

APPENDIX I: PHOTOGRAPHY

A. INTRODUCTION

This appendix deals with photographing museum property for accountability purposes. The objective is to record museum property photographically and to be able to use these results as an adjunct to the catalog system. The procedures outlined give good record photography results if the directions are followed. The only skill requirement is that the cataloger understand the operation of the camera to be used.

Photography is an excellent supplement to cataloging. In most cases, photographs are more efficient and effective than words in describing objects. Not all objects and specimens, however, should be photographed. The cataloger decides if a photograph is warranted. It is recommended that controlled property be photographed.

Recent technical advances have opened up many new possibilities for visually documenting museum property and supplementing cataloging. As a word of caution, the longevity and preservation needs of these products and systems (e.g., VHS and C.D.ROM) should be evaluated. Video and computer imaging are beyond the scope of this appendix.

B. EQUIPMENT

Camera: A 35 mm single lens reflex camera is recommended for museum property photography. 35 mm offers the greatest flexibility and quality, and maximum economy. The model should have the ability to set aperture and shutter speed manually. Automatic models should have an override to permit this adjustment.

Lenses: A 50 mm lens has, in general, the most useful focal length, but a 55 mm macro lens is an excellent choice for small items and close work. On occasion a 35 mm or 28 mm lens is needed for wide angle shots, such as in close quarters with large objects, or for architectural

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photos in surroundings not affording sufficient room to encompass the entire building or object.

Filter: UV filter to protect the front surface of each lens. Close up lens kit for increased focusing capability. Optional polarizing filter for reducing reflections.

Lights: The lights needed are EBW Number B 2 photoflood lamps (500 watts each) mounted in reflectors. The reflectors should be between 10" and 16" in diameter with a preferred size of 12" or 14". The quality and cost vary greatly. Some can be used with clamps attached to chairs and others attach to adjustable light stands. They are available through most photography stores.

Film, Black and White: The following film is recommended for record photography: Kodak T-Max 100 Exposure Index (EI) or ISO 100. Kodak Plus-X, (EI or ISO) 125 may also be used. ASA is no longer used to describe film speed, rather Exposure Index (EI) or ISO is used.

Film, Color: The following film is recommended for record photography: Ektachrome 100 EI 100 for color transparencies and Kodacolor 100 EI color negative film for color prints and Ektapress 125 color negative film for color prints.

Developer: Use the developer recommended by the manufacturer. To ensure longevity of the print, archival processing and washing is recommended.

Kodak T-Max 100 should be developed in T-Max developer or in standard commercial lab developer such as Kodak D-76 or Kodak T-Max RS developer.

- Tripod: A sturdy tripod to hold the camera steady when using a slow shutter speed is needed. A tripod with 2 or 3 telescoping section legs and a swivel or pan head is best.
- Shutter Release Cable: A shutter release cable is also needed when using a slow release shutter speed to avoid moving the camera when releasing the shutter. The cable is attached to the shutter release.
- Exposure Meter: Built into camera or hand-held reflection type. A hand-held incandescent light may be used.
- Kodak gray card: A gray card is used to take accurate exposure meter card readings under the lights. The light reflected from the gray card gives a better reading than that reflected from the object. An 8" X 10", 18% gray card may be purchased.
- Background paper or material: Light gray and dark gray. Paper can be bought at any professional photo supply store and comes in widths of 54" to 11' by lengths up to 100'. Do not use a black or a white background due to potential loss of detail in the object or specimen.
- Identification Card: A card with changeable numbers to show the film roll number, and catalog number of the object or specimen is placed in every photo. With this information in the photo, the photo is less likely to be misidentified. Different size cards and changeable or magnetic numbers are needed for different size items.
- Metric Scale: Photographer's standard metric scale is placed in every photo next to the Identification Card. Centimeter and meter scales of different lengths are

needed for items of different sizes. The scale has alternating black and white blocks in standard metric units (e.g., 1 cm, 10 cm, 1 m).

Color Control Card: A Kodak Color Control Patches Card should be placed in every color photo that is taken, next to the identification card. It provides a scale for determining

colors in color photos. The scale is available from photo stores.

Gray Scale
Control Card

Gray scale control card for inclusion in black and white photographs.

Additional
Equipment

In addition to the above list, the following items may be useful:

Polarizing gelatin filters for lights.
Hand-held light meter. Object or specimen supports--styrofoam, Plexiglas, cardboard, wood blocks, display easels, wall hooks for art.

Standard photo copy stand--with four lights (150W) or with two photofloods. Used to take photographs of different sized two dimensional images.

C. SUMMARY OF PROCEDURES FOR TAKING PHOTOGRAPHS

The basic procedures for taking photographs of museum property are summarized below. Detailed discussions of these steps follow.

- ! Prepare background
- ! Arrange lights
- ! Group items by size and type
- ! Place object or specimen, Identification Card, Metric Scale and Color Control Card
- ! Control Patches Card, for color photo, on background paper
- ! Place gray card
- ! Load camera with film and set EI or ISO

- ! Turn on photoflood lights
- ! Determine exposure
- ! Turn off lights
- ! Mount camera on tripod and compose
- ! Turn on lights
- ! Shoot
- ! Turn off lights
- ! Record information about the photo
- ! Change objects or specimens; repeat steps as appropriate

1. Prepare Background

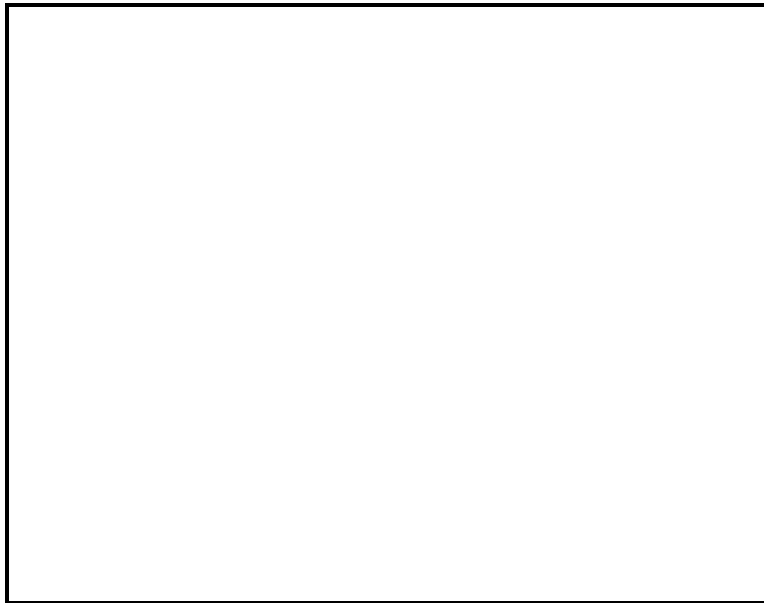


Figure I.1. Two Photography Background Options

A table against a wall works well for objects under 3' in size. Hang the background material on the wall (e.g., with drafting tape, which should not mark the wall) and let the material drape over the table without forming a crease or seam (see Figure I.1). Larger objects are usually easier to handle on the floor. Photographing very large objects should not require the use of a background material.

2. Arrange the Lights

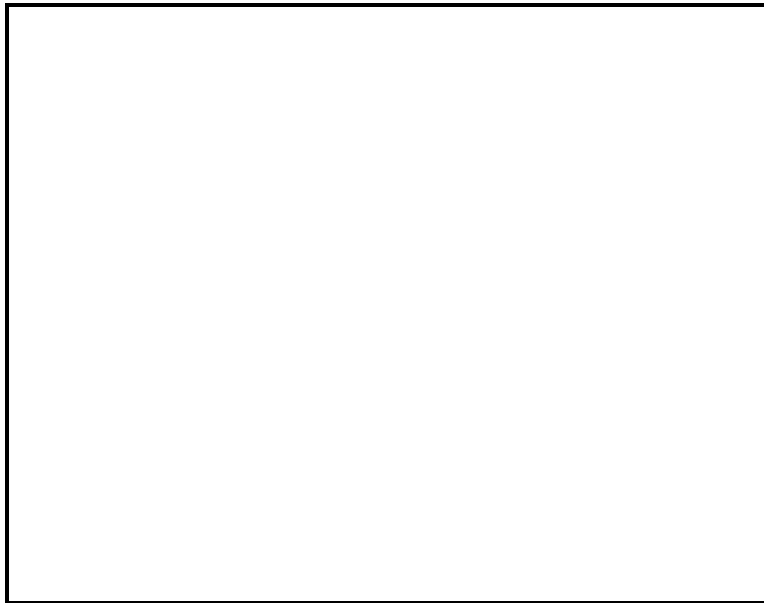


Figure I.2. Basic Lighting Setup

The basic lighting setup for most objects will be a key light set 6' from object at a 45° angle and a fill light set 7' or 8' from the object at a 60° to 70° angle.

Controlling the distance, angle, and height of the lights will make the difference between a properly lit object

and one with many obscuring shadows.

Refer to Figures I.3 and Figure I.4. Use the following standards to set up the lights and then adjust as needed for the best results.

- ! distance: one light at 6' (key light); the fill light at 7' or 8'.
- ! angle: key light (6') at 45° from wall; fill light (7-8') at 60° to 70° from wall
- ! height: high enough to light top surface and front.



Figure I.3.



Figure I.4.

**Recommended Distance and Angles
for Light Placement**

Recommended Height of Light

The distance and angle easily can be determined using a piece of string and a 12" cardboard square. Draw a diagonal line on the card from point A to point D forming a 45° angle (see Figure I.5). From Point A draw a second line to point C forming a 60° angle (see Figure I.5). Place the same illustrations on the reverse, keeping the A-D axis on the same diagonal of the card. Place the card on the background, with point A on the spot where the object is located and point B in the direction of the camera.

Cut the string to 8' and knot at 6' and 7'. Attach the string at point A. Hold it taut and move around until the string aligns with the A-D line for the key light. Flip the card and align the string with the A-C line to position the fill light (see Figure I.5); CD is half of BD.

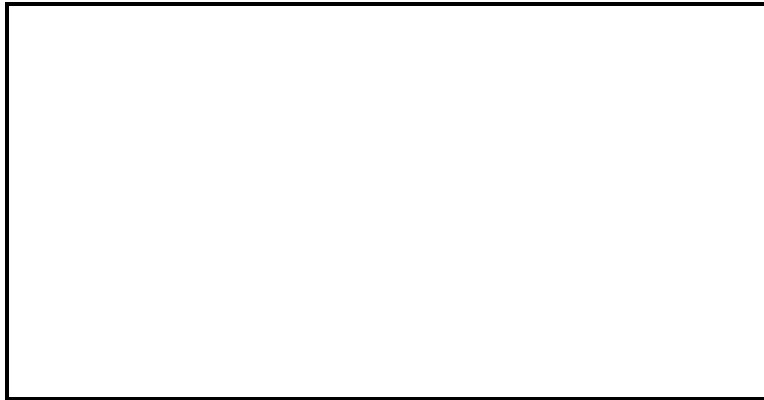


Figure I.5.

Recommended Angles for Key and Fill Lights

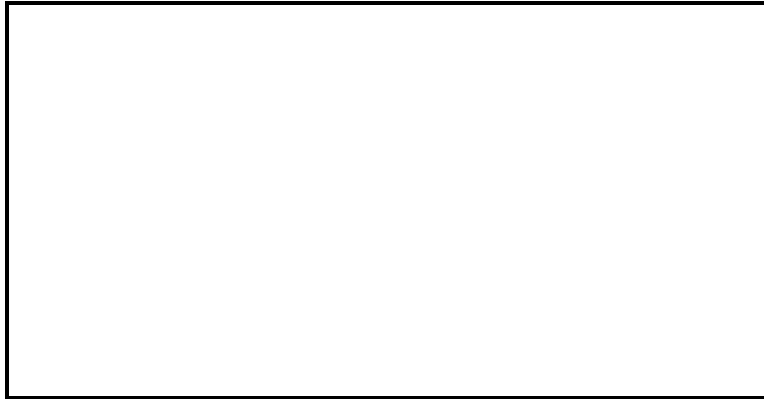


Figure I.6.

Relationship of Shadows from Key and Fill Lights

The key light, at 6', creates a harsh shadow. The fill light illuminates the shadow of the first without creating a second harsh shadow (see Figure I.6.)

3. Group Objects and/or Specimens by Size and Type

Time and energy can be saved if the objects and/or specimens to be photographed are grouped according to size and type. Such groupings preclude having to adjust distances or heights of the lights or camera for every object.

4. Place Object or Specimen, Identification Card, Metric Scale and, for Color Photo, Color Control Patches Card

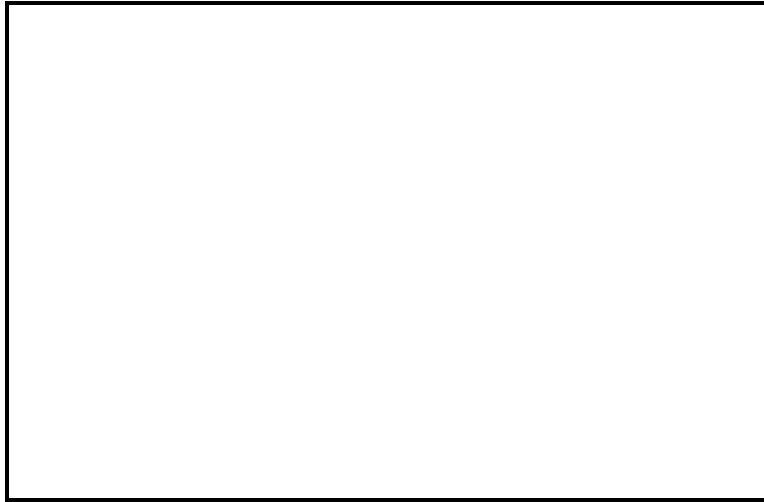


Figure I.7. Recommended Placement of Object

The object should be placed in the middle third of the flat working surface, if possible, to avoid having the front edge of the background in the photo or the back portion of the background in focus (see Figure I.7).

Place the Identification Group (the Identification Card, Metric Scale and, for color photos, the Color Control Patches Card) near the front of the object without blocking any part of the object (see Figure I.8) Different size Identification Groups are needed for different size objects.



Figure I.8. Recommended Placement of Identification Card and Metric Scale

5. Place Gray Card Perpendicular to the Len's Line of Sight

The exposure meter reading should be taken using light reflected from the gray card. This reading will be more accurate than one taken using light reflecting from the object and background.

6. Load Film and Set Exposure Index (EI)

Load the recommended film in the camera. To be certain that the film is advancing properly, wind to exposure one, then turn the rewind knob carefully in the direction of the rewind arrow until a slight tension is felt. When the film is advanced after the first exposure, the rewind knob should rotate in a direction opposite to the rewind arrow.

Set the EI on the camera to match the EI of the film.

7. Turn on Photoflood Lights

If possible, hook both lights up to a foot switch or a hand switch that is located next to the camera in order to minimize the length of time the lights are left on, to protect the object from heat and humidity changes, to extend the life of the bulbs, and to keep the work area cool.

8. Mount the Camera on Tripod and Compose the Photo

Mount the camera securely on the tripod. Compose the photograph to record the object using the largest area of film, within reason. Three of the variables in composition are: distance, angle, and format (horizontal vs. vertical).

a. Distance

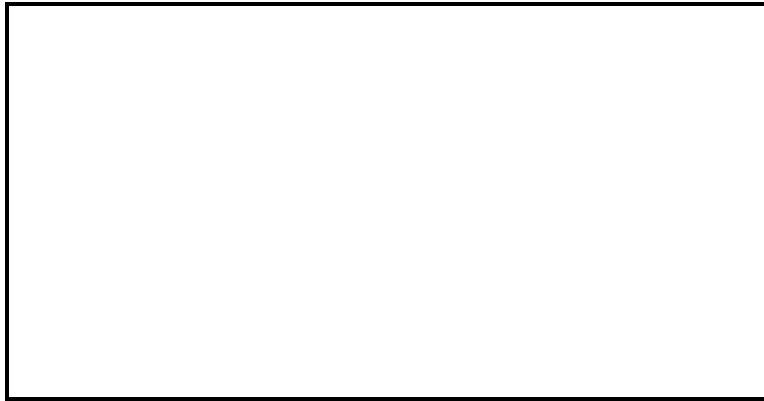


Figure I.9. Composing the Photograph: Recommended Distance

Adjust the distance of the camera to the object so that the object fills one-half to three-quarters of the frame (see Figure I.9).

b. Angle



Figure I.10. Composing the Photograph: Recommended Camera Angle

To make three-dimensional objects appear three-dimensional in the photo, place the camera slightly higher and looking down on the object (see Figure I.10). An

object shot straight on may appear two-dimensional in the photo.

For small two-dimensional objects a copy stand that mounts the camera directly above the object is useful. The stand usually includes fixed lights located about 30 inches from the copy board and at a 45° angle to the camera lens axis. Large two-dimensional objects should be mounted on the wall. The two flood lights should be placed at equal distance, at a 45° angle, from the object; the camera should be level and aimed at the center point of the object. Polarizers are needed on the lights and camera lens when photographing reflective surfaces, for example, oil paintings and reflective glass. A Gray Scale, available from most camera stores, should be used when photographing black and white photographs.

c. Format (horizontal vs. vertical)

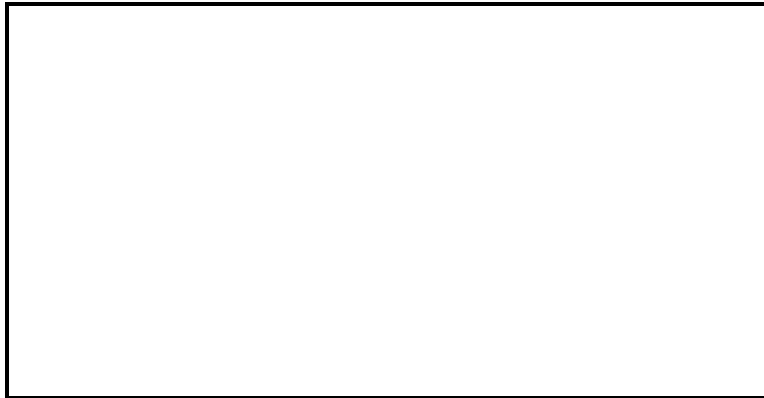


Figure I.11. Choosing Vertical or Horizontal Format

- 1) If the object is taller than it is wide, use the camera in a vertical position.
- 2) If the object is wider than it is tall, use the camera in a horizontal position (see Figure I.11).

9. Determine Exposure

Start by setting the camera shutter speed at 1 sec. The 1 sec. exposure is important for two reasons. It requires use of a large f/stop number (small aperture), resulting in better depth of field (area of sharpness) in the photograph.

A hand-held meter or a camera with a meter may be used to take an exposure reading. To take a reading with the camera, be certain that the gray card fills the entire viewing screen without casting a shadow on the card.

Each package of film has exposure suggestions for different situations.

If a meter is not available, for Kodak T-Max 100 the following exposures may be used as a guide with the use of two 500 watt photoflood lights. Be aware that as the lights become older, greater exposures may be necessary. When taking photographs in this manner, bracket two exposures to either side of the initial shot.

For 100 EI Film

<u>Key Light</u>	<u>Fill Light</u>	<u>Exposure</u>
6 ft.	6 ft.	f/16 at 1/8-1/4 second
6 ft.	7 ft.	f/16 at 1/4-1/8 second
6 ft.	8 ft.	f/16 at 1/4-1/8 second
7 ft.	8 ft.	f/16 at 1/4 second
8 ft.	8 ft.	f/16 at 1/2 second

By reviewing the negatives and the recorded exposures, the photographer can judge whether the settings are appropriate or the negatives are consistently over- or under-exposed. Always shoot and process the first roll of film to assess correct exposure, and then proceed to complete the photographic project.

10. Turn Off Lights

11. Turn On Lights

12. Shoot

Squeeze or depress the shutter or cable release slowly and smoothly. The cable release is especially useful as it allows depression of the shutter release without touching the camera, thus eliminating a potential for camera movement, which could cause blurry photos.

13. Turn Off Lights

14. Record Information About the Photo

Keep a log that records the roll number, exposure number (the frame number on the roll), exposure reading, catalog number, and object name. When the film is developed, the frame number and object may not correspond with the frame number and object listed in the log. The log should be corrected to correspond with the number on the negative.

15. Change Objects; Repeat Steps 11-14

Some objects may require more than one photograph to document detail accurately. After completing the necessary photographs of one object, change objects. For similar objects, the set up of camera and lights remains the same and the process repeats beginning at Step 11.

D. PROCESSING THE FILM

If the unit has darkroom facilities, the film may be developed by unit staff following the tech data sheet provided with the developer. Kodak T-Max 100 should be processed using T-Max developer or standard commercial developer. Kodak Plus X and Kodak Tri-X may be processed using standard development procedures.

If the unit does not have darkroom facilities, the film can be processed by a commercial lab.

The unit may choose either a 3X5 black and white print, or a

contact print.

E. CATALOGING AND STORAGE OF PRINTS AND NEGATIVES

1. Photo Number

After the negatives and prints from a roll of film are developed, the negatives should be cataloged. Either a 3X5 black and white print or a contact print may be used. Because each photo has a unique exposure or frame number on the roll, and because the roll number and object catalog number are shown in the photo, the photo is already numbered and identified.

2. Cataloging the Print

The print is cataloged for identification. The following types of information are recommended for identification. In cases where an original photo is being copied, the information being recorded pertains to the record photograph and not the original.

- a. Unit name
- b. Object and/or Specimen Name
- c. Name of photographer and any assistants
- d. Date photograph was taken
- e. Catalog number of object or specimen
- f. Photo number (Roll Number/Frame Number)

3. Storing the Print

The print may be filed numerically by photo number in a separate card file.

4. Cataloging and Storing the Negative

The negatives are cut in strips, filed by roll and exposure number in pages of archival quality polyethylene

holders and placed in a three-ring binder. One roll is filed on each polyethylene page and the roll number is marked on the page in a space provided at the top. The binder should be stored with the museum property records.

5. Storage Environment

The storage environment is of prime importance. A consistent temperature and relative humidity (RH) is optimum. Humidity is more important but both should be considered. A temperature in excess of 75°F combined with an RH greater than 60 percent is the most damaging situation, but a higher temperature can be tolerated for a limited time if the RH remains less than 40 percent. (This situation does not apply to storage of cellulose nitrate base material. For these materials the rate of decomposition doubles with every 10°F rise in temperature.) The RH should have a constant reading between 20 percent and 60 percent where non-archival photographic material is kept. Temperature should be as constant as possible and should not exceed 70°F. Freezing is often used for cellulose nitrate negatives, but is not practical for photographs that need to be readily accessible. The presence of pollutants in the air such as oxidizing gases and chlorides can contribute substantially to destruction of photographic material. Dust is especially damaging because of its hygroscopic character and because it causes abrasion when negatives are moved. Smoking cannot be permitted in areas where photographic materials are stored.

6. Storing the Object Photograph Log

The object photograph log is stored in a three-ring binder and kept with the museum property records.

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