RISOGRAPHY

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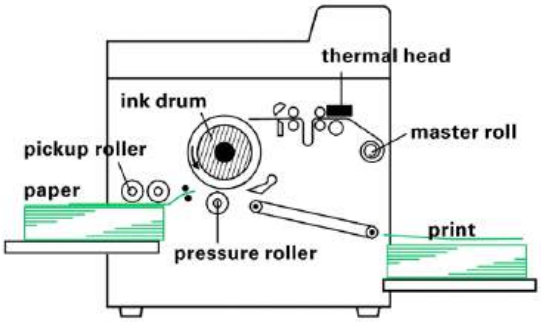
WHAT IS A RISOGRAPH

Risograph (Japan, August 1986) is a brand of digital duplicators manufactured by the Riso Kagaku Corporation, designed for medium-volume photocopying and printing. (50-5,000 sheets). At 20+ prints, it is far less expensive per page than a conventional photocopier, laser printer, or inkjet printer. It's extremely energy efficient. Inks are soy-based and do not conform exactly to any color standards (like Pantone). The inks are also slightly transparent, which allows for variations in color based on the paper and other ink layers.



HOW RISOGRAPHS WORK

The underlying technology of a Risograph is similar to screen printing, with a bit of photocopying mixed in. The original image file is sent to the machine, either through a computer or directly from the Riso's scan bed. The image is burned into a master, which is then wrapped around the print drum. The drum rotates at a high speed, pushing the ink through a screen onto the paper as it is being sent through the machine.

PAPER

Risographs can not print full bleed. We are able to print on a maximum 11 in x 17 in sheet, with a maximum printable area of 10.5 in x 16.5 in on uncoated papers that range from 20# text and 80# cover. You CAN NOT run newsprint, tracing paper, printmaking paper, acetate, glossy papers, or paper with torn edges, sticky parts, unusual sizes, or loose fibers in the riso.

SMFA provides 20# copy paper for proofing, but because it is meant for laser printers, it does not absorb riso ink well. You must purchase your own printing paper for your projects. Recommended papers include: French Paper, Domtar Earth Choice, Cougar Digital 80# text, Mohawk Via Vellum, Neenah Exact Vellum Bristol or Astrobrights.

The SMFA store does not carry paper for the riso but Paper Works, The Paper Mill Store, Limited Papers, and Papers Papers all ship a variety of papers appropriate for riso. You can also purchase some of the recommended papers at any office supply store. We will go over the paper options in detail. If you have questions about a specific paper that is not on the list, check with me before purchasing paper.

INKS

The SMFA SF9450 risographs are single drum machines, which means each color must be printed separately. Masters can not be reused.

Each drum holds a single color of soy based ink. SMFA currently has 13 drums: Red, Yellow, Green, Fluorescent Pink, Blue, Flat Gold, Fluorescent Orange, Light Teal, light lime, white, violet, mist, and Black.

You must wait a minimum of two hours in between printing layers, though it's recommended that you wait 24 hours, since ink that is not dry will get picked up and cause unwanted marks. It is possible to force dry recently printed sheets with a hairdryer, though offsetting will likely still occur.

Hex codes for the colors we currently have are below and at Stencil Wiki. The hex code is an approximation and will look different on the screen versus printed on paper.

HOW TO LAY OUT IMAGES TO BE RISO PRINTED

Each layer, regardless of ink color, must be sent through as grayscale. The nature of a one color machine means that mis-registration will likely occur if you are printing multiple colors. It's good practice to include trapping (having colors overlap rather than butt up against each other, reducing the odds of accidental white space) where necessary. Because the inks are transparent, it is possible to overlap colors to create new colors. I recommend using registration marks on multiple color prints.

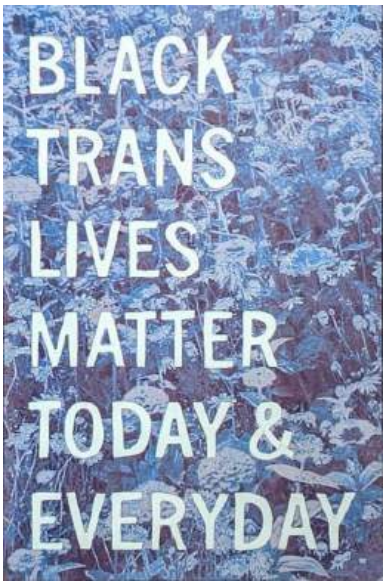
To create your images, you can manually separate spot colors or use photoshop to create a duotone, tritone, or faux CMYK. You can also use Spectrolite.

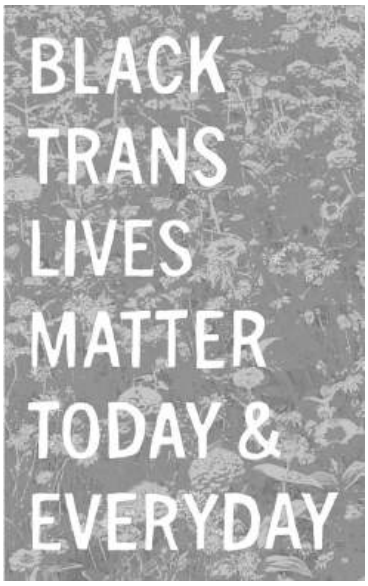
SPOT COLOR

FLUORESCENT ORANGE

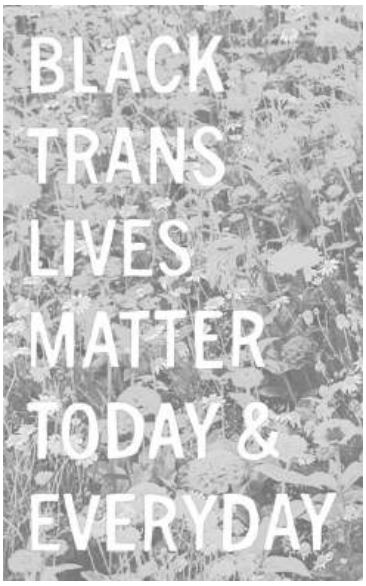
BLACK

DUOTONE





BLUE

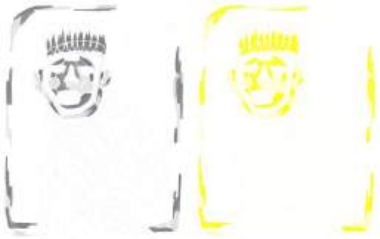


SCARLET

CMYK

AQUA

FLUORESCENT PINK



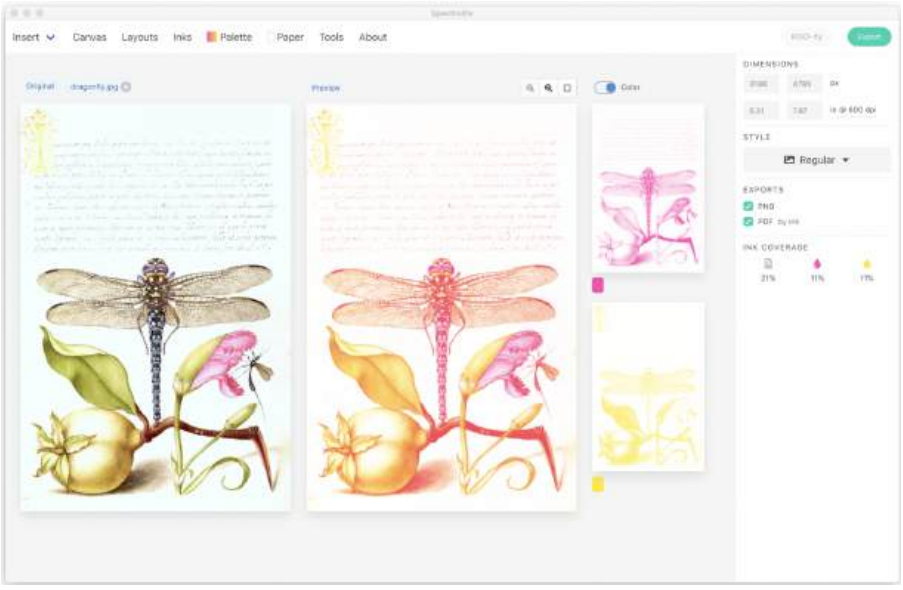
YELLOW

BLACK

In many riso shops, faux CMYK (which mimics four color production printing in Cyan, Magenta, Yellow, and Black) is printed using Aqua, Fluorescent Pink, Yellow, and Black. At SMFA, because we don't have an Aqua drum, we use either Blue or Light Teal. Choose the color that works best with your image.

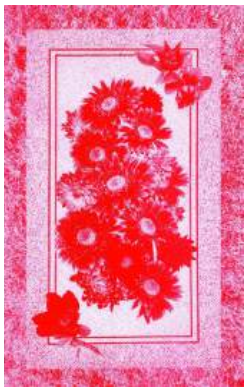
SPECTROLITE

Spectrolite is a free program developed by Anemone. It is only available for Macs. If you have a Mac device, you can download it directly to your personal computer. It is also installed on the four Mac computers in the riso studio.



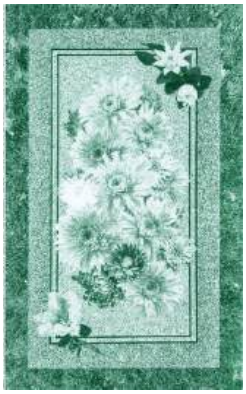
In Spectrolite, you can generate previews of how your image will look in whatever combination of colors you choose.

Spectrolite is great for previewing images in a variety of colors, but because it is an automatically generating computer program, you have no control over the outcome – though you can always open the Spectrolite generated separations in Photoshop and further manipulate them.



SCARLET

LIGHT LIME



PINE

<u>THINGS TO CONSIDER / REMEMBER</u>

Riso ink never fully dries, and can smudge with force. It's best to avoid large areas of color for prints that will be handled a lot. Brighter colors rub off easier than darker colors. Large areas of solid color will not print evenly, and may also cause print marks.

Type that is set in Photoshop (raster) rather than Illustrator (vector) will be pixelated. If you are incorporating typed text and images, you can edit your images in Photoshop, then place them into files in either Illustrator or InDesign.

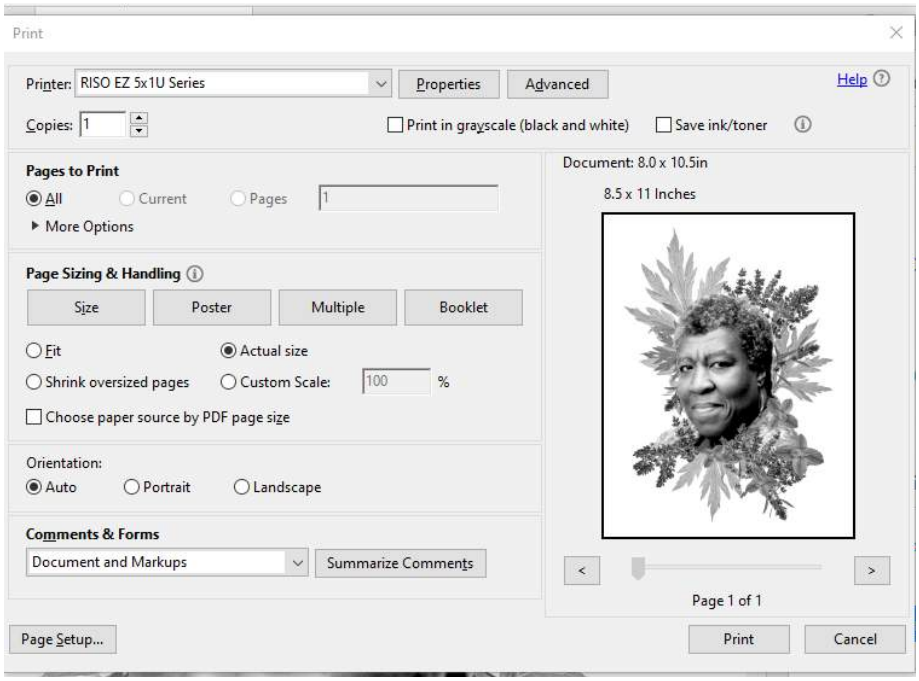
If you are printing more than two layers or double sided, it is likely that there will be print marks. If your image is dense, there might also be roller marks left from the machine's rubber rollers. These can sometimes be removed with a white eraser in the borders of your prints.

To avoid printer marks, you can lay out your images to avoid heavy inking in the first several inches of your paper, and one inch down the middle of the sheet.

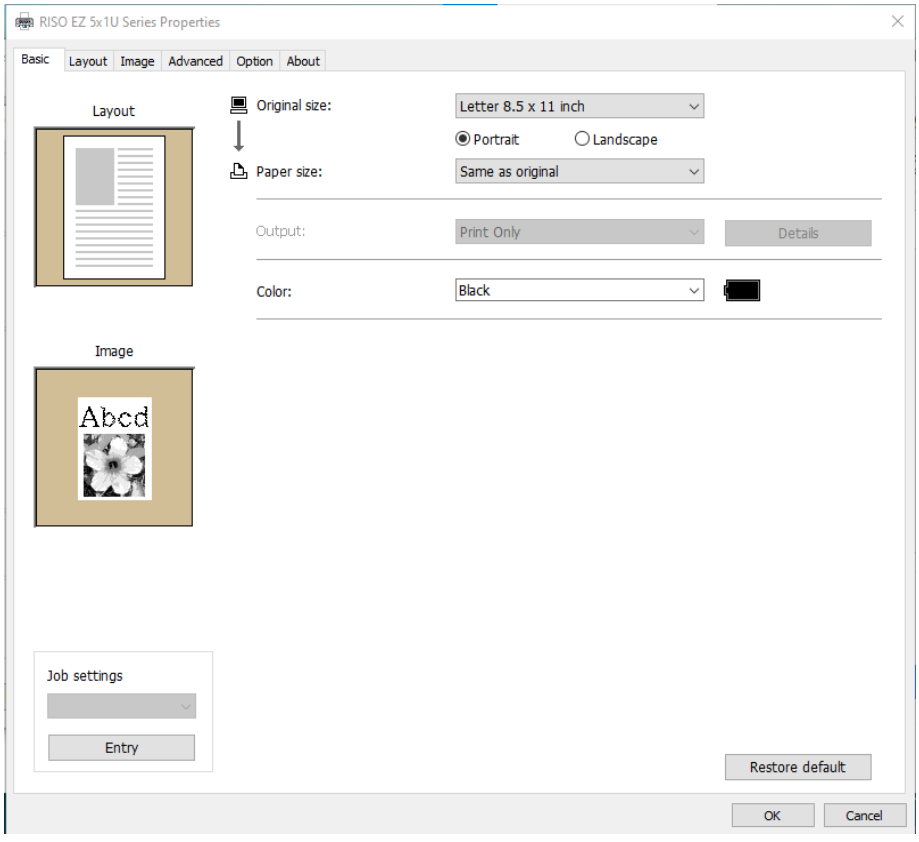
You can also avoid printer marks by printing areas with less coverage first, letting prints fully dry, and using the least amount of ink possible for your prints (i.e. using a dark gray instead of a full black, or setting the print density to 1 - 3).

PRINTING

You can print directly from the scan bed using the keypad options or digitally through the computer. At SMFA we print grayscale PDFs from Adobe Acrobat, rather than directly from Photoshop or Illustrator. The PC connected to the riso does not have editing software, so your files must be ready beforehand. There are several macs in the riso room where you can access Adobe CC software. You can connect a usb or hard drive to the front of the computer or download your files from Box or Google Drive. If the computer is asleep, make sure the monitor is on. If the computer won't wake up, unplug and replug the HDMI cable from the back of the monitor.



Make sure the printer is set to the riso you are using and your image is set to "Actual size." Click on the "Properties" button for image options.

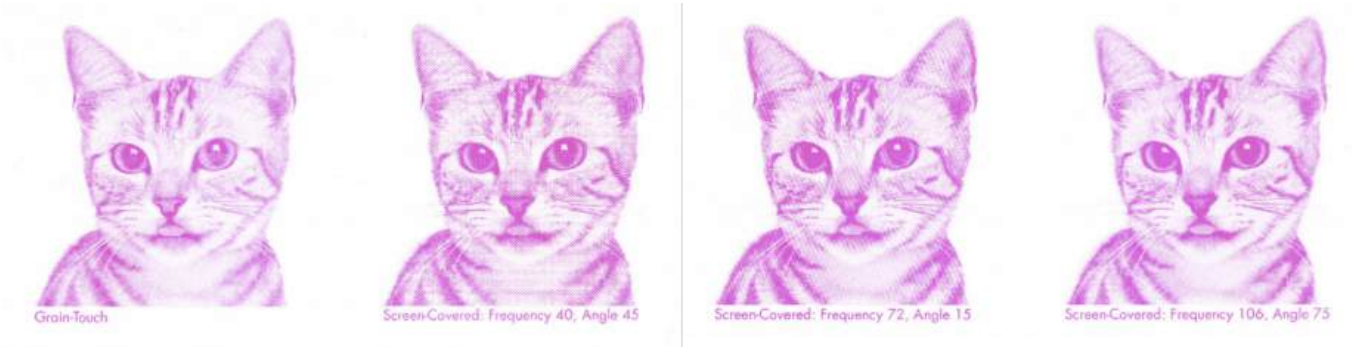


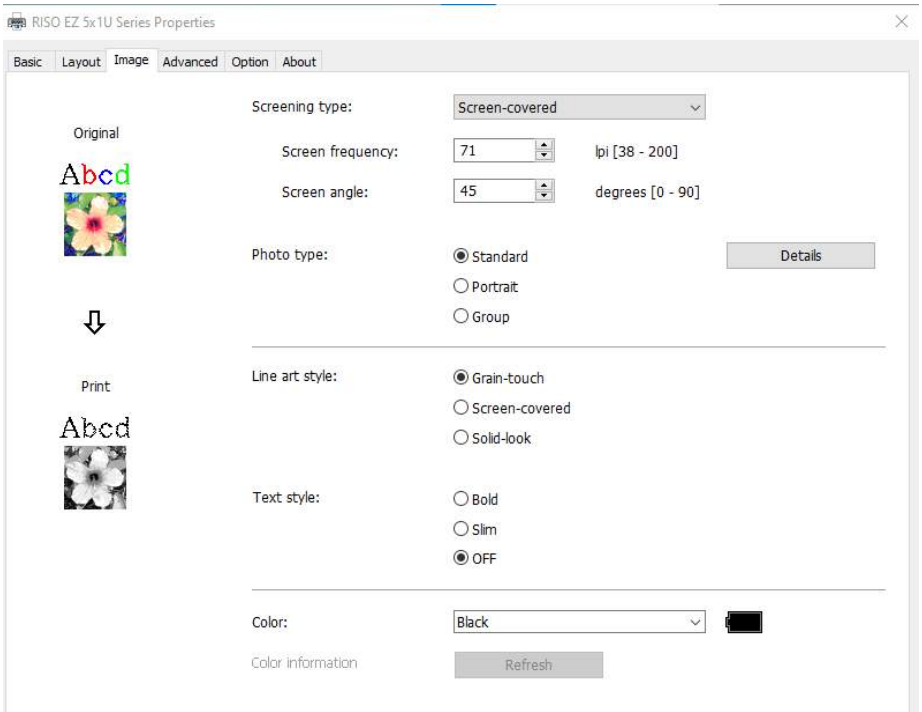
In the "Basic" tab, make sure your paper size is set correctly.

The Riso will halftone images, and there are multiple options in the print dialogue box, such as photographic images versus line art, and halftone frequency.

In the “Image” tab you can choose between “Grain Touch” and “Screen-Covered.” Grain-touch is a randomized diffusion dither pattern. Screen-Covered creates classic halftone patterns. Screen Frequency will control the size of the dots produced (higher numbers = smaller dots = denser and darker images).

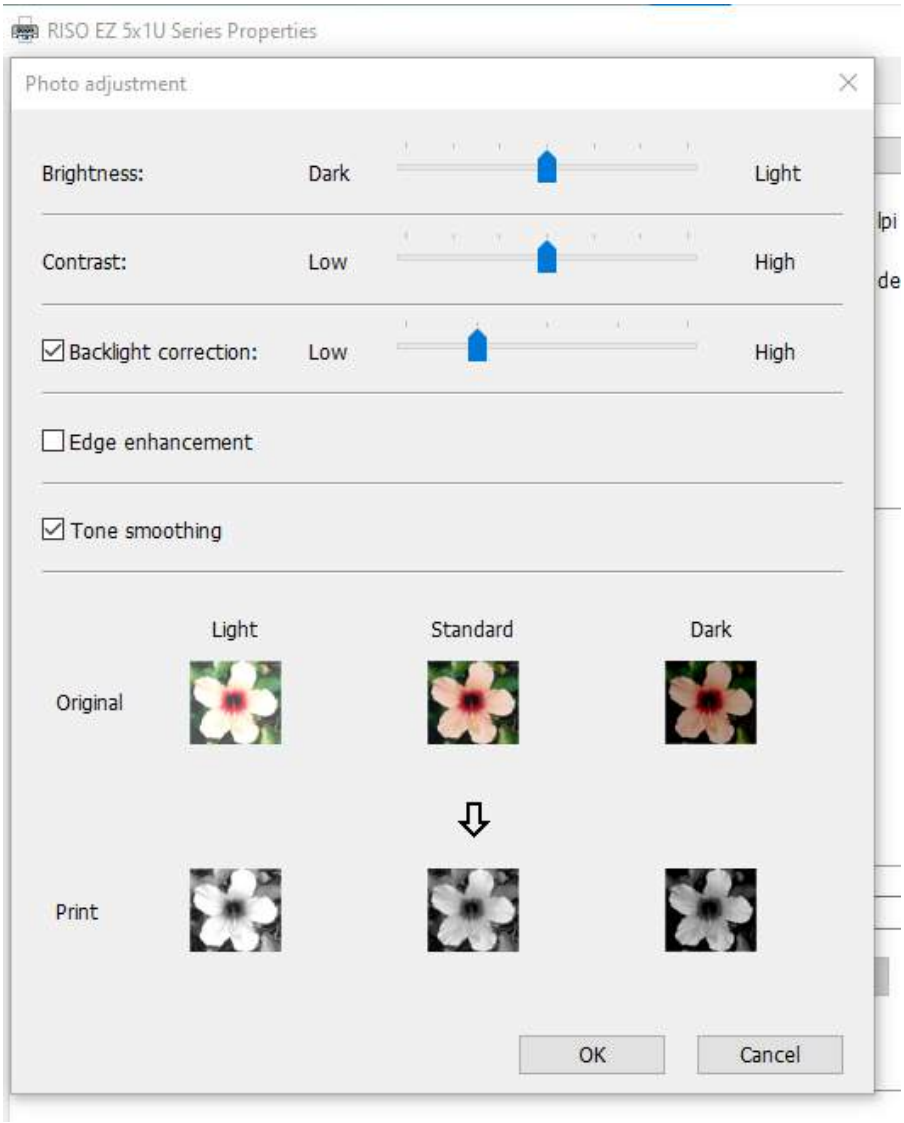
SCREEN-COVERED *GRAIN TOUCH*





If you are printing multiple colors, to avoid moire patterns, the screen angle should be set to different degrees. Commonly, for CMYK printing, we approximate by printing Yellow at 0, Pink at 75, Blue at 15, and Black at 45. Experiment with angles. For two colors, you can print the darker at 45 and lighter at 15. For three colors, the darker at 45, mid at 75, lightest at 0.

The driver also offers several options for photo type, line art style, and text style.



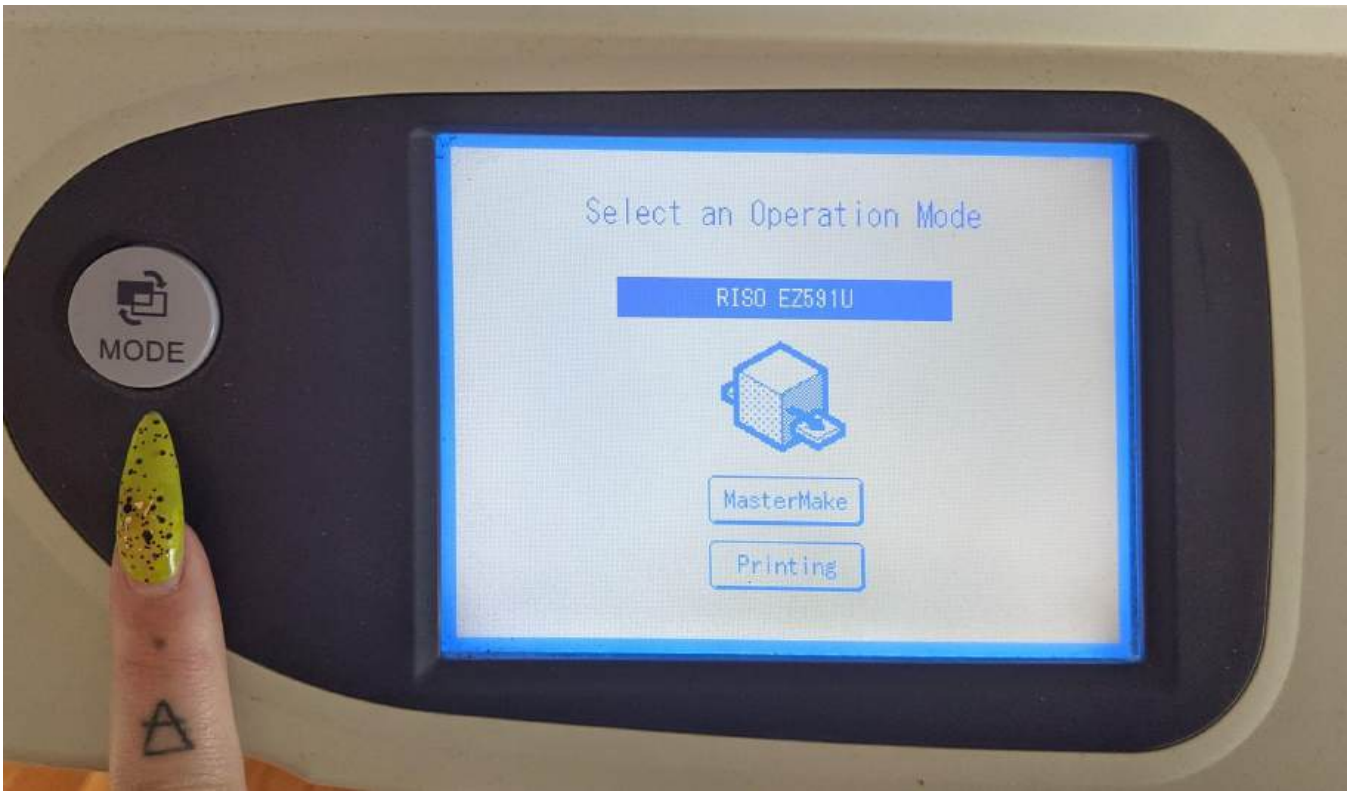
If you click on the “Details” tab, you can make further adjustments to your image.

In the “Advanced” tab, choose Speed 2 and Color Density 3. MAKE SURE “INTERVAL PRINTING” IS CHECKED ON.

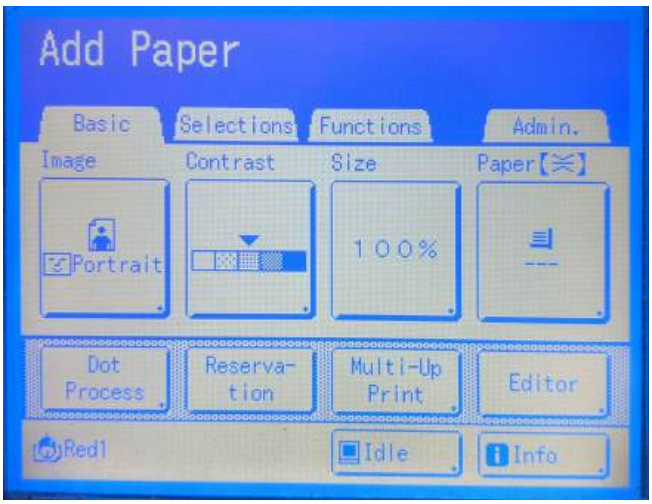
Make sure that the correct type of paper is selected above the paper tray. Push the button to the left for lightweight, text weight paper and to the right for heavier, coverstock papers.

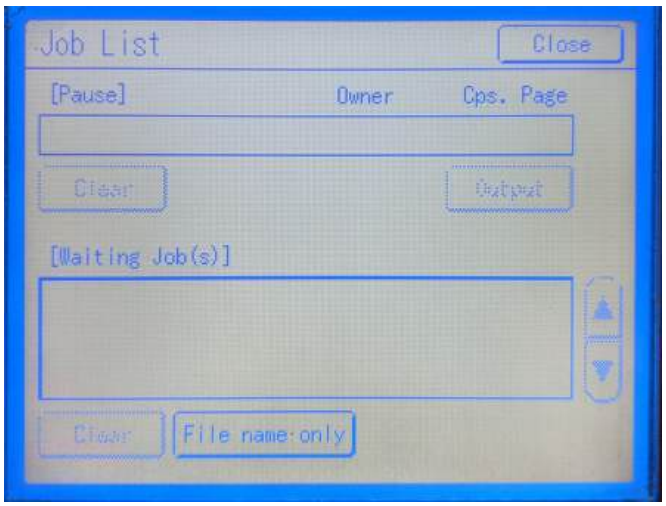
Make sure your paper is in the paper feed tray, the correct color drum is in the riso, and the receiving paper tray is set to a size that hugs but does not squish your paper.

Make sure the riso is in “neutral mode.” If it is in mastermaking or printing mode, press the “Mode” button. After saving your selections, click “Print” on the main print dialog box. Depending on how recently the drum has been used, it may idle for a few seconds to a couple minutes.

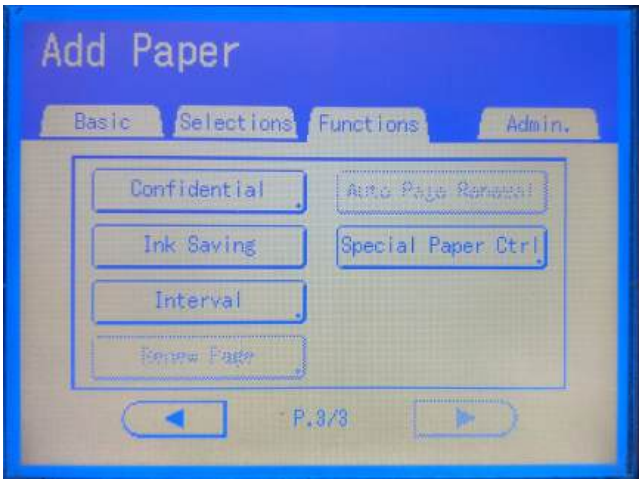


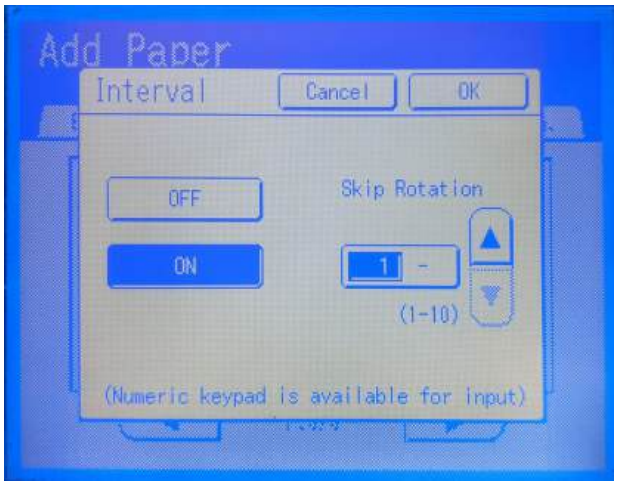
If the riso does not automatically start making the master, press the “Idle” or “Pause” button in the bottom right corner next to the “Info” button to bring up the Job List menu. Choose your file and press “Output” to begin the master making process. The job list is where you can also delete your file without making a new master if you need to.





If you are printing multiple colors, using Interval printing will add drum rotations and can help with “wobble,” making registration easier. If you forgot to click the Interval on in the print dialog box, you can turn it on in the “Functions” menu on the riso touchpad screen.

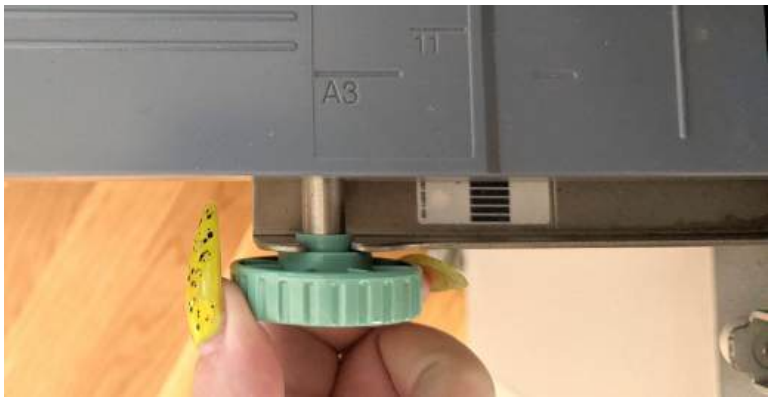




From the keypad, you can enter the number of prints, control the printing speed, density of ink, and print position. The slowest printing speed is actually pretty fast and I recommend printing at 1 or 2. The faster you print, the more likely your prints will misregister. Ink density will be determined by each file, but prints inked above 3, especially in dark colors, tend to offset onto other prints.

If you make adjustments to the ink density, it may take 10 - 20 sheets before the change is noticeable. USE PROOFING PAPER.

On a single drum machine you can adjust the print position in two ways. The keypad allows you to adjust the position of the print left or right by specific increments. To move the position up or down, you must turn the knob on the paper tray.



MAKING ADJUSTMENTS UP OR DOWN IS NOT INTUITIVE.

If the layer you are printing needs to move UP, you must LOWER your paper in the tray by running the knob RIGHT.

If the layer you are printing needs to move DOWN, you must RAISE your paper in the tray by turning the knob LEFT.

HELPFUL HINTS

Risographs are notoriously cranky, and printing is inevitably a collaboration between the artist / printer and the idiosyncrasies of each individual machine. Treat them with kindness and respect. Be nice to them. Tell them they are doing a great job.

If you notice anything wrong with anything in the riso studio, especially the risos, please let me (vin.caponigro@tufts.edu) and Louis Meola (louis.meola@tufts.edu) know ASAP.

Riso prints are imperfect and often vary, which adds to the uniqueness of risograph printing. Proper layout and planning can help minimize roller marks, misalignment of colors, and misregistration.

Always print more than you think you need. Always. You will inevitably lose prints to misregistration, cutting or folding errors, etc.

The nature of risograph printing means that it is most economical in volume. Masters can not be reused and making masters is the most resource-expensive part of printing, while subsequent prints are significantly less expensive. In many instances, the price difference between making a single print and fifty is the cost of paper.

If you're printing a large quantity, dry them in stacks of no more than 50 to prevent ink offsetting onto the backs of other pages.

Save your proofing paper. Once it's dry, you can reuse it. Over and over and over again.