GA-003 Two-hand seed-flat carrier

Move a standard nursery flat using a rigid supporting tray instead of lifting its flexible rim.

Controlling dimensions: US inches and feet. Metric equivalents are references. Original editorial design; no physical build, animal trial or load certification is claimed.

Before marking and cutting

Measure the stated stock sections before cutting. Use the cut-list geometry, not scale measurements from the drawing.

US inch dimensions control; millimeter values are rounded conversions. Ordinary cut target ±1/16 in (1.6 mm); fit commercial accessories before boring attachment holes.

Use limits

Original bounded garden component, not an occupied structure.

No human standing, sitting, climbing, lifting or fall protection use. No stated safe working load.

Geometry and fastener quantities are editorially checked; no prototype build, wind test or crop trial is claimed.

Materials and finished cuts

Part	Qty	Size to cut	Material and detail
P01 Floor	1	24 × 14 × 1/2 in 609.6 × 355.6 × 12.7 mm	measured 1/2 in plywood exterior-bond plywood for protected non-food-contact fixtures; substitute thickness only by recalculating joints
P02 Long retaining rails	2	24 × 1 1/2 × 3/4 in 609.6 × 38.1 × 19.05 mm	1 × 2 in board sound untreated cedar or other durable untreated wood; no unknown salvage
P03 End handles	2	12 1/2 × 2 1/2 × 3/4 in 317.5 × 63.5 × 19.05 mm	1 × 3 in board sound untreated cedar or other durable untreated wood
P05 Handle backing blocks	4	2 × 2 × 3/4 in 50.8 × 50.8 × 19.05 mm	measured 3/4 in plywood exterior-bond plywood for protected non-food-contact fixtures

Hardware and consumables

20 exterior #8 × 1-1/4 in screws: 6 each long rail and 4 each end

2 polypropylene webbing handle loops, 12 in each

4 #10 × 1-1/4 in pan-head screws with 4 wide washers for handle loops; 8 #8 × 1-1/4 in screws for backing blocks

Tools

Tape measure and steel rule; Pencil, square and clamps; Saw suited to the stated stock; eye and hearing protection; Drill/driver, countersink and bits matched to fasteners; Sandpaper and edge file; gloves when handling cut mesh

Primary context and design record

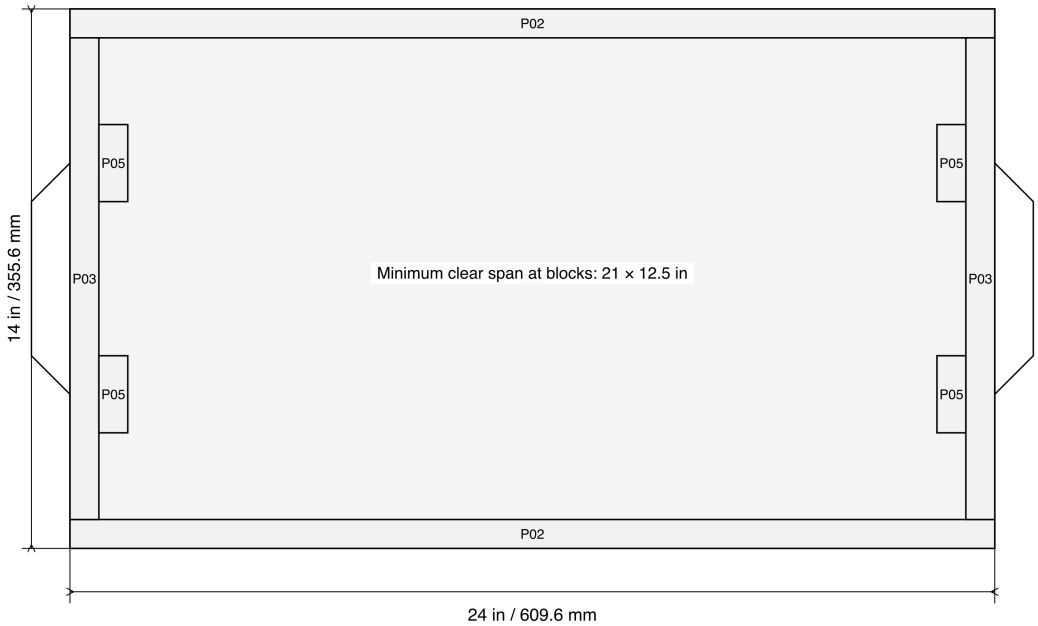
Context references; not design endorsements or certifications.

E02 · Seed and Seedling Biology · Penn State Extension · https://extension.psu.edu/seed-and-seedling-biology

Assembly and first checks

GA-003 Two-hand seed-flat carrier

PLAN — looking down; rear at top; controlling dimensions in inches



Part IDs refer to the finished cut list. Shapes are not load-rated. Read assembly before cutting.
Notches, holes, fittings and operating angles: see numbered steps and geometric annotations.
Original editorial draft • B/W vector • not physically built or tested • no implied Extension endorsement

01 Plan the two-hand seed-flat carrier for this result: Move a standard nursery flat using a rigid supporting tray instead of lifting its flexible rim. Confirm the design reference before cutting: Rim opening 22-1/2 × 12-1/2 in; backing blocks reduce clear span to 21 in (533.4 mm) at their height. In the drawings x runs left to right, y runs front to rear and z runs upward.

02 Verify the required stock before laying out these parts: 1 × 2 in board: actual 0.75 × 1.5 in (19.05 × 38.1 mm); 1 × 3 in board: actual 0.75 × 2.5 in (19.05 × 63.5 mm); measured 1/2 in plywood: measured thickness 0.5 in; measured 3/4 in plywood: measured thickness 0.75 in. Reject split or twisted wood and unknown salvage; thinner stock requires recalculating the joints, not simply using the listed lengths.

03 Cut and label the finished parts: 1 Floor 24 × 14 × 0.5 in (609.6 × 355.6 × 12.7 mm), mark P01; 2 Long retaining rails 24 × 1.5 × 0.75 in (609.6 × 38.1 × 19.05 mm), mark P02; 2 End handles 12.5 × 2.5 × 0.75 in (317.5 × 63.5 × 19.05 mm), mark P03; 4 Handle backing blocks 2 × 2 × 0.75 in (50.8 × 50.8 × 19.05 mm), mark P05. Keep saw kerf outside each finished line. Rip only where the finished width is narrower than the actual stock; use a suitable guide and target ±1/16 in (1.6 mm) for ordinary cuts. Dowel triples mean length × diameter × diameter, not square dowel stock.

04 Lay out the carrier opening: the two end handles occupy x = 0–3/4 and 23-1/4–24 in; the long rails occupy y = 0–3/4 and 13-1/4–14 in.

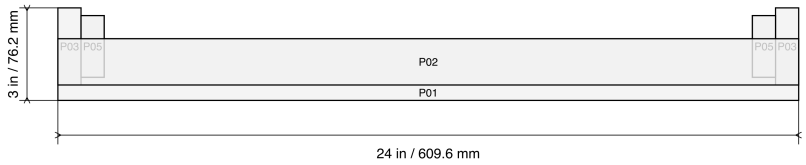
05 Clamp the long rails upright on the base, and fasten through the base with six 1-1/4 in screws per rail, starting 1 in from each end.

06 Fit the two 12-1/2 in end boards between the rails. Their top edges stand 3 in above the base underside.

Complete the assembly

GA-003 Two-hand seed-flat carrier

FRONT — transparent assembly projection from y = 0; controlling dimensions in inches



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07 Fasten each end from below with four centered pilots at y = 2, 5-1/3, 8-2/3 and 12 in. Drive the screws flush.

08 Form a 12 in webbing piece into a loop with 2 in overlap at each end. Mark the attachment points on the outside face of the first end board at y = 4 and 10 in.

09 Fix one 2 × 2 × 3/4 in backing block inside the end board behind each handle attachment, four blocks total, with two #8 × 1-1/4 in screws per block from inside the block into the end board. Locate them at y = 3–5 and 9–11 in, z = 3/4–2-3/4 in. Attach the handle ends at y = 4 and 10 in, z = 1-3/4 in with #10 × 1-1/4 in washer-head screws through the outer board into the backing blocks. Verify no point enters the clear opening.

10 Repeat the handle installation on the other end. Lift the empty carrier at waist height and verify that both loops hold their position.

11 Fit the actual flat before planting. The four handle backing blocks reduce the minimum usable length to 21 in at their height; fit the actual flat within that 21 × 12-1/2 in envelope. Water-draining trays remain removable.

12 Complete the acceptance checks below before putting the assembly into service. Record any changed stock thickness, fastener or equipment fit on the project sheet. The published geometry has not been physically built or load-tested.

Acceptance and intermediate checks

Rim opening 22-1/2 × 12-1/2 in; backing blocks reduce clear span to 21 in (533.4 mm) at their height.

Handle screws do not project into the tray area; backing blocks are present.

No claim of a lifting rating; hand-test empty and then use modest loads close to the body.

Operation

Carry with two hands; do not suspend above people or use as a step.

Cleaning and maintenance

Dry after watering; inspect loops and screw holes before each move.