EDS&R Interim Report No. 27 N (Rev. 1)

MICROFILM CONTAINER SURVEY (U)

by

J. B. Malcom

12 November 1971

prepared for

ENGINEERING DATA STORAGE & RETRIEVAL (EDS&R) PROJECT

PICATINNY ARSENAL

Dover, New Jersey 07801

Under Contract DAAAD21-69-C-0642

by

DATAFLOW SYSTEMS INCORPORATED

7758 Wisconsin Avenue

Bethesda, Maryland 20014

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### Microfilm Container Survey

This survey provides an overview of the field of currently available microfilm containers. The report lists the manufacturers' names, addresses and also the name of the person to contact for more information. Also provided is the physical data on the container manufactured along with a sketch of the item showing the physical dimensions of the container. A proposed addition to this report (to be issued as a revision where information is available) is to include details on the interchangeable cartridge being developed at Picatinny Arsenal by the Engineering Data Storage and Retrieval Project.

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<table>
<thead>
<tr>
<th>KEY WORDS</th>
<th>LINK A</th>
<th>LINK B</th>
<th>LINK C</th>
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<tr>
<td></td>
<td>ROLE</td>
<td>WT</td>
<td>ROLE</td>
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<td>Microfilm container</td>
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<tr>
<td>Standard container</td>
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<td>Survey</td>
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<tr>
<td>Microfilm cartridge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microfilm cassette</td>
<td></td>
<td></td>
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</tbody>
</table>
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by

J. B. Malcom

prepared for:
ENGINEERING DATA STORAGE & RETRIEVAL (EDS&R) PROJECT
Technical Services Directorate
Picatinny Arsenal
Dover, New Jersey 07801

Under Contract DAAA - 21 - 69 - C - 0642
Technical Note No. 16A
AMCNS Code 5910-22-20385

Reissued
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ABSTRACT

This survey provide an overview of the field of currently available microfilm containers. The report lists the manufacturers' names, addresses and also the name of the person to contact for more information. Also provided is the physical data on the container manufactured along with a sketch of the item showing the physical dimensions of the container. A proposed addition to this report (to be issued as a revision where information is available) is to include details on the interchangeable cartridge being developed at Picatinny Arsenal by the Engineering Data Storage and Retrieval Project.
PREFACE
First Reissue

Since the initial distribution of this report in July of 1971, additional containers have become available in conjunction with the new microform systems. Comments on the initial report have also been received and are incorporated in this first reissue.

The Micro 3 Company has introduced a 8mm cassette for microform systems. The DSI Systems Inc. 16mm cassette, now marketed by Stromberg Datagraphix, has also been included in this reissue.

Additional microfilm reader compatibilities have been brought to our attention and have been added to the data sheets. Dimensions in error have been corrected. Of particular note is the continued production of Eastman Kodak Recordak equipment using their Recordak Film Magazine, previously noted in Section 6 as discontinued.

Additional containers and compatibilities will be noted as they become available and may be included in future revisions.

All comments as to the format, content and usefulness of this publication as well as suggestions for its improvement are earnestly solicited. They may be forwarded to: Department of Army, Picatinny Arsenal, Dover, New Jersey, 07801; Attention: SMTSPA-TS-T-R (L. Volkheimer).
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  Eastman Kodak Company  
  Information Design Incorporated  
  Information Design Incorporated  
  Information Handling Services  
  Memorex Corporation  
  Micro 8 Company  
  Stromberg Datagraphix  
  3M Company Microfilm Products Division  

DD Form 1473  

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Microfilm Container Survey

1.0 Introduction

The microfilm industry has standardized on film widths of 16mm, 35mm, 70mm and 105mm. The packaging of these films into cartridges and cassettes for use in microfilm readers, however, has been dependent upon the equipment manufacturer's requirements and little standardization exists. The container of one manufacturer is not interchangeable with those of a second in most equipment. This situation is expanding further in the recent years as new computer-oriented firms enter the microfilm field.

Large users of microfilm equipment and systems, such as the Department of Defense, could simplify their production and packaging of 16mm and 35mm microfilm publications if standard interchangeable cartridges or cassettes for 16 and 35mm microfilm were possible. A study effort, under the American National Standards Institute and the Department of the Army, is striving toward standards for this area.

2.0 Objective

This technical note presents the results of an informal survey made of known manufacturers of microfilm containers used in microfilm readers and reader/printers. The information is intended to serve as an overview of the field of currently available microfilm containers with some sort of easy-rapid or self-threading feature. Emphasis has been placed on the overall physical size and the spindle/drive mechanism interface, since these are the key elements of interchangeability.
3.0 Methodology

An initial list of persons from the microfilm industry, compiled by the Contract Project Officer, was supplemented with additional industry contacts. A letter was sent to each, requesting information on any containers they manufacture. A sample of the proposed format was included.

Additional sources were determined by inquiry to others in the industry. Those were followed up by letters and telephone calls. Those originally queried who did not respond were queried again both by letter and telephone. In the majority of the cases the information desired was readily offered. Over sixteen formal requests were issued, and replies were obtained from all but two producers of microfilm containers.

4.0 Results

The known manufacturers of self threading or rapid threading microfilm containers are tabulated in figure 1.

Following the figure, descriptive sheets are given for each container.

5.0 Discussion

Each of the major manufacturers of microfilm equipment have their own container essentially fitting only their own motor driven readers.

Only one concern, Information Design, Inc., makes equipment to convert existing microfilm readers to "cartridge" type systems, and even then a special container must be used.

Several microfilm readers which will accept more than one cartridge type are currently available. Automatic threading, however, is not available on these readers.
## Microfilm Containers with Cores

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Type</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha Vector</td>
<td>Double Core</td>
<td>11-5/8&quot; x 3-7/8&quot; x 1-11/32&quot;</td>
</tr>
<tr>
<td>Bell &amp; Howell</td>
<td>Double Core</td>
<td>6-1/4&quot; x 4-7/8&quot; x 1&quot;</td>
</tr>
<tr>
<td>Burroughs Corp.</td>
<td>Single Core</td>
<td>4&quot; x 4&quot; x 1&quot;</td>
</tr>
<tr>
<td>DSI Systems Inc.</td>
<td>Double Core</td>
<td>6-1/8&quot; x 4-3/4&quot; x 7/8&quot;</td>
</tr>
<tr>
<td>Eastman Kodak</td>
<td>Single Core</td>
<td>4&quot; x 4&quot; x 1&quot;</td>
</tr>
<tr>
<td>Information Design, Inc.</td>
<td>Single Core 35mm</td>
<td>3-3/4&quot; x 3-3/4&quot; x 1&quot;</td>
</tr>
<tr>
<td>Information Handling Service</td>
<td>Double Core</td>
<td>3-3/4&quot; x 3-3/4&quot; x 1-3/4&quot;</td>
</tr>
<tr>
<td>Memorex Corp.</td>
<td>Double Core 8mm</td>
<td>6-3/4&quot; x 3&quot; x 3/4&quot;</td>
</tr>
<tr>
<td>Micro 8 Company</td>
<td>Double Core 8mm</td>
<td>7-3/8&quot; x 3-1/4&quot; x 1&quot;</td>
</tr>
<tr>
<td>Stromberg Datagraphix</td>
<td>Single Core</td>
<td>4-1/2&quot; x 4-1/2&quot; x 1&quot;</td>
</tr>
<tr>
<td>3M Co.</td>
<td>Single Core</td>
<td>4&quot; x 4&quot; x 1&quot;</td>
</tr>
<tr>
<td>Western Reserve Electronics*</td>
<td>Double Core</td>
<td>8-3/4&quot; x 6-3/4&quot; x 1-1/2&quot;</td>
</tr>
</tbody>
</table>

*Information not provided; container was developed under an Army contract and is not in production.

Figure 1
The newer Eastman Kodak microfilm readers utilize a standard 16mm or 35mm reel with a Thread-Easy\(^{(1)}\) threading mechanism. These are not containers per se, but rather constitute a threading system available only in their readers even though they use a standard reel.

6.0 Trends

No trend can be clearly stated in the spread of container microfilm systems, but several observations can be made.

The 3M Co.'s cartridge design has been licensed to other companies for use in microfilm readers, and several new readers use their cartridges.

While Eastman Kodak has introduced a new line of equipment using their Thread-Easy design with a standard reel, other equipment using the Recordak Film Magazine continues in production including one of their newest readers, the Recordak Microstar PR-1.

We must also note the Memorex cassette and its interchangeable core design which permits rapid changing of the film contents by loading and threading a new film wound on a core. This is the only container designed for easy reloading of the film. The container's overall dimensions are identical to the standard data processing card. This size has also been adapted for a microfiche format.

7.0 Conclusions

Proprietary positions appear to preclude development of a "standard container," but a series of interchangeable cartridge or container designs are possible. Design guides for future compatibility are feasible with standards developed at a later date. A range of sizes, methods and means are desirable in these guides to permit innovation. Overall size, core and spindle design, and film pick

\(^{(1)}\) In Eastman Kodak Co.
up point are practical starting points, for example. Evolution of a military specification for DOD compatibility would develop both an internal DOD standard and guidelines for industry.
<table>
<thead>
<tr>
<th>Manufacturer:</th>
<th>Alpha-Vector Incorporated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type:</td>
<td>16 - 105mm cassette</td>
</tr>
<tr>
<td>Address:</td>
<td>501 Fifth Avenue</td>
</tr>
<tr>
<td></td>
<td>New York, New York 10017</td>
</tr>
<tr>
<td>Person to Contact:</td>
<td>Dr. H. J. Ghelberg</td>
</tr>
<tr>
<td>Used with:</td>
<td>AV-100 Mass Storage Retrieval Station</td>
</tr>
<tr>
<td>Film Size and Capacity:</td>
<td>100 ft. of 7.5 mil film available in 16mm, 35mm, 70mm, and 105mm sizes.</td>
</tr>
<tr>
<td>Spindle Type:</td>
<td>Self-contained drive/ tracking mechanism</td>
</tr>
<tr>
<td>List Prices:</td>
<td>Not quoted</td>
</tr>
<tr>
<td>Comments:</td>
<td>This is a special cassette designed only for use with the AV-100 retrieval unit. Cassette width varies with film size.</td>
</tr>
</tbody>
</table>
Manufacturer: Bell & Howell Co.
Business Equipment Group
Type: 16mm cassette
Address: 6800 McCormick Road
Chicago, Illinois 60645
Person to Contact: Aldolph J. Garwin
Used with: B&H Autoload I, Autoload II

Film Size and Capacity:
16mm x 100' (5 mil)

Spindle Type: 5/16" round shaft

List Prices:
1 - 4  $3.50 each
5 - 99  $2.85 each
100 - 495  $2.75 each
500 - 999  $2.60 each
1000 +  $2.50 each
Manufacturer: Burroughs Corporation
Type: 16mm cartridge
Address: Great Valley Laboratories
Paoli, Pennsylvania 19301

Person to Contact: Mr. Robert Cain

Used with: Burroughs Microfilm Readers B9061-1 & B9061-2

Film Size & Capacity: 16mm x 100' (5 mil base)
Spindle Type: 1-1/4" centering hub
List Price: $1.50

Note: Basically similar to Eastman Kodak Cartridge 1A and 2A which can be used in the Burroughs equipment.

Compatible with: Dietzgen 4317
Microfilm Products 2000
Ednalite
Manufacturer: DSI Systems Inc.

Type: 16mm cassette

Address: 15 Columbus Circle
New York, New York 10023

Person to Contact: Mr. Robert Harte

Used with: Stromberg Datagraphix Microsearch (DMS)

Film Size and Capacity: 16mm x 100' (5 mil base)

Spindle Type: 15/16" special

List Prices: $6.00 each

Comments: Marketed by Stromberg Datagraphix
Manufacturer: Eastman Kodak Co.  
Address: 343 State Street  
Rochester, New York 14605  
Model: 1A  

Person to  
Contact: Mr. M. Schreiber  

Used with: Various Recordak Readers  
Automatic Threading: Miicrostar Reader PT-1  
Loadstar Readers PS, PS-1, PS-1-K  
Miracode Readers PFK & PFK-1  
Manual Threading Readers: Starlet Reader PTA  
20/20 Portable Reader P-20  
Magnaprint Reader P-IA  

Film Size & Capacity: 16mm x 100' (5 mil base)  
Spindle Type: 1" centering hub  

List Price:  
15-149  
1A  
$1.45 ea.  
1A  
$1.55 ea.  
2A  
$1.15 ea.  
2A  
$1.25 ea.  

Compatible with:  
Dietzgen 4317  
Microfilm Products 2000  
Ednalite
Manufacturer: Information Design, Inc.  
Type: 16mm Cartridge

Address: 3247 Middlefield Road  
Menlo Park, California 94025

Person to Contact: Brett Butler, Marketing Manager

Used With: Most reel type equipment, such as Recordak MPE, Magnaprinter, Xerox 141/2 & Microprinter, 3m Filmac 100, 200R, 400 MPR, and others using standard reel spindle. Conversion kits required.

Film Size & Capacity: 16mm x 100' (5 mil film)

Spindle Type: Standard 5/16" square shaft

List Prices:

- 1 - 999 $1.25
- 1000 - 4999 $1.15 each
- 5000 - 10,000 $1.05 each
Manufacturer: Information Design, Inc.  
Type: 35mm Cartridge

Address: 3247 Middlefield Road  
Menlo Park, California 94025

Person to Contact: Brett Butler, Marketing Manager

Used with: Recordak MPE, 3M Filmac 100, 200R, 400 M & B, and others  
use standard reel spindle  
(conversion kits required)

Film Size & Capacity: 35mm x 100' (5 mil film)

Spindle Type: Standard 5/16" Square Shaft

List Prices:  
1 - 999 $1.85 each  
1000 - 4999 $1.70 each  
5000 - 10,000 $1.60 each
<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Information Handling Services</th>
<th>Type:</th>
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<tr>
<td>Address</td>
<td>5500 South Valentia Way</td>
<td>16mm Cassette</td>
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<td></td>
<td>Englewood, Colorado</td>
<td></td>
</tr>
<tr>
<td>Person to Contact</td>
<td>Unknown</td>
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<tr>
<td>Used with</td>
<td>VAX Satellite II</td>
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<tr>
<td>Film Size &amp; Capacity</td>
<td>16mm x 100' (5 mil base)</td>
<td></td>
</tr>
<tr>
<td>Spindle Type</td>
<td>Special</td>
<td></td>
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<tr>
<td>List Prices</td>
<td>3.00 each</td>
<td></td>
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Manufacturer: Memorex Corp.
Address: San Tomas & Central Expressway
       Santa Clara, California
Person to Contact: A. G. Oraborn
Used with: Memorex 1642 Viewer
          Memorex 1643 Autoviewer
          Memorex 1650 Viewer/Printer
Film Size and Capacity: 16mm x 50' (5 mil)
Spindle Type: 15/16" special
List Prices:
   20 - 80  $1.75 each
   100 - 180 $1.50 each
   200 - 980 $1.35 each
   1000+    $1.25 each

Type: 16mm Cassette
Model: C-100
Manufacturer: Micro 8 Company

Type: 8mm cassette

Address: P.O. Box 1087
LaCrosse, Wisconsin 54601

Person to Contact: A. L. Baptie

Used with: Micro 8 Model A
Micro 8 Model C

Film Size and Capacity: 8mm x 50' (thin base)

Spindle Type: 5/16" special

List Prices: $1.50 each
Quantity discounts available
Manufacturer: Stromberg Datagraphix  
Type: 16mm Cartridge  

Address: P. O. Box 20291  
San Diego, California 92120  

Model: SD 1700  

Person to Contact: Mr. Donald Stanley  

Used with: Datagraphix 1700 Roll Film Inquiry Station  

Film Size & Capacity: 16mm x 100' (5 mil film)  

Spindle Type: Standard 5/16" square shaft with 1-3/8" centering shoulder  

List Prices:  

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<tr>
<th>Shell</th>
<th>10-90</th>
<th>100-190</th>
<th>200+</th>
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<td>Price</td>
<td>$0.505 ea.</td>
<td>$0.425 ea.</td>
<td>$0.365 ea.</td>
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<th>200+</th>
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<td>$0.565</td>
<td>$0.505</td>
<td>$0.445</td>
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<td></td>
<td>$1.070 ea.</td>
<td>$0.930 ea.</td>
<td>$0.810 ea.</td>
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</table>
Manufacturer: 3M Co., Microfilm Products Division

Type: 16mm Cartridge

Address: 3M Center, Building 235-2A
St. Paul, Minnesota 55101

Person to Contact: S. M. Trippe

Used with: 3M 400C Reader & Reader/Printer
3M 700 Readers

Compatible with: (requires spindle adaptor)
- Recordak P-20 Reader
- Washington Scientific Industries Reader
- Ednalite 1670 Reader
- Microfilm Products 2000
- Dietzgen 4317

Film Sizes & Capacity:
16mm x 100' 6 mil film

Spindle Type:
Patented drive

List Prices:
$1.25 each