NATIONAL PARK SERVICE

Conserve O Gram

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Planning and Managing a Microfiliming Project for Preservation And Access

This *Conserve O Gram* (COG) describes how to microfilm materials to preservation standards. Archives and libraries use preservation microfilming as a cost-effective method for preserving information and protecting original documents, photographs, books, and other materials. Preservation is the top priority. A time-tested preservation distribution and storage format, "preservation microfilm" -- as opposed to standard commercial microfilm -- refers to national standards for archival-quality microfilm that lasts 100 years or more if properly processed and stored. In contrast, standard commercial microfilming often is not a long-lived or durable product nor a recommended purchase.

Microfilm may be digitized to enhance access, but digital/electronic data must be prepared with adequate metadata, reviewed for appropriate quality assurance and control, maintained in an appropriate and relatively costly digital repository and refreshed/migrated every 5 years. Costs of digital storage are so high over time that many film studios convert digital motion pictures to film media for storage. "Hybrid systems" use microfilm for preservation and digital/electronic records for access, thereby improving preservation and access alike. A hybrid system may involve either microfilming first and then producing digital files from the microfilm or digitizing first and then producing Computer Output Microfilm (COM) from the digital files.

To gain familiarity with the basic microfilming practices listed below, refer to the reference section of this COG and the websites of non-profit regional conservation centers and university libraries for information, photographs of various phases of microfilm projects, and web-links to the preservation film standards established by the American National Standards Institute (ANSI).

To Plan a Microfilming Project Do...	Don't...
How to Plan Microfilming Projects: • Set your goals for the project. Produce: - a silver gelatin (halide) master (1st generation negative) - an intermediate printing master (2nd generation negative) - service copies (3rd generation positive) for use • If you can't afford all 3 copies, start with a master negative and find funds for the printing and service copies later. • Identify project staff, standards, film distribution plans, film format (roll film, microfiche) and project duration and dates. • Review several reference sources and sample contracts to gain an understanding of the training needed in reproduction ratios, quality control, handling procedures, tonal range, etc.	• Don't select microfilm primarily for its access capabilities. • Don't microfilm everything. Select items or collections. • Don't allow use of the master negative for access purposes. • Don't copy other filming contracts slavishly. Write your own. • Don't allow your contractor to sub-contract filming/delivery. • Don't choose acetate-based films, use polyester.

To Plan a Microfilming Project Do...	Don't...
• Identify funding (park, association, program, or foundation). • Set up content selection criteria (See COG 19/10). • Quantify the sizes, formats, processes, and material types to be copied. See *When Materials Pose Special Problems* below. • Get a paper or photograph conservator to conduct a conservation assessment before reformatting. • Catalog and index your items first as they will last up to 20 times longer than unindexed materials due to less handling damage, according to the National Bureau of Standards.	• Don't choose diazo films, as they fade even in the dark. • Don't choose vesicular films if it will be viewed in very hot equipment (>167°F). • Don't neglect to stabilize originals before scanning, including flattening, removing clips, removing mats/frames, and unfolding oversize items.
How to Contract for a Microfilming Project • Get an appraisal of collections for insurance by the contractor. • Obtain contractor recommendations, sample contracts, and scopes of work (SOWs) from colleagues or State Archives. • Contact filming organizations to identify potential contractors. • Obtain copies of standards/specifications. See *References*. • Write your contract and technical specifications, including: - filming, handling, quality control, shipping instructions - sample targets (bibliographic labels and use instructions) - complete micrographic standards and specifications • Send your draft contract to peers for review and comments. • Ask your contractor to insure the items for their fair market value and for the costs of conservation treatment (if damaged). • Consider both microfilm-to-digital and digital-to-COM as excellent strategies for both access and preservation.	• Don't ignore the pre-production issues, such as stabilizing the original; creating targets (sheets providing bibliographic or technical information that appear at the beginning and end of microfilm rolls); arranging collections, double-checking all items, and packaging them for delivery. • Don't allow vendors to splice second generation film into your silver halide master negative.
When to Microfilm First, then Scan from the Film: Film first when: • capturing text, script, and line art is essential. • image density is consistent in text. • reformatting low use materials that must be preserved as scanning can be done later from film when usage increases. • scanning would cause damage, such as unbinding rare books. • preservation is your top priority. Microfilm lasts 100+ years. **You must refresh/migrate digital data every 5 years.**	• Don't film first to capture photographs, tonal illustrations, segmented or oversize items, or items with inconsistent image density. Instead scan first, then produce COM. • Don't expect good quality scans from poor quality film or vice-versa. • Don't use sticky notes for targets.
How to Select and Prepare Materials for Filming: • Select materials to be microfilmed based on the park's Scope of Collections Statement and the criteria listed in COG 19/10. • Check for legal, ethical, or cultural restrictions. See *Museum Handbook* III, Chapter 1, "Evaluating and Documenting Museum Collections Use" and Chapter 2, "Legal Issues." • Stabilize, collate, remove fasteners, flatten, arrange, and target the materials. Targets are instructions to users/filmers. • Identify items already reformatted by other organizations by looking at the National Registry of Microfilm Masters. Buy copies of existing microfilm or digital copies	• Don't microfilm materials that don't relate to your Scope of Collections Statement and fit the reformatting criteria (high value, use, and/or risk). • Don't microfilm materials if you can purchase a good quality copy elsewhere.

To Plan a Microfilming Project Do...	Don't...
• Ensure that all materials to be microfilmed are cataloged accurately and completely. Archival materials should be described in a finding aid that can be used to produce targets. • Ask your contractor to alert you if an item will not film well	• Don't forget to place targets in the collection warning the photographer/ filmer of missing, misnumbered or folded items.
What Materials Pose Special Problems for Reformatting? List and quantify the following in any microfilming contract: • Yellowed, brittle, torn, ripped, or fragile paper • Oversized, small, or oddly shaped materials • Friable media such as charcoal, graphite, pastels, or pencil • Handwritten or hand annotated materials • Materials with notations or images on their front and back • Illustrations, including line drawings, halftones, or blueprints • Blurred, faded, or bled-through images or text	• Don't use standard black-and-white microfilming for producing continuous tone images such as halftones, photographs, and some drawings and prints. Instead use continuous tone microfilm such as Fuji HRII and Minipositive microfilm.
What Microfilm Specifications to Follow in Your Contract: • State that all filming errors must be corrected within 30 days of identification at no extra charge to the park. • Follow American National Standards Institute (ANSI), Association of Imaging and Information Management (AIIM), and Research Library Group (RLG) Standards (See ***References***). • For black-and-white microfilm emulsions, select silver gelatin film with an anti-halation dye layer such as Kodak AHU 1460 for master negatives, Kodak 2468 or 2470 for 2nd generation duplicating masters, and Kodak 2470 for illustrations. • For preservation of master negative color microfilms, select color separation processing which produces several exposures. • For access copies, select a stable color film like Kodak Ilfochrome. • For roll film, select 16 or 35mm format, which look like motion picture film on a reel. **The larger the format, the less vulnerable the microfilm is to damage.** • For microfiche, select 105mm format microfiche (which looks like a plastic file card containing rows of images). • Select film with at least a 4 mil thick polyester (polyethylene terephthalate) film stock. • Select reduction ratios from 8:1-10:1 (8-10 times smaller); although an original may require 24:1 (24 times smaller).	• Don't use diazo or vesicular film. • Don't select cellulose ester (acetate) film. • Don't jacket, strip, or compose/reduce fiche; use COM or silver halide. • Don't film oversize materials out-of-sequence; instead change the reduction ratio (film smaller), or film the item in sections from left to right. • Don't allow splices in 2nd and 3rd generation film. • Don't accept film unless it is wound on chemically inert reels (not spools) with the first target at the outer end. • Don't allow skew (image tilt)>10%; instead insist framing and spaces between frames be consistent. • Don't forget to watch for irregularities from project to project.
How to Select Your Microfilm Contractor: • Ask for 3+ references. Check references thoroughly. • Prepare a test sample of materials containing all formats, problems, and sizes for all potential contractors to film. Compare the resulting work as described below. • Return unacceptable work to the contractors for refilming. Track how long it takes and any damage to original materials. • Visit the selected lab to view their facilities and meet staff. Is the space clean and secure? How do they handle materials? Do they have sufficient experience in processing film regularly in a manner that meets preservation standards?	• Don't forget to develop a simple way to communicate problems and instructions. • Don't avoid regular meetings with your contractor. • Don't choose a standard commercial microfilming contractor for fragile items.

To Plan a Microfilming Project Do...	Don't...
• Make your final decision based upon references, your personal experiences, and the price, speed, and quality of the work. • Select a special service filmer if the material is fragile or exceptionally valuable.	• Don't accept unclean laboratories that lack expertise or basic equipment (book cradles, oversize planetary cameras, inspection tools). • Don't accept a commercial microfilm vendor who can't provide evidence of performing required film processing tests or who dismisses preservation quality as unimportant.
How to Test Microfilm After Receipt from the Vendor: • Check all returned master negatives completely (100%) and spot check (10+%) duplication masters, and usage copies for: - correct targeting (internal bibliographic frame labeling) - correct housing and can labeling - completion of quality control forms - correct order and completeness of originals and copies - legibility • The first quality control check of all items should be done by the contractor before sending the item to you. Insist on this. • Contract to have your newly received microfilm tested by: - density measurements - brittleness test - curl test - methylene blue test for residual thiosulfate (ANSI IT9.1-1989 and PH4.8-1985) for new film. - quality index resolution test (ANSI/AIIM MS23-1991 with a standard of not <8.0 required).	• Don't accept or approve microfilm with incorrect focus, contrast, abrasions, fogging/fading, scratches, fungus, blemishes, stickiness or blocking, powdery residues, curl, delamination, and splices. • Don't accept film with heat welds (only ultrasonic welds are allowed and no more than 6 are allowed per roll). • Don't accept density tests that don't make 12 readings a roll or 5 per title. Ask the test lab to average the results. Note: the maximum acceptable deviation from average should not be >0.15. Average density is 1.0-1.2 for most images.
How to Store Microfilm: • Store master film in a secure space that has HVAC with an air filtration/purification system that is at 65°F +/-5°, 35%RH +/-5% RH. Acclimatize for 3 hours before use. • Wear gloves when handling microfilm. • House extra copies of microfilm in other buildings. • House microfilm on chemically inert cores (no flanges) of uncoated polyester, polyethylene, and polypropylene. • House microfilm reels within neutral pH boxes, such as Conservation Resources MicroChambers, and microfiche in enclosure edge. Place the boxes and fiche in steel file cabinets which have neutral pH guides. • Check enclosures and housing (cores, boxes, and so forth) for acidity, chemical outgassing, stability, and defects. • Use neutral pH paper with neutral pH string and button closures to hold reels closed.	• Don't forget to conduct silver densitometric tests on stored film. • Don't use desiccant-based dehumidification systems or corrosion inhibitors in the HVAC. • Don't draw water for humidification from impure sources. • Don't house film on coated plastic or metal cores, spools, or reels, particularly PVC. • Don't compress fiche or film or house them so loosely they fall over. Instead use dividers. • Don't use rubber bands or twine to hold reels closed.

Standards

American National Standards Institute (ANSI) standards
1430 Broadway
New York, NY 10018

Association for Information and Image Management (AIIM)
1100 Wayne Avenue
Silver Spring, MD 20910

AIIM. TR 11 (Microfilm Jacket Formatting and Loading Techniques)
ANSI/ AIIM MS5-1992 (Microfiche)
ANSI AIIM MS 23-1991 (Operation, Inspection, and Quality Control Procedures for First-Generation, Silver Gelatin Microfilm)
ANSI/AIIMMS14-1998 (16mm and 35mm Formats for Roll Microfilm)
ANSI/AIIM MS19-1987 (Microform Identification)
ANSI/AIIM MS23-1991 (Roll Microfilm Inspection)
ANSI/AIIM MS34-1990 (Reels for Roll Microfilm)
ANSI/AIIM MS43-1988 (Copy Microform Inspection)
ANSI/AIIM MS45-1990 (Microform Inspection for Deterioration)
ANSI/AIIM MS51-1991 (Micrographics Resolution)
ANSI/AIIM PH1.43-1985 (Micrographic Storage)
ANSI/AIIM PH1.53-1984 (Micrographic Storage)
ANSI/ASC PH4.8-1985 (Finding and Measuring Residual Photographic Chemicals, particularly Thiosulfate)ANSI/ASC PH1.4-1984 (Silver Gelatin on Polyester Film Photography of Archival Records)
ANSI/NFPA 232 (Protection of Records)
ANSI/NFPA A 232M (Archives and Records Centers Protection Techniques)
ANSI/NFPA 910 (Library Protection Techniques)
ANSI/NFPA72E (Automatic Fire Detectors)
ANSI/PH1.43-1985 (Storage of Processed Safety Film)
ANSI/PH1.43-1983 (Storage of Processed Safety Film)
ANSI/PH5.6-1974 (Dimensions for 100-Foot Reels for Processed 16mm and 35mm Microfilm)
ANSI/Z39.62 (Microfiche Heading Information)

References

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Fox, Lisa L. *Preservation Microfilming: A Guide for Librarians and Archivists*. Chicago, American Library Association, 1995.

Gwin, Nancy E. *Preservation Microfilming: A Guide for Librarians and Archivists*. Chicago: American Library Association, 1987.

Library of Congress. *Specifications for the Microfilming of Books and Pamphlets in the Library of Congress*. Silver Spring, MD: National Micrographics Association, 1983.

Waters, Donald J. *From Microfilm to Digital Imagery*. Washington, DC: Commission on Preservation and Access, 1991.

Websites

Harvard University Libraries website: http://preserve.harvard.edu/resources/microfilming.html

(includes preservation principles for reformatting collections and on-line links to national ANSI standards for Preservation Microfilm.)

Northeast Document Conservation Center website: http://www.nedcc.org/welcome/micro.htm

(includes an overview of preservation microfilming with photographs depicting phases of work, a questionnaire to assist organizations in gathering information for planning a microfilm project, and technical leaflet on microfilm and microfiche.)

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