

Under-desk clamp-on homelab rack

33" W × 10" D × 10" H · ¾" PureBond birch plywood (0.703" actual) · two opposite-facing U bays, 3-15/16" clear each · no drilling into the desk

The design in one paragraph

A single rigid plywood box hangs under the desk on four removable C-clamps. One horizontal shelf splits it into two bays of 3-15/16" clear height. The lower bay is closed at the wall side and open toward your chair — four mini PCs and the FireCuda live there, all in one row. The upper bay is closed at the front and open toward the wall — that is where the Ethernet switch, the power strips, the bricks and every spare metre of cable hide. Five 2" grommets in the shelf take each machine's cables straight up out of sight, and six 2" holes in the rear wall let anything that wants to go straight back do so. From the chair you see one clean equipment bay and nothing else.

What changed in this revision

The envelope came down from 36 × 10½ × 10-1/8 to **33 × 10 × 10**. Home Depot lists the PureBond sheet as **0.703" actual** (23/32"), not 0.750", so everything thickness-dependent is derived from that:

	Before	After	Change
Overall size	36 × 10½ × 10-1/8	33 × 10 × 10	
Clear width, each bay	34-19/32"	31-5/8"	-3"
Clear depth, each bay	9-13/16"	9-5/16"	-1/2"
Clear height, each bay	4"	3-15/16"	-1/16"
Usable volume per bay	1,356 in³	1,157 in³	-14.7%
Inner panel length	34-9/16"	31-9/16"	
Side panel height	8-11/16"	8-9/16"	

Bay height is 3-15/16" rather than a flat 4" because 10" minus three 0.703" panels leaves 3.9455" per bay — not a number you can mark on a tape. Rounding the walls to 3-15/16" puts the overall height at 9.984", i.e. 1/64" under 10".

The switch moved to the cable bay. At 33" wide, six devices in the front row would have had only 0.40" of air between them. With five they get 1.12", and the switch is now sitting with the patch leads it belongs to. It is 1.1" tall, so it fits the upper bay easily.

The inner length works out at 31.594" exactly and is rounded **down** to 31-9/16" on purpose — a piece that has to drop in between the two sides must never be long. The 1/32" of slack disappears under glue.

PureBond's face veneer is only about 1/42" thick and tears easily, so back every hole with scrap and use a sharp blade. It is a 7-ply sheet at roughly 70 lb — plan how you are getting it home before you buy it.

1 · Cut list

All pieces ¾" nominal. All cuts are straight rectangles. Finished sizes.

#	Part	Length	Width	Qty	Rip	Holes
1	Top panel	33"	10"	1	R1	none
2	Clamp doubler	31-9/16"	2-3/4"	1	R3	none
3	Front wall	31-9/16"	3-15/16"	1	R3	none
4	Middle shelf	31-9/16"	10"	1	R2	5 × 2" grommet holes, one per device

#	Part	Length	Width	Qty	Rip	Holes
5	Side panel (left)	10"	8-9/16"	2	R2	none
6	Rear wall	31-9/16"	3-15/16"	1	R3	6 x 2" cable pass-throughs, equally spaced
7	Bottom panel	33"	10"	1	R1	12 x 1-1/2" vent holes, 2 rows of 6

Buy: one 4' × 8' sheet of ¾" PureBond Birch Plywood — Home Depot internet #100077837, model #165921, about \$75–95. You will use roughly 36% of it and keep a 96" × 20¼" offcut. See drawing sheet 8 for the layout and sheet 9 for exactly what to ask the panel-saw associate for.

2 · Hole schedule — 23 holes, 3 panels, 2 hole saws

Panel	Count / size	Positions along the piece	Across	Purpose
Middle shelf	6 × 2"	3-11/16" · 9-15/16" · 16-3/16" · 22-7/16" · 28-5/16"	7-1/2" from the front edge	cables up into the hidden cable bay; rubber grommets fit these
Bottom panel	12 × 1-1/2"	3-1/4" · 8-1/2" · 13-3/4" · 19" · 24-1/4" · 29-1/2"	two rows, 2-1/2" and 5" from the front	cool air in — a pair under every device, both rows inside its footprint
Rear wall	6 × 2"	2-5/8" · 7-7/8" · 13-3/16" · 18-7/16" · 23-11/16" · 28-15/16"	2" up (mid-height)	cables straight back to the wall without going up through the shelf

Rear-wall spacing is a true equal pitch of 5.266" with symmetric 2.633" end margins, exactly as you asked. It happens to land every hole within 11/8" of a device centreline, so each one still sits fully behind its machine.

Measure from the left end of the piece in front of you. The shelf sits between the sides, so its own left end starts 11/16" further in than the bottom panel's — its marks are 11/16" smaller even though the holes line up once assembled.

Hole saws needed: 1½" and 2". Drill everything before assembly, with the panel clamped over sacrificial scrap.

3 · Can Home Depot do the cuts and the holes?

Cuts — yes. Every store has a panel saw and will break a sheet down for you. Policy varies by store: many give you the first cut or two free then charge around a dollar each, and some cap the total. This design needs nine cuts, which is on the high side, so call ahead. Treat the panel saw as $\pm 1/16"$, not a cabinet shop.

Holes — no. Home Depot does not drill, bore or cut circles as a service at any store. All 24 holes are yours, with a drill and the two hole saws. It is about twenty minutes of work.

The saved-by-design trick

Ask for the three long rips first. Every pair of panels that must match each other comes off the same strip, so their shared dimension is identical no matter what the saw actually did. That is why sloppy store cuts do not hurt this design.

Leave the two side blanks square at $10" \times 10"$ and trim them to $8-9/16"$ yourself after you have measured your actual sheet with calipers. It is the one dimension worth getting right at home.

Drawing sheet 9 is written as a numbered cut request you can hand straight to the associate.

4 · Hardware list

Item	Spec	Qty	Notes
Heavy-duty C-clamp	4" opening, min. 2" throat, cast or malleable iron	4	Must span 1" desk + 0.703" top + 0.703" doubler = 2.41" minimum. A 4" clamp gives margin.
Clamp pads	2" $\times$ 2" adhesive cork or EVA foam, 1/8" thick	8	Two per clamp, one on each jaw. Stops marking and adds grip.
Anti-slip strip	¾" $\times$ 33" adhesive silicone or cork tape	1 roll	Between the top panel and the desk underside. Kills creep and rattle.
Cable grommets	2" snap-in rubber desk grommets, black	6–12	6 for the shelf. Grommet the rear wall too if you want it tidy, or just sand and paint those edges — they face the wall.
Wood screws	#8 $\times$ 1½" flat-head, coarse thread	60	About 56 used. Always into pre-drilled holes.
Wood glue	Titebond II or III	1 bottle	A bead on every joint. The glue does most of the structural work.
Hole saws	1½" and 2", bi-metal, with arbor	2	The only two you need. A 2" Milwaukee Hole Dozer comes with the arbor.
Primer	Grey or white wood primer / sanding sealer	1 can	Birch takes primer well. One coat is enough.
Topcoat	Flat black enamel, spray or brush	2 cans	Flat reads as IT equipment. Satin starts looking like furniture.
Edge banding (optional)	¾" black iron-on veneer tape	1 roll	Hides the plies on the front edges. Biggest visual upgrade for the money.
Velcro ties + cable clips	Black, reusable	1 pack + 10	Dress the loom inside the cable bay and along the front wall.

5 · Assembly sequence

	Step	What to do
a	Sub-assembly first	Glue and screw the clamp doubler (2) to the underside of the top panel (1), flush with the wall-side edge and centred across the width. Four screws down through the top face, countersunk. Set aside to cure.
b	Sides to the bottom	Stand the two side panels (5) on the bottom panel (7), flush with the outer edges. Glue, then drive #8 × 1½" screws up through the bottom panel into the side edges, four a side. Check square with a framing square before the glue grabs.
c	Rear wall	Drop the rear wall (6) in between the sides, sitting on the bottom panel, flush with the wall-side edge. Screw through each side into its ends and up through the bottom into its lower edge.
d	Middle shelf	Rest the middle shelf (4) on top of the rear wall — the wall's 4" height sets the shelf position for you, so there is nothing to measure. Screw through both sides into the shelf edges, seven a side.
e	Front wall	Drop the front wall (3) in between the sides on top of the shelf, flush with the front edge. Screw through the sides into its ends and up through the shelf.
f	Cap it	Lower the top panel sub-assembly on. Screw down through it into both sides and into the top edges of the front and rear walls. The box is now a closed section and should feel completely rigid — if you can rack it by hand, a joint is starved of glue or short of screws.
g	Finish	Fill screw holes, sand to 180, prime, two thin coats of flat black. Iron on edge banding if using. Let it harden overnight before the grommets go in or they will pick up the paint.

Screw pattern

#8 × 1½" at roughly 6" centres — about seven per long joint, two per short joint, 56 in total. Every screw into a pre-drilled hole: 9/64" clearance through the outer panel, 3/32" pilot into the receiving edge, then countersink. Plywood edge grain splits easily and there is no recovering from it. Keep every screw at least 3/8" from a panel end.

6 · Mounting it to the desk

Clamp centres at 4-1/8", 12-3/8", 20-5/8", 28-7/8" across the 33" width — an even 8-1/4" pitch, no unsupported span over 8¾", every clamp landing on the doubler. All four clamp at the **rear** edge of the desk so nothing intrudes on your knee space and the clamp bodies hide against the wall.

Lift the rack flat against the desk underside with its wall-side edge aligned to the desk's rear edge. Get a helper or prop it on books — it is 25 lb empty and awkward. Fit the two outer clamps first, snug not tight, check the rack is square to the desk edge, then fit the inner two and bring all four up evenly.

Load check

	Weight
Rack itself (¾" birch, holes deducted)	21.7 lb
4 × Beelink mini PC + FireCuda (front bay)	7.5 lb
Switch, power strips, adapters, cabling (cable bay)	9.0 lb
Total hanging load	38.2 lb
Per clamp	9.5 lb

Around 10 lb per clamp is trivial for a 4" cast-iron C-clamp rated in the hundreds. The real limits are your desktop's own strength and the clamps not creeping — hence the anti-slip strip. Check them after the first week, then every few months.

7 · Fitting out the bays

Item	Approx. size	X span	Gap to its left
Beelink mini PC #1	5.1" × 5.1" × 2.0"	1.83" – 6.92"	1.12"
Beelink mini PC #2	5.1" × 5.1" × 2.0"	8.07" – 13.18"	1.15"
Beelink mini PC #3	5.1" × 5.1" × 2.0"	14.32" – 19.43"	1.15"
Beelink mini PC #4	5.1" × 5.1" × 2.0"	20.57" – 25.68"	1.15"
Seagate FireCuda HDD	4.4" × 7.9" × 1.9"	26.80" – 31.20"	1.12"
Ethernet switch (<i>cable bay</i>)	4.0" × 6.5" × 1.1"	14.50" – 18.50"	—

X is measured from the left outside face. There is 31-5/8" of clear width in the front bay and the five units use 24.8" of it, so every one gets at least 1.1" of air on each side — better than the 0.83" they had at 36" wide with the switch down here. Turn the drive so its long axis runs front-to-back; that is what buys the gaps. Nothing is stacked and there is at least 2" of headroom above everything.

Airflow

Each mini PC sits over two 1½" floor holes, has an open front, vents up through its own 2" grommet, and has a 2" hole in the wall directly behind it. There is no sealed pocket anywhere in the box.

Cable bay

Work from the wall side. Mount power strips flat against the underside of the top panel with velcro so nothing rests on the shelf, run patch leads along the inside of the front wall, coil slack toward the middle. Each machine's cables come up through the grommet immediately behind it — keep that discipline and the loom never crosses itself. Use the rear-wall holes for anything heading straight to a wall socket or wall port.

Files in this set: [underdesk-rack-cutting-viewer.html](#) (sheet to rack 3D model with cut layout, dimensions and exploded view) · [underdesk-rack-viewer.html](#) (assembled rack viewer) · [underdesk-rack-drawings.pdf](#) (9 dimensioned sheets, including the Home Depot cut request) · [modell](#) (STL + GLB, whole and per-panel) · [rack_params.py](#) (every dimension as one parametric source — change T and re-run `build_model.py`, `draw_plans.py` and `build_guide.py` to regenerate everything).