HO-023 Two-level removable-pin cabinet shelf module

Build a small complete cabinet component whose shelf can be removed and repositioned without taking apart the carcass.

Original bounded component build. Dimensions describe this example, not an approved structural, occupied-building or universal fit design.

US inches/feet control; metric figures are references. No physical build, load certification or animal trial performed.

Before cutting

Read the whole assembly and inspect its receiving space before cutting. Measure actual sheet thickness; nominal lumber labels do not control these joints.

Set aside straight, clean stock and allow it to acclimate. Keep fingers clear of blades, clamp work and use tool-appropriate eye/hearing protection.

Dry-fit moving pieces before final fastening; stop if a proposed dimensional substitution changes clearances. Purchased hardware dimensions and hole patterns below must match the actual item.

Materials and actual cuts

Part	Qty	Actual size	Material and special cut
A Wide-footprint base	1	15 x 12 x 3/4 in 381.00 x 304.80 x 19.05 mm	W: untreated sound wood/plywood. Square ends; remove all splinters and burrs.
B Upright side	2	14 x 10 x 3/4 in 355.60 x 254.00 x 19.05 mm	W: untreated sound wood/plywood. Inside-face pin bores: 1/4 in diameter,1/2 in stopped depth; center rows 3 1/4 and 8 1/4 in above side bottom,2 and 8 in from its front edge.
C Top tie	1	15 x 10 x 3/4 in 381.00 x 254.00 x 19.05 mm	W: untreated sound wood/plywood. Square ends; remove all splinters and burrs.
D Lift-out adjustable shelf	1	13 3/8 x 9 7/8 x 1/2 in 339.73 x 250.82 x 12.70 mm	W: untreated sound wood/plywood. Square ends; remove all splinters and burrs.
E Removable shelf support pin	4	1 x 1/4 x 1/4 in 25.40 x 6.35 x 6.35 mm	Straight 1/4 in round hardwood dowel; actual diameter verified in trial bores Round ends without shortening the 1 in overall length. Mark insertion depth 7/16 in from one end.

Hardware and tools

16 x #8 x 1 1/4 in countersunk wood screw. Eight base-to-side and eight top-to-side screws; actual points retained in receiving wood

Tape, square, pencil; clamped saw setup appropriate to the material; drill/driver and depth stop; countersink for wood fasteners; files/sanding block; clamps. Specific additional tools are noted in the steps.

Measured assembly reference

Coordinates refer to the illustrated pose: x left/right, y front/rear, z up. Positions are inches from the front-left underside datum. A negative position projects beyond that datum. The size vector gives the part orientation before any stated rotation; it is not a substitute for its cut profile.

Part / instance	Origin x, y, z	Size dx, dy, dz / rotation
A / 1	0, 0, 0 in 0.00, 0.00, 0.00 mm	15 x 12 x 3/4 in Rotation x/y/z: 0.0000, 0.0000, 0.0000 deg
B / 1	0, 1, 3/4 in 0.00, 25.40, 19.05 mm	3/4 x 10 x 14 in Rotation x/y/z: 0.0000, 0.0000, 0.0000 deg

Part / instance	Origin x, y, z	Size dx, dy, dz / rotation
B / 2	14 1/4, 1, 3/4 in 361.95, 25.40, 19.05 mm	3/4 x 10 x 14 in Rotation x/y/z: 0.0000, 0.0000, 0.0000 deg
C / 1	0, 1, 14 3/4 in 0.00, 25.40, 374.65 mm	15 x 10 x 3/4 in Rotation x/y/z: 0.0000, 0.0000, 0.0000 deg
D / 1	13/16, 1 1/16, 4 1/8 in 20.64, 26.99, 104.77 mm	13 3/8 x 9 7/8 x 1/2 in Rotation x/y/z: 0.0000, 0.0000, 0.0000 deg
E / 1	5/16, 2 7/8, 3 7/8 in 7.94, 73.02, 98.42 mm	1 x 1/4 x 1/4 in Rotation x/y/z: 0.0000, 0.0000, 0.0000 deg
E / 2	5/16, 8 7/8, 3 7/8 in 7.94, 225.42, 98.42 mm	1 x 1/4 x 1/4 in Rotation x/y/z: 0.0000, 0.0000, 0.0000 deg
E / 3	13 11/16, 2 7/8, 3 7/8 in 347.66, 73.02, 98.42 mm	1 x 1/4 x 1/4 in Rotation x/y/z: 0.0000, 0.0000, 0.0000 deg
E / 4	13 11/16, 8 7/8, 3 7/8 in 347.66, 225.42, 98.42 mm	1 x 1/4 x 1/4 in Rotation x/y/z: 0.0000, 0.0000, 0.0000 deg

Numbered assembly

01. Build a benchtop cabinet module only. There is no shelf load rating, anti-tip anchorage or occupied-building installation detail; keep the component on a level protected workbench.

02. Cut A 15 x 12 x 3/4 in, two B 14 x 10 x 3/4 in, C 15 x 10 x 3/4 in and D 13 3/8 x 9 7/8 x 1/2 in. Check actual thickness before transferring the mating widths.

03. Lay the two B inside faces upward and mark their common front and bottom edges. On each mark y 2 and 8 in from its own front, at heights 3 1/4 and 8 1/4 in above its bottom: four centers per side.

04. Drill each marked B bore 1/4 in diameter and 1/2 in deep using a physical depth stop and a square-backed guide. Test the actual dowel in an offcut first; do not break through the outer side face.

05. Place B upright on A at x 0-3/4 and 14 1/4-15 in, both with front at y 1 in. Their inside faces are 13 1/2 in apart. Keep the unbored faces outward.

06. Clamp both sides square. Pilot/countersink four screws upward through A into each B bottom edge at y 2,4 1/2,7 and 9 1/2 in, centered through the 3/4 in side thickness. Drive eight #8 x 1 1/4 in screws.

07. Set C across the side tops, matching their y 1-11 in footprint. Pilot four screws per side at the same y positions, then drive eight #8 x 1 1/4 in screws down through C into B. Keep the inside width parallel.

08. Cut four E pins 1 in long. On each mark a line 7/16 in from one end; ease the circumference of that end enough to enter the trial bore without hammering. Preserve the bearing diameter and reject split dowels.

09. Insert all four pins to the marked 7/16 in depth in the LOWER row. The 1/2 in bore leaves 1/16 in blind-end space, and each pin projects 9/16 in inside the carcass. The chosen row centers are globally z 4 in.

10. Lower D between the sides with 1/16 in clearance at each side and at its front/rear. Its underside sits at z 4 1/8 in on the four 1/8 in-radius pin crowns. Confirm all four contact before adding a light test object.

11. Remove the object and shelf, move every pin to the UPPER row, then reinstall the shelf. The upper underside position is z 9 1/8 in. Never change height while an object remains on the shelf.

12. Cycle the unloaded shelf between the two levels five times. Stop at rocking, a loose pin, split bore or carcass racking. A subsequent furniture design needs its own load, anchorage and restraint assessment.

Acceptance and intermediate checks

The eight stopped bores remain inside the 3/4 in side thickness.

Side inside spacing is 13 1/2 in at both front/rear and top/bottom.

Each of four pins has 7/16 in insertion and 9/16 in projection; shelf bears on all four.

The empty shelf lifts out and fits both rows without forcing or racking.

Use and maintenance

No seating, stepping, climbing, child-access installation or stored-load capacity is supplied.

Do not glue the removable pins in place, deepen the bores through the outer face or add an unassessed wall mount.

Empty the shelf before inspecting it. Check the sixteen carcass screws, side-bore edges and all four pins for looseness, cracks or crushed fibers; stop at racking or a rocking shelf. Remove the shelf and pins to brush dust from their bearing faces. Use the actual wood or finish supplier cleaning method; do not soak the stopped bores or leave moisture inside them. Dry fully before replacing the pins. After a humidity change repeat the empty fit and four-point contact check at the selected level. Replace a damaged pin or split side rather than driving a larger pin into an unassessed bore. No stored-load or anchorage rating is established.

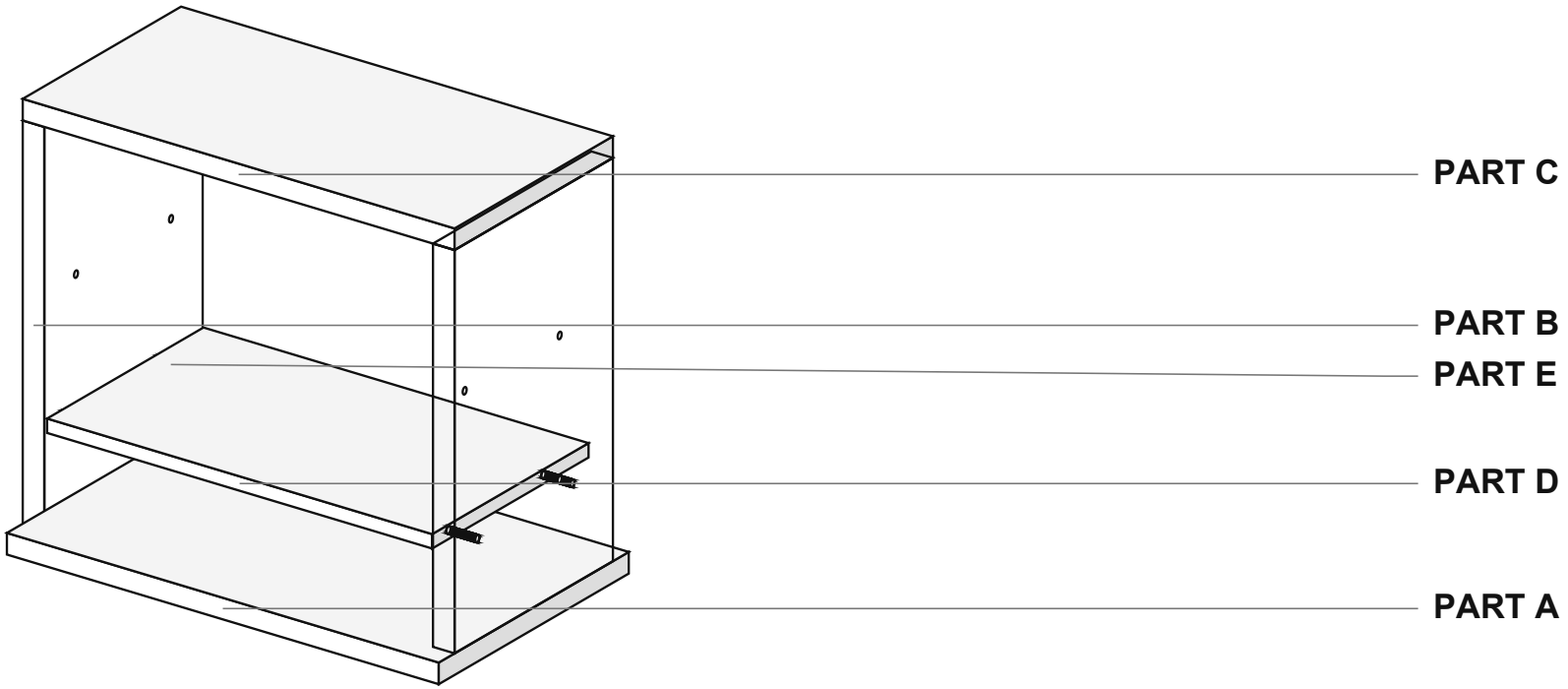
Primary context references

S4: Purdue University Extension, Wood drying: FNR-37. https://extension.purdue.edu/extmedia/FNR/FNR-37.html

S7: American Wood Council, 2021 Code Conforming Wood Design, wall-framing context. https://awc.org/wp-content/uploads/2023/11/CCWD2021_20231129_AWCWebsite.pdf

HO-023 | SHELF SUPPORT CUTAWAY

Side panels B shown in outline to expose the shelf pins and stopped bore positions.



Displayed envelope (width x depth x height):

15 in x 12 in x 15 1/2 in

Metric: 381.0 x 304.8 x 393.7 mm

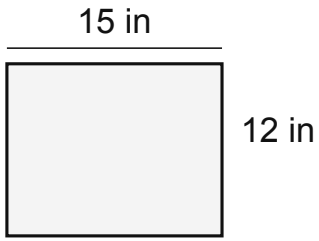
Locate joints and hardware using the numbered steps; view is not a full-size pattern.

Original B/W vector drawing - dimensions control - unbuilt / untested

HO-023 | PART SIZES 1 OF 1

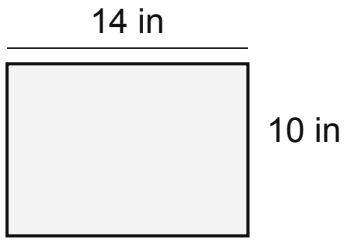
Actual dimensions; labels identify any stock blanks. Allow for saw kerfs between pieces.

A Wide-footprint base x1



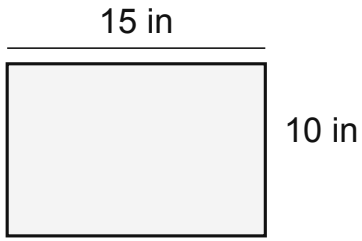
Face: 381.0 x 304.8 mm
Thickness: 3/4 in / 19.05 mm
Special cuts: see cut list and steps.

B Upright side x2



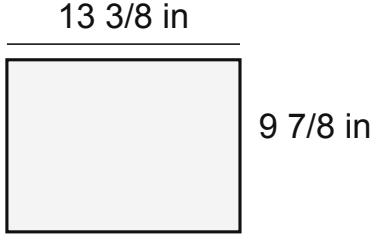
Face: 355.6 x 254.0 mm
Thickness: 3/4 in / 19.05 mm
Special cuts: see cut list and steps.

C Top tie x1



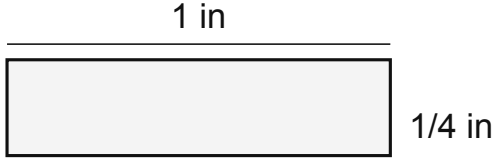
Face: 381.0 x 254.0 mm
Thickness: 3/4 in / 19.05 mm
Special cuts: see cut list and steps.

D Lift-out adjustable shelf x1



Face: 339.7 x 250.8 mm
Thickness: 1/2 in / 12.70 mm
Special cuts: see cut list and steps.

E Removable shelf support pin x4



Face: 25.4 x 6.3 mm
Thickness: 1/4 in / 6.35 mm
Special cuts: see cut list and steps.

Original B/W vector drawing - dimensions control - unbuilt / untested