

Build It Small

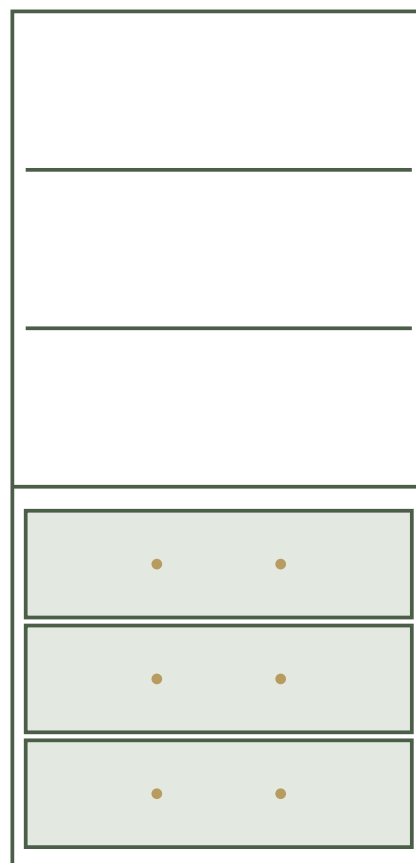
1:12 Cabinet Pair

Laser-cut and hand-cut plans for 1/8-inch basswood



UNIT A

door base + glass-door shelves



UNIT B

drawer base + open shelves

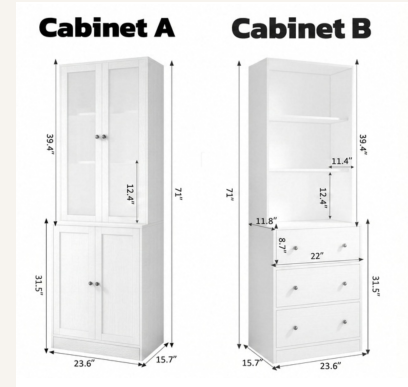
Finished size of each stacked unit

1.9667" W x 1.3083" D x 5.9167" H

Exact decimals drive the laser files; fractions are hand-cut references.

Scale formula: miniature measurement = full-size measurement / 12

Reference	Full size	1:12 exact	Nearest 1/64
Overall height	71"	5.9167"	5 59/64"
Upper section shown	39.4"	3.2833"	3 9/32"
Base section	31.5"	2.6250"	2 5/8"
Overall width	23.6"	1.9667"	1 31/32"
Overall depth	15.7"	1.3083"	1 5/16"
Shelf opening height	12.4"	1.0333"	1 1/32"
Base interior depth	11.8"	0.9833"	63/64"
Upper shelf depth	11.4"	0.9500"	61/64"
Drawer-front height	8.7"	0.7250"	23/32"
Drawer-front width	22"	1.8333"	1 53/64"



Reference image supplied for this project

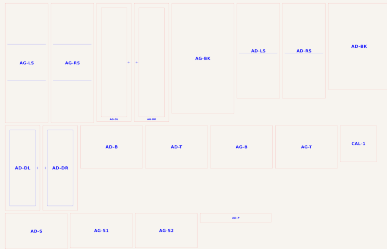
Rounding note

The image lists 39.4 inches above 31.5 inches, totaling 70.9 inches, while overall height is 71 inches. The cut files retain the 31.5-inch base and use a 39.5-inch upper so the assembled miniature reaches the stated 71-inch height. The miniature adjustment is only 0.0083 inch.

Butt-joint construction used in the cut files

- Sides run the full section height. Tops, bottoms, shelves and dividers fit between them: $1.9667 - 0.2500 = 1.7167$ inches.
- Backs are inset between the sides, top and bottom. Closed sections use a 1.1833-inch carcass depth; the 0.125-inch overlay door or drawer front brings finished depth to 1.3083 inches.
- The open upper has no front overlay and therefore uses the full scaled depth. All upper shelves use the stated 11.4-inch life-size depth and align to the back.
- The source image does not specify joinery, back thickness, door gaps, hinges, drawer boxes or toe-kick construction. Those are documented engineering assumptions for this miniature and require a dry fit before finishing.

Door base + glass-door shelf upper | one 12 x 12 x 1/8-inch basswood sheet



One sheet contains both removable sections.

RED outlines cut completely through the 1/8-inch basswood. **BLUE** labels, shelf guides, panel details and knob centers receive a shallow engraving operation. The CAL-1 square is a calibration coupon, not a furniture part.

Sheet A part map

Codes	Part	Qty	Exact miniature size	Nearest 1/64 in
AG-LS / AG-RS	Upper side Shelf guide lines engraved	2	1.1833 x 3.2917	1 3/16 x 3 19/64
AG-T / AG-B	Upper top and bottom	2	1.7167 x 1.1833	1 23/32 x 1 3/16
AG-BK	Upper inset back	1	1.7167 x 3.0417	1 23/32 x 3 3/64
AG-S1 / AG-S2	Upper shelf 11.4-inch source depth	2	1.7167 x 0.9500	1 23/32 x 61/64
AG-DL / AG-DR	Glass door frame Inner opening is laser cut	2	0.9599 x 3.2604	61/64 x 3 17/64
AD-LS / AD-RS	Base side Shelf guide line engraved	2	1.1833 x 2.6250	1 3/16 x 2 5/8
AD-T / AD-B	Base top and bottom	2	1.7167 x 1.1833	1 23/32 x 1 3/16
AD-BK	Base inset back	1	1.7167 x 2.3750	1 23/32 x 2 3/8
AD-S	Base shelf 11.8-inch source depth	1	1.7167 x 0.9833	1 23/32 x 63/64
AD-DL / AD-DR	Lower solid door Inset panel line engraved	2	0.9599 x 2.3438	61/64 x 2 11/32
AD-P	Base plinth front	1	1.9667 x 0.2500	1 31/32 x 1/4
CAL-1	Calibration coupon Test only; not part of cabinet	1	1.0000 x 1.0000	1 x 1

Clear inserts - hand cut from acetate: 2 pieces, 0.8349 x 3.1354 inches (about 53/64 x 3 9/64). This gives about 1/16 inch of overlap behind every edge of each opening.

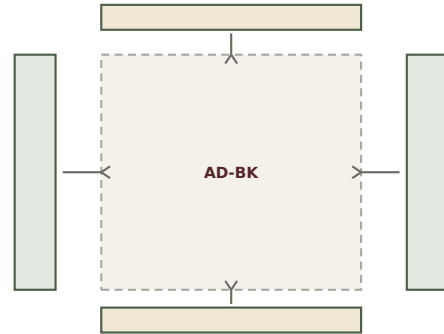
Hardware: 8 miniature hinges or hidden tape/fabric hinges; 4 knobs or beads. Do not laser-cut unidentified clear plastic.

Assemble Unit A - Base

Labels and blue guide lines face inward unless a decorative panel line is meant to show.

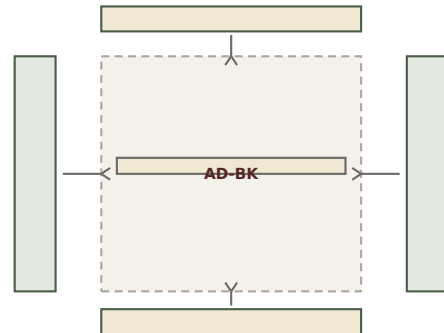
1 Build the base carcass

Dry-fit AD-LS, AD-RS, AD-T and AD-B. The top and bottom fit between the side panels. Glue on a flat surface and compare both diagonals before the glue sets.



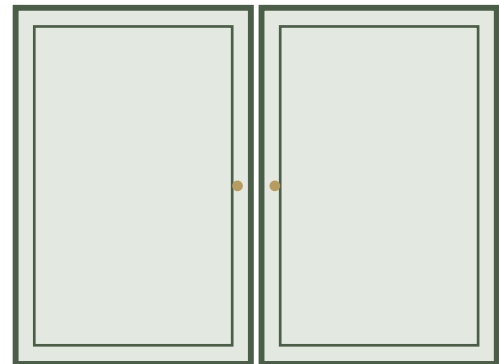
2 Add the shelf and inset back

Set AD-S on the engraved guide lines and align its rear edge with the inside face of AD-BK. Fit the back between the four carcass panels and glue it flush with the rear edges.



3 Fit the plinth and lower doors

Center AD-P across the lower front. Sand door edges for an even reveal, then attach AD-DL and AD-DR with miniature or flexible hidden hinges. Add knobs at the engraved marks.

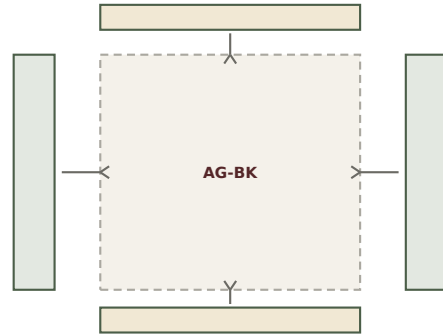


Assemble Unit A - Upper

Build and finish the two sections separately; stack them only after both are square.

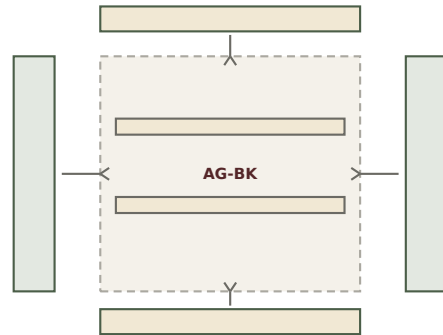
4 Build the glass-door carcass

Join AG-LS, AG-RS, AG-T and AG-B with butt joints. Fit AG-BK inside the back. Keep the opening square so the two doors meet evenly.



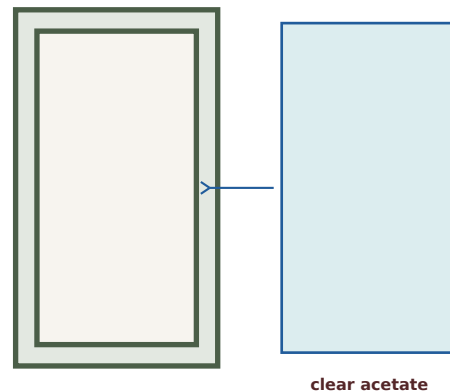
5 Install the shelves

Glue AG-S1 and AG-S2 on the engraved guides with rear edges against the inset back. Square scraps make useful temporary supports while the glue dries.

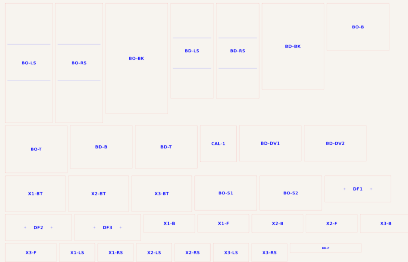


6 Glaze, hang and stack

Glue one clear insert behind each AG-D opening with clear-drying adhesive. Hinge the doors, add knobs, then center the upper on the base. Glue it or use tiny alignment pins if the two sections should remain removable.



Drawer base + open-shelf upper | one 12 x 12 x 1/8-inch basswood sheet



Drawer parts remain grouped by engraved code.

X1, X2 and X3 identify the three drawer boxes. LS/RS are side walls, F/B are the box front and back, and BT is the bottom. DF1-DF3 are the overlay drawer faces. The complete unit still fits on one 12 x 12-inch basswood sheet.

Sheet B part map

Codes	Part	Qty	Exact miniature size	Nearest 1/64 in
BO-LS / BO-RS	Upper side Shelf guide lines engraved	2	1.3083 x 3.2917	1 5/16 x 3 19/64
BO-T / BO-B	Upper top and bottom	2	1.7167 x 1.3083	1 23/32 x 1 5/16
BO-BK	Upper inset back	1	1.7167 x 3.0417	1 23/32 x 3 3/64
BO-S1 / BO-S2	Upper shelf 11.4-inch source depth	2	1.7167 x 0.9500	1 23/32 x 61/64
BD-LS / BD-RS	Base side Divider guide lines engraved	2	1.1833 x 2.6250	1 3/16 x 2 5/8
BD-T / BD-B	Base top and bottom	2	1.7167 x 1.1833	1 23/32 x 1 3/16
BD-BK	Base inset back	1	1.7167 x 2.3750	1 23/32 x 2 3/8
BD-DV1 / BD-DV2	Drawer divider	2	1.7167 x 0.9833	1 23/32 x 63/64
BD-P	Base plinth front	1	1.9667 x 0.2500	1 31/32 x 1/4
DF1-DF3	Drawer face Two knob center marks engraved	3	1.8333 x 0.7250	1 53/64 x 23/32
X1-X3 LS / RS	Drawer box side	6	0.9833 x 0.5000	63/64 x 1/2
X1-X3 F / B	Drawer box front/back	6	1.4167 x 0.5000	1 27/64 x 1/2
X1-X3 BT	Drawer bottom	3	1.6667 x 0.9833	1 43/64 x 63/64
CAL-1	Calibration coupon Test only; not part of cabinet	1	1.0000 x 1.0000	1 x 1

Drawer engineering: Each box finishes 1.6667 inches wide x 0.9833 inches deep x 0.6250 inch high after its 1/8-inch bottom is attached beneath the 1/2-inch walls. It is 0.0500 inch narrower than the carcass opening for a loose-running fit.

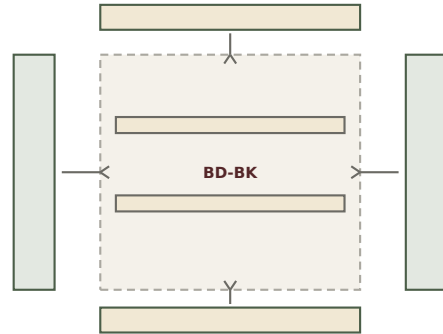
Hardware: 6 knobs or beads. Apply a touch of clear wax to drawer sides and divider surfaces after finishing.

Assemble Unit B - Base

Build all three drawer boxes the same way; keep the X1, X2 and X3 sets together.

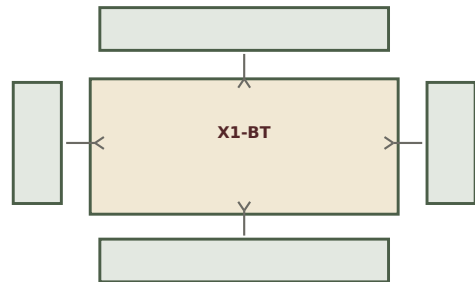
1 Build the drawer-base carcass

Glue BD-T and BD-B between BD-LS and BD-RS. Install BD-DV1 and BD-DV2 on their guide lines, then fit BD-BK flush with the rear edges.



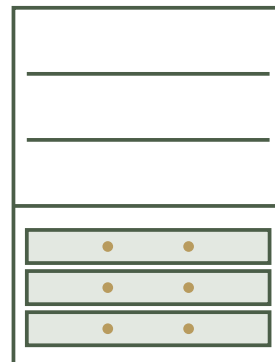
2 Assemble each drawer box

For drawer 1, glue X1-F and X1-B between X1-LS and X1-RS. Square the box, then glue it on top of X1-BT. Repeat with the X2 and X3 sets.



3 Fit the faces and plinth

Slide each box into its opening. Use paper spacers to center DF1, DF2 and DF3, then glue each face to its box. Add two knobs at the marks and center BD-P across the lower front.

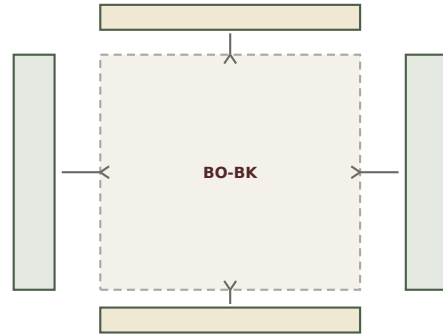


Assemble Unit B - Upper

The open upper uses full scaled depth; its shelves are intentionally recessed.

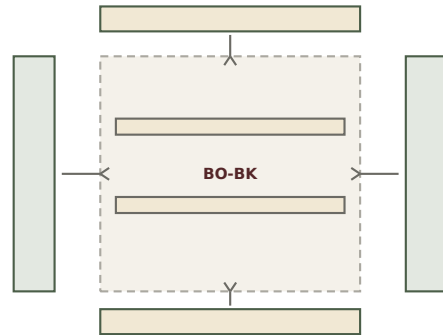
4 Build the open-shelf carcass

Glue BO-T and BO-B between BO-LS and BO-RS. Fit BO-BK inside the rear opening. Check the box for square before the glue sets.



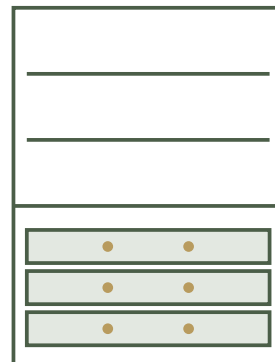
5 Add two recessed shelves

Install BO-S1 and BO-S2 on the engraved guides. Align rear edges with the inside face of the back. The shelf fronts sit approximately 0.2333 inch behind the cabinet front.



6 Square, finish and stack

Sand shelf fronts evenly, complete the finish and test all drawers. Center the open upper on the drawer base. Glue the sections together or add alignment pins so they can separate for transport.



xTool M2 + xTool Studio | verify the installed laser module before choosing settings

File color key

 RED = through-cut outlines

 BLUE = shallow engraving

Import

- 1 Open a new xTool Studio project. Use Upload to import the SVG. SVG is preferred; the matching PDF is a size/reference backup.

Confirm size

- 2 Keep everything selected and confirm the canvas is exactly 12.000 x 12.000 inches. CAL-1 must display as 1.000 x 1.000 inch before processing.

Prepare material

- 3 Measure the actual basswood. Place it flat in the M2 without covering camera viewfinder points. For material up to 6 mm, xTool instructs users to lift the sheet with four magnetic fixtures.

Assign operations

- 4 Assign blue objects to shallow line/fill engraving. Assign red paths to Cut. Arrange the sequence so blue labels and guides process before red outlines.

Test settings

- 5 Choose the 3 mm / 1/8-inch basswood preset matching the installed 10W, 20W or 40W module. Run a material test on scrap because actual wood and glue content vary.

Calibrate kerf

- 6 Cut CAL-1 and measure it. These files contain nominal dimensions with no kerf offset. If accuracy needs adjustment, use the measured coupon to establish the offset for this machine/material/settings combination.

Preview and cut

- 7 Use Framing/Preview, close the lid, start exhaust and air assist, and supervise the entire job. Do not move the sheet until every outline has separated cleanly.

Laser safety: Exhaust smoke outdoors or through a qualified purifier. Process only known laser-safe materials. Basswood is combustible; keep the area clean, keep suitable fire-safety equipment nearby and supervise continuously.

Hand Cutting & Finishing

A cut list, a square and careful marking are enough to build the same miniature without a laser.

Hand-cut method

1. Use exact decimal dimensions; fractions are shop references.
2. Mark every code on the hidden face.
3. Cut against a steel ruler with several light passes and a fresh blade.
4. Pair matching panels and sand their edges together.
5. Mark guide lines across paired sides with a square.

Finishing order

1. Dry-fit and mark mating edges.
2. Sand char and fuzz with 220-320 grit.
3. Seal or prime broad faces if desired.
4. Glue sparingly with PVA and clean squeeze-out.
5. Paint, glaze, install hardware and wax drawer-bearing surfaces last.

Suggested tutorial shot list

Measure: show the life-size width, depth, section heights and smaller opening/front dimensions. Explain: place a $\frac{1}{12}$ calculation on screen and show why two 1/8-inch side panels are subtracted from crosspieces. Design: screen-record the 12 x 12-inch Illustrator artboard, red cut paths, blue labels and the two sheet layouts. Cut: film CAL-1, operation assignment, Framing/Preview, the supervised cut and labeled pieces leaving the sheet. Build: record short overhead clips for carcasses, drawers, glazing, hinges, stacking and finishing. Photograph each completed stage.

Final checks before gluing

- ☐ Both carcasses are square and sit flat. ☐ Upper and base widths match.
- ☐ Shelf fronts are evenly recessed. ☐ Glass doors meet evenly.
- ☐ All drawers slide freely. ☐ Knob marks are level.
- ☐ Each stack finishes approximately 1.9667 W x 1.3083 D x 5.9167 H inches.

Official xTool references used

Import & Parse Vectors: <https://support.xtool.com/article/2520>
 xTool M2 User Guide: <https://support.xtool.com/article/2778>
 Process on Flat Surface: <https://support.xtool.com/article/3366>
 xTool M2 Safety First: <https://support.xtool.com/article/3348>