

A Shop Built Around

Space-saving design improves work support, storage, and dust collection

BY ALAN DEVILBISS

I'm sure every woodworker dreams of designing and building the perfect workshop. I finally got my chance after I retired as a circuit-design engineer for Hewlett-Packard. After two previous shops in two-car garages laid out conventionally with some tools around the walls and others on mobile bases, the engineer in me said there had to be a more efficient way to use space.

My design has a central grouping of stationary machines. By sharing infeed and outfeed space, I achieve maximum capacity for handling large boards in minimum floor space. An added bonus is that this design requires perhaps one-fifth of the dust-collection ductwork of a conventional shop with tools around the walls. This not only saved money but is more efficient.

Cabinets provide storage, infeed/outfeed support

The building is 24 ft. by 40 ft., giving about 875 sq. ft. of floor space, with a 10-ft.-high ceiling. Although about half the area could be used for parking, I park only one vehicle there.

After drawing detailed plans, I marked the outline of the island base on the concrete floor. I anchored 2x4 framing lumber to the floor using a 3/8-in. bead of construction adhesive and 2 1/2-in. self-tapping concrete screws set into 3/16-in. holes hammer-drilled into the concrete. Locating the lowest point on the 2x4 frame using a laser level and tape measure, I then used the level to measure points at approximately 2-ft. intervals along the 2x4s to determine their heights above the low point. I used 2x6 framing lumber standing on edge around the 2x4 base, selectively reducing

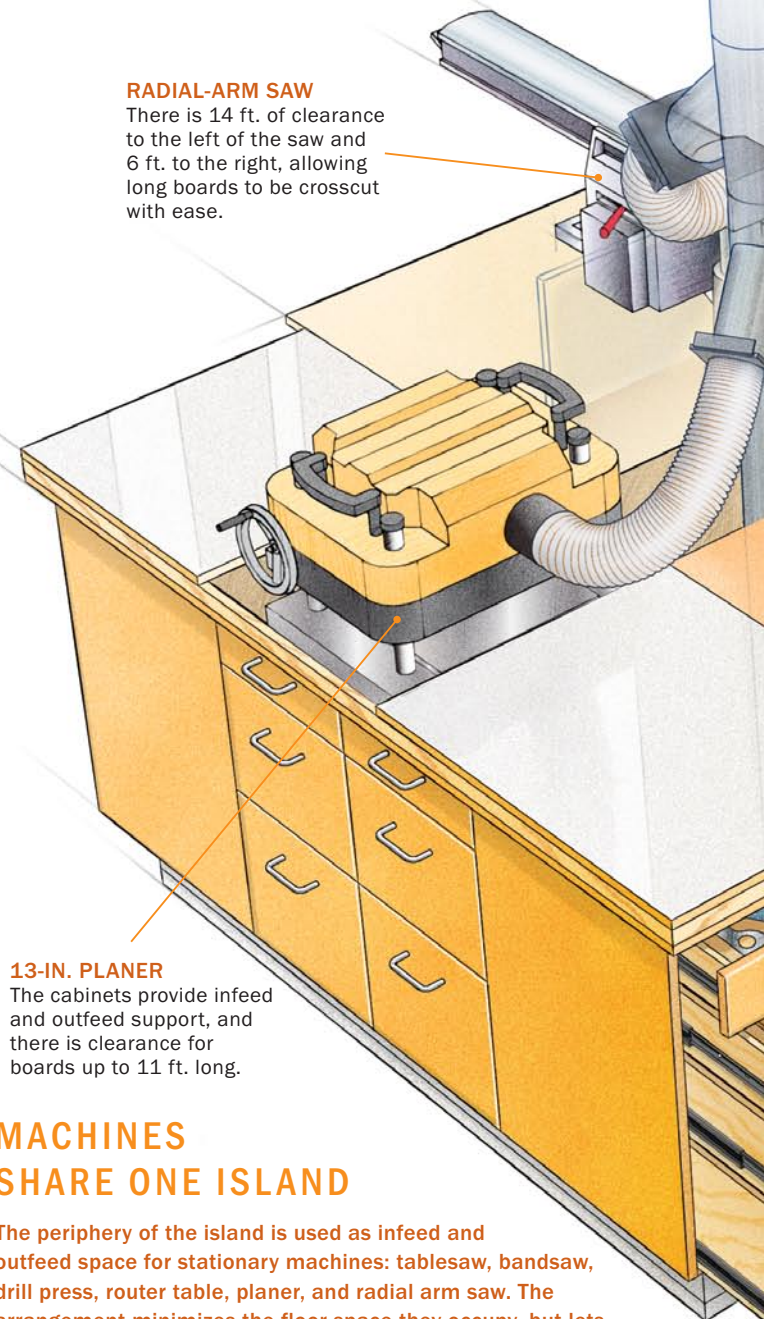


ROUTER INSERT

The router table uses the same fence as the tablesaw, while the large work surface supports long pieces.

RADIAL-ARM SAW

There is 14 ft. of clearance to the left of the saw and 6 ft. to the right, allowing long boards to be crosscut with ease.



13-IN. PLANER

The cabinets provide infeed and outfeed support, and there is clearance for boards up to 11 ft. long.

MACHINES SHARE ONE ISLAND

The periphery of the island is used as infeed and outfeed space for stationary machines: tablesaw, bandsaw, drill press, router table, planer, and radial arm saw. The arrangement minimizes the floor space they occupy, but lets the author work full-length lumber at any position.

an Island

TABLESAW

Placed on a stand so that the table clears the jointer's fence, the tablesaw gets more than 4 ft. of outfeed support from the island.

8-IN. JOINTER

The only tool not built into the island, it is hooked up to the central dust collector and has clearance for boards up to 12 ft. long.

CABINET CONSTRUCTION

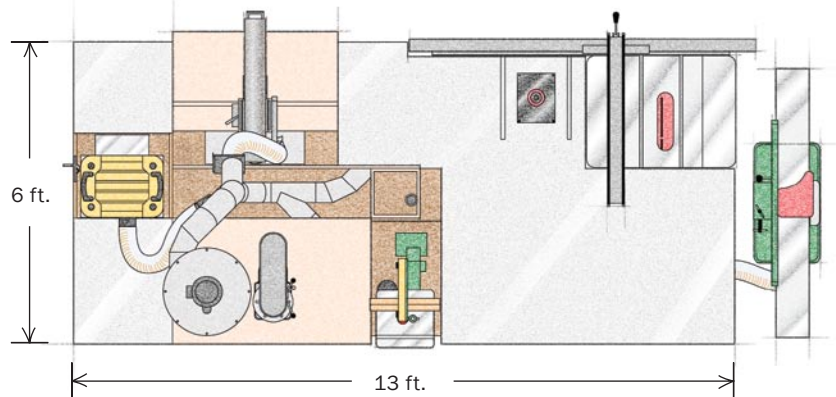
The cabinets are made from ¾-in.-thick particle-board, while the doors are ¾-in.-thick medium-density fiberboard with varnish. There are eight cupboards that hold larger tools and finishing supplies.

14-IN. BANDSAW

The base was removed to lower the table to the same height as the island. There is 6 ft. of support and nearly 11 ft. of clearance on either side of the saw.

DRAWERS GALORE

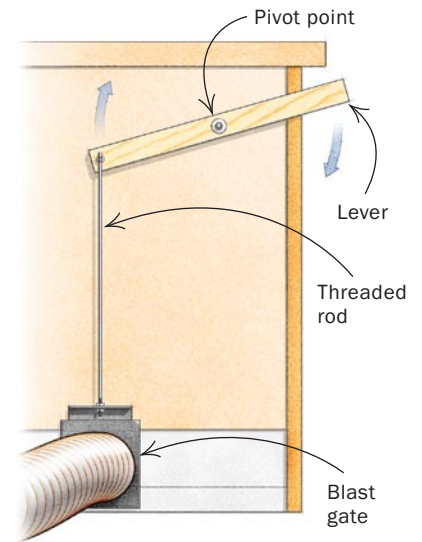
The design gives masses of storage space, including 25 drawers that hold everything from router bits to hand tools.



Work island allows for efficient dust collection



Manual blast gates. Although the dust-collection system comes on automatically when any of the large machines are started, the blast gates are operated manually.



Easier to operate. To avoid bending down, the author attached a simple lever to the blast gate for the table saw.

it in width so that the top surfaces would lay in a level plane when attached to the base. The 2x6s are attached to the base with countersunk 3-in. screws and construction adhesive. With the base complete, I installed the dust-collection ductwork and blast gates (see drawing, facing page).

Another benefit of the island design is the large amount of storage space: 25 drawers and eight cabinets with shelving inside. The base cabinets are made of $\frac{3}{4}$ -in.-thick particleboard on five sides, with the front left open. This construction method is inexpensive, fast, and efficient, wasting no materials or space on face frames. But it is important to cut the panels accurately and square, and to align the edges carefully at assembly. I cut dados $\frac{1}{8}$ in. deep by $\frac{3}{4}$ in. wide to help align the panels, and I used clamps to hold the panels in position while I predrilled and installed $2\frac{1}{4}$ -in. #8 screws at each joint. It's important to get the top surface of the base frame level and flat, so the front opening of the cabinet won't rack out of square when the cabinet is screwed to the base and to the adjacent cabinets.

Each box was screwed to the top of the 2x6 base, and the countertops were attached with screws from inside the boxes. The cabinets are 28 in. deep with a 12-in. space between the two rows for ductwork and filter bags. The cabinet doors and drawer fronts are all made from $\frac{3}{4}$ -in.-thick medium-density fiberboard

(MDF) with rounded-over edges on the outside. The drawer sides and backs are $\frac{1}{2}$ -in.-thick Baltic-birch plywood; the bottoms are $\frac{1}{4}$ -in.-thick tempered hardboard, except for some 26-in.-wide drawers that got $\frac{1}{2}$ -in.-thick plywood bottoms.

The construction method for the drawers is similar to the one described by Lonnie Bird (*FWW* #166, pp. 70-73), with the sides fastened to the fronts with sliding dovetails. I sprayed two coats of clear varnish on the drawers and doors and left the particleboard cabinets unfinished. The drawers were installed in the cabinets using 100-lb.-rated, side-mounted, full-extension, 24-in. ball-bearing slides.

To allow all of the tools to share the 6-ft. by 14-ft. island, the working heights of the tools (except for the jointer) are harmonized at 38 in. above the floor. I placed the table saw so that it is higher than the fence of the adjacent 8-in. jointer, while I lowered the base of the 14-in. bandsaw.

Dust control is centralized and effective

Perhaps it comes from working in the microchip industry with its necessity for clean rooms, but I was determined to keep my shop as dust-free as possible. The workhorse is a 1½-hp dust collector located over the tool island. The ductwork runs between the cabinets in the base with the longest run only 19 ft. All the ducts are 5 in. dia., and the vertical run from the cabinet base to the cyclone inlet is 6 in. dia.

Power to the dust collector is controlled by a current-sensing switch, which means the dust collector comes on whenever I start any of the stationary machines. I operate the blast gates manually, and thanks to the short ductwork, the airflow is good enough to let me work with two gates open at once. □

Alan DeVilbiss, a retired engineer, does woodworking on the west side of Colorado Springs, Colo.

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CENTRALIZED DUST COLLECTION

Grouping all the machines around the island with the dust-collection system in the middle makes for short ductwork with no pipes snaking across the floor or up to the ceiling and back down again.

CYCLONE DUST COLLECTOR

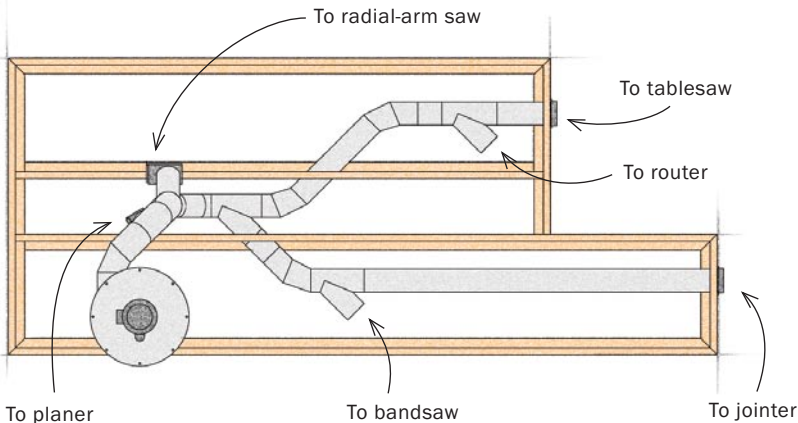
The 1½-hp. dust collector and three 1-ft.-dia. filter bags are suspended from the ceiling.

DUCTWORK

The ducts run in the space below the cabinets and consist of 5-in.-dia. metal tubing and flexible hose with a blast gate for each machine. The vertical pipe to the cyclone intake is 6 in. dia.

A LEVEL BASE

The base consists of 2x4s screwed to the concrete floor, surrounded by 2x6s that are cut to width to compensate for any unevenness in the floor and to create a level platform for the cabinets.



Easy chip collection. The chips from the dust collector fall into a plastic garbage bag kept in a dedicated cabinet. Foam weatherstripping seals the cabinet door when the collector is turned on. It takes only a couple of minutes to remove a full bag and replace it with an empty one.