# PRINTING PAPERS

## FIBER vs. RESIN-COATED PAPER

The original photographic paper is known as Fiber-baser paper, or FB. It is a high-quality acid-free paper that holds a layer of fine-grained silver emulsion that is by definition slower speed, which means it requires longer exposure times. The finer grain renders images with greater detail. Since the paper absorbs some chemistry it has to be washed extensively. This papers is toned for protection and for aesthetic variation in tonality. It is considered to be 'Archival' when properly processed and toned, This is of major concern to art collectors. This is the paper that all professional photographers use for exhibition.

In the 1980's a faster paper was produced called Resin Coated paper, or RC. Resin is a plastic coating that covers the surface of the paper so it does not absorb the chemicals. This cuts down on processing time since Fixer Remover and long washing times are not needed. The paper has a faster speed requiring shorter exposure times because the grain is larger. This means the images are not quite as detailed. Since the paper is plastic, it dries flat in about 5 minutes. This paper is very convenient for making a set of contact sheets quickly for editing your shots., but it is not used for exhibition because it lacks the quality and detail of Fiber paper. It literally has less silver making it less valuable.

## PAPER CONSTRUCTION

Fiber paper is sold in single weight and double weight. The double weight paper is somewhere around 255 g/ms tat is a nice heavy exhibition style paper. The single weight paper is very thin and is almost like tissue paper when in the chemicals. It is difficult to handle and does not make a great finished product.

Fiber-based papers typically are also called Baryta paper (pronounced Ba•ree•ta). These papers have a barium sulphate coating that is a clay-like material that enhances the definition of the print and extends the tonal range. It also whitens the appearance of the paper itself and increases reflectivity to produce a more dynamic looking photograph.

RC paper is about halfway between single and double weight. The base paper has a wood-pulp base sandwiched between two layers of plastic resin. This paper is not particularly archival.

## GRADED vs. VARIABLE CONTRAST PAPER

Graded papers are optimized to print at one specific contrast grade only. They do not respond to contrast filters. They do, however, produce a superior image. The range of contrast grades varies from paper to paper, manufacturer to manufacturer. A grade 2 paper produces approximately the same contrast as a multigrade paper with a number 2 filter, and so on. Contrast can be fine tuned with graded papers by altering the dilution of your developer and by lengthening or shortening the developing time.

Variable Contrast, however, paper can alter its contrast by changing the color of the enlarger light with filters. The VC paper is very convenient to work with and has the normal working paper these days.

SURFACES

There are a range of paper surfaces available, from Glossy to Matte, with Pearl or Satin in between. Glossy FB paper has a smooth surface but is not too reflective. [The high-gloss look that is a favorite of the public relations people come from an additional process that is applied to regular glossy paper. (This high-gloss surface is readily available in Digital paper, but it avoided in Art circles.)]

There is also a very flat surface called either Matte or Semi-Matte, depending on the manufacturer. The Pearl or Satin surface is more prevalent in the RC papers.

The point is to avoid any surface that has too strong a presence. If you find yourself having to look "through" the surface of the paper, then it is obtrusive and should not be used. Sometimes the FB Matte surface reflects more light than the Glossy paper. If the surface supports the content of a particular images without overriding it, then it is advisable to use this paper for those particular photographs.

There are also specialty papers with the surface of Linen and Charcoal paper. These can be used to great effect depending on the sunject. Often these papers will also be off-white or cream colored. They can become a gimmick unless used carefully. The trick is to avoid that tacky "Wedding album" look.

COLD vs. WARM TONALITY

Regular Variable Contrast paper has a neutral tone. Warm-tone papers are available that can go all the way to a brown to red to sepia tonality. The smaller the grain in the paper emulsion is, the warmer the print will be, so Warm-tome papers have extra detail. It is possible to enhance the warmness even further by using toners. These papers lend themselves to more romantic subject, as was popular in the first part of the 20th century..

There are also a limited number of cold-tone papers that lean toward a blue-black color. These are good for subject matter that is more hard-edge, mechanical or gritty. It should be noted, however, that sometimes a hard subject looks great on warm-tone paper and a soft subject can look great on cold-tone paper. Sometimes opposites attract.

COLOR NEGATIVES and B&W PAPERS

It is possible to print onto black & white printing papers with color negs if you boost the contrast. The problem is that color negatives have an orange mask as part of the backing material. The clearest part of a color negative, then, is this relatively dense. This makes these hard but to impossible to print. In fact, many interesting prints have been made in just this way. Color negatives also have a tabular grain structure which has a considerably different look and is intended to be printed on diffusion enlargers rather than the condenser enlargers that we have in the main darkroom.

There used to be papers made especially to respond to the frequency range of color negatives. They gave an accurate rendition of the tonalities of the original scene. The major problem is that they are intended to be used in total darkness or with dark red safelights. It can be possible to print with these papers in our darkroom if the wings of our safelights are closed down and you only have the paper out of the box for a limited amount of time. It is also suggested that you print at either the darkest Omega station furthest from a safelight.

# PRINTING CHEMICALS

## DEVELOPER

Developers are alkaline solutions that change the silver bromide ions in the emulsion that have been struck by photons of light into solid metallic silver crystals.

The good standard developer for prints is Sprint 'QuickSilver' that is mixed from a liquid and stored in large vats and is diluted 1:9 with water for actual use. Other developers are made for varying results, such as Edwal 'Platinum II' that is a warm-tone (softer) developer.

## STOP BATH

Sprint 'Block' Stop Bath is Glacial Acetic Acid in liquid form. It is diluted 1:9 to make a working solution. Immersing a print for 15 - 30 seconds will neutralize the alkalinity of the developer, halting its activity. Stop Bath will turn violet or very dark when exhausted. Replace immediately if this happens. Always rinse your hands after touching any acid .

Developer is alkali and a few drops of acid stop bath or acid fixer will RUIN its quality. Do not stick your hands into the printing chemicals, and do not interchange tongs from one tray to another.

## FIX

Sprint 'Speed' Fixer is a fast-acting ammonium thiosulfate that removes the unused silver salts from a developed print. This will make a print permanent, unaffected by light if washed properly. The stock Fixer is undiluted 1:9. If a print is left in the fixer too long it may bleach out. If a print is not fixed long enough it will stain and eventually turn brown.

## WATER RINSE

RC prints can be washed in a tray with running water for 5 minutes to remove the Fix.

FIBER based paper absorbs much more fix into its uncoated paper stock and requires a much more rigorous procedure, as follows:

Prints are stored in a holding tray until enough are collected to process in a batch.
These next steps happen out in the Finishing Sinks

SPRINT 'ARCHIVE' FIXER-REMOVER is a strong alkali that expedites the removal of the Fix from the fiber based paper. Prints are put in straight Fixer-Remover for 2-3 minutes. If the Fixer is not totally removed your prints will get yellow stains.

SELENIUM or some other Toner may be used at this time to create a color change in the print. Toning is more often done as a separate process sometime after printing.

FINAL WASH time runs for 30 - 60 minutes. Do not add prints to a Final Wash after it has begun. This will just add more traces of Fix and prolong the duration of the Wash.

## DRYING

RC prints will air dry in 5-10 minutes and will stay flat.

Fiber based prints are usually left on the Drying Racks and flattened later.

Prints can be carried home in a Blotter Book and dried by hanging 2 prints back to back on a clothes line, pinned at all 4 corners with plastic clothes pins.

# CONTACT SHEETS

<u>Have negatives</u> in a plastic file sleeve, emulsion side down.

      A full roll of film will fit onto an 8" × 10" sheet of paper if cut into 7 strips of 5 frames each.

<u>Sign out</u> keys for an enlarger from Lab Monitor and set up to print.

<u>Set lens</u> to desired aperture.

      $f/8 \sim f/11$ are good apertures on the Omega enlargers.

<u>Set enlarger</u> height.

      This height should be constant for every contact sheet you make.

      Adjust the Omega enlargers to 30 cm.

<u>Pull focus</u> back to make a wide circle of light on enlarger base.

<u>Set timer</u> to desired amount of time.

      A suggested time / aperture / height setting is

      $f/8$ at 16 seconds with the enlarger height at 30 cm.

<u>Position</u> the Contact Printer directly centered under the lens

      This is a piece of foam backing and a thick piece of glass

      Center the paper in the circle of light coming from the enlarger,

          otherwise you will get an uneven exposure.

<u>Place photo paper</u> with your name, class and date on back under enlarger.

<u>Place negatives</u> in plastic file sleeve on top of paper, emulsion side down.

      Align the negatives with the lower right corner

          so you get all the numbers on the contact sheet and

          also have room to punch holes for your loose leaf book.

<u>Place glass</u> clean and dust free, over negatives

      Apply pressure to the glass to keep negatives flat and in direct contact with the paper.

<u>Make exposure</u> while continuing to apply pressure.

<u>Process</u> in chemistry as you would a normal print.

Finishing Contact Sheets on RC paper:

      <u>Take</u> prints out to the Finishing Sinks in a Print Viewing Tray

      <u>Wash</u> for at least 1 minute in running water in the Transport Tray

      <u>Squeegee</u> on the plexiglass sheets in the right-hand side of the sink

          Squeegee the sheet so it is dry

          Hold the print by one corner, then squeegee 1 side

          Remove the print and squeegee the plexiglass so it is dry

          Flip it over and squeegee the other side, still holding that corner

      <u>Place</u> the semi-dry print on the Drying Racks, face down

          the Contact Sheets will be dry in 5 - 10 minutes

      <u>Punch holes</u> in the left edge

      <u>Put</u> the Contact Sheet into Print Storage Binder, behind the Negatives Sleeve

Notes:

The best exposure for a contact sheet is where the area around the sprocket holes is almost as dark, but not **as dark** as the area inside the sprocket holes. Do not go by the exposures of any individual frame on the roll as they are not constant. The negatives will vary throughout the roll so do not use them to make a "perfect exposure".

All subsequent contact sheets can be made at the same exposure (aperture / time / height combination). The point is to make all your contact sheets as consistent as possible so you can evaluate any negative on any roll of film and have a reasonable idea of what exposure it may require. This will give you a head start when you go to print any particular negative. There are times, however, when special contact sheets may have to be made.

# TEST STRIPS

Set up _____ enlarger.
Place negative _____ in the negative carrier.
Set enlarger height ____ open the aperture and focus the image to the desired size.
Close the lens _____ aperture back down to a good starting point for that enlarger.
       $f$/8 ~ $f$/11 is a good starting point, depending on print size.
Set timer _____ for 5 seconds.
Place _____ a small piece of photo paper under the enlarger, held by an easel,
       position the piece of photo paper so that it falls under both a highlight and shadow area.
       cover all but 1/4" of the paper with an opaque mask.
         a piece of opaque cardboard or exposed photo paper will do.
Start exposure _____ for 5 seconds,
Move _____ the mask over 1/4" more to expose even more of the photo paper.
Make _____ another exposure of 5 seconds
Continue _____ this procedure until, for the last 5 seconds,
       the entire piece of photo paper is being exposed.
Process _____ the print in chemistry as normal.
       if using fiber based paper you may pull the strip from the fix early to save time.
Examine _____ the test strip under white light.

You now have a piece of paper with exposures of 30, 25, 20, 15, 10 and 5 seconds. The darkest
       area is from the longest exposure.
You should be able to use this to determine the proper exposure needed for this print.

Notes:
A new test strip will probably be needed for each enlargement print, as most negatives will vary.
       Your exposure time is determined by which time slice has the best looking whites.
The contrast filter controls how saturated the shadows are in the slice that has the whites right. see
       Prints - exposure and evaluation page
Getting a perfect print is a matter of balancing all the aspects mentioned above. It is not unusual to
       make several test strips to get it all right.

# ENLARGEMENT PRINTING

Sign out _____ a **set of keys** for an enlarger from the Lab Monitor and set up to print.
Put **Lens** _____ onto the enlarger
    Use a 80mm lens for most print sizes
Set **Condenser Lens** ___ to the right height for the negative size being used.
     Open the head cover on the Omega enlarger
     Lift the Condenser Lens out and respiration it according to the diagram inside the cover.
     Be extremely careful. This lens is heavy. Do not force it in the wrong direction.
Place **Contrast Filter** ___ into the Condenser chamber
    start with a #2 Filter that renders normal contrast
Set **Bellows** _____ position, usually all the way up
Turn on _____ the **Timer**, switch is on the back left corner
Set **Enlarger height** ___ to 29cm, to start
Insert **Negative** _____ into a Negative Carrier with emulsion side down.
    Use a filed-out Negative Carrier if available.
**Dust off** _____ negative with the pressurized air nozzle at either end of the Lab.
Insert **Carrier** _____ with negative into Enlarger.
Place **Easel** _____ under the Enlarger.
Adjust height _____ of **Enlarger** to give the desired full-frame print size.
    Different types of edges can be achieved by how you set the easel.
Focus _____ using **Grain Magnifier** with the lens opened up all the way.
Set **Aperture** _____ of the Lens down several stops and make a Test Strip.
    (aka 'Stop Down' the Lens)
    Use a smaller than maximum Aperture if possible.
    Include the most important shadow and highlight areas in a Test Strip if possible.
      see: *Test Strips* page for exact details
Set **Exposure Time** ___ on the Timer.
    Use an Exposure Time of at least 10 seconds.
Place _____ a small long strip of photo paper under the enlarger
Expose _____ the Test Strip
Process _____ the Test Strip in chemistry as normal.
Evaluate _____ the Test Strip under white light and
    Determine the proper exposure for the print:
      Select the best looking Highlight Area first.
        That is the proper Exposure Time.
    Adjust Exposure _____ if the Highlights are not satisfactory, and then make a new test strip.
      Then examine the Shadow Areas, once the Exposure Time is correct:
    Adjust Filter _____ if the Shadows are not satisfactory, and then make a new test strip.
      Use a higher Contrast Filter for darker shadows.
      Use a lower Contrast Filter for lighter shadows.
       see: *Contrast Filters* page for exact details
Make an exposure _____ on a full-size piece of photo paper
    Write your name, date and class plus exposure information on the back.
    Use a permanent marker, never a regular pen.
Process _____ in chemistry as normal.
Make another _____ print
    Adjust Exposure Time and/or Contrast Filters until perfect.
    Burn and/or Dodge certain areas if the tonalities are not balanced to your satisfaction.
      see: *Burning & Dodging* page for exact details

# PRINT FINISHING

## PRINT TRACKING

At the end of the day you will have several prints from the same negative that will all look similar but will be different. The only way you will know how you made the right one is to keep track of what you're doing when you're printing. The easiest way is to write on the back of the print. Another way is to just number the prints and keep notes in a separate notebook.

It is worth transferring the information on how to make the perfect print from any negative onto the back of the contact sheet f rom that roll of film.

<u>Write</u> your name and all relevant printing information on the back of the print <u>before</u> you expose the paper.
This information includes the $f$/stop, exposure time, filter #, and enlarger height as well as your Name, Class and Date of printing.
Write very small, along the very edge of the back of the print.
Use a Sharpie, fine-point permanent marker or pencil. Never use a regular ink pen.

## PRINT HOLDING

When you are finished making your individual prints:
<u>Leave</u> the prints in the large wash tray at the end of the sink, or –
<u>Put</u> your prints and a small holding tray with just enough water to cover them.
In either case, the prints should go in the tray <u>face down</u>.
>*The disadvantage to leaving the prints in the large wash tray is that new prints are always being put in there covered with fresh fixer so that water is never really that clean.*
>*The disadvantage to putting your prints and a small holding tray is that there's only so much room in the sinks and if a lot of people are working it gets very crowded.*
>*Prints tend to float to the surface and if they are face up, part of them will come out of the water, and they will end up getting stained.*

## PRINT TRANSPORTATION

When you are finished printing:
<u>Transfer</u> all the prints into a white plastic 'Print Viewing' tray
<u>Carry</u> them out into the Print Finishing Area, next to the Film Developing Area.

## PRE-WASH
<u>Pre-Wash</u> in plain water at 65˚ - 75˚F for at least 1 minute

## FIXER REMOVER

There should be a large steel tray filled with Fixer Remover.
If the tray is not set up you will have to mix the chemistry yourself.
There are signs with instructions on the wall.
All Sprint chemistry is mixed at the same ratio of 1:9.
<u>Place</u> the prints into the tray of Fixer Remover and agitate for at least 3 minutes.
<u>Put</u> the prints in face down.
<u>Shuffle</u> the prints moving the bottom print to the top to ensure that all the surfaces get the right amount of chemistry.
<u>Remove</u> the prints from the Fixer Remover.

## POST-WASH
<u>Quick rinse</u> in plain water.

# PRINT WASHING

### ARCHIVAL PRINT WASHING

<u>Fill</u> an Archival Print Washer of the desired size with water
between 65° ~ 75°F.
It takes a short time for these to fill, so don't turn them on too far in advance,
otherwise we are wasting water.
<u>Place</u> the prints into the washer when the water is full.
Make sure that none of them have their front faces touching each other.
They can be back to back in the same slot.
<u>Final Wash</u> for at least 15 - 30 minutes.
<u>Remove</u> from the Print Washer with the plastic rod with the rubber end.

### WASHER ETIQUETTE:

Do not add your prints to a wash that is more than halfway through it's time. If somebody has just
started to wash and they are only a couple minutes in, you can add your prints with their
permission and then start counting the 15 minutes from when you add your prints.

### SQUEEGEE PRINTS

<u>Place</u> finished washed prints in another clean holding tray.
<u>Carry</u> prints to the right hand sink where the stainless steel tray is sitting upright
<u>Squeegee</u> the prints gently against the back of the tray.
*It is not hard to scratch the front surface of your photographic prints, so be careful.*
<u>Hold</u> the print by one corner
<u>Squeegee</u> the back, face against the tray
<u>Lift</u> the print away from the tray
<u>Squeegee</u> the remaining water off the tray, then
<u>Flip</u> the print over
<u>Squeegee</u> the front surface
<u>Remove</u> the print
<u>Squeegee</u> excess water off the tray
<u>Place</u> the damp prints onto a Print Drying Rack, face down.
<u>Move</u> dry prints to the top and place damp prints on the bottom to avoid drips.

### PRINT DRYING RACK ETHIC:

<u>Retrieve</u> your prints when they are dry., or-
<u>Take</u> your damp prints home in your blotter book.
<u>Hang them</u> on a clothes line , 2 prints back to back,
with plastic clothes pins on all 4 corners
If you are printing at the end of the night you can leave them overnight
as long as you come back <u>first thing</u> in the morning to get them.
*>These racks are always full and you cannot leave anything sit on them too long
otherwise it creates a big traffic problem.*

### PRINT CURL

Photos on fiber-based paper will not dry absolutely flat. Once they are completely dry you can:
<u>Place them</u> under a stack of heavy books in your apartment. Or-
<u>Bring them</u> back to school and put them into a Dry Mount Press
use low heat just long enough to get them flat.

# FIBER BASE PAPER - ARCHIVAL PROCESSING

DARKROOM PROCESSING

     <u>DEVELOP</u>     <u>2 ~ 3 minutes</u>     (as recommended by the paper manufacturer)
             use constant and consistent agitation
             various developers can be used with fiber-base papers:
                 SPRINT 'QUICKSILVER' is used at 1:9 standard dilution
                 EDWAL 'PLATINUM II' is in a white plastic jug
             mix 1:9 for normal development, 1:15 for even softer tonality
                 let other students know what tray contains which chemistry.
     <u>STOP</u>     <u>30 seconds</u>     with constant agitation
                 use the SPRINT 'BLOCK' STOP BATH mixed 1:9
     <u>FIX 1</u>     <u>half the minimum time</u> recommended by paper manufacturer
                 use the SPRINT 'SPEED' FIXER mixed 1:9
                 If these are Work Prints, the first Fix 1 can be for the full minimum
                 recommended time, and Fix 2 in the next stage can be eliminated.
             use intermittent agitation
             check FIX periodically with 'HYPO-CHECK'
                 but do not discard until exhausted
     <u>WASH 1</u>     <u>5 minutes</u>     in running water with intermittent agitation
     <u>HOLD</u>     <u>in water</u>     for batch processing in the outer film lab


FILM LAB PROCESSING and FINISHING

     <u>RINSE</u>     <u>5 minutes</u>     in running water with intermittent agitation
     <u>FIX 2</u>     <u>half the minimum time</u>     with SPRINT 'SPEED' FIXER
                 use half the time recommended by the paper manufacturer
     <u>RINSE</u>     <u>5 minutes</u>     in running water with intermittent agitation
     <u>FIXER REMOVER</u>     <u>5 minutes</u>     with continuous agitation
     <u>FINAL WASH</u>  <u>60 minutes</u> in Archival Vertical Print Washer
                 place prints back-to-back in the washer,
     <u>SQUEEGEE</u>     gently on a clean, hard surface
                 wash the squeegee first to avoid contamination
     <u>DRY</u>     by placing them face-down on the drying racks.
                 do not leave them there for more than a single day.
                 the racks fill up quickly.
             or - you can dry your prints at home
                 transport damp prints in a blotter paper
                 hang them on a clothes line
                     with two prints back to back, pinned at all four corners
     <u>FLATTEN</u>     by placing the prints under a pile of heavy books at home,
             or - put them into a Dry Mounting Press in the Finishing Area,
                 between two sheets of Archival Drawing paper.
                 run for 2 minutes at a low temperature

# PRINTS: Exposure & Evaluation

EXPOSURE Expose for the Highlights

The overall brightness of a print is controlled by how much light hits the photo paper. The amount
of light reaching the print is controlled by three factors:
1. the aperture setting on the enlarging lens
2. the amount of time the enlarger stays on
3. the height of the enlarger
The highlight areas are used to judge the exposure.
Photo paper starts out white when it comes out of the box, and gets darker as more light hits it.


CONTRAST Adjust contrast for the Shadows

The saturation of the shadows in a print is controlled by adjusting the contrast.
The contrast is controlled by placing a multigrade filter under the enlarging lens when using
multigrade printing paper.
Normal contrast is achieved with a #2 filter.
Higher contrast is generated by filters #2½ to #5
Lower contrast comes from using filters #1½ to #0
Graded papers can be purchased in various levels of contrast which will not respond to filters.


EVALUATION

Look at the areas of the print where the highlights are the brightest.
These regions should be almost, but not quite, as white as the photo paper itself.
- If the highlights in the print are as white as the photo paper,
having no grains of silver whatsoever, the print is **underexposed** - not enough light.
- If the highlights are too grey,
having too many grains of silver, the print is **overexposed** - too much light.

Look at the shadows, considering your print is properly exposed in the highlight areas.
The saturation of the shadow areas is controlled by adjusting the contrast.
- If the shadows in the print are not dark enough, the print needs more contrast.
Make another test strip with a higher numbered contrast filter.
Experience will tell you just how much more contrast you will need.
- If the shadows in the print are too dark, the print needs less contrast.
Make another test strip with a lower numbered contrast filter.


VARIATIONS

Changing the size of a print will affect both the Exposure Time and Contrast of a print. The larger
the print the more light you will need.
e.g. The contrast will drop about ½ a filter grade when you go from 8 x 10" to 11 x 14''.

# CONTRAST FILTERS

When printing: Expose for the highlights – Adjust contrast for the shadows.

Contrast is defined as the range of tonality in a print. It is possible to expand or contract this range by using filters with special printing papers. The opening sentence equates to setting the exposure time according to the highlight density and then changing the contrast filter to achieve the proper saturation in the shadow areas.

CONTRAST FILTERS

Multigrade printing paper can adjust its contrast using magenta and yellow colored filters. There are two layers of emulsion on the paper, one for the highlights and one for the shadows. Each layer is sensitive to changes in the color of the light hitting the paper. As the balance between the magenta and yellow components of each filter change, so does the balance of exposure between the highlights and the shadows.

Ilford Multigrade filters come in 11 contrast grades and can be used with Variable Contrast printing papers, often marked as VC.
Filter #2 produces normal contrast. Filters with lower numbers (00 to 1½) produce <u>less</u> than normal contrast. Filters with higher numbers (2½ to 5) produce <u>higher</u> than normal contrast.

Do not ever touch the filter surfaces Do not ever try to clean the filters.

These are gelatin filters and the color will wash away if it gets wet Since the filter sits above the lens, the positioning is not critical. Small dust spots on the filters will not appear on your photographs.

EXPOSURE COMPENSATION

Ilford filters theoretically have consistent density from grade 0 thru 3½, allowing the contrast to change without altering exposure time. Grades 4 to 5 have more density however, and require 1 stop more exposure (open the lens up 1 stop or double the exposure time).

Multigrade filters all add density to an exposure. The normal filter grades require 1⅓ stops more light than if using no filter. It is recommended, therefore, that you always start with a #2 filter and avoid having to make difficult calculations of exposure time change.

# USING CONTRAST FILTERS

USING FILTERS

<u>Make</u>           a new Test Strip every time you make a new print.
         This is because the light levels and the tonal range will vary considerably from print to print.
<u>Situate</u>        the photo paper to includes the brightest highlight and
         darkest shadow with detail.
         Use long thin pieces of paper. Small squares will not show enough of the important areas.
<u>Place</u>          a #2 Multigrade Filter in the Condenser chamber.
         This is a normal contrast filter.
<u>Expose</u>        the paper sequentially in 5 second steps down from 30 seconds.
<u>Process</u>        the Test Strip in chemistry as normal
<u>Carry</u>         the Test Strip in a Holding Tray and take it out into white light to evaluate.
<u>Find</u>          the Exposure which has the best white in the highlights.
         Photo white should be bright but not as white as the paper itself,
         i.e. there should always be some grains silver even in the brightest highlights.
<u>USE</u>          the TONALITY of the HIGHLIGHTS to DETERMINE EXPOSURE TIME
<u>Look at</u>        how dark the shadows are in the selected slice.
         Look at the edges of the frame also.
<u>USE</u>          the TONALITY of the SHADOWS to PICK the BEST CONTRAST FILTER
         If they are not dark enough - more contrast is needed.
         If the shadows are too dark and have no detail - less contrast is required.
<u>Change</u>        the filter if necessary and make a print or another test strip.
         Usually one full grade in either direction will do.
         It is not uncommon to make several Test Strips or Test Prints to get the it right.
<u>WRITE DOWN</u>    your exposure details on the back of each print and test strip
         Write the final print specifications on the back of the contact sheet also.
         Use pencil or permanent marker.

# PRINTING SIZES and ALIGNMENT

## STANDARD SIZES

Printing your photographs to several standard sizes makes things a whole lot more manageable. Use this sheet as your master template for all your prints. This will add consistency to your images and bring a finished look even to your work prints. Using this technique will also provide formal support for printing sets, series, and/or sequences of images.

This may sound a bit compulsive, but it will be especially appreciated when it comes time to cut mats. These sizes are totally of your own choosing. If you are used to millimeters and decimals rather than inches and fractions, then by all means, use them.

## PROCEDURE

<u>create a master template</u> on the back side of a piece of photo paper
    you may want to use a piece that has been exposed to light, processed and then dried
        this will give you a sheet that can be used as a mask when making test sheets
    if the paper is not processed, it will eventually turn all sorts of funny colors
    a piece of drawing paper can also be used if it is thick enough
<u>draw a set of rectangles</u> of the appropriate sizes
    use these as you standard printing sizes
        the aspect ratio of 35mm film is 2:3 which will produce sizes such as:

| 4 × 6", | 5 × 7.5", | 6 × 9", | 7 × 10.5'' | 8 × 12'' |
|---|---|---|---|---|
| 10 × 15cm, | 12 × 18cm, | 15 × 22.5cm | 18 × 27cm | 20 × 30cm |

        don't print images larger than 6 × 9'' / 15 × 22.5cm on 8 × 10'' paper
        don't print images larger than 8 × 12'' / 20 × 30cm on 11 × 14'' paper
        the aspect ratio of 8" × 10" photo paper is 2:2.5,
            this yields an interesting balance of space around a smaller image
    place the rectangles centered horizontally and slightly higher than centered vertically
<u>draw 2 diagonal lines</u> on the photo paper
    for horizontal photos:
        draw a line 1/2" from the top to a mark 7/8" from the bottom of your sheet
        draw a line 1.5 cm from the top to a mark 2 cm from the bottom of your sheet
    for vertical photos:
        draw a line 3/4" in from the sides on the top edge to a mark 5/8" in from the sides
            on the bottom edge of your sheet
        draw a line 2 cm in from the sides on the top edge to a mark 1.5 cm in from the
            sides on the bottom edge of your sheet
<u>set up to print</u> in the darkroom
<u>adjust the enlarger</u> so that the projected negative image is the size you desire
    use a rule to get the size exact
    if you wish to include the black border in your final matted image, reduce the size of the
        image so the white light around the negative image fits within the desired size
<u>place the master template</u> into the easel
<u>position the easel</u> so the image falls with all four corners
    exactly touching the diagonals
<u>draw a rectangle</u> along the outside edge of the projected negative image
    use a rule to get it exactly right
    it pays to be compulsive this one time since all most of your prints for the rest of the
        semester depend on your accuracy in doing this now
<u>repeat this procedure</u> for each printing size you are likely to use
    make one sheet for all horizontal sizes and one sheet for all your vertical size images