Filming Process

Preservation microfilming is the process of copying the intellectual content of books, journals, newspapers, business records and other print media onto photographic film. Accepted standards and guidelines are followed to produce a high quality bibliographic and technical product.

During the filming process, a master negative is produced. From this "first generation" master negative, service copies (the second generation) are duplicated onto positive film. The master negative is stored in a dark climate-controlled environment and is used only rarely to reproduce additional copies. All film is produced on 16mm or 35mm silver halide polyester film.

Following are 11 steps the Preservation Reformatting Center follows to produce high quality preservation microfilm:

1. **Collating and Collecting Materials For Filming and Pre-Preparation**
   - Each issue of a newspaper or book is inspected, page by page, for the quality of print, correct dates and titles, etc.
   - University records are inspected for correct order.
   - Storage conditions affect the quality of the original that will be filmed; therefore, light, temperature and humidity are controlled to prevent yellowing and brittleness.
   - University records are stored in an insulated, fireproof cabinet while queued for filming.
2. **Pre-Film Preparation**

- Pages of newspapers are split through the long crease using a paper cutter, then re-collated into the proper page order.
- Torn pages are taped with archival mending tape.
- Staples and paper clips are removed.
- Newspapers are ironed to remove creases and warps that might obscure text or cause shadows under the camera lights.
- Targets, such as "Best Copy Available," or "End of Title" are placed within stacks of pages. Targets are filmed to identify the materials on the film. Other targets include the resolution chart, title or file information, and copyright information. Irregularities such as "Torn Pages" or "Intentional 2nd Exposure" are also noted.
- Completely prepared newspapers are placed between boards and taken to the filming area.

3. **Filming**

- There are three types of base film:
  - **Acetate**: Chemically unstable. Over time, the acetate base deteriorates, emitting a gas that smells like vinegar. Its use for preservation microfilming ceased in the late 1980s.
  - **Cellulose nitrate**: Highly self-destructive and spontaneously combustible; hasn't been used in this country since the mid-1950s.
  - **Polyester film**: Very strong; more permanent. Polyester is very stable and is the recommended preservation base.
• **Silver Halide** emulsion is used for preservation microfilm because of its superior resolving capability, its chemical stability and its scratch resistance.

• Most library microfilm is filmed at an 12x to 18x (read: "12 times to 18 times") reduction ratio. Most newspaper film is 16x to 21x reduction because of the large page format. Most 16mm microfilm is 34x.

• According to laboratory testing at the Image Permanence Institute, preservation microfilm composed of a polyester base and silver halide emulsion has a Life Expectancy (LE) of 500 years if it is properly prepared and stored.

4. **Dark Room Work Includes**

   A. Processing
   • Chemical processing is used for developing film.
   • Residual thiosulfate reacts with gases on the reel or in the box, causing problems such as "redox" blemishes: red spots that appear over time on the film. Precise developing prevents this.
   • Methylene blue tests are conducted to detect residual thiosulfate.

   B. Duplicating

   • Service copies are produced from the master negative on the duplicator.
C. Splicing

- Splicing is done with an ultrasonic splicer, which physically fuses two pieces of film together without using damaging tapes or adhesives.
- No more than four splices are allowed per reel of 35mm negative film. No splices are allowed on service copies of 16mm or 35mm film.

5. **Master Negative Film is checked over a light box with a microscope for**

- Correct placement of targets and correct order of issues and pages.
- Good, even quality of image throughout each frame.
- Technical quality due to correct processing.
- Proper resolution and density.
6. Refilms

- Mistakes found while checking the film during quality control checks are corrected.
- The error is refilmed correctly on a new reel of master negative film.
- The new reel has to be processed.
- The refilmed part is cut out of the new reel and spliced into the original reel.
- The master negative is checked again.

7. Duplicating Film

- After the master negative quality control check is finished, the service copies are produced on the duplicator.

8. Checking the Service Copies

- Each positive service copy is checked frame-by-frame on a microfilm reader for bibliographic integrity, completeness and overall quality.

9. Holdings Control

- The Preservation Reformatting Center retains reel-by-reel records of all titles and issues held on master negative microfilm.
- Copies of newspaper film are duplicated and sold to libraries, publishers and historical societies throughout the state and country.
10. **Storage**

- Master negatives are stored in cabinets in the climate controlled environment of UK Libraries' Special Collections and Digital Programs. First generation camera masters of 16mm film of University Records are also retained in the archival storage vault at the Kentucky Department for Libraries and Archives.

- Service copies of 35mm microfilm are available in Young Library's Periodicals area and other campus libraries. Service copies of the 16mm film of University Records are maintained by the University offices.

11. **Original Issues of Newspapers**

- Original newspapers, books and documents are returned to the owner if they were loaned to us for filming.
- If the documents belong to the library and if they have artifactual value, they are stored in alkaline-buffered enclosures and are kept permanently in climate-controlled facilities.
- University records can be destroyed once the proper transmittal and destruction forms have been authorized.