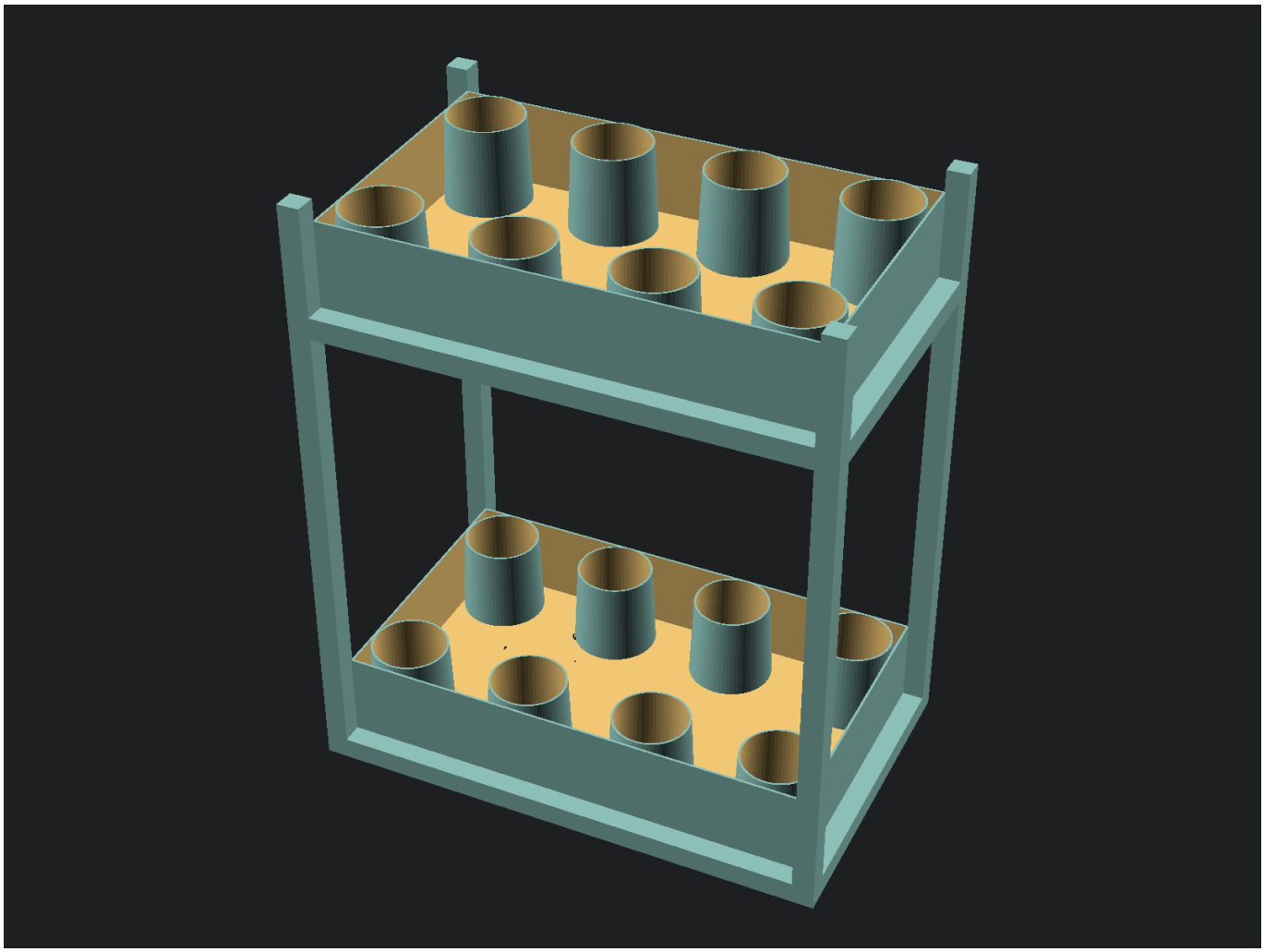
Window-Sill LED Grow Shelf – GridBeam Edition

Window-Sill LED Grow Shelf

GridBeam Edition (v4.1)



Modular indoor garden built from wood, light, and logic.

1 — What This Is

A two-level herb garden for any windowsill. Built using the GridBeam tri-joint system. Each tray holds eight pots; the top tray lights the lower one with 5 V LEDs. All parts are re-usable, screw-based, and repairable.

Size: 40x23x46 cm | Capacity: 16 pots | Power: 5 V DC

2 — Why GridBeam

Three beams meet at one node — X, Y, Z — forming a reusable tri-joint. GridBeam uses one beam profile, holes every 25 mm, and M5 bolts. It's fast, strong, and circular-economy

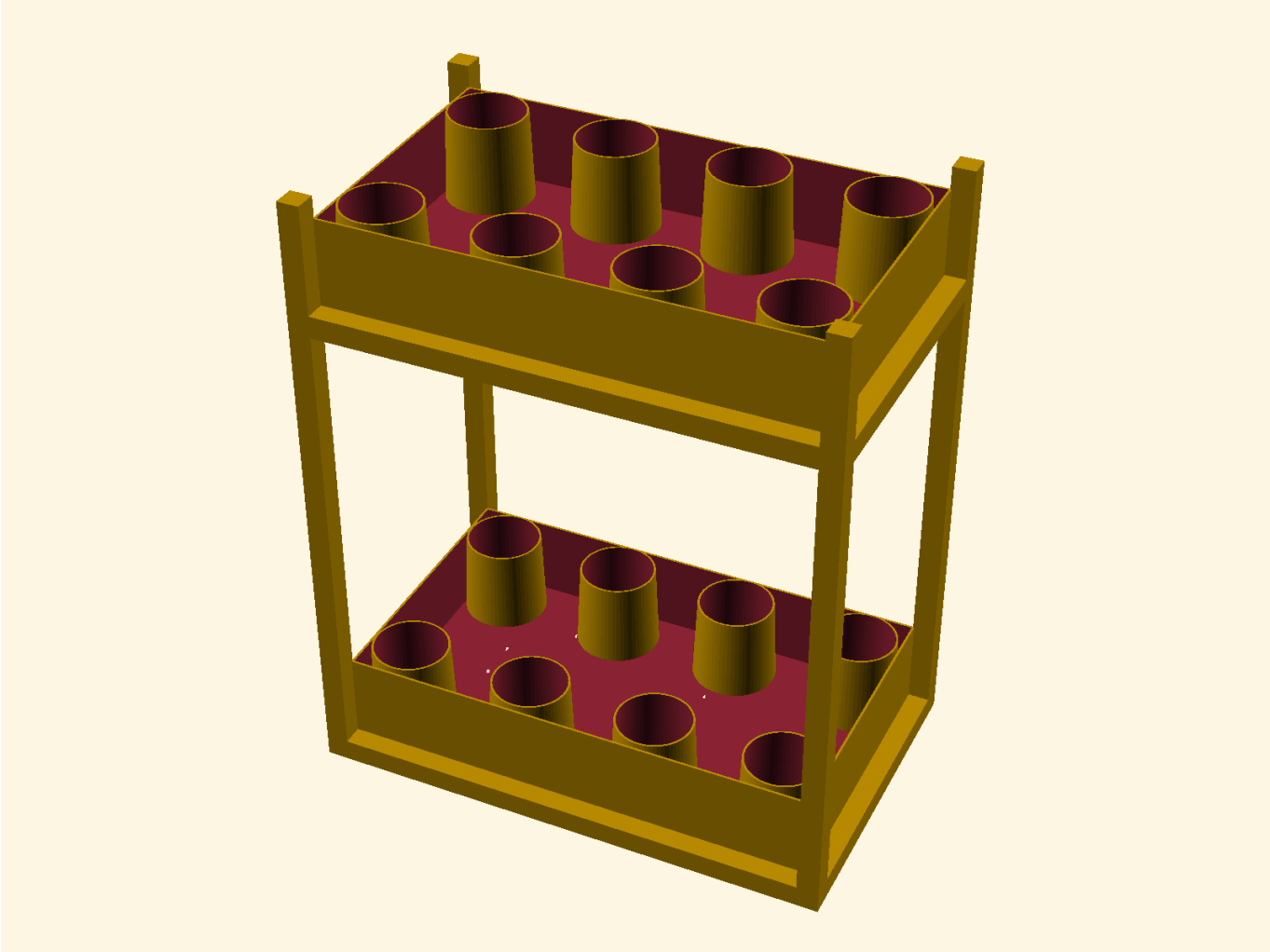


Figure 1: Rendered model

friendly.

3 — Bill of Materials

Frame - 4 m of 18x18 mm pine/beech - 4 x 400 mm (X), 4 x 230 mm (Y), 4 x 450 mm (Z) - 24 x M5 bolts + nuts + washers

Trays & Pots - 2 x baking trays (39x23x7 cm) - 16 x pots Ø 70 mm x H 80 mm - Potting soil

Lighting - 1 m 5 V red/blue LED strip - 5 V 2 A adapter, 22 AWG wire - Heat-shrink, solder, digital timer, extension lead

4 — Tools

Saw / mitre box • Drill (5 mm) • Screwdriver or spanner Solder iron • Heat-gun • Multimeter • Square • Tape • IPA cleaner

5 — Build the Frame

1. Drill holes every 25 mm on beam centerlines (Ø 5 mm).
2. Bolt base corners: X + Y + Z beams form each tri-joint (3 bolts).
3. Add upper rails ~ 310 mm above lower tray.
4. Seat trays flat on beam tops (15 mm wall gap).

6 — Add Pots & Soil

Each tray holds 8 pots (2x4) with ~ 35 mm gap from walls. Fill with soil and herbs (basil, mint, thyme). Cut drainage holes if using tetra packs.

7 — LED Wiring

1. Cut strip to fit tray underside (~ 35 cm runs).
2. Solder red to +5 V, black to -, join segments with jumpers.
3. Insulate with heat-shrink; test polarity.
4. Clean and stick strip under upper tray; glue ends if needed.
5. Power via adapter -> timer -> wall. Set timer: 12–14 h ON (winter) / 8–10 h ON (summer).

8 — Safety & Use

Keep electrics dry; route cables down rear post. Tighten bolts monthly, trim plants weekly. Optional: foil reflector or PWM dimmer.

Back Page

LED Circuit Sketch

+5V Adapter -> Timer -> LED Strips Red -> +5 V Black -> GND

License

Released into the public domain under CC0 1.0 Universal. https://creativecommons.org/publicdomain