherboards are kept close to where the tablesaw or router table is operated, these safety devices are more likely to be used. Try to locate receptacles so that extension cords don't snake across a broad floor area and pose a tripping hazard.

Shopmade and store-bought storage solutions can work well together

Today, you can trick out a workshop with rugged-looking cabinetry from companies like Gladiator and Garage-Tek (see *FHB* #176, pp. 50-55). But the best shops I've seen are full of storage solutions that are ingenious, inexpensive, and customized to fit the space and the tools or materials being stored.

The workshop wall always has been a great place to hang tools. That's why it's better to finish walls with wood rather than drywall. You can drive screws and mount hooks, hangers, shelf supports, and shopmade holders anywhere without giving a thought to stud locations or heavyduty drywall anchors. I like the Ply-Bead plywood panels I used to finish the walls of my current shop (photo p. 48). Manufactured by Georgia-Pacific (www.gp.com), the ³/₈-in.-thick panels cost less than \$20 apiece and have a beaded face that looks nice when it's painted or finished with a solid-color stain.

Cabinets salvaged from a kitchen-remodeling project often play a major role in workshop storage, primarily because they're free. But shopmade cabinets are often a better choice. They can be sized to hold specific items, and can be built ruggedly and inexpensively (photos p. 53). Open cubbies for portable power tools provide better organization and faster access than a standard base or wall cabinet. In Matthew Teague's workshop, wall-mounted cubbies are adjustable, thanks to a kerfed MDF case that accommodates ¼-in.-thick dividers. A frequent contributor to *Fine Woodworking* and *Fine Homebuilding*, Teague also used kerfs to build a multiple-drawer cabinet that serves as a base for his chopsaw (photos left, p. 53). Metal shelves from Lee Valley Tools slide in the kerfs, providing plenty of protected storage and supporting my contention that the best storage strategy is a blend of shopmade and store-bought solutions.

Tim Snyder is executive editor of *Fine Homebuilding*. Photos by Charles Bickford, except where noted.

SOURCES

GOOD BOOKS

All books listed below are available from The Taunton Press (www.taunton.com).

Workshop Idea Book by Andy Rae

The Workshop by Scott Gibson

Small Woodworking Shops The Best of Fine Woodworking

Projects for Your Shop by Matthew Teague

The Workshop Book by Scott Landis

Smart Workshop Solutions by Paul Anthony

Setting Up Shop by Sandor Nagyszalanczy

HEAVY-DUTY CASTERS

Grizzly Industrial Inc. www.grizzly.com

Northern Tool & Equipment www.northerntool.com

ROUTER-TABLE EXTENSIONS FOR TABLESAWS AND OTHER SHOP ACCESSORIES

Woodhaven www.woodhaven.com

Rockler www.rockler.com

Rousseau www.rousseauco.com

Craftsman www.sears.com

Lee Valley Tools www.leevalley.com

FIRE EXTINGUISHERS AND FIRST-AID KITS

Northern Tool & Equipment www.northerntool.com

Amazon www.amazon.com