

DIY Exposure Unit for 20" x 24" screens

This can be scaled up for bigger screens, but I will write the guide as if I were making it for 20" x 24" screens.

This setup exposes my screens coated in speedball diazo photo emulsion in ~ 2 minutes very consistently. (The time can vary depending on how much of the sensitizer I mix into my ink but it is consistent within the same batch.) Because the UV LEDs have no warm-up time it ends up being a consistent time-based exposure. The LED strips listed below had some extra length so you could make a bigger exposure unit, or space out the LEDs more to increase the coverage (This may increase exposure time.)

Parts list:

Exposure Unit (essential)

- Aluminum Foil
- LED UV strips: https://www.amazon.com/gp/product/B09DKHSVMH/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&th=1
- One 2" x 2" x 96" wood strip (If you don't build the screen drying rack you'll need another 24" of this 2x2 wood)
- 2.5in screws
- Strong Duct Tape (I like T Rex Tape)
- 20" x 24" x 0.25" foamcore board
- 20" x 24" glass panel (thicker the better but I use picture frame glass and it works fine)
- Spray adhesive
- Timer relay switch (optional and I will make a guide on integrating this later)
https://www.amazon.com/gp/product/B06X3YSXY9/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&th=1
- Copper wire (you could strip apart a few old USB charger cables for the wires or buy a spool)

Backlight bleed blocker (essential)

- Wood board 16" x 20" x (0.5" or 0.75" thick)
- Black t shirt/fabric
- Furniture foam 16" x 20" <https://www.hobbylobby.com/Fabric-Sewing/Batting-Fillings-Forms/Cushions-Pillow-Forms/Premium-Poly-Foam-Chair-Pads---22-x-22-x-1/p/109411?queryId=881bb9068b4f9d6a91ec616aed3a93c4>
- Weight (I use a 20lb dumbbell)

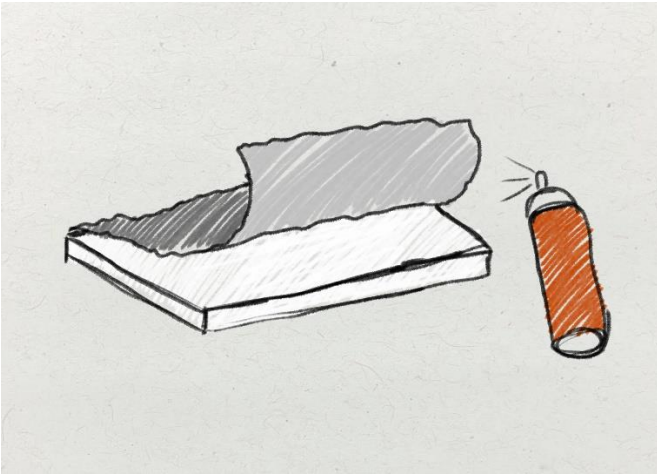
Integrated screen drying rack (optional)

- Two 1" x 2" x 96" wood strip
- Two 24" x 20.25" x 0.25" MDF panels
- One 24" x 24" x 0.25" MDF panel
- 24" x 18" matboard, chipboard, or cardboard (for the door)

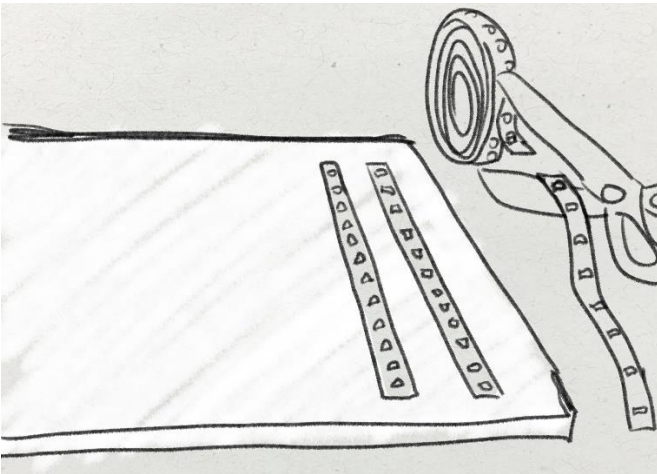
Tools required:

- Stapler that opens or staple gun
- Woodglue
- Miter Saw, jig saw, or circular saw (anything to cross cut wood strips)
- Table saw, jig saw, or circular saw to cut MDF panels
- soldering iron & solder
- Drill
- Rulers/measuring tape
- Wire strippers (your life will be hell without wire strippers)
- Wire cutters

LED unit

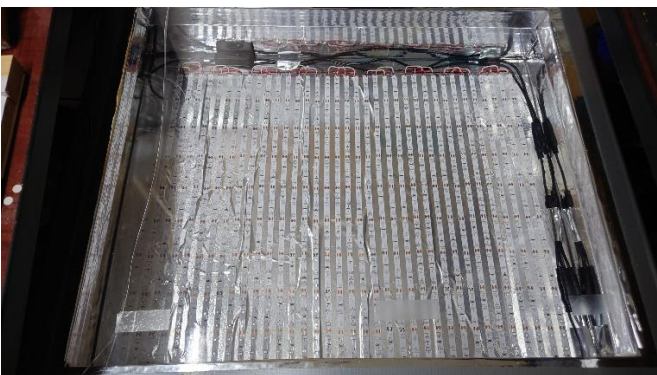


Spray your foamcore board with spray fixative and laydown aluminum foil as flat as you can. Cover the whole sheet. Aluminum foil is a cheap and thin material that lets no light through. (useful if your drying box is directly below) and helps add some efficiency to our weak lights.



Cut your LED strips at the pre-defined cut marks. Make them approximately the length of your screen mesh. In this case, I am making them ~16~17 inches in length. If I had to do this again I would run the LED strips along the longer dimension of the screen. So less soldering is required. I spaced my LED strips so that there is 1 LED strips worth of spacing in between them.

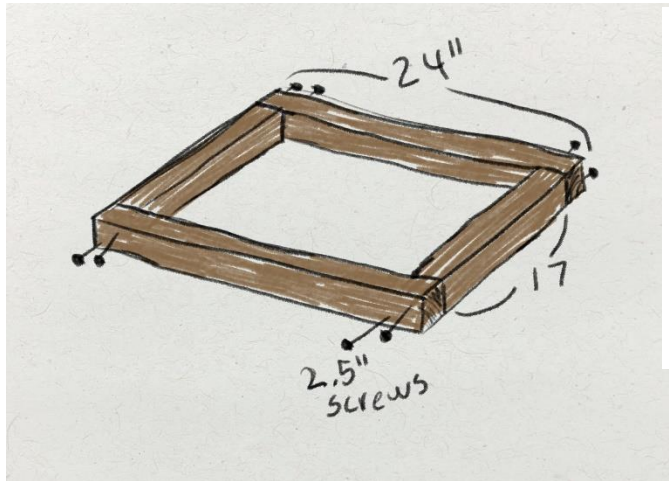
I have 2 sets of LED strips running across the board. I imagine it would be the same if it was wired as one super-long strip but I don't have enough electrical knowledge to know. Keep track of the orientation of the LED strips as you lay them down.





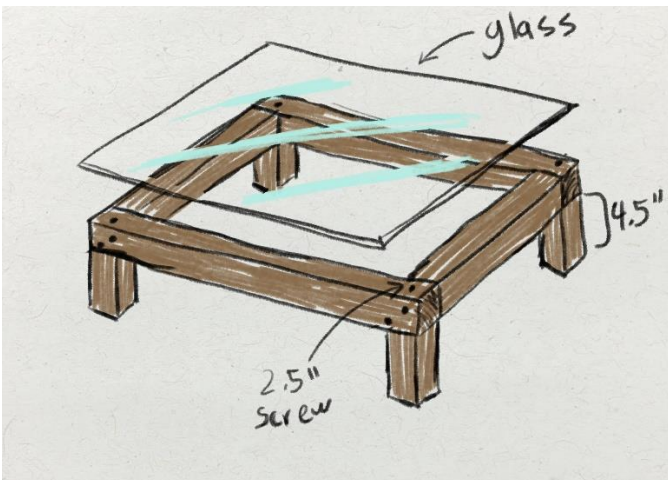
Cut several lengths of short wire and solder the strips into two long chains. The soldering is simple, just keep positive to positive and negative to negative and make sure bare metal on the wires do not touch.

The Frame



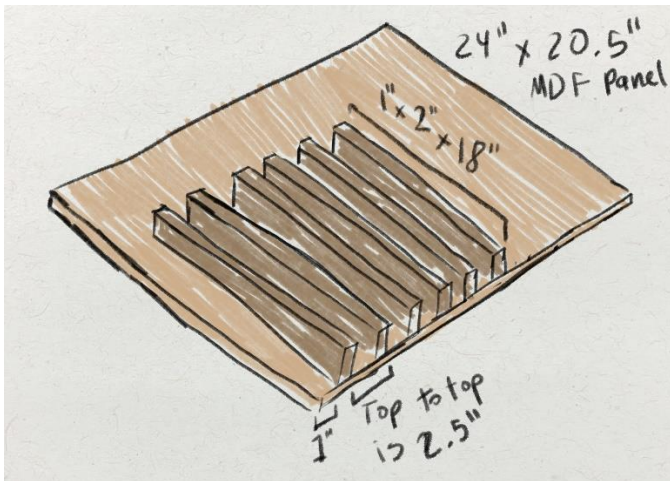
Cut your 2" x 2" x 96" piece of wood into two 24" pieces and two 17" pieces. Screw them into a rectangle.

Option 1: No screen drying rack version



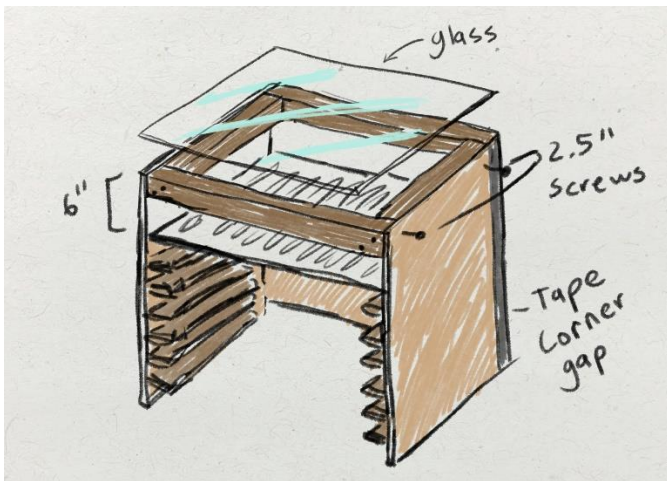
Cut four pieces of the 2" x 2" into 4.5" lengths. Screw these into the corner of the frame so that the top of the frame is 6" above the ground. Put a sheet of glass on top of the frame and you are basically done! Set this on top of your foamcore LED panel and you are ready to expose.

Option 2: Integrated screen drying rack



Cut your two 1" x 2" x 96" strips of wood into twelve 18" lengths. Glue these as indicated in the diagram. There should be a 1 inch gap from the bottom of the bottom piece of wood. Then measure and mark every 2.5" above that bottom piece of wood. The top of each piece of wood should be 2.5" away from the top of the one above it.

Make two of these panels. They should mirror each other.

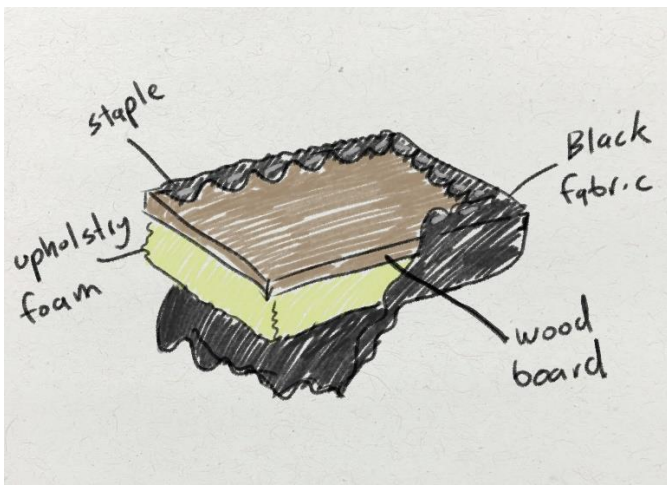


Screw these two side panels to the side of the frame so that the slats of wood are flush with the front. Then screw on the 24 x 24 panel to the back side of the frame. I then use duct tape to cover the corner seams.

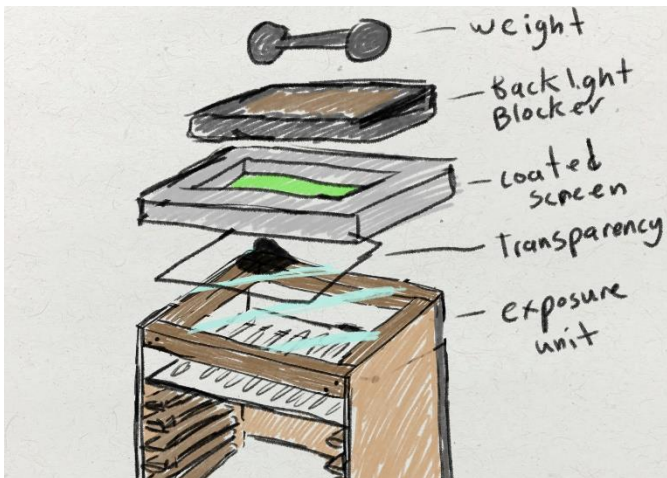
Tape the LED panel in position 4.5" below the bottom of the wood frame. The LED panel should be 6" from the top of the exposure unit where the glass is.



To make the door I used a piece of chipboard and duct tape to make a hinge. And tape to shut it closed. Every now and then the latch duct tape piece will lose its stickiness and I have to replace it, but I have been too lazy to replace it with a better system



In place of a vacuum hood I make a simple backlight blocker out of foam, cloth, wood, and a weight. This is built to be about an inch smaller on each side than the inside of my screen. I made this one 16" x 20" and used 2 inches of foam. Wrap the fabric around the foam and staple it to the wooden board.



When exposing your screen, simply place your transparency right read on the glass, then your screen mesh side down. Place the backlight blocker inside the screen mesh and place the weight on top of it. If you have other screens unexposed underneath, remember to close the door before turning on the exposure unit.

You can flip the LED power switch on and off manually and set a timer on your phone. In my unit I turn it on and off with an externally I am working on integrating a power timer switch into the system so it can manage its own time and auto-shut off... but I have not gotten around to it yet.

