

## APPENDIX B

### INFORMATION RETRIEVAL EQUIPMENT AND SUPPLIES SOURCES

The following list is based on the best available information at the time this handbook was prepared. Any manufacturers not included will, upon notification to NARS, be included in the next revision.

#### MICROFILM ROLL MECHANIZED (OR MOTORIZED)

Alpha-Vector Inc.  
501 Fifth Ave.  
New York, N.Y. 10017

Atlantic Microfilm Corp.  
700 South Main St.  
Spring Valley, N.Y. 10977

Bell and Howell Co.  
Business Equipment Group  
6800 McCormick Rd.  
Chicago, Ill. 60645

Computer Micro Viewing, Inc.  
15 Tenth Ave. South  
Hopkins, Minn. 55343

DASA Corp.  
15 Stevens St.  
Andover, Mass. 01810

Eugene Dietzgen Co., Inc.  
2425 N. Sheffield Ave.  
Chicago, Ill. 60614

The Ednalite Corp.  
200 North Water St.  
Peekskill, N.Y. 10566

Information Design Inc.  
3247 Middlefield Rd.  
Menlo Park, Calif. 94025

Information Handling Services, Inc.  
Denver Technological Center  
Englewood, Colo. 80110

Kauffel and Esser Company  
30 Whippany Rd.  
Morristown, N.J. 07960

Eastman Kodak Co.  
Business Systems Market Div.  
343 State St.  
Peekskill, N.Y. 10566

Micro 8 Co.  
P. O. Box 1087  
La Crosse, Wis. 54601

Microfilm Products, Inc.  
40 West 15th St.  
New York, N.Y. 10011

Microsystems Inc.  
1717 Barnum Ave.  
Bridgeport, Conn. 06610

3M Co.  
Microfilm Products Div.  
3M Center-220-10  
St. Paul, Minn. 55101

Morgan Information Systems, Inc.  
193 Constitution Dr.  
Menlo Park, Calif. 94025

Reproduction Systems  
One California St.  
San Francisco, Calif. 94111

Stromberg DatagraphiX, Inc.  
P. O. Box 2449  
San Diego, Calif. 92112

Washington Scientific Industries, Inc.  
13111 Wayzata Blvd.  
Minnetonka, Minn. 55343

and others

**ROLL MICROFILM WITH PHOTO-OPTICAL**

**BINARY CODE**

AIL Information Systems (formerly FMA)  
5730 Arbor Vitae St.  
Los Angeles, Calif. 90045

Alpha-Vector Inc.  
501 Fifth Ave.  
New York, N.Y. 10017

Eastman Kodak Co.  
Business Systems Market Div.  
343 State St.  
Peekskill, N.Y. 10566

Morgan Information Systems, Inc.  
193 Constitution Dr.  
Menlo Park, Calif. 94025

Stromberg DatagraphiX, Inc.  
P. O. Box 2449  
San Diego, Calif. 92112

and others

**MICROFILM STRIP**

Eastman Kodak Co.  
Business Systems Market Div.  
343 State St.  
Peekskill, N.Y. 10566

Other microfilm strip systems are sometimes prepared in-house.

**MICROFILM CHIP, AUTOMATED**

Houston Fearless Corp.  
11801 West Olympic Blvd.  
Los Angeles, Calif. 90064

Itek Corp.  
1001 Jefferson Rd.  
Rochester, N.Y. 14603

Photo Devices Inc.  
33 Litchfield St.  
Rochester, N.Y. 14608

and others

**MICROFICHE AND MICROFILM JACKETS**

Arcata Microfilm  
700 South Main St.  
Spring Valley, N.Y. 10977

Atlantic Microfilm Corp.  
700 South Main St.  
Spring Valley, N.Y. 10977

Walter M. Ballard Co.  
7705 Georgia Ave., NW  
Washington, D.C. 20012

Bell and Howell Co.  
Business Equipment Group  
6800 McCormick Rd.  
Chicago, Ill. 60645

Business Efficiency Aids, Inc.  
8114 Lawndale Ave.  
Skokie, Ill. 60076

Camera Optic Mfg. Co.  
23-53 Sternway St.  
Long Island, N.Y. 11105

DASA Corp.  
15 Stevens St.  
Andover, Mass. 01810

Data Reproduction Systems  
300 East Beach Ave.  
Inglewood, Calif. 90302

Eugene Dietzgen Co. Inc.  
2425 N. Sheffield Ave.  
Chicago, Ill. 60614

DuKane Corp.  
St. Charles, Ill. 60174

GAF-Reprographic Products  
140 West 51st St.  
New York, N.Y. 10020

Houston Fearless Corp.  
11801 West Olympic Blvd.  
Los Angeles, Calif. 90064

Keuffel and Esser Co.  
30 Whippany Rd.  
Morristown, N.J. 07960

Eastman Kodak Co.  
Business Systems Market Div.  
343 State St.  
Peekskill, N.Y. 10566

Micro Design, Inc.  
2355 Johnson St.  
Hartford, Wis. 53027

Microdisplay Systems, Inc.  
Subsidiary of Communication Systems  
Two Penn Plaza  
New York, N.Y. 10001

Micrographic Technology Corp.  
1732 Kaiser Ave.  
Santa Ana, Calif. 92705

Micro Image Corp.  
10469 Roselle St.  
San Diego, Calif. 92121

3M Co.  
Microfilm Products Div.  
3M Center—220-10  
St. Paul, Minn. 55101

Minolta Corp.  
200 Park Ave. South  
New York, N.Y. 10003

Mosler Co.  
1561 Grand Blvd.  
Hamilton, Ohio 45012

National Capital Systems, Inc.  
P.O. Box 3762  
Washington, D.C. 20007

NB Jackets  
31-31 31st St.  
Long Island City  
New York, N.Y.

NCR-Industrial Products Div.  
3100 Valleywood Dr.  
Dayton, Ohio 45429

Photo Devices Inc.  
33 Litchfield St.  
Rochester, N.Y. 14608

Frederick Post Co.  
P. O. Box 293  
Chicago, Ill. 60690

Randomatic Data Systems Inc.  
344 West State St.  
Trenton, N.J.

Readex Microprint Corp.  
5 Union Square  
New York, N.Y. 10003

Realist, Inc.  
N93 W16288 Mogal Dr.  
Menomonee Falls, Wis. 53051

Remington Rand Office Systems  
P. O. Box 171  
Marietta, Ohio 45750

Sanders Associates, Inc.  
1 Fairchild Ave.  
Plainview, N.Y. 11802

Stromberg DatagraphiX, Inc.  
P. O. Box 2449  
San Diego, Calif. 92112

The Taylor-Merchant Corp.  
25 West 45th St.  
New York, N.Y. 10036

Technifax Corp.  
195 Appleton St.  
Holyoke, Mass. 01042

University Microfilms, Inc.  
300 North Zeeb Rd.  
Ann Arbor, Mich. 48103

Visu-Flex Co.  
633 South Carondelet  
Los Angeles, Calif. 90057

Washington Scientific Industries, Inc.  
13111 Wayzata Blvd.  
Minnetonka, Minn. 55343

and others

APERTURE CARDS (MICROFILM—EAM PUNCHED  
CARD OR MICROFILM—EDGE-NOTCHED CARD)

Advanced Technology Corp.  
P. O. Box 245  
Chambersburg Pa 17201

DASA Corp.  
15 Stevens St.  
Andover, Mass. 01810

Dakota Microfilm Service  
9655 W. Colfax Ave.  
Denver, Colo. 80215

Eugene Dietzgen Co., Inc.  
2425 N. Sheffield Ave.  
Chicago, Ill. 60614

B. K. Elliott Co.  
P. O. Box 3240  
Pittsburgh, Pa. 15230

Itek Business Products  
1001 Jefferson Rd.  
Rochester, N.Y. 14603

Keuffel and Esser Co.  
30 Whippany Rd.  
Morristown, N.J. 07960

Kleer-Vu Industries, Inc.  
878 Sussex Blvd.  
Broomall, Pa. 19008

Eastman Kodak Co.  
Business Systems Markets Div.  
343 State St.  
Rochester, N.Y. 14650

Litton Automated Business Systems  
1700 Wisconsin Ave., NW  
Washington, D.C. 20007

Microseal  
2222 West Main St.  
Evanston, Ill. 60204

3M Co.  
Microfilm Products Div.  
3M Center-220-10  
St. Paul, Minn. 55101

Mosler Co.  
1561 Grand Blvd.  
Hamilton, Ohio 45012

Remington Rand Office Systems  
P. O. Box 171  
Marietta, Ohio 45750

The Taylor-Merchant Corp.  
25 West 45th St.  
New York, N.Y. 10036

Washington Scientific Industries, Inc.  
13111 Wayzata Blvd.  
Minnetonka, Minn. 55343

and others

#### SUPERMINIATURE MICROFORMS

Microform Data Systems, Inc.  
2700 Sand Hill Rd.  
Menlo Park, Calif. 94025

NCR-Industrial Products Div.  
3100 Valleywood Dr.  
Dayton, Ohio 45429

and others

#### VIDEO RECORDING

Ampex Corp.  
401 Broadway  
Redwood City, Calif. 94063

Trans-A-File Systems Corp.  
371 Santa Trinita  
Sunnyvale, Calif. 94086

and others

#### MISCELLANEOUS CARD SELECTORS AND MECHANIZED RETRIEVAL DEVICES

Access Corp.  
4632 Paddock Rd.  
Cincinnati, Ohio 45229

BCD Computing Corp.  
P. O. Box 240  
Buffalo, N.Y. 14225

Dakota Microfilm  
9655 W. Colfax Ave.  
Denver, Colo. 80215

DASA Corp.  
Graphic Products Div.  
15 Stevens St.  
Andover, Mass. 01810

DSI Systems, Inc.  
1225 Connecticut Ave., NW  
Washington, D.C. 20036

"Electrofile"  
Acme Visible Records, Inc.  
Crozet, Va. 22932

Foto-Mem Inc.  
2 Mercer Rd.  
Natick, Mass. 01760

Image Systems, Inc.  
11244 Playa Ct.  
Culver City, Calif. 90230

Microform Data Systems Inc.  
Suite 1507-Palo Alto Office Center  
Palo Alto, Calif. 94301

Microsystems Inc.  
1717 Barnum Ave.  
Bridgeport, Conn. 06610

Mohawk Industrial Laboratories, Inc.  
1 Ward St.  
Vernon, N.Y. 13476

Morgan Information Systems  
3197 Park Blvd.  
Palo Alto, Calif. 94306

Mosler Co.  
1561 Grand Blvd.  
Hamilton, Ohio 45012

NCR-Industrial Products Div.  
3100 Valleywood Dr.  
Dayton, Ohio 45429

Randomatic Data Systems, Inc.  
344 West State St.  
Trenton, N.J. 08618

Regiscope Corporation of America  
7 East 43d St.  
New York, N.Y. 10017

Remington Rand  
Office Systems Div.  
2233 Wisconsin Ave., NW  
Washington, D.C. 20007

Sanders Associates, Inc.  
95 Canal St.  
Nashua, N.H. 63060

Technifax  
6200 Kansas Ave., NE  
Washington, D.C. 20011

Varian ADCO  
470 San Antonio Rd.  
Palo Alto, Calif. 94306

and others

#### CLUE WORD EXTRACT CARD

Prepared in-house—a known user is:

Battelle Memorial Institute  
505 King Ave.  
Columbus, Ohio 43201

and others

#### PERMUTED INDEXES

Usually prepared in-house by electronic computers. KWIC (keyword in context) and other standard computer programs available from IBM, RCA, and others.

"Spindex"  
Dr. Frank G. Burke  
Director, Educational Programs Division (NE)  
National Archives and Records Service (GSA)  
Washington, D.C. 20408

"Wadex"  
Dr. Harold Wooster  
Chief, Research and Development  
Lister Hill National Center for  
Biomedical Communications  
National Library of Medicine  
8600 Rockville Pike  
Bethesda, Md. 20014

and others

#### COLUMNAR CARD

Can be prepared in-house; also available commercially from:

Dataflow Systems, Inc.  
7758 Wisconsin Ave.  
Bethesda, Md. 20014

and others

#### DUAL DICTIONARY

Prepared in-house, usually by electronic computer. Users include:

Battelle Memorial Institute  
505 King Ave.  
Columbus, Ohio 43201

"Kros-Term"  
Engleman and Co. Inc.  
2480 16th St., NW  
Washington, D.C. 20009

and others

#### EDGE-NOTCHED CARD

"Keysort"  
Litton Automated Business Systems  
1700 Wisconsin Ave., NW  
Washington, D.C. 20007

and others

#### OPTICAL COINCIDENCE

Better Ideas, Inc.  
210 Wayne Dr.  
Cinnamon, N.J. 08077

Carter-Parratt Limited  
Iddesleigh House  
Caxton St.  
London S.W. 1 Works: Sutton & Bath  
England

Find-It  
P. O. Box 25942  
Los Angeles, Calif. 90025

Information Retrieval Inc.  
801 Welch Rd.  
Palo Alto, Calif. 94304

"Keydex"  
Litton Automated Business  
1700 Wisconsin Ave., NW  
Washington, D.C. 20007

"Termatrix Systems"  
REMAC International Corp.  
26 North Summit Ave.  
Gaithersburg, Md. 20760

Scientific Advances, Inc.  
1400 Holly Ave.  
Columbus, Ohio 43212

Joshua Stern  
Chief, Instrumentation Application Section  
Room A-351, Building 225  
National Bureau of Standards  
Gaithersburg, Md. 20234

and others

#### PUNCHED CARDS

Friden, Inc.  
2100 L St., NW  
Washington, D.C. 20037

IBM Corp.  
1111 Connecticut Ave., NW  
Washington, D.C. 20036

UNIVAC  
2121 Wisconsin Ave., NW  
Washington, D.C. 20007

and others

#### COMPUTERS (AND COMPUTER MASS MEMORIES)

Essentially any of the existing digital computers can, with proper programming, be used in an information retrieval system. Many computer manufacturers also offer computer mass memories of various capacities. Since there are so many manufacturers, and this information is readily available from other sources it is not included here.

## APPENDIX C

### INFORMATION RETRIEVAL RECOMMENDED PRIMERS AND SELECTED RESEARCH SOURCES

Methods of Information Handling, Charles P. Bourne. John Wiley and Sons, New York, 1963.

A useful source of information of design of information retrieval systems as well as fairly current reference to the various types of equipment and devices.

Introduction to Information and Storage Retrieval: Tools, Elements, Theories, Joseph Becker and Robert M. Hayes. John Wiley and Sons, New York, 1963.

A general introductory text on information retrieval. Explains the uniterm system, especially the printed dual dictionary index; the termatrix and minimatrix systems; punched cards organized as collator decks; magnetic tape and tape search units.

Information Storage and Retrieval: A State-of-the-Art Report, Lawrence Beral. Auerbach Corporation, Sept. 14, 1964. AD 630 089.

An easy to read comprehensive survey of the many areas of activity which are a part of information retrieval. The biggest contribution made by this report is to bring the subject into clear and organized perspective. None of the activities are analyzed in any depth, however.

Principles of Automated Information Retrieval, William F. Williams. Business Press, Elmhurst, Illinois, 1965.

A general discussion of the field of information retrieval showing many different types of equipment. This book is similar in content to reference No. 1 of this list, but does not go into as much depth.

"Information," Scientific American. Vol. 215, No. 3, Sept., 1966.

This source is an excellent discussion of the application of computers to information processing, manipulation, storage and retrieval. It extends beyond the boundaries of information retrieval to include electronic system logic, software definitions, data communications, time sharing, programmed learning, and other topics currently being discussed under the heading, "Automation." The particular value of this report is to show how information retrieval fits into this broader picture.

Microfilm in Business, Joseph L. Kish, Jr., and James Morris. The Ronald Press, New York, 1966.

A useful work on the application of microfilm to the office.

Journal of the American Society for Information Science (formerly American Documentation) and the Proceedings of the American Society for Information Science, No. 1 to date, American Society for Information Science. Washington, D.C., 1964 to date.

These are the most important publications in the field of Information Retrieval. Any survey of the literature must include some of the articles printed in this magazine. At one time or another, every major topic is discussed at great length and depth. To keep current in the field, this is the one most important reference.

Microfilming Technology: Engineering and Related Fields, Carl Nelson, McGraw-Hill, New York, N.Y., 1965.

A basic guide on microfilm, particularly in the field of engineering data.

Annual Review of Information Science and Technology, Carlos A. Cuadra, Editor. John Wiley & Sons, New York, 1966 to date.

A highly useful source of information on the latest developments in information retrieval sciences.

Information Retrieval Systems, Characteristics, Testing, and Evaluation, F. W. Lancaster. John Wiley & Sons, New York, to date.

An analysis of the basic elements and essential features of information retrieval systems with particular attention to testing and evaluation.

## OTHER SOURCES OF INFORMATION

Most of the magazines writing in the general area of automation contain worthwhile articles on information retrieval. Some of the most interesting to office information retrieval are:

- Datamation
- Data Processing
- Systems
- Business Automation

Other more technical magazines are:

- Special Libraries Journal
- Association of Computing Machines Journals
- Aslib Journal

The two most abundant sources of current information on all aspects of information retrieval are Defense Documentation Center, (DDC,) Cameron Station, Alexandria, Virginia and the National Technical Information Service, Department of Commerce, Springfield, Virginia (NTIS). All agencies of the Federal Government and all private companies under contract to the Department of Defense are eligible to receive free research reports from DDC. There are certain restrictions put upon distribution which vary with the report and the source of the request. However, much of the information is available for the asking. For this reason, DDC is one of the most valuable sources of current information on information retrieval in the United States today.



For those people who are not qualified to receive from DDC, NTIS is available. All unrestricted research reports produced under contract by private companies for the Federal Government are available for a standard cost of \$3.00 to the general public. Since most reports on information retrieval are not classified, NTIS provides an extensive selection on the subject to the interested reader. Whereas DDC contains only Defense Department reports, the NTIS receives reports from HEW, NASA, AEC, and many other Government agencies, civilian and military.

4. Manufacturer's literature is an important source of information on systems theory as well as equipment characteristics. The International Business Machines Corporation has a series of pamphlets on information retrieval applications in the office, the hospital, the law, etc.
5. The most valuable source of information on microfilm is the National Microfilm Association, Suite 1101, 8728 Colesville Road, Silver Spring, Maryland 20910. Their publications include the Micro-News Bulletin, Journal of Micrographics (formerly NMA Journal) and the proceedings of their annual meetings.

# APPENDIX D

## SAMPLE FORMS FOR EVALUATING INFORMATION RETRIEVAL SYSTEM POTENTIAL

|   |           |   |                                     |                          |                 |   |
|---|-----------|---|-------------------------------------|--------------------------|-----------------|---|
| Evaluating Information Retrieval System Potential<br>INFORMATION FACILITY   |           | EVALUATOR'S NAME  |                                     |                          |                 |   |
|   |           | DATE  |                                     |                          |                 |   |
| LOCATION AND FACILITY   |           |   |                                     |                          |                 |   |
| NAME AND ADDRESS OF ORGANIZATION OF JURISDICTION  |           | TYPE OF RECORDS <input type="checkbox"/> OTHER (Specify)        |                                     |                          |                 |   |
|   |           | <input type="checkbox"/> FOLDERS <input type="checkbox"/> CARDS |                                     |                          |                 |   |
|   |           | CONTENTS OF RECORDS   |                                     |                          |                 |   |
| NAME OF INFORMATION FACILITY  |           | NO. (Net) OF EMPLOYEES AT FACILITY                              |                                     | BUILDING AND ROOM NUMBER |                 |   |
|   |           |   |                                     | PHONE NO                 |                 |   |
| DATA (Estimated manhours spent annually in looking up, searching, extracting or correlating information or data at this facility)   |           |   |                                     |                          |                 |   |
| PRIMARY USERS (Organization & Unit)   | JOB TITLE | ANNUAL MANHOURS   | PRIMARY USERS (Organization & Unit) | JOB TITLE                | ANNUAL MANHOURS |   |
|   |           |   |                                     |                          |                 |   |
|   |           |   |                                     |                          |                 |   |
| EVALUATION FACTORS  |           | YES OR NO   | KEY                                 |                          |                 |   |
| Total Additions Equal or Exceed: (Circle applicable letter, if any)   |           |   |                                     |                          |                 |   |
| 2,000 pages, if system is used mainly for storage of written information.   |           |   |                                     |                          |                 |   |
| 100,000 characters, if system is used for storage of precise data such as names, numbers, etc.  |           |   |                                     |                          |                 |   |
| 100 individual items, if system is used mainly for storage of graphic, pictorial, or other matter not covered above (Explain in remarks).   |           | Y   | Y                                   | Y                        | N               | N |
| Information will be in continuous use for over 5 years and one man-year use is being used for looking up, searching, extracting, or correlating information or data at this facility.   |           | Y   | N                                   | N                        | N               | Y |
| Information will be in continuous use for less than 5 years and two man-years use are being used for looking up, searching, extracting, or correlating information or data at this facility.  |           | N   | Y                                   | Y                        | N               | N |
| Use presently required for looking up, searching, etc., information or data at this facility is mainly attributable to limitations of conventional methods.   |           | -   | Y                                   | N                        | -               | Y |
| Information maintained at this facility could be readily obtained from other source(s) (Specify sources and locations under remarks).   |           | N   | N                                   | N                        | N               | N |
| CONCLUSIONS   |           |   |                                     |                          |                 |   |
| Modern information retrieval seems a likely possibility.  |           | X   | X                                   |                          |                 |   |
| Probably that present or improved conventional methods will suffice.  |           |   |                                     | X                        | X               | X |
| Probably that present or improved conventional methods will suffice; HOWEVER, also consider modern information retrieval systems (particularly those which use inexpensive equipment.)  |           |   |                                     | X                        | X               |   |
| Consider discontinuance of either this or other duplicate facility (ies), and if duplication widespread, also consider possibility of a central information service or facility.  |           |   |                                     |                          |                 | X |
| Remarks (Specify and explain - use remarks if additional space is required).  |           |   |                                     |                          |                 |   |
| <p>INSTRUCTIONS - Prepare one of these Decision Tables for each file station, record collection, index file or other information at the installation being surveyed. Where reference is made to user manhours, specify those spent by employees of the organization as well as any spent at the facility by personnel from other organizational units. Answer "YES" or "NO" in the appropriate column opposite the Evaluation Factors to indicate the existing situation.</p> <p>Compare your overall findings with those in the columns under the KEY. (A dash indicates that it makes no difference whether the answer to that evaluation factor is Yes or No.) When you find a column that duplicates your answers, place a check mark in the top of the column (preferably with a colored pencil). Follow the appropriate column down into the Conclusions column and circle the appropriate X.</p> |           |   |                                     |                          |                 |   |

| Evaluating Information Retrieval System Potential<br>USER NEEDS  |  |        |                   |                           | EVALUATOR'S NAME  |            |   |   |   |   |   |   |   |
|--|--|--------|-------------------|---------------------------|---|------------|---|---|---|---|---|---|---|
|  |  |        |                   |                           | DATE  |            |   |   |   |   |   |   |   |
| BROAD TYPE OF INFORMATION  |  |        |                   |                           |   |            |   |   |   |   |   |   |   |
| ORGANIZATIONAL UNIT  | USER'S JOB TITLES (Exclude personnel assigned to operate information facilities) | NUMBER | PHYSICAL LOCATION | ESTIMATED ANNUAL MANHOURS | PRIMARY SOURCES OF THIS INFORMATION   |            |   |   |   |   |   |   |   |
|  |  |        |                   |                           |   |            |   |   |   |   |   |   |   |
|  |  |        |                   |                           |   |            |   |   |   |   |   |   |   |
|  |  |        |                   |                           |   |            |   |   |   |   |   |   |   |
|  |  |        |                   |                           |   |            |   |   |   |   |   |   |   |
| <b>EVALUATION FACTORS</b>  |  |        |                   |                           | <b>YES or NO</b>  | <b>KEY</b> |   |   |   |   |   |   |   |
| 1. 5% or more of users' total man-hours (minimum 1 man-year) are being spent in looking up, searching, extracting, or correlating information or data.<br><i>(*Users include all persons who personally do the looking up, searching, extracting or correlating, EXCEPT those assigned to operate the Information Facilities)</i>  |  |        |                   |                           |   | -          | Y | Y | Y | Y | N | N | N |
| 2. Current information facilities are INADEQUATE for one or more of the following reasons; (Circle any that apply)<br>A. Pertinent documents or information are regularly being missed or system produces too much non-relevant material or information.<br>B. System can furnish documents, only, whereas users would like to receive only portions thereof or precise data.<br>C. System cannot satisfy need for retrieving precise data and correlating it.   |  |        |                   |                           |   | -          | Y | Y | N | N | Y | Y | N |
| 3. Much faster retrieval speed is needed than could ever be achieved under present or any other conventional method.   |  |        |                   |                           |   | Y          | N | N | N | N | N | N | N |
| 4. Time presently spent in looking up, searching, extracting, or correlating information or data is mainly attributable to limitations of conventional methods.  |  |        |                   |                           |   | -          | Y | N | Y | N | Y | N | - |
| <b>CONCLUSIONS</b>   |  |        |                   |                           |   |            |   |   |   |   |   |   |   |
| A. Modern information retrieval system seems a likely possibility  |  |        |                   |                           |   | X          | X | X |   |   |   |   |   |
| B. Likely that present or improved conventional methods will suffice.  |  |        |                   |                           |   |            |   |   | X |   | X | X |   |
| C. Likely that present or improved conventional methods will suffice; HOWEVER, also consider modern information retrieval systems (Particularly those which use inexpensive tools)   |  |        |                   |                           |   |            | X |   |   | X |   |   |   |
| D. Other (Specify and explain)   |  |        |                   |                           |   |            |   |   |   |   |   |   |   |
| <b>INCONVENIENT FEATURES</b><br>(Features NOT necessarily attributable to limitations of conventional methods. CHECK ANY THAT APPLY.)  |  |        |                   |                           | <b>DIFFICULT TO OBTAIN ACCESS TO INFORMATION</b>                                |            |   |   |   |   |   |   |   |
|  |  |        |                   |                           | <b>USERS PREFER TO SEARCH BUT FIND SYSTEM DIFFICULT TO UNDERSTAND OR USE</b>    |            |   |   |   |   |   |   |   |
|  |  |        |                   |                           | <b>USERS NOT ROUTINELY INFORMED OF NEW INFORMATION PERTAINING TO THEIR WORK</b> |            |   |   |   |   |   |   |   |
|  |  |        |                   |                           | <b>OTHER (Specify and explain)</b>  |            |   |   |   |   |   |   |   |
| <b>REMARKS</b>   |  |        |                   |                           |   |            |   |   |   |   |   |   |   |
| <p><b>INSTRUCTIONS</b> - Prepare as many of these Decision Tables as needed to collect data during the course of surveying individual user groups to estimate manhours spent in looking up, searching, extracting, or correlating information or data. Summarize your findings by preparing one Decision Table for each of the broad, similar types of information required at the installation being surveyed.</p> <p>Enter "YES" or "NO" in the column opposite each of the Evaluation Factors to indicate existing conditions. Compare your overall findings with those in the columns under "KEY" until you find a set that matches yours - place a check mark at the top of that column (preferably with a colored pencil) - Follow the selected column down to the "CONCLUSIONS" and circle the appropriate X.</p> |  |        |                   |                           |   |            |   |   |   |   |   |   |   |

# APPENDIX E

## SAMPLE DIRECTIVE (AIR FORCE) COVERING DOCUMENT MINIATURIZATION SYSTEMS

DEPARTMENT OF THE AIR FORCE  
Headquarters US Air Force  
Washington DC 20330

AF REGULATION 12-40

5 March 1971

### Documentation

### DOCUMENTATION STORAGE AND RETRIEVAL (DS&R) SYSTEMS

*This regulation provides general information and instructions on the establishment and use of systems for documentation storage and retrieval and assigns responsibilities for related actions. It applies to all Air Force activities that are responsible for initiating, evaluating, approving, operating, or using a DS&R system. It applies whether the documentation is generated by the using activity or is purchased, leased, or otherwise obtained from some other source.*

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Related Directives. The following directives also relate to DS&R systems. The provisions of those in b through d must be met when the use of ADP equipment for any systems is contemplated.

a. AFR 12-1—Explains the Air Force Documentation Management Program and assigns responsibilities for its implementation.

b. Other regulations in the 4 and 12 series—Give additional information about the programs and the systems discussed in this regulation.

c. AFR 300-2—States policy on design and operation of automated data processing (ADP) equipment.

d. AFR 300-3—Tells how to design, develop, and implement automated data systems.

Replaces AFR 12-40, 25 Nov. 1969. (For summary of revised, deleted, or added material, see signature page.)

Prepared by: DAD

Distribution: S

tems that use computers, punch card accounting machines, or any auxiliary or peripheral equipment.

e. AFM 171-9, chapter 5, 9 May 1966—Provides specifications with which to justify and obtain ADP equipment.

f. AFR 400-14—States Air Force responsibility for the recovery, reclamation, and use of silver contained in expended photographic materials and silver-bearing scrap.

**2. Documentation Storage and Retrieval System Explained.** Any system that can store, index, select, and retrieve documents (pages of information) is a DS&R system, even though it uses only conventional manual filing and research methods. (For many collections of records, manual techniques are still the most effective and economical.) However, in this regulation the term DS&R will be used *only* to refer to a system that uses a combination of manual, mechanical, electronic, photographic, video, and similar techniques to miniaturize, store, index, select, and retrieve documentation. Technological advances are resulting in continuous development of new or improved systems to perform those functions. Because of the variety of available equipment and devices, and their diverse capabilities, the potential for developing effective DS&R systems is almost limitless.

**3. System Media.** Currently, microfilm is the most commonly used medium for DS&R systems. Attachment 1 contains general information and instructions on its use. As need is indicated, similar information on other media (see AFR 12-1, attachment 1, 20 May 1969) will be published.

**4. Systems Interface.** Expanded use of mechanical and automated techniques has increased interface between systems regulated by the AFR 300 series and AFM 171-9 and those covered by this regulation. For example: Devices that initially convert data from magnetic tape to microfilm are in the ADP category regulated by the AFR 300 series and AFM 171-9, but devices that further

process that same microfilm (developers, duplicators, readers, etc) are in the DS&R category and are regulated by this regulation. When a system interface is anticipated, managerial responsibilities of the staff offices concerned at all levels of command must be fully coordinated, joint endeavors.

**5. Responsibilities of Air Force Activities.** DS&R systems are established and operated under the Air Force Documentation Management Program (See AFR 12-1.)

a. Air Force Documentation Management Officer (DMO). The Air Force Documentation Storage and Retrieval Office (AF/DAD) carries out the following responsibilities of the Air Force DMO:

(1) Develops and coordinates policies and procedures governing the use of DS&R systems, Air Force-wide.

(2) Negotiates with other agencies, as required by law, executive order, or regulation, on Air Force use of DS&R systems.

(3) Evaluates and approves or disapproves the use of DS&R systems by Air Force activities, based on:

(a) Policies and requirements affecting the creation, maintenance, and disposition of Federal records.

(b) Information furnished in the proposal (soundness of system, selection of equipment, method of accomplishment, economies, etc).

(c) Coordination and comments of activities that have either a functional interest in the documentation or a responsibility to support implementation of the system.

NOTE: Approval of a DS&R system does not constitute approval of funds, manpower, or facilities for the system; those resources must be approved through regular command channels.

b. Command Documentation Management Officers. Command DMOs will:

(1) Promote the effective use of mechanized and automated systems that will result in economic savings and improved service and advise about and help develop and implement such systems.

(2) Evaluate, justify, coordinate, and submit proposals—for establishing or chang-

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ing DS&R systems—to HQ USAF/DAD, Wash DC 20330 as prescribed by this regulation.

(3) Insure that approval of HQ USAF/DAD is obtained before DS&R systems are installed or procurement of equipment, supplies, or service contracts is initiated (see exception in c below).

(4) Insofar as practicable, centralize equipment and operations to support more than one DS&R system (see AFR 12-42).

(5) Provide for periodic review of approved DS&R systems to determine their continued justification and to insure compliance with this regulation.

(6) Submit DS&R Systems Reports as specified in paragraph 9 and attachment 3; take any required action on matters reported.

**c. Activities Responsible for Research and Development (R&D).** An activity that has been delegated the R&D responsibility may implement experimental DS&R systems under an approved development or test directive without obtaining prior approval of HQ USAF/DAD. However, the activity must furnish the command DMO a copy of the approved directive and a report of the results of the experiment, including the disposition to be made of the equipment being tested or developed.

**6. How to Develop a DS&R System Proposal.** A mechanized or automated system that stores, indexes, selects, and retrieves documents can be advantageous, if a realistic analysis (of document content and nature, equipment characteristics, and users' requirements) proves that the total planned system is effective and economically sound. To develop a DS&R system proposal:

**a. Analyze the Documentation:**

(1) Determine and justify the reason for maintaining the collection, and the purpose that it serves. For example: Consider whether the same information is available from another source; consider whether less frequently used documentation can be segregated and retired to a staging area or to a records center (see AFM 12-50).

(2) Determine the requirements for and methods of updating information in the

collection, and analyze the current and contemplated system for disposing (purging) of information as it becomes noncurrent.

(3) Be sure the filing arrangement permits easy access to up-to-date information. Ascertain the frequency of each type of reference (view only, borrow, copy) and identify user requirements.

(4) Study the physical characteristics of the paper documents and determine the practicality of converting them to another form.

(5) Identify and define the specific inadequacies of current procedures. Determine whether those inadequacies can be eliminated through improvements resulting from actions in (1) through (4) above.

**b. Plan the Proposed System:**

(1) Contact representatives of various commercial firms to obtain a knowledge of available technology. Determine capabilities, limitations, and costs of equipment to establish and continue techniques being considered for the system. Specific equipment, identified by the manufacturer, make, model, etc, may be selected for planning purposes only, but a commitment must not be made nor implied before approval of the proposal by HQ USAF. (Manufacturers' proposals or recommendations for ADP or PCAM equipment will not be solicited; unsolicited proposals will be forwarded to HQ USAF/ACDC, Wash DC 20330 per AFR 300-2.)

(2) Establish the objectives of the proposed system and, after considering all users of the documentation, plan the total system.

(3) Determine the availability of any suitable Air Force-operated equipment that could be used (shared) in the proposed system.

**c. Prepare and Submit the System Proposal:**

(1) When preparing the DS&R system proposal, follow the format in attachment 2. Prepare the proposal in sufficient copies to provide at least one for the command DMO and two for HQ USAF/DAD. Furnish information that will permit a clear understanding of the present system and the proposed system, and provide a justification for the

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change. If appropriate, attach sample copies of documents, studies, flow charts, cost analyses, etc.

(2) If a feasibility (pilot) test is planned for the system, indicate objectives and limitations of the test. (The test period will not exceed 6 months, and equipment will be leased and not purchased for the system during the test period.) Submit copies of any progress and final reports of these test systems to HQ USAF/DAD.

(3) If an interface with ADP is contemplated in the proposed system, prepare a single document proposal, and:

(a) When an automated data system change is proposed, submit in accordance with AFR 300-3 and attach information required for the DS&R system proposal (see format, attachment 2). Send an information copy of the entire proposal to HQ USAF/DAD.

(b) When there is no automated data system change involved, submit equipment specifications in accordance with AFM 171-9 and attach information required for the DS&R system proposal format. Send an information copy of the entire proposal to HQ USAF/DAD.

**7. Evaluation and Approval of Proposed DS&R Systems.** When evaluating the merits of a proposed DS&R system, the primary factors to consider are the operating and administrative procedures that can be improved now or later, and the relative costs of the proposed system as compared with costs for any alternate procedure. The procedures for evaluating and approving or disapproving a proposed DS&R system are as follows:

a. Command DMOs will:

(1) Insure that:

(a) The information in the proposal is accurate and complete, and

(b) The techniques and equipment proposed for the system are practical.

(2) Determine whether any of the operations required for the proposed system could be accomplished by sharing the use of existing approved equipment and facilities. If not, furnish reasons.

(3) Coordinate the proposal with all activities that might be affected by, or interested in, the implementation of the system. (Include any required coordination on funds, manpower, and facilities for the proposed system.)

(4) Send recommended proposals to HQ USAF/DAD, for approval. Include with command recommendations any additional information that justifies or clarifies the proposal.

(5) Return incomplete or unacceptable proposals to the initiating activity with appropriate explanations.

b. HQ USAF/DAD will:

(1) Approve or disapprove proposed DS&R systems (see paragraph 5a(3)).

(2) Assign a systems control number to each approved proposal (for future identification of the system) and furnish any appropriate contingencies or instructions on establishing and operating the system.

(3) Return disapproved proposals to the command DMO, with appropriate explanations.

**8. Operation of a DS&R System.** Established systems must be periodically monitored to insure that continuance is justified and that procedures and equipment are improved in keeping with technological advancements. As a minimum, provisions must be made for:

a. **Safeguarding Classified Information:** The same security requirements that apply to safeguarding, storing, shipping, and granting access to classified papers also apply to classified information in a DS&R system. In addition, take these precautions:

(1) Use the services available from Air Force facilities as far as practicable; use commercial firms only when they have been cleared and authorized to handle classified information under AFR 205-4.

(2) Comply with AFRs 205-1 and 205-4, which govern the reproduction of classified documents.

(3) Review each classified document before including it in the system to insure that:

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(a) All possible downgrading and declassifying actions have been completed, and

(b) Downgrading/declassifying notations, as required by AFR 205-2, appear on all documents remaining classified.

**b. Inspections:**

(1) Carefully inspect miniaturized images before disposing of related paper copies. Insure that:

(a) All documents intended to be processed have been included, are properly indexed, are legible, and can be satisfactorily retrieved.

(b) System medium meets required standards of quality. (For microfilm, see attachment 1.)

(2) Periodically inspect entire collection to determine whether there is any deterioration from any cause.

**c. Disposition of Documentation.** Comply with disposition instructions specified in the approved system for:

(1) Paper copies of the documents committed to the system.

(2) Miniaturized copies of documents. Attachment 1 discusses the retirement of microfilm copies of documents that have a permanent retention value.)

**d. Housekeeping and Film Handling Procedures.**

Insure that proper housekeeping and handling procedures prevail, especially in filming, processing, film duplicating, and bridge or jacket-loading operations. (See attachment 1, paragraphs 6 and 7, for details.)

**e. System Documentation.** Maintain statistical and other information on a continuous basis. (See paragraph 9 and attachment reporting requirements.)

**f. AF Form 112, "Documentation Storage and Retrieval System Report," RCS: HAF-112.**

Reports on each DS&R system must be submitted through documentation management channels on AF Form 112, prepared and submitted as shown in attachment 3. Presently, the report is designed for systems

that use microfilm as the documentation medium; when specifically required by HQ USAF/DAD reports will be submitted on DS&R systems that use other media.

**10. Microfilming Histories and Related Documents.** Major commands that desire to microfilm their histories and related documents (see paragraph 2, attachment 4) must submit the DS&R system proposal required by paragraph 6. In the letter of transmittal, indicate the levels of command for which microfilming of historical documents is being proposed. When HQ USAF/DAD approves the proposed DS&R system, microfilm the histories and related documents as explained in attachment 4.

**11. Change to an Approved DS&R System.**

Approval of a DS&R system applies to the system as initially authorized. When any major change (see a through f below) is contemplated, advance approval of HQ USAF/DAD must be obtained. Proposed changes are to be prepared and submitted in the same manner as the initial proposal. For example, major changes are proposals to:

a. Discontinue inservice operations and contract for the services with a commercial firm, or vice versa.

b. Take over an approved system from another activity.

c. Change, add to, or discontinue any documentation or indexes approved for the system.

d. Change the disposition criteria for any documentation in the system.

e. Change the format of the converted documentation.

f. Obtain equipment, or equipment modifications, not originally approved for the system.

**12. Cancellation of an Approved System.** To cancel an approved DS&R system, notify HQ USAF/DAD by letter. Include:

a. Date of cancellation.

b. Reasons for cancellation.



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- c. Disposition of the documentation.
- d. Disposition of the equipment approved for the system.
- 13. Command Supplements and Other Publications. Commands may not issue supplements or other publications that change the basic policies, procedures, or formats pre-

scribed in this regulation. Forward a copy of each MAJCOM supplement or other publication on this subject to HQ USAF/DAD as required by AFM 5-1, paragraph 10-7 and rule 4, table 14-1, 1 October 1968.

- 14. Supply of Form. Locally produce AF Form 112, on 8" X 10½" paper, as shown in attachment 5.

BY ORDER OF THE SECRETARY OF THE AIR FORCE

OFFICIAL

JOHN D. RYAN, *General, USAF*  
*Chief of Staff*

DWIGHT W. COVELL, *Colonel, USAF*  
*Director of Administration*

Summary of Revised, Deleted, or Added Material

This revision adds procedures for microfilming history and related documents (para 10 and atch 4); substitutes "ANSI" for "USASI" (paras 2d and 6a(2) of atch 1), new office symbols for old, and a new reports control symbol for AF Form 112; and revises instructions for microfilming permanent documentation (atch 1, para 4).

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## GENERAL INFORMATION AND INSTRUCTIONS ON USE OF MICROFILM

**Microfilming Explained.** Microfilming, or microphotography, is a process by which miniature photographic images of documents are reproduced on film. Generally, these images must be magnified to be read. As technological advances are made in microfilming systems and equipment, various forms of microfilm are being developed and its uses are being expanded.

**Microforms.** The more common forms of microfilm are:

(1) *Roll Microfilm.* A length, usually 100 feet, of microfilm that is kept on a reel in a cartridge or similar type container.

(2) *Aperture Card.* A card with one or more holes, or windows, designed to hold a piece of microfilm. Although the card may be of any size, this term generally refers to aperture cards that can be mechanically inserted, filed, and extracted by punch card sorting machines.

(3) *Strip Microfilm.* A unit length of microfilm that is too short to be wound on a reel. The strips are inserted in a jacket, clipped on to a sheet of film, or stored in a container.

(4) *Microfiche.* A sheet of film containing multiple microimages, generally arranged in a grid pattern.

(5) *Chip Microfilm.* A unit of microfilm containing one or more microimages and an area for recording code bits.

**Sizes.** The width of microfilm is measured in millimeters. The most commonly used sizes are 16mm and 35mm for roll microfilm and 105mm for microfiche. Wider or narrower film generally requires special cameras and readers. The length of microfilm is usually measured in linear feet or inches.

**Copies (Prints).** The relation of a copy to the original document is called "generation." The original exposed and developed microfilm is the first generation microfilm. Copies made from the first generation microfilm, whether reproduced on film or

paper, are second generation prints. Copies made from the second generation prints are third generation prints, etc. Any generation print may be either a positive or a negative, depending on the type of process and the film used. (A positive is identical to the original document in that dark portions appear dark and light portions appear light. A negative is just the reverse.)

**d. Types.** The three most common types of microfilm are: Silver, diazo, and vesicular. For many years, silver film was the only type able to receive the image from the camera. However, recent developments in the use of vesicular film for this purpose have been successful. Although silver film can be used to make prints, either diazo or vesicular film is generally used for the "work copy."

**2. Standards and Specifications.** The following specifications and standards apply to the various areas of microfilm. Experience proves that compliance with the requirements of these specifications and standards where possible guarantees microfilm of excellent quality.

### a. Federal Standards:

(1) Fed-Std 125a Film, Photographic and Film, Photographic Processed (For Permanent Record use.)

(2) COSATI Standard PB 167-630, Microfiche.

### b. Military Specifications:

(1) MIL-M-9868D — Microfilming of Engineering Documents, 35mm; requirements for.

(2) MIL-P-9879A—Photographing of Construction/Architectural Drawings, maps and related documents, 105mm; requirements for.

(3) MIL-M-38748A Microfiche; for Engineering/Technical Data, reports, studies and related data, requirements for.

(4) MIL-M-38761—Microfilming and Photographing of Engineering/Technical

Data and Related Documents: PCAM Card Preparation, Engineering Data Micro-Reproduction System, General Requirements for, Preparation of.

**c. Federal Specifications:**

- (1) L-F-315b—Film, Direct Positive, Roll (Diazotype)
- (2) L-F-320b Film, Thermal Developing
- (3) L-F-334d Film, Photographic, Roll, Microfilm (Black & White)

**d. ANSI Specifications:**

- (1) PH 1.28-1957—Photographic Film for Archival Records.
- (2) PH 1.29-1958—Curl of Photographic Film, Methods for Determining the.
- (3) PH 2.19-1959—Diffuse Transmission Density
- (4) PH 4.8-1958—Determining Thiosulphate Content of Processed Black and White Photographic Film and Plates; Method for. (There is a small fee for ANSI items.)

**3. Legal Status of Microfilmed Records.** A record's legality and admissibility as evidence in court are not affected by the fact that the record has been microfilmed. A microfilmed copy of a record is admissible in evidence in a legal action when it can be established that the record was microfilmed by the authorized custodian of the records as a routine, controlled procedure approved by higher authority. The same substantiating measures also are sufficient to establish the authenticity or legality of microfilmed records for audit or investigative purposes (44 U.S.C. 399).

**★4. Microfilming Permanent Documentation:**

**π. Authorized Production.** When documentation that has a permanent retention value is microfilmed, only the following production is authorized, unless HQ USAF/DAD specifically approves others. Care must be taken to preclude scratching the master films (camera negative and silver positive).

(1) One camera master silver negative, and produced from it:

- (a) One silver positive print.

(b) One diazo copy for internal use or further reproduction purposes.

(2) One silver negative film reproduced from the silver positive film.

**b. Copies for National Archives.** Retire to the National Archives or to the appropriate records center the camera master silver negative and the positive silver print made from it (see AFM 12-50) after inspecting them to assure that they are adequate substitutes for the original documents (see FED-STD 125 and ANSI Specification PH-1.28-1957).

**5. Microfilm Equipment.** Basic equipment for a microform system consists of a camera, a processor, and a viewer. In addition, duplicators, viewer-printers, retrieval keyboards, inspection kits, splicers, and a variety of other accessories and peripheral devices are available. It is not feasible to identify and describe the function of all types of microform equipment; however, some general information and guidance are provided below.

**a. Description of Microform Equipment:**

(1) *Microfilm Cameras.* Microfilm cameras are referred to as being either planetary or rotary cameras. When a planetary camera is used, both the film and the document are still; when a rotary camera is used, both the film and the document are in motion. Most rotary cameras use 16mm film, and most planetary cameras use 35mm film; however, there are planetary and rotary cameras that will accept either 16mm or 35mm film. A step-and-repeat camera is a planetary type camera used for producing microfiche. Using 105mm film, it microfilms an image at a time, completes a row of images, then returns and repeats the process on the next row in the microfiche grid.

(2) *Processors.* The microfilm processor accepts the roll of film that has been exposed in the camera, develops the latent images, washes the chemicals from the film, and dries and rewinds the film onto a reel. Variances in processors include factors such as speed, daylight or darkroom loading, and film sizes (width and length). Processing exposed microfilm is perhaps the least time-consuming operation of any system; one microfilm pro-

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cessor is capable of supporting several systems.

(3) *Viewers and Viewer-Printers.* Equipment for viewing or reading microfilm images differs widely. Some can print a copy of the document being read (viewer-printers); others (viewers) cannot. (Usually the print copy approximates the size and quality of the document that was originally microfilmed.) Some will accommodate only one form of microfilm (roll, microfiche, aperture card, etc); others will accept combinations of microforms. Since this equipment is the retrieval station, many different devices and ways to select the desired images are available with it.

(4) *Other Equipment, Accessories, and Devices.* Obtain brochures from, and discuss other types of microform equipment with, your local manufacturers' representatives.

b. *Selecting Microform Equipment.* System objectives and requirements dictate parameters for selecting equipment, just as a knowledge of equipment capabilities and limitations may affect the system design. The comparison of cost versus worth dominates most determinations. The local representative's reliability for service and maintenance must be considered when selecting equipment.

c. *Procuring Microform Equipment.* Equipment identified in an approved DS&R system is authorized under TA 006, section D. Before initiating procurement actions for this equipment, consider:

(1) Sharing use of existing Air Force operated equipment.

(2) Lease of equipment with option to purchase, particularly for short-term use and for systems that are subject to changes that may require corresponding changes to equipment. In these instances, a service contract to accomplish the filming and/or processing may be more economical than either purchasing or leasing the equipment.

(3) Maintenance contracts on purchased equipment.

6. *Checklist for Contract or In-House Microfilm Operation.* This list is not all inclusive, nor is it intended to infringe upon the many

laws and regulations on procurement and contract operations. Experience indicates that the several important items and procedures necessary to obtain desired results are:

a. *A visit to the microfilm facility or laboratory to:*

(1) Examine the facility's physical condition, manpower, and capability to complete the proposed job in the desired manner (for example, skilled technician, plant capacity, etc).

(2) Observe the chemical mix area. This area should provide clean mixes and have properly mixed chemicals that comply with ANSI standards and preclude oxidation of the chemicals. Check the procedures in this area. Ask if there is a copy of the current ANSI standards on file. If there is, review to insure currency.

(3) Discuss the facility's record-keeping practice. Explain any requirements the vendor or technician does not understand (inspection sheets for processed film, indexes, processor quality control sheets, etc).

(4) Check the quality control program and procedures in the processing area; for example, the control over processing solution temperature, processing time, control over replenishment-chemicals flow into the processing equipment, etc.

(5) Evaluate the film inspection facilities and procedures. It is most important that the resolution, density, residual hypo, etc, be checked on all film processed, and that the instruments for these inspections be capable of performing according to existing specifications. Observe, also, whether a frame-by-frame check is performed on the processed film passing through the laboratory.

(6) Verify the technical competence of the personnel assigned, and note whether manning is adequate for satisfactory performance.

(7) Inspect the overall cleanliness and the film handling techniques. Do personnel wear white cotton gloves at all times when handling film? This requirement applies to all operations that involve film handling.

Attachment 1

(8) Observe the procedures involved in camera operation. Do the camera operators handle submitted data carefully? Do they display technical competence in their jobs? Do they wear dark or other nonreflecting garments while operating the cameras?

b. A sampling of the contractor's work. If possible, before contract award, submit excellent, medium, and poor-quality samples to each vendor being considered. Inspect his efforts when he returns the samples to see whether:

- (1) His performance is satisfactory, and
- (2) Poor quality material will microfilm satisfactorily.

7. Care in Handling Microfilm. To protect microfilm from scratches, lint, dust, and other materials that might damage or distort the film image, take the following precautions:

a. Always wear white-cotton, lint-free gloves when handling film of any kind.

b. Always hold film by its edges, never on its flat surfaces.

c. Never wind film on the reel too tightly nor grab or hold the end of the film and pull it to tighten it on the reel. Wind film on the reel only as tight as the camera, viewer, or other rewind mechanism permits.

d. Before using viewers, microscopes, densitometers, etc, always clean all parts that will come in contact with the films, and keep them clean during use. Dust is a deadly enemy to film.

e. After the service (workhorse or use) copy of the microfilm has been inspected, accepted, and produced, use the original camera negative only in emergencies.

f. Never use a viewer that has revolving flats to view camera negative microfilm or any other microfilm. Such viewers tend to

scratch the film (especially in the diagonal plane of the film).

g. Keep chemicals and chemical fumes away from film-storage and film-use areas. Never use alcohol to clean film; use film cleaner (photographic).

h. Wind and store film on plastic instead of metal reels. In humid areas metal tends to rust and the rust penetrates the film emulsion.

i. Periodically check stored film. This check is most important. Check for fungus, mildew, film stickiness, too tight winding, image etching, etc. Perform this check at least annually and more often in areas of high or very low natural humidity, especially if film is not maintained under controlled temperature and humidity.

8. GSA Microfilming Services. The GSA regional offices offer Federal agencies the services described below. Consider them when developing a microform-based DS&R system.

a. Central Source of Information on Microfilming. This service includes furnishing information on current uses of microforms and on new techniques and developments in this field.

b. Technical Advice and Assistance. This service is designed to promote programs to:

- (1) Preserve records;
- (2) Reduce volume;
- (3) Provide security copies;
- (4) Make duplicate copies; or
- (5) Improve information retrieval system.

c. Central Reimbursable Microfilming Service. This service includes preparing, indexing and filming records; inspecting film; and labeling film containers.

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**FORMAT FOR DS&R SYSTEM PROPOSAL**  
(Type on Appropriate Letterhead)

REPLY TO  
ATTN OF:

(Office symbol of requesting office)

SUBJECT:  
TO:

Proposed DS&R System for (Brief title of documentation and location)

(Major command documentation management officer)

1. Name of activity. (Show complete organizational identification and location where proposed system will be established.)

2. Present system:

a. Document description. (Indicate records series by title and appropriate table and rule number from AFM 12-50. When more than one series is involved, list each series. Show inclusive dates of the documentation, its security classification, and the physical characteristics of the documents (paper, microform, or other media). When other than paper documents are involved, state whether original paper documents are available, or whether the medium used is a suitable substitute for the paper records. Show largest, smallest, and majority of document page sizes; estimate number of documents in the files and average number of pages in each document. Include any other remarks pertinent to description of the documentation.)

b. File volume. (State on-hand volume in cubic feet; estimated weekly, monthly, or yearly accumulation in cubic feet. If more than one series of documents, show volume for each series.)

c. File (document) maintenance and disposition. (Describe kind of files, and whether centralized or decentralized. Describe filing arrangement, related indexes, method of updating and other changes, number of updates or other changes per day, week, or other, and system of disposing of non-current information. Discuss indexing and filing procedures.)

d. Retrieving and furnishing information. (Describe method of referencing the file, and show the number of references per day, month, etc. Identify duplicates and related records series and their locations. Identify typical users of file by office, position type (engineer, scientist, manager, etc), and grade ranges. List sample questions asked, time required for typical search, percentage of searches that require copies of documents to be made, and method of copying).

e. Manpower. (List Personnel (by grade and AFSC) presently employed in indexing, filing, retrieving and copying documents. Show manhours spent in filing, updating, indexing, retrieving, copying, and disposing of documents. Explain whether personnel are full or part time, military or civilian.)

f. Equipment and floor space. (List equipment used for maintaining document files. Include all file cabinets, sorting racks, desks, tables, book-cases, etc, directly related to file operation, and indicate floor space required for operation.)

Attachment 2

### 3. Proposed system :

a. System description. (Describe proposed storage medium—aperture card, microfiche, jacket, roll film, video tape, etc.—and include microform size and reduction ratio to be used. Explain procedures for converting files and implementing the system; indicate number of copies and distribution of film to be made; discuss method of retrieval, how film will be duplicated, etc.)

b. File volume. (Show cubic feet of on-hand holdings and estimated number of images to be converted to new system. Show estimated annual volume to be entered into system.)

c. Files maintenance and disposition. (Describe in detail all changes that will result from conversion to proposed system. For example: Will documentation be centralized or decentralized? What changes will be made to filing arrangement, indexes, method and frequency of updating or other changes to information in file? If a thesaurus or dictionary is to be developed, what is the status? Indicate method of disposing of non-current information from converted documentation and include disposition of paper records after they have been converted, and disposition of the converted documentation.)

d. Retrieving and furnishing information. (Explain method of referencing, estimate number of references per day and average time for search, and indicate type of questions to be asked of file, if different from paragraph 2d. Identify any difference in users described in paragraph 2d above. Explain method of furnishing information to searcher and the percentage of searches that will result in duplicate microform copies or hard copy enlargements.)

e. Manpower. (Estimate, by grade and AFSC, the manpower required to operate the proposed system on a continuing basis and the additional temporary personnel that will be required to establish the system and convert the backlog. Show manhours required for each operation (micro-filing, inspecting, mounting, etc). If presently assigned personnel are to be used, explain the required training and its costs. If contractor service is to be used, explain actions taken under AFR 26-12.)

f. Equipment. (Identify each item of equipment required for the proposed system; furnish make and type, if known, and reasons for selecting a particular equipment. Identify any Air Force-operated equipment available for use in the proposed system, or explain reasons for not sharing the use of existing equipment. Indicate whether rental or purchase is contemplated, and the cost of each item. Explain disposition to be made of equipment used for present system; see paragraph 2f above.)

g. Supplies. (Itemize supplies and costs contemplated to implement proposed system, and estimate annual requirements.)

h. Facilities. (Explain increase or decrease of floor space for proposed system over current system, after backlog is converted. Describe any changes in facilities or utilities required for new system and furnish costs.)

i. Resources. (Provide information about approval of funds, manpower, and facilities for the proposed system.)

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j. Schedule. (Prepare a schedule showing significant events and their estimated beginning and ending dates; for example: Procuring and installing equipment, modifying facilities, beginning of indexing, beginning and ending dates for backlog, starting dates for conversion of current documents. For scheduling purposes, the day the systems approval is received will be "O" day. When slippage occurs, send schedule of adjustments and reasons for slippage to the command documentation management officer.)

4. Justification. (Explain advantages of new system over old, cost reductions, management improvements, etc.)

FOR THE COMMANDER (or other appropriate closing)

(No.) Attachments  
(Attach sample documents,  
flowcharts, cost studies, etc,  
as appropriate.)

Attachment 2



**RESPONSIBILITIES AND INSTRUCTIONS FOR PREPARING, SUBMITTING,  
AND REVIEWING AF FORM 112, "DOCUMENTATION STORAGE AND  
RETRIEVAL SYSTEM REPORT," RCS: HAF-G12**

**1. Responsibility for Preparing Report.** Each activity that is responsible for producing microfilm (either original camera microfilm or duplicate film) will prepare AF Form 112, "Documentation Storage and Retrieval System Report." This requirement includes activities that are responsible for service contracts for microfilming, processing, duplicating, or similar microfilm operations. It does not apply to leased commercially prepared microfilm, such as the VSMF, Showcase, and similar systems.

**2. Report Preparation.** The report is self-explanatory; if exact information is not known enter estimated statistics and indicate that they are estimates. Use additional sheets of blank paper if needed. Prepare a separate report for each separate DS&R system. In addition, if it meets the requirements in paragraph 1:

a. Each Engineering Data Service Center (EDSC) will prepare a separate report, even though it operates under a common DS&R system number (AFLC 1-58).

b. Each Accounting and Finance Office (AFO) will prepare a separate report, even though the office operates under two common DS&R system numbers (AFAFC 1B-54 and AFAFC-2B-69).

c. Each Base Civil Engineer will prepare a separate report, even though it operates under a common DS&R System number AF/PRE 2B-63.

**3. Submission of Reports and Responsibilities for Review:**

a. The preparing office will submit three copies of the report to its documentation manager (DM). (See AFR 12-1 for assigned responsibilities.)

b. The Activity's DM will:

(1) Review the report for completeness and assist the preparing office, as required.

(2) Retain one copy of the report for followup action and information until it is replaced by the next report.

(3) Send the original and duplicate to the command DMO. (Exception: Send reports from AFOs to AFAFC/SUAD, 3800 York St, Denver CO 80205, and a courtesy copy to the DM of the host activity.)

c. The command DMO will:

(1) Insure that all reports have been received from intracommand activities required to submit reports.

(2) Submit by transmittal letter to HQ USAF/DAD the original of each report received; include in the letter any appropriate comments concerning the report.

(3) Retain duplicates of reports for followup action and information until they are replaced by the next report or are no longer needed for managerial purposes.

**4. Reporting Periods and Due Dates.** Submit reports annually to cover the period 1 June through 31 May. Reports are due in HQ USAF/DAD by 31 July.

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## ★POLICY AND SPECIFICATIONS FOR MICROFILMING HISTORICAL MATERIALS

1. Application of Policy and Specifications. The policy and specifications in this attachment apply to all major commands and their subordinate activities that microfilm documents for historical purposes.

a. Command historical offices are encouraged to establish microfilming projects as required. When a project is being established, the command historian should coordinate his initial plan with the Historical Research Division, Air University (ASI/HO) to insure that it is compatible with the activities of that headquarters. Allow at least 30 days for ASI/HO's reply. When reply is received, the command DMO will process the plan as a DS&R system under this regulation. Allow 30 days for final determination of approval by HQ USAF/DAD.

b. The specifications outlined in this attachment for microfilming historical records and related documents are essential to meet quality requirements of the National Archives and Records Service; the Office of Air Force History (AF/CHO), HQ USAF; Historical Research Division, AU; the Documentation Systems Division (DAD), HQ USAF; and other Air Force activities. (As used in this attachment, the term "historical records and related documents" includes all unit histories, monographs, special studies, and CHECO reports, with associated supporting documents and other historical material)

2. Division of Effort. Since command historical archives contain some documents, particularly unit histories, that duplicate those deposited in the archives at Maxwell, microfilming activities must be divided to minimize duplication.

a. Unit Histories. Although some exceptions may be made by agreement between ASI/HO and a command historical office, the filming of unit histories and their supporting documents will usually be divided as follows:

(1) ASI/HO will microfilm unit histories below numbered Air Force (or compara-

ble) level, and will produce copies of film when requested by Air Force commands.

(2) Any command historical office that establishes a microfilming project may microfilm its own histories and the unit histories of its assigned numbered air forces (or comparable levels). Before beginning any microfilming effort, the command historical office must coordinate with ASI/HO to insure that the histories have not already been microfilmed elsewhere.

b. Other Documents in Command Archives. The command must coordinate with ASI/HO to prevent possible duplication and arrange for exchanges of film whenever it appears that the command's archives contain significant duplication of documents held by the Air Force historical archives. Such coordination is necessary, for example, before microfilming command monographs and other documents, if the permanent record copies have been deposited in the Air Force historical archives.

### 3. Microfilm Film Requirements:

a. The film used to microfilm history and related documents will be as follows:

(1) 16mm nonperforated of the anti-halation undercoat (AHU) type, or equal.

(2) Microfilm roll length—not more than 100 feet, including a 6-inch leader and trailer of blank film on each roll.

b. Splicing into a roll of microfilm should be avoided. However, when you must splice film, use the Recordak Presstape Microfilm Splicer, Model 5A, or equal.

4. Camera Equipment. Camera equipment used to film the histories and related documents can be either rotary or planetary. However, it must produce microfilm that meets all requirements in this attachment, and must provide for placing a standard image control mark (blip) on the bottom center of each frame of microfilm.

5. Specifications and Standards. The current issues of the following documents apply:

**a. Specifications—Federal:**

- (1) L-F-315b—Film, Direct Positive, Roll (Diazotype).
- (2) L-F-320b Film, Thermal Developing.
- (3) L-F-334d Film, Photographic Roll, Microfilm.
- (4) PP-B-636—Box, Fiberboard.

**b. Standards**

(1) *Federal*: FED-STD-125a Film, Photographic and Film, Photographic Processed (For Permanent Record Use).

**(2) Military:**

(a) MIL-STD-105—Sampling Procedures and Procedures and Table for Inspection by Attributes.

(b) MIL-STD-129—Marking for Shipment and Storage (Federal Government activities may obtain copies of Federal Specifications and Standards, and the Index of Federal Specifications and Standards from established engineering data service centers (see AFR 12-41)).

**c. Other Publications**

- (1) ANSI-PH-1.23-1957—Photographic Film for Archival Records
- (2) ANSI-PH-2.19-1959—Diffuse Transmission Density
- (3) ANSI-PH-4.8-1958—Determining Thiosulphate Content of Processed Black and White Photographic Film and Plates; method for
- (4) ANSI-PH-5.6-1961—100 foot reels for processed 16mm and 35mm microfilm, dimensions for (American National Standards Institute (ANSI) standards may be obtained from 10 E. 40th St, New York NY 10016) (There is a minimal charge for ANSI publications.)

**6. Quality.** The legibility and archival quality criteria for microfilm are as follows:

**a. Acceptable Reduction Ratios:**

- (1) Minimum—24x
- (2) Maximum—26x

**b. Density.** The background density of processed microfilm, as measured by the method prescribed in ANSI-PH-2.19-1959, will be 0.95 to 1.50 for the camera master

negative. When that density cannot be attained because of contrast differences within the documents caused by age, erasures, etc, a density as close as possible to it may be used if legible hard (paper) copy can be produced by a viewer-printer from third-generation negative microfilm.

**c. Resolution.** A minimum resolution of 100 lines/mm is required for the camera master negative. Determine resolution by exposing the NBS Microcopy Resolution Test Charts (see figure 1) as the first and last exposure on each roll of microfilm produced. To measure resolution, use a microscope having a minimum magnification ratio of 50x to measure the exposed targets. Measure the patterns in figure 1 in all 5 positions for planetary equipment and in the center only for rotary equipment.

**d. Archival Quality.** The residual hypo content and archival quality of the camera negative and of the silver positive print film made from it must meet the requirements of FED-STD-125 and ANSI PH-4.8-1958.

**7. Number of Copies and Distribution.** The number of copies of microfilm and the distribution will be as follows:

**a.** The original camera master negative and the silver positive print made from it will be forwarded to the National Archives, Wash DC 20408, in accordance with provisions of AFM 12-50.

*NOTE:* The camera master negative will only be used to reproduce the silver positive print and/or a "workhorse" diazo copy. All other copies required will be reproduced from the silver positive or "work horse" diazo film.

**b.** Two duplicate silver negative copies will be forwarded to ASI/HOA Building 914, Maxwell AFB AL 36112. ASI/HO will forward one copy to AF/CHO.

**c.** Other copies as needed will be made by the major command for internal headquarters use or for distribution to subordinate activities.

*NOTE:* When the Miracode System is used and a requirement exists for reproducing the code patterns for use to automatically retrieve images, all reproductions must be silver-to-silver or the code patterns will not function correctly.

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8. **Quality Control.** A quality inspection must be performed on all microfilm produced. To preclude unnecessary damage to the original camera master negative, comply with paragraph 8b, basic regulation; paragraph 6 and 7, attachment 1; and the following:

a. **Master Camera Negative.** Perform *only* resolution, density, and residual hypo content inspections.

b. **Duplicate Silver Negative or Diazo Negative.** Perform frame-by-frame check for legibility.

*NOTE:* If the duplicate silver negative or the diazo negative is not legible, the camera master negative can be checked to ascertain if original filming quality was poor or if reproduction equipment is causing poor quality.

9. **Arrangement of Material on Microfilm.** To obtain as much uniformity as possible in page arrangement, comply with the following:

a. **Page position for microfilming:**

(1) **Standard-size page.** Film in position to be readable, without modification, on a reader or reader printer with a 13" X 13" viewing screen that produces 8½" X 11½" prints; that is, film with the top and bottom of each page parallel to the edges of the microfilm.

(2) **Oversize pages.** Photograph oversize pages (those that require multiple frame exposures for 16mm film at 24x to 26x reduction) in sections from left to right and then from top to bottom, with a minimum of 1-inch overlap between adjacent sections.

b. **Sequence (see paragraph 10a(1)) below):**

(1) **Required Sequence.** Film the complete series of histories of one unit (command or numbered air force) in sequence. Keep the volumes of any periodic installment in order, and film successive installments in sequence by date from earliest date to the most recent. Leave at least 2 inches of blank film between each history and between each volume.

(2) **Complete Series.** Do not split a series by filming some installments and omit-

ting others, for example, by filming narratives and omitting supporting documents.

(3) **Divisions of Unit History Films.** Do not divide any installment of a unit history between two rolls of film except between volumes that originally (in the first copy) were bound separately; do not divide narratives and supporting documents between rolls if they were bound together in the original paper copy. On a rare occasion, an exception may be necessary because of the great length of the history being microfilmed. When it is, break the film at a logical place, such as the beginning of a new chapter of the narrative or a new section of the supporting documents.

(4) **One History Per Roll.** Do not put histories of more than one unit on any roll of film sent to ASI/HO.

10. **Security Classification.** The security classification of a completed microfilm roll must correspond with the highest classification marking on any document in it. If a roll contains no classified documents, show "UNCLASSIFIED" on the NBS Microcopy Resolution Test chart (see figure 1). If a roll contains classified documents, show its security classification.

a. **Separation by classification.**

(1) Microfilm Top Secret (TS) histories, or TS volumes or annexes of histories, on separate TS rolls. (Paragraph 9b is modified to the extent necessary to provide for separate filming of TS materials.)

(2) Microfilm together, as indicated in paragraph 9b, histories that are classified Secret or lower and those that are unclassified.

b. **Roll and Copy Numbering.** For accounting and control purposes, the rolls, as well as the copies, must be numbered (see *c below*). A simple method would be to number the rolls in sequence, with the roll number followed by the copy number (for example, 10/1 for Roll 10, Copy 1; 10/2 for Roll 10, Copy 2; etc), but each command may devise its own system.

c. **Labeling:**

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(1) Comply with AFRs 205-1, 205-2, and 12-31 and with other applicable USAF directives when marking reels, boxes, etc for security and other restrictions on use.

(2) Put roll and copy number on each reel, box, etc (see *above*).

(3) Do not put any other markings on the reels and boxes sent to ASI/HOA.

d. Shipping Inventory. Include a complete inventory of the contents with each copy of each roll distributed as indicated in paragraph 7. In the inventory, list the contents in the order in which the documents appear on the roll of microfilm and include the following information:

(1) Information relating to the roll:

(a) Roll number.

(b) Overall classification plus any other restrictions on use of the roll.

(2) Information relating to each document on the roll:

(a) Title.

(b) Date(s).

(c) Volume numbers.

(d) Any other descriptive information necessary for quick and positive identification of the document.

(e) Image number for the beginning of the document.

(f) Security classification of the document.

11. Contingency Operations. Exceptions to the preceding instructions in this attachment may be required for contingency operations; for example, the reduction factor (paragraph 6a) may have to be reduced to 22x to permit use of portable cameras for microfilming in a combat theater. Exceptions will be authorized by special instructions issued by HQ USAF/DAD as required.

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SECURITY CLASSIFICATION MARKING



MICROFILM ROLL NUMBER

Figure 1. Resolution Target.



MICROFILM ROLL \_\_\_\_\_  
 NOMENCLATURE \_\_\_\_\_  
 CONTRACT NUMBER \_\_\_\_\_  
 AGENCY \_\_\_\_\_  
 CONTRACTOR \_\_\_\_\_  
 OPTION: \_\_\_\_\_



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| DOCUMENTATION STORAGE AND RETRIEVAL SYSTEM REPORT<br><i>(If more space is needed use remarks and continue on an 8 x 10 1/2" sheet)</i> |           |  |                                 | 1. REPORT PERIOD     |                           | REPORTS CONTROL SYMBOL                                     |
|--|-----------|--|---------------------------------|----------------------|---------------------------|--|
| THRU:  |           | TO:  |                                 | FROM:                | THRU:                     | <i>(Name and Location of Organization or Staff Agency)</i> |
| 2. DSR SYSTEM NUMBER   |           | 3. NO. OF MILITARY & CIVILIAN PERSONNEL ASSIGNED TO DSR SYSTEM |                                 |                      |                           |  |
|  |           | GRADE  | AFSC                            | FULL TIME            | PART TIME                 |  |
| 4. PRODUCTION AND DISPOSITION  |           |  |                                 |                      |                           |  |
| 4. MICROFILMING OPERATION  |           |  |                                 |                      |                           |  |
| TYPE CAMERA USED   |           | NUMBER OF FRAMES BY SIZE                                       |                                 |                      |                           |  |
|  |           | 16MM   | 35MM                            | OTHER (Specify)      |                           |  |
| ROTARY   |           |  |                                 |                      |                           |  |
| OVERHEAD   |           |  |                                 |                      |                           |  |
| STEP AND REPEAT  |           |  |                                 |                      |                           |  |
| 5. NUMBER OF 100' ROLLS OF FILM  |           |  | 6. UNITIZING (Number of Frames) |                      |                           |  |
| BY MM SIZE   | PROCESSED | LOADED IN CARTRIDGES   | MOUNTED IN APERTURES            | INSERTED IN JACKETS  | STRIPPED-UP FICHE         | OTHER (Specify)  |
|  |           |  |                                 |                      |                           |  |
| 7. DUPLICATING (Number)  |           |  | 8. DISPOSITION (Number)         |                      |                           |  |
| SILVER   |           |  | DIAZO                           | VESICULAR            | TRANSFERRED (Distributed) | RETIRED  |
| APERTURE CARDS   |           |  |                                 |                      |                           | DESTROYED  |
| MICROFICHE   |           |  |                                 |                      |                           |  |
| 100' ROLLS 16MM  |           |  |                                 |                      |                           |  |
| 100' ROLLS 35MM  |           |  |                                 |                      |                           |  |
| OTHER (Specify)  |           |  |                                 |                      |                           |  |
| 11. COST DATA  |           |  |                                 |                      |                           |  |
| CONTRACTED SERVICES  |           | COST   |                                 | INHOUSE              |                           | COST   |
| MICROFILMING   |           | \$   |                                 | EQUIPMENT            |                           | \$   |
| PROCESSING   |           |  |                                 | MAINTENANCE CONTRACT |                           |  |
| LOADING/UNITIZING  |           |  |                                 | SUPPLIES             |                           |  |
| DUPLICATING  |           |  |                                 | MANPOWER             |                           |  |
| OTHER (Specify)  |           |  |                                 | SPACE                |                           |  |
|  |           |  |                                 | UTILITIES            |                           |  |
|  |           |  |                                 | OTHER (Specify)      |                           |  |
| 9. EXPLANATION OF COST DATA  |           |  |                                 |                      |                           |  |
| REMARKS (Include contemplated changes to system, problem areas, etc.)  |           |  |                                 |                      |                           |  |
|  |           |  |                                 |                      |                           |  |
| DATE   |           | TYPED NAME AND GRADE OF PREPARING OFFICIAL                     |                                 |                      | SIGNATURE                 |  |
| DATE   |           | TYPED NAME, GRADE & OFCS SYMBOL OF DOCUMENTATION MGR           |                                 |                      | SIGNATURE                 |  |

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Attachment 5

FPMR 101-11.3

RECORDS MANAGEMENT HANDBOOK

Managing Information Retrieval

INFORMATION  
RETRIEVAL SYSTEMS

1970



GENERAL SERVICES ADMINISTRATION  
NATIONAL ARCHIVES AND RECORDS SERVICE  
OFFICE OF RECORDS MANAGEMENT

Federal Stock Number  
7610-161-7577



RECORDS MANAGEMENT HANDBOOKS are developed by the National Archives and Records Service as technical guides to reducing and simplifying paperwork.

RECORDS MANAGEMENT HANDBOOKS

|   |      |        |
|---|------|--------|
| Managing correspondence: <i>Plain Letters</i>                               | 1955 | 47 p.  |
| Managing correspondence: <i>Form Letters</i>                                | 1954 | 133 p. |
| Managing correspondence: <i>Guide Letters</i>                               | 1955 | 23 p.  |
| Managing directives: <i>Communicating Policy and Procedure</i>              | 1967 | 62 p.  |
| Managing forms: <i>Forms Analysis</i>                                       | 1960 | 62 p.  |
| Managing forms: <i>Forms Design</i>   | 1960 | 89 p.  |
| Managing forms: <i>Forms Management</i>                                     | 1969 | 134 p. |
| Managing mail: <i>Agency Mail Operations</i>                                | 1957 | 47 p.  |
| Managing current files: <i>Files Operations</i>                             | 1964 | 16 p.  |
| Managing current files: <i>File Stations</i>                                | 1967 | 52 p.  |
| Managing current files: <i>Subject Filing</i>                               | 1965 | 40 p.  |
| Managing information retrieval: <i>Information Retrieval Systems</i>        | 1970 | 150 p. |
| Managing information retrieval: <i>Microform Retrieval Equipment Guide</i>  | 1970 | 64 p.  |
| Managing emergency preparedness files: <i>Federal Vital Records Program</i> | 1968 | 161 p. |
| Managing noncurrent files: <i>Applying Records Schedules</i>                | 1964 | 23 p.  |
| Managing noncurrent files: <i>Federal Records Centers</i>                   | 1967 | 39 p.  |
| Mechanizing paperwork: <i>Source Data Automation Equipment Guide</i>        | 1965 | 78 p.  |
| Mechanizing paperwork: <i>Source Data Automation Systems</i>                | 1970 | 122 p. |
| Mechanizing paperwork: <i>Source Data Automation Systems</i>                | 1963 | 183 p. |
| General: <i>Bibliography for Records Managers</i>                           | 1965 | 58 p.  |
| General: <i>Copying Equipment</i>   | 1965 | 82 p.  |

## FOREWORD

The methods and equipment used in most offices for storing and retrieving information have changed insignificantly in the past 50 years, and many of these systems are still adequate today. However, the situation is rapidly changing and has already become a serious problem in some offices. The information explosion that began with World War II and the increased complexity in Government operations make it necessary for many managers to consider improved methods and equipment. Fortunately, because of pioneering efforts in the scientific and engineering communities and developments in records miniaturization, computer technology, and electronic communications, today's manager has new answers to his information retrieval problems. This handbook contains descriptions of representative nonconventional systems in use today, with a view toward providing managers, management analysts, supervisors, and others with ideas as to how they might improve the dissemination, storage, and retrieval of information in their offices.

Although this handbook is issued as one of a series of Records Management Handbooks produced by the National Archives and Records Service, General Services Administration (GSA), the United States Air Force shared in its development. It was produced under a contract jointly funded and administered by the Air Force and GSA.

For sale by the Superintendent of Documents, U.S. Government Printing Office  
Washington, D.C., 20402 - Price \$1.75

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# INTRODUCTION

## Purpose

The purpose of this handbook is simply to describe selected information retrieval systems in use today, so that those seeking information on the subject may learn what others are doing to solve their information retrieval problems. No attempt has been made to evaluate the relative merits of the systems described or to include all of the information retrieval systems in use within the Government today.

Three general principles were followed in selecting the systems to be included in the handbook:

- To cover, as far as possible, a representation of the more significant nonconventional methods and equipment in use today, from the simplest to the most complex.
- To provide a wide spectrum of the types of work activities where nonconventional information retrieval methods and equipment are being successfully employed.
- To limit the examples to operating systems, or those in the process of implementation, using equipment that is generally available.

This handbook clearly illustrates that there are many approaches one might take in solving any given information retrieval problem. Some of the systems described may at first seem too expensive for the situation you have in mind. This may not prove to be the case, since it may be possible to share the costs of development and equipment with some other group having a similar need or to have the work performed by a service bureau. On the other hand, some of the systems in the handbook may seem overly simple, and there may be a temptation to underrate their value.

The right choice in any situation can be made only after a careful cost-benefits study has been conducted—a study that compares

the best suited conventional methods for accomplishing the task against the best suited nonconventional information retrieval methods and equipment. Hence, the broader your knowledge of systems, the more likely you are to find the best answer to your information retrieval problem.

## Related Handbooks and Workshops

The National Archives and Records Service has three handbooks that provide guidance in the development and operation of conventional systems: *Subject Filing*, *Files Operations*, and *File Stations*. There is also available a training workshop, "Files Improvement."

In addition to this handbook on information retrieval systems, two others are being developed. The first is titled *Microform Retrieval Equipment Guide*, and the second is *Information Retrieval*. A workshop, "Office Information Retrieval" is also available. The materials for this workshop and the one titled "Files Improvement" may be purchased by individual agencies who wish to conduct workshops for their own personnel; or, in some situations, workshops may be conducted at an agency location by National Archives and Records Service personnel. In addition, agency personnel may attend the regularly scheduled workshop sessions conducted by the National Archives and Records Service in Washington, D.C., and by the General Services Administration regional offices.

If the system selected employs an electronic computer, one of the major costs and possibly the most serious problem will be in converting the input data to a machine-language format. The Records Management Handbook *Source Data Automation* and the workshop of the same title provide guidance in this area. There is also available a General Services Administration Handbook titled *Source Data Automation Equipment Guide*.

IDENTIFICATION OF SYSTEMS BY METHOD AND EQUIPMENT CLASS

| LIST OF SYSTEMS   | PAGE NUMBER | METHOD AND EQUIPMENT CLASSES |                |               |                 |                   |                     |              |                      |                  |            |                 |                               |                                  |                              |                           |                                |                            |                 |          |
|---|-------------|------------------------------|----------------|---------------|-----------------|-------------------|---------------------|--------------|----------------------|------------------|------------|-----------------|-------------------------------|----------------------------------|------------------------------|---------------------------|--------------------------------|----------------------------|-----------------|----------|
|   |             | CLUE-WORD<br>EXTRACT CARD    | PERMUTED INDEX | COLUMNAR CARD | DUAL DICTIONARY | EDGE-NOTCHED CARD | OPTICAL COINCIDENCE | PUNCHED CARD | MISC. CARD SELECTORS | MICROFILM JACKET | MICROFICHE | MICROFILM STRIP | MICROFILM ROLL,<br>MECHANIZED | MICROFILM ROLL,<br>PHOTO-OPTICAL | MICROFILM CHIP,<br>AUTOMATED | APERFURE CARD,<br>PUNCHED | APERFURE CARD,<br>EDGE-NOTCHED | MICROFILM<br>SUPERMINATURE | VIDEO RECORDING | COMPUTER |
| Aerospace Information Dissemination                                 | 113         |                              |                |               |                 |                   |                     |              |                      | X                |            |                 |                               |                                  |                              |                           |                                |                            |                 | X        |
| Aircraft Accident Analysis  | 14          |                              |                |               |                 |                   |                     |              |                      |                  |            |                 |                               |                                  |                              |                           |                                |                            |                 | X        |
| Aircraft Maintenance Manual, Distributing and Updating              | 145         |                              |                |               |                 |                   |                     |              |                      |                  |            | X               |                               |                                  |                              |                           |                                |                            |                 |          |
| Allotment Disbursement Record                                       | 54          |                              |                |               |                 |                   |                     |              |                      |                  |            | X               |                               |                                  |                              |                           |                                |                            |                 |          |
| Animal Inventory Management   | 125         |                              |                |               |                 | X                 |                     |              |                      |                  |            |                 |                               |                                  |                              |                           |                                |                            |                 |          |
| Automated Engineering Data Retrieval and Reproduction               | 32          |                              |                |               |                 |                   |                     |              |                      |                  |            |                 |                               | X                                |                              |                           |                                |                            |                 |          |
| Automated Merchant Vessel Report (AMVER)                            | 131         |                              |                |               |                 |                   |                     |              |                      |                  |            |                 |                               |                                  |                              |                           |                                |                            |                 | X        |
| Automated Name Search   | 122         |                              |                |               |                 |                   |                     |              |                      |                  |            |                 |                               |                                  |                              |                           |                                |                            |                 | X        |
| Automated Personnel   | 88          |                              |                |               |                 |                   |                     |              |                      |                  |            |                 |                               |                                  |                              |                           |                                |                            |                 | X        |
| Battle Clue-Word Card   | 140         | X                            |                |               |                 |                   |                     |              |                      |                  |            |                 |                               |                                  |                              |                           |                                |                            |                 |          |
| Battle Dual Dictionary Index  | 143         |                              |                |               | X               |                   |                     |              |                      |                  |            |                 |                               |                                  |                              |                           |                                |                            |                 |          |
| Beneficiary Information   | 82          |                              |                |               |                 |                   |                     |              |                      | X                |            |                 |                               |                                  |                              |                           |                                |                            |                 | X        |
| Building Space Information  | 34          |                              |                |               |                 |                   |                     |              |                      |                  |            |                 |                               |                                  |                              |                           |                                |                            |                 |          |
| Census Age Search   | 20          |                              |                |               |                 |                   |                     |              |                      |                  |            |                 |                               | X                                |                              |                           |                                |                            |                 |          |
| Computer Output Data Retrieval                                      | 137         |                              |                |               |                 |                   |                     |              |                      |                  |            | X               |                               |                                  |                              |                           |                                |                            |                 |          |
| Congressional Information Network                                   | 107         |                              |                |               |                 |                   |                     |              |                      |                  |            |                 |                               |                                  |                              |                           |                                |                            |                 | X        |
| Correspondence Retrieval  | 42          |                              |                |               |                 |                   |                     |              |                      |                  |            |                 |                               |                                  |                              |                           |                                |                            |                 |          |
| DDC Information Storage, Dissemination and Retrieval                | 75          |                              |                |               |                 |                   |                     |              |                      | X                |            |                 |                               |                                  |                              |                           |                                |                            |                 | X        |
| Deficiency Identification   | 37          |                              |                |               |                 |                   |                     |              |                      |                  |            |                 |                               |                                  |                              |                           |                                |                            |                 | X        |
| Engineering Drawings Storage and Reproduction (with Color Overlays) | 39          |                              |                |               |                 |                   |                     |              |                      |                  |            |                 |                               |                                  |                              |                           |                                |                            |                 |          |





## How to Use the Guide

*General browsing.* If you are looking for ideas on how you might improve information storage, retrieval, and dissemination, it is suggested that you take a look at most of the systems described. This is the preferred approach, since the answer to many information retrieval problems lies in the proper combination of methods and equipment. Also, you may find in some simple yet little known technique the necessary clue to the solution of your problem.

*Identifying systems by agency.* If you are interested in those systems used within a particular agency, the table of contents will direct you to the proper pages. However, please remember that this handbook includes only representative systems; therefore, no agency listing is complete and many agencies are not represented at all.

*Identifying systems by method and equipment class.* If you are interested in a particular information retrieval method or type of equipment, figure 1 classifies each system. While it is realized that the titles of some of the classes may not be ones with which you are familiar, or may represent classes that have also been given other titles, the system description should clarify any questions you may have.

*Identifying systems by functions served.* If you are interested in identifying systems by the information retrieval function served, the system titles may provide the necessary clue. However, you may find figure 2 helpful not only for this purpose, but also for gaining a better understanding of just what each system can do and what it cannot do. Please note that some of the systems in this handbook are designed to perform more than one function. The following is a definition of each of the four functional categories shown in figure 2:

DR—Document Reference (Index) Systems— Those used for conducting searches by subjects, characteristics, or attributes where the method and equipment employed merely identify, by name or number usually, the documents or other items that are pertinent to the

query. If complete information is needed, the user must refer to another source, often the document or other item itself.

DS—Document Storage Systems— Those used solely for storage of documents or their images. The documents or images are arranged and also retrieved on the basis of their name, number, address location, or some other simple identifier.

URS—Unified Reference-Storage Systems— Those that combine the functions of the first two (DR and DS). These systems are able to identify documents on the basis of subjects, characteristics, or attributes, and then automatically or simultaneously present or display those documents or their images that are pertinent to the search query.

DFR—Data or Fact Retrieval Systems— Those that provide the user with the precise data or facts pertinent to his query, rather than merely referring him to a document.

Data is defined for the purposes of this handbook as discrete quantitative or qualitative information, such as names of persons, places or things; dates; units of measure; and physical characteristics or attributes.

Facts are defined as complete thoughts, concepts, or answers often representing conversational like responses to the search questions and expressed often in a conversational manner, as concise sentences, phrases, or paragraphs.

Data or fact retrieval, as covered by this handbook, is of two levels:

1. *Simple data retrieval* as in situations where the requirement is merely to look up data by name, number, or some other simple means, and extract all or some of the related data found in that part of the record store.
2. *Complex data or fact retrieval* involving comprehensive searching of the system store, correlating or other manipulating of data, and in other ways developing answers to questions. (Generally, systems capable of performing

complex data or fact retrieval can also be designed to serve one or more of the first three functions above.)

### How to Obtain Additional Information

Additional information regarding any specific system included in this handbook may be obtained by contacting the originator at the

address shown. Inquiries may also be directed to:

Paperwork Standards and  
Automation Division (NRP)  
National Archives and Records Service  
General Services Administration  
Washington, D.C. 20408

## IDENTIFICATION OF SYSTEMS BY FUNCTIONAL CATEGORY

| LIST OF SYSTEMS   | PAGE NUMBER | FUNCTIONAL CATEGORY |    |     |     |
|---|-------------|---------------------|----|-----|-----|
|   |             | DR                  | DS | URS | DFR |
| Acrospace Information Dissemination                                 | 113         | X                   | X  |     |     |
| Aircraft Accident Analysis  | 14          | X                   |    |     | X   |
| Aircraft Maintenance Manual, Distributing and Updating              | 145         |                     | X  |     |     |
| Allotment Disbursement Record                                       | 54          |                     |    |     | X   |
| Animal Inventory Management   | 125         | X                   |    |     | X   |
| Automated Engineering Data Retrieval and Reproduction               | 32          | X                   | X  |     | X   |
| Automated Merchant Vessel Report (AMVER)                            | 131         |                     |    |     | X   |
| Automated Name Search   | 122         | X                   |    |     | X   |
| Automated Personnel   | 88          |                     |    |     | X   |
| Battelle Clue-Word Card   | 140         | X                   |    |     |     |
| Battelle-Dual-Dictionary Index                                      | 143         | X                   |    |     |     |
| Beneficiary Information   | 82          |                     |    |     | X   |
| Building Space Information  | 34          |                     |    |     | X   |
| Census Age Search   | 20          |                     |    |     | X   |
| Computer Output Data Retrieval                                      | 137         |                     |    |     | X   |
| Congressional Information Network                                   | 107         | X                   |    |     |     |
| Correspondence Retrieval  | 42          |                     |    | X   |     |
| DDC Information Storage, Dissemination and Retrieval                | 75          | X                   | X  |     |     |
| Deficiency Identification   | 37          |                     |    |     | X   |
| Engineering Drawings Storage and Reproduction (with Color Overlays) | 39          |                     | X  |     |     |
| ERIC (Educational Resources Information Center)                     | 80          |                     | X  |     |     |
| Failure Rate Data Dissemination (FARADA)                            | 45          |                     |    |     | X   |
| The Fostic SS   | 17          |                     |    |     | X   |
| Information Retrieval and SDI Current Awareness                     | 98          | X                   |    |     |     |
| Information Storage and Retrieval for Patents (Ex)                  | 26          | X                   | X  |     |     |

Figure 2

IDENTIFICATION OF SYSTEMS BY FUNCTIONAL CATEGORY (Cont'd)

| LIST OF SYSTEMS                                       | PAGE NUMBER | FUNCTIONAL CATEGORY |    |     |     |
|---|-------------|---------------------|----|-----|-----|
|   |             | DR                  | DS | URS | DFR |
| JCS Records Retrieval                                 | 29          | X                   |    |     |     |
| Land Patent Control Document Index                    | 93          | X                   | X  |     |     |
| Legal Information Through Electronics (LITE)          | 57          | X                   |    |     | X   |
| Machine Readable Catalog Dissemination (Project MARC) | 110         | X                   |    |     |     |
| Meat Label Storage and Retrieval                      | 8           |                     | X  |     | X   |
| Medical Record Storage                                | 78          |                     | X  |     |     |
| Microform Engineering Drawings Support                | 72          |                     | X  |     | X   |
| Microform Personnel Record                            | 60          |                     | X  |     |     |
| Miniaturized Management Reports Distribution          | 63          |                     | X  |     |     |
| Miniaturized Navy Catalog Data                        | 48          |                     | X  |     | X   |
| NASA/RECON Automated Reference                        | 116         | X                   | X  |     |     |
| National Crime Information Center (NCIC)              | 104         |                     |    |     | X   |
| National Driver Register                              | 128         |                     |    |     | X   |
| National Employee Account Card Holders                | 85          |                     |    |     | X   |
| National Marine Data Inventory (NAMDI)                | 119         |                     |    |     | X   |
| National Weather Records Center                       | 23          |                     |    |     | X   |
| Office Files Coordinate Index                         | 66          | X                   |    |     |     |
| Personnel Skills Inventory                            | 134         | X                   |    |     |     |
| Pesticide Label Control                               | 11          | X                   |    |     | X   |
| Public Works Drawings Retrieval                       | 51          | X                   | X  |     |     |
| RIRA-Legal Information                                | 101         | X                   |    |     |     |
| SDI Current Awareness                                 | 96          | X                   |    |     |     |
| <del>Technical</del> Data Dissemination and Retrieval | 69          |                     | X  |     | X   |
| Video Tape Information Storage & Retrieval            | 91          |                     | X  |     |     |
| ZIP Code Data Retrieval                               | 148         |                     |    |     | X   |

Figure 2 (Continued)

**NAME OF SYSTEM:**

**Meat Label Storage and Retrieval**

**ORIGINATOR:**

**Consumer Protection Program**

**Consumer and Marketing Service**

**U.S. Department of Agriculture**

**Washington, D.C. 20250**

**OBJECTIVE.** To design and implement a document storage system within the Department's Meat Inspection Division that will eliminate the inefficient conventional case folder storage arrangement. Further, to insure that the new system will enhance the overall administration of the meat label approval program.

**BACKGROUND.** One of the responsibilities of the Meat Inspection Program is to approve the labels placed on meat or packages of meat products processed in commercial meat packing houses. All meat packing houses are required by Federal regulation to submit copies or sketches of labels for Department approval before being used on meat or meat products. Each label must meet specified Government standards with respect to the product information, such as color, quality, and kind of meat product. For example, transparent or semitransparent wrappings for such articles as sliced bacon or pork sausage should not bear colors that may give a false impression as to the leanness of the product.

Over 250,000 approved labels are on file in the Meat Inspection Division, with about 3,500 new label submissions received monthly. In order to properly administer and control the label standards program, the Division scientists and regulatory and administrative personnel need frequent information relative to approved labels. Somewhat the same information requirements hold true for the 2,000 Federal inspectors located at the various processing plants.


For some time the Division had wished to eliminate the cumbersome case folders containing bulky and odd-shaped label material.

The system designers eventually selected an aperture card system (punched cards with windows for microfilm images) as being the most feasible way of eliminating unsatisfactory storage conditions, while still possessing the necessary characteristics to assure the integrity of the labels and supporting papers. Other considerations prompting the selection of this system included its ability to prepare duplicate sets for use by the headquarters and the inspectors located at meat processing plants, to accurately machine sort and arrange in numerical sequence the master card decks, and to allow for use of 35-mm. color microfilm images in lieu of black and white in instances where color could better portray label features.

The aperture card selected as the storage medium is the standard 80-column punched card with an area of about 30 columns reserved for the insertion of the 35-mm. microfilm image.

**THE NEW METHOD.** The initial input to the new system is the packing house label forwarded to the Meat Inspection Division in Washington, D.C., for regulatory compliance. An aperture card is punched by a Division keypunch operator for each approved label. The punched portion of the aperture card includes such data as plant number, product code, date of approval, brand number, and product description. The coded data is also interpreted and printed across the top of each card for use in manual searches at headquarters and in field packing houses. The aperture cards are then held until the approved labels and associated papers have been photographed. The filming process enables the photographing of up to four or five images per aperture card. After development and inspection, the approved microfilm is placed into the aperture card window through use of a manually operated aperture card mounting machine. When a full batch of label images have been mounted, the newly accessioned cards are manually placed in the master file. This file is arranged numerically by assigned packing house number and by brand approval number thereunder.

The master aperture card file at the head-



quarters represents the basic inventory of approved labels, and only manual file searches are made of these interpreted cards. Viewing the labels and related correspondence is made possible by use of standard universal-type microfilm readers. The duplicate set of interpreted punched cards that does not contain the microfilm images is arranged by product code and may be used for machine searching on punched card equipment.

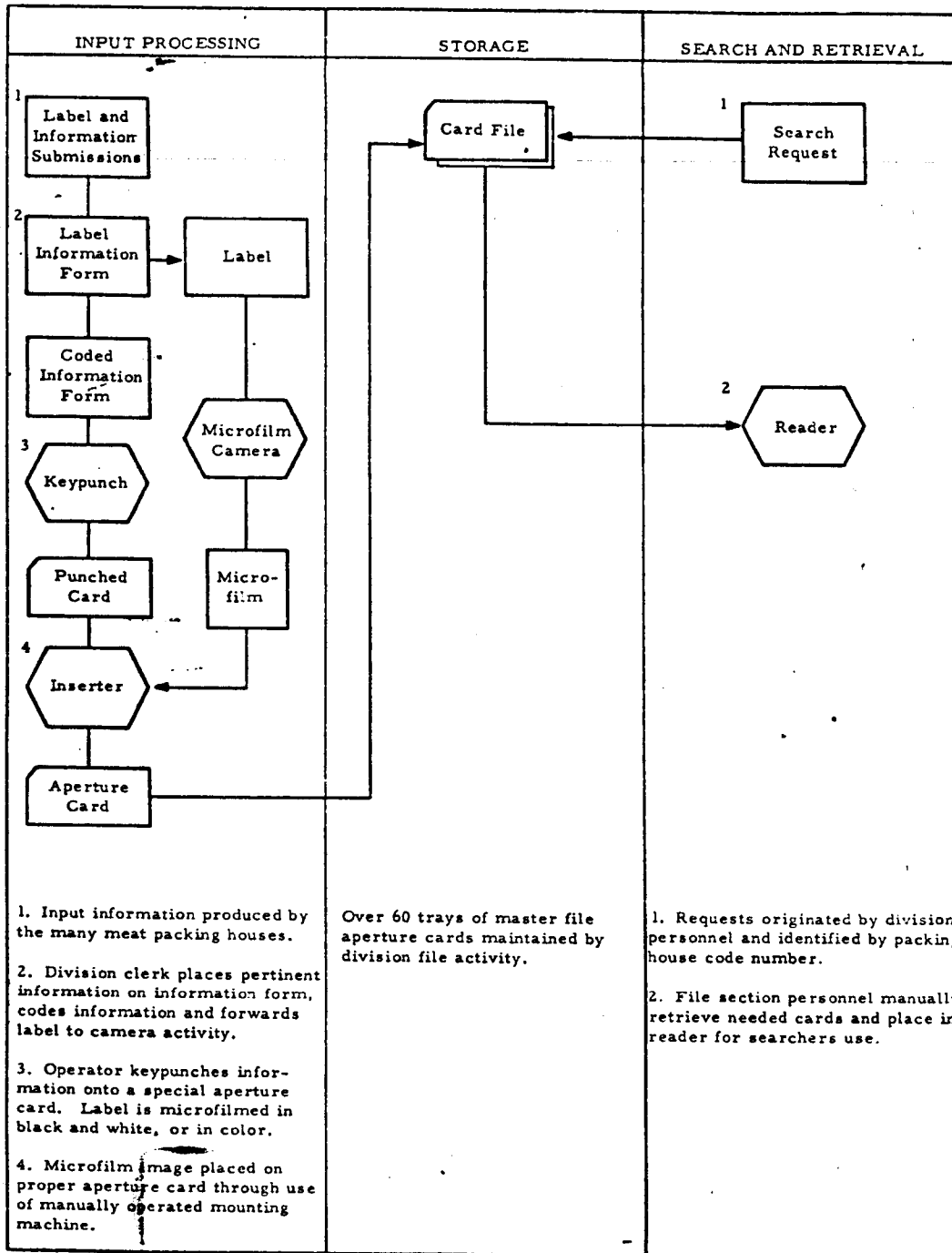
**REMARKS.** This aperture card application combines three recordkeeping methods into one overall system. It has the document storage features of microfilm plus the mechanized sorting, arranging, and reproducing potential of standard punched cards. Additionally, it

permits manual searching of interpreted cards.

In application, the system permits faster manual searches of a standard size deck of aperture cards than searches through a conventional file containing odd-size material. While file maintenance is currently the only mechanized phase of the system, the searching procedure could be mechanized with little disturbance to the daily storage and search routines.

While the most common use of aperture cards is for the dissemination, storage, and retrieval of engineering drawings, this system illustrates their usefulness in accommodating odd-sized documents or documents of eight pages or less.

## MEAT LABEL STORAGE AND RETRIEVAL



**NAME OF SYSTEM:**

**Pesticide Label Control**

**ORIGINATOR:**

**Pesticides Regulation Division**

**Agriculture Research Service**

**U.S. Department of Agriculture**

**Washington, D.C. 20251**

**OBJECTIVE.** To develop and operate an appropriate data or fact filing and retrieval system that will insure more efficient management and control over the Pesticide Registration Program. More specifically, to provide greater latitude, flexibility, and ready access to a variety of information needs.

**BACKGROUND.** The Pesticides Registration Program of the Department of Agriculture is responsible for insuring that pesticides used by farmers in producing foods will not be harmful to consumers. This program regulates the manufacture and distribution of these poisons by requiring registration of the descriptive labels placed on the containers of approved pesticides. These labels list, among other things, the chemical ingredients of the formula and the approved practices for using the formula. The regulation specifies that approved labels automatically expire after 5 years and must be renewed if their sale is to be continued.

To carry out this program scientists such as chemists, bacteriologists, and pharmacologists evaluate the toxicity and other chemical characteristics of the pesticides. A regulatory group of personnel are concerned with the proper label registration and enforcement of the pesticide law.

Because of the sensitive and exacting nature of this program, both scientists and regulatory staff members must have ready access to a variety of pesticide control information.

**THE NEW METHOD.** The program developers adopted a combination mechanized and manual information storage and retrieval system. A punched card system was estab-

lished for the rather critical pesticide label data requirements. The information requirements under the mechanized portion include inventory status of approved pesticide labels, expiration dates, and specific information on various groups of related pesticides. The conventional manual portion of the system would handle current data on pesticide manufacturers and other general inquiries regarding the label program.

The gathering of input data for the pesticide label data file begins with the registration jacket, which contains the registration for label approval and the label to be used on the product. This document is routed to several scientific offices where the pesticide formula is examined in terms of regulatory compliance. Responsible offices affix the applicable coded pesticide information on the jacket. Upon reaching the Registration Section, the information is transferred to a Pesticide Registration Form by a coding clerk.

The Data Processing Unit accepts the coded information from the Registration Section, and the keypunch machine operator punches the coded information into punched cards. Descriptive data codes are needed to permit the key information to be contained within the 80-column limit of the cards. The keypunch equipment has the additional capability of printing the coded data across the top of the punched card. The completed cards are filed mechanically by punched card sorting equipment, in pesticide label registration number sequence. Expired cards are withdrawn during the same sorting runs. The master file totals about 60,000 punched cards.

This system also has the capability of coordinate type searching of the pesticide label file. In this type of search, the entire file is processed through the collating machine, which compares each card with a coded search card. Cards that match the wanted terms drop into a pickup hopper and are then placed in the list printer, which prints out the coded information at a speed of 100 lines per minute. The precise list of label information is then forwarded to the office needing the information.



REMARKS.<sup>1</sup> The mechanized features of the Pesticide Label Control System permit relatively easy updating and purging of the master label file. Such characteristics also assure accurate mechanized coordinate search capability, which is important in the monitoring of pesticide chemical properties. The system also possesses the flexibility for optional manual selection and filing of cards.

Additionally, the punched card used in the system provides for a simple, fast, economical conversion to computer use should the system's growth warrant the change.

The two standard restrictive factors in any punched card system are the limited space for data and the relatively slow processing output speed as the card file grows in size.

<sup>1</sup> During the time period involved in issuing this handbook, the Pesticides Regulation Division has been transferred to the Environmental Protection Agency.

## PESTICIDE LABEL CONTROL

