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FILE

Member Manual 4-H Photography
Darkroom Techniques

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Introduction

4-H Photography Awards

County
Gold Medals of Honor in Photography

State
Expense-paid trip to National 4-H Congress

National
Six educational scholarships of $1500 each. A scholar incentive grant of $500 is given to national winners whose grades rank in the upper half of their class during the semester they use the $1500 scholarship.

T his unit tells you how to process your black-and-white film and how to make black-and-white enlargements.

Near the end of the book is some advice on preparing a darkroom. You may want to read it first if you're planning on making enlargements.

There are practical reasons for working in the darkroom. You can save money by making your own prints or you can make nice enlargements and put together a photo exhibit. You can crop your pictures just the way you want them. You can even sell enlargements. These are all good reasons. But there's a better one. Because you like it.

It won't take you long to discover that there's a special feeling of magic that becomes yours each time you turn out the room lights. Bathed in the eerie glow of the safelight, you pull out a sheet of enlarging paper. It appears to be a piece of plain, white paper. You place the paper on an easel and turn on the enlarger which projects the image of your negative onto the paper. Then, strangely enough, you dunk the paper in a tray of liquid called developer. Soaking wet, shiny, floating just beneath the surface, the paper stares back at you. Nothing happens. The paper remains blank.

You glance at the ceiling, scratch the back of your leg with your foot, look back at the paper. Still nothing. The soft glow of the safelight is hypnotic. You close your eyes and drift off thinking of the paper rocking in the tray. Then you open your eyes and look down at that wet paper and you see vague, dark patches on it. The patches are spreading, growing darker. They're on the top, on the bottom, everywhere. And then before your very eyes, the patches take form. They change into shapes, features. Suddenly there's a pair of eyes staring back at you from the paper, a wave of glistening hair, and a broad friendly smile that beckons you back to the day that… There's a certain feeling of magic in the darkroom. I hope you find it.

1 Preliminaries To Film Processing

To process film you'll briefly need a totally dark room for the loading of the film into a light-tight processing tank. Any room that you can completely darken will do. You can use a closet, basement, kitchen, or even set up a permanent darkroom. Once the film is loaded into the processing tank, all the other steps can be carried out in normal room light. Sit in the room you're going to use as a darkroom for 5 minutes with the lights turned off. After 5 minutes, if you still can't see a sheet of white paper placed against a dark background, the room passes inspection. If there are light leaks, cover them with heavy cloth. Use a rug to cover the crack under the door.
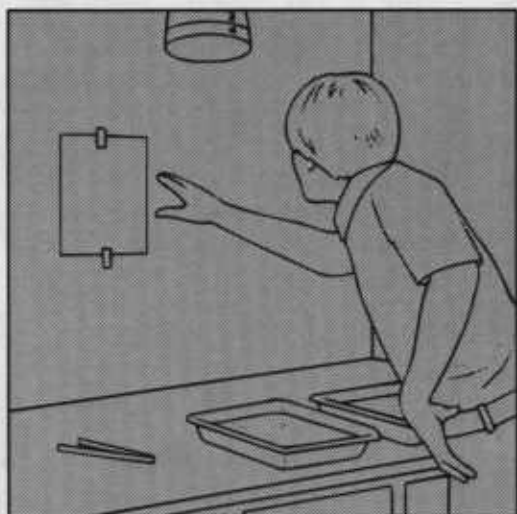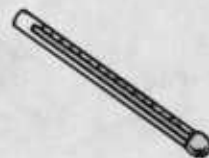

Checking darkroom light with a sheet of white paper.

Things You Need For Film Processing

1. A processing tank designed to take your film size.

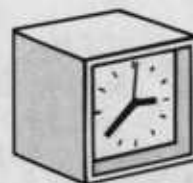2. A darkroom thermometer to measure temperatures of solutions.

3. A 32-ounce (969 milliliter) darkroom graduate or kitchen measuring cup.

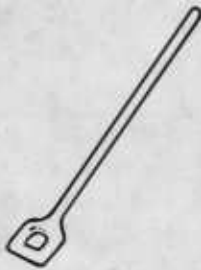
4. Some film clips or spring-type clothespins.

5. 3 large jars.

6. A darkroom timer or a clock with a sweep second hand.

7. Chemicals: developer, stop bath, and fixer.

8. A stirring rod to mix the chemicals.

9. Enthusiasm and patience.

Mix all your chemicals with water at the temperature given in the chemical instructions. Rinse the measuring cup between uses so that you don't contaminate one solution with another. Process one roll, and look at your results before doing any more.

The result of this darkroom effort should be a · usable negative, if you exposed the film correctly. You'll soon learn the appearance of a properly exposed and properly developed negative. It will have considerable detail, even in the lightest and darkest portions. It's not all dark or all light. The illustrations of negatives on page 7 show things that can go wrong.

Try to evaluate your own negatives. A very common fault is overdevelopment, which produces very dark negatives.

The scientific way to avoid over- and underdevelopment is to use the time-temperature approach. Develop for the recommended time at the recommended temperature, and you can hardly help but get good negatives. These recommendations are given by the film manufacturer and are on the developer package.

The traditional temperature in black-and-white darkroom work is 68°F (20°C). That's the solution temperature for which the recommended times are given to process paper or film. Maybe you can't adjust your solutions to that temperature for some reason. When your solutions are warmer than 68°F (20°C), you have to develop for less than the usual time. That's because developing occurs faster at higher temperatures. By the same token, solutions colder than 68°F (20°C) take a longer-than normal developing time. Exactly how long? Check the instructions that come with your chemicals.

Unless you have a self-feeding processing tank, the first time you try to thread film onto a reel you might find it difficult. It can be especially frustrating because you'll be fumbling in the dark. You'll be trying to find your way by touch instead of by sight. So before you actually process film, you might want
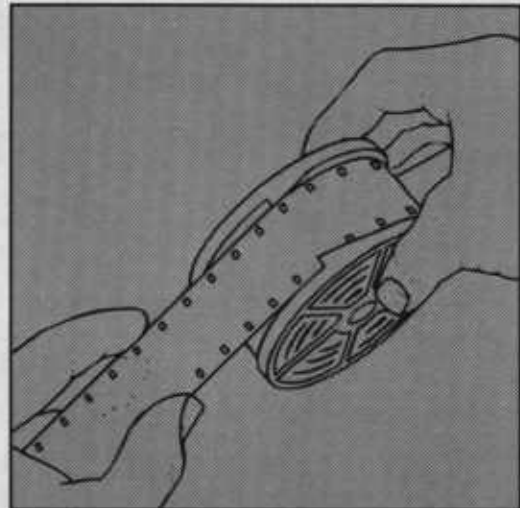
to practice threading film onto a reel. Practice in daylight until you get the hang of it and then practice in the dark. This means you'll have to break open an unused roll of film to practice with. You won't be wasting that roll of film, however. The practice you get with it will save you from spoiling many fine pictures in the future. In threading the film onto a reel, handle the film only by the edges. Fingerprints can mar a negative.

1. In one of the jars, mix the developer according to the package instructions. Label the jar DEVELOPER.

2. In the second jar, mix the stop bath according to the package instructions. Label the jar STOP BATH or STOP.

3. In the third jar, mix the fixer according to package instructions. Label this jar FIXER.
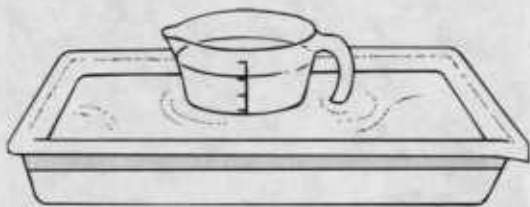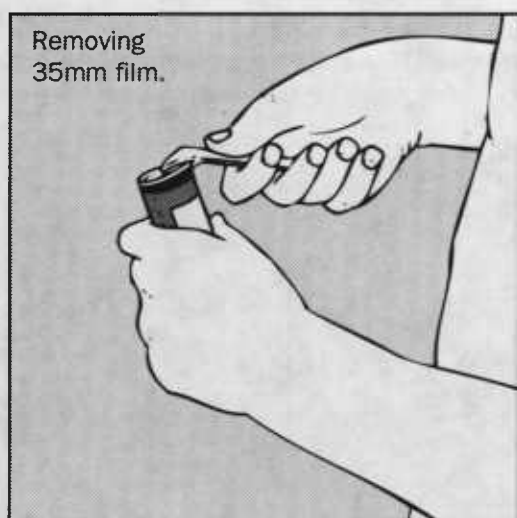

4. Pour the required amount of developer into the measuring cup or graduate. Stabilize the developer at 68°F (20°C) by placing the cup in a tray of warm or cool water.

5. When the developer reaches 68°F (20°C), pour the developer into the developing tank. Rinse the measuring cup after each step.

Removing 126 film.

Removing 35mm film.

6. ***In total darkness*** remove your film from the cartridge. With 126-size film, break open the cartridge by bending the cylindrical chambers toward the label. If you are using roll film, rip off the EXPOSED sticker, and then separate the film and paper backing. Use a bottle cap opener to open 35 mm magazines.
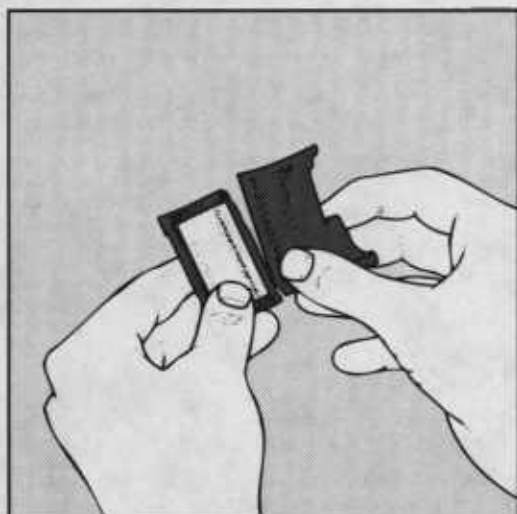
7. To remove the film from 126 cartridges, separate the plastic sections surrounding the spool.
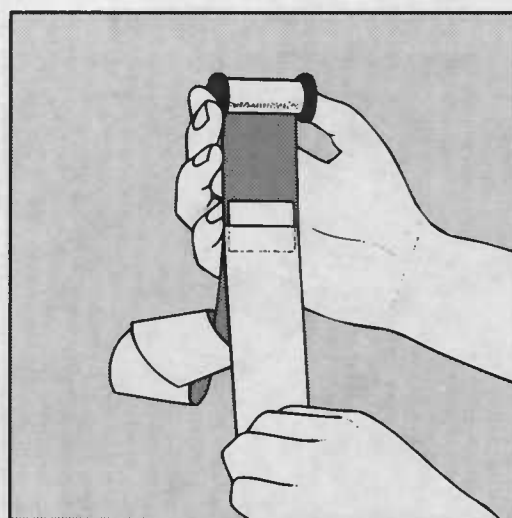
8. The film in 126 cartridges is attached to the paper backing with a strip of tape. Detach the film and discard the paper and tape. Handle the film by the edges only.

9. Handling the film by the edges, roll it into the apron or reel according to the tank instructions. Put the reel or apron into the tank, secure the lid, and start timing. You may now turn on the room lights.

10. Tap the tank against your working surface to remove any air bubbles. After 30 seconds, agitate the tank by inverting it, rotating it in a circular motion, or rotating the reels. Do this for about 5 seconds at 30-second intervals. At the end of the recommended developing time, pour the solution back into the developer jar.[1] When pouring, tip the tank only slightly at the start.

11. With the tank tilted a bit, pour the stop-bath solution, stabilized at 65 to 75°F (18 to 24°C), through the opening in the top. Do not open the tank. Agitate gently for about 30 seconds then pour the liquid back into its original jar.

[1] For information about the life of the developer, read the instruction sheet.

12. Add the fixer solution (stabilized at 65 to 75°F— 18 to 24°C) and agitate as before. At the end of the fixing time, pour the solution into its jar.
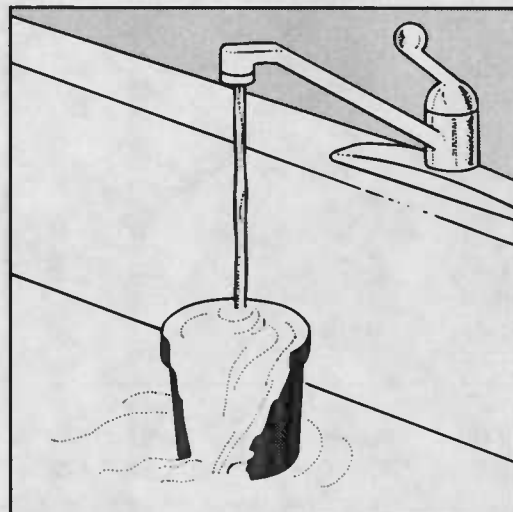
13. Remove the tank cover. Place the tank under a moderate stream of 65 to 75°F (18 to 24°C) water, and let the film wash for about a half hour. To shorten washing time, rinse the film in hypo clearing agent. First wash the film for 30 seconds. Next submerge it in a hypo clearing agent solution for 1 to 2 minutes, with moderate agitation. Then you need only wash in water for 5 minutes.

14. Hang up the film with a film clip or clothespin at each end. Dampen a viscose sponge, wring it out, and then gently run it along both sides of the film to remove large droplets of water. (To eliminate the necessity of wiping the film, minimize water marks and drying streaks, and shorten drying time, rinse the film with a diluted wetting agent. Follow the instructions on the bottle.) Let the film dry. Don't forget to rinse out all parts of the film tank.
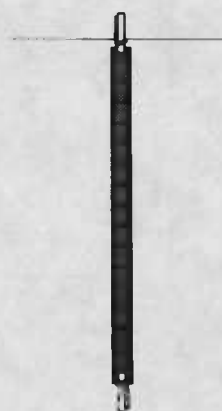
3 Things That Can Go Wrong

Streaky Negatives—Due to uneven development. Probably not all of the film was in contact with the developer throughout development time or there simply wasn't enough solution.

Rows of Regularly Spaced Marks—If they occur inside the picture area of the negative, it's because the film wasn't properly seated in the apron or because you used the wrong apron.

Overall Grayness—Often caused by light sneaking into your darkroom during the time you were loading your developing tank.
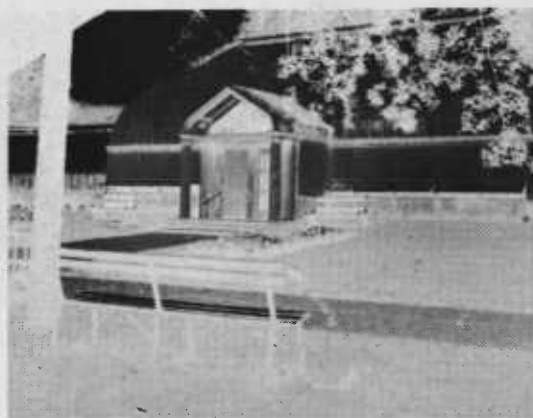
Thin, Very Transparent Negatives—If there are no really dark black areas in the entire negative, it usually means that your developer was too cold, the developing time was too short, or the negative was underexposed.

Black Streaks—A sign that light reached the film while you were loading or unloading your camera. If all the streaks are on the same side, it might be because the top of your developing tank was loosened during processing.

Dense, Heavy Negatives—This indicates that the developer was too warm, the film was developed too long, or the negative was overexposed.

4 Proof Sheets

Proof sheets consist of many prints made from a strip or strips of your negatives. These prints are the same size as your negatives. Proof sheets help you choose the best negatives for enlarging and make a good record to file with your negatives. Remember that your negatives won't all have the same density, so some of the individual prints on your proof sheet will be darker than others.

Proof sheets are made by placing negatives into contact with photographic paper. Light shining through the negative forms an image on the paper. When you immerse this paper into the three successive solutions developer, stop bath, and fixer—you end up with a proof sheet.

Since photographic paper is sensitive to light, you must handle it in a dark place. Paper isn't as sensitive to light as film, however, so you can process paper under safelight illumination. A safelight has a low wattage bulb and a special filter.

Things You Need For Proof Sheets
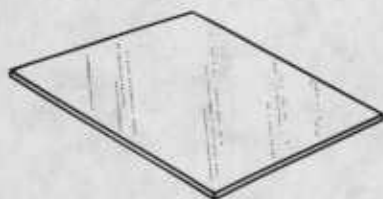
1. A printing frame and a 7-watt light bulb or an enlarger and a piece of glass. You can make a

printing frame by using a piece of window glass and a piece of composition board. Both pieces should be the same size. Put one piece on top of the other and use wide adhesive tape to make a hinge connecting the two pieces. (It's a good idea to tape the remaining edges of the glass so that you won't cut yourself.)
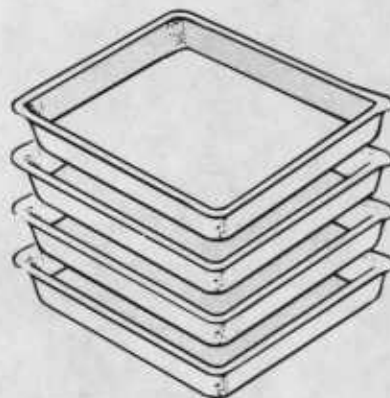
2. Four 8 x 10-inch trays.
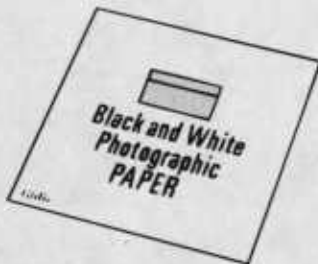

3. A stirring rod to mix the chemicals.

4. A 32 oz. (946 ml) darkroom graduate or kitchen measuring cup and 3 large jars.

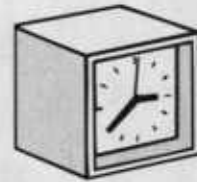5. A safelight with a light amber filter (see your photodealer).

6. Chemicals: developer, stop bath, and fixer.

7. Photographic paper, 8 x 10 inches.

8. A darkroom thermometer to measure temperatures of solutions.

9. A darkroom timer or a clock with a sweep-second hand.
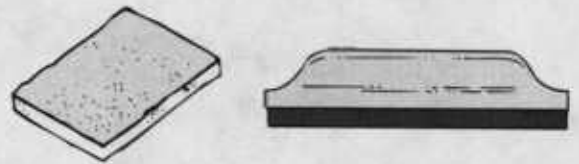
10. A sponge or a squeegee.

Making A Proof Sheet

If you've processed your own film you have already prepared the stop bath and fixer. Don't use film developer for photographic paper. Mix the developer for the paper according to the instructions. Pour it into a jar labeled PAPER DEVELOPER, and start with step 2 on the next page.

1. In your 3 large jars, mix the developer, stop bath, and fixer solutions according to the package instructions. Label the jars DEVELOPER, STOP BATH, and FIXER.

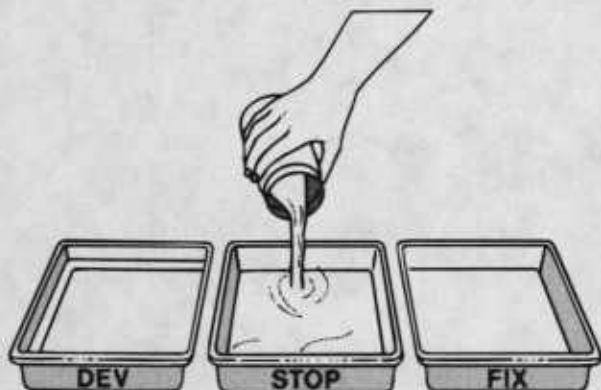2. Stabilize the developer at 65 to 75 °F (18 to 24 °C) and pour about 1/2 inch into the tray labeled DEVELOPER.

NOTE: It's a good idea to rinse your graduate after steps 2, 3, and 4.

3. Stabilize the stop bath at 65 to 75 °F (18 to 24 °C) and pour about 1/2 inch into a tray labeled STOP BATH or STOP.

4. Stabilize the fixer at 65 to 75 °F (18 to 24 °C) and pour about 1/2 inch into a tray labeled FIXER.

Minimum of 4 feet.
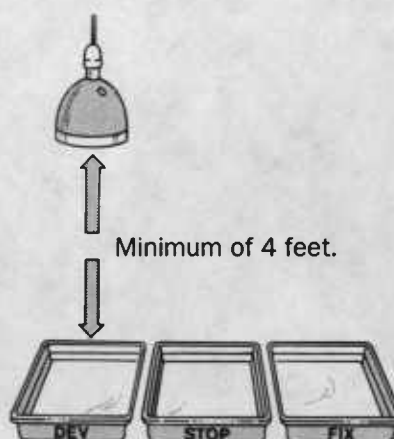
5. Arrange your trays in front of you so that, from left to right, you have developer, stop bath, and fixer. Then rinse your hands well and dry them thoroughly. Turn off all lights except the safelight. The safelight should be placed at least 4 feet from your working area.
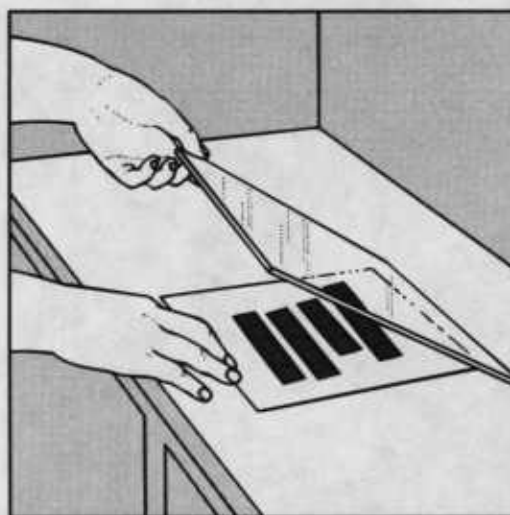
6. With all lights off, open the package of paper, remove one sheet, and close the package again so that light can't get in. Place your negatives so that their dull sides face the shiny side of the paper. The negatives should be near the light source. Cover with the glass.
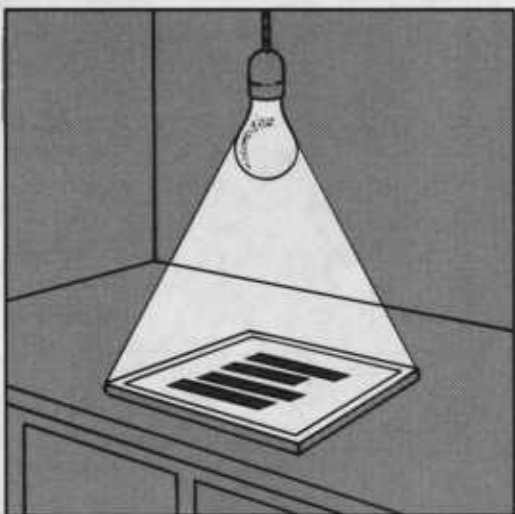
7. If you're using a printing frame and a 7-watt bulb to make your proof sheet, hang the bare bulb 2 feet above the frame and turn it on for about 10 seconds. The length of time the bulb is on is called the exposure time. You may have to experiment a bit (see step 12) to get the correct exposure time for your negatives.
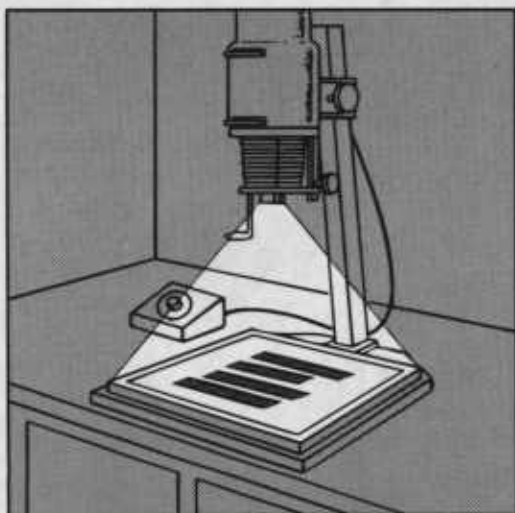
8. If you're using an enlarger, place the empty negative carrier in the enlarger, and set the lens at $f/11$. Adjust the enlarger height so that the light covers an area just a bit larger than your paper. Expose for about 8 seconds. Again, you may have to experiment to get the correct exposure time.
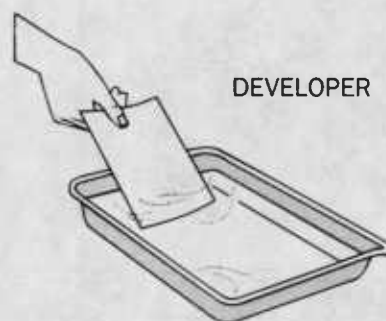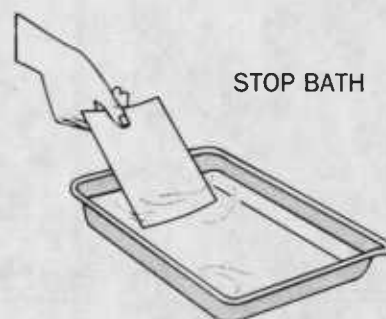

DEVELOPER

9. Remove the paper from your printing frame and slide the paper, shiny side up, into the developer (left-hand tray). Rock the tray gently for 1 minute by tipping up first one end, then the other.

STOP BATH

10. Take the paper out of the developer, and after letting it drain for a second or two, slide it into the stop-bath solution (center tray). Agitate the tray for 5 seconds in the same manner you did in step 9.
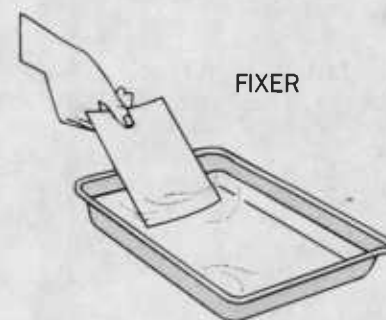
FIXER

11. Withdraw the paper from the stop bath and slip it into the fixer. Agitate frequently for 2 minutes, and keep it separated from any other prints in the tray. After the print has been in the fixer for 25-30 seconds, you can turn on the room lights.

12. Examine your proof sheet. If most of the pictures seem too light, try again with double the exposure time you used at first. If most of the pictures seem too dark, use half the exposure time. It's a good idea to keep notes on your exposure times and the results. You'll soon be able to come up with a good average exposure time to use.
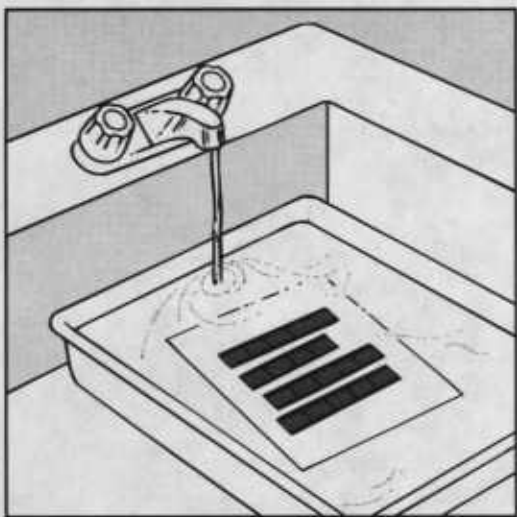
13. Using your fourth tray, wash the print for 4 minutes at 65 to 75 °F (18 to 24°C). Use running water, and agitate the print frequently while it is washing.
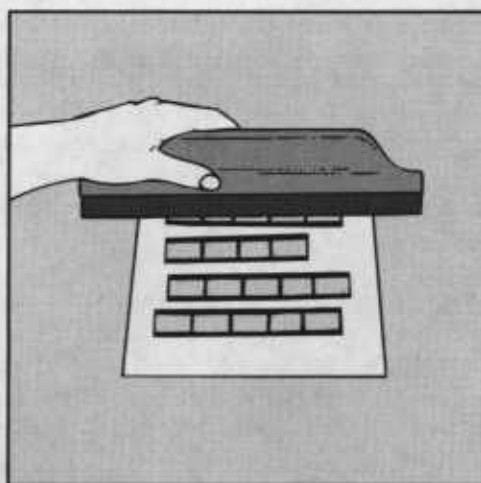
14. Gently sponge or squeegee the surface water from both sides of the print, and place it onto a flat surface to dry at room temperature.

5 Enlarging Black-and-White Negatives

First of all, you'll need an enlarger. There are many kinds of enlargers, and your photo dealer will be glad to help you select one to suit your needs. Before continuing, be sure to become completely familiar with your enlarger. Read the instruction manual!

Before the negative goes into the enlarger, it has to be placed into a negative carrier. This is a glass or metal part that holds the negative in the enlarger. Light is passed through the negative and then directed by the enlarger lens onto an easel, which is a board that holds your paper.

Let's start out with one of the negatives you used for making your proof sheet. The project this time will be to make an enlargement of this negative. You'll do these things in the same darkroom you used for contact printing, using the same safelight.

Things You Need for Black-and-White Enlarging
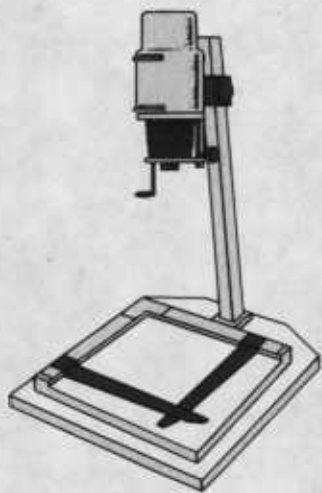
1. An enlarger.
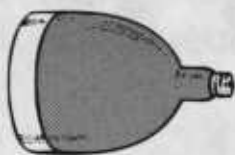
2. The same safelight you used for contact printing.
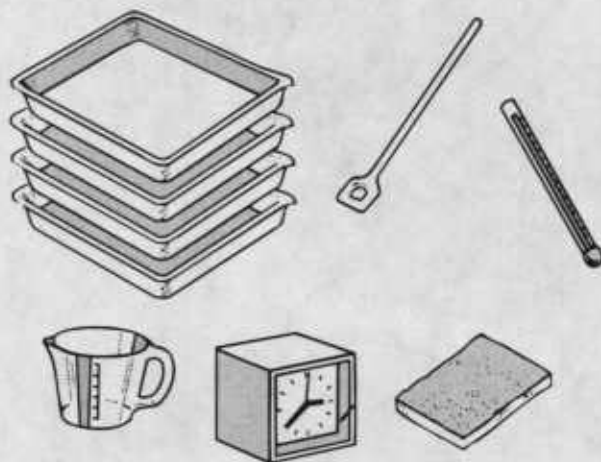
3. The same graduate or measuring cup, stirring rod, thermometer, trays, timer, and sponge or squeegee you used when making a proof sheet.

4. The same paper that you used when making a proof sheet.
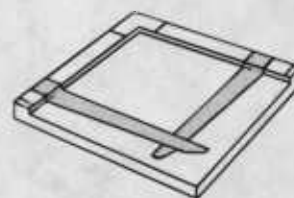
5. An easel to hold the paper.

6. The same chemicals you used when making a proof sheet.
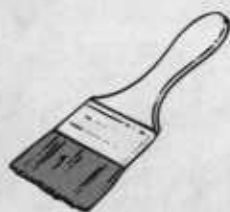
7. A camel's hair brush.

Parts of an Enlarger

Red Filter

Lens

Negative Carrier

Filter Drawer

Lamphouse

Easel

Baseboard

Focusing Knob

Height Adjustment Knob
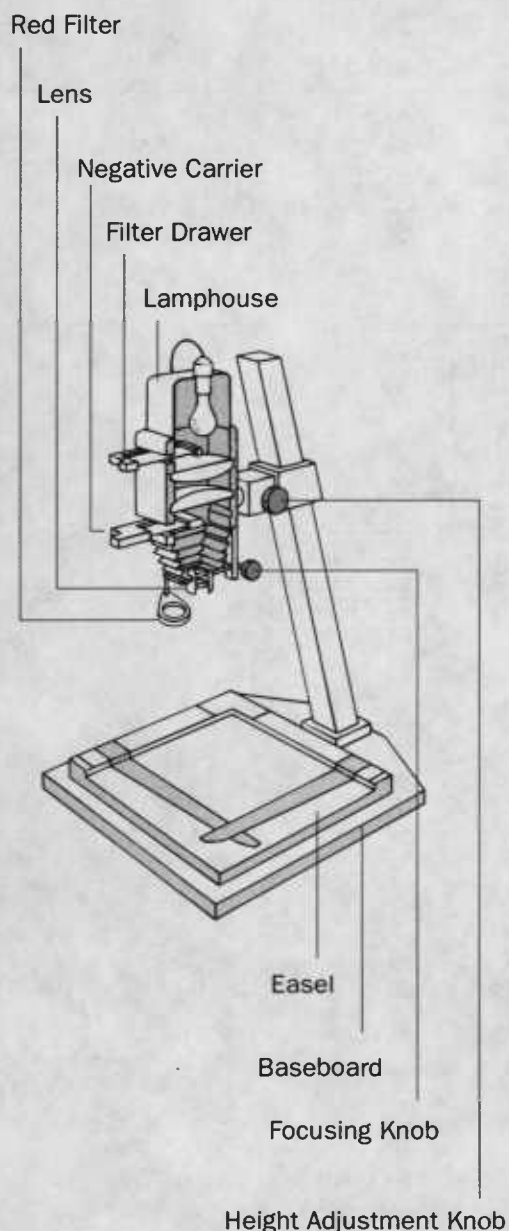
Making An Enlargement

If you've already made a proof sheet, you've had a good introduction to enlarging. The processing steps are nearly the same. And you'll be using the same chemicals used for the proof sheet.

Enlarging is fun and rewarding, so let's get started!

1. Prepare your chemicals according to the instructions packaged with them.
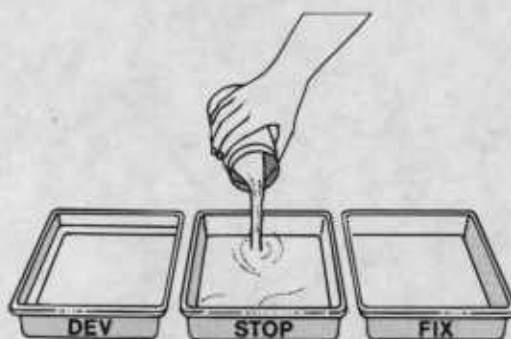
2. Put about 1/2 inch each of developer, stop bath, and fixer into 3 trays, just as you did when making a proof sheet.

3. The wash tray goes to the right of the fixer. Or you can place it in a sink, if one is convenient.
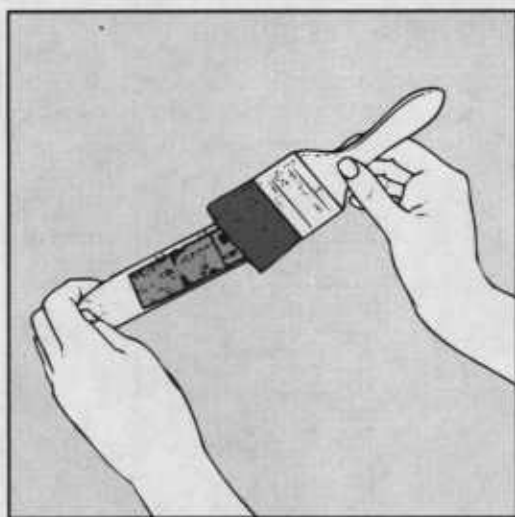
4. Holding the negative gently by its edges, dust it on both sides with the camel's-hair brush. Select the correct negative carrier (dust it also if it's glass), and place your negative into it so that its emulsion side (that's the dull one) is down.
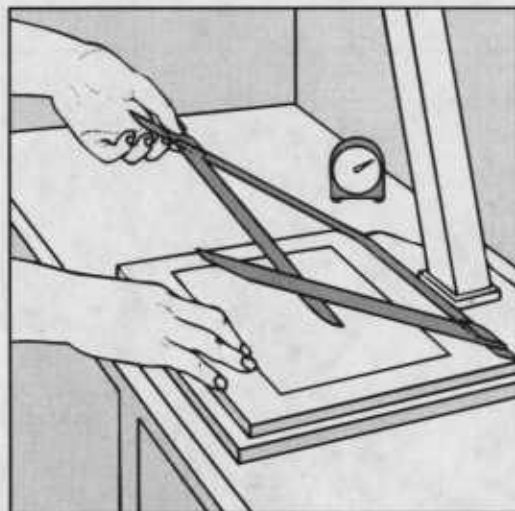
5. Slide a sheet of smooth, white, typing paper beneath the guides of the enlarger easel for a focusing aid; turn the safelight on and the room lights off. Wait a minute for your eyes to adjust.
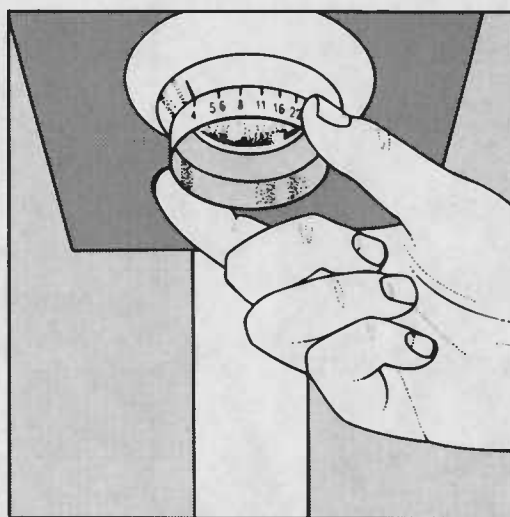
6. Set the enlarger lens at its widest opening (the smallest number on the lens mount). Turn the enlarger on. By adjusting the enlarger's height, arrange your picture so that the desired negative image appears within the easel guides.
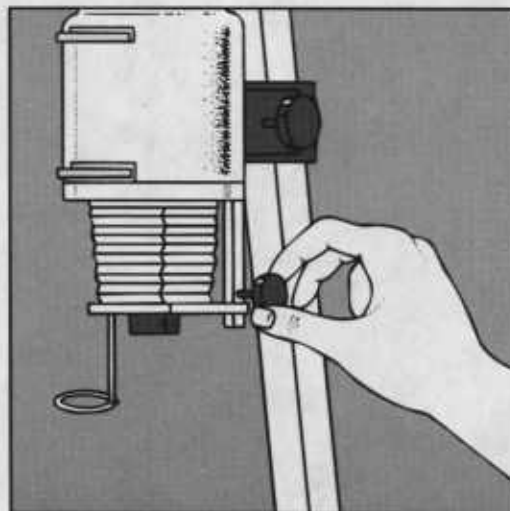
7. By adjusting the enlarger lens, bring your picture into the sharpest possible focus. Once

this is done, change the lens setting to 1/11, and turn the enlarger off. Take a sheet of enlarging paper, and place it onto the easel, emulsion (shiny) side up.
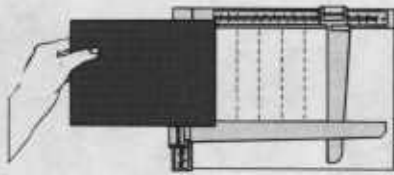
8. Cover all but a sixth of this sheet with a piece of cardboard, and turn on the enlarger. Every 5 seconds, slide the cardboard over to expose an additional sixth of the paper. At the end of 30 seconds, turn the enlarger off.

9. Process this test sheet for 1 minute in the developer and 5 seconds in the stop bath; then slide it into the fixer for 25-30 seconds, and turn the room light on.

10. From your print, choose the exposure time giving the most pleasing result. Turn out the room lights, and put a piece of photographic paper, shiny side up, into the easel.
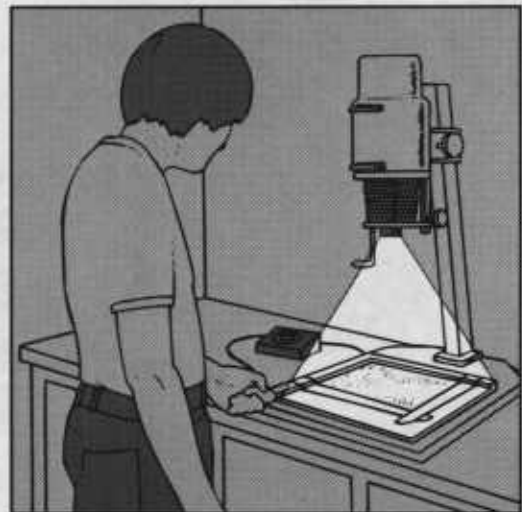
11. Expose the paper and process it as you did the test print but with a 2-minute fixing time. Lights can go on after 25-30 seconds in the fixer. Wash the enlargement for only 4 minutes at 65 to 75°F (18 to 24°C). Use running water and agitate the print frequently while it is washing.

17
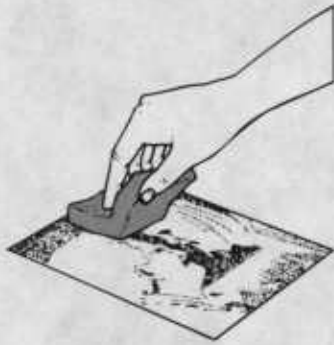
12. Gently sponge or squeegee the surface water from both sides of the print, and place it onto a flat surface to dry at room temperature.

Evaluating the Print

After the print has been in the fixer 25-30 seconds, you can turn on the room lights and examine your print. If you have a print made by a photofinisher, compare the two. Is yours too light? Too dark? If your print looks too light, make another with double the exposure time. If the print is too dark, cut the exposure time by half.

Enlarging Parts of Negatives

Although you enlarged the whole negative when making your first enlargement, you may want to enlarge only a part of the negative. You can improve many pictures by printing only the best part of the scene, eliminating cluttered backgrounds or unimportant areas. This is called cropping.

Suppose, for example, that your negative is a full-length picture of a person. If you like, you can enlarge just the small area of the negative containing the image of the person's head. When enlarging only part of a negative, be sure to use more exposure time than you did when enlarging the whole negative.

6 Control Techniques

Up until now we've been concerned primarily with making straight enlargements—enlargements made without the use of any special control techniques. However, using control techniques, along with print-finishing techniques (see page 23), often makes the difference between a good print and an excellent one. Of course, not all negatives require special printing treatment. But since control techniques are quite useful, this section will cover the most important controls, such as dodging and printing-in. These are the methods you can use to produce high-quality enlargements.

Composition

Composition means the arrangement of the lines and areas that make up your picture. While entire books have been written on composition, there are a few basic pointers that will help you compose the most pleasing and interesting enlargement. For example, it's usually best to have the center of interest other than in the middle of the picture or too near the margins. Also, try to keep the horizon line in scenic shots above or below the mid-point of the picture, rather than dividing the picture right in the middle.

Your picture should tell its story as simply and clearly as possible. This means you should try to eliminate areas and details that are unnecessary or distracting. Often you can do this simply by shifting the enlarger easel. Or perhaps you can enlarge the picture more, to eliminate distracting areas near the edges.

If your picture contains a light area that draws attention away from the main subject or an area that would print too dark, you may be able to correct this by printing-in or dodging.

Printing-In and Dodging

In many instances, the range from light to dark areas of a subject is far beyond the range of tones that can be reproduced in a print. However, you can partially make up for this in two ways: (1) You can give additional exposure to the highlight areas that would otherwise print too light. This is called printing-in or burning-in. (2) You can hold light back from areas that would otherwise print too dark. This is called dodging.

You can easily make your own printing-in and dodging tools from wire, black tape, and dark paper or cardboard. When you use these tools, always keep them moving so that you won't be able to see a sharp line on the finished print, indicating where you printed-in or dodged.

Printing-In

There are many situations where printing-in comes in handy. For example, let's assume you've taken a flash picture of a group of people. When you make a straight print from the negative, the people in the foreground will probably be much lighter than those who were farther from the camera. You can darken the people in the foreground by printing-in. After you've given the print its normal exposure, hold a piece of cardboard under the enlarger lens about midway between the lens and the print. Turn on the enlarger and move the cardboard so that only the area of the print that is too light receives additional exposure. If the area you want to darken is small or near the center of the print, it's easier to confine the additional exposure to that area if you do the printing-in with a piece of cardboard in which you've cut a hole. Remember to keep the cardboard in continuous motion so that the doctoring won't be apparent on the finished print.

When printing-in, use a piece of cardboard to block light from all but the small area you wish to darken. Vibrate the cardboard during exposure. Otherwise it will leave an outline on the print.

A technically good print of a landscape which reproduces all the tones in the original scene may be weakened pictorially by light-toned areas which compete for attention with the center of interest. These light areas could be bright stones in the foreground, bright reflections, a white house, a light sky, or some other distracting element. You can darken such areas by printing-in.

If the line between the satisfactory area and the area you want to darken is rather intricate, you can make a printing-in tool from a test print of the same size. Just cut the area you want to darken out of the test print. After you've given your final print its normal exposure, print-in the area that is too light. Hold the cutout print very close to the paper you are exposing. Move the cutout print only very lightly during the exposure.

Dodging

In dodging, you hold back light from the projected image during the basic exposure time. The photographic paper receives less-than-normal exposure in areas that were too dark in your straight print. The tools used in dodging are also very simple to make. You can cut any shape you need from a piece of dark cardboard or paper, and tape it to a piece of wire. Then while you expose the print, hold the cardboard by the wire and move the cardboard over the area of the projected image which is too dark. In dodging, besides keeping the cardboard in motion, make sure you move the wire from side to side too. Otherwise, you can get a light line on your print, caused by the shadow of the wire.

Dodging helps eliminate some of the shadows to make the boy's face lighter.
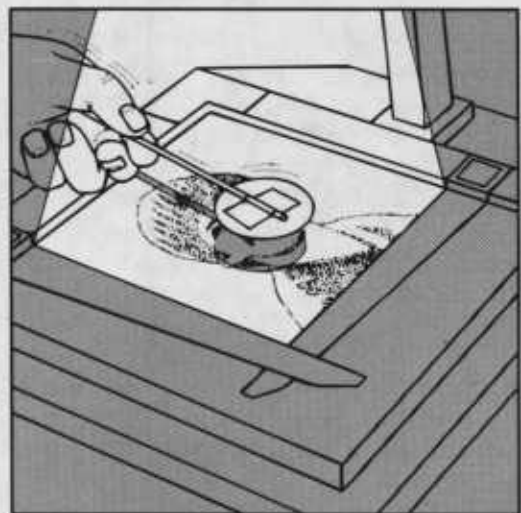
While you expose the print, hold the cardboard by the wire and move it over the area of the projected image that is too dark.

This is the original picture. The boy's face is fitted with shadow.

Now Try This

When used with filters, variable contrast paper allows you to choose a paper contrast appropriate to the negative contrast. Negatives that have little contrast and appear flat on normal enlarging paper can be made more contrasty on variable contrast paper. With acetate filters or equivalent, this paper can have seven different degrees of contrast. You'll find that you can soften contrasty negatives and pep up uncontrasty negatives. Different types of negatives are illustrated here to help you see what they look like.
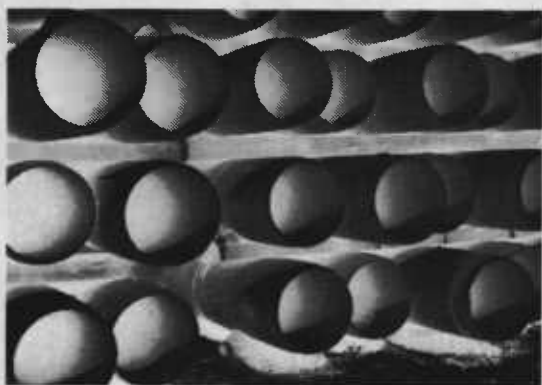
Contrasty negative

Low-contrast negative

PC1 filter

.*PC4 filter*

Normal negative

A print made without a filter or with a PC2 filter looks good.

A print made with polycontrast acetate filter PC1 is flat.

A print made with a PC4 filter is contrasty.

7 Print-Finishing Techniques

After you've processed your enlargement, there are a number of finishing techniques you can use to add the final touch that can set your enlargement apart from others. This section describes some of those techniques.

Mounting

A mount emphasizes a picture by separating it from its surroundings. Usually a special mounting board is used for this purpose. A well-chosen mount directs attention to the picture, not to itself. Most photographers use a dry-mounting tissue to mount their prints. Some dry mounting tissues don't become adhesive until activated by heat or pressure. Others are always adhesive and are covered by wax paper until used. The package instructions will clearly explain how to use the type inside. Since the heat-sensitive types are traditionally the most popular, we'll give a brief procedure on using them.
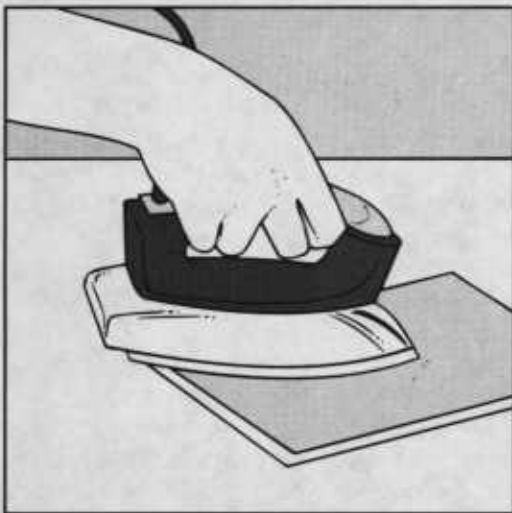
1. Tack the heat-sensitive tissue to the center of the back of the print, using a tacking iron or a household iron. (Set the household iron at the lowest setting in the synthetic fabrics range and adjust if necessary.)
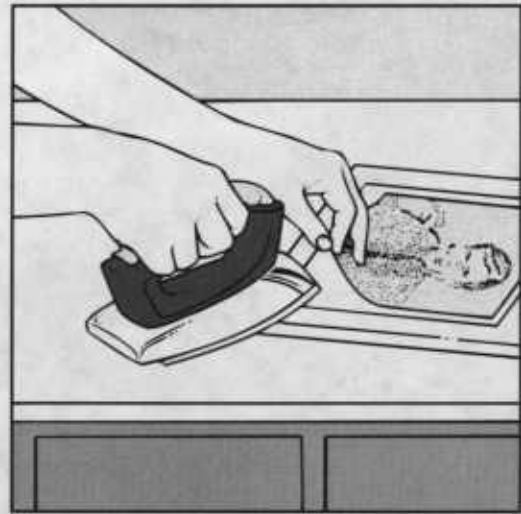
2. Trim the print and position it on the mounting board. Holding the print in place, lift one corner of the print and tack the mounting tissue to the mount. Do this on all corners.
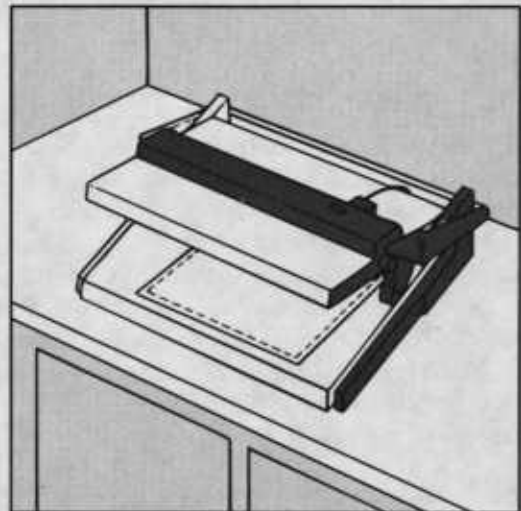
3. If you plan to use a dry-mounting press, be sure to protect the print with a double thickness of heavy kraft wrapping paper. Before you put your print into the press, make sure that the kraft paper is completely dry. Close the press on the kraft paper for about 1 minute. This will keep the paper from sticking to the surface of your print. Place your covered print in the press and close the press for at least 30 seconds. The temperature of the press should be between 180 and 210°F (82 and 99°C).

4. Remove the mounted print from the press, place the print face down on a clean, smooth surface, and keep flat until cool. A heavy book or other flat weight is useful for this purpose.
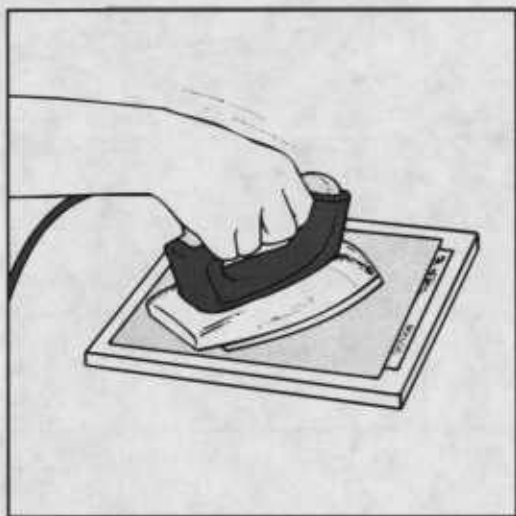
5. If you don't have a mounting press, you can use a household iron to do your mounting. Use the same setting on the iron as suggested for tacking the mounting tissue to the print (see step 1). Cover the print with a double thickness of kraft paper, and run the iron back and forth over the print. Keep the iron moving, and work from the center of the print toward the edges. Don't push down too hard or you could mar the surface of the print.

Underlays in gray, black, or color dress up a print. An underlay is a piece of paper that goes under the Print with its edges sticking beyond the print. Here's how to mount a print with an underlay:

1. Tack the dry-mounting tissue to the print, and trim off the excess tissue.

2. Tack the print to a piece of art paper that is slightly larger than the print. Do this just as you would to tack the print to a mounting board.

3. Tack dry-mounting tissue to the art paper, and trim the excess tissue.

4. Tack the art paper to the mounting board.

5. Mount the print with a mounting press or a household iron.

Another way to mount prints is to use overlay mounts. You can buy overlay mounts in art- or photo-supply stores. There's no actual mounting involved when you use an overlay. Just lift the overlay and slide the print into place. Then tape or glue the bottom corners of the print to the mounting board. While these mounts are fine for temporary or home use, they usually aren't acceptable for photographic contests.

You may also mount your prints by using cement that's safe for photographs. Never use rubber cement for mounting paper-base prints because it may contain compounds which could stain your prints.

Before Spotting

After Spotting

Don't jab with the brush when spotting. Instead carefully stipple with it.

Spotting

To spot your print, dampen the spotting brush slightly and pick up a little spotting dye on the tip of your brush (you can mix colors if necessary). Rotate the brush to make a fine point. Apply the dye with a dotting motion until the dye matches the tone of the surrounding area and the spot is no longer visible. It's best to begin with dark areas, and work on light areas as the dye works out of the brush. If the dye bubbles when you apply it, the brush is too wet.

Despite all the precautions you take against dust and dirt, most prints seem to end up with at least a few white spots. You can fill in the spots by using a good-quality spotting brush with an especially fine point.

Some Helpful Hints

Don't run off without filing your negatives safely for future use. For relocating a particular subject, it's a good idea to place an identifying number on the back of each print and on the negative envelope.

Also, the cleaning chore will be much easier if you do it right away. Be sure to wash all the containers and trays you used, and rinse the thermometer. Discard the developer you used, even if you think you could squeeze through a few more prints. Developers don't keep well even overnight—in open trays.

Are there any hypo marks on the splashboard behind your sink or on the floor? Fixer-spotted darkrooms not only look messy, but the fixer may become airborne. If fixer dust settles on photographic paper or film emulsion surfaces, it will cause small spots, called pinholes, on the emulsion.

The towels you used should be washed before your next printing session. This will help eliminate another possible source of mysterious spots on your negatives and prints. As you leave, check to be sure that all of the electric lights, including the safelight and the enlarger lamp, are turned off.

8 Darkroom Planning

How elaborate you make your darkroom will depend primarily on your needs, finances, and space. To develop an occasional roll of black-and-white film, almost any makeshift arrangement will do. If you want to make prints and enlargements, you may want a well-equipped room that is conveniently arranged and properly heated, lighted, and ventilated.

The room must be light-tight. To check for stray light, stay in the darkroom for 5 minutes with all the lights turned off. After 5 minutes, if you still can't see a sheet of white paper placed against a dark background, the room passes inspection. If there are light leaks, you will be able to see them because your eyes will have become adapted to the dark. Eliminate small light leaks with black tape. For large ones, such as the crack around a door, use dark heavy cloth or weather stripping.

For your health and comfort, you should introduce a plentiful supply of clean, fresh air into your darkroom— especially during the chemical mixing and processing operations. Be sure to follow the safety advice given in the instructions packaged with the processing chemicals. Check the photo magazines in your local library for articles on building light-tight darkroom ventilators.

Arrange your safelights so that they provide as much light as possible, but keep them at a safe distance at least 4 feet from your working area. Use a safelight equipped with a 15-watt bulb and the filter recommended on the paper (or film) instruction sheet. You can make a simple safelight test as follows:

1. Set your enlarging easel to give 1/2-inch white borders for the paper size you'll use in the test.

2. Place a normal-contrast negative typical of your work in the enlarger. Be sure the clear borders of the negative are completely masked.

3. Size and focus the image on the easel.

4. With all safelights on, make a good-quality print on the paper you normally use. Develop for the recommended time in one of the developers recommended for the paper. Mark this print No. 1.

5. Turn the safelights off, and make print No. 2 in the same way as print No. 1.

6. Turn the safelights off, and expose print No. 3 in the same way as print No. 2. Do not develop print No. 3.

7. With the safelights still off, place a piece of cardboard over the developing tray and put print No. 3 on it, emulsion side up. Safelight illumination is generally brightest in this location. Cover one-fourth of the print with an opaque card and turn on all the safelights. In the same way that you would make an exposure test strip, expose print No. 3 to the safelight for 1, 2, and 4 minutes, in steps. This gives four steps with safelight exposures of 0, 1, 3, and 7 minutes superimposed on the image exposure. Develop this print for the same length of time as prints No. 1 and 2, with safelights turned off.

8. Fix, wash, and dry all the prints in the normal manner.

9. Compare the prints. Prints No. 1 and 2 should be identical. If print No. 1 shows lower contrast or fogged highlights when compared with No. 2, you have a serious safelight problem. Be sure that the safelight filters (especially the one over the developing tray), bulb wattage, and distance and number of safelights are consistent with the recommendations on the paper instruction sheet.

If all three prints are identical, your safelight conditions are good. If print No. 3 shows slight fogging of highlights in any of the safelight exposure areas, it is a warning to limit the time of exposure to safelight illumination to a time that will produce no fogging.

Note that fogging from safelight illumination will show up in areas that have already received some exposure before it will show up in the white borders. For this reason safelight fog may go unnoticed unless the safelights are tested correctly.

In planning a darkroom, the main objective is to arrange your equipment and materials for efficiency and convenience. One of the most important requirements is to provide for a flow of work that can be done in the least amount of time with

minimum effort. Another consideration is cost. Here are some desirable features for darkroom design and some suggestions you should consider in setting up your darkroom.

CAUTION: Some photographic chemicals, particularly acid solutions, may cause corrosion. To minimize the chances of damage to your sink and drainage system, use cold water to thoroughly wash the sink and flush the drain after each use.

Selecting and Preparing the Room

For developing black-and-white films and making prints, you can get started with only a minimum of equipment. You also need an easily darkened kitchen, bathroom, closet, or any other room that has an electrical outlet. For night work, you can use practically any room as a darkroom; however, you should pull the shades or cover the windows with some dark material to block light from streetlamps, car headlights, or nearby lighted windows. A sink and a supply of water are desirable but do not have to be in the same room. The kitchen is probably the most convenient place to set up a temporary darkroom since it is supplied with running water and electrical outlets, and the sink and counters provide enough working space.

When space is not available for setting up a permanent darkroom and you must work in a room regularly used for other purposes, darkroom convenience sometimes has to be sacrificed. However, always try to arrange your equipment to allow a smooth, convenient flow of work from your enlarger through the developer and stop bath to fixing and washing. You should have a large tray filled with water for washing your prints. You should also have a container of water to rinse the solutions from your hands. This helps prevent contamination of your developer with other solutions. Use a clean towel to dry your hands thoroughly before handling film, negatives, and photographic paper. Group your equipment so that you can perform all operations with a minimum of steps, but allow sufficient working space. One suggested arrangement for a kitchen darkroom is shown on the next page.

Have a table or other separate work area on which you can perform all the dry operations, such as printing and loading film tanks. This prevents water and solutions from splashing on equipment

and dry materials. Set up all wet processing in or near the sink.

If there is no lamp socket over your processing area, use an extension cord to suspend the safelight over the processing trays. Keep the safelight at least 4 feet from your trays.

The best way to develop your film, especially in a temporary darkroom, is to use a film-developing tank. Since these tanks are light-tight, any light that might leak into your darkroom would affect the film only during the time you are loading it into your tank. This minimizes the danger of light fogging your film, a frequent source of trouble. Check for stray light in your darkroom by following the procedure described on page 31 under "Darkroom Planning". After you have placed the cover on your film tank, you can turn on the room lights during development and the remainder of the processing steps.

With a temporary darkroom, it is important to consider ways of reducing the time and energy required to prepare the room for use and to clean it up afterwards. For instance, keeping all of your darkroom equipment in one or two boxes reduces both the time spent collecting equipment and the chance of misplacing something.

While the kitchen usually makes the best temporary darkroom, other rooms will serve. One possibility is a bathroom. However, although it has running water and electricity, there is usually no work surface to support trays and apparatus. You can make a work surface by placing a piece of plywood on the bathtub, but processing trays will be uncomfortably low. Sometimes it's possible to set up a card table to hold your trays and printing equipment. Protect the tabletop from spilled solutions by covering it with a piece of plastic such as a plastic tablecloth.

You can also use a small closet for a temporary darkroom. A closet is usually easy to make dark even in the daytime. However, this is its only advantage. It will have no running water and possibly no electrical outlets. Moreover, the closet probably will be filled with its normal contents. If your closet has shelves, perhaps one of them is located at a convenient height. If not, you may be able to install a removable shelf or bring in a small table. In any case, use plastic sheeting under the trays to catch any spilled solutions.
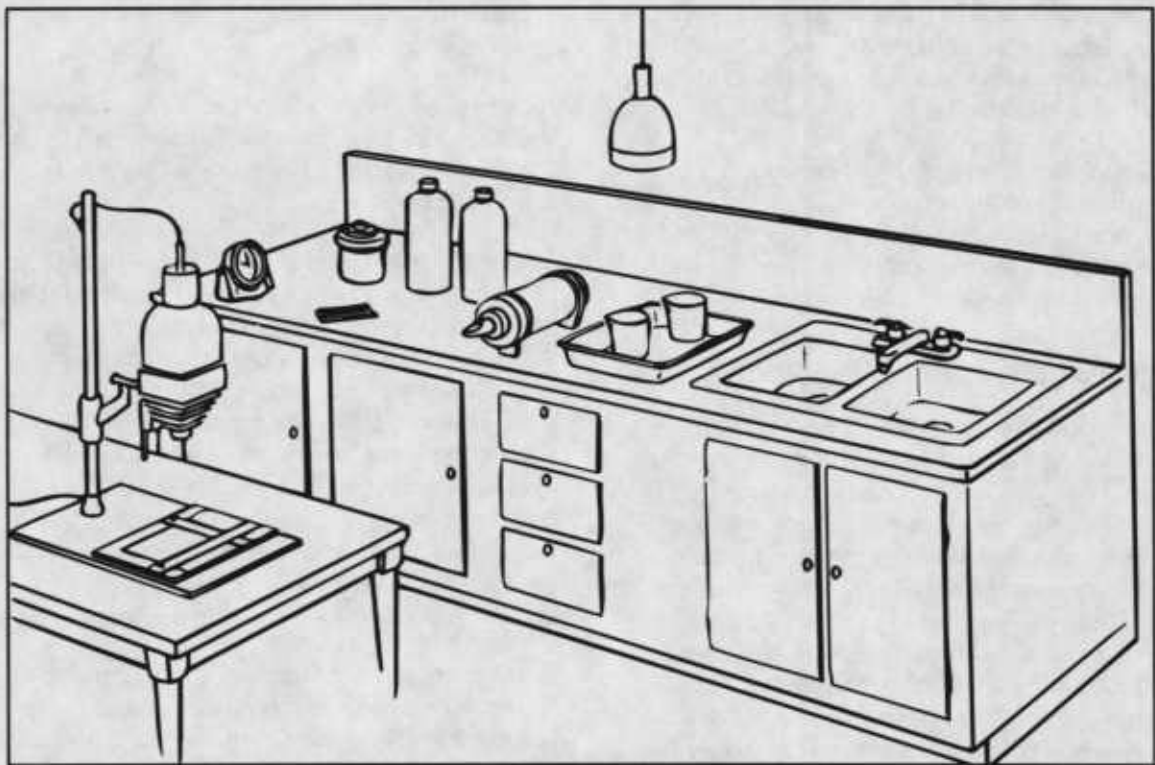
MAGIC HAPPENS HERE!

Have fun bringing bright, sharp pictures
to life in the darkroom with your personal touch!