

Chapter 12 - Building Analog Negatives

General Description	12.1
Equipment	12.4
Film	12.5
BASE FILM	12.5
MASK FILM	12.5
Processing Chemistry	12.6
Building the Positive and Shadow Mask	12.7
MAKING THE POSITIVE	12.8
MAKING THE SHADOW MASK	12.8
Building the Negative and Highlight Mask	12.9
MAKING THE NEGATIVE	12.9
MAKING THE HIGHLIGHT MASK	12.10
Manipulations	12.11

Chapter 12 - Building Analog Negatives

Building Negatives by the Analog Method

updated August 2001

General Description

The two general methods available for building negatives are digital and analog. The Digital Method optically scans an original into bits electronically stored on a computer, manipulates the data by software, and prints a negative with ink on a transparent substrate using a printer. The digital method is discussed in Chapter 13. The Analog Method consists of enlarging and exposing by optical means onto photographic film and is the subject of this chapter.

The nature of the platinum/palladium print requires that a contact print be made. Thus the size of the print is restricted to being the same size as the negative. To make a larger print, a larger negative must be made. As always, there are many ways that this can be accomplished. But, the techniques described here will give unsurpassed, excellent results. It is most important to consider that the built negative can alter and independently manipulate several tonal ranges producing a final negative that would be impossible to create with camera and film alone. These negative building techniques were learned from Sal Lopes and used over many years. Finally, after years of building negatives, I made some minor refinements.

The basic steps are:

- ✓ Set up original negative in an enlarger.
- ✓ Make a positive and a shadow mask.
- ✓ Make a negative and a highlight mask.
- ✓ Use the negative and highlight mask to make a print.

A general rule to remember is:

NEVER take short-cuts.

Materials like direct duping films that bypass the negative step will **NOT** give anywhere near the quality of the results of the process described here. Negative building is a time consuming process, but well worth the results.

This chapter will provide information on equipment and materials needed and detailed instructions on how to make the negative, shadow mask, positive, and highlight mask. Do **NOT** assume that one can get results quickly or willy-nilly. One must make an effort to adhere to these directions. This is the only negative building process I learned from Sal Lopes and the only process I have used and continue to use. Only after many years of mastering this process have I suggested some small refinements.

Note: Do not attempt to build large negatives until original negative processing and the matrix

General Description
Equipment
Film
Processing Chemistry
Step-by-Step Instructions for
Positive
Shadow Mask
Negative
Highlight Mask
Manipulations

described at the beginning of this manual have been mastered. (A waste of time and materials can be the result.)

Enormous control is achieved through these four pieces of film. The relationship between the masks and the bases is quite interesting. The exposure will determine the range of image values to appear on the mask. These image values start at the darkest for the shadow mask and at the lightest for the highlight mask. The range of values may extend as far as one desires. However it must be remembered that 2556 film is quite contrasty which means that it has a limited range of total value dynamic range. If one wishes to produce a mask of a large value range, they should consider another less contrasty film for the mask. [Note: Try to keep the mask film as thin as possible while maintaining dimensional stability.]

An interesting feature of the masks is that they will increase the discrimination of tonal values. When each mask increases value discrimination on the positive and the negative, an extremely sharp image is formed. In fact a built 11x14 negative from a 4x5 can have more apparent sharpness than an original 11x14. Incredible sharp images can even be produced from 35 mm originals. This overall sharpness effect only works if both a positive and negative are made. Do keep in mind though that a smaller original negative will have less information to work with. There is no way to create more original information.

A common need in platinum/palladium prints is enough detail in shadow areas. Because of the mat surface of most papers, detail is lost in the shadow areas. The contrast of the shadow mask can be increased to overemphasize the shadow contrast in the negative resulting in a good normal contrast in the print shadows.

A trick Sal Lopes taught me years ago is that the grain in an image can be made to disappear. When making the shadow mask an embroidery hoop with a nylon stocking stretched across it is placed in front of the enlarger lens and jiggled during exposure. Then when the negative is made, a piece of Mylar is placed between the positive and the shadow mask. These actions offset the masks from the bases just enough so that any image resulting from the grain in the original is canceled and disappears.

Burning and dodging of areas can be achieved which would normally be close to impossible and too tedious. For example: The image has a sky with many individual clouds in it and to further complicate the situation tree branches are everywhere. The problem is that a couple of the clouds in one portion of the print are too light and the contrast of the print is perfect and the sky and branches are perfect. Simple burning would darken portions of the sky and the upper portions of the branches as well. The solution is to build a highlight mask which only includes the values of the clouds and higher. The sky and branches (darker tones) will be blank on the mask. The clouds which are too bright can have some density removed on the highlight mask with the Potassium Ferricyanide solution. In the final print all the clouds are consistent and the sky and branches are the same. Remember that the density of the mask is added to the density of the base requiring larger changes than one might first expect.

A general rule is that any hand work should be applied to only the masks, whereas exposure dodging and burning may be done on any of the films. One should consider that if a general burn or dodge is needed on a base, it will most likely also be needed on the mask.

There have been instances where multiple shadow or highlight masks are used. An image has some trees with some very dark areas in which there are a lot of lines. If only a short exposure mask was made, the zone II and III would be lacking some needed contrast. If the proper exposure and contrast necessary for the dark line were given, the zone II and III would look unnatural. So, a proper shadow mask is made to accommodate the zones II and III and a second shadow mask is made with less exposure and high development to only add the line to the print. When using more than one shadow mask the mask controlling the lowest values should be placed on the stack last (and furthest from contact). And when using more than one highlight mask the mask controlling the highest values should be placed on the stack last (and furthest from contact). These mask will be further from the printing area and thus less focused, but because they are in the darkest or lightest areas of the image any loss of sharpness should not be as noticeable.

By this technique one may control many image characteristics.

Some examples:

- reduce the contrast in the mid Zones by lowering the contrast of the positives and negatives
- increase contrast in the dark or light zones by increasing the contrast of the shadow or highlight masks
- lose upper or lower end zones by increasing contrast of the positive and lowering contrast of the negative. This can take zones II through VIII and make them look like zones I through IX.

+++ GOOD LUCK +++

“Luck is a combination of skill and preparedness.”

(Quote by Edward Weston from his daybooks.)

Equipment

The following equipment is required for building negatives as instructed in this guide:

- Enlarger with cold light
- Good easel fixed so that will not move in relation to enlarger
- Contact printing frame - the same one used for platinum printing will do
- Opal glass or plastic sheet same size as printing frame
- Dodging tools - these will be custom made as needed
- Mylar sheets same size as film (See mask making)
- Embroidery hoop and nylon stocking (See mask making)
- Safe lights for film - 2
- Timer for enlarger [see appendix for schematic of a light intensity monitoring device.]
- Compensating developer timer from Zone VI Inc.
- Large sink - 3 foot by 10 foot works well for up to a 16x20 film size.
- Water filters on tap water.
- Trays - Five trays work well.
 - For film sizes over 24 inches, a mechanical processor should be considered.
 - For film sizes capable of handling, trays slightly larger than the film size will work best.
 - Note: NEVER use the same trays for platinum processing - stains will ruin prints.
- Print/negative washer which accommodates the size of film.
- Graduated cylinders - 2, 100 ml with increments of 1 ml
- Graduated measuring cup - 1, 500 ml with increments of 10 ml
- Measuring cups - 2, 1 quart with increments of 1 ounce
- Storage bottles - 2 (for stop bath and fixer)
 - Notes: Developer and hypo clearing bath should be made fresh each time.
 - NEVER use these graduates, measuring cup, or bottles for platinum processing
- Towels to dry hands (separate from those used for platinum processing)
- Paper towels
 - Note: Bounty brand paper towels (regular) do not leave lint and do not scratch.
- Clips and line to hang negatives for drying
- Wet light table - large enough to hold two or more of largest film-size pieces and water-proof
- Small plastic beakers - 3, for manipulation chemistry
- Cotton balls and Q-tips
- Several small sizes of sable brushes
- Notebook

Film

In general the films used must be dimensionally stable because of the requirement for precise registration. The films should be as thin as possible. Also it is advantageous to use a film that can be used with a safe light.

BASE FILM:

The best base film for building negatives should have a very long straight line density-log-exposure curve and a very high silver content. These are the characteristics of Kodak Commercial Film 4127. No other film achieves the image quality that 4127 film provides. The problem with 4127 film is that it is currently only easy to buy in 4x5 or 8x10 sizes, unless one purchases an entire run from Kodak. [This is a problem.]

There may be several substitutes for 4127 film. A possibility could be Kodak Duraclear material. It is processed by the Ra4 chemistry in a tray or mechanical processor. It is available in a variety of sizes including some long roles. This film has not yet been tested.

MASK FILM:

An excellent film for the masks is Kodak Kodalith Film 2556.

It may be helpful to have the base film slightly larger than the masking film, although this will cost extra. For example with 8x10 film, make the image size approximately 7x9 and trim the masks to 7½x9½. This is because the image is easier to view on the light table with the mask on top of the base. This is done when registering by taping together. Having the top piece of film smaller gives room to tape together. Having the mask larger than the base can work, but not as easily. Having the mask and base the same size makes it difficult to tape the films together for registration.

Note: Unfortunately films are becoming less available as the graphic arts industry moves to digital.

One film that has promise, while it remains in production, is Kodak Duraclear.

Processing Chemistry

Function	Chemical	Mixing	Time
develop	Kodak HC-110	8, 16, 32, 64, 128, or 512 ml per liter	3 - 6 min.
stop	Kodak Indicator	12 to 15 ml per liter	30 sec.
fix	Kodak Rapid Fixer	250 ml per liter (Part A only)	2 - 4 min. (4127) 1 - 2 min. (2556)
rinse	water	tray	1 min.
hypo clearing	Sprint or Hyco	1½ oz per quart	1 min.
wash	water	print/film washer	10 - 15 min.
wetting	Kodak Photoflo	5ml per liter	30 sec.
mask manipulation:			
lower density	Potassium Ferricyanide	12 crystals per 30 ml	1 - 10 min.
increase density	Selenium toner	straight to 1:4	1 - 4 min.

Note: All mixing is with 0.05 um filtered tap water.

Building the Positive and Shadow Mask

- ✓ With the original negative in the enlarger, select a size which will leave at least a ½ to 1 inch wide boarder on the size of film used.
 - ✓ Focus carefully on a piece of scrap 4127 film in the easel, then remove that film.
 - ✓ TEST: [Note: The positive and shadow mask are tested in tandem.]
 - ✓ Make a guess at the exposure time and development concentration and time for each.
 - ✓ Expose a small piece of 4127 film cut from a piece of film from the same box as will be used.
 - ✓ Expose a small piece of 2556 film at the same location.
 - Notes: 4127 film can vary widely from batch to batch.
 - Choose part of the image that has both extreme light and dark values.
 - When exposing, it is much more accurate to:
 - 1) hold a card I front of the lense;
 - 2) turn on the enlarger;
 - 3) remove the card and start the timer simultaneously;
 - 4) when time is up, replace the card;
 - 5) turn off the enlarger.
 - Note: Instead of a timer, metronome tics can be counted from a device that varies the time between tics directly as a function of the intensity of the lamp intensity. A schematic for such a device is found in this guide labeled “light intensity monitor”.
 - ✓ Develop films at their respective concentration and time.
 - ✓ Stop
 - ✓ Fix
 - ✓ Rinse
 - ✓ Evaluate on light table
 - ✓ Repeat these TEST steps until the positive and shadow mask look right when registered.
 - Note: The positive and shadow mask should look pretty much like the print except that the dark values will be blacker in the print. When done properly, the image will have a “glow” to it. A matrix could be made for this process; but there are so many variables, such a matrix may not be practical. After several hundred built negatives, one should begin to understand the relationships between the finished print and the positive, negative, and masks
 - ✓ Enter date, image size, f-stop, exposure time, developer concentration and time into the notebook for each.
- IMPORTANT:** Once the enlarger is set up do NOT move anything, do NOT focus, do NOT change f-stop, do NOT move easel, do NOT bump enlarger.
BE CAREFUL!

MAKING THE POSITIVE:

- ✓ Expose a sheet of 4127 film for the exposure time
- ✓ Develop at the concentration and time
- ✓ Stop 30 sec.
- ✓ Fix 2 - 4 min.
- ✓ Rinse 1 min.
- ✓ Hypo clear 1 min.
- ✓ Wash 10 min.
- ✓ Wet 30 sec.
- ✓ Dry

MAKING THE SHADOW MASK:

- ✓ Expose a sheet of 2556 film for the exposure time
- ✓ Develop at the concentration and time
- ✓ Stop 20 sec.
- ✓ Fix 1 - 2 min.
- ✓ Rinse 1 min.
- ✓ Hypo clear 1 min.
- ✓ Rinse 1 min.
- ✓ Place on light table emulsion side up and blot with paper towel.
- ✓ Using a cotton ball, spread Potassium Ferricyanide solution over the mask for 30 sec. to 2 min..
- ✓ Using a paper towel, blot up the solution.
- ✓ Using a cotton ball, spread fixer over the mask.
- ✓ Lift the mask by a corner and drain.
- ✓ Place into fixer for 15 sec.
- ✓ Rinse 1 min.
- ✓ Hypo clear 1 min.
- ✓ If any density adjustments are needed, do them at this time. [see section on manipulations]
- ✓ Wash 10 min.
- ✓ Wet 30 sec.
- ✓ Dry

Note: After rinsing, the positive and shadow mask may be viewed in registration to check if fine adjustments are needed such as dodging, burning, increasing or decreasing local densities.

Note: Film can be saved by making a RC print to first check for dodging and burning. Also film processing can be calibrated using RC paper thus saving film. One must establish the relationship between the two materials. If one has mastered the normalization technique used with the Matrix, this will be quite simple.

Building the Negative and Highlight Mask

- ✓ Fasten the positive and shadow mask together with tape in registration and place into a contact printing frame.

- ✓ TEST: [Note: The negative and highlight mask are tested in tandem.]
 - ✓ Make a guess at the exposure time and development concentration and time for each.
 - ✓ Expose a small piece of 4127 film cut from a piece of film from the same box as will be used.
 - ✓ Expose a small piece of 2556 film at the same location.
Notes: 4127 film can vary widely from batch to batch.
Choose the same part of the image that was used for the positive test.

With a contact printing frame, exposure is made with the opal glass or plastic sheet covering the printing frame under the enlarger with the original negative removed and even illumination covering all of the contact printer.

 - ✓ Develop films at their respective concentration and time.
 - ✓ stop
 - ✓ fix
 - ✓ rinse
 - ✓ evaluate on light table
 - ✓ Repeat these TEST steps until the negative looks right when registered with the highlight mask.
Note: The negative and highlight mask registered together should look like a negative would for the Pt/Pd process. Keep in mind that this is a wet negative on a light table. It might be helpful to compare values with the normal negative from the matrix study also wet and on the light table.

- ✓ Enter date, image size, f-stop, exposure time, developer concentration and time into the notebook for each.

MAKING THE NEGATIVE:

- ✓ Expose a sheet of 4127 film for the exposure time
- ✓ Develop at the concentration and time
- ✓ Stop 30 sec.
- ✓ Fix 2 - 4 min.
- ✓ Rinse 1 min.
- ✓ Hypo clear 1 min.
- ✓ Wash 10 min.
- ✓ Wet 30 sec.
- ✓ Dry

MAKING THE HIGHLIGHT MASK:

- ✓ Expose a sheet of 2556 film for the exposure time
- ✓ Develop at the concentration and time
- ✓ Stop 20 sec.
- ✓ Fix 1 - 2 min.
- ✓ Rinse 1 min.
- ✓ Hypo clear 1 min.
- ✓ Wash 10 min.
- ✓ Wet 30 sec.
- ✓ Dry

After rinsing the negative and highlight mask may be viewed in registration to check if fine adjustments are needed such as dodging, burning, increasing or decreasing densities locally.

Note: Film can be saved by making a RC print to check for dodging and burning. Also film processing can be calibrated using RC paper thus saving film. One must establish the relationship between the two materials. If one has mastered the normalization technique use with the matrix, this will be quite simple.

Manipulations

There's a lot to add here, but not yet written. Please see the General Description section.

It may be that future manipulations as well as enlargements are accomplished digitally. Dan Burkholder and Dave Fokos both have written excellent material on digital negative building. The author has researched the building of digital negatives. Two of the greatest challenges are the scanning of enough information from the originals and the equipment or service bureau to produce the final negative.