AMERICAN WOODWORKER

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Revolutionary Router Table

Innovations You Won't Find Anywhere Else

PLUS
Tips for a Hassle-Free Glue-Up

Revolutionary Router Table

Innovative Features Set a New Standard in Router Table Design

by the staff of AMERICAN WOODWORKER

Benchtop or floor model. *Our new router table works in either mode. The benchtop base unit is designed to fit into the floor stand (above), or it can be used on its own with the tabletop and fence (right).*

R outers have revolutionized woodworking, making it possible to remove stock in many ways with great precision. But to get the most from your router, you need a router table. A router table lets you use your router like a small shaper to form profiles, rabbets, grooves, and even dovetails with safety and control.

Our first router table design, published more than two years ago, became one of our most popular projects. (See AW #24.) But since then, the standards for router table performance have gotten higher. Many companies now manufacture router tables, and the number of specialized router-table accessories has increased dramatically.

This time around, we took a fresh approach to give woodworkers more precision, flexibility and convenience than ever before.

A Component Approach

Our design gives you plenty of choices because it's based on components that can be combined in different ways. Depending on your needs, you can build the benchtop version and not miss out on any major features. Or, if a freestanding work station is more to your taste, you can add the stand, with or without its lower storage drawers. (See photos, left.)

If you already own one or more router-table accessories, chances are you can adapt them to work with our design. You could also buy some of the parts rather than build them. We designed the benchtop base and stand to fit most manufactured tops and fences. And you won't have problems adding positioning jigs, feather boards and other aftermarket accessories.

A Full Menu of Features

We started with some fairly standard requirements, knowing that an exceptional router table would need to meet these exceptionally well:

• A dead-flat router tabletop and router base insert.
• A miter slot that's more accurate and longer-wearing than a simple groove routed in the tabletop.
• Precise and adjustable supports for the base insert to keep it perfectly flush with the table, and to accommodate inserts that may vary in thickness.
• A square, straight fence with an adjustable opening.

Hassle-free height adjustment.
No more groping under the table.
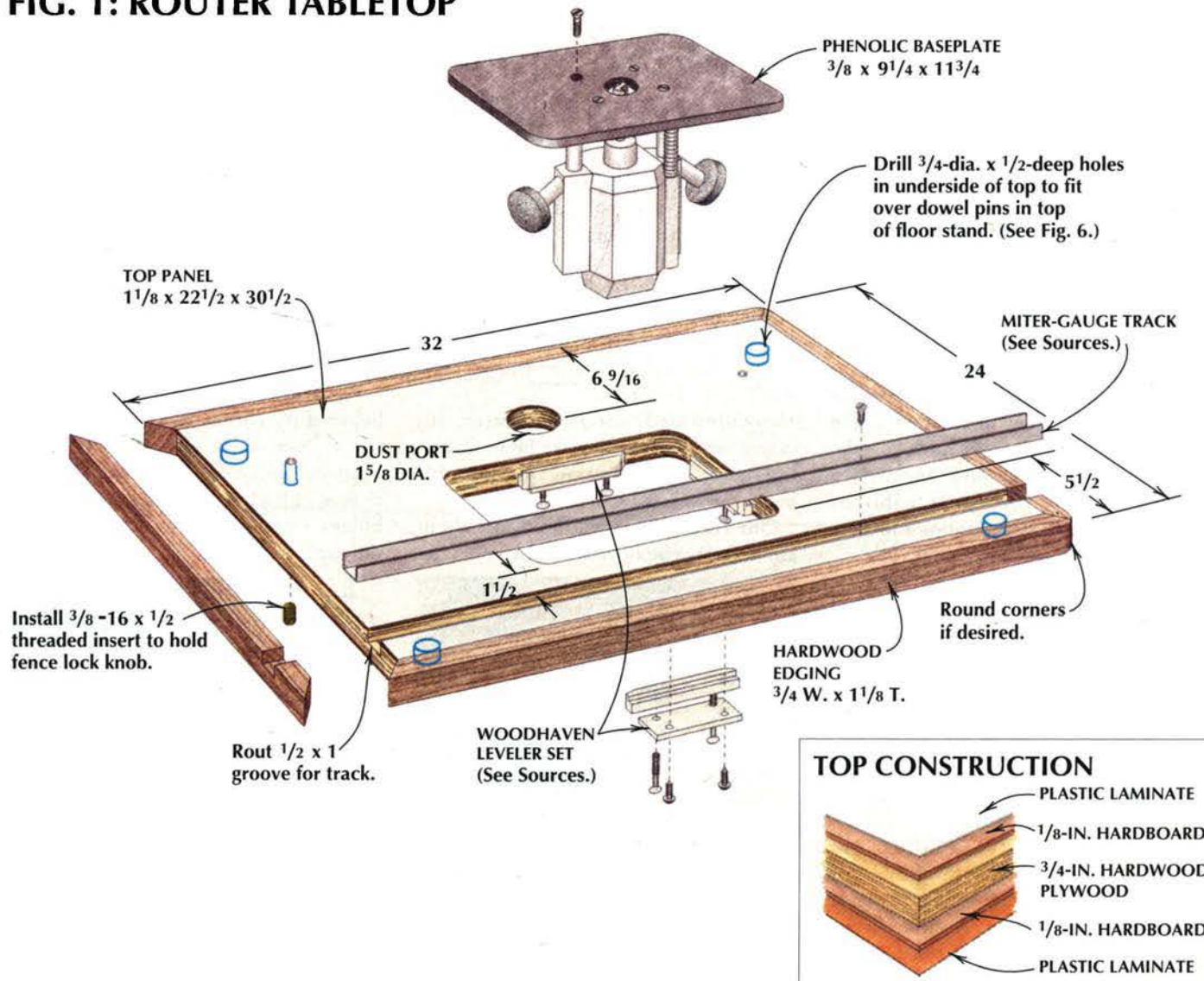Turn the handwheel to raise or lower
the bit in precise increments.

Super-efficient dust collection.
With just a single port at the back of
the base, you can extract sawdust and
chips from under and over the table.

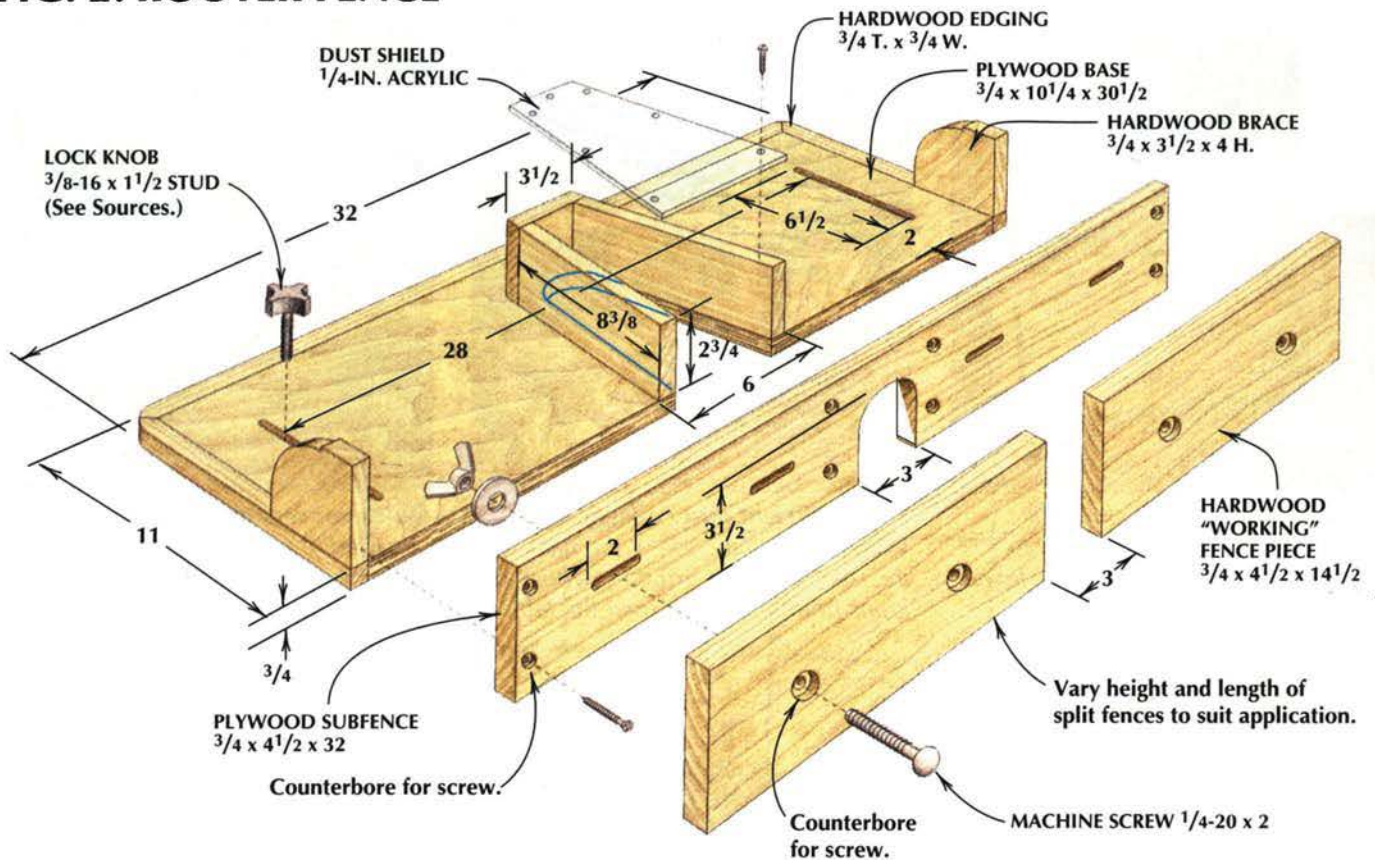**Quick conversion.** With the top
removed, it's easy to slide the base
out of its stand for benchtop or
jobsite use.

FIG. 1: ROUTER TABLETOP

PHENOLIC BASEPLATE
$3/8 \times 9 1/4 \times 11 3/4$

Drill $3/4$-dia. x $1/2$-deep holes
in underside of top to fit
over dowel pins in top
of floor stand. (See Fig. 6.)

TOP PANEL
$1 1/8 \times 22 1/2 \times 30 1/2$

MITER-GAUGE TRACK
(See Sources.)

32

$6 ^{9}/16$

24

DUST PORT
$1 5/8$ DIA.

$5 1/2$

$1 1/2$

Install $3/8$ -16 x $1/2$
threaded insert to hold
fence lock knob.

Round corners
if desired.

HARDWOOD
EDGING
$3/4$ W. x $1 1/8$ T.

Rout $1/2$ x 1
groove for track.

WOODHAVEN
LEVELER SET
(See Sources.)

TOP CONSTRUCTION

PLASTIC LAMINATE

$1/8$-IN. HARDBOARD

$3/4$-IN. HARDWOOD
PLYWOOD

$1/8$-IN. HARDBOARD

PLASTIC LAMINATE

FIG. 2: ROUTER FENCE

DUST SHIELD
1/4-IN. ACRYLIC

HARDWOOD EDGING
3/4 T. x 3/4 W.

PLYWOOD BASE
3/4 x 10 1/4 x 30 1/2

HARDWOOD BRACE
3/4 x 3 1/2 x 4 H.

LOCK KNOB
3/8-16 x 1 1/2 STUD
(See Sources.)

32

3 1/2

6 1/2

2

28

8 3/8

2 3/4

6

3

11

2

3 1/2

3

HARDWOOD
"WORKING"
FENCE PIECE
3/4 x 4 1/2 x 14 1/2

3

3/4

PLYWOOD SUBFENCE
3/4 x 4 1/2 x 32

Counterbore for screw.

Vary height and length of
split fences to suit application.

Counterbore
for screw.

MACHINE SCREW 1/4-20 x 2

•An accessible power switch for safe router operation.
•Ample storage space for bits, wrenches, bases, and other accessories.
•Compatibility with precision alignment jigs such as the Incra Jig and JoinTech.

You'll find all these features in this new router table. But to really push the envelope, we knew we'd have to take precision, convenience, and versatility to new levels. We did quite a bit of research and experimentation, and here are the innovations we came up with:

•**External bit adjustment.** If you're tired of groping under the router table to fine-tune the height of the bit, you'll appreciate the ease and precision of our externally mounted adjustment wheel. It's linked by a flexible shaft to the plunge router's depth-adjustment screw. This idea came from Zach Etheridge, of Highland Hardware in Atlanta.
•**Super-efficient dust collection.** Sawdust is extracted from above and below the table through a single exhaust port at the base's back. A clear acrylic door closes off the base's front to optimize your dust collector's pulling power.

•**One switch for all functions.** A receptacle for the dust collector is wired to the router table's main power switch. Turning on the router automatically turns on your dust collector.
•**Quiet routing.** The door to the router compartment helps keep the lid on noise. This is the quietest router table you'll find anywhere.
•**Benchtop or freestanding status.** It's easy to convert this router table from a freestanding workstation to a portable benchtop or jobsite machine.

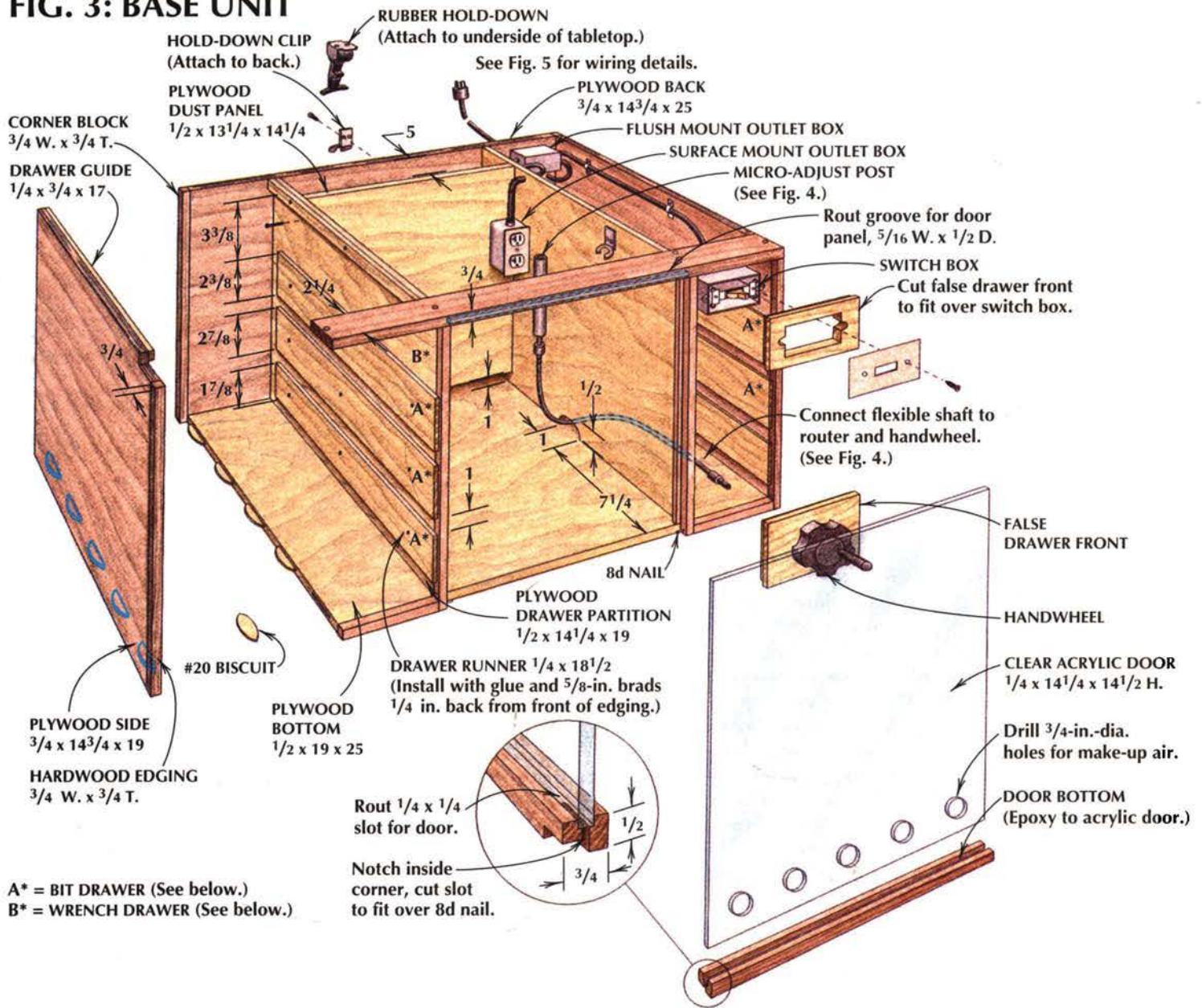Our router table will hold just about any size or type of router, but you'll get the most out of it if you use a plunge router with a plunge lock that can remain in the *unlocked* position. This way you can rotate the handwheel to change bit height without reaching inside the table to hold the plunge lock open. (For more on plunge routers, see AW #33 and #41.)

We also recommend that you use a heavy-duty router (2 1/2 HP or more) and a 3/8-in.-thick phenolic baseplate to resist deflection from the weight of the router. The baseplate rests on leveler blocks which are screwed underneath the top. (See Fig. 1.)
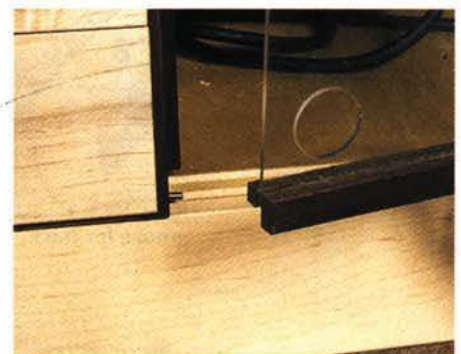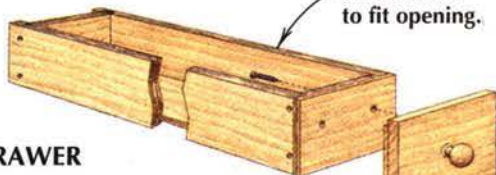

Easy access. *A clear plastic door panel closes off the router compartment, reducing noise and promoting dust collection. The top of the door fits into a groove (left) while the hardwood strip at the bottom of the door slips over two metal pins (right), so you can install and remove the door with ease.*
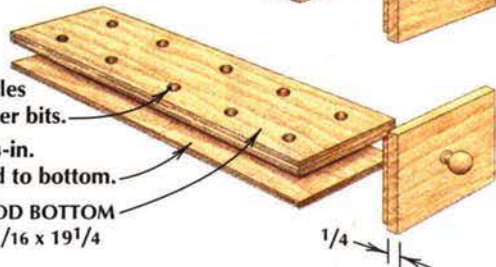
FIG. 3: BASE UNIT

HOLD-DOWN CLIP
(Attach to back.)

RUBBER HOLD-DOWN
(Attach to underside of tabletop.)
See Fig. 5 for wiring details.

PLYWOOD
DUST PANEL
1/2 x 13 1/4 x 14 1/4

PLYWOOD BACK
3/4 x 14 3/4 x 25

CORNER BLOCK
3/4 W. x 3/4 T.

DRAWER GUIDE
1/4 x 3/4 x 17

FLUSH MOUNT OUTLET BOX

SURFACE MOUNT OUTLET BOX

MICRO-ADJUST POST
(See Fig. 4.)

3 3/8

2 3/8

2 1/4

3/4

Rout groove for door
panel, 5/16 W. x 1/2 D.

SWITCH BOX
Cut false drawer front
to fit over switch box.

2 7/8

1 7/8

3/4

B*

A*

A*

1/2

A*

A*

1

'A'

1

A*

1

7 1/4

Connect flexible shaft to
router and handwheel.
(See Fig. 4.)

8d NAIL

#20 BISCUIT

PLYWOOD
DRAWER PARTITION
1/2 x 14 1/4 x 19

FALSE
DRAWER FRONT

HANDWHEEL

CLEAR ACRYLIC DOOR
1/4 x 14 1/4 x 14 1/2 H.

PLYWOOD SIDE
3/4 x 14 3/4 x 19

HARDWOOD EDGING
3/4 W. x 3/4 T.

PLYWOOD
BOTTOM
1/2 x 19 x 25

DRAWER RUNNER 1/4 x 18 1/2
(Install with glue and 5/8-in. brads
1/4 in. back from front of edging.)

Drill 3/4-in.-dia.
holes for make-up air.

DOOR BOTTOM
(Epoxy to acrylic door.)

Rout 1/4 x 1/4
slot for door.

1/2

Notch inside
corner, cut slot
to fit over 8d nail.

3/4

A* = BIT DRAWER (See below.)
B* = WRENCH DRAWER (See below.)

DRAWER CONSTRUCTION

WRENCH DRAWER

Size drawer
to fit opening.

BIT DRAWER

Drill holes
for router bits.

Glue 1/4-in.
plywood to bottom.

PLYWOOD BOTTOM
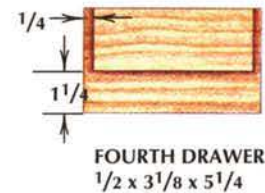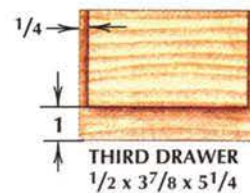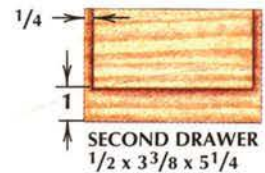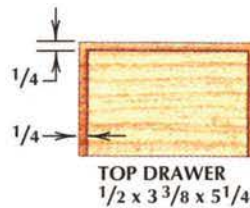3/4 x 4 11/16 x 19 1/4

1/4

BACK VIEW OF DRAWER FRONTS

1/4

1/4

TOP DRAWER
1/2 x 3 3/8 x 5 1/4

1/4

1

SECOND DRAWER
1/2 x 3 3/8 x 5 1/4

1/4

1

THIRD DRAWER
1/2 x 3 7/8 x 5 1/4

1/4

1 1/4

FOURTH DRAWER
1/2 x 3 1/8 x 5 1/4

FIG. 4: BIT HEIGHT ADJUSTER DETAIL

Screw micro-adjust post to router's depth rod.

Cut off knob from micro-adjust post.

Epoxy 1/4-in. socket into post.

Grind flat for set screw.

Saw off end of 1/4-in. drive socket extension and secure to flexible shaft.

SET SCREW

FALSE DRAWER FRONT

FLEXIBLE SHAFT (See Sources.)

HANDWHEEL (See Sources.) Secure to end of flexible shaft.

Counterbore for flex-shaft nut.

Enlarge hole for end of flexible shaft.

SET SCREW

Making the Tabletop

A piece of 3/4-in.-thick plywood forms the tabletop's core. The top gains its rigidity from laminations of 1/8-in.-thick hardboard and plastic laminate that are glued to both sides of the plywood core. (See Fig. 1.) Use yellow or white PVA glue to bond the hardboard to the plywood and contact cement to adhere the plastic laminate. Feel free to use less-expensive backer laminate (plastic laminate without the colored top layer) for the bottom surface. Trim the edges flush with the plywood, then cut and glue on the hardwood edging.

Next, rout a 1/2-in.-deep, 1-in.-wide groove in the top for the metal track. We used a Tru-Fit Miter Track to guide our tablesaw's standard 3/4-in.-wide miter-gauge bar. We chose this track because it adjusts to fit worn guide bars that may be slightly narrower than 3/4 in.

Now rout the opening for the router baseplate. We first made a router template from a piece of 1/4-in. hardboard, jigsawing and filing the template opening to fit the baseplate exactly. After tracing the template opening in the correct location on the tabletop (see Fig. 1), we cut a rough opening to within 1/8 in. of the line. Then we clamped the template to the tabletop and routed the finished opening with a pattern bit (a straight router bit with a bearing above the cutting edge), following the template and taking progressively deeper passes to rout through the table.

To hold our router baseplate flush with the table, we installed a set of Woodhaven plate levelers. These well-designed nylon blocks support the plate on all four sides and have screws for fine height adjustment. (For a more detailed description of how the levelers work, see page 76.)

If you're building the fence that goes with our router table (see Fig. 2), you can finish up the tabletop by drilling a 1 5/8-in.-dia. dust extraction hole as indicated in Fig. 1. When you hook up your dust collector or shop vacuum to the benchtop base unit, this hole will direct sawdust and chips down into the collection chamber.

Making the Fence

If you already own a router fence, you can probably use it with our table. However, our shop-made fence is designed to work with the router table's built-in dust-collection system. (See Fig. 2 and bottom drawing, opposite.) The split fence works much like a shaper's fence: The two "working" pieces can move closer together or further apart when you change cutter sizes. The two-part fence design also lets you use the table to joint the edge of stock by shimming the outfeed fence. And it's easy to replace the split fence if it gets chewed up, or if you need to use a different sized fence.

After you make the fence, drill holes in the tabletop for the threaded inserts that hold the fence lock knobs. (See Fig. 2.) You can also use these knobs and inserts to attach Incra or JoinTech jigs.

Making the Base Unit

The base unit (see Fig. 3) forms the core of our router table. All the features you want are here in a portable package that can stow away easily or be transported to a jobsite. To make the benchtop unit into a floor model, simply build the stand. (See Fig. 6.)

To create a sturdy yet lightweight benchtop unit, we built the base from hardwood plywood. Make sure your router will fit inside the router compartment, with a minimum of 4 in. between the end of the router's height-adjustment screw and the bottom of the cabinet. If the inside of the router compartment isn't wide enough for your router, or if you plan to use a different base-
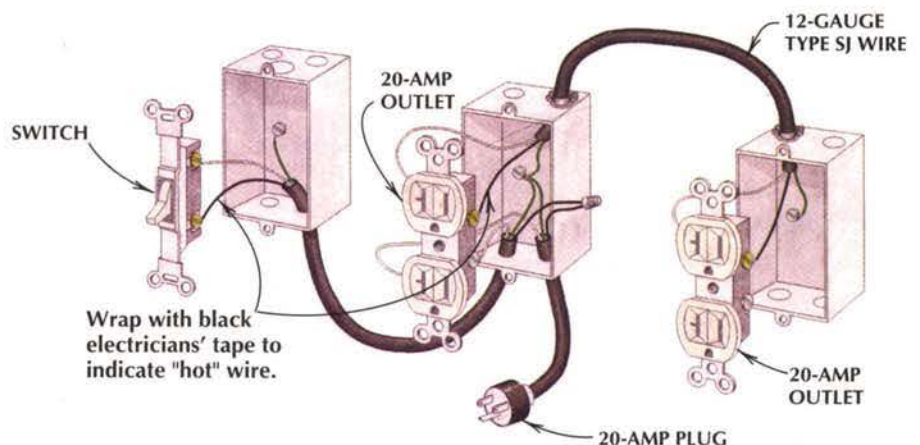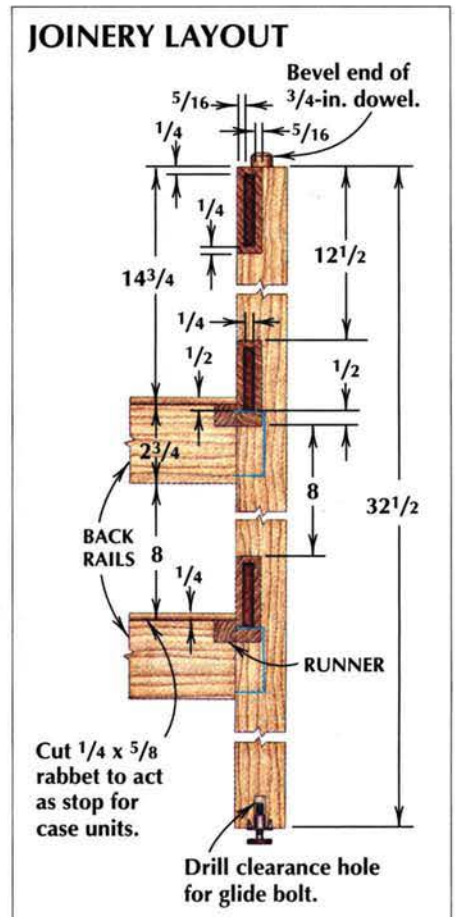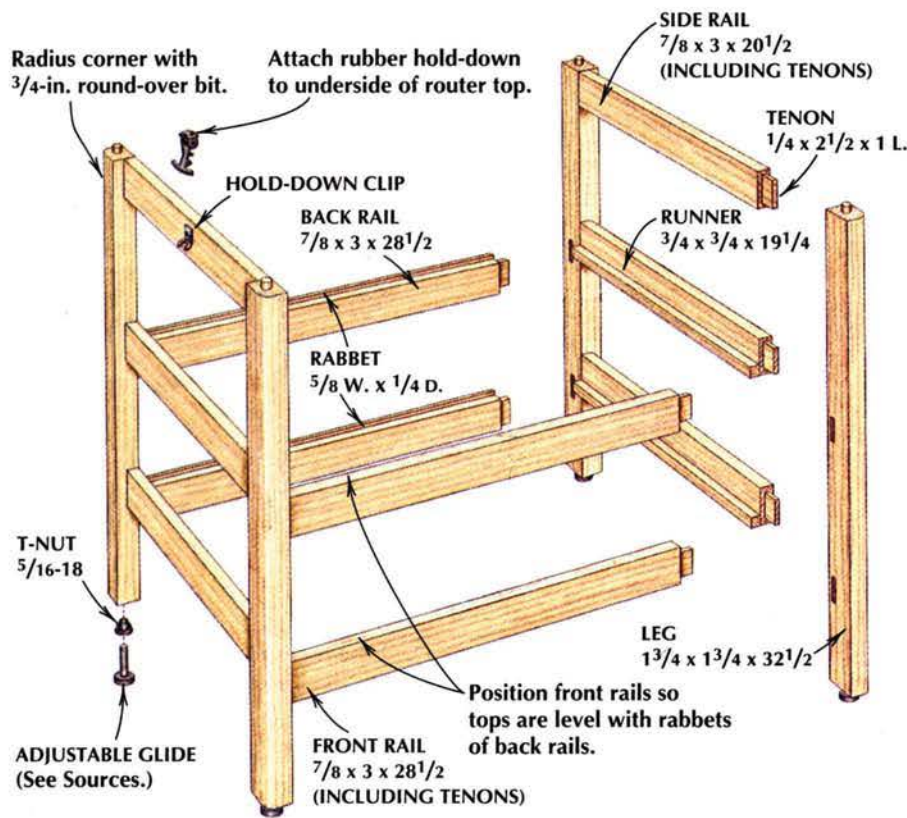
FIG. 5: WIRING DIAGRAM

SWITCH

20-AMP OUTLET

12-GAUGE TYPE SJ WIRE

Wrap with black electricians' tape to indicate "hot" wire.

20-AMP PLUG

20-AMP OUTLET

FIG. 6: FLOOR STAND

Radius corner with
3/4-in. round-over bit.

Attach rubber hold-down
to underside of router top.

HOLD-DOWN CLIP

BACK RAIL
7/8 x 3 x 28 1/2

RABBET
5/8 W. x 1/4 D.

T-NUT
5/16-18

ADJUSTABLE GLIDE
(See Sources.)

FRONT RAIL
7/8 x 3 x 28 1/2
(INCLUDING TENONS)

Position front rails so
tops are level with rabbets
of back rails.

SIDE RAIL
7/8 x 3 x 20 1/2
(INCLUDING TENONS)

TENON
1/4 x 2 1/2 x 1 L.

RUNNER
3/4 x 3/4 x 19 1/4

LEG
1 3/4 x 1 3/4 x 32 1/2

JOINERY LAYOUT

Bevel end of
3/4-in. dowel.

5/16
1/4
5/16
1/4
14 3/4
12 1/2
1/4
1/2
1/2
2 3/4
8
BACK
RAILS 8
32 1/2
1/4
RUNNER

Cut 1/4 x 5/8
rabbet to act
as stop for
case units.

Drill clearance hole
for glide bolt.

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plate, you may have to change the interior dimensions by moving the drawer partitions and/or the dust panel.

Bit and wrench storage—The narrow drawers that flank the center opening in the base are perfect for storing router bits, wrenches, collets and other small accessories. Size the holes in the bit drawers to fit the shank diameters of your bits.

Flex-shaft height adjustment—The key to the handwheel adjusting mechanism for bit height is a flexible shaft that turns inside its own stationary housing. We couldn't find the type of shaft we needed from any mail-order source, so we had one made by a company that specializes in flexible shafts for industry.

One end of the flex-shaft is connected to a handwheel. At the other end of the shaft we installed a cut-off 1/4-in. drive socket extension with a ball detent. The extension snaps into a 1/4-in. drive socket. We recommend a drive socket that has small dimples on the inside of the drive end (available at Sears) for positive locking onto the extension. We epoxied the socket into the open end of a Woodhaven micro-adjustment knob
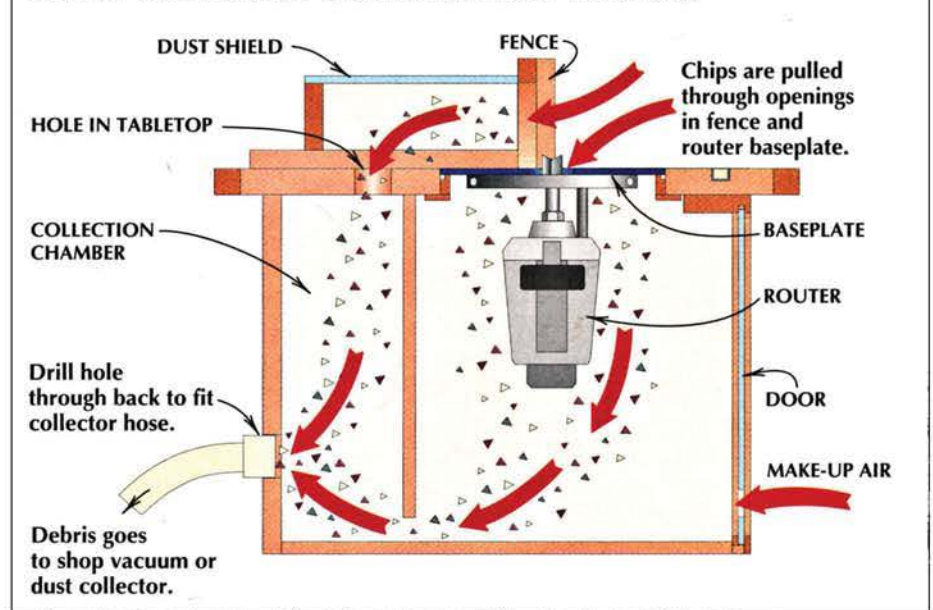
that has its handle cut off. The opposite end of the knob screws onto the plunge router's threaded rod. (See Fig. 4.) This arrangement allows you to disengage the flex-shaft easily when you need to remove the router from the table.

Dust collection—Chips and dust are collected from two areas on the router

table: the fence and the router compartment. A hole drilled in the top directs debris into the collection chamber in the base unit. To access the dust chamber, drill a hole through the back of the base whose diameter matches that of your shop vacuum or dust-collector hose.

The removable acrylic door seals off

HOW THE DUST COLLECTION WORKS

DUST SHIELD

FENCE

Chips are pulled
through openings
in fence and
router baseplate.

HOLE IN TABLETOP

COLLECTION
CHAMBER

BASEPLATE

ROUTER

DOOR

Drill hole
through back to fit
collector hose.

MAKE-UP AIR

Debris goes
to shop vacuum or
dust collector.

the router compartment to improve suction. Drill holes at the bottom of the door for make-up air so chips don't settle at the front of the compartment.

Power switching—As shown in Fig. 3, the benchtop base unit contains two outlet boxes, or receptacles. One receptacle is mounted inside the router compartment; the other is installed in the back of the base. Both boxes are wired to the main switch box at the front of the unit, so you can turn the router and the dust collector on and off at the same time. (See Fig. 5.)

Attaching the tabletop—Engaged against matching clips, three rubber hold-downs secure the top to the base. Screw one clip to the base back as shown in Fig. 3, then fasten its rubber hold-down to the underside of the table. Install the remaining pair of clips on opposite sides of the router compartment and fasten their hold-downs to the top of the table.

Making the Floor Stand

Our stand is designed to hold the tabletop on its own, or it can hold the entire benchtop unit. The stand also has room for its own set of drawers. (See photos, page 30.)

We made the basic frame using mortise-and-tenon joints for strength. (See Fig. 6.) Though our rails are $7/8$ in. thick, feel free to substitute $3/4$-in.-thick stock if that's what you have on hand.

Pins and holes—In the top of each leg, we drilled a $3/4$-in.-dia., $1/2$-in.-deep hole for a dowel pin that registers in a corresponding hole drilled in the underside of the tabletop. It's a good idea to bevel the top edges of the dowels. That way, they'll find the holes in the top when you go to position it on the stand. Two more rubber hold-downs secure the top to the stand.
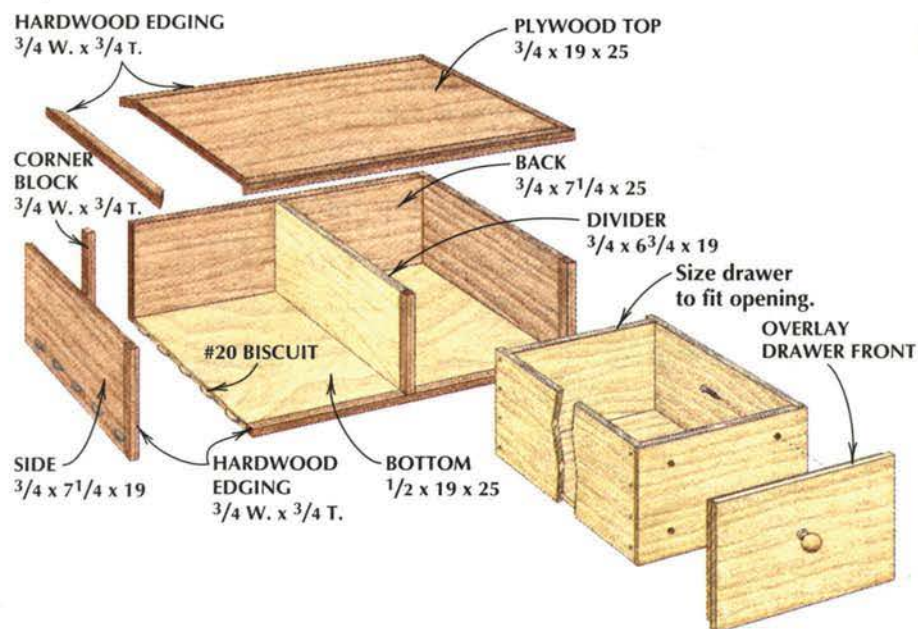
Adjustable glides—To keep the stand steady on uneven floors, we screwed adjustable glides into T-nuts that were installed in the bottoms of the legs.

Drill the holes for the T-nuts 2 in. deep so that the glide screws can adjust fully into the legs.

Lower storage unit—The optional drawer cabinet (see Fig. 7) converts the open area near the base of the stand into a useful storage space for larger items such as extra baseplates, feather boards, and edge guides. The cabinet holds a pair of drawers with overlay fronts. If you don't need drawers, you can lay a piece of plywood on the support rails to create a shelf. ▲

FIG. 7: DRAWER CABINET

HARDWOOD EDGING
$3/4$ W. x $3/4$ T.

PLYWOOD TOP
$3/4$ x 19 x 25

CORNER BLOCK
$3/4$ W. x $3/4$ T.

BACK
$3/4$ x $7^1/4$ x 25

DIVIDER
$3/4$ x $6^3/4$ x 19

Size drawer to fit opening.

OVERLAY DRAWER FRONT

#20 BISCUIT

SIDE
$3/4$ x $7^1/4$ x 19

HARDWOOD EDGING
$3/4$ W. x $3/4$ T.

BOTTOM
$1/2$ x 19 x 25