DuraGrain Maker Plan Library: Desk and Charging

5 projects · CNC router and Laserbox · inches · Recommended Finish: DuraGrain Hardwax Oil & Pure Walnut Oil

Projects

#	Project	Machine	Stock
1	Monitor Riser	CNC router	3/4" hardwood or plywood, about 24" x 17"
2	Headphone Stand	CNC router	3/4" hardwood, about 13" x 7" (walnut or maple look great)
3	Charging Valet	CNC router	6/4 hardwood planed to 1-1/4", 12-1/2" x 7-1/2"
4	Laptop Stand	Laser	1/4" (6 mm) Baltic birch plywood, two 14" x 10" pieces
5	Cable Comb	Laser	1/4" (6 mm) Baltic birch plywood, scrap is fine

Before you cut

Measure your stock. Joint sizes are generated from the thickness values at the top of *desk.py* (CNC_T, VALET_T, LASER_T). Plywood and "3/4" hardwood are rarely exactly nominal, so change them and rerun the script if yours differs.

Laser fit. Laser slots are drawn narrower than the finished size by the kerf. The fit-test comb on the laptop-stand sheet tells you which offset is right for your plywood and machine.

CNC files for VCarve (DXF, inches)

Import: create the job in inches with Z zero on the material surface, then File > Import Vectors and pick the DXF. The layers come in by name.

Smooth the curves: curves are exported as fine polylines. Select all and run *Fit Curves to Vectors* (arcs, tolerance about 0.002") before toolpathing for smoother cuts and shorter G-code.

Toolpath by layer: in the Layers panel, select a layer's vectors and create the toolpath listed for it on the project page. Each project page lists the toolpaths in cutting order.

Layer names give the operation and depth: **PROFILE_OUTSIDE_0.750** (cut outside the line, through 0.750"), **PROFILE_INSIDE_0.750** (cut inside, through), **POCKET_0.375** (pocket to that depth), **DRILL_...**. Paths are on the line; leave tool offset to the CAM.

Parts are nested on a 38" x 38" area to leave room for hold-downs, and keep the orientation they are drawn in, with the grain running left to right. Parts from different stock thicknesses go in separate files (named with the thickness): each is its own VCarve job.

Underside operations come as a separate **-underside** file, mirrored as you'll see the part after flipping it, with the part outline on a REFERENCE layer for registration.

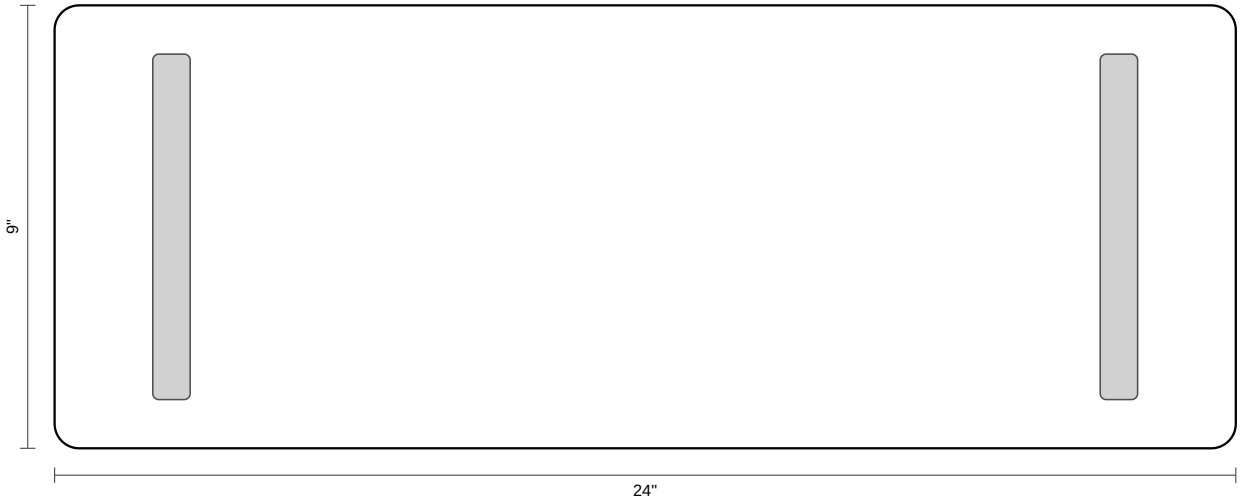
Laser files (SVG and DXF)

Laid out for a 14-1/2" x 10-1/2" area, inside the Laserbox bed. Red lines cut, blue lines and text engrave. Projects that don't fit on one sheet come as numbered sheets.

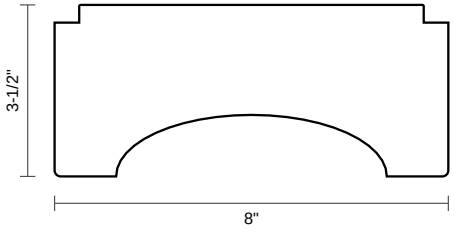
1. Monitor Riser

24" x 9" shelf, 3-7/8" tall. Arched legs leave room for a keyboard or cables underneath.

Top - 3/4" stock



Leg (make 2) - 3/4" stock



Machine & stock

CNC router, 1/4" end mill for profiles and dados. Stock 3/4" thick: measure it and set CNC_T so the dados fit snugly.

Dados are cut into the face you machine; that face becomes the underside.

Steps

1. Cut the two dados 3/8" deep in the top, then profile all three parts with tabs.

2. The dados have rounded ends from the bit. Round the four corners of each leg tenon with a file or sandpaper until it seats.

3. Dry fit, then glue the tenons into the dados. Clamp lightly and check the legs are square.

4. Round over the top edges with a 1/8" roundover bit or sandpaper and finish with DuraGrain Hardwax Oil (0.0 g/L VOC Tung, Walnut & T1 Carnauba finish).

VCarve toolpaths (in this order)

Pocket, layer POCKET_0.375: cut depth 0.375", 1/4" end mill. Select every vector on the layer together so islands are left standing.

Profile, Outside, layer PROFILE_OUTSIDE_0.750: cut depth 0.750" (through), 1/4" end mill, with tabs.

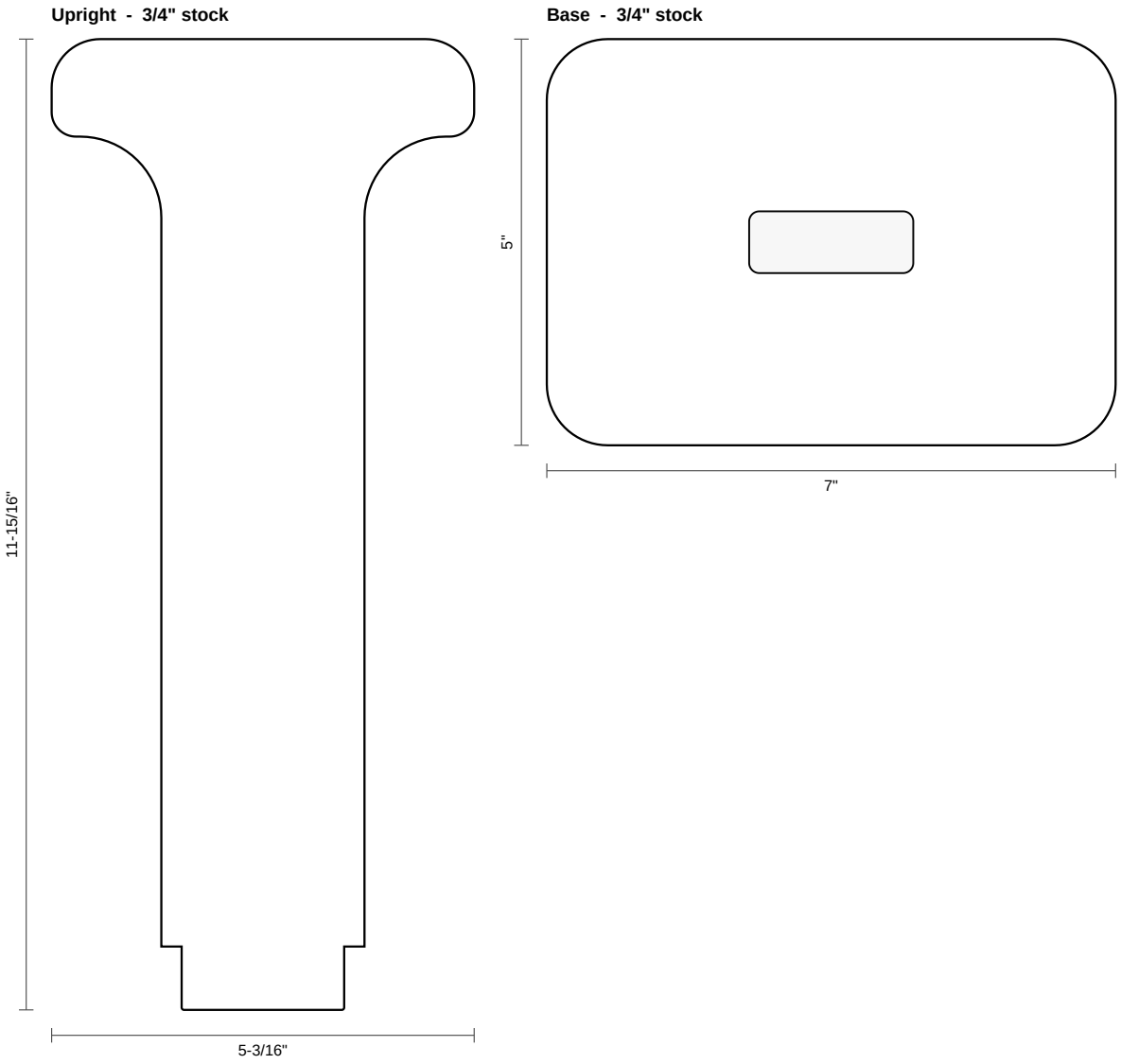
Files

dxf/monitor-riser.dxf

Plan view, drawn at about 1:3.9. Grey = pocket (depth noted), dashed = underside pocket, light fill = through cut. Cut files are full size.

2. Headphone Stand

11-1/4" tall. The T-shaped saddle spreads the headband load; a through-tenon locks it into the base.



Machine & stock

CNC router, 1/4" end mill. Stock 3/4" thick (set CNC_T to your measured thickness).

The tenon is 1/32" longer than the base is thick so it can be sanded flush.

Hardware

Four small felt or cork pads for the base.

Steps

1. Profile both parts, cutting the mortise in the base as an inside profile.

2. Round the tenon's four corners to match the 1/8" radius left in the mortise ends.

3. Glue the tenon into the base, check the upright is square, and sand the tenon flush underneath.

4. Round over every edge of the saddle generously so it won't dent the headband padding.

5. Finish, then add the felt pads.

VCarve toolpaths (in this order)

Profile, Inside, layer PROFILE_INSIDE_0.750: cut depth 0.750" (through), 1/4" end mill.

Profile, Outside, layer PROFILE_OUTSIDE_0.750: cut depth 0.750" (through), 1/4" end mill, with tabs.

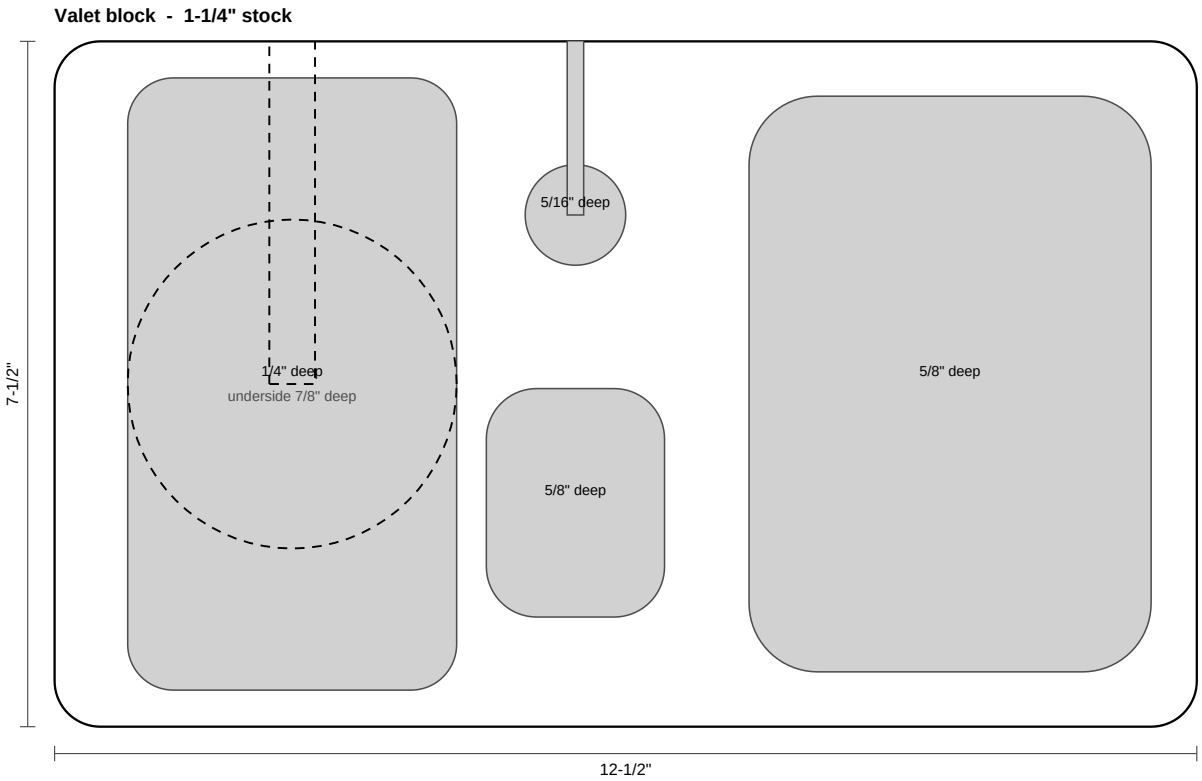
Files

dxf/headphone-stand.dxf

Plan view, drawn at about 1:2.2. Grey = pocket (depth noted), dashed = underside pocket, light fill = through cut. Cut files are full size.

3. Charging Valet

Phone, watch, earbuds and a catch-all in one block, with a wireless charger hidden under the phone.



Machine & stock

CNC router, two setups. 1/4" end mill for the big pockets and profile; 1/8" end mill for the watch cable channel.

Top pockets: phone bed 1/4", watch charger and its cable channel 5/16", earbuds 5/8", catch-all 5/8".

Underside: 3.6" round pocket 7/8" deep for a Qi charging pad, leaving 1/8" of wood under the phone, plus a 1/2" cable channel out the back.

Hardware

A round Qi charging pad up to 3-1/2" across and no more than 3/4" thick, with a thin foam spacer to press it against the wood.

A watch charging puck. Measure yours: the pocket is 1.10" across and 5/16" deep, with a 0.18"-wide channel for its cable.

Cork sheet for the bottom.

Steps

1. Underside first while the blank is flat: run the underside file (it is mirrored, as seen from below), with the outline as a registration reference.

2. Flip the block, register on the same corner, and cut the top pockets, then the profile with tabs.

3. Before finishing, test the charger: put the pad in its pocket with the phone in the bed. If it won't charge, deepen the underside pocket so the skin is 3/32".

4. Ease the edges and finish with DuraGrain Hardwax Oil (0.0 g/L VOC Tung, Walnut & T1 Carnauba finish). Seat the pad with foam behind it and cover the underside with cork.

VCarve toolpaths (in this order)

Underside first: in VCarve Pro use a double-sided job and import the -underside file onto the bottom side; otherwise run it as its own job, aligned on REFERENCE_OUTLINE.

Pocket, layer POCKET_0.250: cut depth 0.250", 1/4" end mill. Select every vector on the layer together so islands are left standing.

Plan view, drawn at about 1:2.1. Grey = pocket (depth noted), dashed = underside pocket, light fill = through cut. Cut files are full size.

3. Charging Valet (continued)

Pocket, layer POCKET_0.312: cut depth 0.312", 1/8" end mill. Select every vector on the layer together so islands are left standing.

Pocket, layer POCKET_0.625: cut depth 0.625", 1/4" end mill. Select every vector on the layer together so islands are left standing.

Profile, Outside, layer PROFILE_OUTSIDE_1.250: cut depth 1.250" (through), 1/4" end mill, with tabs.

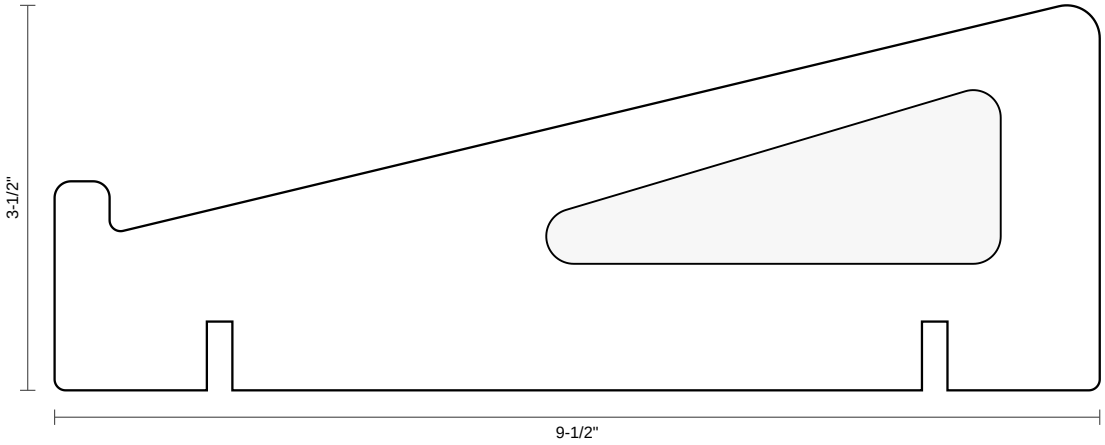
Files

dxf/charging-valet.dxf, dxf/charging-valet-valet-block-underside.dxf

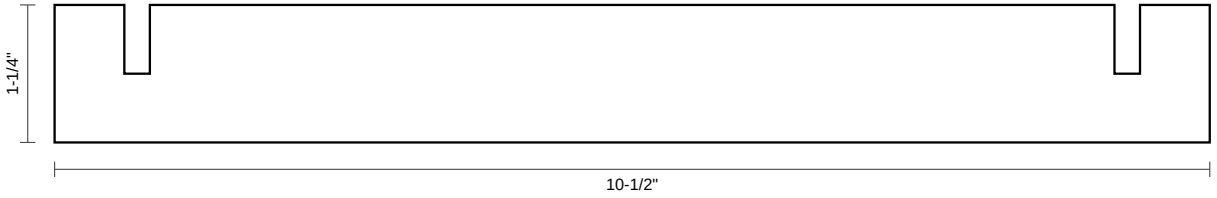
4. Laptop Stand

Slot-together, no glue. Tilts a laptop about 13 degrees; the front lip stops it sliding.

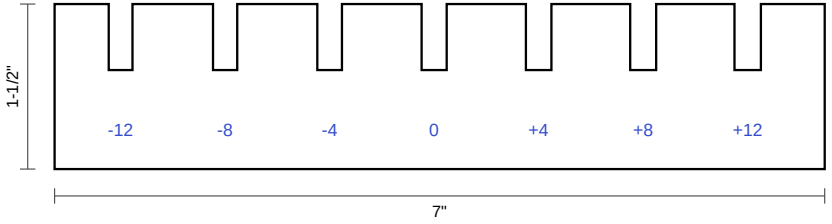
Side (make 2) - 1/4" stock



Crossbar (make 2) - 1/4" stock



Slot fit-test comb - 1/4" stock



Machine & stock

Laserbox 40W CO2. Red = cut, blue = engrave; set the operation for each color in the Laserbox software.

Slots are drawn for 0.236" plywood and a 0.008" kerf. Cut the fit-test comb first.

Hardware

Four small rubber bumpers for the bottom edges (optional).

Steps

1. Cut the fit-test comb and push a scrap of the same plywood into each slot. If the snug, hand-pressable slot isn't the one marked 0, change SLOT_FIT by that many thousandths and regenerate.

2. Cut both sheets.

3. Stand the two crossbars on edge, slots up, and press the side panels down onto them (side slots down), lips at the front. The bottoms of all four parts end up flush.

4. Sand off any scorch marks; finish with DuraGrain Hardwax Oil (0.0 g/L VOC Tung, Walnut & T1 Carnauba finish) if you like.

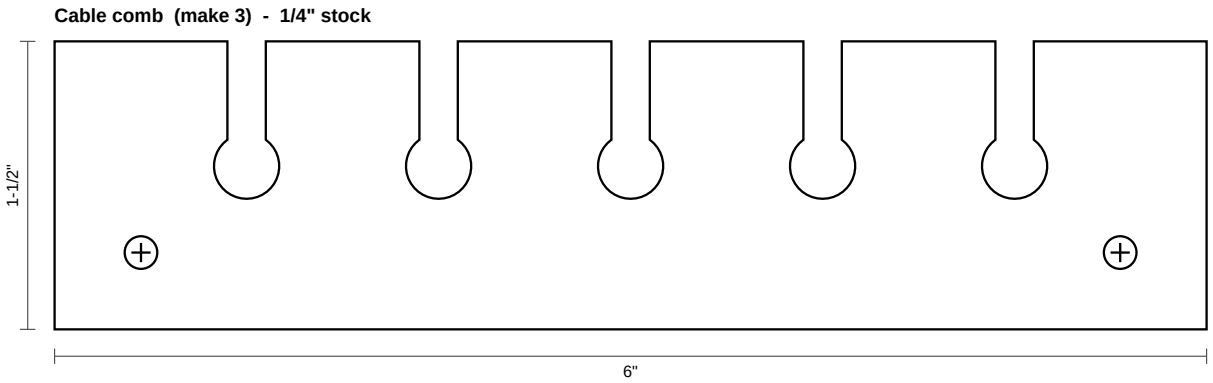
Files

dxf/laptop-stand-sheet1.dxf, svg/laptop-stand-sheet1.svg, dxf/laptop-stand-sheet2.dxf, svg/laptop-stand-sheet2.svg

Plan view, drawn at about 1:1.7. Grey = pocket (depth noted), dashed = underside pocket, light fill = through cut. Cut files are full size.

5. Cable Comb

Screws to the back edge of a desk and holds five charging cables where you can reach them.



Machine & stock

Laserbox 40W CO2, cut only.

The 0.2" neck opens into a 0.34" hole: cables from about 1/8" to 5/16" thick snap in and stay put.

Hardware

Two #8 x 3/4" screws per comb.

Steps

1. Cut three combs (one sheet).

2. Countersink the two screw holes by hand.

3. Screw the comb to the back edge of the desk, slots up, and press each cable through a neck.

Files

dxf/cable-comb.dxf, svg/cable-comb.svg

Plan view, drawn at about 1:1. Grey = pocket (depth noted), dashed = underside pocket, light fill = through cut. Cut files are full size.