Traditional Photography Lab Manual
ART 140: Photography 1

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Waubonsee Community College Photography Lab Manual,

Adapted from Northeastern Illinois University Photography Lab Manual

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Introduction

The Waubonsee Community College Photography Lab Manual was created in order to provide guidelines and instruction for those students taking photography classes that involve lab use. This manual is designed to discuss these procedures as they apply to our particular lab, and to be used as a supplement to your textbook. If you are a beginning student and have never worked in a darkroom, this manual will familiarize you with basic information about darkroom procedures as they are carried out in this lab. If you are a more advanced student, you will find this manual to be a valuable reference for more advanced processes and techniques. It is suggested that you print a copy and keep this manual with you when you come to class, since your instructor may refer to it during lectures or demonstrations. It is also recommended that after a demonstration of a specific process, you review the pertinent material in this manual before attempting to do the process on your own.

Course Descriptions

There are currently eight courses offered in photography at Waubonsee Community College:

Art 104 – History of Photography, 3 cr. This course covers the history of photography from its beginnings in the 1830s to the present. It familiarizes the student with key photographic artists, styles and movements. Current photographic processes and criticism are discussed.

Art 135 – Basic Digital Photography, 3 cr. This is a bsic digital photography course for non-photo majors. Students learn basic camera operations using either a digital camera and/or an electronic device capable of taking digital photos with six or more mega-pixels. *Notes: Students are required to have a Mac compatible external hard drive with at least 100 GB of storage, digital camera and/or an electronic device capable of taking digital photos with six or more mega-pixels.*

Art 140 - Photography I, 3 cr. This course serves as an introduction to the art of black and white, 35mm film photography. The student is introduced to basic darkroom techniques including film processing, enlarging, finishing and presentation. This course is made up of both lab and lectures, is designed to emphasize basic aesthetic grammar of photography, and provide a historical and critical context for visually analyzing and creating photographs. *Notes: Students are required to have their own SLR 35mm film camera with interchangeable lenses and manual settings. Cameras are available to checkout by photography students.*

Art 142 – Beginning Digital Photography, 3 cr. This course is designed to introduce students to computer tools that manipulate and enhance photographic images. Students learn the skills to correct, retouch and enhance digital input in order to create high-quality digital output utilizing Adobe Photoshop. Using a digital camera, students will learn manual exposure, digital capture, and specific lens characteristics. *Notes: Students are required to have their own DSLR digital camera that has interchangeable lenses, is capable of photographing with the RAW file format, has manual settings, and has a minimum of 8 mega-pixels. Cameras are available to checkout by photography students.*

Art 240 – Photography II, 3 cr. In this course, students will experiment with advanced black and white darkroom techniques, which will offer them distinctive opportunities to explore how to make creative photographs. This course will introduce medium format film, multiple imagery, construction of narratives, toning, and split filter printing. Students will learn to master camera operations and film processing, as well as special effects and manipulations. In the last part of the semester, students will apply these techniques to the printing of photographs in a self-directed project. *Notes: Students are required to have their own SLR 35mm film camera with interchangeable lenses and manual settings. Cameras are available for checkout by photography students*. This Prereq: ART140

Art 241 – Photographic Lighting, 3 cr. This course introduces students to fundamental lighting techniques and concepts encountered in the studio and on location. Students are instructed in the use of 4x5 view camera, light meters, sheet film, instant film and digital photographing techniques. Both artistic and commercial uses of lighting are explored. *Notes:*

Students are required to have their own DSLR digital camera that has interchangeable lenses, is capable of photographing with the RAW file format, has manual settings, and has a minimum of 8 mega-pixels. Cameras are available for checkout by photography students. Recommended Prereq: ART240, Prereq: ART142

Art 242 – Intermediate Digital Photography, 3 cr. Building upon techniques learned in previous classes, students refine their command and control of Adobe Photoshop skills, focusing on the use of more advanced photo manipulation tools. A strong emphasis is placed on the manipulated image, while engaging the student to create a cohesive final project of professional quality. Students will also be introduced to Adobe Lightroom software. *Notes: Students are required to have their own DSLR digital camera that has interchangeable lenses, is capable of photographing with the RAW file format has manual settings, and has a minimum of 8 mega-pixels. Cameras are available for checkout by photography* students. Prereq: ART142

Art 243 – Advanced Digital Photography, 3 cr. This advanced level course builds upon the student's digital abilities from previous classes utilizing Adobe Photoshop and Lightroom. Emphasis is placed on color management, profiling, printing, and commercial versus fine art practices along with an introduction to 4" x 5" cameras with scanning backs. The culmination of this course is a final digital and archival print portfolio. *Notes: Students are required to have their own DSLR digital camera that has interchangeable lenses, is capable of photographing with the RAW file format, has manual settings, and has a minimum of 8 mega-pixels. Cameras are available for checkout by photography students.* Prereq: ART242

Photo Lab Rules and Regulations

GENERAL

1. To have access to the darkroom you must **currently** be enrolled in one of the darkroom photography lab courses at Waubonsee Community College listed in the front of this manual during the current semester. Every semester all students will be required to attend an orientation/safety demonstration in the first two weeks of the semester before working with any chemistry.

2. Visitors are not allowed in the photo lab. Anyone not currently enrolled in a traditional class must remain outside the lab away from chemistry.

3. You should have a towel with you at all times that you are working with chemistry in the lab.

4. The supply room is off limits to all students.

5. Students are not permitted to work in the lab during another class's time.

6. All "Dry Areas" must be kept clean and dry at all times. Dry areas include: enlarging stations, light tables, changing rooms, and areas around the print dryers.

7. Chemical or water spills must be cleaned up immediately.

8. Please make sure to return all trays to their proper storage location.

9. Never touch any dry or electrical equipment if your hands are wet.

10. Use of toners is only for intermediate and advanced photography students.

11. If something is broken or not working properly, please come see The Photography Lab Coordinator and let them

know what the problem is, even if you broke it. Accidents do happen and it is important to let the PLC know, so it can be dealt with right away.

12. Clean up after yourself. Replace what you've taken. Turn off what you've turned on if it's not being used or you are the last to use it.

13. Before trying to access the lab, please make sure to check the lab hours (both www.waubonsee.edu/photography and blackboard). This will ensure that you do not show up when the lab is closed.

14. If in doubt -- Please Ask!

15. Overall, please be considerate of others as well as the lab in general. Again, if you are ever confused about anything, please do not hesitate to ask the Photography Lab Coordinator.

16. Food or drinks are not allowed in the Darkroom or processing lab.

FILM PROCESSING AREA

17. All chemistry must be cleaned up before you leave the facilities.

18. **Film Processing Area:**
All **Film Developers** (Kodak T-Max Film Developer or Kodak D-76) should be poured down the drain. **Stop Bath** can be returned to the working solution container if it is still yellow/orange. Purple Stop Bath should be poured down the drain. ALWAYS return **Fixer** and **Fixer Remover** to the working solution containers. Finally, please return the **Photo-flo** to the working solution container.

19. If while developing film you "pour back" chemistry into the wrong container, notify your instructor immediately.

20. Do not dump or adjust any of the 5-gallon containers of chemistry.

21. Please turn off all faucets when not in use. If you are the last one to leave the darkroom and/or the last person to remove your prints/film from the washers, please make sure all washers are turned off.

DARKROOM

22. **Print Processing Area:**
All **Print Developers** (Kodak Polymax or Kodak Dektol) should be poured down the drain. **Stop Bath** and **Fixer Remover** can also be dumped. **Fix** needs to be poured into a gallon container, and from the container, then poured into the blue drum (located under enlarger stations 1 & 2).

23. Keep all tongs in their designated tray. Using tongs from the fixer for prints in the developer can cause chemical contamination and will ruin your prints. This applies for all chemicals and tongs.

24. Gloves are supplied to students to minimize contact with chemistry. Gloves should be used when processing film. Gloves or tongs should always be used when processing prints.

25. Do not use the enlargers to read by. These lights have a short life span and should only be used for short periods of time.

26. All wet prints must be carried in a tray.

27. No fiber paper is ever put into the RC (resin-coated) paper dryer. No RC (resin-coated) paper is ever put into the Fiber paper dryer.

28. Do not leave your enlarging station for an extended period of time without closing down your station completely.

29. Never leave the darkroom with your box of paper open. If you are not in the darkroom and someone asks if it is ok to turn on the lights you will loose all your paper.

30. Please do not change your VC filters when your enlarger light is on. You will flood the darkroom with light and ruin everyone else's paper. The same thing will happen if you use your enlarger light or cell phone as a flashlight. Please use masked off penlights only.

31. To ensure all students have access, please only use one enlarger station at a time.

32. Please turn off all faucets when not in use. If you are the last one to leave the darkroom and/or the last person to remove your prints/film from the washers, please make sure all washers are turned off.

33. Please return enlarger stations to their default state. Please place easels on the shelf below the station, return the enlarger to a mid-level height, and place the cover over the enlarger. Make sure that speed easels have been put away in the cabinet above the print dryer. Make sure all contact proofers have been put in the cabinet under enlarger #14.

34. If the enlarger does not go up or down, check to see if it's locked. If it is not, do not force anything and come see your instructor or the Photography Lab Coordinator as soon as possible.

35. Please make sure that the print drying screens are returned to the racks properly. The entire screen should be in the rack with no part of the screen protruding from the rack. This will ensure that students do not get hurt. Since students use the drying racks, if you leave your work for more than a day it may be moved. This is a shared space and you are responsible for your own work.

36. 10-15 minutes before the lights are to be turned on at the end of lab hours the PLC will come in and ask you to finish what you are doing. At this point you should finish what you are doing and begin cleaning up. If you are in the middle of making a print, it is OK to finish printing it, but please do not begin making more prints.

37. Clean up will begin 20 minutes before the lab closes, 30 minutes if it is crowded in the lab. The lights will be turned on at this time.

38. There is a radio in the darkroom that can be used by anyone during open lab. As a courtesy to others, please make sure to get approval before playing anything.

39. Please keep wet prints away from the easels. If you need to bring a wet print back to the enlarger station for further processing, ask your teacher or myself for help on how to proceed.

CLASSROOM (VON 225)

40. You will be provided locked cabinets in Von 225 in order to store your photography materials. Neither the staff nor faculty at Waubonsee is responsible for lost or stolen items from the storage cabinets. It is a good idea to write your name on everything you leave there. Storage spaces will be assigned at the beginning of every semester, and will be cleaned out at the end of every semester.

41. Please turn off the light box after you are done using it.

42. Please keep all your personal belongings in the classroom so they do not get damaged.

Standard Operating Procedures

Film Developing Chemicals

1.0 PURPOSE

1.1 To outline the procedures and safety requirements when using film processing chemicals.

2.0 SCOPE

2.1 This applies to all faculty, staff or students who will process film with film chemistry.

3.0 RESPONSIBITLITY

3.1 Faculty are responsible for training on the proper procedures for safety, HMLS labels, chemistry setup, use, disposal, and washing of equipment.

3.2 Training requires reading and understanding the S.O.P. and a hands-on demonstration.

4.0 PROCEDURE

4.1 Safety

4.1.1 MSDS must be read prior to use of chemistry.

4.1.2 Adequate ventilation must be used.

4.1.3 Use personal protective equipment including eye protection, water resistant apron, and gloves when transporting any chemistry and washing equipment. When using chemistry over the sink and under the ventilation hood, eye protection is maintained by use of the glass shield built into the ventilation unit, and physical contact should be prevented by use of gloves.

4.1.4 Never place wet materials on the dry side of the darkroom that contains electrical components.

4.1.5 Wipe up any chemistry or water that you drip on the floor to prevent slips.

4.2 Setup

4.2.1 Locate the four graduated cylinders that are designated for the four chemicals used for film processing (Film Developer, Stop Bath, Fixer, Fixer Remover, and Photo Flo).

4.2.2 Clean each cylinder before use to remove contaminants. Use water and a small amount of dish soap on a clean sponge and rinse thoroughly with water when finished. Gloves, an apron, and eye protection should be used when transporting any chemistry or cleaning.

4.2.3 Locate the water mixing temperature control unit for the film processing sink. Before turning on the water, check to ensure the water hose is nestled inside the sink tray to prevent spilling water on the floor. Turn on the water by turning the red valve at the center of the unit downwards. Allow water to flow for about one minute to clear the pipes, then adjust the temperature slowly with the mixing valve.

4.2.4 Locate the appropriate five-gallon storage container of Kodak T-Max film developer (D-76 for 4x5 film) and fill the corresponding graduated cylinder with 300 ml of developer for one reel tanks or 650 ml for double reel tanks (if you have two reels, you may have to use two cylinders since ours only hold 500ml).

4.2.5 Locate the appropriate five-gallon storage container of Kodak stop bath and fill the corresponding graduated cylinder with 300 ml of stop bath for one reel tanks or 650 ml for double reel tanks (if you have two reels, you may have to use two cylinders since ours only hold 500ml).

4.2.6 Locate the appropriate five-gallon storage container of Sprint fixer and fill the corresponding graduated cylinder with 300 ml of fixer for one reel tanks or 650 ml for double reel tanks (if you have two reels, you may have to use two cylinders since ours only hold 500ml).

4.2.7 Locate the appropriate five-gallon storage container of Sprint ARCHIVAL fixer remover and fill the corresponding graduated cylinder with 300 ml of fixer remover for one reel tanks or 650 ml for double reel tanks (if you have two reels, you may have to use two cylinders since ours only hold 500ml).

4.2.8 Locate the appropriate five-gallon storage container of Kodak Photo Flo and fill the corresponding graduated cylinder with 300 ml of photo flo for one reel tanks or 650 ml for double reel tanks (if you have two reels, you may have to use two cylinders since ours only hold 500ml).

4.3 Proper use of chemistry

4.3.1 Each chemical solution has a recommended immersion time and agitation time. Agitation provides circulation of fresh chemistry to ensure even development. To agitate, gently and slowly flip your developing tank upside down twice over approximately 10-15 seconds. When complete, gently tap your developing tank on the side of the sink to dislodge bubbles. Agitate continuously for the beginning of each chemical.

4.3.2 Check the temperature of your developer and reference the type of film and temperature on the film developer chart. Ensure that the water and remaining chemicals are between 68-75 degrees.

4.3.3 First, remove the red cap on your developing tank and pour in the water. Re-cap and agitate continuously for one minute. When complete, pour the water down the drain.

4.3.4 Remove the red cap on your developing tank and pour in the developer. Re-cap and agitate continuously for one minute, then every 30 seconds for a duration of 5 seconds for the remaining time determined from the chart. When complete, pour the developer back into the graduated cylinder labeled developer and set aside to dispose of after you are finished with all of the 5 chemicals.

4.3.5 Remove the red cap on your developing tank and insert hose. Allow water to rinse, fill and drain in your tank for 30 seconds.

4.3.6 Remove the red cap on your developing tank and pour in the stop bath. Re-cap and agitate continuously for 30 seconds. When complete, pour the stop bath back into the graduated cylinder labeled stop bath and set aside to dispose of after you are finished with all of the 5 chemicals.

4.3.7 Remove the red cap on your developing tank and insert hose. Allow water to rinse, fill and drain in your tank for 30 seconds.

4.3.8 Remove the red cap on your developing tank and pour in the fixer. Re-cap and agitate continuously for one minute, and then every 30 seconds for a duration of 5 seconds (for a total of 5 minutes). When complete, pour the fixer back into the graduated cylinder labeled fixer and set aside to dispose of after you are finished with all of the 5 chemicals.

4.3.9 Remove the red cap on your developing tank and insert hose. Allow water to rinse, fill and drain in your tank for 30 seconds.

4.3.10 Remove the red cap on your developing tank and pour in the fixer remover.
Re-cap and agitate for the entire 3 minutes. When complete, pour the fixer remover back into the graduated cylinder labeled fixer and set aside to dispose of after you are finished with all of the 5 chemicals

4.3.11 Locate the hurricane wash and turn on the water control panel that connects to it. Balance the temperature between 68-75 degrees.
Place the film (on reels) in the tube and ensure it settles horizontally at the bottom. Wash for 5 minutes. When complete, turn off the water and reach in to the water to remove the reel(s). The hurricane wash should be poured out carefully and turned upside down to prevent mold growth.

4.3.12 Place your reel of film back into your tank, but leave the lid off.

4.3.13 Locate the appropriate five-gallon storage container of Kodak Photo Flo. With the lid off of your tank, directly draw out enough chemistry to cover your reel(s) of film. Leave in for 30 seconds to one minute. Do NOT agitate film. When complete remove your reel from the developing tank. Drip your reel over the sink for one minute.

4.3.14 To remove the film from the reel, hold the reel in your left hand and turn the top side clockwise approximately 45 degrees. This should release the reel into two parts.

4.3.15 Carefully lift the film out of the reel with your right hand. Hold it high and avoid allowing the bottom to touch the floor or other surfaces.

4.3.16 It is now time to examine your film. If you do not see frames you can skip to drying film (keep and show your instructor to determine what went wrong).

4.3.17 Locate two metal film clips.

4.3.18 Clip the one metal film clip to the top of the film. Squeeze the center of the clip to open the jaws.

4.3.19 Turn off the film drying cabinet (if it is already on).

4.3.20 Wait ten seconds and open the door.

4.3.21 Place the film into the drying cabinet at the back and hook the film clip over one row of the metal rack in the top of the cabinet.
4.3.22 Use a metal clip clipped at the bottom of the film to prevent it from sticking to the wall or other rolls of film.
4.3.23 Close the door and press all three switches so they are in an upward position. Film is usually dry around 30 minutes and can be removed. The cabinet will NOT automatically turn off, so you must stay the entire 30 minutes and manually turn the cabinet off.
4.3.24 The 30 minute drying time should be used to clean and dry all of the parts of the developing tank and dispose of the chemistry that was kept in the labeled graduated cylinders, SEE BELOW.
4.3.25 Thoroughly rinse out the remaining parts of your developing tank to remove all chemistry.

4.4 Disposal

4.4.1 All five chemicals that were used should be in the properly labeled graduated cylinders ready for disposal. All chemistry except for developers must be returned to the labeled storage tanks at the end of each printing session. Film Developers should be diluted and poured down the drain after each use. When finished, rinse out the graduated cylinder labeled Film Developer. Gloves, an apron, and eye protection should be used when transporting any chemistry or cleaning.
4.4.3 Stop bath should be returned to the five-gallon storage container after each developing session. When stop bath exhausts it will change in color from yellow to lavender. When exhausted stop bath should be diluted and poured down the drain. When finished, rinse out the graduated cylinder labeled Stop bath.
4.4.4 Fixer should be returned to the five-gallon storage container after each developing session. Fixer exhaustion should correspond to that of stop bath. When exhausted fixer should be stored in a large blue drum containers and the instructor (or photo lab coordinator) should be notified to dispose of it. NEVER POUR FIXER DOWN THE DRAIN. When finished, rinse out the graduated cylinder labeled fixer.
4.4.5 Fixer remover should be returned to the five-gallon storage container after each developing session. Fixer remover exhaustion should correspond to that of stop bath. When exhausted fixer remover should be diluted and poured down the drain. When finished, rinse out the graduated cylinder labeled fixer remover.
4.4.6 Photo Flo should be returned to the five-gallon storage container after each developing session. Photo Flo exhaustion should correspond to that of stop bath. When exhausted it should be diluted and poured down the drain. When finished, rinse out the graduated cylinder labeled Photo Flo.

4.5 Washing equipment

4.5.1 After removing chemistry all graduated cylinders and parts of the developing tank cleaned and completely dried.
4.5.2 Rinse out the cylinders and developing tank thoroughly with the water hose.
4.5.3 If there is residue, use a sponge, water, and photo finish cleaner to remove it (gloves should be used when using photo finish).
4.5.4 Use paper towels or a blow-dryer to remove all moisture from cylinders and tank and reels.
4.5.5 Re-assemble the tank and reels (lid upside down with reels on spindle placed on top) and place back on the shelf (only after approved by instructor or lab coordinator).

5.0 DOCUMENTATION

5.1 N/A

6.0 DEFINITIONS

6.1 MSDS- Material safety data sheet

7.0 APPROVALS

Print Developing Chemicals

1.0 PURPOSE

1.1 To outline the procedures and safety requirements when using darkroom print processing chemicals.

2.0 SCOPE

2.1 This applies to all faculty, staff or students who will process prints with darkroom chemistry.

3.0 RESPONSIBITLITY

3.1 Faculty are responsible for training on the proper procedures for safety, HMLS labels, chemistry setup, use, disposal, and washing of equipment.

3.2 Training requires reading and understanding the S.O.P. and a hands-on demonstration.

4.0 PROCEDURE

4.1 Safety

4.1.1 MSDS must be read prior to use of chemistry.

4.1.2 Adequate ventilation must be used.

4.1.3 Use personal protective equipment including eye protection, water resistant apron, and gloves when transporting any chemistry and washing equipment. When using chemistry in trays, eye protection is maintained by use of the glass shield built into the ventilation unit, and physical contact should be prevented by use of tongs or gloves.

4.2 Setup

4.2.1 Locate the four trays that are designated for the three chemicals used for print processing and one for washing.

4.4.2 Locate 6 tongs, two for each chemical.

4.2.3 Clean each tray, cylinder, and all tongs before use to remove contaminants. Use water and a small amount of photo finish cleaner on a clean sponge and rinse thoroughly with water when finished. Gloves, an apron, and eye protection should be used when transporting any chemistry or cleaning.

4.2.6 Place two tongs on the lip of each tray, one tong on each side of the sink.

4.2.7 First, locate the one gallon used developer storage container and use any stored developer if it is not exhausted (see section 4.4.2 on exhaustion). Locate the appropriate five-gallon storage container of sprint quicksilver print developer and fill the graduated cylinder labeled print developer with one liter (thirty four ounces). Carefully transport this chemical to the sink with trays and carefully pour into the first tray (closest to the wall). Return to the five-gallon storage container and fill again with one liter of sprint quicksilver print developer. Again, carefully transport and pour into the first tray.

4.2.8 Locate the appropriate five-gallon storage container of sprint block stop bath and fill the graduated cylinder labeled stop bath with one liter (thirty four ounces). Carefully transport this chemical to the sink with trays and carefully pour into the second tray (second from the wall). Return to the five-gallon storage container and fill again with one liter of sprint block stop bath. Again, carefully transport and pour into the second tray.

4.2.9 Locate the appropriate five-gallon storage container of sprint record speed fixer and fill the graduated cylinder labeled fixer with one liter (thirty four ounces). Carefully transport this chemical to the sink with trays and carefully pour into the third tray (third from the wall). Return to the five-gallon storage container and fill again with one liter of sprint record speed fixer. Again, carefully transport and pour into the third tray.

4.2.10 Locate the water mixing temperature control unit. Before turning on the water, check to ensure the water hose is nestled inside the wash tray to prevent spilling water on the floor. Turn on the water by turning the red valve at the center of the unit ninety-degrees clockwise. Allow water to flow for about one minute to clear the pipes, then adjust the temperature slowly with the mixing valve.

4.3 Proper use of chemistry

4.3.1 Each chemical solution has a recommended immersion time and should be agitated continuously to provide circulation of fresh chemistry. To agitate, lift one corner of the tray up and down approximately ½ to 1 inch every five to ten seconds.

4.3.2 When transferring a print from one chemical to the next it should be dripped for approximately fifteen seconds before placing into the next tray. Use a tong for one tray only and do not dip it into the next tray.

4.3.3 First, immerse a print face up in the developer for 2 minutes with constant agitation.

4.3.4 Second, immerse a print face up in the stop bath for 5-30 seconds with constant agitation.

4.3.5 Third, immerse a print face up in the fixer for 3 minutes (5 minutes for Fiber) with constant agitation.

4.3.6 Immerse the print face up in the wash for 5 minutes (10 minutes for Fiber). No agitation is needed if the water is flowing. The water will overflow the tray and provide circulation of fresh water.

4.3. Finally, place print in upright water bath for a total of 10 minutes.

4.3.7 Use a clean "washed" tray to transport the print to the dryer. Before leaving the sink, hold the tray vertically to drip out the water for 15 seconds.

4.3.8 Turn on the print dryer and set the temperature to 8 and speed to 3. Insert RC prints in the RC dryer face up. Insert fiber prints in the fiber dryer face down.

4.4 Disposal

4.4.1 All chemistry should be covered with a tray lid at the end of each printing session. Exhausted developer should be diluted and poured down the drain. Gloves, an apron, and eye protection should be used when transporting any chemistry or cleaning.

4.4.2 Print developer should be stored in its current tray with tray lid covering it after each printing session. When print developer exhausts it will turn darker in color and images will take considerably longer time to appear and not reach a rich black. When exhausted print developer should be diluted and poured down the drain.

4.4.3 Stop bath should remain in tray and covered with a try lid after each printing session. When stop bath exhausts it will change in color from yellow to lavender. When exhausted stop bath should be diluted and poured down the drain.

4.4.4 Fixer should remain in tray and covered with tray lid after each printing session. Fixer exhaustion should correspond to that of stop bath. When fixer is exhausted the instructor or lab coordinator should be notified to transfer it out of the tray into a container labeled "fix" and dispose of it in one of the blue drums. NEVER POUR FIXER DOWN THE DRAIN.

4.5 Washing equipment

4.5.1 After removing chemistry all trays and tongs should be cleaned. Gloves, an apron, and eye protection should be used when transporting any chemistry or cleaning.

4.5.2 Rinse out each tray thoroughly with the water hose.

4.5.3 If there is residue, use a sponge, water, and photo finish cleaner to remove it.

4.5.4 Flip the trays upside down on an angle on the edge of the sink to drain the remaining water and allow airflow to prevent mold.

4.5.5 Rinse the tongs and place them in container located on shelf.

5.0 DOCUMENTATION

5.1 N/A

6.0 DEFINITIONS

6.1 MSDS- Material safety data sheet

7.0 APPROVALS

Lab and Classroom Safety

At the beginning of each photography course taught which involves lab use, students are given a hazardous materials orientation to make them aware of the safety procedures to follow and the location of documentation to reference. Although the photo lab area is a relatively safe environment, there are some precautions that should be kept in mind.

Electricity

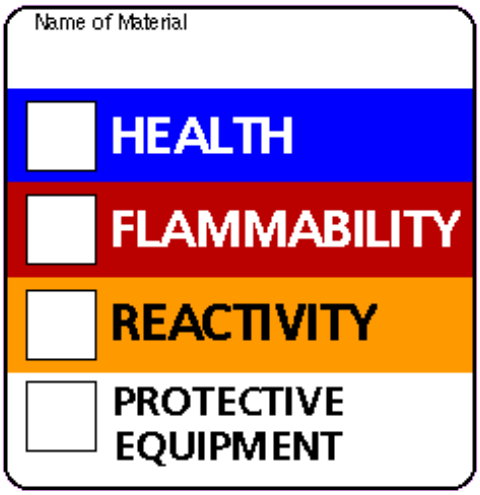
Make sure your hands are dry before touching any piece of electrical equipment. Any loose connections or malfunctions in equipment should be reported to your instructor immediately. Turn off your enlarger and safelight before leaving the darkroom. Make sure that the print dryer, tacking irons, and dry mount presses are turned off when not in use.

Cutting

All equipment such as paper cutters and mat cutters, X-Acto knives and loose blades, should be used with care. All have extremely sharp blades, which demand concentration when used.

Chemistry

The chemicals used in the lab are, for the most part, well-diluted solutions and are safe if not taken internally or absorbed over time by the skin. It is for this reason that it is required that students use tongs with printing chemistry and gloves when processing film. This will also reduce the risk of contamination, the staining of prints, and skin irritations.



HMLS Labels

Hazardous Materials Labeling System labels should be used on all individual containers of hazardous materials (ie. barrels, bottles, cans, buckets, tubs, etc) so that there are never any unlabeled containers in the work area. **Always regard unlabeled containers as dangerous!**

If you bring any outside chemistry into the lab you must first have it authorized by the Photography Coordinator, submit three copies of the chemicals MSDS, procure and store it in an authorized container, and attach a properly identified HMLS Label.

Blue = Health Hazard
Red = Flammability
Yellow = Instability
White = Special Hazard Information (such as what personal protective equipment to wear)

If a substance is transferred from its original container into a portable container which is not labeled, the portable container must be labeled with an HMLS label to identify the contents of the container. All unattended containers must be labeled.

HEALTH

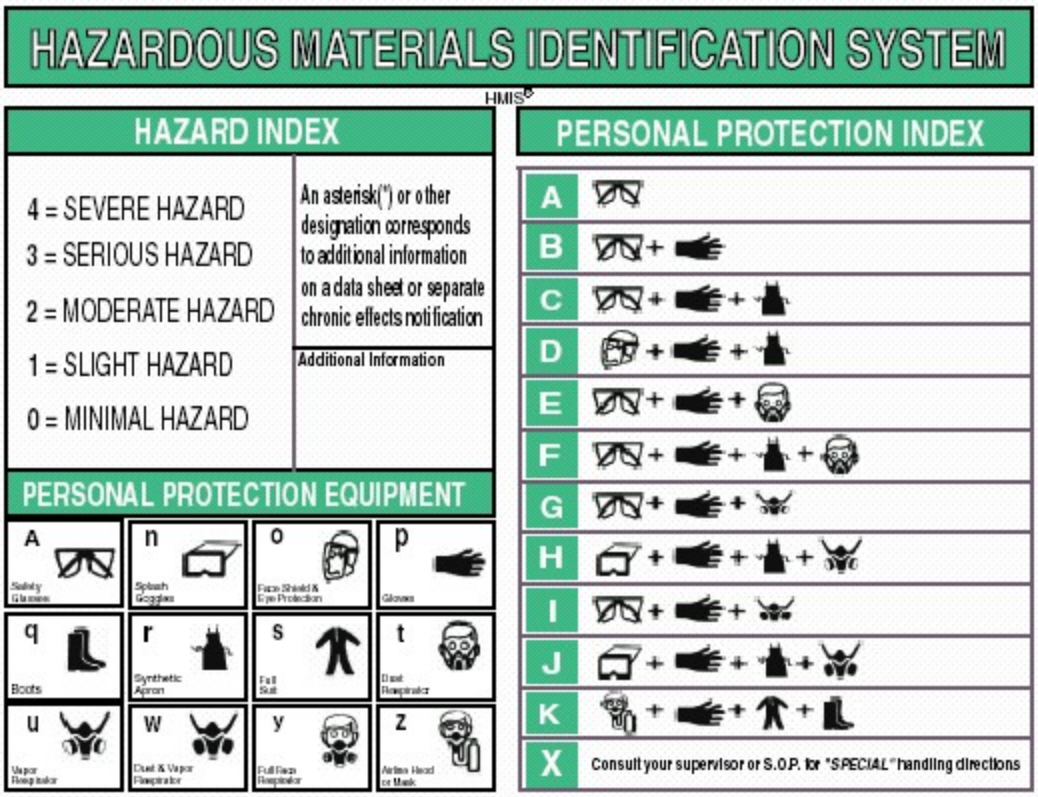
4	Deadly: even the slightest exposure to this substance would be life threatening. Only specialized protective clothing, for these materials, should be worn.
3	Extreme Danger: serious injury would result from exposure to this substance. Do not expose any body surface to these materials. Full protective measures should be taken.
2	Dangerous: exposure to this substance would be hazardous to health. Protective measures are indicated.
1	Slight Hazard: irritation or minor injury would result from exposure to this substance. Protective measures are indicated.
0	No Hazard: exposure to this substance offers no significant risk to health.

FLAMMABILITY

4	Flash Point Below 73ºF and Boiling Point Below 100ºF: this substance is very flammable, volatile or explosive depending on its state. Extreme caution should be used in handling or storing of these materials.
3	Flash Point Below 100ºF: flammable, volatile or explosive under almost all normal temperature conditions. Exercise great caution in storage or handling of these materials.
2	Flash Point Below 200ºF: moderately heated conditions may ignite this substance. Caution procedures should be employed in handling.
1	Flash Point Above 200ºF: this substance must be preheated to ignite. Most combustible solids would be in this category.
0	Will Not Burn: substances that will not burn.

INSTABILITY

4	May Detonate: substances that are readily capable of detonation or explosion at normal temperatures and pressures. Evacuate area if exposed to heat or fire.
3	Explosive: substances that are readily capable of detonation or explosion by a strong initiating source, such as heat, shock or water. Monitor from behind explosion-resistant barriers.
2	Unstable: violent chemical changes are possible at normal or elevated temperatures and pressures. Potentially violent or explosive reaction may occur when mixed with water. Monitor from a safe distance.
1	Normally stable: substances that may become unstable at elevated temperatures and pressures or when mixed with water. Approach with caution.
0	Stable: substances which will remain stable when exposed to heat, pressure or water.



Hazardous Materials

I. Location and Identification of Chemicals

A. In the film developing area there are the following containers of chemistry:
Kodak T-MAX Developer
Kodak Indicator Stop Bath
Kodak Fixer
Orbit Bath (Hypo Eliminator)
Kodak Photo-Flo 600 solution
Sprint Film Systems (FL001) STANDARD B&W FILM DEVELOPER
Sprint Film Systems (PR004) QUICK SILVER PRINT DEVELOPER
Sprint Film Systems (SB004) BLOCK STOP BATH
Sprint Film Systems (FX004) RECORD SPEED FIXER
Sprint Film Systems (FR004) ARCHIVE FIXER REMOVER
Sprint Film Systems (AL004) RECORD ALUM HARDENING CONVERTER
Arista Stain Away
Arista Liquid Lith Developer A/B

B. In the darkroom area the following chemistry is ready to be mixed:
Kodak Dektol Developer
Kodak Polymax T (Paper) Developer
Sprint Film Systems (SB004) BLOCK STOP BATH
Sprint Film Systems (FX004) RECORD SPEED FIXER
Sprint Film Systems (FR004) ARCHIVE FIXER REMOVER
Sprint Film Systems (AL004) RECORD ALUM HARDENING CONVERTER

C. In the classroom (Von 225) the following chemistry is used:
Kodak D-76
Agfa Photo Rodinal
Kodak Lens Cleaner
Tiffen Lens Cleaner
Kalt Lens Cleaner
Pec 12 Emulsion Cleaner

D. In the storage room (for use with instructor supervision only) currently there are the following containers of chemicals used:
Sprint Film Systems (PR004) QUICK SILVER PRINT DEVELOPER
Acufine Replenisher
Arista Paper Developer B/W
Premium Arista Paper Developer
Eco Pro Paper Developer
Clayton Titan Blue System Cleaner
Arista B/W Chromo Stabilizer and Activator
Agfa Sistan New image Silver Stabilizer
Ilford Ilfotec DD-X
Premium Arista Film Developer
Arista Film Developer B/W
LMAX Film Developer
Clayton F60 Film Developer
Clayton F76 Plus Film Developer
Edwal Hypo Check
Kodak Sepia Toner A/B
Kodak Brown Toner
Kodak Rapid Selenium Toner
Kentmere Rapid Selenium Toner
Fotospeed Blue Toner
Fotospeed Gold Toner
Fotospeed Sepia Toner
Rockland Polytoner
Photographer's Formulary: Metol
Photographer's Formulary: Hydroquinone
Photographer's Formulary: Sodium Carbonate, Anhydrous
Photographer's Formulary: BW-65 Paper Developer A & B

II. Handling of Chemicals

A. Prevention Practices

- The Photography Lab Coordinator gives all students an orientation of lab rules and procedures before they use the Photography Labs.
- The Photography Lab Coordinator is certified in First Aid, CPR and AED.
- Teachers discuss safety with students during their first week of class.
- Any chemicals that need extra ventilation to be used are to be used in the ventilation booth in VON 225.
- MSD Sheets are kept in both the film processing area and VON225 for all photo chemicals.
- Fire extinguishers are located in both the photo classroom and the film processing room.
- Students are only allowed to handle chemicals that are not hazardous in the case of direct contact to the skin. All other chemicals are to be handled only by the teachers and the Photography Lab Coordinator.
- In case chemicals come in contact with a student's eyes, an eye-wash station containing bottles of saline is mounted by the main entrance of the film processing room, in the darkroom by the revolving door and in Von 225 by the ventilation booth. These bottles are routinely replaced by campus operations to ensure

that the saline solution is fresh. There are also two permanent eye wash stations; one in Von 225 and one in Von 224 (in the film processing area).
- The darkroom (VON 224) has extra ventilation in the form of exhausts vents in the ceiling.
- All chemicals in the lab area contain HMLS labels (both for concentrate solution and a working solution).

B. Storage and handling of hazardous materials and waste
- Chemicals are either stored in their original packaging (for stock solutions) or are properly labeled (for working solutions). MSD Sheets are always kept on hand in the film processing area (224) and in VON 225.
- Hazardous waste materials (photo fixer) are stored in the darkroom in blue storage containers provided by Safety-Kleen, or in individual gallon containers (used photographic toners) and are taken away by Safety-Kleen to their disposal facilities to be properly disposed of.

C. Personal protective equipment
- Students are provided with tongs and disposable gloves (both vinyl and latex) for handling prints and chemicals in the darkroom.
- Protective eyewear is also available for students (located in a labeled drawer in the film processing area).
- One ventilation mask (located in the film processing area) is also available to any student that would need them, however, any chemicals that create harmful fumes should be used in the ventilation booth in VON 225. This pertains directly to photographic selenium and sepia toners.
- First Aid Kits are available in Von 225 and Von 224 by the main entrances to those rooms.
- Hand soap and paper towels are provided for the students.
- There is an AED outside of Bode 136 and one outside of Dickson 148.

D. Emergency Response actions
- In the event of an emergency, campus police 466-2552 will be called with the phone in the Von Ohlen hallway outside of the photo lab and/or 911.
- As mentioned previously, fire extinguishers are on hand in case of a fire.
- As mentioned previously, first aid kits are available if anyone is injured.
- In case chemicals come in contact with the skin, the effected area should be washed immediately. 911 should only be called in the case of chemical burns, as most photo chemicals should be innocuous when they come in contact with the skin.
- In case of chemical contact with the eyes, eyes should be flushed with saline from the available eyewash station. 911 should be called immediately.
- In case of chemical ingestion, 911 should be called immediately. Teachers or the Photography Lab Coordinator should follow instructions from the ingested chemical's MSDS until help arrives.

III. MSDS & Chemical Inventory

A. What the MSDS tell you

The MSDS are detailed reference publications on chemicals used in the Photo Lab. Each chemical listed is comprised of about twelve sections. They are as follows:

Identification
Product and Component Hazard Data
Physical Data
Fire and Explosive Hazard Data
Reactivity Data
Toxicity and Health Hazard Data
Personal Protection and Controls
Special Storage and Handling Precautions
Spill, Leak, and Disposal Procedures
Environment Effects
Transportation
References

B. Where to find the MSDS
All the sheets are kept in a yellow 3-ring binder in VON 224 (Darkroom) and VON 225 (Classroom).

C. What the Chemical Inventory Sheets tell you
These sheets list all the chemicals used in the lab and each manufacturers name, address and telephone number. The CAS Number refers to individual components which are considered hazardous will have numbers listed.

D. Where to find the Chemical Inventory Sheets
These sheets are kept in the yellow 3-ring binders. Copies of specific MSDS can be made available to students by request. Please feel free to ask your instructor any questions that relate to safety in the photo lab area.

Photography Lab Etiquette

The photo lab area is an environment that is shared by many students each semester. Because of this, you cannot afford to be selfish. The dripping of chemicals, contamination of solutions, and not cleaning up your work area, cannot only ruin your negatives and prints, but also those of others. This is why attention to certain points of darkroom etiquette area emphasized with respect to specific procedures that are described in this manual is imperative. For now, please take note of the following general rules for cleanliness and decorum:

1. **If in Doubt, Rinse it Out!**
   To safeguard your work from chemical contamination, rinse out with hot water any tanks, reels, beakers, thermometers, or tongs that might be left on the sinks before using as well as after using. Never assume that any piece of equipment lying around has been cleaned. Check carefully equipment that has been put back into its proper place for stains (dark or white residue) before using. Rinse clean if necessary.

2. **Don't Drip!**
   When processing your film, keep your tank over the sink and wrapped in a towel. When taking prints out of the darkroom to view or to dry, make sure they are in a tray to catch any water.

3. **Keep Your Hands Clean!**
   A cotton towel is **must** for every student to have while working with chemistry in the photo lab. Some students have attached a clip through their towel and fastened it to their belt loop to assure its always available for drying hands. Rinse your hands immediately after contact with chemicals. Special care should be taken to make sure that your hands are clean before handling dry equipment and materials (ie. enlarger knobs, photo paper, etc.).

4. **Clean Your Workspace!**
   Before leaving the film developing area, rinse out all equipment used and return them to their proper place. Check the changing room for garbage and throw it away. Before leaving the printing area, clean up your station. Any scraps of paper or tape should be disposed of in the garbage.

5. **No Food or Drink!**
   Keep all food and drinks outside of the photo area.

6. **Knock!**
   Always knock before entering the revolving door for the film loading room/ darkroom.

7. **Non-Cooperation with Photography Lab Etiquette**
   Any student who fails to comply with the basic points of darkroom etiquette as requested by their instructor or The Photography Coordinator will be expelled from the lab.

Film

The quality of your print is in a direct relationship to the quality of your negative. One of the most important steps in producing a photographic image is processing the film. **If a good negative is not properly processed, no amount of "darkroom magic" is going to produce a satisfactory print.** Each step in the processing procedure should be followed to the letter, exact measurements made, and uniform handling of the film followed.

Loading Film

Film must be unloaded from the cassettes and onto the reels in **total darkness**. You may use the film loading room or a changing bag for this step.

FILM LOADING ROOM:

There are two light switches in the room. When loading film, all lights **must** be off. This includes the safe light. If you can read the sign on the wall, or you can see your hand in front of your face then all the lights are not off. The film loading room has a **pair of scissors** and a wall mounted 35mm canister opener. Please discard all garbage in the garbage can before you leave.

FILM CHANGING BAG:

Place all your items in the inner chamber of the bag; zip up the zipper for both the inner chamber and the outer chamber. When you place your arms in the sleeves, the bag becomes light tight.

DO NOT TAKE YOUR ARMS OUT OF THE BAG IF YOU HAVE NOT COMPLETELY LOADED YOUR FILM ON THE REEL AND PUT IT IN THE TANK WITH THE LID OF THE TANK FASTENED.

You will need your **exposed film**, a **plastic developing tank** with enough **reels** to fill your tank, a **center post (spool)** in proportion to your tank, and a black **plastic lid** with a red cap. Check that the tabs on both halves of the reels are lined up, if not align them before entering the loading room or placing in the changing bag. Put these out on the counter top in the loading room so you have some idea where they are in the dark. In your class you will have a demonstration on how to load the film onto the reels. There is film in the Von225 to use to practice with before rolling your own. When you're ready:

1. For the film loading room: **Turn off BOTH the white light and the safe light.** It must be completely dark before you can load your film.

2. Place the film canister in the metal bracket on the wall, flat ring to the wall. Pry off the flat end of the film cassette by twisting up/down/left/right. When using a changing bag, you will need to pry off the flat end of the film cassette as you would pry off the cap of a bottle (put a little elbow in it).

3. Remove the film from the canister and cut the narrow lead of the film. Be careful not to allow the film to unravel and/or touch the floor.

4. Begin rolling the film onto the reel from the flat part of the tabs. Insert the film in the direction it naturally curls with the shiny side out. After inserting about one to two inches the film will advance with a ratcheting motion of the reel tabs.

5. When there is about six inches of film remaining, gently twist the tape that attaches the film to the the film canister plastic spool. This should break the tape and detach the film (some tape will remain on the film on an unexposed portion of the film). Then ratchet the final six inches past the tabs on the reel.

6. When complete, place rolled film reel(s) on the center post and into the tank (fat part of the post goes down) and cover with the black lid.

7. The tank is now light tight and you may turn on the lights or open the door or remove your arms from the changing bag. Clean up your garbage and move on to processing.

NOTE: If you have a difficult time rolling the film, **do not** turn the light on and open the door or remove your arms from the sleeves of the changing bag. Remove your film from the reel by twisting the top/right hand side clockwise and separating the two halves of the reel. Insert the center post (spool) without the reels. Then place film, **as is**, around the post in the tank and cover with the lid. Find your instructor or an advanced student and ask for help. If you have rolled the film onto the reels but would like it checked, we will do this for you.

Film Processing

General guidelines for processing standard black and white negative roll film.

TMAX Developer is not recommended for use with sheet film or some 35mm films. If you have these films you should ask your instructor for a demonstration on how to use the Kodak D-76 Developer.

***Note:** From start to finish (loading film onto reels to your negatives cut down; in negative preservers), it will take you approximately 1 hour and 15 minutes (give or take 15 minutes) to process your film.

Save instructions from film and paper for processing information. Often it is best to follow the manufacturer's guidelines for processing materials. The following information is meant as a general guide, and not as a replacement for the manufacturer's recommendations.

In this lab all chemicals are to be used straight from the containers (working solution). **Developer is discarded after your use. All other chemicals are returned to containers for repeated use.**

All chemicals and fluids should be kept at the same temperature, preferably **68° F/20° C.** You can raise, lower, or keep the temperature of your chemicals consistent by using a water bath.
***Temperatures different from 68°F/20°C will require one to use different processing times in developer.**

1. Pre-Soak:
Remove the red cap from the top of your developing tank and fill tank with water for **one minute** constantly agitating.
Notes:

2. STANDARD Film Developer:
Measure the temperature of your chemicals. Find designated development time for your type of film on the **development chart** (posted in the lab or use your film box). Fill the tank and tap to eliminate air bubbles. Agitate for 1st full minute, then 5 seconds every 30 seconds thereafter. **Discard.**
Notes:

3. Rinse:**
30 seconds- Fill and drain the tank with temperature- consistent water. **Discard.**
Notes:

4. Stop Bath:
Agitate continuously for **30 seconds**. **Save.**
Notes:

5. Rinse:**
30 seconds- Fill and drain the tank with temperature- consistent water. **Discard.**
Notes:

6. RECORD Speed Fixer with RECORD Alum Hardening Converter:
Five minutes; agitate 1st full minute, then 5 seconds every 30 seconds thereafter. **Save.**
Notes:

7. Rinse:**
30 seconds- Fill and drain the tank with temperature- consistent water. **Discard.**
Notes:

8. ARCHIVE Fixer Remover:
Three minutes agitating consistently. **Save.**
Notes:

9. Water Wash:
Five minutes in plastic washer from the time the last reel was added to the washer. Immerse reel(s) with film still on into temperature-consistent water.
Notes:

10. Photo Flo:
Maximum One minute. Treat film in Photo Flo one roll at a time. Gently remove film from reel. Slowly slide film into tank filled with Photo Flo. Leave film in for several seconds to enable fluid to saturate film gelatin. Gently remove film. Drain fluid from film. **Save.**
Notes:

11. Dry:
Rinse and dry two film clips for each roll of film prior to using. In drying cabinet- clip film at the top end, then clip with weighted clip on the bottom. Do not remove film before dry.*
Notes:

Do not place wet or slightly wet negatives into negative preservers or holders. Wait until completely dry

**Rinsing film between steps is recommended to extend the life of chemicals, but does not effect the film in the process. This step is optional, however it is recommended.

Film drying cabinets
Film drying cabinets have limited capacity. Hang your wet film as far to the rear of the cabinet as possible to make room for others. Remove your film promptly when it is dry, within 2 hours to prevent curling and excessive dust. The switches control the power and temperature for the film drying cabinet. The large switch on the right will turn on the cabinet. The middle switch will put the temperature on low, and the left switch will put the temperature on high.

*Prior to putting your film in the cabinet, make sure it has been turned off and settled for a minute. Put your film in the cabinet, and immediately close the door. Then turn the dryer back on.

12. Clean up:
Wash, dry and return all reels, tanks, trays, thermometers, and measuring beakers to their proper place. Wipe down and dry countertops and replace lids on 5-gallon chemistry containers.
Notes:

13. Storage:
Cut film into strips of 5 frames (35mm) and place into negative sleeves. Negatives should be placed into the page with letters and numbers on the edges readable and in numerical order. Do not leave negatives hanging in the film drying cabinet overnight.

Chromogenic Black and White Film

Ilford XP 2 Film / Kodak T-Max T400 CN

These are films that employ a dye to form the image similar to the dyes used in color negative film. It must be processed in color C-41 chemistry. Many one-hour photo labs carry these Black and White films, but we cannot process this film with our chemistry. These films also have an orange base that prevents the proper adjustment of contrast in the darkroom. Ask specifically for the film recommended on your syllabus. Do not process these films in our lab.

The Enlarger Stations

Each student in the darkroom class will be able to check out a pack of contrast filters and each enlarger station will be equipped with a #8053 negative carrier. Please keep the workstation clean and notify your instructor if anything seems to not be working properly.

Contrast Filters

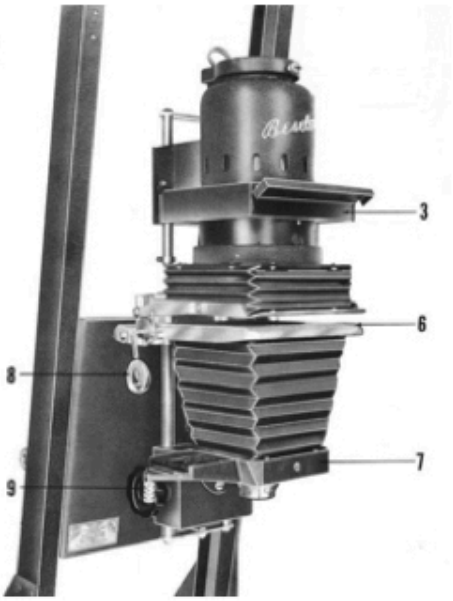
Individual contrast filters are placed in the Filter Drawer (3) on your enlarger. Never use more than one filter at a time. Keep filters clean and organized in the box when not in use. When inserting or removing contrast filters from the drawer make sure the enlarger light is off or you may inadvertently spill light on other students work stations and ruin their photo paper.

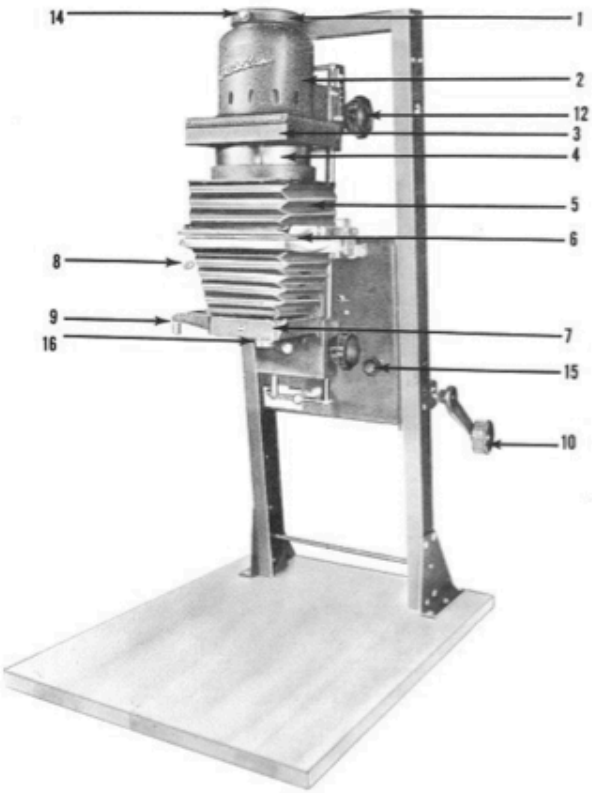
***HANDLE CONTRAST FILTERS WITH CLEAN AND DRY HANDS ONLY!!!**

Negative Carrier

All the supplied negative carriers in the enlargers should be marked #8053 35mm.
*There are additionally different size negative carriers that can be loaned out.

The Enlarger





1. Lamp House Cap
2. Lamp House
3. Filter Compartment
4. Condenser Housing
5. Upper Bellows
6. Negative Stage
7. Lens Stage
8. Negative Stage Lever
9. Accesory Filter Holder (Not used)
10. Elevation Handle
12. Condenser State Adjustment Knob
14. Lamp House Locking Screw
15. Elevation Lock
16. Enlarging Lens

Beseler 23CII Enlarger. The basic steps to operate the enlarger will be shown to you by your instructor at the beginning of the semester.

*Make sure the lamp house is raised all the way for printing 35mm film.

Enlarging Station Checklist

Before you go to work

- Avoid placing your belongings on top of the easel, or at another workstation. Place belongings underneath your workstation or in the classroom.
- Carefully remove dust cover, fold, roll and place underneath your workstation.
- Locate and unlock elevation lock (lower right-hand corner of chassis) before changing height of enlarger.
- Locate format guide (upper right-hand side on right side of lamp house) set it to the appropriate format size for your negative.
- Check your contact proofer or the four blade easel for cleanliness (ie. Dirt, fingerprints, tape, etc.).

Before you leave

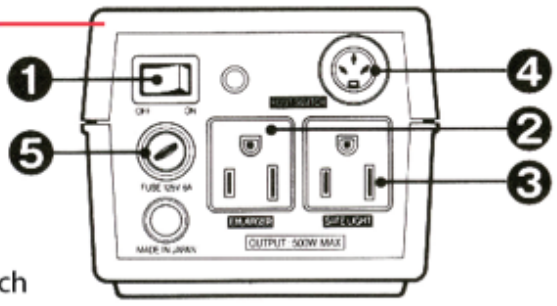
- Please leave the enlarger set for 35mm negatives (format size guide set at 35mm).
- Move grain magnifier back into its corner (opposite corner of power cords).
- Turn off power switch on the timer.
- Remove your negative and contrast filter.
- Return any contrast filters to the filter box in the proper order and check them back in to the person on duty.
- Collect and return all tools to their storage places.
- Lower your enlarger (using the elevation control knob) to the middle position on its support.
- Place your easel to its resting shelf.
- Return contact proofers back into their cabinet (under enlarger #14).
- Remove all debris and all your belongings from workstation.
- Carefully replace dust cover over enlarger.
- Turn off print dryers, tacking irons, & mounting presses.
- Wash your hands.

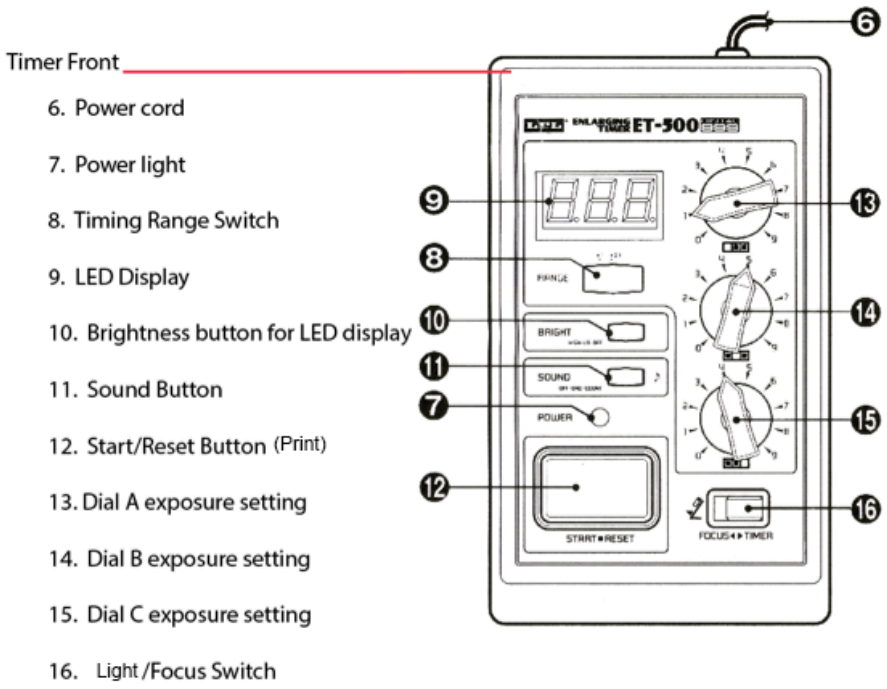
The Timer

Basic Features and Controls

Timer Top

1. Power Switch
2. Plug in outlet for Enlarger
3. Plug in outlet for Safelight
4. Plug in outlet for optional foot switch
5. Fuse Case





Timer Instructions

Start by flipping the ON/OFF Power Switch on the top of the timer to on (1). Before taking your paper out, you will want to focus your negative, so make sure the bottom right switch (16) is to the left. This will keep the enlarger light on. Make sure that you set the Range (08) to the right at x0.1 setting. This will allow your dials to work in whole and tenths of seconds. The top dial (13) is your tens seconds (10, 20, 30, etc.). The middle dial (14) is your ones (1, 2, 3, etc.). The Lower dial (15) is your tenth of a second (.1, .2, .3, etc.). You can adjust the brightness of your LCD display by pressing the brightness button (10) multiple times. When you have the time set and are ready to expose a sheet of paper, slide the button from focus to timer (16) and then push the Start/Reset button (12) to allow the timer light to go off. Before leaving your station, make sure the Power Switch (12) is in the "**Off**" position.

The Lens

The lens has an aperture which opens and closes like your camera lens. There are f/stop numbers on the lens, which you can't always see in the darkroom, so it is important to know the f/stops in order. Most of our lenses have an f/stop range from f**/3.5 (wide open**) to **f16 (closed down)**. If you know the sequence (f/3.5, f/4, f/5.6, f/8, f/11, f/16) you can always find the setting you want to use. For example: If you want to use f/8, close down all the way (least amount of light) and open up three stops (two clicks) to f/8. When the enlarging light is on you can see it get brighter and darker as you turn the aperture ring.

- *This is a general guide. Please use pen lights for a more accurate look at your enlarger aperture.*

When using the lenses for Besler 45 Condensor Lightsource (Stations 8 & 9):

If Printing	**Use this lens**	**Set condenser stage**
35mm	50mm	Highest position possible
Medium Format (120/220)	80mm	Check scale on right side
4x5	150mm	(Ask instructor)
8x10	300mm	(Ask instructor)

Printing in the Darkroom

Printing

These instructions are a guide to help reinforce your instructor's lessons on making contact sheets and enlargements. If you have any darkroom and lab experience, you might find that these procedures may vary from what you know. Please follow these steps, as they will apply to our specific photo-lab system. Here are some general guidelines for printing in the darkroom.

1. You must have a towel when working in the lab for spills or for wiping wet hands.

2. Dress down for lab work as chemicals being used can stain clothing.

3. Do not put your hands into the printing solutions for several reasons:
   A) Your skin will absorb the chemicals.
   B) This can cause contamination of the chemistry.
   C) This can create stains on the prints.
   So always use the tongs to handle prints in the trays.

4. When you pick up a print with the tongs, let it drain for a few seconds over the tray.
   Do not shake the print because this could spray chemistry.

5. Agitation of prints in the tray is crucial to image quality. Rock trays every 5-10 seconds by lifting one corner up and down slightly (about 1 inch). This will give a fresh flow of solution to the prints (this is important because solutions can exhaust in one area if not moving). Air pockets can block out chemistry, and prints can stick together. All these can cause an uneven distribution of solution to the print, which can cause discoloration and weak image quality. Do Not Leave a Print Unattended in the Chemistry!

6. Always process your print going from **Developer** to **Stop Bath** to **Fixer** to (and **Fixer Remover** for fiber prints) **Wash Cycle**. Never go back the opposite way- this will contaminate the solutions.

7. Leave your prints in the solution for the recommended times. If your print comes up too fast and too dark in the developer, don't try to save it! The resulting print will be flat and muddy with uneven development. Go back to your enlarger and decrease your exposure time and/or recheck your aperture.

8. If the print develops too light, adjust the exposure time and/or aperture to allow additional light through (open up). **Note**: Your test strip should be a good indicator of approximate exposure times. **Remember: The more light that strikes the paper, the darker the print will be.**

9. Viewing prints to judge exposure or overall quality of the print should always be done when under the brightest light available (ideally the light in which they will be viewed for critiques). Do not try to judge a print under safelight conditions because this will not give you an accurate assessment of your image, i.e., exposure, sharpness, scratches or dust marks, burning, dodging, and contrast decisions, etc.

10. Whenever you take a wet print away from the sink for viewing, rinse the print in water for 30 seconds or more to remove some of the chemistry. Place wet prints in a **VIEW** tray and drain it over the sink for 10 seconds to avoid dripping on the floor. Use **WASH** trays only for prints that have been completely washed. If fixer gets on a washed print it will contaminate it and need to be rewashed to prevent discoloration.

11. The enlarging stations are dry areas. Any wet materials (trays, prints, etc.) must be kept away from these stations.

12. Open your box of paper only under safelight conditions.

Cutting Test Strips

When making enlargements or contact prints we will need to calibrate the enlarger before each exposure. In order to do that we will cut many small strips of photo paper. You will want these strips to be approximately one inch in width by full length of your photo paper (one 8”x10” sheet of paper will result in 8-10 test strips). **Note:** Do not open your box of paper until you get a demonstration of this by your instructor. Photo paper is light sensitive and your box of paper can only be opened in the darkroom under safe lights.

1. Turn off all the lights in the darkroom. Turn on the orange/red safelights.

2. Cut the tape on 3 sides of the bottom of the box. It is recommended that you leave the packaging decal on the fourth side to act as a hinge so your box will not open if dropped on the ground.

3. Open the box and unfold the black plastic bag. Remove one sheet of paper from the bag.

4. Fold over the bag and place it back in the box; seal the box.

5. Find the paper trimmer. The Roto-trimmer only cuts in one direction, toward the plastic measurement scale. Carefully cut your 1” strips of paper. Keep track of the cut paper as it could easily get lost on the floor in the dark.

6. Place the strips inside your black bag at one side of the bag (so they are easy to find). The cardboard box alone will allow small amounts of light through that will ruin paper.

Always close your paper box when not removing paper. Accidents happen in the darkroom and not closing your box risks the ruin of an entire box of photo paper. If someone accidentally turns on the light and your box gets ruined it is your fault for leaving the box open.

Making a Contact Sheet

The contact sheet allows you to see in print form all of the images on a roll of film, and to evaluate how well you are judging exposure when taking pictures.

1. Make sure the Power Switch is **ON** to the timer (see The Timer section). Start by setting the aperture at f/8 and setting the timer to 3 seconds.
   DO NOT USE A CONTRAST FILTER

2. With no light being projected (light switch set to timer), lift up the glass of the contact proofer and place one 2" strip of paper, emulsion side (shiny) up, on the foam of the contact proofer. Place one strip of your negative in the negative sleeve emulsion side (dull) down onto the paper strip. Place the glass on top of the negatives and paper strip.

3. Take a piece of mat board or your paper box and cover up all but 1/2" of the first frame and expose for 3 seconds. After 3 seconds, move the board to the middle of the next frame and expose for 3 more seconds. Keep doing this until you've exposed the entire strip (cutting each frame in half with each incremental exposure time).

4. Remove the test strip and slide it (emulsion up) into the Developer. Agitate, face up, constantly for 2 minutes for both RC Paper and Fiber paper (Fiber should be developed in Dektol only). Place into the **Stop Bath** face up for 5 seconds for RC paper (30 seconds for Fiber paper), then into the **Fixer** face up for 3 minutes.

5. Rinse the strip in the **Holding bath** for a minimum of one minute to remove **Fixer,** then put into a small, clean, viewing tray. Drain the tray and bring it out to the viewing light to look at the exposures.

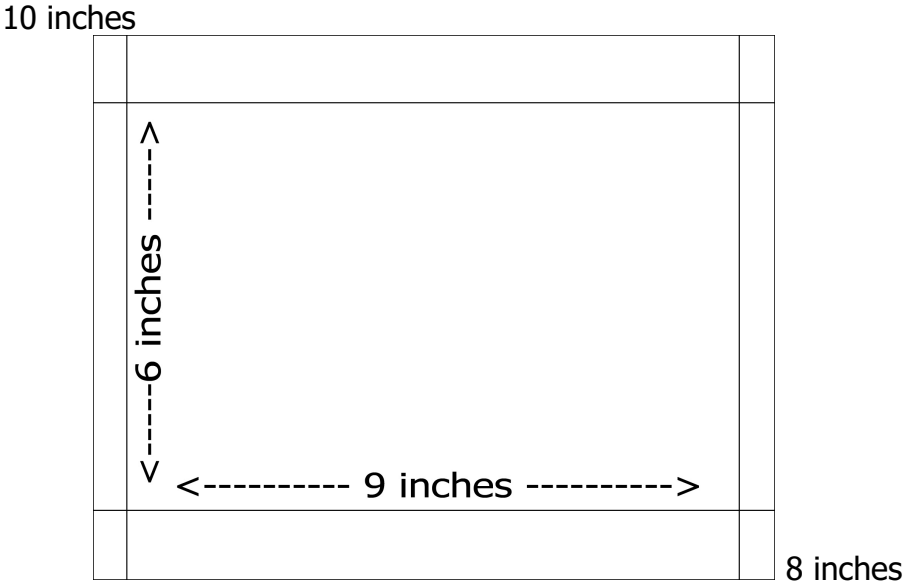
6. Looking at the sprockets you will notice divisions of exposures. Starting at 3 seconds (the lightest section) find the point where the sprockets go to black and there is no separation between exposures. Count from light to dark by threes to find this point. For example, 3, 6, 9, 12, and 15 with 15 seconds the last exposure where divisions

can be seen. Do not judge the time to use by the images in the frames. How those images look (their relative lightness and darkness) can vary because of bracketing or miscalculating lighting conditions during the picture-taking process.

7. Once you find your exposure time, set the timer for that time. Place the negative sleeve (with all of the negatives) on top of a fresh sheet of paper (emulsion to emulsion) under the glass and expose for the time selected.

8. Process in trays for times given for the test strip. Use the results of the contact sheet to judge how well your picture-taking exposures are working, as well as any film processing problems that need to be addressed.

Making A Target Print (Template)



Before enlarging the first time you will start by making a target print. A target print is used for two purposes: 1) it is used as a guide to make all prints at a consistent six by nine inch size. This also allows for a minimum of a half-inch blank space to handle the print to prevent oils from your skin getting on the image portion of the photograph. 2) it also is used to ensure that the image is focused on the top of a sheet of photo paper rather than the bottom which would result in a slightly out of focus image.

To make a target print, process a blank sheet of photo paper through the chemistry without exposure and dry it. Using a ruler and carpenters square draw a 6”x9” rectangle on the center of the emulsion side with a pencil. On an 8”x10” sheet of paper held horizontally the line should be a half inch from the left and right sides, and one inch from the top and bottom.

To Focus the Image

To Focus, open the lens to f/2.8 to project the brightest amount of light possible. Adjust your easel and enlarger height to match the size of print you wish to make. Place the Grain Focuser on top your target print on the easel. Make sure the mirror is unobstructed or you will not see any light. While looking through the eyepiece, turn the **Focusing Knob** slowly on the right side until you see what looks like fine sand granules. This is the grain of the negative. If you rotate the focus knob too far the image will go back out of focus (rotate back until sharp again). The image is now in sharp focus. Don't forget to stop down the lens to F/11 before making an exposure. Make your exposure as soon after focusing as possible because focus will shift due to enlarger movement or negative buckling. Always refocus before making a final print exposure.

Making An Enlargement

On your contact sheet find an image you want to enlarge. Look at the number underneath the image and find that frame number on your negatives. Remove the entire strip of negatives (5 frames) that includes the frame you want to enlarge. Find the negative carrier that holds the 35mm negative in place. The negative carrier should be numbered #8053 35mm. Bring the carrier and your negatives out to the light table (you will also need some compressed air or a negative brush). Place both on the light table.

1. Open the negative carrier and place the strip inside with the frame you chose in the rectangular space for a 35mm negative. **Note**: the emulsion of the film (dull side) should be facing down and the frame numbers should be upside down. If needed use a small piece of tape on the sprocket holes to secure it.

2. Carefully place the negative carrier (with the negative in it) in the enlarger with the large ring of the negative carrier facing down.

3. Pull your easel out and place on the baseboard of the enlarger.

4. Place your target print (template) in the 10” slot on the easel for 8" x 10" (second slot from the back). This focus sheet will be reused and will give you a bright surface to view the projection on. It will also function as a template to keep all your prints equal in size. Do not process this sheet of paper. **Note**: this must be a piece of photo paper to ensure proper focus.

5. Turn on Power switch of the timer (on top). Flip the light switch to focus. Raise or lower the elevation of the enlarger so that the projection spills slightly over each of the four easel blades. Focus the image with the lens aperture wide open (most amount of light) at f/2.8. There should be clear space around the projected image that will look black after the print is developed. The elevation knob and focus knob should be used in tandem.

6. Use the grain focuser to bring the negative into sharp focus. (**Note**: Always recheck focus before making an exposure. The enlargers can shift focus and negatives can buckle). Turn off focusing light by switching to timer.

7. Stop down the lens (smaller openings) to f/11 and set the timer for 3 seconds. Press the **start/print button** on the timer and the enlarger light should turn off after 3 seconds.

8. Remove the target print (template) from the easel and put it aside. Take out a test strip and place it in the easel emulsion side (shiny) up in an area of the image you consider to have the most important light and dark areas.

9. Cover up all but about 1/2 inch of the strip the long way using a piece of cardboard.

10. Push the **Start/Print** button and expose your test strip for 3 seconds. Move card to show another 1/2 inch of the strip and expose for another 3 seconds. Continue to do this until you have exposed the full strip (5-8 steps). Be careful not to move the strip between exposures, as this will cause a blurred image. Hold the board just above the easel to avoid this.

11. Process the test strip in the same manner as you processed the contact sheet. Rinse and view the strip in a tray out in the viewing light.

12. You should see a variety of exposures from light to dark. (Remember, the **lightest** exposure has the **least** amount of time, and the **darkes**t the **most**.) Select the best time, which can also be between the test times. For example, if 6 seconds is too light and 9 seconds is too dark, 7.5 seconds could be used. If the strip is overall too dark, reduce exposure time and/or close down lens aperture to f/16 and redo the strip. If the strip is overall too light, increase exposure time and/or open up the aperture to f8 and redo the strip. (**Note**: the exposure time and aperture settings are only guides, they can change according to negative density, enlargement size, paper used, etc.)

13. Judge your proper exposure by the brightest part of the image. Choose the exposure setting that gives a bright highlight with detail (you will adjust contrast with filtration to get a rich black with detail). Compare your highlight to paper white and your black to the black on the template.

14. Once you've decided on a time
    a. throw away the strip (per instructor's directions);
    b. reset the timer for the time selected;
    c. turn **Focusing Light on**;
    d. refocus, wide open on your target print (template);
    e. stop down the lens and flip the light switch to the timer;
    f. take out a full sheet of paper and place it in the easel;
    g. press the **Start/Print** button to begin the exposure;
    h. process the print through the chemicals as directed.

Processing a Black and White Print

In this lab, the chemicals are already mixed to a working solution and are ready for use for film processing. For printing, we mix the chemicals from a concentrate to make a working solution.

Mixing chemicals to make a working solution for printing (All mix to a ratio of 1:9)

Developer **Mix 13oz of Kodak Polymax T Developer with 115oz of water at approx. 70^0 F.**
(Pour into beaker 13oz. of developer concentrate, and using approx. 70^0 F water, bring up to a total of 64oz; pour into tray. Fill beaker again with 64oz. of only water; add to tray).

Stop Bath **Mix 13oz of Sprint Block Stop Bath with 115oz of water at approx. 70 F.**
(Pour into beaker 13oz. of developer concentrate, and using approx. 70^0 F water, bring up to a total of 64oz; pour into tray. Fill beaker again with 64oz. of only water; add to tray).

Fixer **Mix 13oz of Sprint Record Speed Fixer with 115oz of water at approx. 70 F.**
(Pour into beaker 13oz. of developer concentrate, and using approx. 70^0 F water, bring up to a total of 64oz; pour into tray. Fill beaker again with 64oz. of only water; add to tray).
***To make a hardening fix: Add 2oz. of Sprint Alum Hardening Converter per gallon of fix.**

Resin-Coated (RC) Paper-Print Processing Sequence

1. Kodak Polymax T Developer – 2 minutes - continuous agitation; drain well

2. Stop Bath – 5 seconds - continuous agitation; drain well

3. Fixer - 1-3 minutes - with agitation; drain well

4. Holding Bath: Used to hold prints until ready to wash, and to use as a rinse before evaluating prints. **This is NOT a final wash and should not be treated as such.**

5. Wash - 10 minutes – in archival washer, from the moment the last print was added to the slot.
   Small Washer- no more than two 8x10" prints per slot.

Large Washer- no more than four 8x10" prints per slot.

6. Drying – bring RC prints in a wash tray to the RC dryer in film processing area of lab; let dryer warm up for 5 minutes prior to use. **Set dial controls at 8 heat, 3 speed; feed wet, fully-washed prints through emulsion side up. Turn off dryer when you are done.**

Fiber Paper-Print Processing Sequence

1. Dektol Developer - 2 minutes - continuous agitation

2. Stop Bath – 30 seconds - continuous agitation

3. Fixer - 3-5 minutes - with agitation

4. Fixer Remover – 3 minutes; continuous agitation (mix 1:9)

5. Archival wash – 20 minutes

6. Drying – squeegee off excess water, dry emulsion side down on screens, sandwiching prints in between two screens to lessen curl.

Washing And Drying RC Prints

All the prints you are going to make must go through a complete washing. After fixing completely place your prints in to the holding bath tray. Make sure prints are fully submerged and do not stick together. For the archival washer check (68° - 72°) temperature and turn on water to full pressure. Wash for at least 10 minutes but do not leave in wash for longer than one hour or the paper will start to fall apart.

When completely washed, place the print into a clean "wash" tray. Make sure to drain the tray for 10 seconds before leaving the darkroom. Check the settings on the RC dryer (8 heat and 3 speed) and insert the print face up. Do not dry test strips, they will get stuck inside the dryer. When the prints come out they should be dry and ready to store away in a print sleeve in your print file box.

Washing and Drying Fiber Prints

The fiber paper used by intermediate and advanced students has a different washing cycle than Resin-Coated Paper. Because solutions soak through fiber paper, it takes longer to clear the chemicals out. Make sure you allow at least 1 hour from the time you finish printing for the completion of this process. Insufficient washing will result in discoloration, so follow these steps carefully: Use Archival Print Washers only! We have two of them. The water is pumped in the bottom of the unit and contaminated water overflows the top.

1. After Fixing, place print into Fixer Remover for 3 minutes with continuous agitation.

2. Place prints into one of the archival washers. Place either 2 - 8" x 10"s vertically or 1 - 11" x 14" horizontally into each slot and wash for **20 minutes**.

3. **Option 1:** Place prints into a clean, "wash" tray. Making sure squeegee board is clean, transfer print onto squeegee board and squeegee dry. Place prints face down between a set of screens in the drying rack.

4. **Option 2:** place the print into the Fiber Print Dryer face down. Make sure to leave about 4 inches between each print and do not put prints on the fabric seam.

5. If prints come out damp, try running them through a second time. The dryer is designed to remove moisture so prints curl less. **Warning:** do not increase the temperature as it can melt the print surface if it gets too hot. Do not leave dryer unattended, prints can get stuck to the drum and get wrinkled if they go through a second revolution.

6. Catch prints as they come out of the dryer and either: a) place in dry mount press to flatten and remove additional moisture; b) place under books to keep flat; c) if still damp, or leaving for a long period of time, place print between drying screens in the drying rack.

Note: Fiber paper prints will curl… its just their nature. The degree of curl is based on the paper manufacturer, the size of the paper, and the amount of humidity in which they are stored. Best results come from removing moisture with heat, then placing under weight for a few hours.

Printing with Contrast Filters

All beginning photography students are required to use Variable-Contrast Papers. These papers will allow you to change contrast (the difference between dark and light tones in a print) without changing to a different paper. Different paper manufacturers use different prefixes to designate a paper as **variable-contrast**. For example: Ilford - **Multi**grade; Kodak - **Poly**contrast, **Poly**max; Agfa - **Multi**contrast; and Oriental - Seagull Select **VC**. All of these papers will allow for the use of these filters to change contrast but beginner students are required to use Ilford Multigrade to ensure consistancy. The contrast grade of your paper is approximately **#2 ½** without the use of a filter. A **#2 ½** paper grade is considered to be a normal grade contrast. This means that whatever contrast is in your negative will be reproduced in the print. Each darkroom student will be will be allowed to check out a contrast filter pack during class and open lab. The filter set contains twelve (12) filters and students' accounts will be charged for the replacement cost of the pack if it is not returned in complete with all filters in order.

Contrast Scale

Lowest---------- **Normal** ---------- **Highest**

00 0 ½ 1 1 ½ 2 2 ½ 3 3 ½ 4 4 ½ 5

With normal printing changing the contrast filtration will make the dark portions of a print more or less black. Increasing the filter number makes the dark areas more black; Decreasing the filter number makes the dark areas less black (more gray). Contrast should be adjusted until you have a black that is rich (as dark as possible) while retaining detail. Exposure time should always be adjusted before contrast. Judge exposure time based on the brightest part of a print (use your contact print as a guide for this). Increase exposure time if the brightest area of a print is too bright and has no detail; Decrease exposure time if the brightest part of a print is too gray. A good exposure time will ensure that you have a bright white that retains a detail in the highlights of the print.

Always start an enlargement with a #2 filter. If you begin printing without a contrast filter and determine a good exposure time but need to increase or decrease your contrast you will have to start over. Contrast filters block light. Filters 00 through 3½ block equal amounts of light so you will be able to use the same exposure time to get detail in your brightest white when you switch contrast grades. Filters 4 through 5 will block twice that of grades below 3 1/2.

Note: The use of a **#2½ filter** matches the contrast grade of Variable-Contrast paper and should make no change in the print contrast, but this is not always the case. The various paper manufacturers produced different contrast levels for the same contrast grade of paper. In other words, using no filter on a multigrade Ilford paper with different surfaces (glossy, matte, pearl/luster) or even different production lines (when you change to a new box of paper) will not necessarily produce the same contrast level. *To assist with this issue it is recommended that students purchase 100 sheet boxes of paper and avoid gloss or matt paper that have greater problems with this issue.*

*To compound this, the different brands of filter sets produce different results. Such as a **#3 1/2 filter by Kodak** and a **#3 1/2 filter by Ilford** will not produce identical contrast using the same paper. It is recommended that student always use Ilford paper and contrast filters (the school packs of contrast filters are all Ilford).*

To conclude, the use of a **#2 filter** can give you a resulting print with slightly more or less contrast than no filter depending on the variables discussed above. To create more midtones or grays, reduce contrast in the print by using a lower numbered filter. To create darker shadows and brighter highlights, increase contrast in the print by using higher numbered filters. Remember, a **#00 filter** will produce the lowest contrast and a **#5 filter** will produce the highest contrast. Always start at 2 and move half a number at a time.

Exposing with Filtration

You should always start printing with a **#2** filter. Check to make sure your filters are clean before using. Filters that are scratched or stained with chemistry will diminish the quality of your print. There are two places to put filters. If you have a 6" x 6" filter use the drawer above the negative carrier. If you have 2" x 2" filters, use the filter holder that swings under the lens. The 2" x 2" filter holder can cut out some of the image on the corners if it is not aligned just right so make sure you're projecting a full image. It is easier to focus your image with white light (no filter) because the filter blocks out some light. Place the filter in the filter holder before exposing. It is suggested you make another test strip each time you change the filter. Use the filter factor guides below to approximate your exposure:

- Going from No Filter to a #00 through #3 1/2 filter, double your exposure time (2x).
- Going from No Filter to #4, #4 1/2, #5 filter, quadruple your time (4x).
- Going from filters #00 through #3 1/2 to a 4, 4 1/2, 5 filter, double your time (2x).

Remember:
- Use only one filter at a time.
- Hold filters by the sides. They smudge and scratch very easily. Do not attempt to clean them.
- Return filters to the filter storage tray in their proper order.
- Notify your instructor and/or The Photography Coordinator if your box is missing any filters.

Print Finishing

Retouching Prints

It is unavoidable that most prints will need to be retouched. Whenever you enlarge an image, any dust, lint or UFO that is sitting on the negative surface hitches a ride and grows with the enlargement size. If the UFO is sharp it is somewhere on the negative, dust on the contrast filter or lens would be out of focus. Even with the most meticulous care of wiping, blowing, or brushing on the negative, dust can still find its way to your film.

Helpful Hints to Avoid Needing to Retouch Prints

1. Handle your negatives with care. Never let film touch the tabletops or floor. Always turn off the film dryer before opening the door and do not leave the door open when finished. Do not leave film in the drying cabinet for more than an hour. Always cut and sleeve film immediately and clean the light table before using it. Never store film in anything made of paper like an envelope or book, as lint and ink will stick to the film. Never handle film across the image area; oils from your skin will leave permanent marks on the emulsion.

2. Scratches on your film will show up on the print. If the scratch on the negative is showing up black on the print, for all intents and purposes, there's not much you can do. This is an emulsion scratch. If the scratch shows up white, this can be repaired. The scratch is refracting light away from the surface of the paper, leaving a white line. By

filling in the scratch with Vaseline, **Edwals No-Scratch**, or nose grease (no kidding), light is redirected back on to the surface of the print. Make sure these are applied across the scratch and wiped off afterward. Also clean your negative carrier to prevent spread of these materials.

3. When you make the first print from a negative and bring it out to the viewing light, along with your critical analysis of the print, look also at the surface of the print to check for dust spots. This way you can remove the dust from the negative before making your final print.

4. The anti-static cloth on your supply list for the class works best to repel dust. Wipe both sides of the negative with the cloth before placing the negative into the carrier. NEVER wet these orange cloths because they contain an anti-static detergent that can spread and ruin your film.

5. Compressed air blows dust off but doesn't help repel dust. **Important: Do Not tilt the can of compressed air while using.** A gas will spray out and can stain your negatives. Keep the can upright and **tilt the film** when using.

To Retouch Your Prints You will need:
- Marshalls Neutral Black Spot All liquid, Spot Pen retouching makers, or Peerless Dry Spot retouching sheets
- a brush #000 or finer
- a small cup of water
- a scrap of white paper
- patience

Procedure

Place a few drops of spotting fluid on a surface that will not absorb it. (A plastic or metal spoon works well.) Let this dry overnight.

1. Wet the brush in water and brush the edge of the dried spotting fluid until some is absorbed into the brush.

2. On a scrap piece of white paper, brush out the spotting fluid from the brush until it shows up light gray. **Important**: **Always start lighter** than the area you need to match. You will build up to the value you need by applying more spotting fluid to it.

3. Apply the spotting fluid to a white spot of a **dry print** by using the point of the brush to fill the spot. **Do not brush this on**. Fill the spot one dab at a time.

4. If you are spotting a line, do not brush the length of the line but dab consecutive points on the line to fill it in.

5. Remember to stay within the borders of the spot, as the surrounding areas can also get darker with spotting fluid.

6. Spotting fluid will dry quickly so work carefully. Spotting fluid can be washed out of the print by rewashing the print for about 10 minutes. **Remember** that this will wash out **all** the Spot tone-mistakes or not.

Another option to the above is spot pen markers. These markers are available for in lab use. There are ten markers in a pack with an approximate shade on the side. Always start one tone lighter than you think you will need. Be careful not to push hard and ruin the tip, as they are not replaceable. Return all ten markers to the pack in proper order before turning into the person on duty.

Dry Mounting

Dry mount presses are available for your use in the classroom. Your instructor will demonstrate its proper use. There are a number of methods for presenting your work; dry mounting is the standard for black and white darkroom prints. Careless and improper use of the press will result in your ruining your photographs and possibly the press itself. The supplies you will need are: mount board or museum board (un-textured, white on one side), dry mount tissue (Seal Color Mount for resin-coated [RC] paper), Seal MT-5 Plus for fiber-based paper.

Precautions:

Never use the dry mount press without a cover sheet both above and below the work! Pressing without a cover sheet may ruin both your prints and the press. Do not use a cover sheet that is wrinkled, it will impress the wrinkles right into your print.

Never exceed the recommended mounting temperature for the type of paper you are mounting. For **RC** and **fiber based prints**, a temperature between 190 and 200°F is sufficient and not to be exceeded; **Excessive temperatures can scorch or melt your prints**. Leaving the print in the press for too long a time can also burn it. A time of 90 seconds (or until the print is affixed firmly) is recommended. Do not leave unattended or longer than 2 minutes. **Check the temperature based off the thermometer scale and not the dial.**

Turn off the press and the tacking iron before leaving the area! Unplug the tacking iron and turn off the power switch on the press. Failing to do so can create a fire hazard in the lab. Also, NEVER place the tacking iron directly on the table, it will burn the surface of the table and could start a fire. Always use a metal cradle between the iron and the table.

Exercise care when using the paper trimmers. When holding the print down, do not apply pressure toward the blade. Do not use the rotary paper trimmers for cutting mat board. This will dull or jam the blade. **Collect all unwanted scraps and throw them in the garbage.**
(See instructions below.)

Procedure:

1. Plug in, turn on, and set the temperature on the press in advance and allow 15 minutes for the press to warm up. Use between 190° and 200°F for mounting resin-coated paper and fiber-based prints.

2. Plug-in the tacking iron and set its thermostat at a medium setting. Place it on the metal cradle.

3. Remove excess moisture from both the print and the mount board. To do so, place each in the heated press separately for about 1 minute. Position the print and board under a protective sheet in the press to keep them from being scorched. If you have glossy, use an additional sheet of unused white printing paper to protect the print surface.

4. Place a mounting board on a clean, dry, flat surface. Place the print face down top of the mat board.

5. Lay a sheet of dry-mounting tissue on the back of the print. The tissue should equal the size of the print or larger. Center the tissue to completely cover the print.

6. With a short easy stroke, move the heated tacking iron across the middle of the tissue (1-3 seconds of contact). Since the tissue becomes sticky when heated, it will adhere to the print at the spots that are touched. **Note:** Do not press down too hard with the iron or move too slowly; this can cause indentations on the print, and melt the resin-coating on the image side resulting in a shiny spot in the surface. **Tack the print to the tissue BEFORE you trim the print.**

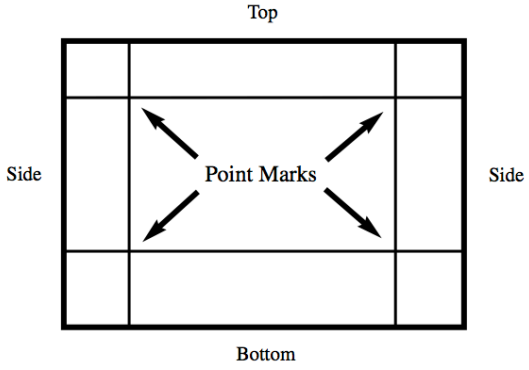
7. Turn the print over and place it on the paper trimmer. Since the dry-mounting tissue and the print are attached, they will be cut at the same time, and they will be the same size. Check to make sure the trimmer is clean before use.

8. Slide the print under the plastic guard to the cutting edge. **Note:** The roto trimmer only works in one direction and

will leave a rough edge if used the wrong way. If you are going to cut a window mat, leave some white border around the print. If no window mat is going to be used, cut all the way to the black border around the image without removing it. Make sure to cut an even width on the black border and match all four sides to be equal width. Do not use the 90° scale on the trimmer to cut your prints because the frame inside your camera is not always 90° and this could result in crooked or uneven black borders.

9. Place the trimmed print (with the attached tissue) on the mount board. Position it so that the space on the sides is equal and the bottom has about **1/2"** to **1"** more space than the top. Use a ruler; there is nothing worse than spending hours making a print to then mess it up by being sloppy with your mounting.

10. Mark the approximate corners lightly with a hard leaded pencil. Measure distance to sides and top and remark if inaccurate then align print with marks.



11. Once the print is positioned, cover it with a clean piece of paper and apply pressure to keep the print from moving.

12. Lift up one corner of the print, leaving the tissue lying flat in place on the board, and apply the tacking iron gently to the corner of the tissue to attach it to the mount board (1-3 seconds of contact. **Important: Tack outward toward the corners of the tissue. Tacking inward can cause air to be trapped under the tissue and bubbling under the print. Ensure that the iron does not touch the mount board because it will leave yellow residue.**

13. Re-measure all the sides to check that the borders are square. If they are not, remove the tissue at the corners, reposition the print, and tack down the corner again.

14. Place the print with a piece of clean white paper over it and the attached board in the dry mounting press. Be sure that the protective release paper is positioned between the heating plate of the press and the print. Close the press for about 90 seconds, or until the print is affixed firmly to the board.

15. Take the mounted print out of the press but return the protective release paper.

16. Place the print on the designated flattening countertop and cover it with a white piece of paper, then add weight with textbooks to prevent the mat board from curling.

17. After five minutes the board should be cooled and the work should be moved to provide space for the next person.

18. If dry mount tissue is showing around the edges of the print after mounting, use an x-acto knife to trim it off.

19. Turn off the tacking iron and mounting press, put away text books, and throw away your trash.

Recommended Board Sizes

The following sizes are commonly available at art stores: 8x10, 9x12, 11x14, 12x16, 14x18, 16x20, 18x24, 20x24, 20x30, 24x30, 24x36, 30x40. Mat boards come in thicknesses of 1 ply, 2 ply, or 4 ply. Buy 2 ply or 4 ply thick boards. DO NOT buy boards that are smaller than 12"x16" if you are in a 100 or 200 level class. Boards should always have 2½" to 3" of space on each side of the print.

If your image size is approximately:	Your board size should be at least:
6" x 9"	**12" x 16"**
8" x 11"	14" x 18"
10" x 13"	16" x 20"
13" x 17"	20" x 24"

Using a Gray Card

There is a direct relationship between the quality of your negative and the quality of your print. Exposure (picture-taking) and development (of film) together create the density and contrast your image will have. Generally, students have very little problems with the film development process as long as they follow the step-by-step procedures. But film exposure problems can haunt some students all semester. It goes like this:

Wrong Exposure = Poor Quality Negative = Poor Quality Print =
Frustration for waste of time, money, and energy!

This can mostly be avoided by using a **Gray Card** to measure exposure. A Light meter averages everything in a scene to 18% gray, which is the brightness of a gray card.

1. Place the Gray Card so that the gray surface is facing the camera. Make sure that the same light illuminating your subject is also illuminating the Gray Card.

2. Try to position the Gray Card as close to the subject as possible. For daylight exposures, exposure readings can be made near the camera as long as it receives the same intensity of light as the subject (watch for changes in light on partly cloudy days caused by moving clouds).

3. Make sure the Gray Card is positioned at the same angle as the subject. Tilt it back slightly to ensure that it does not create a shadow on itself.

4. It is also important that you read only the Gray Card. In other words, if your meter is in the camera, fill the viewfinder with the Gray Card. The Gray Card does **not** have to be in focus. Be careful not to cast your shadow onto the Gray Card.

5. Set your meter based off the Gray Card and leave that setting. When you remove the Gray Card the meter reading will usually change, but **Do Not** adjust for the change. In other words, if your Gray Card reading is f/8 at a 1/125, but then by removing the Gray Card your camera meter indicates you are now over or underexposed, leave the setting at f/8 at a 1/125. You want to calibrate to the gray card and recalibrate for each image with different lighting.

6. If your subject and lighting remain the same, you should then bracket your exposure **one stop over** and **one stop under** for negative film. Bracketing will provide some exposure variations to choose from so that you have options when printing in the darkroom. **Bracket only after your initial Gray Card exposure.**

7. If you are in low light conditions and your meter will not give you a reading, you can use the white side of the Gray Card. Measure light the same way as discussed but add 2 1/3 stops more to your exposure.

8. Remember if lighting conditions change, another Gray Card reading must be taken.

In conclusion: The use of a Gray Card is the primary means for judging exposure. It's a simple tool to give you more accurate meter readings, but it must be used to work for you. The result will be a qualitative difference in the negatives and prints you produce.

Ethical and Legal Aspects of Photography

During every semester, in every class, the question of the ethics and legalities of picture taking is always an issue. It is important for students to know the parameters of these areas for their own knowledge and protection. This writing by Arnold Gassan should help to broadly clarify some of these questions, but remember that there are judgments made due to a variety of conditions, which tend to obscure definitive answers.

Restrictions
By and large, in our society a photographer is free to photograph what he or she wishes, but there are some limits on what can be photographed, and what can be published. Some of these limits are established by law and others by good taste. For example, under the United States Code, it was formerly considered counterfeiting to photograph American currency. Now, in certain circumstances, for certain uses, it is permitted. You can make pictures of almost anybody in a public place, unless that person is protected by the law and the public place is not one in which photographs are prohibited, or where a permit is required. Some seemingly public spaces in fact require you to obtain permission to take photographs; e.g., the New York subway and many museums.

Privacy
We each own our faces, and therefore retain the right to privacy. An amateur photographer is under fewer constraints than a professional, but either one should have permission from the person photographed or the owner of property to use photographs for sale, profit, and most public exhibitions.

The following have been legally established as violations of privacy:
• publishing a photograph of a person's face or likeness or a photograph of their property for advertising or trade, without that person's permission
• disclosing embarrassing private facts to the public
• using a picture to suggest a falsehood
• trespassing to take a photograph

Permission to reproduce a photograph must be obtained by the photographer, and anyone can release the right to privacy; permission to reproduce photographs is easily obtained by having subjects sign a model release. A sample model release is shown at the end of this section; this can be photocopied and carried for use when needed.

Not all uses of pictures require a release. No release is needed if the event is news worthy, and in general a release is often not sought when the picture is used in an editorial, rather than advertising or trade, context. But this is a legal gray area, and the trouble of obtaining a release is small when compared to the expenses of protecting yourself in even one legal suit for invasion of privacy.

Many art and commercial photographers do use or exhibit pictures of people and buildings or other images without a release. At the least, they do so unethically, and they do so at their own financial risk. There have been several recent sizable financial settlements made to property owners whose buildings were unwisely used for advertising by photographers who thought they were photographing public property.

Intrusion and Trespass
Intrusion is legally similar to trespass: you need not step foot on another's property to be intrusive. The photographer is prohibited from being intrusive in the act of making a picture. Intrusion can be defined as making your presence evident even when you are not physically on another person's property. Intrusion is more difficult to prove legally than trespass, but it is usually unethical behavior, at the least. Photographers have been arrested for going to unreasonable lengths to produce photographs; for example, by hiring boats and using telephoto lenses to photograph someone on a private

beach.

Publicity and Libel
A right of publicity is retained by many people who have created a celebrity value in their name or features. Commercial use of photographs of pictures of such a person is considered subject to license contracts. This is different from being a newsworthy figure, and has been considered as a capital asset by the courts.

Libel is defined as damaging a person's reputation by communicating a false statement.
For many years, a newsworthy photograph of a public figure was not suitable for liable unless it was shown to be made with reckless disregard for the truth, or was deliberately false to the reality of the situation. Obviously, a photograph can give a false impression when it is changed by cropping, but powerful distortions of the physical reality of the situation can be created by choice of lens and point of view. Libel law is now being reconsidered in the courts, and definitions of who is subject to libel may change.

Copyright
The U.S. Copyright Law was revised in 1978, and now provides protection for photographs as well as written material. Your unpublished photograph is automatically protected in this country under the copyright act if it is original work. To protect it when it is exhibited or published, the print must bear the copyright symbol ©, your name, and the year, or the phrase "Copyright (year) by (name)," where it can be seen easily.
Under copyright law, you have five exclusive rights, four of which are of concern to photographers:
• the right to reproduce the picture
• the right to prepare derivative works
• the right to distribute the work to the public
• the right to exhibit in public
The definitions of most of these rights are evident, but the second in the list also means that others cannot reuse your photographs in modified form without permission.

Photographs can be registered with the copyright office of the Library of Congress (Washington, DC., 20559), but whether registered or not, copyright protection for your original photographs extends for the duration of your life, plus 50 years. When photographs are made for hire, the law is a little different: the copyright protection is for 75 years from publication or 100 years from creation (whichever is shorter). While the copyright registration does not have to be done until the work is published, if publication is considered, copyright should be completed, if only to avoid possible litigation.

Who Owns the Picture
When you make a photograph to order for a client, the client owns the pictures you make, including the negatives and all rights, unless a specific contract defining ownership has been prepared. The photographer may retain the negatives, but cannot make use of them without the customer's permission. In other words, the photographer functions as a factory that manufactures and warehouses photographs.

When the photographer works on speculation or assumes the expenses and produces the pictures for his or her own profit, however, ownership is generally considered specific to the photographer. But even then there may be an implied contract, in which ownership would revert to the model who was photographed, or to the client who used the photographs.

Because of this long-standing legal definition of ownership of photographs, it is wise to have a licensing agreement before beginning work. This kind of contract helps assure the photographer that only the usage of the pictures has been purchased, not the original photographic materials themselves.

Obscenity and Pornography
The legal definitions of obscenity and pornography are unclear at present. Our society is very confused about sex and art and photography. Ultimately, it seems that community standards prevail when defining permissible images. Where the photograph is exhibited affects a definition, as much as does the subject matter. An art gallery can show explicit nakedness and sexual relationships that might be cause for arrest if seen elsewhere. The proof is on the photographer, should the question be raised, to show that the work, taken as a whole, has serious artistic value.

PROPERTY RELEASE

Specify Property
Covered by Release: _____

Property Address:_____

_____

_____

Contact Phone:_____

Contact E-Mail:_____

Attach visual reference here, aligned to top right-hand corner if larger than box.

For example, Polaroid, print, photocopy, etc.

OWNER'S PERMISSION AND RIGHTS GRANTED:

As owner or authorized representative of the Property and by signing this release, I give the Photographer/Filmmaker and Assigns my permission to create and use the Images depicting the Property in any Media, for any purpose (excluding defamation and/or pornography) which may include, among others, advertising, promotion, marketing and packaging for any product or service. I agree that the Images may be combined with other images, text and graphics and cropped, altered or modified. I agree that all rights to the Images belong to the Photographer/Filmmaker and/or Assigns.

Unless prior written permission is obtained, Photographer/Filmmaker and Assigns agree that the Property's owner, tenant and/or location (with the exception of reference to general region, country or state) will not appear in the image caption or in any other information presented with the image for licensing purposes and all trademarks, names, and logos will be removed from the image prior to promotion, marketing and licensing.

I agree that I have received Consideration for the rights granted in this release. I acknowledge and agree that I have no further right to additional Consideration or accounting, and that I will make no further claim for any reason to Photographer/Filmmaker and/or Assigns. I acknowledge and agree that this release is binding upon my heirs if applicable, assigns or any person claiming an interest in the Property. I agree that this release is irrevocable, worldwide and perpetual, and will be governed by the laws of the state of New York, excluding the law of conflicts.

I represent and warrant that I am at least 18 years of age. I have the full legal capacity and right to execute this release and grant the rights herein granted with respect to the Property, and to bind all persons claiming an interest in the Property.

For Individuals:

Owner Signature_____
Date

Owner
Printed Name_____

For Corporate Ownership:

Name of
Corporation_____

Employee
Signature_____
Date

Employee
Printed Name _____

Title/Position_____

Owner [ ] Authorized Representative [ ]

DEFINITIONS:
"PROPERTY" means the place and or property that is the subject of the Shoot.
"MEDIA" means all media including digital, electronic, print, television, film and other media now known or to be invented.
"PHOTOGRAPHER/FILMMAKER" means photographer, illustrator, filmmaker or cinematographer, or any other person or entity photographing or recording the property.
"ASSIGNS" means a person or any company to whom Photographer/Filmmaker has assigned or licensed rights under this release as well as the licensees of any such person or company.
"IMAGES" means all photographs, film or recording taken of the Property as part of the Shoot.
"CONSIDERATION" means something of value I have received in exchange for the rights granted by me in this release.
"SHOOT" means the photographic or film session described in this form.

_____The following to be completed by Photographer/Filmmaker_____

Photographer's/Filmmaker's Name: _____ Shoot Date: _____

Photographer/Filmmaker's Signature: _____

Shoot Description [and Shoot Reference if applicable]: _____

_____

Release Reference-Stills Only
(e.g. pr1.jpg)

Property Std USA 0406

MODEL RELEASE

Model's Name: _____

Model's Address: _____

_____

_____

Model's Phone: _____

Model's E-mail: _____

Attach visual reference here, aligned to top right-hand corner if larger than box.

For example, Polaroid, drivers license, print, photocopy, etc.

MODEL'S PERMISSION AND RIGHTS GRANTED:

For good and valuable Consideration herein acknowledged as received, and by signing this release I hereby give the Photographer/Filmmaker and Assigns my permission to license the Images and to use the Images in any Media for any purpose (except pornographic or defamatory) which may include, among others, advertising, promotion, marketing and packaging for any product or service. I agree that the Images may be combined with other images, text and graphics, and cropped, altered or modified. I acknowledge and agree that I have consented to publication of my ethnicity(ies) as indicated below, but understand that other ethnicities may be associated with Images of me by the Photographer/Filmmaker and/or Assigns for descriptive purposes.

I agree that I have no rights to the Images, and all rights to the Images belong to the Photographer/Filmmaker and Assigns. I acknowledge and agree that I have no further right to additional Consideration or accounting, and that I will make no further claim for any reason to Photographer/Filmmaker and/or Assigns. I acknowledge and agree that this release is binding upon my heirs and assigns. I agree that this release is irrevocable, worldwide and perpetual, and will be governed by the laws of the state of New York, excluding the law of conflicts.

I represent and warrant that I am at least 18 years of age and have the full legal capacity to execute this release.

To be completed By Model:

Model's
Signature:_____Date:_____

Model's
Printed Name:_____

Model's
Date of Birth: _____

Additional information to be completed by Model:
(Optional)

Ethnicity information is requested for descriptive purposes only, and serves as a means of providing more accuracy in assigning search words.

___Asian – circle each that applies to you:

(Chinese, Indian, Japanese, Korean)

___Asian, Other ___Caucasian, White

___Hispanic, Latin ___Middle Eastern

___Native American ___Pacific Islander

___Black ___Mixed Race

___African American

Other:

DEFINITIONS:
"MODEL" means me and includes my appearance, likeness and form.
"MEDIA" means all media including digital, electronic, print, television, film and other media now known or to be invented.
"PHOTOGRAPHER/FILMMAKER" means photographer, illustrator, filmmaker or cinematographer, or any other person or entity photographing or recording me.
"ASSIGNS" means a person or any company to whom Photographer/Filmmaker has assigned or licensed rights under this release as well as the licensees of any such person or company.
"IMAGES" means all photographs, film or recording taken of me as part of the Shoot.
"CONSIDERATION" means something of value I have received in exchange for the rights granted by me in this release.
"SHOOT" means the photographic or film session described in this form.

_____The following to be completed by Photographer/Filmmaker_____

Photographer's/Filmmaker's Name: _____ Shoot Date: _____

Photographer/Filmmaker's Signature: _____

Shoot Description [and Shoot Reference if applicable]: _____

_____

Release Reference-Stills Only
(e.g. mr1.jpg)

Adult Std USA 0406