

## DOCUMENTS ON 16mm MICROFILM READING AND REPRODUCING DOCUMENTS FROM MICROFILM



### 1. GENERAL

1.01 This section primarily covers the requirements for the production of duplicate microfilm and enlarged copies, such as paper prints and reproducibles made from 16mm microfilm. This section also covers the requirements for the equipment and materials needed to produce these copies and the readers needed to use microfilm copies directly.

1.02 This section is reissued:

- (a) To include resolution requirements for duplicate microfilm in 3.03.
- (b) To include requirements of centering the image on the duplicate microfilm in 3.04.

Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

1.03 Use care in handling microfilm to avoid scratching or otherwise damaging the film.

1.04 A list of equipment and materials considered suitable for reading and reproducing drawings from 16mm microfilm is covered in Section 006-220-100. Section 006-220-100 also covers file equipment for 16mm microfilm.

1.05 The general plan for the production, distribution, and use of 16mm microfilm of documents in the Bell System is covered in Section 006-200-100.

1.06 Inspection procedures for duplicate microfilm are covered in Section 006-215-500.

### 2. REPRODUCTION MATERIAL

#### Duplicate Microfilm

2.01 The film used for producing duplicate microfilm shall be 16mm nonperforated, nonreversing, safety type.

#### Paper Prints

2.02 Printing material for enlarged reproductions shall conform to the type and grade recommendations of the equipment manufacturer unless otherwise specified in Section 006-220-100.

#### Processing Material

2.03 Processing material required for reproduction shall conform to the type and grade recommendations of the equipment manufacturer unless otherwise specified in Section 006-220-100.

### 3. DUPLICATE MICROFILM

3.01 It is recommended that duplicate 16mm film be obtained from outside contractors because of the more precise equipment available to commercial processing specialists.

3.02 All duplicate microfilm shall have negative images (light lines on a dark background) and shall be free of scratches, foreign material, stains, or defects which make document information illegible.

3.03 The processed duplicate microfilm shall have sufficient resolution to permit resolving the following test chart pattern.

TYPE OF CAMERA (See Note 2)	TEST CHART PATTERN (See Note 1)
Planetary	4.0
Rotary	2.5

**Note 1:** This will insure a resolution, of minimum 57.5 lines per millimeter on rotary cameras and minimum 92 lines per millimeter on planetary cameras at 23X reduction.

**Note 2:** The type of camera which originated the silver film can be identified by the configuration of the test target image. A

target containing five resolution test charts, one in each corner and one in the center, is indicative of microfilm produced on a planetary camera. A target containing three diagonally arranged resolution test charts indicates microfilm produced on a rotary camera.

**3.04** Document images shall be centered such that the entire image shall appear within the 16mm width of the film.

**3.05** The 16mm microfilm in reels or magazines shall have identification and indexing information on the container. Section 006-210-100 covers information on identification and indexing of 16mm microfilm.

#### 4. ENLARGED REPRODUCTIONS

**4.01** Enlarged reproductions from 16mm microfilm shall be produced at a magnification of at least 19 times.

**4.02** Enlarged reproductions in the form of paper prints shall have positive images (dark lines on a light background).

**4.03** Enlarged reproductions shall provide a distinct contrast between the information and the background. The background shall be uniform in intensity.

**4.04** Screen-projected images shall be negative (light lines on a dark background).

#### 5. REPRODUCTION EQUIPMENT

##### 5.01 General

(a) All reproduction equipment shall be capable of producing legible reproductions from negative 16mm nonperforated microfilm. Such equipment may have optional accessories or capabilities for handling film mounted in aperture cards, envelopes, or other carriers.

(b) All printers and readers shall be provided with a means of positioning the microfilm flat and secure in the focal plane during printing and viewing, but shall permit the passage (including splices) of the microfilm without damage.

(c) Glass flats and reader screens should be cleaned periodically, as required, and when not in use, readers should be covered with dust covers provided.

(d) The installation, operation, and maintenance instructions provided by the equipment manufacturers should be followed to assure obtaining high quality reproductions.

##### Readers

**5.02** A reader is a machine which projects an enlarged image from microfilm onto a self-contained screen. A reader permits quick and ready reference to document information.

##### Reader-Printers

**5.03** A reader-printer is a machine which combines a reader with a printer for making paper prints from microfilm. A microfilm image may be viewed on the screen and a print of the image as seen on the screen can be produced in less than 10 seconds.

*Note 1:* The paper print produced by an electrochemical process is electroconductive and a caution note, such as the following should be stamped in red on the front of the print.

**CAUTION**  
**ELECTRO-CONDUCTIVE PAPER**  
**AVOID CONTACT**  
**WITH LIVE CIRCUITS**

*Note 2:* A warning note should be affixed to the Filmac®\* 400B and 400M reader-printers stating that the glass flats should be opened before the film is advanced.

#### 6. FILES

**6.01 File Facilities:** Drawer files are recommended for the retention and filing of 16mm microfilm. Various sizes are employed with capacities ranging from 600 to 1200 reels of 16mm microfilm. (See USA PH 5.4, Storage of Microfilm, for the recommended practices and conditions for storage of microfilm.)

**6.02** Access file units are recommended for the storage of Microstrip®† holders. These units have a capacity for 100 holders. The units are modular in design and 10 units can be arranged around the reader on a reference work station.

\*Trademark of the Minnesota Mining and Manufacturing Company.

†Registered trademark of Eastman Kodak Company.