

PREMIUM PLAN: STANDARD 36-INCH BASE CABINET (FRAMELESS)

DESIGN CODE: BC-36F-PRO | DIFFICULTY: INTERMEDIATE | EST. BUILD TIME: 4 HOURS

Section 1: Tools & Hardware Master List

A. Required Tools

#	Tool	Purpose	Critical Notes
1	Pocket-Hole Jig	Joinery for p2, p3, p4	Set to 3/4"; verify depth collar
2	Drill & Impact Driver	Pre-drill & drive fasteners	Clutch 8–12; two units recommended
3	35mm Forstner Bit	Hinge cups on p5	Depth 11–13mm MAX; use stop
4	90° Corner Clamps (×2)	Square side-to-bottom joints	Required for solo 36" assembly
5	18ga Brad Nailer	Secure 1/4" back panel (p6)	3/4" or 5/8" brads only
6	Edge-Band Iron & Trim Tool	Band p5 edges + p1 & p2 front edges	Trim flush after full cooling
7	Table Saw / Track Saw	Dimensional accuracy	Tolerance ±1/32" for frameless
8	Speed Square & Diagonal Tape	Squaring verification	Diagonal diff ≤1/16" at each stage
9	Bar Clamps (×4) + Cauls	Glue-up alignment	Protect veneer faces
10	ROS Sander, 120/220 Grit	Surface prep	Sand with grain only

B. Hardware Bill of Materials

Item	Spec	Qty	Notes
Pocket Screws	#8 × 1-1/4" Coarse	30	Bottom 10 (5/side), Stretchers 8 (2 per end, 4 per rail), Toe Kick 4 (2/side), Spare 8. ⚠️ Never exceed 1-1/4"
Back Panel Fasteners	3/4" Brads or #6×5/8"	32	p6 is a rear-overlay panel (overlaps each side panel by 0.25" per side; 0.5" total reveal from cabinet outer edges).
Concealed Hinges	35mm 110° Full Overlay	4	Cup depth 11-13mm. Requires 3-6mm edge distance (K-value) on p5.
Hinge Screws	#6 × 5/8" Flat Head	16	Typically included; confirm thread type. 4 per hinge (2 cup / 2 plate).
Wood Glue	Titebond II/III	8 oz	All mating surfaces; Pocket screws provide clamping; glue forms the permanent structural bond.
Edge Banding	7/8" Pre-Glued Birch/Maple	25 ft	p5 all edges: ~16 ft. p1 & p2 front edges: ~8.5 ft. Total: ~24.5 ft. 25 ft roll is sufficient (includes trim waste).
Door Bumpers	Clear Silicone	4	Interior corners of p5

⚠️ Safety Notice: List engineered for 3/4" plywood frameless construction only. Never substitute screw lengths or omit glue. Dry-fit before gluing. Wear ANSI Z87.1 eye protection. Wear NIOSH N95 respirator when sanding or cutting plywood to prevent wood dust inhalation.

C. Stock List & D. Parts Cut List

ID	Material	Sheet Size	Qty	Notes
s-ply34	3/4" Plywood	48" × 96"	2	Cabinet box, stretchers, and doors
s-ply14	1/4" Plywood	48" × 96"	1	Back panel (p6)

D. Parts Cut List

ID	Part Name	Dimensions (W × H)	Qty	Grain Direction
p1	Side Panels	24" × 34.5"	2	Vertical (34.5" side)
p2	Bottom Panel	34.5" × 24"	1	Horizontal (34.5" side)
p3	Top Stretchers	34.5" × 4"	2	Horizontal (34.5" side)
p4	Toe Kick Board	34.5" × 4"	1	Horizontal (34.5" side)
p5	Doors	17.875" × 29.875"	2	Vertical (29.875" side)
p6	Back Panel	35.0" × 30.5"	1	Vertical (30.5" side)

Section 2: Pre-Assembly Prep

A. Sanding & Surface Prep Priority Matrix

Priority	Part(s)	Grit Sequence	Areas to Sand	Notes
1	p5 Doors (both faces + edges)	120 → 220	All surfaces before edge banding	Sand before banding; re-sand banded edges at 220 only after trim
2	p1 Side Panels & p2 Bottom Panel (interior faces)	120 → 180	Full interior faces + front edges	Interior must be smooth pre-assembly; exterior/back sanded post-assembly if needed
3	p3 Stretchers, p4 Toe Kick	120 only	Top/visible faces + glue mating edges	Light pass to remove mill marks; do not round over joinery edges
4	p6 Back Panel	120 only	Front (interior-facing) face only	1/4" ply sands fast—avoid burn-through

 **Glue-Up Rule:** Never sand mating surfaces beyond 120 grit. Over-smoothing reduces PVA mechanical bond strength. Wipe all joints with tack cloth before gluing.

B. Pocket-Hole Layout (Exact Positions)

All holes are drilled using the **3/4" (19mm) setting** on both the jig and the drill bit collar. Holes must be placed on the **hidden/internal faces** to ensure a clean exterior.

⚠ All pocket screws must engage the face grain of the receiving panel (p1) for maximum strength.

Part	Hole Count	Position from Edges	Center-to-Center Spacing	Orientation
p2 Bottom Panel	10 (5 per side)	First/Last hole: 2" from front/back edges	Approx. 5.0"	Holes face DOWN (underneath)
p3 Top Stretchers	4 (2 per end)	1" from top/bottom edge of rail	Approx. 2.0"	See Pro Guardrail below
p4 Toe Kick	4 (2 per end)	1" from top/bottom edge of board	Approx. 2.0"	Holes face INWARD (behind board)

⚠ Pro Guardrails:

- Split Prevention: For the 4" wide p3 and p4, never exceed 2 holes per end. Excessive drilling in such a narrow span destroys the plywood's structural integrity.
- Depth Check: 3/4" setting should result in the screw exiting approximately 3/8" into the center of the receiving side panel (p1).
- Orientation for p3: Rear stretcher holes face UP (lying flat). Front stretcher holes face toward cabinet INTERIOR (vertical orientation).

C. Back Panel (p6) Pre-Mark Template

The back panel **p6 (35.0" W × 30.5" H)** is a partial-overlay design. It sits centered on the rear of the cabinet, leaving a 0.5" reveal from the outer edges. To ensure your fasteners hit the dead-center of the 3/4" plywood edges, mark the following reference lines on the **rear exterior face** after dry-fitting:

1. Vertical Nailing Reference Lines (Left/Right):

- **The Calculation:** Since the cabinet's interior opening is 34.5" wide and your back panel (p6) is 35.0" wide, you have a total of 0.5" of "overlap" to split between two sides. This means p6 overlaps each side panel (p1) by exactly **0.25" (1/4")**.
- **The Action:** On the **rear exterior face** of p6, measure and draw a vertical line exactly **1/8" (0.125") inward** from the left and right outer edges of the panel.
- **Engineering Logic (Why 1/8"?)**: This line represents the dead-center of the 1/4" overlap zone. Driving your fasteners (brads/screws) along this 1/8" line ensures they are centered within the 1/4" overlap zone, leaving a safe 1/8" margin on either side.

⚠ Pro Tip (Avoid "Shiners"): Failure to mark this line will likely result in "shiners"—nails blowing out through the interior cabinet wall or the exterior side face. Stay strictly on the 1/8" line.

2. Horizontal Nailing Boundaries (Top/Bottom):

- **Bottom Line:** Align the bottom edge of **p6** flush with the **bottom face of p2** (Bottom Panel).
- **Top Line:** Align the top edge of **p6** flush with the **top face of p3** (Top Stretcher).
- *Note:* No pencil lines needed if aligned flush; simply ensure p6 is trapped between the top of the cabinet and the bottom of the main cabinet box (p2 bottom face).

3. Squaring Protocol (MANDATORY):

- Because **p6** is not a full-inset panel, it **cannot** automatically square the box.
- **Action:** Measure the two diagonal corners of the cabinet box. Adjust the cabinet's lean until the diagonal difference is **≤ 1/16"**.
- **Crucial:** Only fire your brad nails/screws into **p6** *after* squaring is verified.

D. Hinge Cup Pre-Drill Setup (p5 Doors)

- **Bit:** 35mm Forstner, sharp carbide preferred
- **Depth:** Set depth stop to exactly 12mm. Acceptable range for seating: 11–13mm (verify per hinge manufacturer spec).
- **Center Distance from Door Edge:** 22.5mm (standard Euro overlay hinge spec)
- **Vertical Placement:** Top cup center: **4"** from top door edge. Bottom cup center: **4"** from bottom door edge. (Symmetric placement for 29.875" door height.)
 Verify hinge plate clearance; ensure mounting screws do not interfere with p3 pocket screws.
- **Test Fit:** Insert hinge cup into test hole; flange should sit flush without gap or binding. Adjust depth slightly if flange does not sit perfectly flush.

 Orientation: Drill into the INTERIOR face of the door only. DO NOT drill through the front show-face. Use a depth stop to ensure exactly 12mm depth.

Section 3: Cabinet Box Assembly

Note: Apply wood glue to ALL mating surfaces. Pocket screws provide clamping force; the glue creates the permanent structural bond.

A. Master Assembly Sequence

Step	Action	Critical Engineering Note
1	Set Bottom Height: Mark a line 4" up from the bottom of both p1 side panels. Align the bottom face of p2 with this line.	Creates the 4" toe-kick void. Verify p2 front edge is flush with p1 front edge.
2	Drive Base Screws: Secure p2 to p1 using 10 total #8 × 1-1/4" pocket screws (5 per side).	Use 90° corner clamps. Confirm interior width = 34.5" before final torque. TIP: Use a right-angle adapter or lay the cabinet on its back to drive p2 screws comfortably at the 4" height.
3	Install Stretchers (p3): Front stretcher → vertical, holes facing interior. Rear stretcher → horizontal, holes facing up. Flush both with p1 top.	Front vertical orientation maximizes countertop screw engagement. Rear horizontal orientation serves as wall-mount rail. 8 total #8 × 1-1/4" screws (4 per side) + glue.
4	Install Toe Kick (p4): Position between p1 panels, set back 3.5" from p1 front edge. Drive 4 total screws (2 per side) from inside only.	NKBA-standard ergonomic recess. No fastener heads visible on face.
5	Square the Box (MANDATORY): Measure rear-opening diagonals. Adjust clamp pressure until difference ≤ 1/16".	⚠ STOP HERE. Do NOT proceed to back panel until square. Skew here = doors will never align.

⚠ Glue Open Time: Titebond II/III ≈ 10 min at 70 °F. Have all clamps, screws, and square staged before applying glue. Wipe squeeze-out within 5 min using damp cloth.

B. Back Panel (p6) Installation

This panel locks the cabinet into its final square geometry and provides a dust-proof rear seal.

Step	Action	Alignment Logic
1	Dry-Fit p6: Position the 35.0" × 30.5" panel against the rear. Top edge flush with p1 top. Bottom edge flush with p2 bottom face.	The 4" height difference = toe-kick height, fully enclosed by p4. No interior gap.
2	Side Reveals: Center p6 horizontally → 0.5" reveal each side (36.0" – 35.0" = 1.0" ÷ 2). Verify against the 0.5" pencil reference lines marked in Section 2C.	Reveals accommodate wall irregularities during installation.
3	Re-check Diagonals: With p6 held in place (tape temporarily), re-measure diagonals. Confirm still ≤ 1/16".	Prevents panel from shifting box out of square during fastening.
4	Use all 32 fasteners from BOM. Start 2" from each corner, then space at approximately 4" centers. This locks the box permanently.	All 32 fasteners from BOM are consumed. Locks racking permanently. Locks racking permanently; creates shear panel.
5	Post-Fasten Verification: Final diagonal measurement. Must still read ≤ 1/16" difference.	Confirms no shift occurred during nailing.

C. Post-Assembly Quality Gate

❌ Fail ANY item → correct immediately. Once glue cures (~2 hrs), correction requires full disassembly.

#	Check Item	Acceptance Criteria	Tool
1	Exterior Width	36.0" $\pm$ 1/32"	Tape measure
2	Interior Width	34.5" $\pm$ 1/32"	Tape measure
3	Diagonal Squareness	Difference $\leq$ 1/16"	Diagonal tape
4	Toe Kick Setback	3.5" $\pm$ 1/16" from p1 front face	Speed square
5	Front-Face Flushness	No "steps" at p1/p2/p3 joints	Straightedge + fingertip
6	Pocket Screw Heads	Flush or slightly recessed; none proud	Fingertip sweep
7	Glue Residue	Zero visible squeeze-out on all surfaces	Visual inspection

Door Reveal Verification (Reference):

- Horizontal: 36.0" - (2 x 17.875") = 0.25" total gap (1/8" each outer edge).
- Vertical: 30.5" - 29.875" = 0.625" total reveal (split top/bottom).

✅ All 7 checks passed? → Proceed to Section 4: Door Hanging & Hardware Installation.