

SCREENPRINT MANUALS

The following is a PDF compiled from many generous resources, including information targeted towards both the beginning and advanced printmaker.

SCREENPRINTING MANUAL

By Janet Ballweg, Bowling Green State University

This manual is based on notes from:

“Water-Based Screenprinting Today” by Roni Henning, “Water Based Screenprinting” by Lynwood Kreneck, teaching notes by artists Kevin Haas and David Newman, as well as advice from various artists, online sources, and facebook posts found over the years. I have tried to give credit whenever the source was identifiable. If you copy this manual, please give appropriate credit.

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CREATING IMAGE LAYERS

CREATING STENCILS/FILMS

Paper Stencils: Can made from freezer paper, drawing paper, contact paper, etc. Cut with a sharp knife on a stable surface and do not overcut corners, as ink will bleed into the cracks. Paper stencils are fairly temporary, used for monoprints or small editions. Lay them on your printing paper where you don't want ink to print. Begin with one very firm stroke of the squeegee so the ink will adhere the stencil to the screen (the ink acts as an adhesive). The stencil will usually remain in place during the printing of the edition, though sometimes stencils will sag or fall off or ink will penetrate through the stencil. Prolonged use may also trap ink along the edge of the stencil, making the screen harder to clean later.

Drawing Fluid/Screen Filler Stencils: Elevate the screen off the table. Draw with a heavy coat of drawing fluid on the back side of the screen. Allow to dry thoroughly. On the same side of the screen, squeegee a thin layer of Screen Filler (diluted 50% with water) with a piece of mat board. Begin in one corner of the screen and move with steady pressure. Do not back-track except on a small overlay of edges and do not squeegee on the other side of the screen as the fluid will be sandwiched and will not wash out properly. Continue this until the drawing fluid area and the open mesh are evenly covered. Dry the Screen Filler thoroughly with a hot hair dryer. Repeat the Screen Filler coating. When the Screen Filler is totally dry, wash out the Drawing Fluid with warm water and a sponge or light spray hose. Tip: Adding syrup or sugar to Drawing Fluid will give it more body and help it wash out easier. Note: Any material that will dry to the touch and readily dissolve in warm water can be used in place of drawing fluid, such as thin syrup, sugar dissolved in water (with ink added for color), or a bar of soap shaved to a point (soap rubbings work very well!).

Screen Filler: Screen Filler can be used on its own to create negative stencils (the areas that won't print). Elevate the screen off the table. Stir the Screen Filler well and apply it to the back side of the screen to reduce friction during printing; however, you will need to work on both sides because the Screen Filler will push through on the opposite side. Apply a thin layer of Screen Filler by brushing, spraying, using a drawing reed, blotting with a cloth or sponge, applying with a stamp, etc. Use a hot hair dryer as you work and dry the Screen Filler completely before printing.

To create a tonal, lithographic wash effect, brush water on the screen mesh first, then brush on a thinned solution of filler (25% filler/75% water) over top. Dry the screen at least 8 hours before printing. When printing, the image may fill in slightly for the first few proofs before it stabilizes. Proof until the stencil is stabilized.

Note: Keep the Screen Filler container tightly covered to prevent thickening (thin with water, if needed and mix well).

Reversal of a Screen Filler Stencil:

Print the initial stencil and then wash out the ink with water, leaving the stencil intact. Dry the screen thoroughly. Squeegee the back of the screen with a thin, even layer of photo emulsion. Allow the emulsion to dry in sunlight or under fluorescent lights for at least one hour. Remove the Screen Filler with Bon Ami, Wisk, 409 Cleaner or Mr. Clean. The photo emulsion will remain in the screen, creating a reversed image of the original.

Wax Crayon Stencils: Crayola crayons can be used to make textured stencils and marks (the crayon acts as a resist and will not print). Lay textured materials beneath the screen and rub over the screen with the crayon to pick up the textures. Apply a thick layer of crayon so the block-out will hold up under the friction of printing. Heat the crayon drawing with a hair dryer briefly to melt the crayon into the fabric. Tip: Crayons can also be used during the reduction process to block out areas of a previous stencil. For multiple printings, wash ink from the screen with cool water so the crayon stays intact.

Lithographic Crayon Resist:

Litho crayons dissolve in water and lend themselves to a textural crayon-like image (as with drawing fluid, the drawn areas will print). Draw or rub (#0-#1) litho crayons on the screen with the mesh in contact with the printing surface. Elevate the screen and coat the entire mesh with one thin pass of Screen Filler. Let the screen filler dry. Wash the crayon marks out with cold water and then set the Screen Filler with a hot hair dryer.

Photo Stencils using Photo Emulsion: Photographic emulsion translates a hand-drawn, digital, or photographic image into a stencil on the screen.

Images may be made in various ways:

- Hand-draw on thin paper (e.g. computer/bond paper or frosted mylar) using any opaque, black drawing material: Sharpie, Micron, Identi-pen, Paint pen, or Sumi ink. A double layer of Sharpie/Micron may be needed as these pens are not entirely opaque (it's best to photocopy the drawing to ensure that it's dark/opaque enough).
- Photocopy or laser-print onto transparency or computer/copier paper
- Digitally print onto transparency or computer paper
- Hand-cut stencils from Rubylith film (cut through the red layer only)
- Use opaque paper or flat, opaque objects as stencils, similar to making photograms

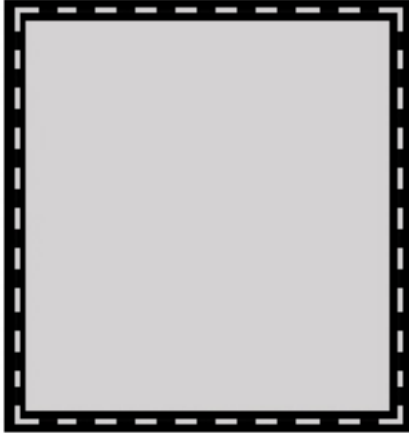
Regardless of how you make the "drawing," the image area must be black and opaque (no greyscale or colors) in order to resist the light exposure, and the negative areas must be translucent in order for the emulsion to harden during exposure.

If your image is drawn/printed on computer paper, you must oil the paper to make it translucent. Note: Be sure to clean the table and the exposure glass after use and store the oiled images in baggies or a designated tray, as the oil will leech out and destroy everything in its path.

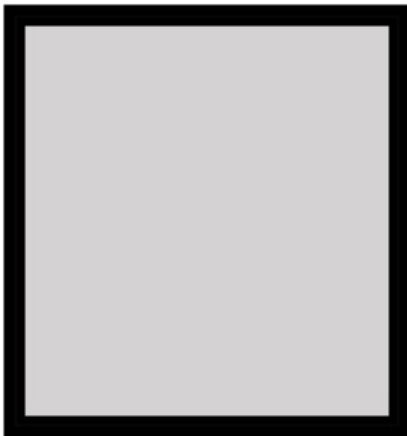
See "Photo Emulsion" for more detail on how to work with photo stencils.

TRAPPING COLORS

When printing multiple colors, it's important to "trap" the colors so they're easier to align during printing. This is done by slightly overlapping the color layers when creating the image layers. This will ensure that the edge of one color will be slightly overlapped by the color layer that's printed on top of it.



The grey layer is drawn to the dotted line in order to overlap the width of the black line.



When printed, the black line traps the outer edge of the grey layer so you won't see the overlap.

WORKING WITH PHOTO EMULSION

SCOOP COATERS

Scoop coaters, used for coating screens with emulsion, must be kept free of dirt and nicks along the coating edge. Flaws will result in heavier deposits of emulsion, which in turn will affect the image, especially bitmapped images.

PHOTO EMULSION

Wear gloves when handling and use under low lighting (yellow lights). TZ Photo emulsion comes as 2 components; the sensitizer powder must be mixed with water and added to the liquid emulsion solution before the emulsion will become light sensitive. The shelf life of un-sensitized emulsion is one year; sensitized emulsion is 4-6 weeks (unrefrigerated) or 3-4 months (refrigerated). Ideally screens should be exposed within a week of preparation, though they can be kept in a dark, cool space for up to a month.

COATING THE SCREEN

Carefully pour emulsion into a scoop coater that is large enough to cover the width of your screen without overlapping the frame. Stand the screen at a slight angle with the back side of the screen (flat side) facing out. Starting at the bottom of the screen, push the scoop coater against the screen and tip the scoop coater until the angle allows the emulsion to run evenly against the screen. Move the scoop coater up the length of the screen, keeping solid contact with the screen. At the top, tip the scoop coater back to collect the remaining emulsion, and then move it gently side-to-side 2-3 times to keep the emulsion from dripping as you pull the scoop coater away from the screen. Immediately, flip the screen around so the top is now the bottom and repeat the coating process; this ensures that the mesh is adequately covered and you haven't missed any spots. Use a small piece of mat board to clean up the edges so there are no thick ridges or drips. Note: some artists coat the screen on both sides; however, that requires a slightly longer exposure time, as you will be exposing through two thicknesses of emulsion.

When coated, carefully put the screen horizontally in the designated drying rack and allow to dry thoroughly.

Return unused emulsion to the bucket of emulsion, wipe the rim of the bucket to remove any drips, and return the bucket to the refrigerator. Clean the scoop coater and spatula with water and paper towels.

Allow your screen to dry for at least 1 hour (longer is better). The emulsion needs to be fully dry or the screen will not properly expose.

EXPOSING THE SCREEN

When the screen is fully dry, use a few small pieces of tape to attach your image to the back side of the screen (flat side), with the drawing facing the screen. Lay the screen on the exposure unit with the outside (flat side) facing down.

If using the Amergraph light unit: Close the top and lock it in place. Turn on the power switch, turn on the vacuum switch, and set the appropriate exposure time. When the vacuum has stabilized (usually “22-24” on the dial), hit the “Start” button (the machine will go through a warm-up period and then the light will come on to expose your screen. If you want to avoid the warm-up period, hit “Start/Ins/Start” (must be in that order!). When the exposure is finished, the dialog box will read “EC” (exposure complete). Turn off the vacuum before opening the unit!

If using an exposure unit without a vacuum: Place a weighted board on top, and use weights to create better contact.

Note: Avoid looking at the UV light as it can damage your eyes.
White mesh may require a shorter exposure than yellow/orange mesh.

DEVELOPING THE SCREEN

The washout process is controlled by the temperature of the water, the strength of the spray, and the length of wash-out time. It is best to use cold water and a gentle spray. Begin by wetting both sides of the screen. From the printing side (the inside), spray with a gentle spray of water. The image should show up within a few minutes; if not, your exposure time may have been too long. Stubborn images may require a longer wash out, slightly warm water, and/or the use of a stronger spray but be careful not to be too forceful because it can cause pinholes (open areas in the negative areas of your image). If you have small areas of emulsion that won't wash out, or a thin film of residual emulsion in unwanted areas, you can use a Mr. Clean magic eraser to gently remove those areas, but be careful as it can weaken the emulsion surrounding the image. When the image is completely washed out, rinse the screen on both sides to remove any soft emulsion and allow to dry. If desired, you can post expose the screen to harden the emulsion by sitting the screen in the sun for 5 minutes.

DRYING THE SCREEN

Lean the wet screen in front of a fan to dry or allow to air dry.

POST-EXPOSING THE SCREEN

Some people like to post-expose their screens to harden the emulsion (this may also make it easier to remove the emulsion later). To post-expose, put the screen in the sun for 5-10 minutes or use the light exposure unit (without the vacuum) for roughly a minute.

PRINTING

SCREENS

Fabric: Use only synthetic fabrics with water-based inks. Monofilament polyester fabrics work well. They have good dimensional stability with less stretch and no change when wet, which aids in registration. Orange or yellow fabric is preferred (rather than white fabric), because the colors reduce the bounce of light during exposures.

The mesh count of a screen is the number of threads per inch. The higher the mesh count, the more detail your image can hold; however, ink dries faster in a screen with a high mesh count because the holes are smaller and therefore they plug up faster.

120 mesh count is good for printing on ceramics

155 mesh count is good for t-shirt/fabric printing

200 mesh count is good for general printing and flats

230-400 mesh count is good for photo images and fine details

Screen frame: Wood frames allow you to re-stretch the fabric if needed, but wood will warp over time. Aluminum will not warp, but it needs to be factory stretched. Also, it's wise to tape over the glued area of the mesh on an aluminum frame so stripping chemicals won't dissolve the glue.

Screen size:

Choose a large enough screen for your work. The maximum printing area of a screen is about 6" smaller than the inside dimensions of the screen. It is critical that a 3" minimum border be maintained around the image to allow for the movement of the screen during printing. Ideally, keep a 4" border on the edges where the squeegee starts and ends to allow adequate room for the ink trough.

Stretching a screen. Factory stretched screens are best but if you want to stretch a wood frame yourself, you can do it using the staple method:

1. Buy a piece of monofilament polyester screen fabric that is at least 2" larger than your frame all the way around.
2. Immerse it in water and have a sponge handy to keep it moist during the stretching process.
3. Lay the frame on your work surface. Center the wet fabric over the frame.
4. Lay bias tape (used for sewing) along one side (to keep the staples from ripping the fabric). Staple the middle of this side and then pull the fabric taut across to the opposite side of the frame, lay a strip of bias tape along that side, and staple the middle of that side.
5. Work from the center of the first side toward the corners, a few staples at a time; then do the same on the opposite side.
6. Begin at the centers of the other two sides. Continue stretching and stapling all around the edge. Remember to keep the fabric moist with the sponge so that it will stretch evenly.

7. Hammer the staples in and trim the excess fabric to within ½ inch of the staples.
8. Tape the entire frame to keep water from warping it. Bring tape at least 1 inch into the printing area and try to align the tape from both sides of the screen so it's even (otherwise exposed tape adhesive will break down during cleaning).

Alternate staple pattern: Start with 3 staples in the middle of one side, 3 staples in the middle of the opposite side, 3 staples in the middle of the third side, and then 3 staples in the middle of the 4th side. Then move out from the middle toward the corners.

Screen care: Be careful about storing your screen, as the fabric will easily puncture if it comes into contact with sharp objects or surfaces, or if it is heavily abraded during cleaning. Also, the longer you leave a product in the screen, the harder it is to remove. Ink should be removed immediately because it will dry quickly into the screen. Emulsion and screenfiller should be removed within 2 weeks. See "Cleaning" for more details.

SQUEEGEES

Squeegees come in varied durometers (hardness/softness). The higher the number, the harder the squeegee. When printing on paper, squeegees must be fairly hard (60-70 durometer), with a square profile blade that is sharp and free from nicks; the left and right ends of the blade should be slightly rounded to avoid damaging the screen mesh. The size of the squeegee should extend beyond the image area by 1-1/2" on both sides to ensure full coverage of the image. When printing on fabric, a softer squeegee (50-60 durometer) is best.

Squeegee care: Do not store the squeegee on its blade and avoid nicking the blade. Clean thoroughly with soap and water after use; dried ink will affect all subsequent printings. Squeegee blades may be sharpened using garnet paper and a jig that holds the blade at a right angle.

INK

Screenprinting inks are water-based but become permanent on paper when fully dry (10+ days). If you plan to add intaglio to the prints, it's best to allow the screenprints to dry for 2-3 weeks before soaking the paper. Screenprinting inks also become permanent in screens, so do not let ink dry in screens (or on clothing)!

Screenprinting inks are generally the right consistency in the jar, but they should be mixed with some type of base to keep them from clogging the screen (either extender or transparent base). When mixing color, mix the hue, value, and saturation first and then add transparent/extender base and/or other modifiers. If you want a very transparent color, start with transparent base and add a little color to it or you will end up with a huge amount of ink. Use an ink card to do a draw-down to check your color before putting it on the screen; however, keep in mind that the draw-down will be substantially lighter than the printed color because printing lays a thicker deposit of ink.

FABRIC INKS: When printing on fabric, textile inks must be used. Even a small portion of regular screenprinting ink mixed into the textile ink will cause the ink to wash out of the fabric. However, fabric inks can be used when printing on paper.

INK ALTERNATIVES:

There are various plants and food products that produce pigment. E.g. chocolate, cocoa powder, curry, turmeric, red cabbage, red onion, raspberries, and blueberries. To make an ink-like consistency, add sweetened condensed milk or syrup to loosen or add cornstarch to stiffen. And print with a lower screen mesh (120-140 mesh because the consistency of the “ink” will be thicker than actual ink).

INK MODIFIERS

To loosen ink, use one of these additives:

- TW Graphics Transparent Base: will add transparency to ink colors, will loosen the ink (TW is the loosest transparent base).
- Golden Silkscreen medium: will add transparency to ink colors, may also loosen the ink, making it easier to print (Golden Medium is the perfect consistency for printing).
- Speedball Extender Base: extends the ink color, adds a little transparency.
- Water: If your ink transparency level is perfect, but the ink is still too thick, add water but don't overdo it; water will make your paper wrinkle and may make the ink mold.

To thicken ink, add:

- Speedball Transparent Base: will add transparency to ink colors and will also thicken the ink (Speedball Trans Base is the thickest base).
- Cornstarch. Mix extremely well.

To slow the drying time of ink and help the ink flow, add one of these retarders:

- Glycerin –Do not exceed 1 part glycerin to 15 parts ink mix.
- Retarder – Use to help the ink flow through the mesh and to slow evaporation, but add no more than 10-15% retarder.
- Floetrol –Use to help the ink flow through the mesh and slow evaporation.

Gloss medium: can be added in varying proportion to achieve a satin or glossy finish. It will generally darken and intensify the colors beneath it. Gloss Medium can be applied to printed surfaces that will be subjected to wear and tear, such as book covers, signage).

Overprint varnish: can be added to create glossiness. Can be added to a color or used on its own.

PAPER AND OTHER PRINTING SURFACES

Most printmaking papers will work for screenprinting but it's best to choose strong, heavy-weight papers with good sizing so the paper doesn't grow, shrink, or buckle when laying down multiple colors. Most printmakers prefer a medium to heavy-weight paper (200-300gm) for screenprinting; however, Eastern papers can also work for some applications.

Things to consider about paper for screenprinting:

1. **Ability to hold many layers of color without warping.** Lightly or non-sized papers will allow the ink to sink into the paper. A surface-sized paper will keep the ink on the surface and allow more layers to be printed.
2. **Dimensional stability.** Look for a paper that will not stretch or contract with moisture during printing. This is crucial for holding registration when printing multiple colors.
3. **Texture.** A smoother paper will produce a sharper image, capturing more detail (especially for photographic silkscreen). When using a more heavily textured sheet the textured surface will become a more pronounced part of the final image.
4. **Weight.** Heavier papers are typically better for stability and to keep the paper from buckling. The general rule of thumb: the larger the sheet size, the heavier the weight; it will make handling the paper a lot easier if it has some heft.

PAPERS RECOMMENDED FOR SILKSCREEN:

Arches 88, Arches Cover Stock, Arches Platine, Arches Watercolor, Canson Edition, Colorplan, Copperplate, Coventry Rag Smooth, Curious Metallics, Domestic Etching, Fabriano Artistico, Folio, Frankfurt, Hahnemuhle Copperplate, Hahnemuhle Durer Etching, Hahnemuhle German Etching, Incisioni, Johannot, Lanaquarelle, Legion Art Coated Cover, Legion Art Cover, Legion Bamboo, Lenox 100, Lettra, Magnani Acquerello, Magnani Velata, Magnani Vergata Multimedia Aquarelle, Murillo, Nideggen, Parchtone, Pergamenata Parchment, Pescia, Plike, Revere, Rising Barrier Paper, Rising Conservation Board, Rising Drawing Bristol, Rising Museum Board, Rives BFK, Rives de Lin, Rives Lightweight, Rives Heavyweight, Rosaspina, Saunders Waterford, Shine, Sirio Ultra Black, Skin, Somerset Satin, Somerset Velvet, Stonehenge, Strathmore Pure Cotton, Thai Chiri, Tiziano, Yupo, Zerkall Book, 2-ply museum board. For proofing, cardstock is recommended. Avoid newsprint because it will often stick to the screen.

PRINTING ON OTHER SURFACES

If it's a flat surface, you can probably screenprint on it! Try:

- Paper – found, wallpaper, wrapping paper, brown paper bags, boxes, etc.
- Glass, Plexiglas, Plastic, or Metal sheets
- Fabric- clothing, sheets or panels, canvas, bookcloth
- Leather, vinyl, Tyvek
- Photographs or Digital Prints
- Wood panels or veneer
- Clay slabs or as decals
- Walls

REGISTRATION

Various registration methods can be used for aligning colors within your image: Kento/3-point registration, registration pins, T-and-bar, and acetate registration. The use of registration pins is the most effective and efficient, as it allows for exact registration during repeated printings. Acetate registration is helpful for setting up pin registration, and also to fix registration problems during printing.

Fixing registration problems: Stop immediately if you notice an issue. Tape down a piece of acetate under the screen, print on the acetate, clean out the screen, dry the ink on the acetate with a hair dryer, and then use the printed acetate under your screen to re-set the registration so you can continue printing.

Tips for minimizing or avoiding registration problems:

- Don't use nylon screen fabric. Monofilament polyester is more dimensionally stable, with less stretch and no change when wet with water.
- Take extra care when creating stencil positives to ensure that everything aligns.
- Prepare printing paper in advance: punch registration and allow the paper to acclimatize by reaching a stable equilibrium with shop humidity and temperature. A 22 x 30" sheet of paper may have as much as 1/8" dimensional distortion with humidity change.
- Printing a flat beneath the entire image will contribute to the dimensional stability of the paper for the remaining runs. Use 1:1 white ink with Speedball Extender or Transparent Base.
- Use the minimum length of squeegee that will span the image area to reduce drag and deflection from friction. Use the same size and durometer of squeegee for all runs to maintain this consistency.
- Pull all runs from the same direction to reduce deflection.
- Use trapping to avoid slight misalignments.
- Make sure hinges are tightened so the screen doesn't shift during printing.
- Add a small amount of Glycerin or Floetrol to make the ink slicker and reduce squeegee drag.

PRINTING

SETTING UP FOR PRINTING: You will need your screen, hinge board, squeegee, squeegee holder/prop, registration guide, ink, spatula or ink cards, a damp sponge and/or paper towels, spray bottle, drafting tape, packing tape, contact paper, scissors, 2 off-contact blocks, screen block prop, paper for editioning, paper for proofing, newsprint for emergencies, and easy access to a drying rack.

PREPARING THE SCREEN: On the inside of the screen, place contact paper in the open border areas to prevent ink from traveling through during printing. Use packing tape along the edge of the contact paper to keep the ink from lifting its edges. Tape off any open areas of the screen that you don't want to print.

OFF-CONTACT PRINTING: Use off-contact blocks on the bottom outer edges of the screen to lift the screen off the table, allowing the screen to touch the paper only when the squeegee forces contact; the screen will snap back after the squeegee passes. This ensures a crisp, un-blurred image with an even, thin coat of ink. Roughly 1/8" off-contact is desirable, depending on mesh tension and screen size. Flats and large open areas of mesh require more off-contact distance than screens with smaller open areas.

FLOOD STROKE: A flood stroke is done with the screen propped up, away from the paper. The flood stroke is used to fill the screen mesh with ink immediately before the first pass and immediately after each pass to keep the screen from drying out. To flood the screen, hold the squeegee at a 60-75 degree angle and move it from the front of the screen to the back with minimal pressure to evenly distribute a layer of ink. The entire image area must be coated with ink or the open areas will dry out. Do not use pressure when flooding the screen or you will deposit ink on the underside of the mesh.

PULLING THE PRINT: Lower the screen into printing position. Evenly distribute the ink along the squeegee and then, with pressure, pull the squeegee from back to front with both hands, holding the squeegee at a 60-80 degree angle. Do not apply excessive pressure; too much pressure will create friction and cause the squeegee blade to bend and/or the mesh to warp, resulting in a thick deposit of ink and an image that is not crisp. However, too little pressure is also not good, as you must make contact with the surface below in order to transfer the ink through the screen.

Lift the screen immediately after the printing stroke (inserting a prop block to hold the screen in place), do a flood stroke, put the squeegee in the squeegee holder, and remove the printed paper. Place another sheet of paper on the registration guides, lower the screen and print. Repeat until the run is complete.

PRINTING PROBLEMS: Stop printing immediately if you notice a problem. Try to resolve it and proof on newsprint or index stock before proceeding. If it can't be readily fixed, wash the ink out of the screen with sponges and paper towels, dry the screen, and resolve the problem before you re-start printing. See the section on "Troubleshooting."

CLEAN UP: When finished printing, clean up at your printing station (do not put ink down the sink drain and do not use the power washer to remove ink!). At your printing station, remove ink from the screen and squeegee using an ink card; put the excess ink into a lidded container to save. Wash the remaining ink from the screen using damp sponges or paper towels, making sure to remove every trace of ink before it dries in the screen (pay close attention to edges of stencils and along edges of contact paper and tape). Clean squeegees with a sponge, being careful to remove all ink from the blade edges and handle. Clean spatulas, plastic ink cards, etc. with a damp sponge to remove all ink; do a final cleaning of spatulas and ink cards with cleanser in the sink. Take your screen to the pressure washer to remove the emulsion from the screen (see "Cleaning" section).

Note: The longer the exposed emulsion remains in the screen after printing, the harder it is to remove, so wash out the emulsion within a few days of printing.

CLEANING SCREENS

CAUTION! For all of these products, avoid contact with eyes and skin. Wear gloves, goggles, and protective clothing. Work in a well ventilated area; do not breathe the fumes. And use ear protection when using the pressure washer.

GENERAL SCREEN CLEANING PROCEDURES

The following three products will handle your typical cleaning needs.

DEGREASING THE SCREEN – Use 409 Cleaner

You don't need to use this every time you coat a screen, but it's recommended that you degrease the first time you use a screen and before you start each new project.

Instructions:

1. Wet the screen and spray it with 409 cleaner. Rub it across the mesh on both sides using the designated pad.
2. Rinse the screen mesh with warm water and then allow the screen to dry.
3. Rinse the cleaning pad with warm water, ring it out, and return it to the assigned area.

REMOVING SCREENFILLER FROM THE SCREEN – Use Bon Ami or Comet

Instructions:

1. Wet the screen on both sides.
2. Sprinkle Bon Ami on one side and use a green scrubbie to gently move it around. Repeat on the other side of the screen.
3. Allow the screen to sit for 5-10 minutes. Then use the pressure washer to wash out the Screenfiller and remove all residue of Bon Ami.
4. Rinse the scrubbie when finished and return it to the assigned area.

Note: If you have both emulsion and Screenfiller on a screen, remove the Screenfiller first, as it will be trapping some of the emulsion.

REMOVING EMULSION FROM THE SCREEN – Use Ulano Stencil Remover #4

Instructions:

1. Wet the screen on both sides.
2. Pour some Stencil Remover on a scrubbie and gently move it around on the screen. Repeat on the other side of the screen and keep it moving for 30 seconds (**Do NOT allow it to dry in the screen because it will lock the emulsion into the screen!**)
3. Immediately, use the pressure washer to wash the stencil out of the screen from both sides.
4. You may wish to repeat this process to ensure that all emulsion is washed out of the screen.
5. Rinse the scrubbie when finished and return it to the assigned area.

DEEP CLEANING SCREENS

DO THIS ONLY if the above chemicals don't work!

If you haven't sufficiently cleaned your screen after each use, ink, emulsion, and screenfiller can accumulate in the screen and block the mesh. To clean, you may need to use one or more of these products (use one at a time; do not mix!)

REMOVING STUBBORN EMULSION LEFT IN THE SCREEN – Use Ryonet Sgreen Dehazer

Instructions:

1. Remove all ink, screenfiller, and emulsion from the screen.
2. Wet the screen with water. Apply dehazer on the ink side of the screen.
3. Use a pad to rub both sides of the screen for 4-10 minutes.
4. Rinse with low pressure, then use the pressure washer with high pressure, spraying from bottom to top of the screen.
5. Flip the screen over and rinse with high pressure, then use low pressure to rinse the entire screen.

REMOVING TAPE RESIDUE OR SMALL SPOTS OF DRIED INK – Use Rubbing Alcohol

Instructions:

1. Apply rubbing alcohol to 2 cotton pads and rub the spot on the screen from both sides of the screen simultaneously.
2. Immediately use two clean cotton pads to dry the screen.
3. Pressure wash the screen to remove any loose residue. Do not allow the alcohol to dry on the screen, as it will leave a stain and clog the screen.

REMOVING DRIED INK FROM THE SCREEN – Use Krud Kutter

Instructions:

1. Remove all ink, screenfiller, and emulsion from the screen.
2. Wet the screen with water. Apply Krud Kutter to the screen.
3. Use a pad to rub both sides of the screen for 4-10 minutes.
4. Rinse with low pressure, then use the pressure washer with high pressure, spraying from bottom to top of the screen.
5. Flip the screen over and rinse with high pressure, then use low pressure to rinse the entire screen.

ALTERNATE CLEANING PRODUCTS FOR SCREENS, INK, AND STENCILS

Removing Speedball Screen Filler

Cleaning products such as Lysol cleaner, Simple Green, Mr. Clean (without bleach or ammonia), Tide or Wisk detergent can be used to remove screen filler but each requires soaking for 20 minutes. Lay a stack of paper towels on a sheet of Plexiglas. Pour the cleaning product on the paper towels. Lay the screen on top and cover with another sheet of Plexiglas to keep the screen from drying out. Wash out with the pressure washer after 20 minutes.

Removing Emulsion

Franmar sells a product called Stripee-doo that works well, though it has a strong odor.

Removing Crayon Stencils

All purpose spray cleaner: Make a sandwich of Plexiglas and paper towels soaked in an all purpose spray cleaner which states that it takes out crayon. Soak for 30 minutes. Rinse well, dry, and finish with cotton pads saturated with alcohol, if needed.

Removing Water Soluble Crayons and Pencils

A spray of warm water will wash out most water soluble crayons. If additional cleaning is needed, use an all-purpose spray cleaner.

Removing image stains on the screen

Rubbing a Mr. Clean eraser over the screen will lessen the staining. Rinse clean.

Removing materials that have permanently dried into the screen

Lawson's ID-360 (highly toxic and smelly – use only when nothing else has worked). Apply with a brush. Let stand 10 minutes, rinse, then pressure wash. Degrease the screen extremely well afterwards, as Lawson's is greasy.

Removing ink from clothes

It is very difficult to remove ink from clothing. If you catch it immediately when it happens, wash the clothing with water and a little Mr. Clean (test it first, as Mr. Clean may bleach out the garment color).

PRESSURE WASHER

Instructions for using the Pressure Washer:

1. Turn on the water valve under the sink (left = on; right = off).
2. Squeeze trigger of gun to ensure that water is flowing.
3. Turn the pressure washer switch "on."
4. Spray the screen from a distance of roughly 8-12" away.
5. Turn off the pressure washer when not in use so it doesn't burn out the motor!
6. When completely finished, turn off the water valve under the sink.
7. Pull the gun trigger to release the remaining pressure in the gun.

TROUBLE-SHOOTING

PROBLEM	POSSIBLE CAUSES/SOLUTIONS
Screen doesn't wash out	<p>Exposure was too long.</p> <p>Image positive was too thin/transparent.</p> <p>Image wasn't washed out long enough.</p> <p>Water was too cold to break down the emulsion.</p> <p>Water pressure was not sufficient.</p> <p>Screen was pre-exposed to light.</p>
Emulsion breaks down during washout	<p>Emulsion application was not uniform or mesh tension was too loose.</p> <p>Wash out was too vigorous or abrasive.</p> <p>Water was too hot.</p> <p>Exposure time was too short (or emulsion too thick).</p> <p>Emulsion was not completely dry before exposure.</p> <p>Emulsion was too thin (was easily abraded).</p> <p>Emulsion was too old or improperly mixed.</p> <p>Positives were too thick or yellowed.</p>
Photo emulsion on screen has pin holes	<p>Excessive washout (washed out too long, water too warm, or too much water pressure)</p> <p>Mesh was not degreased properly.</p> <p>Mesh was wet during emulsion application.</p> <p>Emulsion was too thin.</p> <p>Screen coating stroke was too fast.</p> <p>Dust on the screen or in the emulsion.</p> <p>Exposure glass was dirty.</p> <p>Air bubbles were in the emulsion (wait 1 hour after mixing new emulsion to let it de-bubble)</p>

<p>Photo stencil has poor definition or fuzzy/sawtoothed edges</p>	<p>Check resolution of the image positive.</p> <p>Poor contact during exposure.</p> <p>Image positive is warped.</p> <p>Screen was under-exposed.</p> <p>Uneven application of emulsion.</p> <p>Mesh is too coarse (use a higher mesh count).</p> <p>Light scattering due to white fabric (use orange or yellow mesh).</p>
<p>Screenfiller stencil has pin holes</p>	<p>Screenfiller applied too thin.</p> <p>Screenfiller not hardened properly with a hot hair dryer.</p> <p>Dust in screen filler.</p>
<p>Screenfiller breaks down and comes off on print</p>	<p>Screenfiller was not completely dry.</p> <p>Screenfiller was not hardened (dry with hot hair dryer).</p> <p>Screenfiller was not mixed well before use.</p>
<p>Image prints double or appears to skid</p>	<p>Mesh is too loose.</p> <p>Paper is sticking to mesh after print stroke (use vacuum or tape paper to base).</p> <p>Too much friction (pressure) when printing.</p> <p>Too much pressure when flooding.</p>
<p>Printed ink has an orange peel texture or oyster shell shape</p>	<p>Paper is sticking to mesh after print stroke (use vacuum or tape paper to base).</p> <p>Not enough off-contact distance for screen to snap back.</p> <p>Mesh is too loose.</p>
<p>Flat lacks coverage</p>	<p>Ink is too transparent (use extender base instead of transparent base)</p> <p>Not enough ink was laid down (double print wet-into-wet or wet-into-dry)</p>
<p>Ink on bottom of screen during printing</p>	<p>Too much pressure during flood stroke.</p> <p>Squeegee is dull and needs to be sharpened.</p> <p>Squeegee was held too low (hold at 60-80</p>

	<p>degrees).</p> <p>Something under the screen prevented contact.</p> <p>Vacuum was too strong (place a sheet of newsprint over the vacuum base to reduce vacuum strength.</p> <p>Paper stencil was loose or clumped.</p>
Screen dries and clogs during printing	<p>Forgot to use a flood stroke.</p> <p>Excessive delay after flood stroke.</p> <p>Ink is too thick (modify with a thinner).</p> <p>Air is too dry or drafty.</p>
Ink has thin, streaky areas when printed	<p>Base and ink were not fully mixed.</p>
Ink has color streaks when printed	<p>Colors were not properly mixed.</p> <p>There were dried specks of ink in mixed color.</p>
The ink is thicker and thinner in differing places on the print.	<p>The squeegee has nicks or unevenness.</p> <p>Squeegee pressure varied during printing.</p>
Areas or edges do not print cleanly	<p>Too little squeegee pressure.</p> <p>Screen is clogged.</p> <p>Paper is too textured.</p>
Screenfiller or photo emulsion won't wash out	<p>Using the wrong chemical for the job.</p> <p>Insufficient soaking time.</p> <p>Washout water is too cold.</p>
The mesh tore during cleaning	<p>Too much abrasion! Allow the cleaner and appropriate soaking time to do the work.</p> <p>The pressure washer force was set too high.</p>

STRATEGIES FOR MAKING PRINTS

ADDITIVE SCREENPRINTING

Additive printing entails the creation of separate image layers that will be printed sequentially to form the final image. If a key image layer is used, typically spot colors are printed first and the key image is printed last.

REDUCTIVE SCREENPRINTING

Reductive printing is a method used to print multiple layers from the same image on the screen, by printing, filling in some of the open areas of the screen, printing again, filling in more open areas, printing, etc. Reducing the screen can be done by applying screen filler with a brush, card, stamp, atomizer, toothbrush, or airbrush (dilute 50/50 with water), or by using crayola crayons. Heat set into screen filler and crayons into the screen with a hair dryer.

When mixing color for reduction printing, keep in mind that each color layer will be influenced by the layers beneath it. Therefore, reduction printing usually requires a progression of layering from light-to-dark and warm-to-cool.

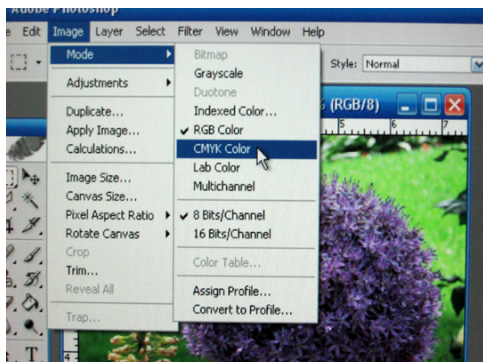
Pin registration is preferred during Reductive Printing. If possible, leave the screen attached to the hinges throughout the reduction process in order to retain exact registration.

CMYK FOR SCREENPRINTING

CMYK separations can be hand-drawn on mylar or tracing paper, or digitally printed on transparencies, or printed on thin paper and then oiled. This document deals specifically with the preparation and output of digital images.

DIGITAL CMYK SEPARATIONS:

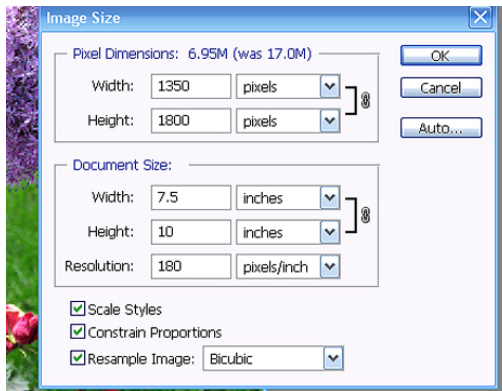
1. Scan or prepare the image in Photoshop in RGB mode.
2. Adjust the image size as needed (Image>Image Size).
3. Convert from RGB to CMYK (Image>Mode>CMYK).



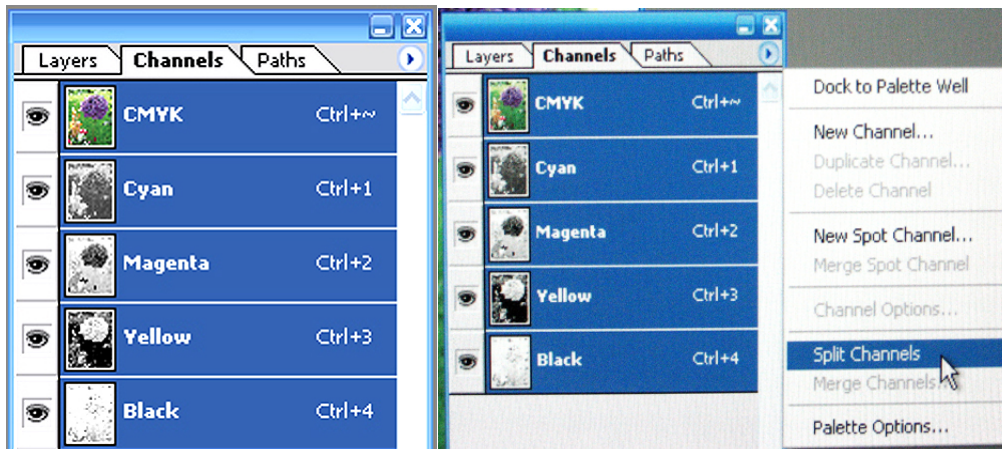
- Under Levels, adjust the input to 1.4 and the output to 40 so the printed image is not overly saturated (the image must be comprised of dots, not solid areas). You may need to play with these values after you see how the image has bitmapped.
- If your printer will not allow you to print cross hair registration marks such as the ones below, you may want to create your own registration marks around the image to assist with registering the separations later. To make your own registration system, adjust the canvas size (Image>Mode>Canvas Size) to create a white border around your image. Make registration marks in black in each corner of the border (a simple X will do). Creating registration marks at this stage will automatically align the marks on all four color separations. However the registration marks will become bitmapped during the separation so be sure to make them large enough to accommodate this.

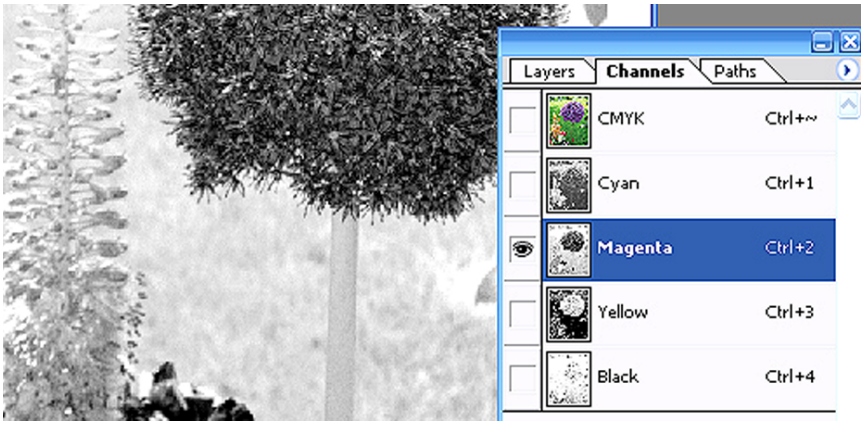


- Adjust the resolution. For halftone images, any resolution is fine. For diffusion dither images, the maximum dpi should be no more than 180 when using a 200 mesh screen or 200 for a 230 mesh screen).



- Open the Channels window. Click the triangle in the upper right corner of the box, then click “Split Channels” from the drop-down menu. Your 4 color separations will automatically appear as individual grayscale images.



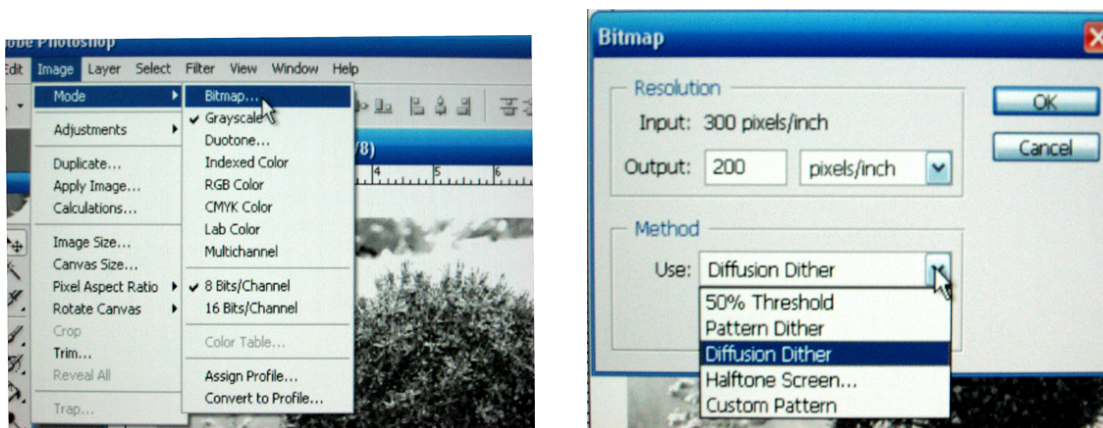


8. Save these color separation files as .tiff or .jpg files with the color in the filename.

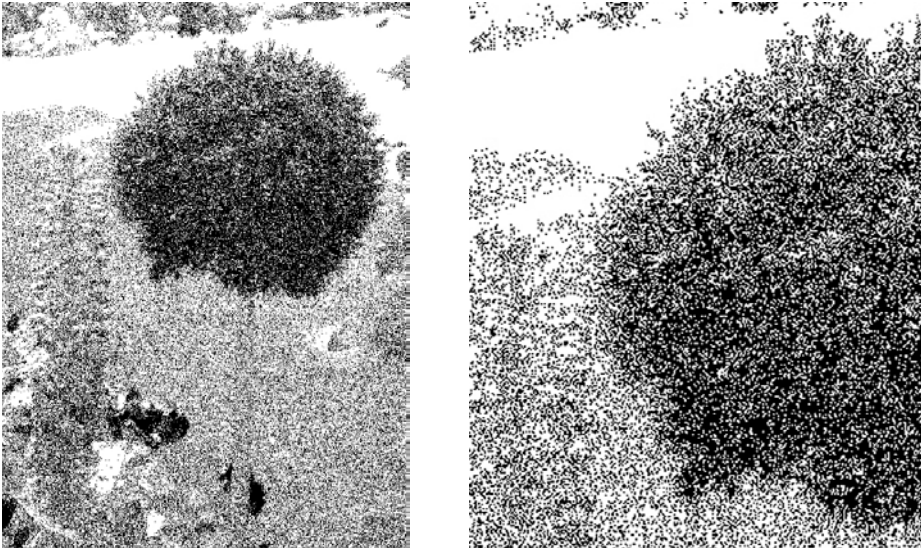
At this point, follow the instructions for using either a halftone screen or diffusion dither. Note: whichever you choose, do NOT print a greyscale image - it must be a dot pattern because greyscale will not withstand the light of the exposure unit.

CHOOSING DIFFUSION DITHER:

1. Change each color file to bitmap (Image>Mode>Bitmap).
2. In the dialog box, select Method>Diffusion Dither. This will create a random dot pattern (diffusion dither looks like a grainy photo. The benefit of choosing "diffusion dither" over "halftone" is that a diffusion dither looks more informal and usually does not result in a moiré pattern).
3. Set the output to match the resolution you chose in step 6 above (e.g. the maximum output you should use for a 200 mesh screen is 180 pixels/inch; a 230 mesh count screen can take output at 200 pixels/inch). Keeping dots at this maximum size will ensure that the dots do not fall through the mesh openings of the screen. Using lower numbers will make printing easier but the image will look coarser.



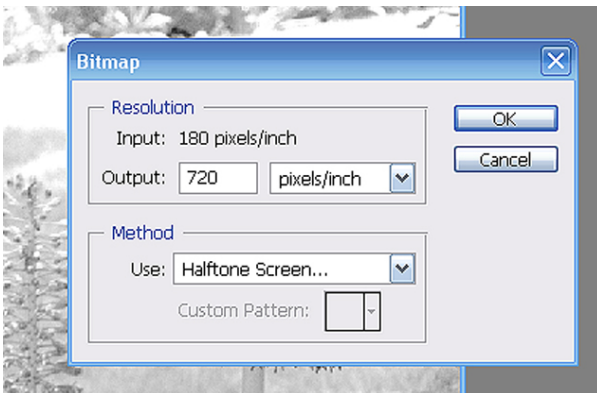
Below is an image of the bitmapped image and the close up at right. Note that the dots are the same size but randomly spaced.



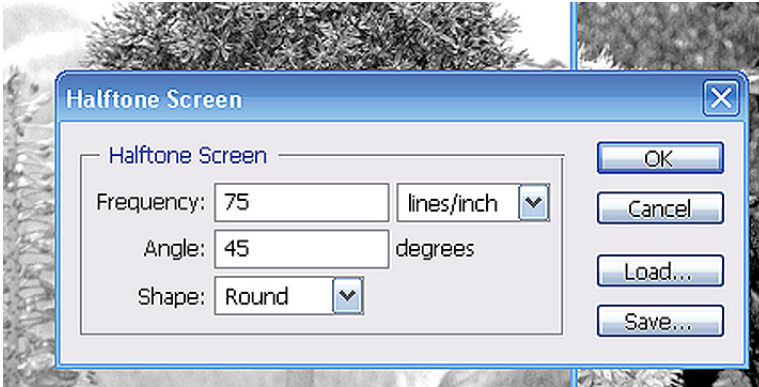
4. ATTENTION! If you magnify the image and see that the black areas are solid, you will need to go back to step 4 above to further adjust the Levels.
5. Save each color file. You are now ready to print your film positives.

CHOOSING A HALFTONE SCREEN:

1. Change each color file to bitmap (Image>Mode>Bitmap).
2. In the first dialog box that appears, select Method>Halftone Screen and set the Output to 720.



3. In the next dialog box, set the Frequency. The general formula for determining Line Frequency is: the mesh count divided by 4 (e.g. 200 mesh count divided by 4 = 50). Therefore, the screen line frequency would equal 50 lines per inch. When determining the line frequency to use, consider that the halftone dots must be large enough not to fall through the mesh openings; however, a very low frequency will result in a coarse image. It is generally recommended to use between 45-65 lpi in the beginning because a coarse halftone screen is easier to process and print.

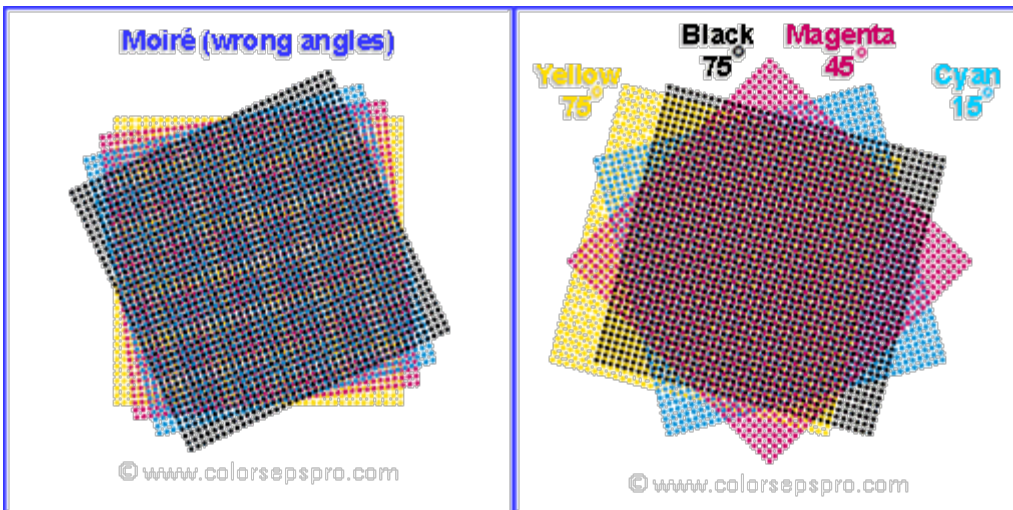


4. Set the Screen Angle. It is important to change the screen angle for each color in order to avoid a moiré pattern when printing. Suggested screen angles are:

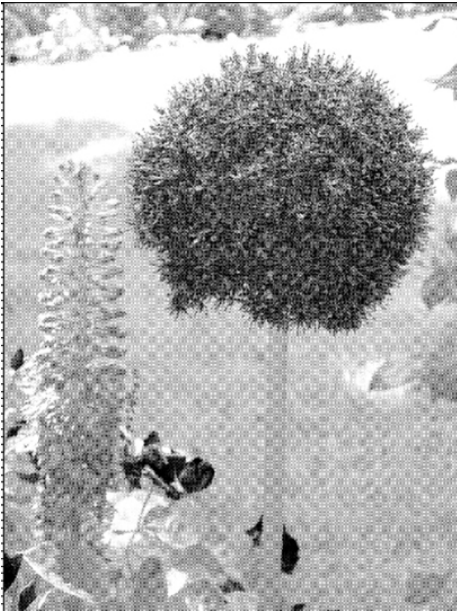
C = 15	Cyan
M = 45	Magenta
Y = 75 or 0	Yellow
K = 75	Black

Alternately, you could use the following angles:

C = 15	Cyan
M = 75	Magenta
Y = 0	Yellow
K = 45	Black



Below is the magenta image with a halftone screen and a close up of the halftone. Notice the pattern created across the image at left. The image at right shows that the halftone is made up of dots of varying sizes and values.



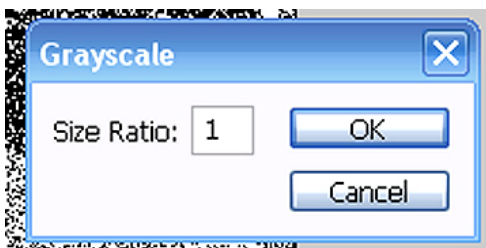
5. Save each color file. You are now ready to print your film positives.

PRINTING FILM POSITIVES

“Film positive” refers to the black image printout (the term “film” is a throwback to b&w photography days), and it can be output using either a laser printer inkjet printer, or photocopier. Be sure to use the correct transparency film for each printer because inkjet transparencies will melt in a laser printer and inkjet ink will not dry on the surface of a laser transparency. A less expensive option is to print the positives on computer paper, though slight subtleties may be lost with this method. To make the paper translucent, oil with baby oil (see more about this under “Stencils”).

Inexpensive printers work fine for printing, though they are limited in size. If you want to print larger, you may need to work with a commercial shop (e.g. Staples or Kinko’s), but be sure to tell them that you want it printed on thin, white, bond paper. Regardless of your printer choice, it’s best to print with the black ink cartridge only in order to ensure the maximum density of black ink. Remember, the goal is to create an image that withstands light.

Note: Some printers will not render a bitmap file. If you are using such a printer, convert the bitmap halftone or diffusion dither files back to grayscale (Image>Mode>Grayscale) with the Size Ratio set to 1.



EXPOSING SCREENS WITH BITMAPS

Tip: Because the bitmapped image consists of small dots, you may need to adjust your exposure time to avoid over or under-exposing, particularly where small dots of white or black lay amidst a large field of the opposite tone.

MIXING INK AND PRINTING CMYK

CMYK colors must be printed with a lot of transparency so that the colors visually blend. Finding the right blend is somewhat of a trial-and-error process due to the many variables involved: how the inks are mixed, how the image is adjusted in Photoshop, how the film positives are made and exposed, the order in which the colors are printed, as well as individual preference.

For CMYK process color runs, the following ink mixtures are recommended:

Cyan	35% Cyanine Blue	65% Transparent Base
Magenta	40% Process Magenta	60% Transparent Base
Yellow	50% Process Yellow	50% Transparent Base
Black	40% Black	60% Transparent Base

EXCAVATED SCREENPRINT

Consolidated from notes by Allison Rosh, Emilee Holmes, and Erin Clarkson

An excavated screenprint is made by printing multiple layers of screenprint ink over one another and then sanding, laser-engraving, or abrading the layers to expose the layers beneath.

Materials Needed:

Paper: Arches 88, Stonehenge, Somerset Satin, Rives BFK (with calendaring). If using pin registration, add 2 inches on to the paper.

Acrylic screenprint ink: Speedball inks will work but TW Graphics inks work best.

Transparent base: Do not use overprint varnish (this will make the prints sticky).

Image positives for exposing

Paper warpage: To help keep the paper from warping, seal the paper on the front and back with 2 layers of TW Graphics Transparent Base. It may also help to print flat layers that are slightly smaller than the paper, as excessive borders will create more warping. If the paper begins to warp during the printing process, you can print more layers of transparent base on the back to help it lay flat again.

If you plan to excavate an image (i.e. etching, relief, monotype, etc.), print this image first and ensure that it is fully dry before you start screenprinting. You can also screenprint an image but you should do this on top of several layers of ink so you don't sand through the paper (screenprinting an image on top of the 2-3 initial transparent layers should be enough to withstand the sanding). If printing an image underneath, use a darker opaque color so your image shows up underneath your colored layers.

Expose your screen with the desired shape: Less complicated positives (circles, squares, rectangles, etc.) make it easier to register the layers. It's helpful to expose a slightly larger shape for the final color, in order to trap the colors below and cover any mis-registration that may occur throughout the printing process.

Mix inks: Mix enough color for 2-3 layers of each color. If you are working with larger flats, mix double the amount of ink.

Use one slightly tinted transparent color for your first 2-3 layers. Mix opaque colors for the remaining layers (transparent colors are too thin and will embed into each other during sanding, and transparent colors will also sand through much faster than opaque ink layers).

White or colored inks mixed with a substantial amount of white hold onto the paper more and are harder to sand through. Metallic inks, no matter when they are printed in the layering, will contaminate ALL other colors when sanded; the glitter particles release when sanded and embed themselves wherever they land, especially in the borders of the paper.

Keep in mind that the ink colors will mix and contaminate each other a little when sanded. For example, if a bright blue layer is printed under a bright orange layer they will dull each other slightly.

Begin printing:

Print 2-3 layers of the tinted transparent base.

Printing the opaque colors, printing 2-3 layers of the *same* color before moving to the next color. Be sure the ink is dry between *each* layer of color. The layers will dry fast at first, but the more layers you print the longer they will take to dry. They **MUST** be dry before you move to the next layer or moisture will be trapped between the layers.

Continue printing 2-3 layers per color until all colors have been printed.

Let your ink dry for a total of 24 hours before sanding. For editions with more than 20 layers, 48 hours was a better dry time before sanding.

Sanding:

There are various ways to sand:

Sand on a flat surface for a smooth look or put a raised surface underneath the print (similar to a charcoal rubbing) to achieve textural effects. Begin with coarser grit (100, 120, 180, or 220), applying pressure as desired. Depending on how fast/how noticeable you want the sanding marks to show you can decide when to move to a finer grit and when to stop. Sand paper with 100-180 grit will leave substantial scratches in the ink/paper and depending on how much pressure is being applied, they will not "buff out" easily when moving to a higher grit sand paper. 400 and 600 grit are great for softly revealing color below as well as slightly hiding the sanding marks. To make less noticeable marks, sand in a circular motion; this also helps to give a gradual shift from color to color that way you can see each color to the bottom.

It's possible to use an electric palm sander but use only 400-1000 grit sand paper and only for editions exceeding 15 layers of ink; otherwise the sander will quickly tear up the prints. Also, tape the paper down to a surface before palm sanding or it will go flying when you put the sander on it.

The sanding process will produce an ink dust/residue on the paper that can be brushed off carefully. Make sure to keep the borders clean while doing so. Blotting the ink area with a damp towel/paper towel will remove residue that isn't easily brushed off.

It's a good idea to print 3-4 extra prints that you can use to experiment with. You'll need to figure out which level of grit and amount of pressure from the hand is needed to reveal the color or image below. It would also be good to experiment with switching the color order to determine which colors look best at the top or closer to the bottom. Generally darker colors toward the bottom make a better print.

FLOCKING

Flocking is the deposit of tiny fibers onto an adhesive-coated surface to create a velvet-like texture. Flocking is done by applying an adhesive to a substrate (using a screen to control where the adhesive is placed), dusting the flocking particles onto the substrate, and then removing excess particles that haven't been adhered.

Flocking materials can be purchased online, but any kind of powder should work (e.g. spices, cocoa powder, charcoal powder, graphite powder, mica powder, red iron oxide, talcum powder, glitter, etc.).

To make an adhesive: Mix 50% PVA/50% screenprint ink (you can use either transparent base or extender base, and tint this base with color if desired). You could also use straight gloss screenprint medium or acrylic extender base as the adhesive, though the addition of PVA makes it thicker and stronger. For heavier flocking particles, you'll need to lay down more particles and use a thicker viscosity of ink/adhesive. Regardless of which adhesive you use, you'll need a partner to assist with this process because you'll have to work fast to ensure that the adhesive doesn't dry in the screen and that you apply the flocking before the adhesive dries.

WARNING: Flocking particles float easily so they will get everywhere; therefore, you MUST do this in a very confined space (use a box/tub/bag to contain the particles) so you don't contaminate the entire studio (seriously!).

To flock onto paper:

1. Expose your image onto a low mesh screen (83-150 mesh count is needed, due to the thickness of the adhesive needed).
 2. Wear a mask to avoid breathing in the particles.
 3. Screen the adhesive onto your paper. You may need to double-coat it.
 4. Immediately dust the flocking over the substrate.
 5. Lay the substrate flat to dry.
 6. When dry, use a brush to dust off any excess flocking material that isn't adhered.
-

SCREENPRINT MONOPRINTS

1. Block out the borders with photo emulsion or screen filler for a heavy-duty border. For a quick and easy way, use scotch magic tape to define the edges and apply screen filler on the outside of the tape; dry the screen filler with a hot hair dryer and remove the tape.

2. Create an image by drawing, painting or doing rubbings with any water-soluble material onto a dry screen (can also wet the screen with water before drawing):

- watercolor (the cheap cake watercolors release from the screen the best)
- goauche (tends to stay in the screen more than watercolor)
- charcoal (can brush over with water after drawing to smooth it out)
- chalk pastels (not oil or water-soluble pastels)
- watercolor pencils
- graphite pencils
- water-soluble markers
- caran d'ache crayons

Note: Do not use acrylic paints; they'll dry in the screen. Do not use any oil or wax based drawing tools as they will not dissolve in a water-based medium.

You can draw on the inside or outside of the screen (it's easiest to draw on the inside of the screen).

3. Allow the medium to dry (it MUST be dry or it will run when you squeegee over it).

4. Align the printing paper under the screen. Tape the paper to the hinge board around the entire perimeter. The paper will wrinkle when wet but the tape will help to flatten it.

5. With the screen raised, flood the screen several times with transparent base (containing 10% glycerin or floetrol so the base doesn't dry in the screen) in order to dampen and loosen the drawing materials.

6. After one minute, lower the screen and print on-contact, as the base is thin. Using heavy pressure, squeegee across the image. Lift the screen to check the amount of pigment released. If the image has not fully released, flood the screen, and then use a hair dryer to dry the paper. The paper must be fully dry before you print again; you can not print wet-into-wet. Be careful not to dry out the screen while using the hair dryer. Lower the screen and squeegee again to get the remaining pigment to release.

If you plan to build the image with multiple layers, raise the screen and flood it; you can also spritz the screen with water if necessary to keep it damp. Use a hair dryer to dry the printing paper after each pull to flatten it. You can add stencils at any stage during the printing. You can also use a mouth atomizer to add pigment to the transparent base. To do this, mix some watercolor pigment with water to make it loose. Spritz over the base on your screen. Let it sit for 60-90 seconds before pulling the print.

7. When finished printing, clean the image from the screen with soap and water. If you need to clean the screen without losing the registration, lay a piece of Plexiglas over the printing paper while cleaning to avoid damaging the print.

Paper choices:

Paper should be medium to heavy weight and preferably waterleaf (without sizing). Smoother papers (e.g. Somerset, Arches Cover or Arches 88, Rives BFK, and Stonehenge) tend to print better because more pigment is released.

POSTERIZATION

Compiled from notes by Kevin Haas

Posterization allows you to divide a photo into a select number of values. These values can then be individually exposed to screens and printed light-to-dark.

1. Select a photo image. In Photoshop, go to Image>Mode>Grayscale to turn the image into a grayscale file.
 2. Go to Image>Adjustments>Levels to adjust the level of contrast (move the 3 sliders as needed).
 3. To posterize the image, go to Image>Adjustments>Posterize. Select the number of levels desired. Keep in mind that one of the levels may be the white of the paper, if there is white in the image (which means that you will not have to print that level).
 4. Save your file as “original posterized.psd” so you can come back to it. Now that the image has been broken into several values, you will need to “extract” each one as a film that can be exposed to your screen.
 5. Go to Image>Adjustments>Threshold. The bars will indicate the division of colors, with the darkest on the left and the lightest on the right. Move the slider under the first color on the right and click “Ok.” Save this as “#1.” Note that this image is the darkest; however, it will be printed in your lightest color because it will lay beneath all of the other colors.
 6. Go to Edit>Undo Threshold to return to the original image. Repeat the Image>Threshold function to isolate the next value. Repeat this process until you’ve isolated all of the values in the image.
 7. Print out the images as films and expose to screens.
-

RESOURCES

HELPFUL TIPS AND LINKS FOR PREPARING IMAGES IN PHOTOSHOP:

How to adjust a one-color image in Photoshop in order to properly burn it onto a silkscreen for screen printing, including scanning, levels, and threshold:

<https://www.youtube.com/watch?v=HQngFmHgOao>

How to separate spot colors:

https://www.youtube.com/watch?v=6ljJryKAf_U

How to work with halftones:

<https://www.youtube.com/watch?v=4n3vuD6I9CI>

<https://www.youtube.com/watch?v=rAkk4AkmxbA>

CMYK for screenprint:

<https://www.youtube.com/watch?v=qooBg20wYLU&t=194s>

IF YOUR IMAGE LAYER WON'T GO SOLID BLACK WHEN YOU ADJUST THE LIGHTNESS AND SATURATION OF THE COLOR:

It may be that you initially created the image with a transparent brush. When using Photoshop, you must draw with the full opacity of each color. If you want to see how the color looks when it's transparent, use the "Fill" or "Opacity" settings in the Layers dialog box to modify the transparency of the image. This will ensure that your images will print out as opaque black.

IF THE BACKGROUND OF AN IMAGE FILLS IN WHEN YOU ADJUST THE LIGHTNESS AND SATURATION OF THE COLOR:

If you used Illustrator to "Image Trace" a shape (either as line or shape) to bring back to Photoshop, you will need to do the Image Trace with "Ignore White" selected in the options panel. This will create a transparent background. To retain the transparency in Photoshop, export the file from Illustrator as a PNG file, with "transparent" selected when saving.

NUMBERS, ACRONYMS, AND GENERAL FORMULAS FOR DIGITAL PRINTING

Notes from Kevin Haas

ppi = pixels per inch (the resolution of your file)

lpi = lines per inch (lines of halftone dots)

dpi = dots per inch (pertains to printers)

Optimal lpi for screenprinting = mesh divided by 4 or 5

Optimal resolution for halftone bitmap file = printer resolution divided by 2 (for Epson printers, this is 1440 divided by 2 = 720. This avoids conflicts between the file and the printer's resolution).

SETTING UP YOUR OWN STUDIO:

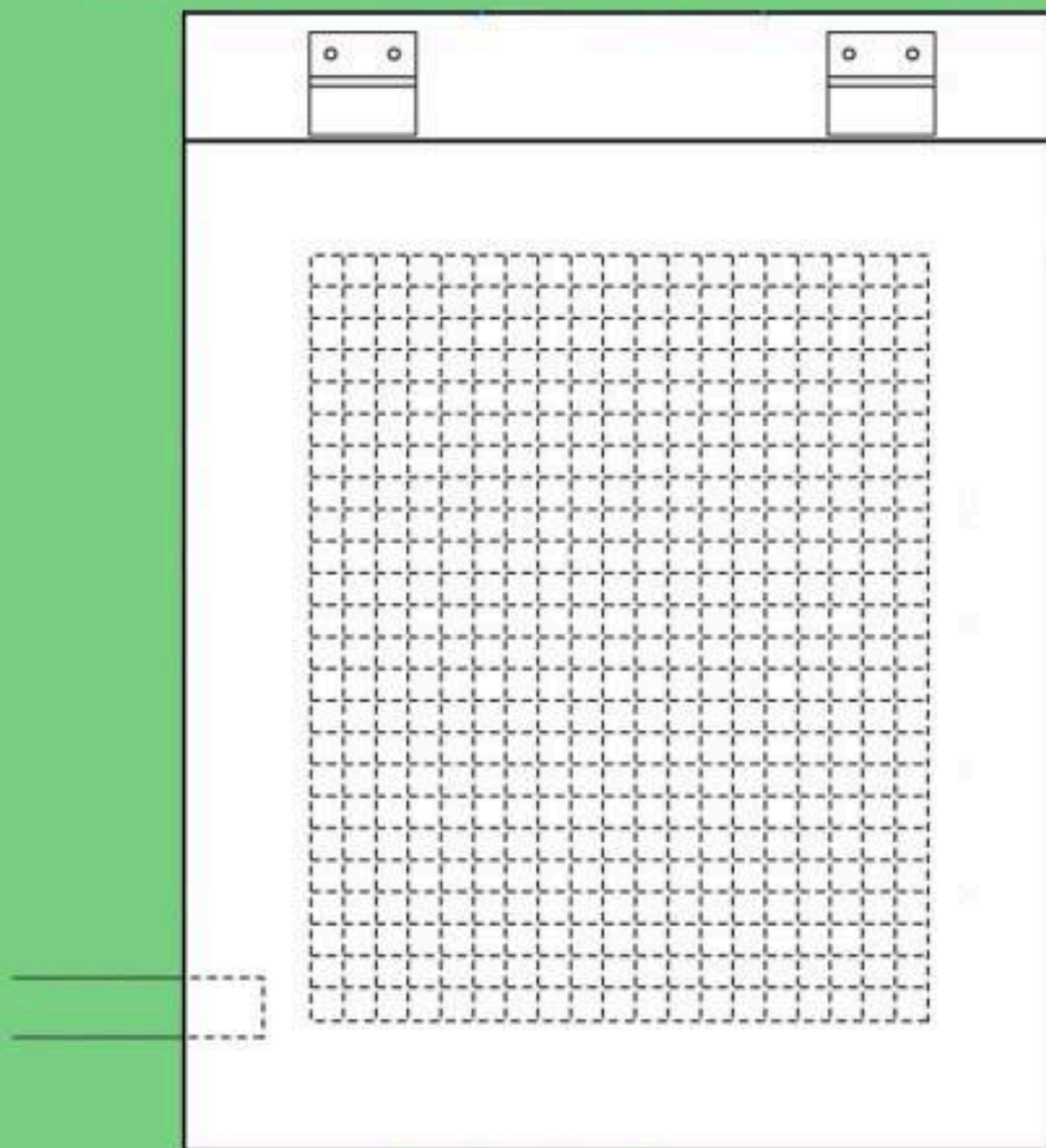
Check out Google and Pinterest to find various ways to build inexpensive equipment for your studio:

- Exposure Units
- Screen drying and storage racks
- Vacuum Tables
- Sound baffles for the vacuum table
- Washout Booths
- Screen props

BUILD YOUR OWN VACUUM TABLE

(why? because building things is awesome!)

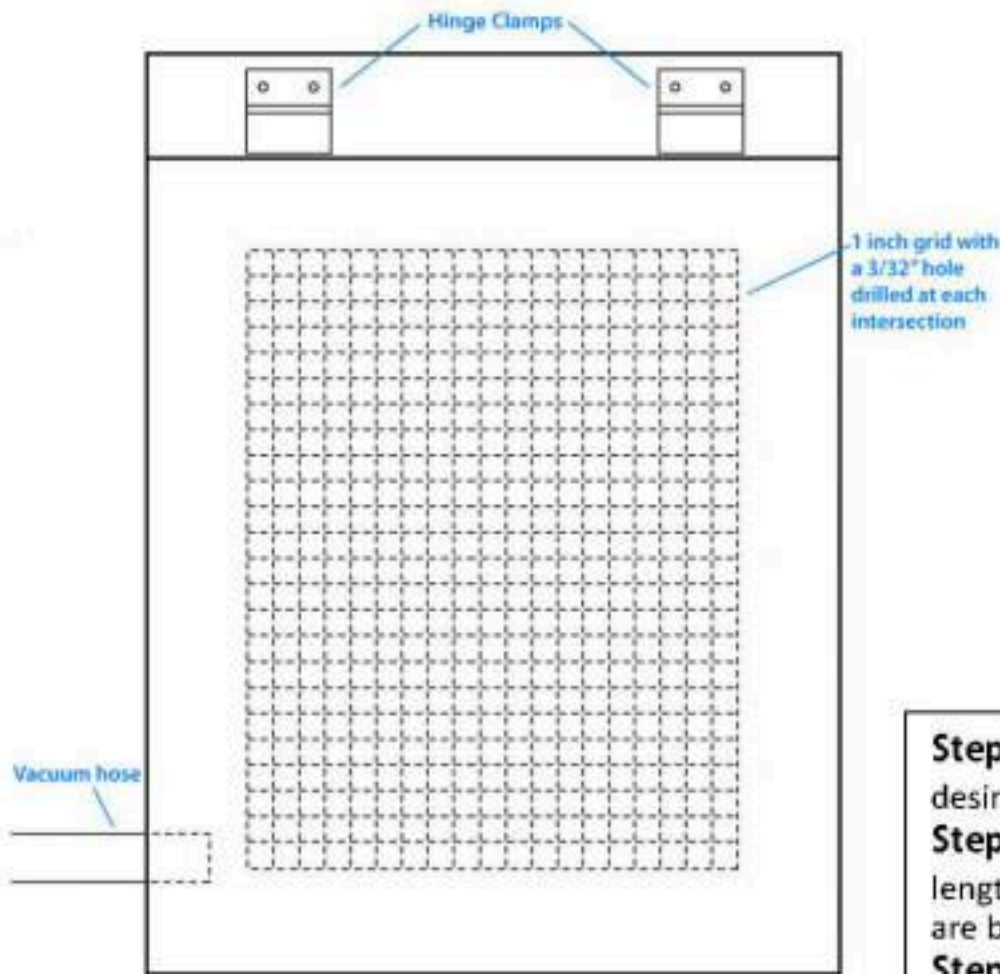
Screenprinting Table Workshop



By Tonja Torgerson
(Artist in Residence)

8:30 pm on Wednesday, September 25th
Rm #111 McCuskey Hall

SCREENPRINTING VACUUM TABLE



Materials

- 1/4 in. thick Marker Board (white board)
- Plywood (5/8 in. or thicker)
- Contact Cement
- Wood Glue
- Shop Vacuum
- Silicone Caulk
- 1 in. Screws

Step 1: Cut marker board and two pieces of plywood to the desired size of your table.

Step 2: From the remaining plywood, cut strips that are the length of your table at 5/8 inch thickness. You need at 10, more are better.

Step 3: Using contact cement, adhere marker board to one of your plywood pieces.

Step 4: With a dry erase marker, draw a 1 inch grid on your marker board, leaving at least a 2 inch surrounding border.

Step 5: Drill holes at the intersections of your grid, using a 3/32 or smaller drill bit. Make sure to penetrate through the adhered boards. (See diagram)

Step 6: When drilling is complete, lightly sand until surface of vacuum table is smooth and flat.

Step 7: Using the plywood strips, create a border on the underside of your vacuum table's top section. Be sure to leave a space for the vacuum nozzle. Disperse remaining strips across the inner dimensions of the table without blocking the holes. (see diagram) Clamp and glue.

Step 8: Glue and screw the second plywood piece to the back of your table, creating an air pocket between the two sections of plywood.

Step 9: Seal all large gaps along the edges with silicone caulk.

Step 10: Attach vacuum and screenprinting clamps.

Step 11: Behold the power and wonders of vacuum suction while printing!

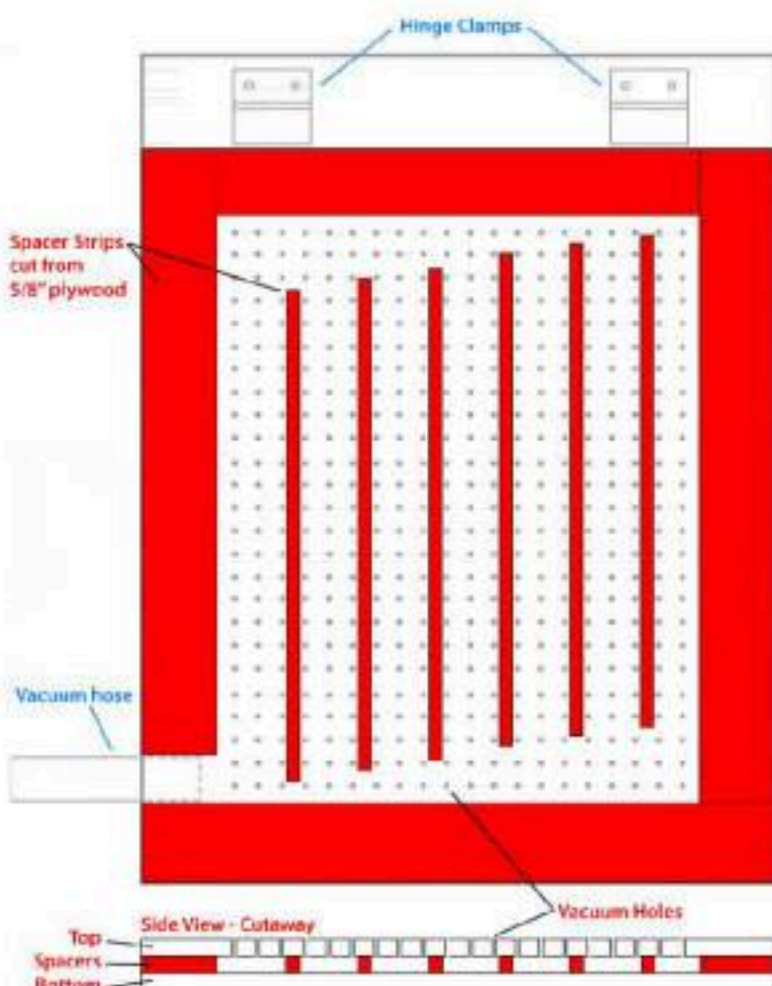
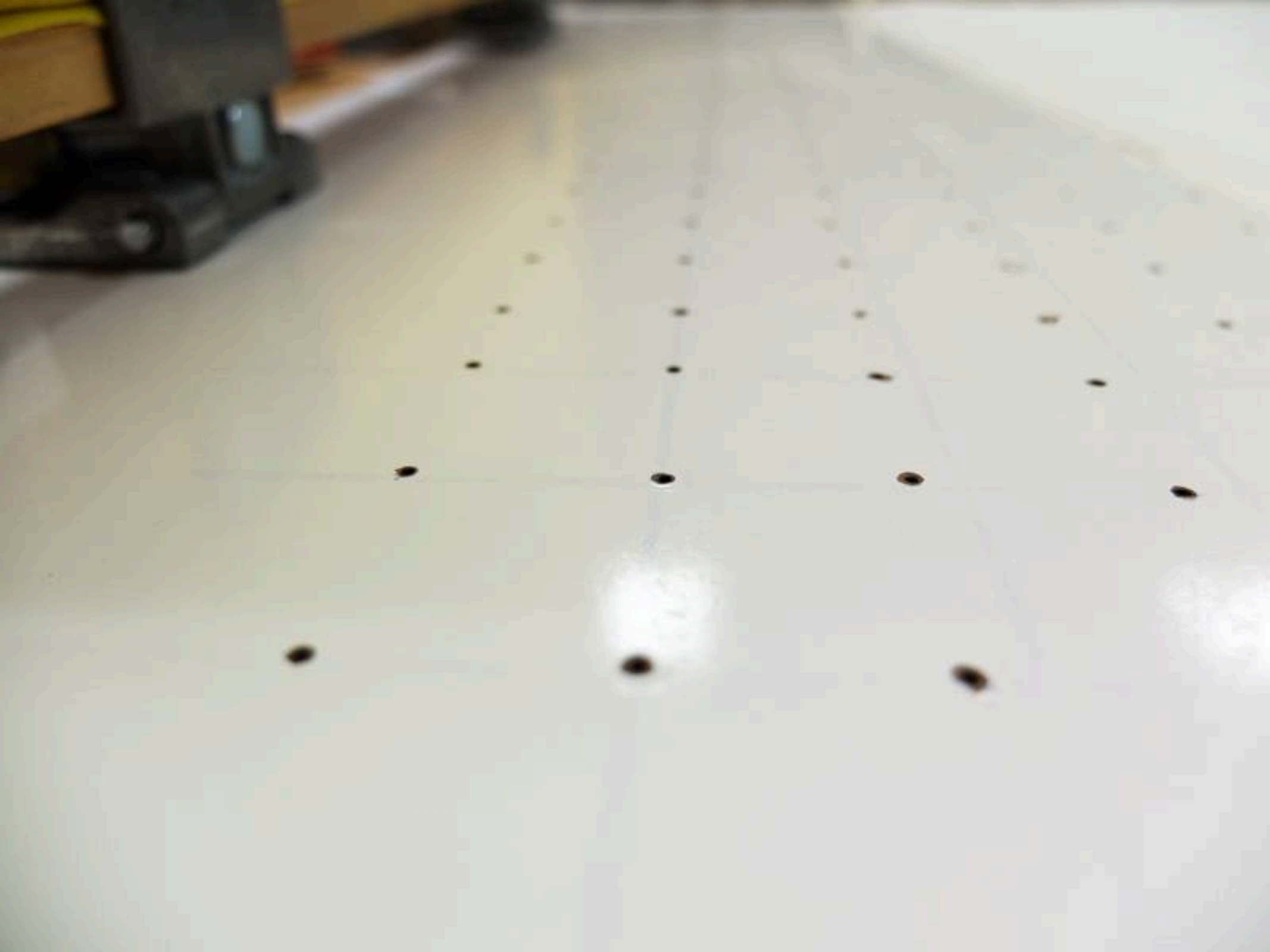


Table Diagrams taken from:
<http://diysilkscreenprinting.blogspot.com/2010/12/building-your-own-vacuum-table-poster.html>





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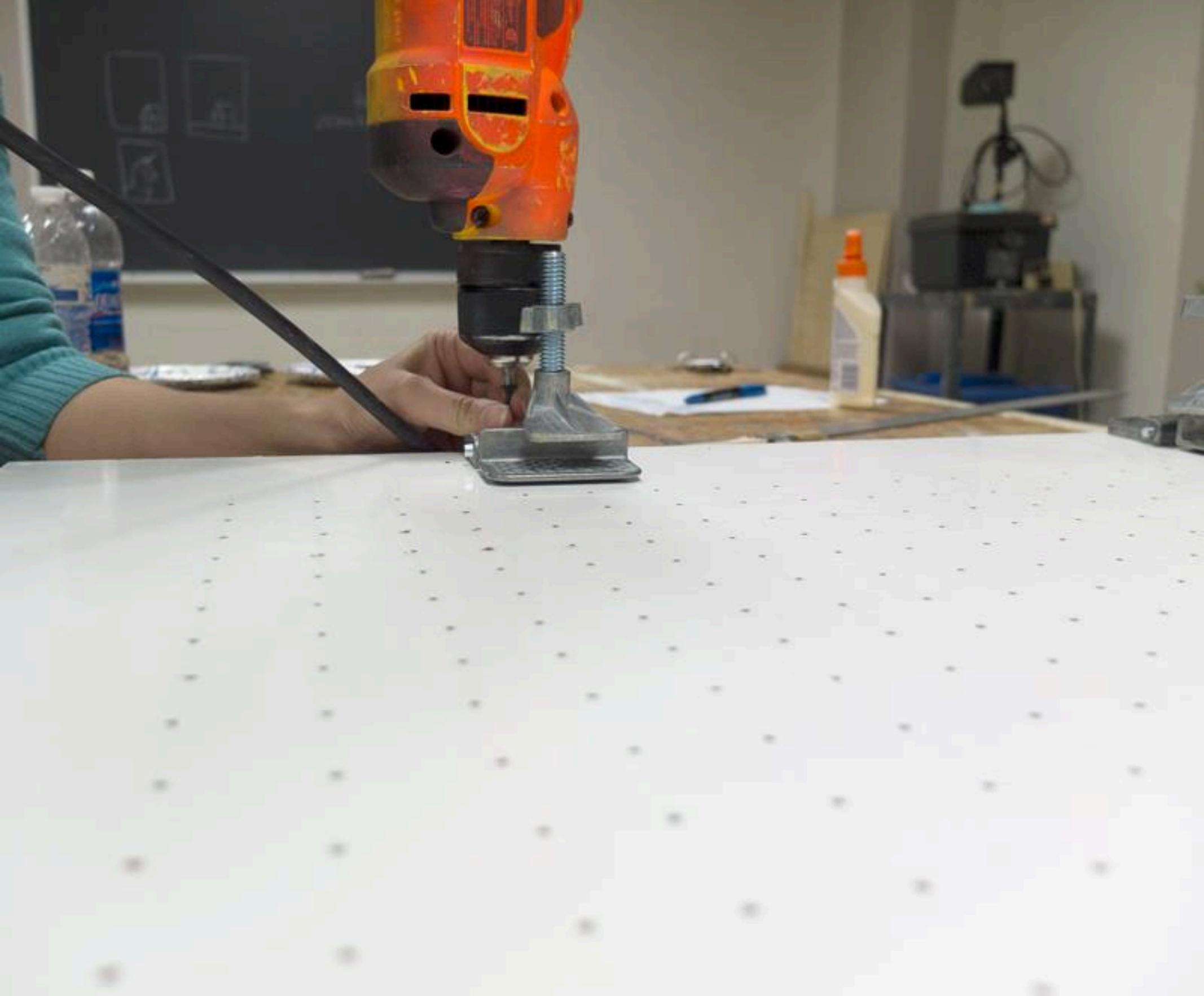
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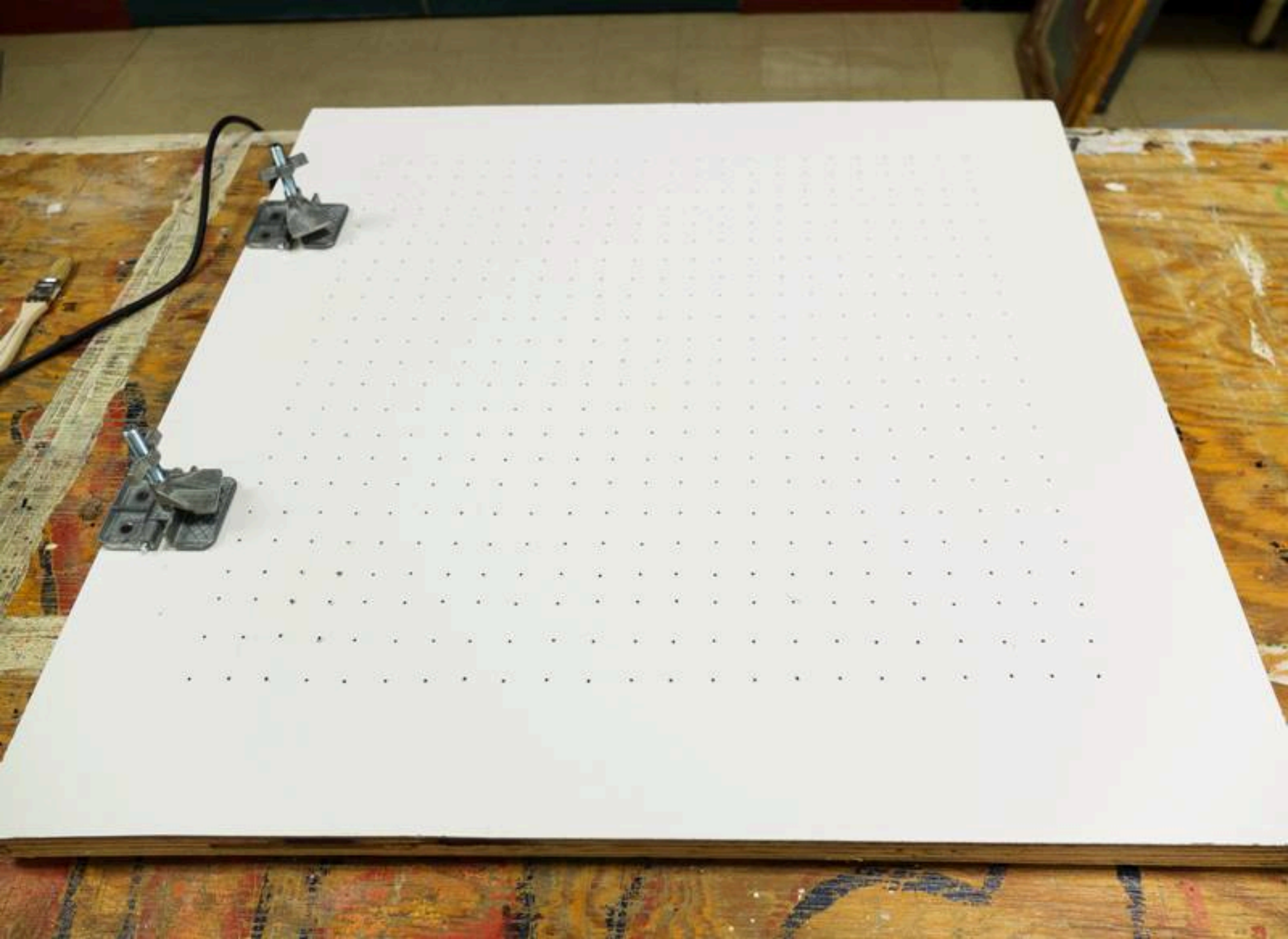
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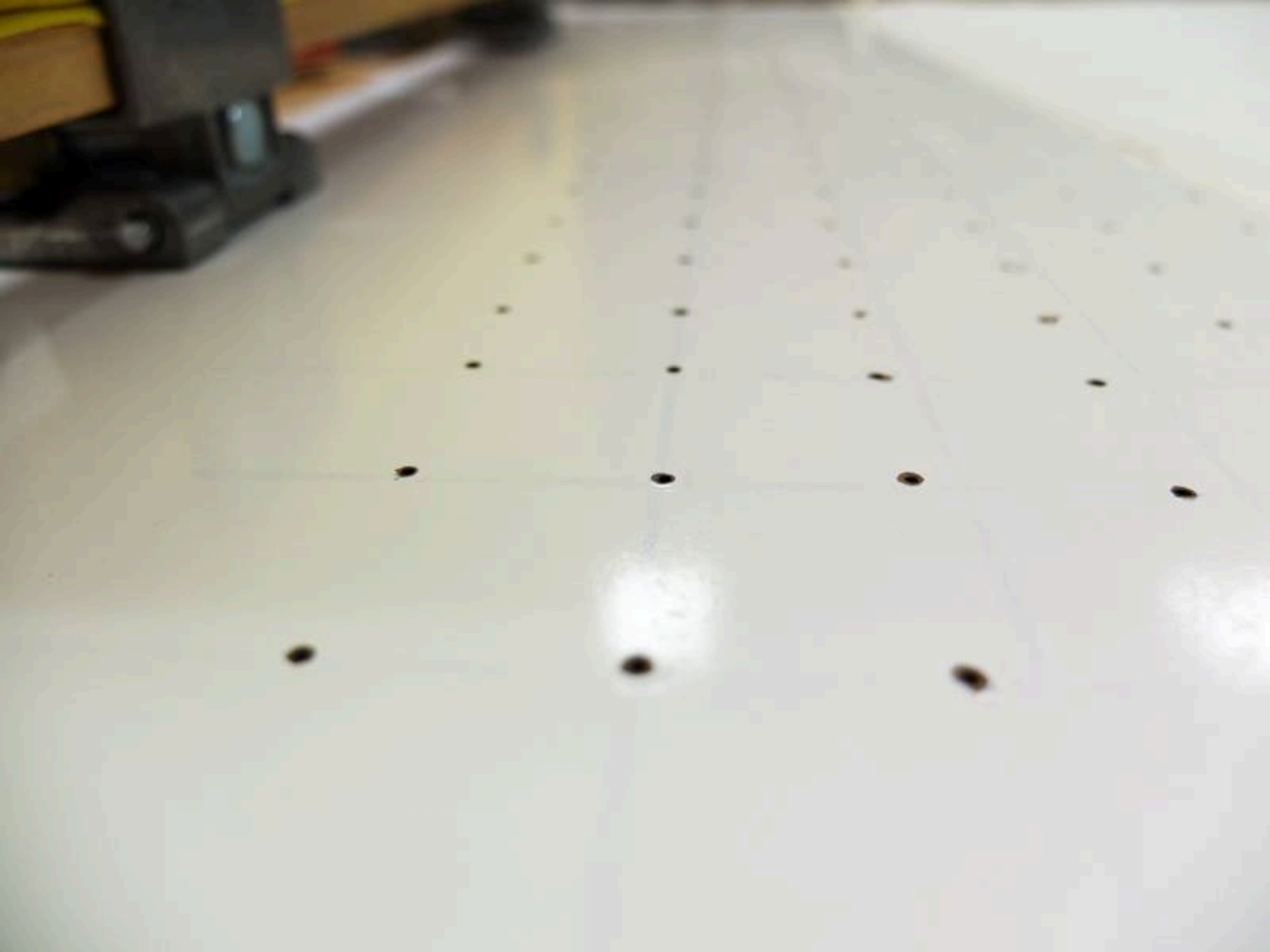






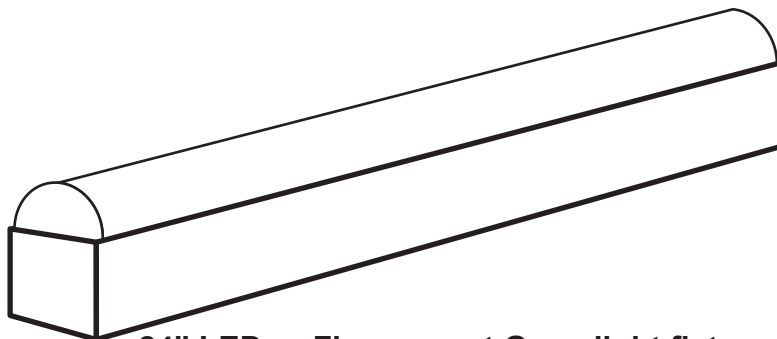
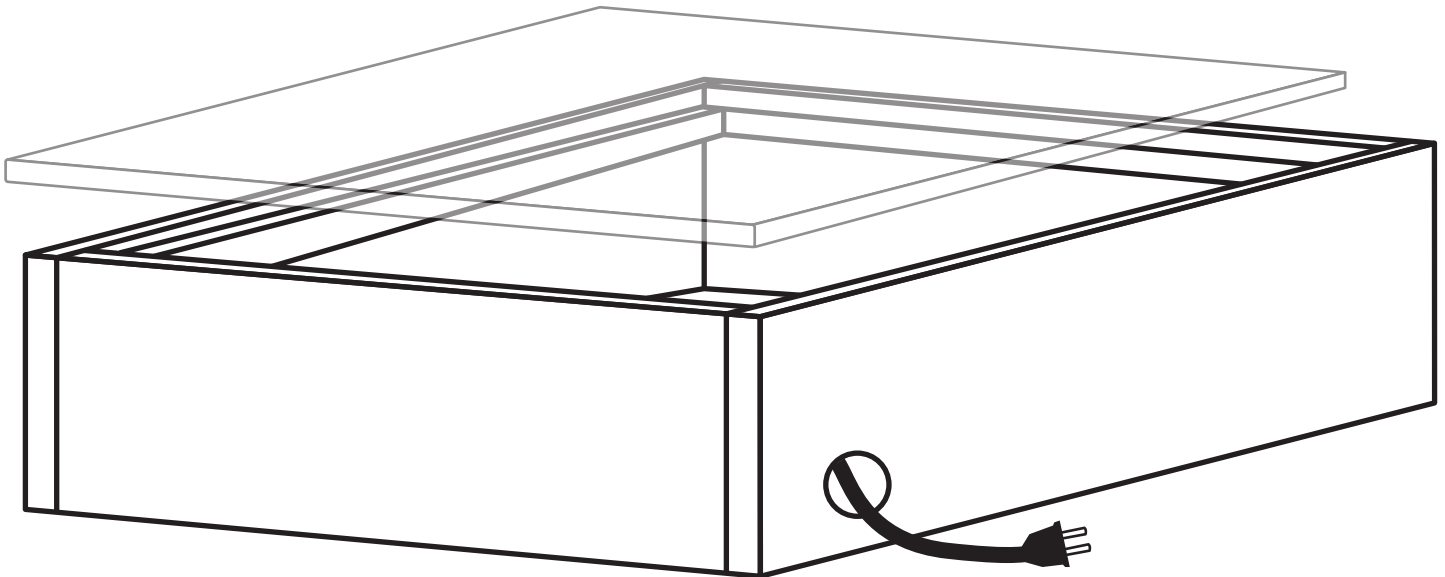




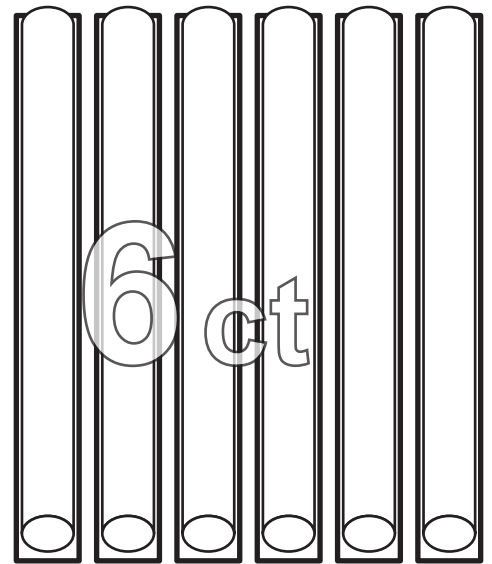


DIY Light Box Exposure Unit

To construct a light box for an exposure unit, you'll need some basic carpentry tools/skills. Listed below are the tools and materials needed.



24" LED or Fluorescent Grow light fixture



Tools:

Drill (corded or cordless)

Circular saw (If you have access to miter saw and table saw that's better—jigsaw can work but is not recommended. Handsaw only if you want a work out)

Wood screws (#8, 1 1/2"–2") or nails (1 1/2"–2")

1/8" drill bit

Hammer (if using nails)

1" paddle bit or forsnor bit

Wood glue

PLEASE NOTE:

These measurements are relative to the length and space of the bulbs, adjust all measurements per the procedure in the whole handout.

Materials:

28"x32" (approx. see whole handout) 1/2" plywood

112" (or 2ct 6') of 1"x1" wood strip

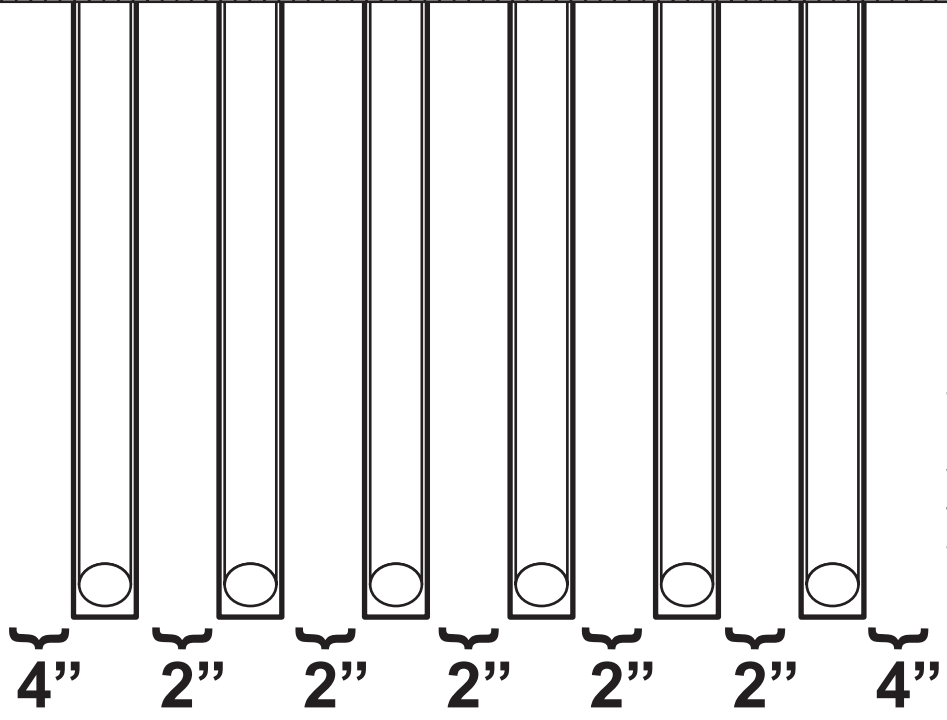
124" (or 1 ct 6' + 1 ct 8') 1"x6" lumber

6 ct 24" UV fixtures + bulbs (LED or flurouscent)

(Grow Lights, Black Lights, or Aquarium bulbs seem to work best)

26"x30" piece of 1/2" tempered glass

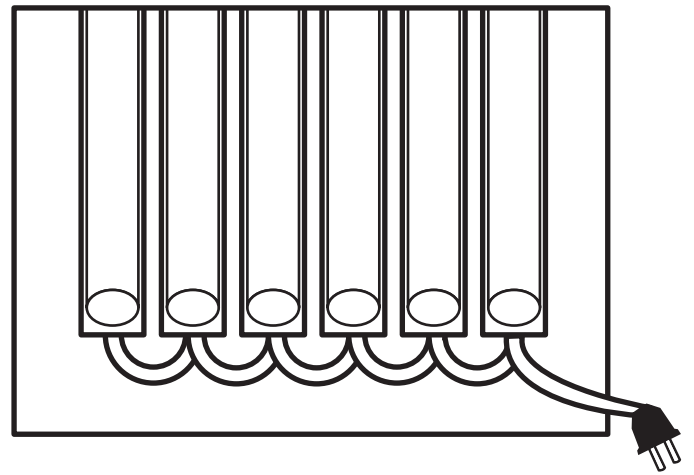
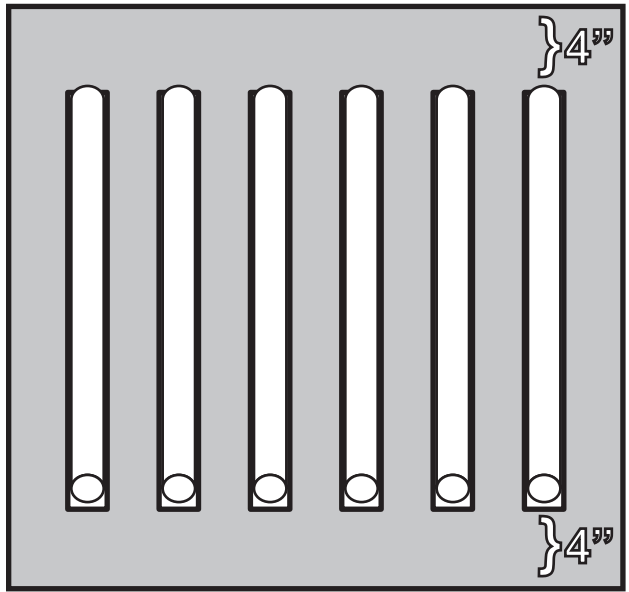
Powerstrip? (see whole handout)



Measure and space out the light fixtures so they're about 2" apart to disperse the light. Measure to make sure there is also 2" on both left and right sides and 4" on top and bottom, the edges are light deadzones so you want to space the fixtures waway and towards the center.

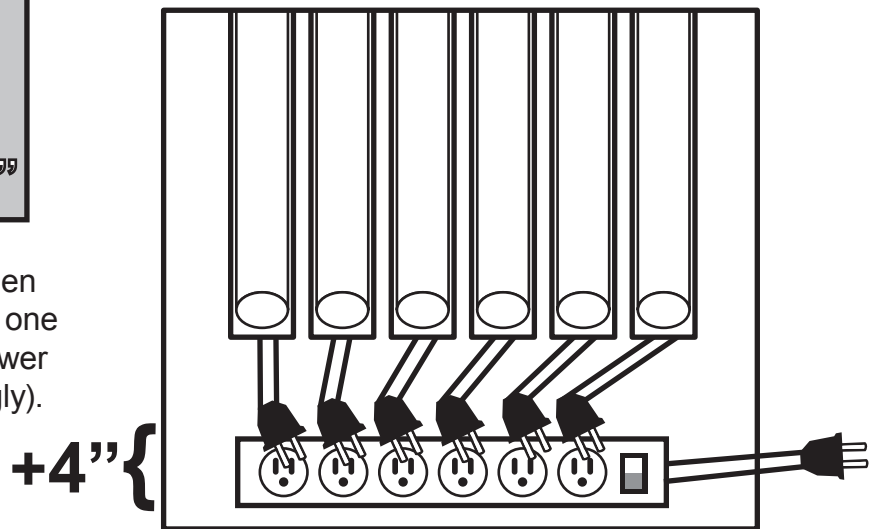
Measure but do not cut the bottom plywood piece yet if possible.

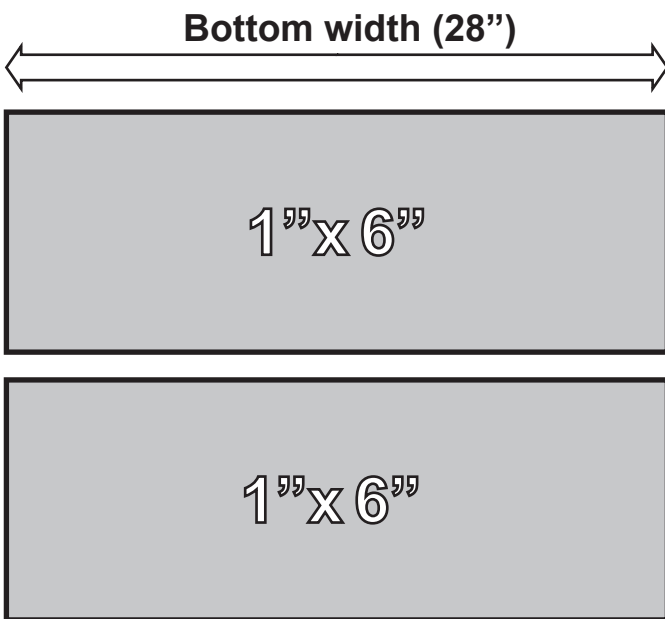
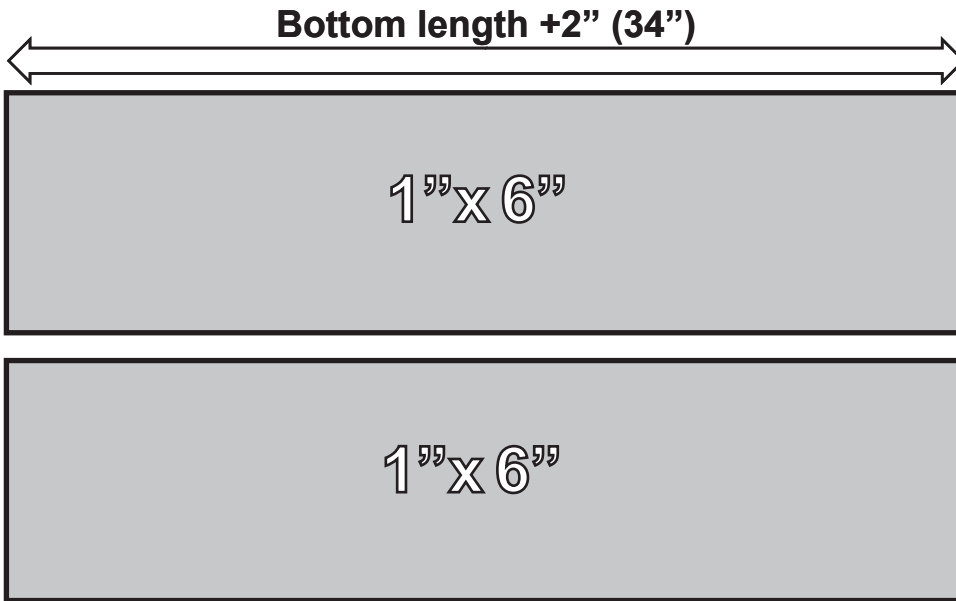
~28"



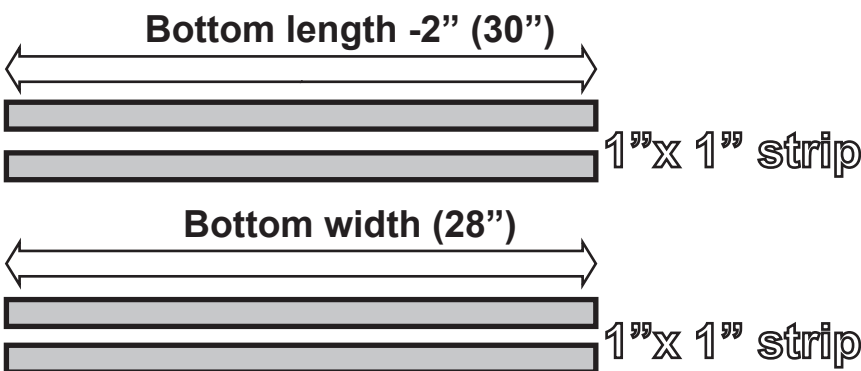
~32" If you can set up the bulbs as a serial then you only need one plug.

If you have to set up a parallel system then you may need to add extra space ~4" to one side of the length to make room for a power strip (adjust all measurements accordingly).

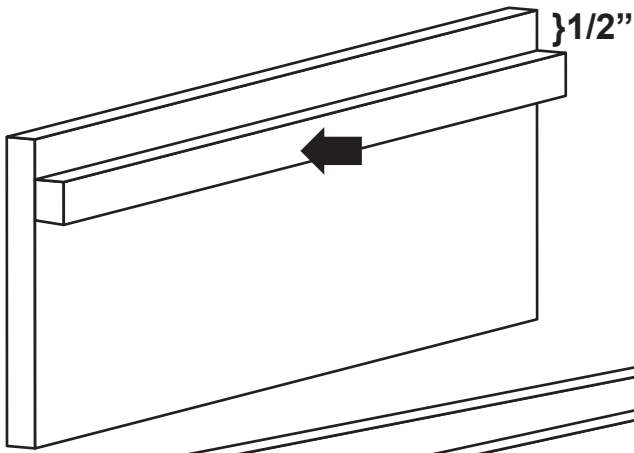




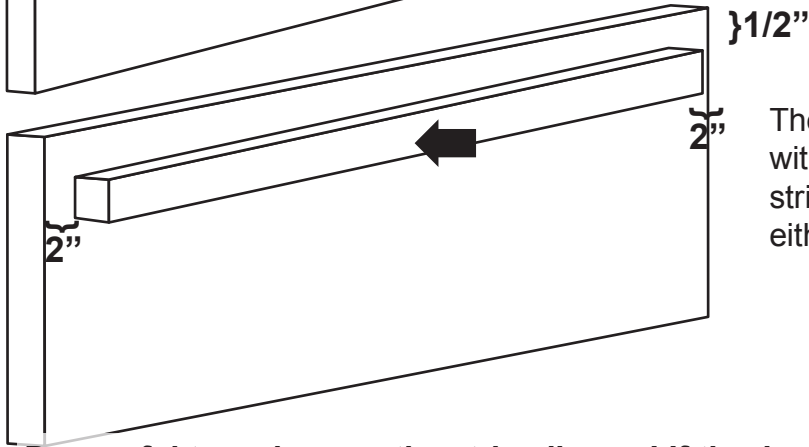
Cut the the 1"x6" to match the width of the bottom, and cut the length boards to exceed the length dimension by 2" each, this is to accommodate for the overlap of the length boards over the width boards.



Cut the 1"1" to the width dimension of the bottom and -2" of the length on each of the strips. These strips create a "shelf" for the glass to rest on. They can be shorter than these lengths, easily, but this makes the box perhaps more aesthetically cohesive.

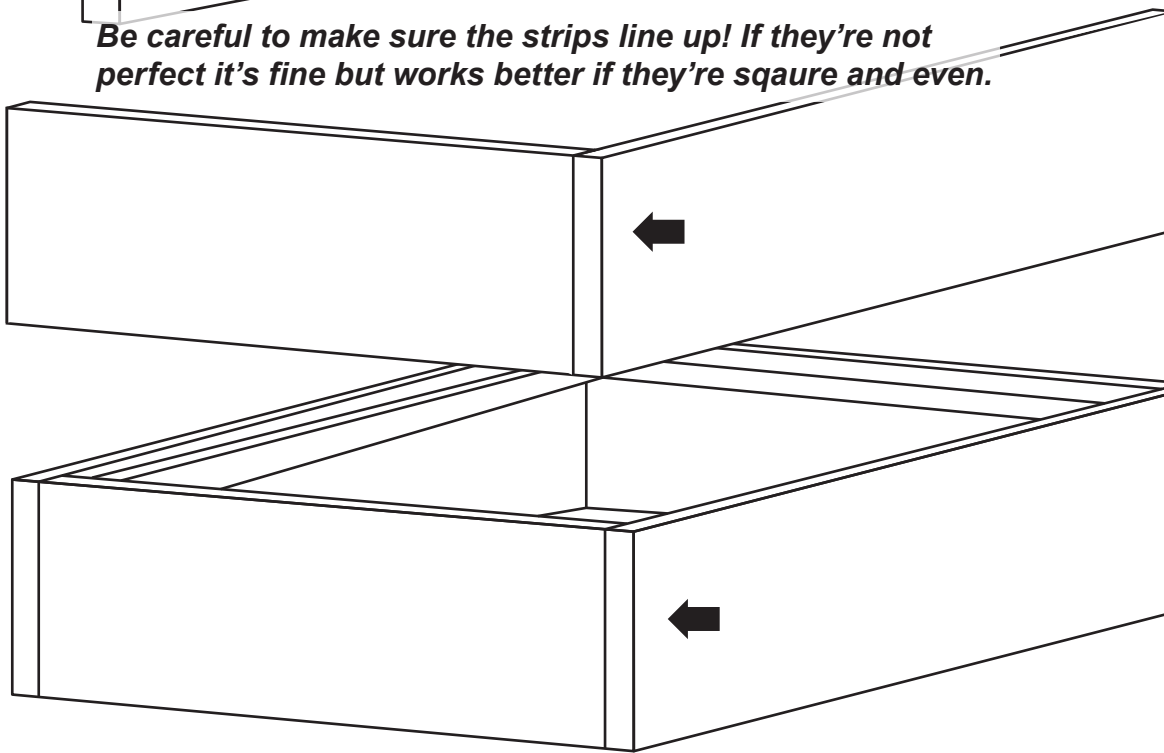


Glue and nail/screw the strips 1/2" from the top of the 1"x6" sides. This 1/2" is to accommodate for the 1/2" glass. If using thicker or thinner glass increase/decrease the space accordingly.



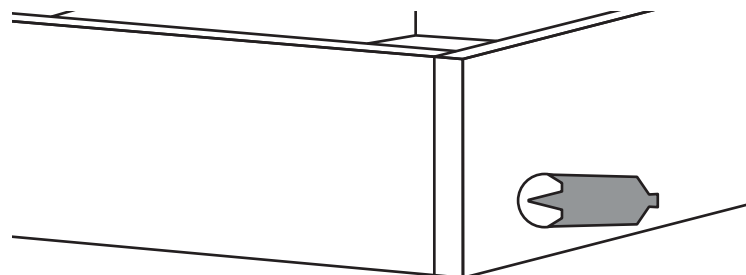
The width strips should align perfectly with the the width dimension. The length strips should be centered, with 2" on either side of the side 1"x6" board.

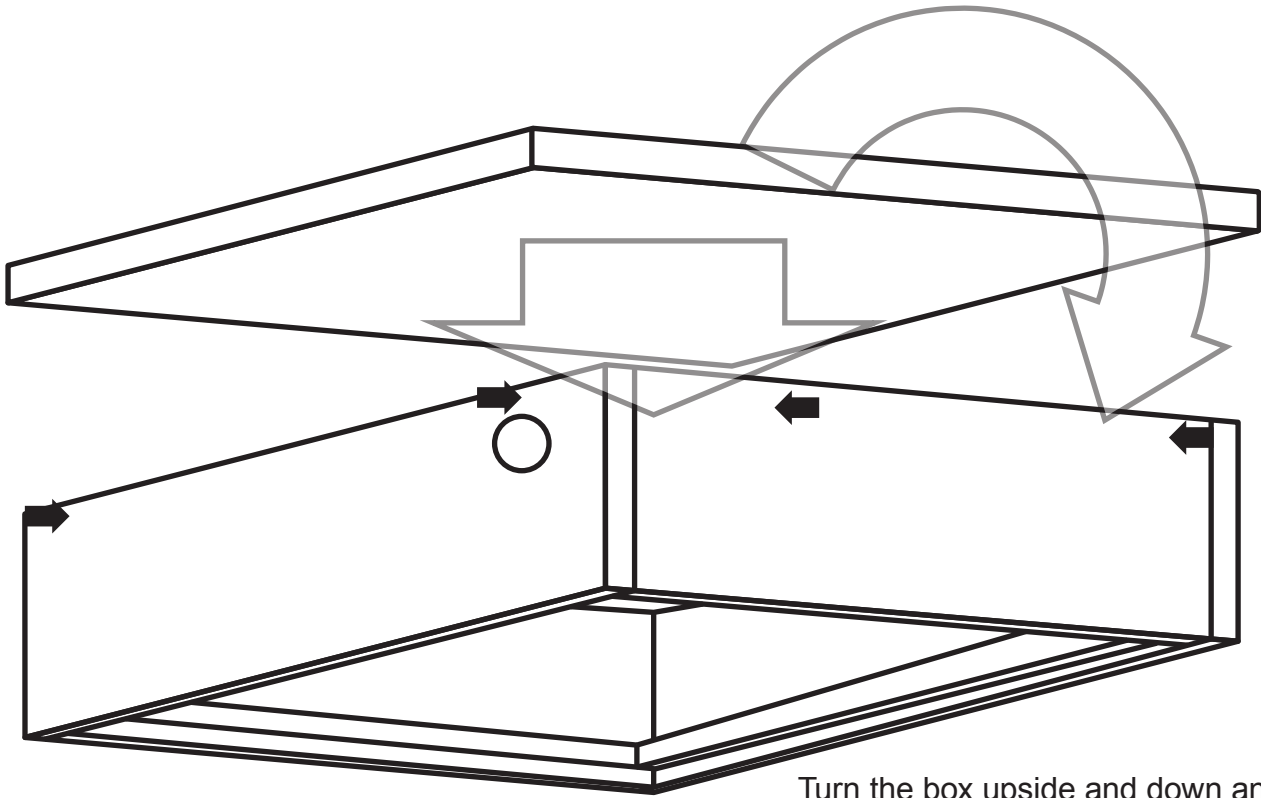
Be careful to make sure the strips line up! If they're not perfect it's fine but works better if they're square and even.



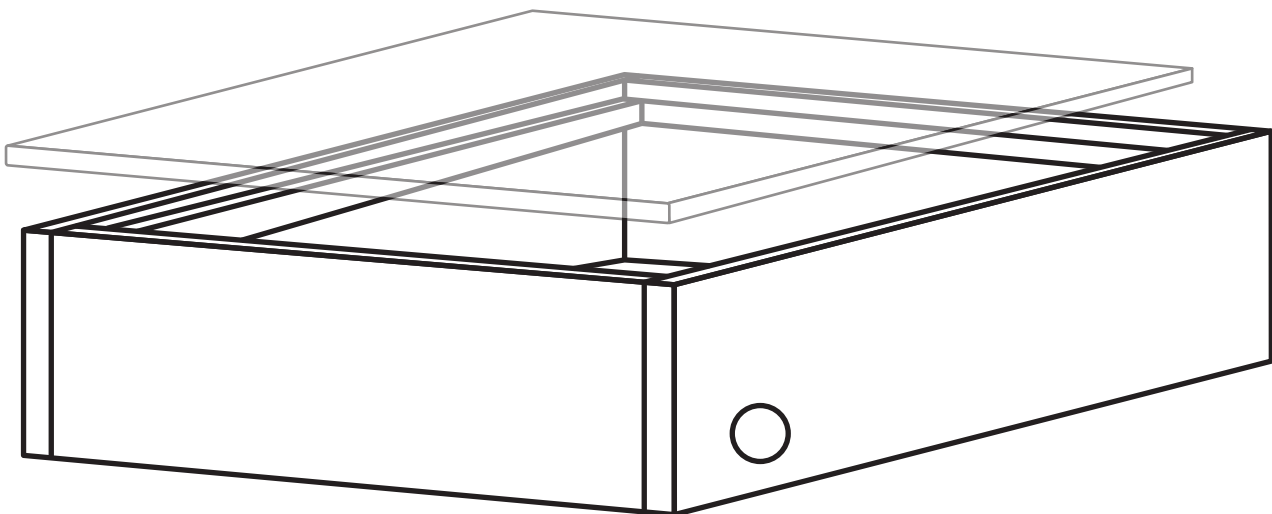
Join (with glue+screws/nails) one width board with strip to the adjacent length board with strip with glue and screws/nails. Then join the other width board+strip to the length board+strip. And join the two together to form the box/sides.

Using the paddle or forstner bit to create a 1" diameter hole ~1/2"-1" from the bottom towards one end of the box along either the length or width **(this should be towards where the plugs or power strip will be).**





Turn the box upside and down and check the measurements to be sure that your bottom will fit within the sides perfectly. Optionally you can make the bottom slightly larger to so it rests underneath the sides. Cut the bottom to the correct size. and affix with glue and screw/nails.



Flip it over again to rest the glass on top of the “shelf” strips. The glass, like the bottom, is best to be cut after everything is assembled so you can have the most accurate measurement.

If using a found or pre-cut piece of glass you may have to reverse engineer your measurements to fit that measurement.

Building your own wooden crates

- Step 1:** Measure your outside frame dimensions
- Step 2:** Do the math in the formula to the right----->
- Step 3:** Cut all your widths (buy 4" #2 pine if your frames are 2" wide or less
- Step 4:** Cut all your lengths
- Step 5:** Drill countersink holes 3/8" from the ends of your short boards
- Step 6:** Using 1 5/8", course screws, attach the short piece to the long piece. REPEAT
- Step 7:** Attach the bottom to the frame using 1" screws
- Step 8:** Hot glue the foam into appropriate places
- Step 9:** Place framed piece FACE DOWN in the foam pocket
- Step 10:** Attach lid with 1" screws
- Step 11:** Adhere address lable to the front of crate
- Step 12:** Write with Sharpie, OPEN THIS SIDE on the TOP

TITLE:OF WORK: _____

LONG SIDE of Frame= _____

+ 2"

=====



<-----length of your longer crate piece

+ 1.5"

=====

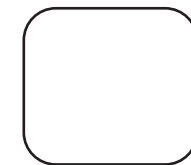


<-----Long dimension of TOP & BOTTOM

SHORT SIDE of Frame= _____

+ 3.5"

=====



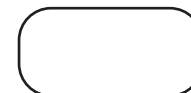
<-----length of your shorter crate piece
(this piece gets the countersink holes)

<-----Short dimension of TOP & BOTTOM

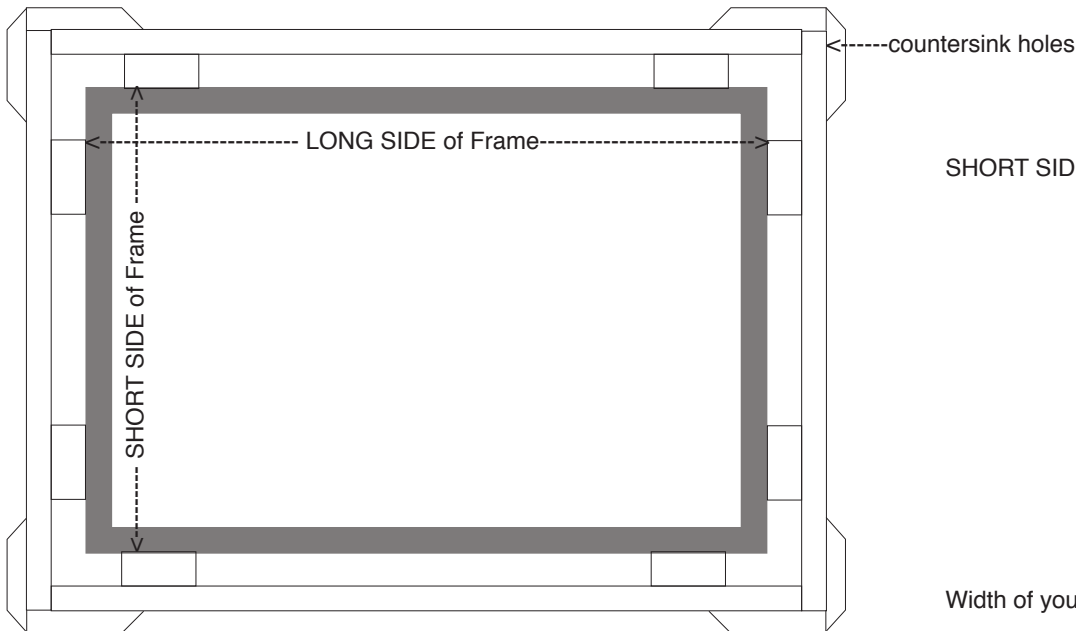
Width of your frame stock= _____

+ 2"

=====



<-----Width of CRATE BOARDS



ALL FOAM PIECES ARE 1" x 2" x 2"
ALL CRATE STOCK IS .75" PLYWOOD

Web Resources:

Exposure calculator information:

<https://www.anthemprintingsf.com/Screen-Exposure-Calculator-s/216.htm?fbclid=IwAR3H-mmvlzI lzFcMcHbDFrCRYC bzYZa8ly9jGJ046V4ovx57q7XO4VuVcug>

Screenprinting on the Cheap Tutorial Videos:

https://squawkproductions.com/screen-printing-on-the-cheap/?fbclid=IwAR0MQh6n9DfjVa_eXIsMWxwYQVd4mKz2_8kVHakVoVfThjZ3BHBluHlrQs

Print Resources:

Print Liberation: The Screen Printing Primer by Nick Paparone

https://www.amazon.com/dp/1600610722/ref=cm_sw_r_cp_api_i_wG53EbRJJ5QJY?fbclid=IwAR38GMG_oLF-AeizBBsq_ga6MAxjfW34NjBs8Xctcnb42Bz5vbc8cv4UIRI

How to Create Your Own Gig Posters, Band T-Shirts, Album Covers, & Stickers: Screenprinting, Photocopy Art, Mixed-Media Collage, and Other Guerilla Poster Styles by Ruthann Godollei

<https://www.barnesandnoble.com/.../how-to.../1118059632>

Water-Based Screenprinting (Printmaking Handbooks) by Steve Hoskins

https://www.amazon.com/Water-based-Screenprinting-Printmaking-Handbooks-Hoskins/dp/0713650559/ref=sr_1_1?dchild=1&keywords=waterbased+screenprinting&qid=1591802194&s=books&sr=1-1

Water-Based Screenprinting Today: From Hands-on Techniques to Digital Technology by Roni Henning

https://www.amazon.com/Water-Based-Screenprinting-Today-Hands-Techniques/dp/0823057283/ref=sr_1_2?dchild=1&keywords=waterbased+screenprinting&qid=1591802232&s=books&sr=1-2