PRESERVATION BASICS FOR PAPER-BASED RECORDS

Maintaining public records requires judicious management of resources. It compels records custodians to identify simple, practical, cost-effective approaches that can be incorporated into daily routines.

Many preservation activities do not require additional staff, sophisticated equipment, or significant expense. Though your repository may not have a formal "preservation program," many preservation actions are probably already a part of your everyday activities, in many cases, "preservation" is simply properly channeled common sense.

EVALUATING TREATMENTS

Preservation has no all-purpose treatment. Many years ago, the term "lamination" became almost synonymous with "preservation." Lamination came to be viewed as *the* treatment of choice, and was even applied to documents in pristine condition. Lamination is seldom appropriate to need, does not use stable materials, is radically intrusive, and difficult to reverse. With experience, we learned that lamination can no longer be considered a viable preservation option for papers of enduring value.

Effective preservation treatments, whether preventive or remedial, must always be based on a variety of factors: the nature of an item, its condition, and how it will be used. We look for treatments that *use stable materials* and are *appropriate to need, structurally sound, minimally intrusive,* and *potentially reversible.*

INTELLECTUAL CONTROL

Records collected over the years can become unintelligible piles of useless paper unless intellectual control is maintained. Intellectual control establishes order over records. Records inventories represent the holdings of a repository. Finding aids are created so that users can locate information within the records. By maintaining intellectual control, records custodians are protecting the rights of Georgians to have access to the public records of their communities. Knowing what you have is essential before beginning other records or preservation activities.

RETENTION SCHEDULES

Retention schedules are used to determine which records need to be kept and for how long. Records without permanent value may be scheduled for eventual destruction. Retention schedules save space, because only a limited number of records have long-term value. The development and implementation of retention schedules also save money by ensuring that

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Department of the Interior

only records of enduring value will be permanently retained.

The *Official Code of Georgia Annotated (O.C.G.A.)* 50-18-86 – 90-50-18-103 requires each government agency to develop retention schedules for each individual type of record in its custody. Retention schedules are created by evaluating the purpose and information content of records. Common records schedules have been created for public school systems, courts, and county and municipal governments.

For more information about retention schedules and their use, please call 404-656-2379 to contact the State Records Management Program at the Georgia Department of Archives and History, a division of the Office of Secretary of State.

STABLE HOUSING MATERIALS

Once it has been determined that records are to be permanently retained, make the effort to provide the best possible physical support and stable housing.

Protect all records from dust and light by placing them in enclosures, *e.g.*, folders and boxes. When feasible, store heavy bound volumes flat. Remove records from the floor and place them on pallets (plastic pallets, if possible). Store records in contact with stable papers and plastics that will not accelerate degradation.

If possible, purchase paper products that meet the American National Standards Institute (ANSI) Z39.48-1992 standard for permanent paper. *Permanent papers* are made from cotton or 100% chemically purified wood and have a pH between 7.5 and 10, making them *alkaline.* They contain an alkaline reserve (2-3%) and are expected to last at least 300 years under normal storage conditions. Some alkaline papers are available that do not meet the ANSI standard for permanence, but even these papers should be strongly favored over their acidic counterparts.

Because you cannot visually distinguish between acidic and alkaline papers, test all paper shipments —paper-based storage materials, blank photocopy paper, computer printer paper — with an Abbey pH pen to ascertain that papers are, in fact, alkaline. (See the "Resources and Publications" section at the end of this leaflet for supply sources.) The marking from the pH pen will turn purple if papers fall within the alkaline range. Be wary of vendor assurances of alkalinity: older papers may have been manufactured before the switch to an alkaline paper-making process.

For alkaline-sensitive materials such as blueprints or color photos, *neutral papers* (pH 7) are preferable. Adherence to the Photographic Activity Test (PAT), ANSI IT.9-l6-1993, will ensure that neither papers nor adhesives will adversely react with the materials they are designed to protect.

Unfortunately, there is no set standard useful for specifying the quality of plastics used for storing permanent records. Plastics used for storage need to be inert or chemically stable. The plastic most commonly used to store permanent records is polyester film (polyethylene terepthalate) — for example, DuPont Mylar D or ICI Mellinex 516. This material is used for protective sleeves or L-velopes (sleeves sealed on two adjacent sides). Because plastics generate a static charge, they are unsuitable for loosely bonded media, such as soft pencil and flaking media or emulsions.

There is no safe, simple way to test plastics. Request Material Safety Data Sheets (MSDS), which will provide detailed information about the chemical make-up of the plastic product you wish to purchase. Avoid plastics made of polyvinyl chloride (PVC), which are capable of doing extensive damage to paper and inks.

HOLDINGS MAINTENANCE

Holdings maintenance refers to the variety of basic preventive measures designed to prolong the useful life of records, deferring or potentially eliminating the need for future conservation treatment. Holdings maintenance activities include removing surface dust from materials, replacing poor quality enclosures and boxes, removing damaging fasteners, making photocopies of unstable records, and placing weak or damaged documents into protective sleeves.

DUST

If records are heavily soiled, a soft, white brush may be used to gently remove surface dirt from the documents before placing them in sleeves or folders. (Soft bristles minimize damage to a document's surface, and accumulated dirt is readily visible on a *white* brush.) Wash dirty brushes using a mild soap, rinse them thoroughly, and allow them to dry completely before using them again.

To dust records, place a thin pile of large sheets of scrap paper on the base of your work surface, beneath the document. Gently dust from the center of the document outward towards the edges. Never dust

inwards from the edge of the document towards the center, since this can easily damage the document's edges. Discard sheets of scrap paper as they become soiled.

Fasteners

Where possible, use folders or folded sheets of paper instead of fasteners to keep groups of records together. Fasteners such as rubber bands, staples, paper clips, and "bull-dog" clips used to store records in discrete groups can cause serious damage. Rubber bands become sticky and eventually harden, leaving behind a solid residue attached to paper. Metal fasteners may rust and can also cause rips and tears. Though plastic clips do not rust, they produce pronounced indentations that can eventually lead to tears.

If staples or metal paper clips must be used in the course of working with records, shield documents from damage by placing a barrier strip of *alkaline* paper between the fastener and the document. After the fastener has been placed, fold the barrier strip back over the fastener. In this way, only the bather strip is in contact with the fastener, preventing damage from staining or abrasion to the fastened documents or those adjacent to them. Stagger the placement of fasteners (right, center, left) to distribute thickness.

Paper clips can be safely removed from records by inserting a piece of polyester film on each side of the clip, between paper and fastener. Once the polyester is in place, you can safely slide the clip from the paper with minimal damage.

Remove staples by using a strip of polyester film and a small lifting tool, such as a microspatula. Insert the polyester under the back of the staple. Using a lifting tool, open each shank of the staple. Turn the document over, and if necessary, use the lifting tool to remove the staple.

Folders and Boxes

Good housing is an important part of records preservation. Folders and boxes keep records together in discrete groups and provide support when records are transported. Folders and boxes also provide protection from light and dust Use the score lines at the base of a folder to accommodate the volume of records inside. The use of these score lines will help to avoid overstuffing folders and will allow the documents to rest flat at the base of the folder.

To provide adequate protection, a folder should be large enough for unfolded records to be completely covered by the folder. Do not allow documents to protrude beyond the edges of a folder. Never house documents in folders too small to accommodate a document's entire dimensions. Select standard-sized folders, *e.g.*, letter, legal, 11 x 17," and one or two oversized dimensions. Do not cut folders to the size of documents — and of course, never cut documents to fit the size of a folder.

Store oversized items such as maps or blueprints flat within oversized folders, and store these folders in flat files. Up to ten oversized stable items may be safely placed in each folder.

If oversized items have been previously rolled, they may be rolled *around* a wide diameter tube (3-6 inches) that extends beyond the length of the record. (This tube should adhere to the ANSI standard for paper permanence, or be covered with a paper that adheres to this standard.) Do not roll items without a support core, or stuff items inside of a tube. Once the document is rolled around the tube, cover the record with a stable paper to protect it from light and dust Information about the record may be written in pencil on this protective cover sheet. Do not roll brittle papers, items printed on heavy board, or records with a fragile image or support.

Record boxes come in standard sizes to accommodate various sizes of folders. Place folders upright in boxes. Since too few folders inside a box can cause records to sag, use spacerboards (box board inserts folded to take up additional space) as needed. Do not overstuff boxes. This makes retrieval difficult and cart damage records. House three-dimensional objects in separate boxes from those containing paper-based records.

Use pencil to label folders and boxes. Inks fade and may run if folders are exposed to excessive moisture. Adhesive labels often fall off eventually, causing a loss of information and perhaps also damaging other materials to which they may inadvertently adhere.

Never use glues or pressure-sensitive tapes (including "post-it" type notes) on any original record. These materials do considerable damage, obliterate information, and can be extremely costly to remove.

Sleeving Records

Polyester sleeves may be used to provide support for fragile records. Their static charge will hold torn or broken papers together in the sleeve. Sleeves may also be used to protect unstable papers and media from damaging adjacent records. [continued]

RESOURCES/PUBLICATIONS

Gaining and maintaining intellectual control, following retention schedules, practicing good housekeeping, and performing regular holdings maintenance activities will greatly contribute to the preservation of records.

For more information on preserving the records in your care, call 404-656-3554 to contact the Conservator at the Georgia Department of Archives and History, a division of the Office of Secretary of State.

OTHER RESOURCES

Local Government Handbook: Using the Common Records Retention Schedules
Office of Secretary of State
Department of Archives and History
330 Capitol Avenue, S.E.
Atlanta, GA 30334.
Telephone: 404-656-2379.

Ritzenthaler, Mary Lynn.
Preserving Archives and Manuscripts.
Chicago: Society of American Archivists, 1993.
Available from:
Society of American Archivists
600 5. Federal, Suite 504
Chicago, IL 60605.
Telephone: 312-922-0140.

American National Standards Institute (ANSI)
11 West 42nd Street
New York, New York 10036.
Telephone: 212-642-4900.

pH pens are available from: Abbey Publications, 7105 Geneva Drive, Austin, TX, 78723, Telephone: 512-929-3993; Gaylord, Box 4901, Syracuse, NY, 13221-4901, Telephone: 1-800-448-6160; or University Products, P.O. Box 101, South Canal Street, Holyoke, MA, 01041, Telephone: 1-800-628-1912. ■

This paper meets the ANSI Z39.48-1992 standard for permanent paper. ∝

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DISASTER PREPAREDNESS

Records custodians may think of disasters as large, catastrophic events such as tornadoes or floods — dramatic natural events over which there is little, if any, control. Yet many disasters are events that only affect records within a single repository. But whether large or small, disasters can threaten the security of records. A single fire or flood can erase substantial portions of a community's unique recorded history.

Caretakers of official records are responsible for safeguarding holdings from all varieties of threats. Preparing for disasters requires an ongoing commitment to:

- reduce potential risks
- develop a plan of action for response to disasters.

To prepare for a disaster, we must first become aware of the potential dangers records face.

FIRE

Fire is a serious threat to records. Even if records do not burn completely, heat from the fire can char paper and melt plastic, rendering paper documents, photographic film, d audio, video, and computer tapes unintelligible. Smoke and soot leave behind odors and stains. Moreover, firefighting efforts may do considerable damage to records, from both the pressure and quantity of water used to extinguish a blaze.

Arson

son is the single greatest cause of fires in records repositories throughout United States. Because records centers represent government, they may be targets of deliberate or random violence. In some cases, the arsonist is someone known to staff. Arsonists may use whatever combustible material is to hand or they may collect combustible material and bring it to their chosen site.

Take all threats of arson seriously and immediately report them to the police. If the threat is made by telephone, carefully record details of the call. Monitor any areas in your building where individuals can linger without the supervision of staff. Install intruder alarms and make sure that they work. Test all alarm systems frequently. Sometimes incendiary devices are thrown through windows; an intruder alarm may be the first defense against fire.

[continued]

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Fires from Small Appliances

Portable electric heaters and coffeemakers are common sources of fires. Their high electrical demand frequently overloads older wiring, and they are often accidentally left on after staff have gone home for the day. Restrict coffeemakers to break rooms or other areas away from records. Check appliances frequently and verify that they are unplugged at the end of the day.

Smoking and Fire Risk

Smoking within a records facility is unrelated to any function or operation, and literally brings fire into the building. Prohibit smoking within all record centers and courthouses for the protection of records and for the health and safety of individuals.

WATER DAMAGE

Water distorts paper and causes ink and other media to run or even disappear. Wet records can grow mold within 48 hours, so even a small water disaster requires a prompt response.

Pipes

Water pipes typically run throughout a building and may well be located directly over areas where records are stored. Any water from a leaking pipe will run to the lowest level in the building, making all areas beneath a leak susceptible to damage. Know where pipes run directly over stack areas.

Do not store records in boxes directly on the floor. Set boxes on pallets (plastic, if possible) that are *5"* higher than floor level. Install water alarms in basements or other low-level areas to wam of rising water during times when the building is closed. Link all alarm systems to a security office or other location that is staffed 24 hours a day.

Alert all staff to the location of water cutoff valves within the building. Ensure access to these valves at all times. If it takes an hour to find a person who knows how to turn off the water, then what started out as a simple job for a mop and bucket can develop into a major flood.

Keep rolls of plastic sheeting handy to cover shelving and cabinets in the event of a leak. Do not, however, use plastic sheeting as a permanent covering for records: it will prevent good air circulation and create a potential climate for mold.

Immediately air dry or freeze wet records to prevent further damage and mold growth. Being prepared for disasters means developing contacts with the appropriate consultants and vendors beforehand, not after the fact.

The Roof

Know the age and current condition of your roof. Roof weaknesses are usually discovered in the middle of a rainy season, just when protection is needed most. Regularly inspect roofs and roof drains to ensure that they are n clogged. Note that flat roofs tend to collect debris which may clog the drains.

Roofs have limited life spans. If your roof was guaranteed to last 15 years and has passed its tent year, begin making plans to replace it.

RENOVATION

Statistics indicate that disasters are more likely to occur when a building's mechanical or structural systems are being renovated. Construction projects also provide workers access to stack and storage areas of the building, reducing records security. Do not permit workers to wander freely about the building. Ensure that fire detection and security systems remain active at all times during any renovation project Be involved in your renovation project.

Coordinate your institution's day-to-day work with the work of the renovation. Allow staff to share their concerns about the project. Transfer records to a safe location before work begins.

SECURITY

Unfortunately, theft is a common threat to records. To prevent thefts:

- Establish written policies that stipulate exactly how a user may interact with records.
- Never permit users to browse stack areas and retrieve records for themselves.
- Do not label a record box with a list of contents; a user who gains unauthorized access will readily find whatever item is sought. Label record boxes with location numbers known only to staff. Exclude location information from user finding aids. timit the number of records that a user can view at one time.
- Photocopy or microfilm popular historic records and limit access to the originals.

By providing controlled access for current users, you help to ensure availability of records for future generations.

YOUR DISASTER PLAN

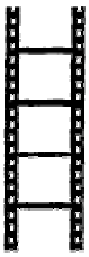
After potential risks have been assessed, the next step in preparing for disasters is to develop an organized plan for responding when a disaster actually occurs.

This plan will include:

- Locator maps for firefighters that show the location of vital records within the building.
- A telephone tree of staff and volunteers from your community who can be counted on to provide help in the event of a disaster. Include contacts within the Georgia Department of Archives and History.
- An inventory list of emergency supplies and their location.
- An established chain of command for coordinating the recovery effort, based upon *tasks* to be performed.
- The names and telephone numbers of your pre-established contacts at freezer storage and disaster recovery services.

Update your plan annually, and distribute copies of the disaster plan to all staff. Remember to keep a duplicate copy of the plan at home. Your recovery plan will be of no use if it burns up inside your desk at work. Practice and reevaluate your plan regularly.

MICROFILMING VITAL RECORDS



Even the best-laid plans cannot prevent every possible disaster from happening. Accordingly, the safest way to secure the information in records is to create another copy to store off-site. Microfilm all vital records. Be sure to include inventories and finding aids which are a part of your vital records.

BACKING UP COMPUTER RECORDS

Create backup copies of all computer records. Store the backup copy off-site in a secure location.

RESOURCES AND PUBLICATIONS

Preparing for disasters requires an ongoing commitment to ensure that potential risks are minimized and that a workable plan exists for active response. Even a small disaster can deprive today's Georgians and future Georgians of a significant portion of their history.

For more information, please call 404-656-3554 to contact the Conservator at the Georgia Department of Archives and History, a division of the Office of Secretary of State.

[continued]

RESOURCES

AND PUBLICATIONS

[continued]

OTHER RESOURCES

Federal Emergency Management Agency.
Emergency Management Guide for Business and Industry: A Step-By-Step Approach to Emergency Planning, Response and Recovery for Companies of All Sizes.
Washington, DC: FEMA, 1993.
Order from:
Publications Distribution Center
P.O. Box 2012
Jessup, MD 20794.
telephone: 1-800-480-2520.

Fortson, Judith.
Disaster Planning and Recovery.
New York: Neal-Schuman Publishers, Inc., 1992.
Available from:
The Society of American Archivists
600 5. Federal Street, Suite 504
Chicago, Illinois 60605.
Telephone 312-922-0140.

National Archives and Records Administration,
Office of Records Administration.
Vital Records and Records Disaster Mitigation and Recovery.
College Park, MD: NARA, 1996.
Available from:
Publications and Distribution Staff
(NECD) RM. G-9
National Archives
Washington, DC 20408. ■

This paper meets the ANSI Z39.48-1992 standard for permanent paper. 00

Georgia Department of Archives and History
Secretary of State
330 Capitol Avenue, S.E.
Atlanta, GA 30334

THE STORAGE ENVIRONMENT

The storage environment into which a record is placed can have a dramatic effect on the long-term usefulness of that record and the information it contains. Key environmental factors are:

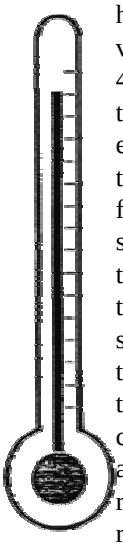
- temperature
- relative humidity
- pollutants
- light.

Air may contain excessive moisture, pollutants, microorganisms, and other particulates that accelerate the deterioration of paper. Dirt and dust particles can scratch film and tape emulsions and carry pollutants that may promote paper degradation.

Because records do not possess the human ability to recuperate, we look for preventive means to minimize damage from the environment. Controlling temperature, relative humidity, and light and keeping the environment clean can have a dramatic effect on the longevity of records.

TEMPERATURE AND RELATIVE HUMIDITY

Records exposed to high levels of heat, humidity, light, and dirt degrade more quickly than records stored under conditions that are cool, dry, dark, and clean. Research has shown that cooler temperatures can dramatically reduce the rate of degradation of all records.



A target temperature and relative humidity for storing records composed of a variety of materials is 68° F. +/- 2° F and 40% +/- *5%* relative humidity (RH). The true goal is to provide a stable environment, keeping as close as possible to the levels suggested with minimal fluctuations. Some heating and cooling systems come with programmable thermostats that provide varying temperature schedules. While these may save fuel by shutting down the system, they will also increase the period of time that records are not stored under desired conditions. Keep conditions as *consistent* as possible. Maintain the building housing records at the same temperature and relative humidity 24 hours a day, even days a week.

Do not store permanent records in barns, equipment sheds, or any other building without the capacity for heating and cooling as needed.

[continued]

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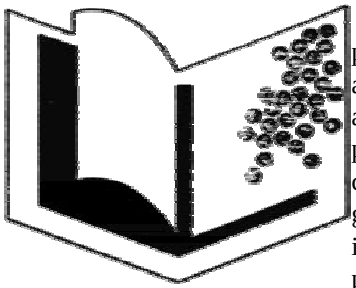
MOLD



Excessive heat, poor air circulation, and relative humidity above 65% can provide a suitable climate for mold growth. High humidity is especially problematic in basements, where ground water and cooler temperatures encourage water vapor to collect. The appearance of mold indicates a serious condition — take immediate action.

W-hen mold occurs, reduce the temperature and relative humidity. Do not move records or try to remove mold from records without first consulting with preservation personnel.

Determining the mold species is an important first step in addressing the mold outbreak. Some molds can present very serious health concerns. Even dormant (dry or powdery) mold spores can be readily redistributed within a storage space, becoming active (velvety) when environmental conditions are favorable for growth.

If you discover records with mold, immediately contact the Conservator, Reference and Preservation Program, Georgia Department of Archives and History, at 404-656-3554.

Lowering temperature and relative humidity levels and increasing air circulation are usually required to discourage future mold growth.

LIGHT

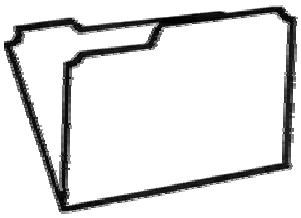
Light, whether natural or artificial, can weaken some materials, causing them to fade or darken. Damage from light is irreversible, and the effects of exposure accumulate over time. A record exposed to a dim light for a long time will ultimately show the same effects as a record exposed to a bright light for a short time. Reduce exposure to the greatest degree possible.

Cover windows with shades or drapes that block light entirely. Blocking light in this manner will also help keep a more stable temperature by reducing solar heat gain. Turn off interior lights when not in use. Storing materials in folders and boxes is an excellent way to protect records from light.

Photocopiers can be a powerful source of light. Avoid repeatedly copying the same record. Create "surrogates" or use copies for heavily requested records. Provide users with surrogate copies to reduce wear and tear on originals.

DUST AND POLLUTANTS

State-of-the-art repositories use chemical filtration to remove pollutants from the air. Even without an expensive filtration system, there are a number of ways to limit the effects of pollutants.



One important way is to house records within folders and boxes that meet the American National Standards Institute ANSI) standard for permanence, Z39.48-1992. The alkaline reserve in these materials will serve a buffer between the contents and a potentially ha environment. Boxes and folders meeting ANSI standard will create a stable micro-environment for permanent records.

Maintain an overall environment that is dust-free as possible.

- Change furnace and air conditioner filters on a regular schedule, *e.g.*, quarterly.
- Use vacuum cleaners equipped with high-efficiency, particulate air (HEPA) filters if possible, so as not to redistribute dust.
- Avoid introducing materials that create internal pollutants, such as wooden cabinets and shelves, cleaning compound and carpeting.
- Do not store records near copying machines, which produce ozone and dust from toner.

PESTS

A pest infestation not only creates anxiety among staff — it can cause significant damage to records. Insects are generally a barometer of another environmental problem, such as high relative humidity, gaps in the building envelope, or poor housekeeping.

Remove trash daily from inside the building, and do not allow collected trash to accumulate in areas directly outside the building. A clean and environmentally-controlled building will discourage pests from making their home in storage areas.

Unless there is a specific problem to be addressed, avoid regularly scheduled chemical treatments. ***There is no all-purpose chemical for eliminating every pest problem.*** Moreover, chemicals that emit strong odors may create long-term problems for staff, records, and record users. Glue traps contain no chemicals and are useful for determining the existence and type of pest present. Such monitoring devices can be furnished by your local pest control technician or purchased in hardware stores.

Limiting food and beverages to designated areas, monitoring the environment, using identification and least toxic eradication methods *first*, and working with your pest control technician are all part of a preventive approach known as ***integrated pest management,*** or IPM.

A pest infestation ***inside* records** boxes indicates a serious condition. Consult a conservator immediately.

RESOURCES AND PUBLICATIONS

By providing an optimal environment for the records entrusted to your care, you help to assure the preservation of your community's unique heritage for present and future generations of Georgians.

For more information, please call 404-656-3554 to contact the Reference and Preservation Program at the Georgia Department of Archives and History, a division of the Office of Secretary of State.

OTHER RESOURCES

Conservation Center for Art and -Historic Artifacts.
Managing a Mold Invasion: Guidelines for Disaster Response.
Philadelphia: CCAHA, revised 1996. Telephone: 215-545-0613.

Lull, William P., and Paul Banks.
Conservation Environment Guidelines for Libraries and Archives.
Ottawa: Canadian Council of Archives, 1995. Telephone: 613-995-0210.

Rossol, Monona, and Wendy C. Jessup.
No Magic Bullets: Ethical Considerations for Pest Management Strategies.
New York: ACTS, 1996.
Available from:
Arts, Crafts and Theater Safety (ACTS)
Telephone: 212-777-0062. ■

This paper meets the ANSI Z39.48- 1992 standard for permanent paper. 00

THE STORAGE ENVIRONMENT

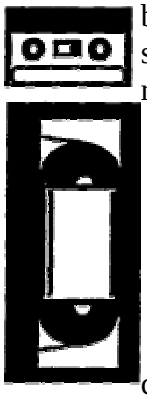
Other technical leaflets in this series:

- ***Preservation Basics for Paper-Based Records***
- ***Disaster Preparedness***
- ***Reformatting Records***
- ***Machine Readable Records***
- ***Selecting an Off-Site Records Facility.***

To request copies, please call 404-656-2374 to contact the
Reference and Preservation Program of the Georgia Department of Archives and History,
a Division of the Office of Secretary of State.

Georgia Department of Archives and History
Secretary of State
330 Capitol Avenue, S.E.
Atlanta, GA 30334

MACHINE READABLE RECORDS



Over the years, records have been produced in a variety of shapes, sizes, and types. Whether records are hand-copied ledger books or printed text, information can be read simply by looking at the text. Records on audio, video, and computer media present an important change in the way information is recorded and retrieved. Such records require equipment to read the information they hold. These records are referred to as ***machine readable.***

The information stored on a videotape or computer diskette must be retrieved by a machine specifically designed to read its particular format. ***The format encompasses both the physical media and the way the electronic signals are recorded on that media.*** VHS format videotapes require a video player designed to read the particular format of those VHS tapes. (For example, a video produced in England would not be playable on a standard video player purchased in the U.S.) Audiocassettes can only be played on a cassette player that accommodates the correct size audiotape that includes the correct number of tracks in the correct physical location.

Changes in technology can cause machine formats to become obsolete, preventing access to information even if the medium *(e.g.*. tape, diskette, CD) holding the information is in perfect condition. Machine readable records are also sensitive to their environment, making environmental controls a requirement. Machine readable records cannot be stored in an attic or basement and reclaimed after years of neglect.

Securing and maintaining machine readable records require planning and diligence beyond that traditionally applied to paper-based records.

INTELLECTUAL CONTROL

It is important to know what machine readable records you are storing. For audiotapes, include the record name, format type, playing speed, and the date that the copy was made in inventories and on storage containers or on the item itself Also include any special signal processing that may have been used, such as "Dolby C" for noise reduction.

For computer tapes and diskettes, record and maintain information about the version of the

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operating system and version number of the pro-. gram or application used to create the record, as well as ownership and date of each record series. Be sure to mark media in the manner recommended by the manufacturer, *e.g.*, never use ballpoint pen for marking CD's.

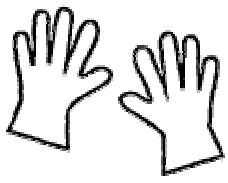
Audiotape, videotape, and computer diskettes are sometimes called magnetic media, because information is recorded on magnetized particles. Because magnetic heads record the information, magnets can also erase it or make it hard to read. For this reason, do not expose these media to strong magnetic fields, *e.g.*, electric motors or audio speakers.

Dust, heat, and high relative humidity are the enemies of machine readable records. Dust scratches tape surfaces, obscuring information and clogging the magnetic heads used to read them. Heat may cause the plastic film of the tape to distort, changing the recorded pattern and scrambling information. Heat can also deform plastic parts inside a cassette, preventing the tape from moving from one reel to the other. High relative humidity can degrade the binder that holds the magnetic information particles on the tape and encourage mold to grow.

For these reasons, store machine readable records in an environment free from heat and dust. Ideal long-term storage conditions would be very cool and dry (50° F and 20% RH). While such conditions may not be realistic for your setting, do not let temperatures exceed 70° F, and if possible, keep the relative humidity below 40%. Make every effort to keep temperature and relative humidity levels constant.

CARE AND HANDLING

Avoid touching the surface of any tape or computer diskette. Oil from skin leaves a residue that can coat the equipment's playing head and attract dust. If you must handle tape, wear clean white cotton gloves. Never use commercial products advertised to clean tapes and diskettes. Contact an experienced professional to clean or repair dirty or damaged tapes.

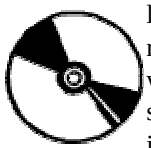


Return tapes and diskettes to their individual boxes immediately after use to avoid possible damage and dust. Never use paper clips or adhesive tape to attach notes directly to cassettes, reels, or diskettes.

Always rewind tapes before storing. If a tape is only partially played, advance the tape to the end (using either regular speed or fast-forward) before rewinding it for storage.

Maintain machines according to manufacturer's specifications to ensure that equipment will not damage tapes.

Most compact disks or CD's are not magnetic media. However, CD's do require careful handling to ensure access to information that has been recorded on the bottom (printless) side of the disk. CD's have been advertised as almost indestructible. They are not



Scratches to the surface can distort the laser light that reads the disk, causing it to skip or repeal tracks. Remove dust with a soft cloth, wiping from the center out, as if along the spokes of a wheel. Return CD's to their cases immediately after use.

USE AND BACKUP COPIES

Backup copies are the best insurance for protecting valuable tapes. In the event of media aging or a natural disaster, a copy may be the only means available to retrieve information from a master that is no longer playable. To prevent the loss of information, create a "copy master" from the original tape. Use this copy master only when making another use copy.

Use reel to reel audio tape for master audio copies. A written transcript of an audio or video tape can also be used as a "use copy" or "backup copy." A transcript may contain every word on the original tape, or only a general rendering of the discussion.

The loss of a single computer diskette can mean the loss of a large quantity of information. For this reason, backup copies are critical to ensuring the preservation of computer-based records. If maintaining an active computer database of records is part of an institutional operation, copy the information recorded on the system's hard

drive onto backup diskettes or tapes on a daily basis. As a part of disaster prevention, store backup copies in another secure location.

REFRESHING

Audio, video, and computer tapes designed to be maintained for long periods of time will require periodic copying to ensure access to information. Every three to five years, re-copy all master tapes onto high quality, polyester-based tape in the currently established formats for the media.

MIGRATION

Information formats disappear as new technology emerges. Within the last twenty years, 8-track tapes, beta format video, 1/2" videotape, and countless other formats have become obsolete. Access to information is limited when machines necessary to read these records fail and cannot be replaced. To ensure access to information, copy older formats onto a stable technology while playback machines remain available.

Be knowledgeable about the formats of all machine readable records in your care.

RESOURCES AND PUBLICATIONS

Machine readable technologies provide versatile methods for recording and storing information beyond the capability of conventional paper-based records. However, machine readable records require a proactive response from their custodians to ensure the long-term preservation of information.

For more information on preserving machine readable records, phone 404-656-3554 to contact the Conservator at the Georgia Department of Archives and History, a division of the Office of Secretary of State.

OTHER RESOURCES

American National Standards Institute (ANSI). *ANSI/NAPM 1T9.23-1996 Imaging Materials: Polyester Base Magnetic Tape: Storage.* New York: ANSI, 1996. 212-642-4900.

Elkington, Nancy E., editor. *Digital Imaging Technology for Preservation.* Mountain View, California: Research Libraries Group, Inc. 1994. Telephone: 415-691-2200.

Lindner, Jim. *Digitization Reconsidered.* This and a number of other related publications are available at <http://www.panix.com/~Vidipax>, or from the author by phoning Vidipax at 212-982-5676. The Vidipax help line is 1-800-653-8434.

Van Bogart, John W.C. *Magnetic Tape Storage and Handling, A Guide for Libraries and Archives.* Washington, DC: The Commission on Preservation and Access and the National Media Laboratory, *1995.* Telephone: 202-939-3400. ■

[The Georgia Department of Archives and History wishes to thank Mr. Jim Lindner for his technical assistance in the preparation of this leaflet.]

This paper meets the ANSI Z39.48-1992 standard for permanent paper.

MACHINE READABLE RECORDS

Other technical leaflets in this series:

- ***Preservation Basics for Paper-Based Records***
- ***The Storage Environment***
- ***Disaster Preparedness***
- ***Reformatting Records***
- ***Selecting an Off-Site Records Facility.***

To request copies, please call 404-656-2374 to contact the
reference and Preservation Program of the Georgia Department of Archives and History,
a Division of the Office of Secretary of State.

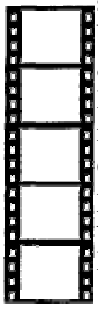
Georgia Department of Archives and History
Secretary of State
330 Capitol Avenue, S.E.
Atlanta, GA 30334

REFORMATTING RECORDS

The Georgia Records Act requires each state agency to "establish and maintain an active program for the economical and efficient management of records..." *[Official Code of Georgia, Annotated (O.C.G.A.) 50-18-94]*. Each local government is required to "approve by resolution or ordinance a records management plan..." *[O.C.G.A.* 50-18-99].

Records come in a variety of shapes, sizes, and types, such as hand-copied ledger books, newspaper files, and various forms created over time to record information for licenses, court orders, and permits. Unstable or heavily used records may require transfer to another format, such as microfilm or permanent paper, to ensure preservation of the information they contain.

MICROFILM



Records are microfilmed to preserve their information, reduce wear and tear on originals, save space, and improve access. Copies of film can be distributed to off-site locations, providing access to more than one user at a time. The Microfilm Disposal Schedule and some records retention schedules allow for the early disposal of records once microfilmed. If properly processed and stored, black and white, silver gelatin microfilm has a usable life of about 500 years, far longer than the useful life of many poor-quality original paper records. Camera masters of the film currently may be stored at the Georgia Department of Archives and History, ensuring the existence of a "security copy." Even if original paper records were damaged, stolen, or destroyed, the *information* from those records would still survive if the originals had been filmed.

Selection

Microfilm all vital records. *O.C.G.A.* 50-18-91 defines vital records as "any record vital to the resumption or continuation of operations, or both; to the recreation of the legal and financial status of government in the state; or to the protection and fulfillment of obligations to citizens of the state." Vital records are among the permanent records for which an agency is responsible.

Typical vital records include board minutes and tax, birth, marriage, deed, and death records. Also regard inventories and finding aids as vital records. Many record schedules indicate which records are vital.

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Produced by the Georgia Department of Archives and History, a Division of the Office of Secretary of State

Lewis A. Massey, Secretary of State

Funded in part by
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National Park Service,
United States
Department of the Interior

Contracts

A written contract will outline specific requirements and describe the record series to be filmed. Include cubic feet or number of items, if known. Specify in this contract that all work must be done according to the *Micrographics Standards* established by the Georgia State Records Committee and the Administrative Office of the Courts. Copies of these standards are available from the Georgia Department of Archives and History.

Research several companies and determine whether other agencies were pleased with the quality of their work. Solicit bids for the project from at least three companies.

Standards

Micrographics standards define exactly what should happen in the microfilming process, to ensure that the end product is of the highest quality possible. Standards prescribe appropriate targets, density and resolution, film quality, processing, and quality control. The standards also prescribe the creation of a camera negative (security copy), a printing negative (reproduction copy), and use copies. All microfilm, whether produced by a microfilm service company or produced in-house, must meet the *Micrographics Standards.*

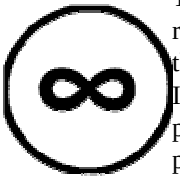
DIGITAL SCANNING

While scanning records for electronic use allows access by multiple users and saves space, digital scanning requires an expensive commitment to supporting technologies used to convert and retrieve records. Moreover, digital technology is not yet standardized, and new developments are continually occurring.

Microfilm is a stable technology and a proven method for preserving records. Microfilm records first. At at later date, the microfilm copy can be scanned for ready access as needed.

PHOTOCOPYING

Photocopying is another way to preserve the informational content of records. Records on poor-quality papers and those generated by thermofax copying processes or pressure-transfer forms are unstable.



Transfer information from these records to alkaline papers that meet the American National Standards Institute (ANSI) standard for permanent paper, Z39.48-1992. Such papers are readily available from paper distributors upon request. Copying onto stable alkaline paper will help to ensure the long-term preservation of the information contained in a record.

Make all preservation photocopies using a black and white copy machine. Color photocopies may not be stable over the long term.

Surrogates

As a records custodian, you are protecting the rights of both present and future users to have access to records. Continued use of originals can prevent future access to information if records become damaged through excessive wear. Use photocopiers to create a “use copy,” or surrogate. Write policies to limit access to originals when surrogates are available, and explain to users why you are taking this extra care.

When making surrogates, never send original records through a document feeder on a photocopier. If it is necessary to “feed” oversized records through a copying machine designed exclusively for this purpose, place original documents in protective polyester sleeves prior to duplication.

RESOURCES

RND PUBLICATIONS

Reformatting is an effective way to ensure the long-term preservation of information. For more information, call 404-656-3554 to contact the Georgia Department of Archives and History, a division of the Office of Secretary of State.

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RESOURCES/PUBLICATIONS
[continued]

ADDITIONAL RESOURCES:

American National Standards Institute (ANSI)
11 West 42nd Street
New York, New York 10036.
Telephone: 212-642-4900.

• ***Local Government Handbook: Using the Common Records Retention Schedules***
• ***Managing Public Records, Common Retention Schedules for County Governments***
• ***Managing Public Records, Common Retention Schedules for Municipal Governments***
• ***Managing Public Records, Common Retention Schedules for School Systems***
Office of Secretary of State
Department of Archives and History
330 Capitol Avenue, S.E.
Atlanta, GA 30334.
Telephone: 404-656-2379.

Managing Public Records: Micrographics Standards
Office of Secretary of State
Department of Archives and History
330 Capitol, Avenue, S.E.
Atlanta, Georgia 30334.
Telephone: 404-656-2379

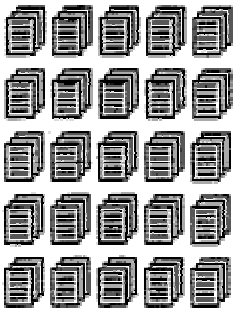
The Georgia Newspaper Project
Photographic Services
University of Georgia Library, Main
Athens, Georgia 30602.
Telephone: 404-542-2131.

Eklington, Nancy E., editor.
RLG Archives Microfilming Manual.
Mountainview, California: Research Libraries Group, Inc., 1994.
Telephone: 415-691-2200■

This paper meets the ANSI Z39.48- 1992 standard for permanent paper. 00

Georgia Department of Archives and History
Secretary of State
330 Capitol Avenue, S.E.
Atlanta, GA 30334

SELECTING AN OFF-SITE RECORDS FACILITY



The last five decades have seen immense growth in the development and activity of government agencies. More records have been created within the last 50 years of government activity than had been generated in the preceding 150 years. This records explosion has strained both the financial and physical resources of all government agencies responsible for maintaining public records.

Records with infrequent reference use need not be housed within the agency office and can be moved to an off-site storage facility. Permanent records may be kept at minimal cost in an off-site, centrally located facility with adequate personnel assigned to maintain them.

In the past, attics, basements, equipment sheds, and warehouses, as well as old jails or school buildings no longer suitable for human habitation, have been commandeered for records storage. But in such settings, records are often inaccessible for public use and vulnerable to excessive damage from uncontrolled environmental conditions. Custodians of government records are required by law to both maintain and provide access to permanent records.

RECORDS INVENTORY AND RETENTION SCHEDULES

The first step in planning an off-site records center is to identify the series and quantity (in cubic feet) to be transferred to the new center. Using a current inventory, also estimate the volume of records that will be transferred in the future, by adding 30-40% to allow for growth. Specify in your written plans the records series that will occupy this future space. Be careful not to over-estimate the amount of space needed to house records.

A large volume of empty space may seem attractive "temporary" storage for materials incompatible with records storage. Dedicate the building solely to the storage of ***records.*** Shared storage with equipment or other materials can compromise the safety and integrity of records.

Consult retention schedules to be certain that records are not kept longer than necessary. Some retention schedules allow for the disposal of paper records when information has been transferred to microfilm. Microfilming records saves space, and can provide security when a copy of the film is stored at the Georgia Department of Archives and History.

[continued]

Produced by the Georgia Department of Archives and History, a Division of the Office of Secretary of State

Lewis A. Massey, Secretary of State

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National Park Service,
United States
Department of the Interior

SELECTING THE FACILITY

Once the total estimated space needed is known, next select an appropriate building to house the records.

It may be more cost-effective to renovate an existing facility than to build a new one. County governments within Georgia have renovated a jail, a high school, a bank building, and other community buildings to serve as off-site facilities. There are, however, specific criteria to follow when selecting a building to house records.

Location

Locate your off-site storage facility as close to the existing courthouse or current storage area as possible. A close location will facilitate the efficient operation of records retrieval and provide users ready access to both active and inactive records. For the safety of all records, select a building location above the flood plain and away from commercial warehouse storage areas.

The Building

Some renovation will likely e necessary to convert an existing building into a records storage center. A building engineer and/or architect experienced with designing records storage facilities will be a helpful addition to those working on the selection and modification of an existing building. Such individuals can provide valuable assistance in determining the feasibility and cost of renovation.

Consult local fire officials to conduct an initial inspection of the building and provide assistance throughout the renovation process to ensure that all structural changes and systems meet fife codes. Inspect the building for lead and asbestos; discovery of either can significantly increase renovation costs.

Whether new or renovated, the basic building will be a sound, insulated structure with a stable roof, free from leaks. Specify secure doors and as few windows as possible. A loading dock at the rear of the building will facilitate unloading supplies for the renovation, as well as later handling of records. If the building has a basement, be certain that the basement remains dry and that it is also supplied by the building's heating, ventilation, and air conditioning (HVAC) system

Ceiling height will influence the capacity for records storage. Standard high-density shelving for records centers requires a ceiling height of at least 15 feet Shorter shelving units are also available. A lower ceiling height will reduce the amount of records that can be stored within the square footage of the building.

Compact shelving — shelving where ranges roll on a track fixed to the floor — can significantly increase available space. The cost of compact shelving may not, however, justify the increase in space.

A concrete floor able to support a load of at least 300 pounds per square foot is required, and compact shelving requires even greater support. For this reason, a single story building is preferred.

The concrete floor must be sealed. Use a floor sealant that contains a film-forming resin that is a stable, inert material, such as acrylic, polyester, or a two-component epoxy. Avoid materials that will release unstable vapors over time, such as polyvinyl acetate (PVA) or vinyl-toluated alkyds. Do not use products that contain biocides, formaldehydes, or sulphur-bearing compounds. (These guidelines also apply to painted surfaces such as walls and cabinets.) Allow an ample amount of time for sealants to cure — at least three months. ***Never introduce records into a site which has just been painted or had its floors sealed.***

Carpeting records storage areas is discouraged. Carpeting retains moisture, harbors molds, and is difficult to clean effectively. New carpeting and adhesives outgas chemicals harmful to both staff and records.

Building Systems

Employ a qualified contractor to inspect all wiring systems. Install lighting levels bright enough to enable staff to work without relying on windows for light. Place light fixtures over aisles, *not* over shelving. Select lamps that emit low ultraviolet (UV) radiation, *e.g.,* fewer than 75 microwatts per lumen. High pressure sodium vapor lamps are highly recommended for storage lighting. They contain little UV, do not generate significant heat, and are extremely efficient.

Inspect the plumbing throughout the building for any sign of rust or discoloration on pipes, which may indicate a potential leak. Note the location of any overhead pipes that might pose a potential risk to the records.

A central heating and air conditioning system should remain operational 24 hours a day, seven days a week, maintaining an interior temperature of 68-72° F and a relative humidity between 40 and *45%*.

Install a fife detection and suppression system in the building. If the building already has a system in place, be certain that it works. This system will notify the fire department automatically in the event of a fire. Smoke detectors, fire extinguishers, and a sprinkler system are necessary to provide a secure records environment.

If the building's basement is intended for records storage, install a water alarm to warn of leaking pipes or incoming ground water. Install the water alarm at the lowest level on the basement floor. Do not assume that the floor drain is the lowest level. Instead, drop a marble or ball bearing on the floor and see where it rolls. In many older buildings, the lowest level on the floor may be a corner.

Fit doors with deadbolt locks. Install intruder alarms on all windows and doors. Alarms should automatically notify local law enforcement of a break-in.

Layout

A public service area will be required if records are to be used on-site. Separate this area from records storage. Assign adequate staff to monitor users and retrieve records. If records are to be used off-site at the courthouse or main records center, design an accurate system to ensure the safe delivery and return of the records.

Allocate space for offices, records processing, and records storage. Allow 100 square feet/person.. Laws require restroom facilities on-site. All public areas must meet Americans with Disabilities Act (ADA) requirements for wheelchair access. Be certain to provide adequate lighting for work. Locate the offices and processing area within the same structure.

Housing and Shelving

Over the years a variety of paper, metal, and wooden housing systems have been devised to store records. The most efficient means of housing records is in cubic-foot record boxes. These enclosures will protect records from light and dust. When constructed of boxboard that meets the ANSI standard Z39.48-1992 for permanence, these boxes also create a beneficial micro-environment for records storage.

Metal shelving that has been painted using a "powder-coating" method is recommended for records storage. All shelving should be rated for records storage loads. Bolt each unit to the floor and brace it at the top to prevent a "domino effect" of toppling stacks.

Arrange stacks so that there are no dead-end aisles. Build shelving units around support columns so that they will not obstruct aisles. Maintain a minimum width of 30" between rows of shelving. Design the most efficient layout possible for the maximum use of space and the security of the records.

COOPERATIVES AND FUNDING

Several counties in Georgia have worked together to build a single off-site facility to house their records. The shared costs and responsibilities have allowed these counties to create a large and efficient facility.

Local historical societies concerned with the preservation of their communities' historical records may be a valuable asset in planning an off-site facility. Members may be able to solicit funds and raise public support for the new facility.

The National Historical Publications and Records Commission (NHPRC) provides grant money to local governments to improve records storage conditions. Information about the NHPRC and grant applications is available on the World Wide Web at <http://www.nara.gov/nara/nhprc>, or by phoning 202-501-5610.

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RESPONSIBILITY

The Georgia Records Act, as stated in *Official Code of Georgia Annotated (O.C.G.A.) 50-18-94*, requires permanent records to be secured and made available for use. Creating an off-site records facility is a cost-effective means of providing secure access to records. The care that records custodians provide today will mean that future generations of Georgians will have access to the unique history of their communities.

RESOURCES AND PUBLICATIONS

For more information about *selecting an off-site facility*, call 404-656-2379 to contact the *Records Management Program* of the Georgia Department of Archives and History, a division of the Office of Secretary of State. For additional information about ***building materials and furnishings***, call 404-656-3554 to contact- the ***Conservator*** at the Georgia Department of Archives and History, a division of the Office of Secretary of State.

OTHER RESOURCES

Lull, William P., and Paul Banks.
Conservation Environment Guidelines for Libraries and Archives.
Ottawa: Canadian Council of Archives, 1995.
Telephone: 613-995-0210.

Minnesota Historical Society.
Specification for Wall and Ceiling Paint for Artifact Areas.
St.Paul: Minnesota Historical Society, 1991.
Telephone: 612-297-3896.
Also available through:
Conservation Online (COOL)
Conservation DistList Archives
<http://palimpsest.stanford.edu>~

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