

Project III KWIC (Computer) Program
Barry H. Buckingham
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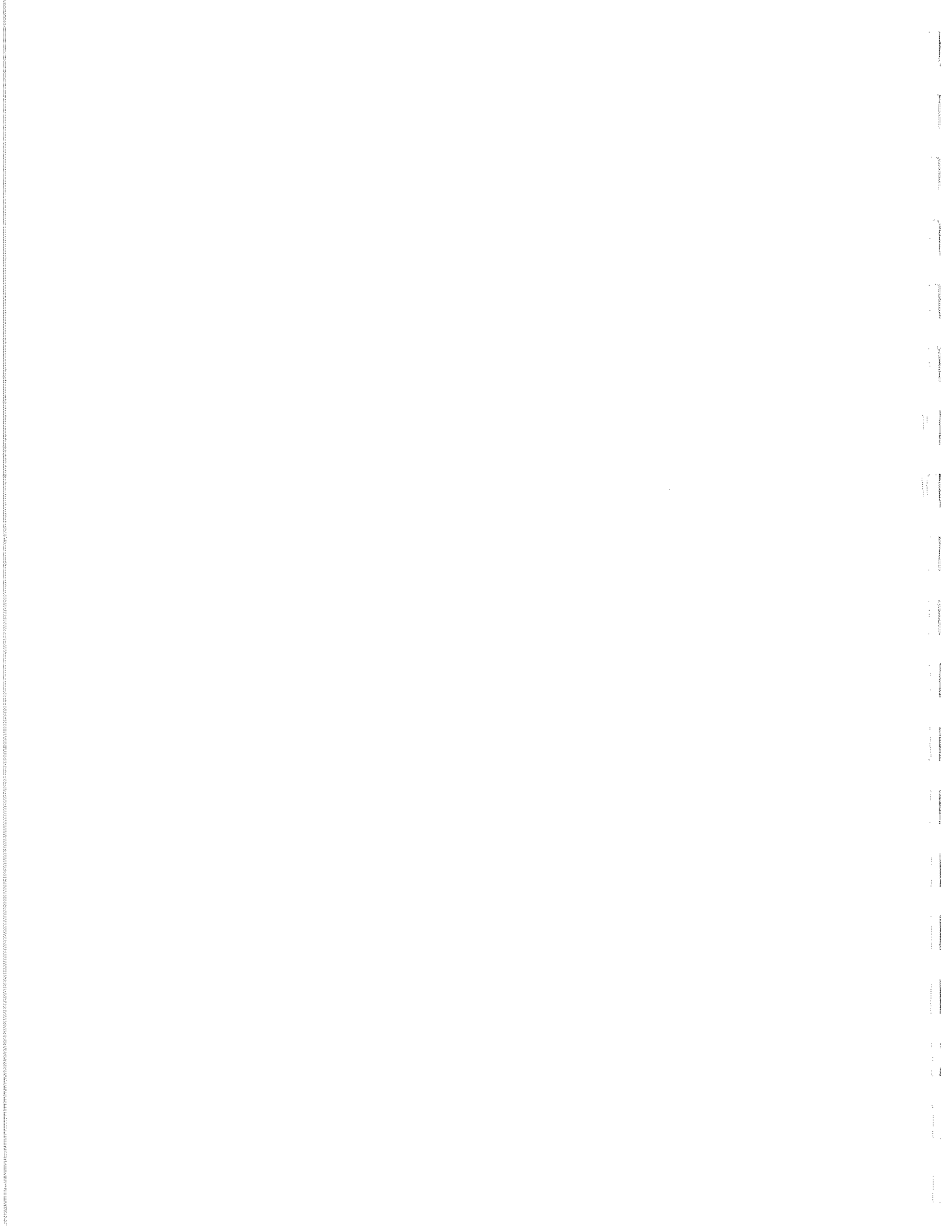
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Resource Materials System
using the
KWIC Indexing Method

3-696



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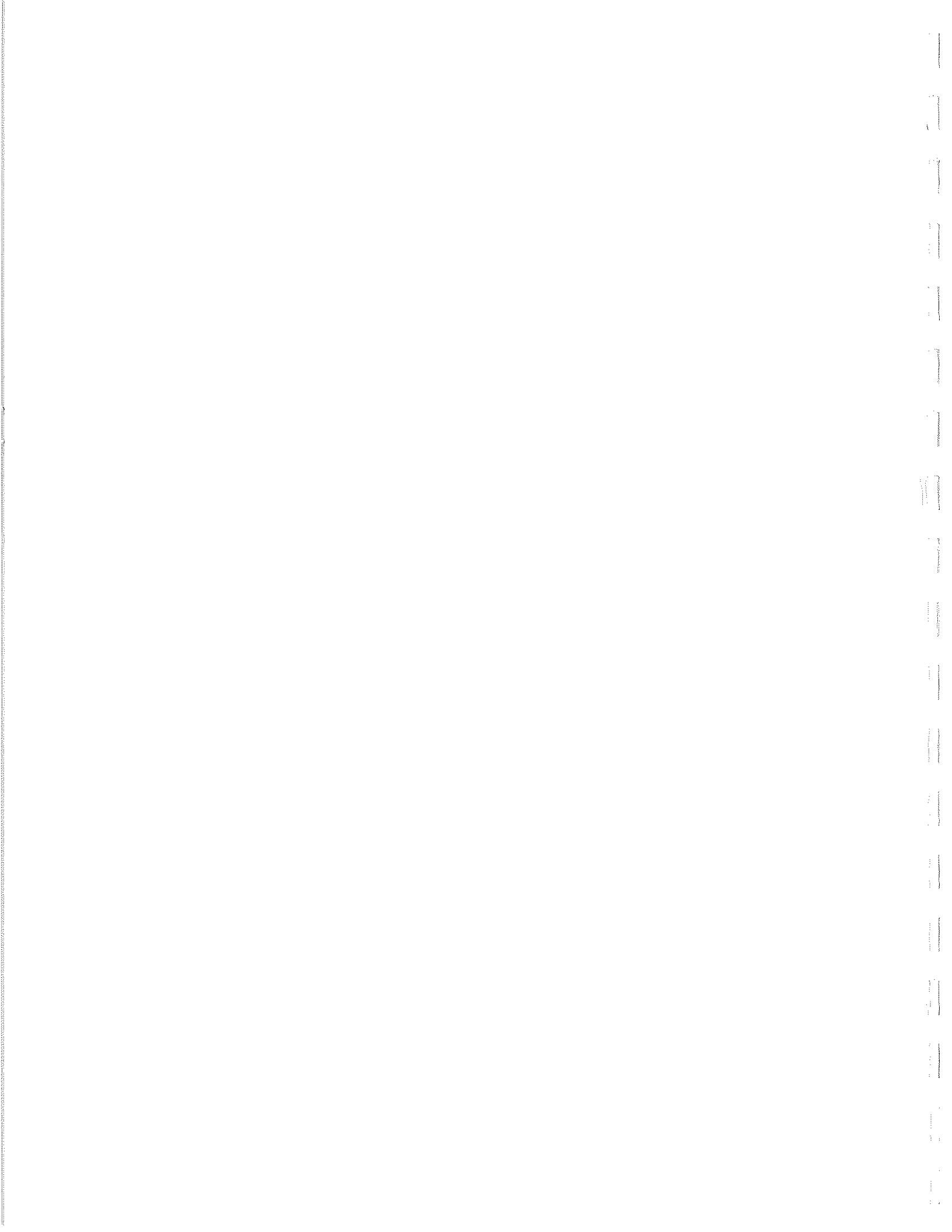
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MIDWESTERN STATES EDUCATIONAL INFORMATION PROJECT
P.L. 89-10, Title V, Section 505

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FOREWORD

This publication is a report of the Midwestern States Educational Information Project Resource Materials System. It contains a general description of the Key-Word-In-Context (KWIC) indexing system, upon which the Midwestern States Educational Information Project's (MSEIP) Resource Materials System is based, a description of the MSEIP Resource Center, specific procedures for classification and coding of library materials, and descriptive examples of the indexes produced.

The MSEIP Resource Materials System was developed to facilitate availability of resource material to Project personnel. It is believed that this library system will be useful not only to the Midwestern States Educational Information Project, but to other organizations requiring similar library services.

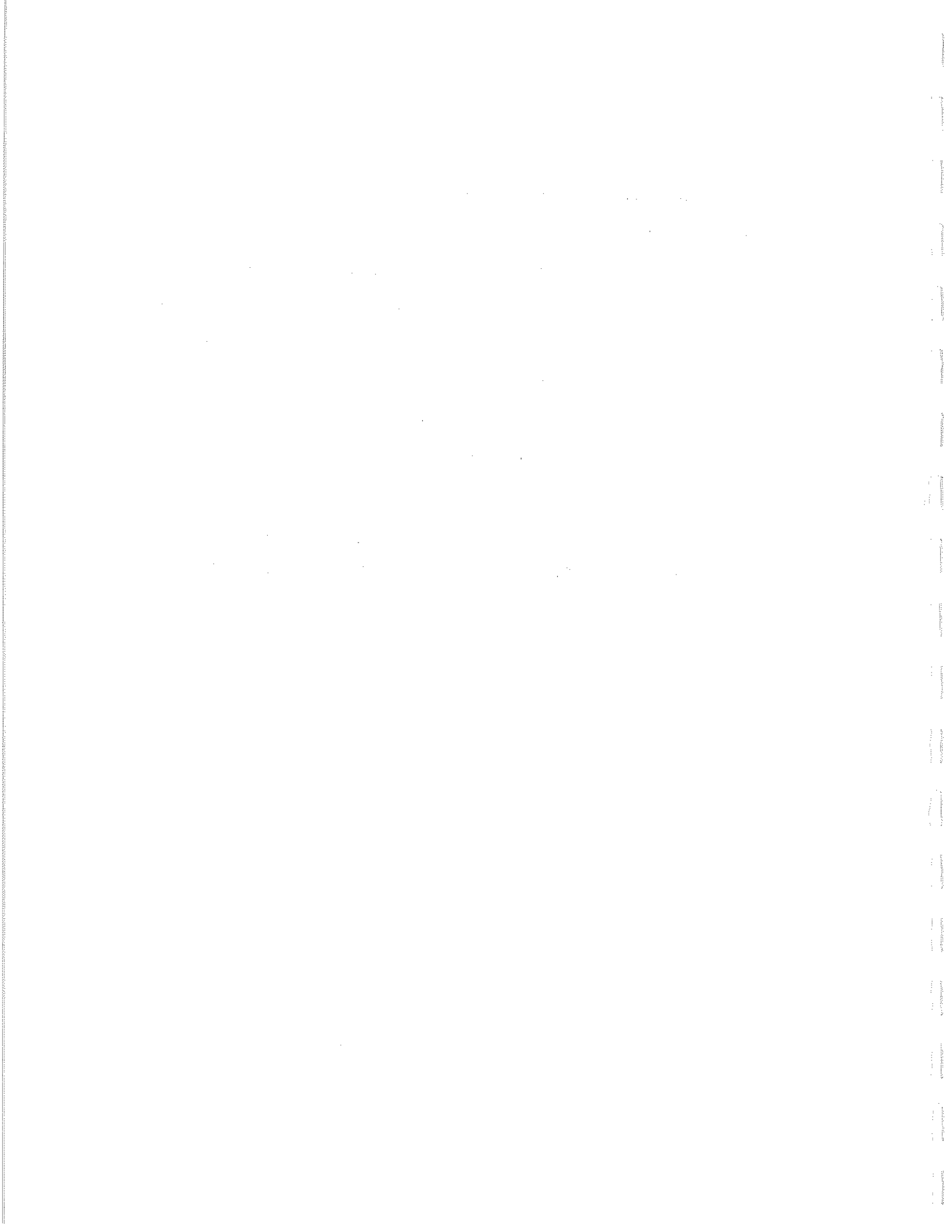
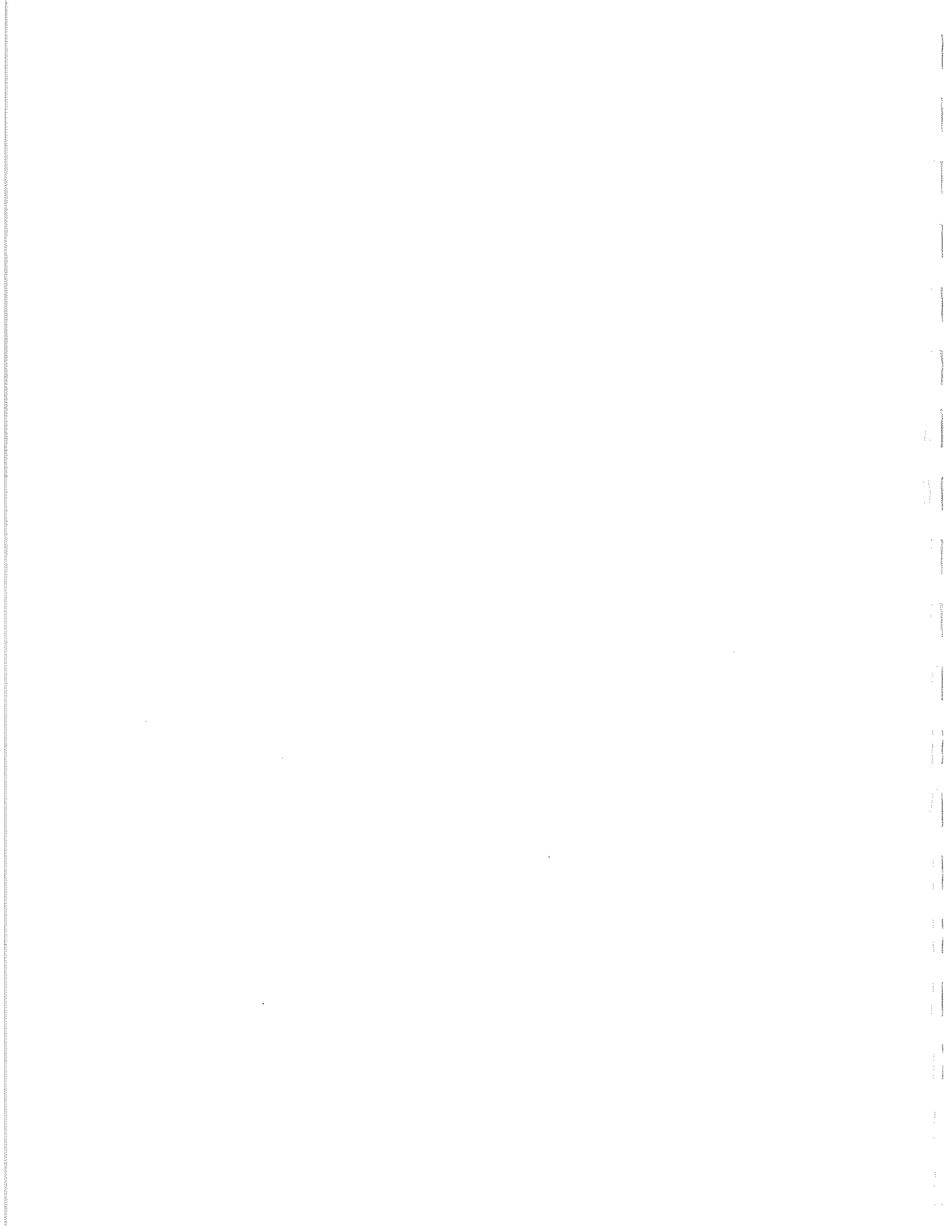


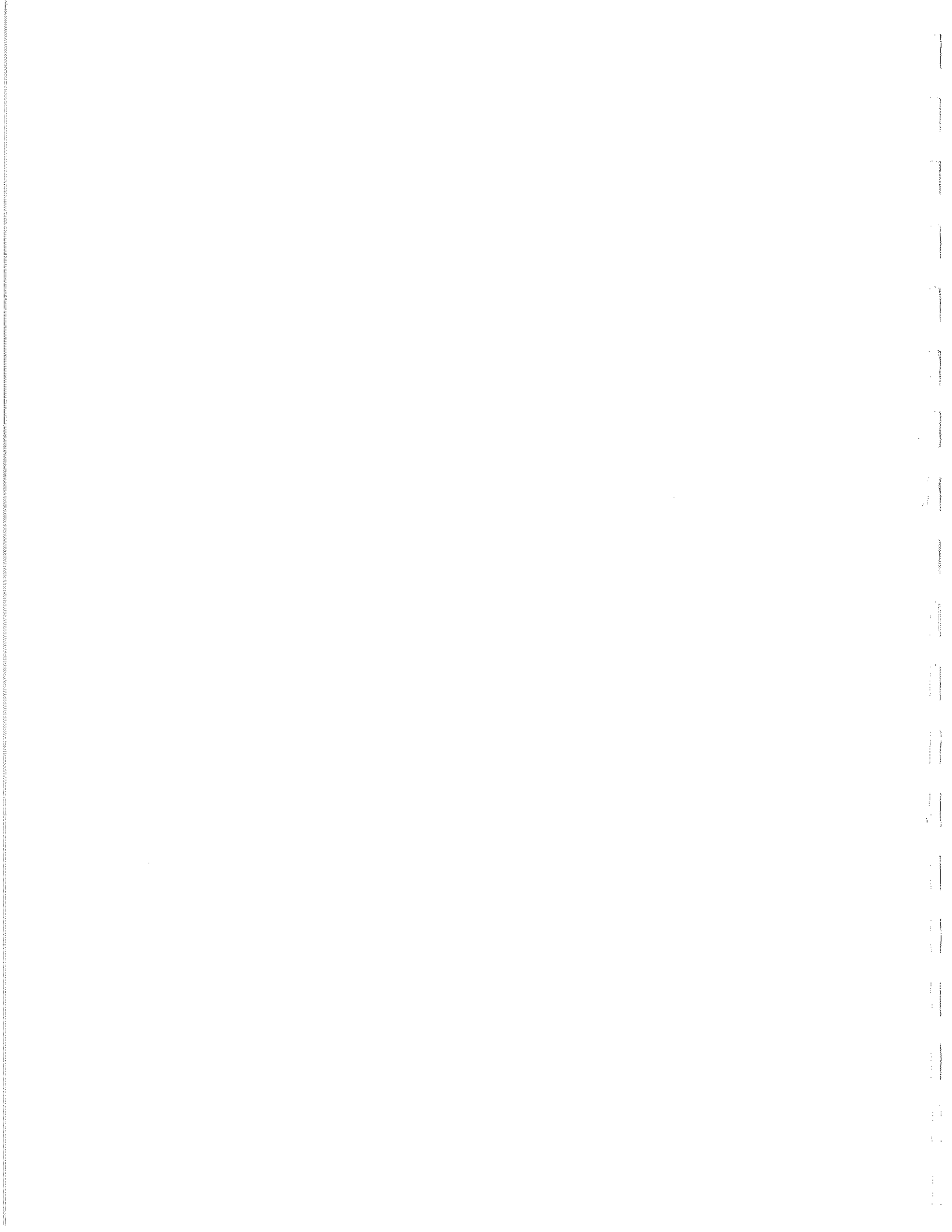
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I. MSEIP LIBRARY

General Description

The Midwestern States Educational Information Project (MSEIP) is a federally-funded project designed to develop and implement an educational information system which will be compatible among 13 midwestern states. The MSEIP library serves the Project by organizing and maintaining its resource materials.

The MSEIP library system is a method for organization and retrieval of resource materials in the Project library. The system utilizes a modified version of the Key-Word-In-Context (KWIC) indexing system.

The KWIC indexing system is a computerized system designed by the International Business Machines Corporation for organizing information by indexing.¹ KWIC indexing is based upon the theory that a simple way to index information is to use the actual words contained in documents as index terms. This is done by listing the document words in alphabetical order. A refinement over this simple alphabetical listing is to include with each index word those words by which it is surrounded. A further refinement is to exclude, from the index, non-significant words such as prepositions and articles. The KWIC index proper does just that: it excludes words which the program has designated as non-significant, and it lists alphabetically all the remaining words (keywords), with each surrounded by the words which appear with it in the original material. Hence the name, Key-Word-In-Context.

¹Information regarding KWIC indexing may be obtained from the International Business Machines Corporation, Data Processing Division, 112 East Post Road, White Plains, New York 10601.

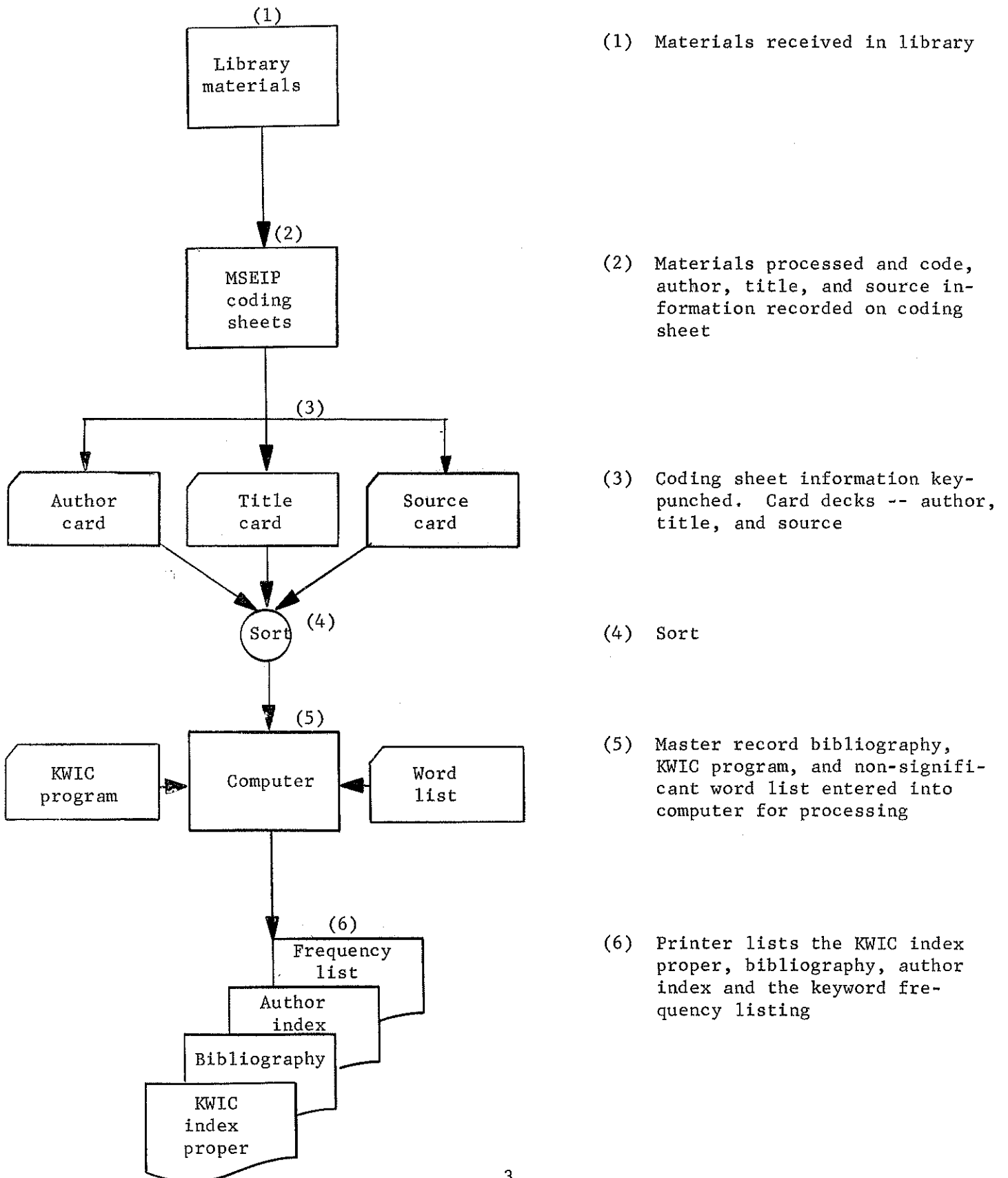
A KWIC index has three sections: (1) KWIC index proper, (2) bibliography, and (3) author index. A reference code is assigned to each document placed in the index and is used to tie the three sections of the KWIC index together. In each section, the reference code is recorded with every entry. Thus, the system provides a means of finding materials listed by author, title, or keyword.

KWIC indexing has several particular advantages that make it valuable to all libraries as a supplement to the traditional card index. Specifically, KWIC indexing can be applied to the literature of any specialized discipline, as well as to correspondence, reports, office documents, and vertical file materials. It may be reproduced for distribution by such means as multilith processing, and it can be operated relatively easily. However, other considerations in the use of KWIC indexing are cost and time factors. Funds must be appropriated for the use of data processing equipment, and preparing a machine-readable record for each new document is time consuming.

The system may be carried out on various levels depending on the purpose the index is to serve. The MSEIP limited its KWIC indexing to the titles of its resource materials. In order to produce a KWIC index of titles, bibliographical entries consisting of at least title, author, and source are recorded in machine readable form so that a printed index with the related bibliographical data can be produced. This process is illustrated by the general flow of the MSEIP library system in Figure 1.

All library materials to be processed through the system are first recorded on a coding sheet. (See Figure 5.) This coding sheet records the

Figure 1. General Flowchart of the MSEIP Library System



retrieval code, author, title, and source of the document. This information is punched on cards which make up the master record bibliography.

This bibliography, the special word list of non-significant words, and the KWIC program, constitute the input to the computer. All ordering and arranging of the input information for the three major output reports is performed by the computer. The output information is placed on magnetic tape prior to the printing of the reports. The output reports are: (1) the KWIC index proper, (2) the bibliography, and (3) the author index.

Keyword Determination

The computer must be given instructions concerning the words to consider keywords in order to produce the KWIC index proper. Since the significance of words is difficult to predict, it is more practical to reject all obviously non-significant words. When establishing a word list in this manner, there is the risk of omitting words of questionable significance. These non-significant words may be eliminated later through a statistical analysis of frequency, or simply tolerated. The list of non-significant words is prepared and continually adjusted according to the nature of the material being indexed and user reaction. This list is recorded and maintained on punched cards and becomes part of the input to the computer for processing the KWIC index.

The computer prints a list which identifies the keywords and the frequency of their appearance in the KWIC index proper. This list assists in analyzing keywords.

Management Control Procedures

The three MSEIP library system management control procedures specify steps in acquiring resource materials, processing new materials, and retrieving materials.

The procedure for acquiring new materials is illustrated in Figure 2, and Figure 3 illustrates their processing procedure.

After initial processing, coding sheets are filed in a "hold" status until the index is to be updated. When a sufficient number of sheets have been received, they are batched for final processing.

Figure 4 illustrates the procedure for retrieving library materials.

Figure 2. Management Control Procedure for Acquiring Resource Materials not in the MSEIP Library

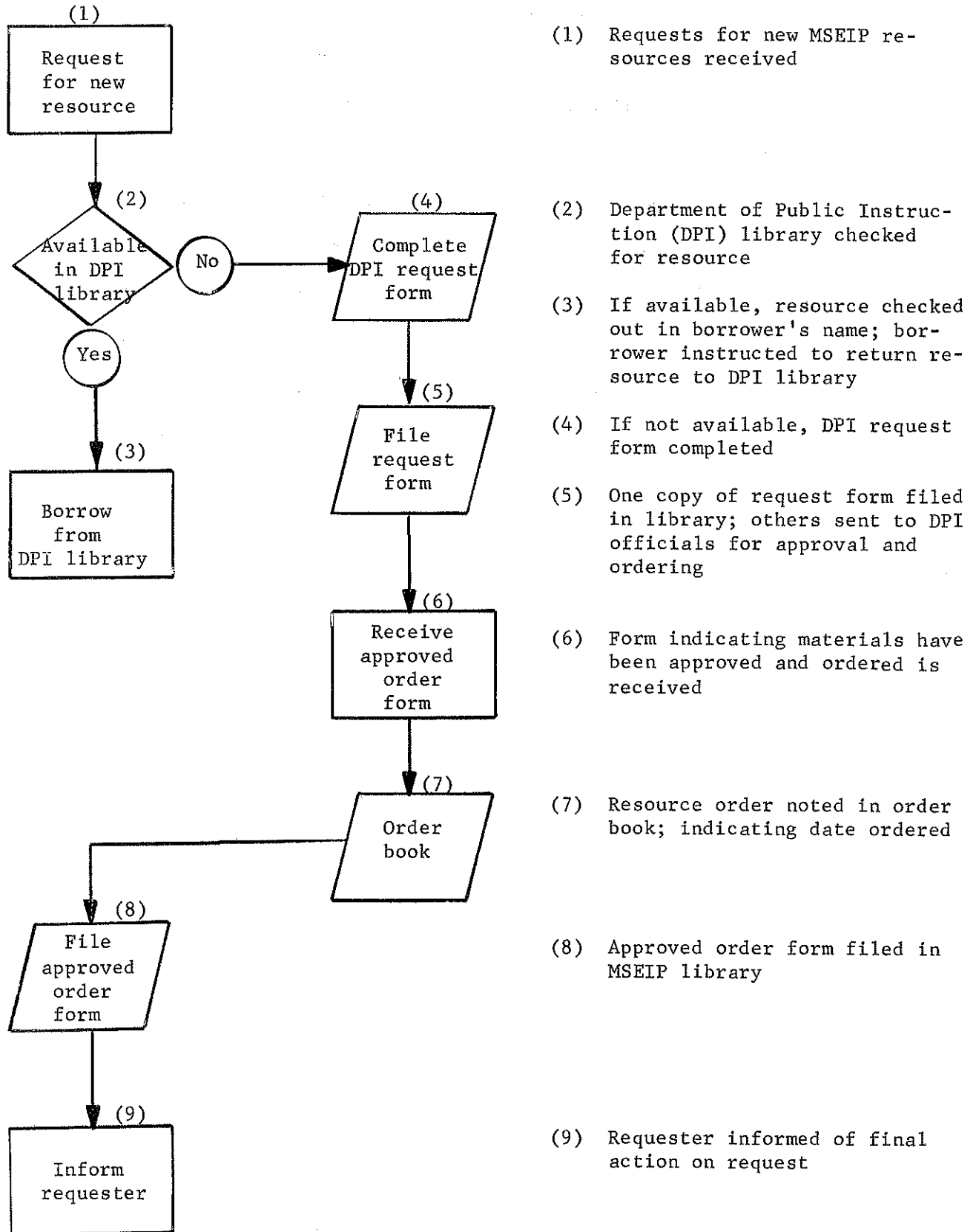


Figure 3. Management Control Procedure for Processing New Materials

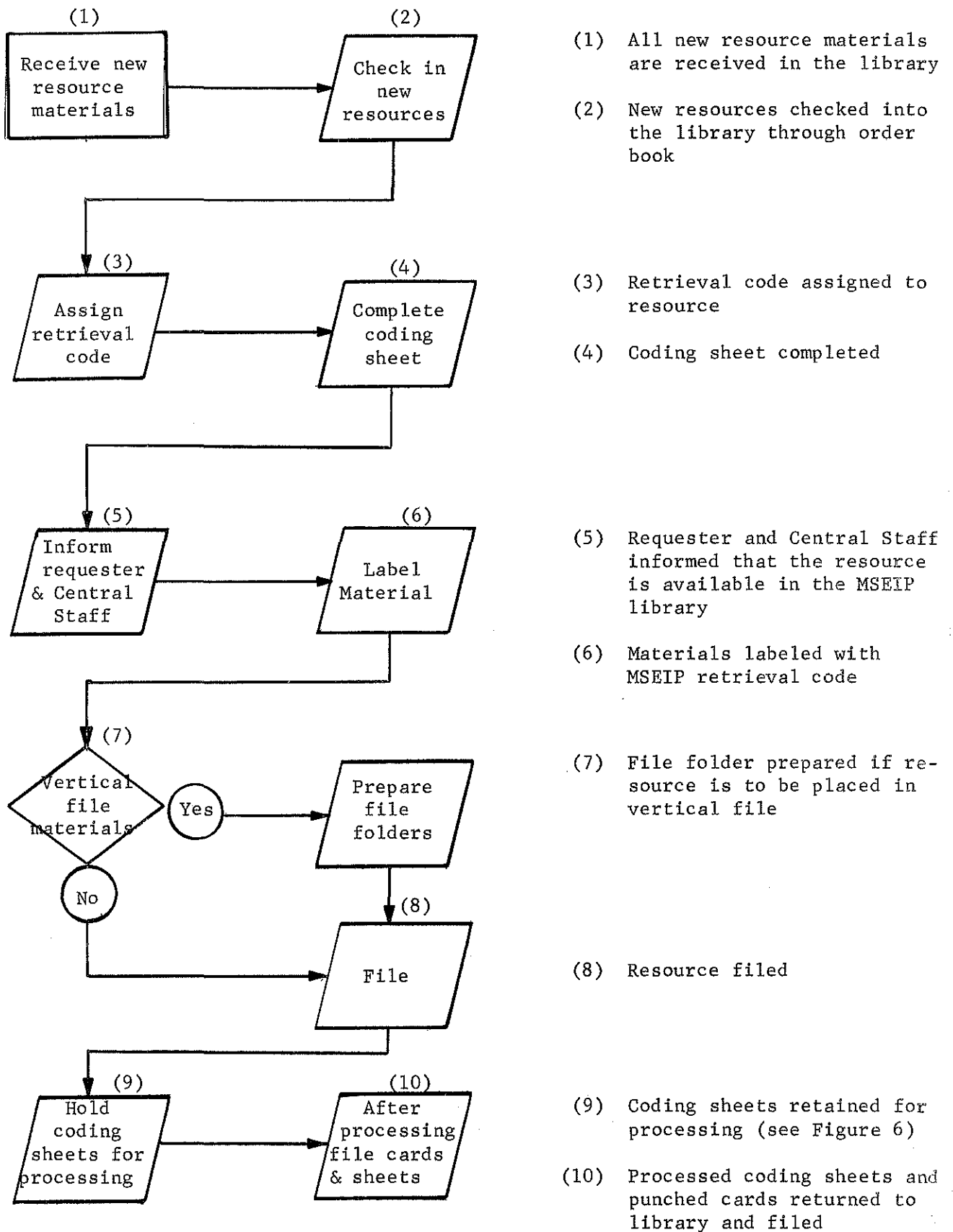
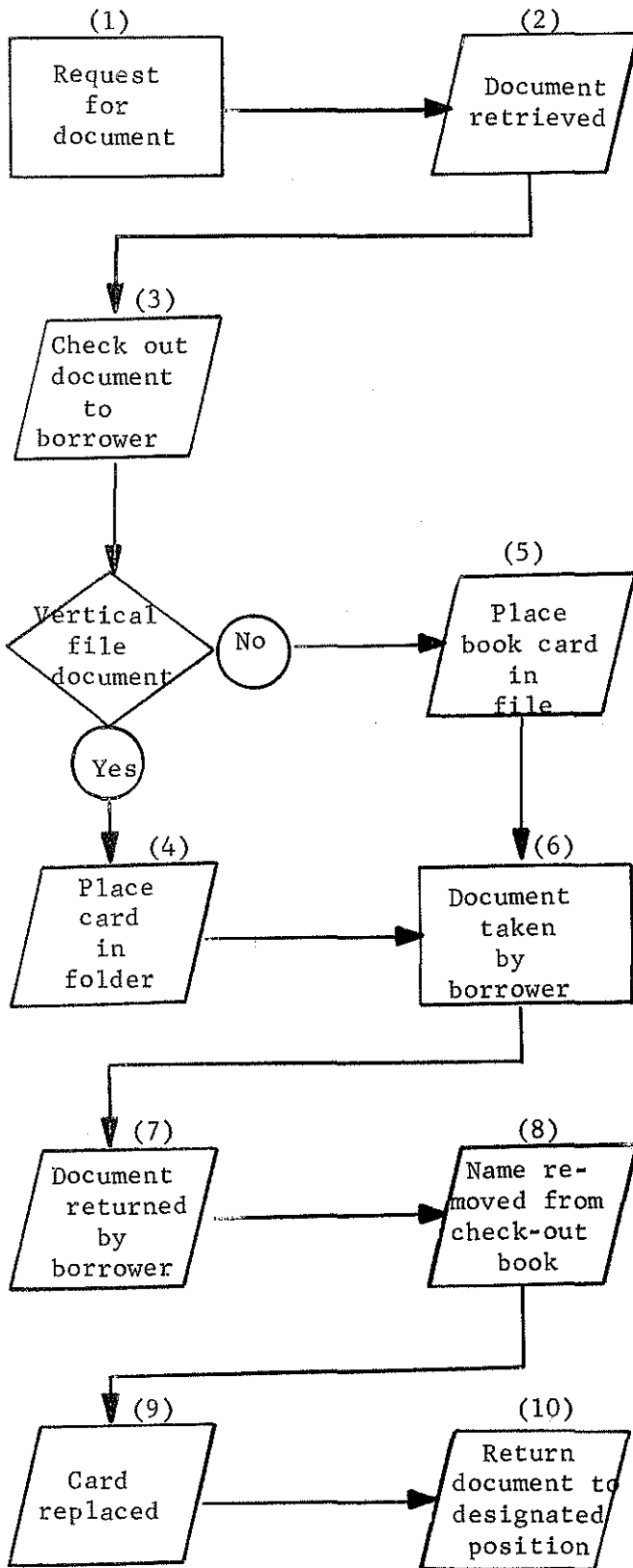


Figure 4. Management Control Procedure for Retrieving Resource Materials in the MSEIP Library



- (1) Requests for documents directed to librarian
- (2) Library resources retrieved
- (3) Borrower's name, document title, retrieval code, and date placed in check-out book in library
- (4) If document is in vertical file, card with borrower's name placed in empty folder
- (5) If document is book, card removed from pocket and placed in library card file with borrower's name and date; other documents do not use cards
- (6) Document removed from library by borrower
- (7) Borrower returns document to library personnel
- (8) Library personnel record document return in check-out book
- (9) Cards returned to book or removed from file folders
- (10) Document returned to designated position in library

II. CLASSIFICATION AND CODING

Reference Code Description

All materials to be included in the KWIC index are classified into one of the following predetermined categories and assigned the corresponding reference code. These reference codes and descriptions were established for use in the MSEIP library and are not mandatory for successful operation of a KWIC system.

<u>Reference Code</u>	<u>Description</u>
A	Books and Shelf Materials
B	Vertical File Materials
C	USOE Publications
D	Periodicals
E	Technical Manuals
F	MSEIP Materials
G	Audiovisual Materials

Terms Defined

- A. Books and Shelf Materials - Bound material available in book or booklet form located on the library shelves, which cannot be classified into any other category.
- B. Vertical File Materials - Special materials which lend themselves to vertical files. Exceptions are USOE publications and MSEIP materials which are located in the vertical file but are treated as separate categories.

- C. USOE Publications - Documents published by the U.S. Office of Education, containing the FS5.2 Superintendent of Documents number.
- D. Periodicals - Publications with a fixed interval between the issues or numbers; may include individual articles.
- E. Technical Manuals - Publications describing specialized techniques and machinery.
- F. MSEIP Materials - Materials written by MSEIP staff members and consultants dealing directly with the Project.
- G. Audiovisual Materials - Materials and equipment which involve looking and listening.

Retrieval Code and Format Descriptions

The retrieval code provides the means of relating an entry in the KWIC index proper and author index to the corresponding entry in the bibliography. The retrieval code may be assigned on the basis of document number, report number, or some arbitrary numbering system. In the development of this system, the use of Library of Congress or Dewey Decimal numbering systems was anticipated. These numbering systems can be readily adapted to the KWIC coding structure.

No specific code is needed for the successful operation of the KWIC system; however, two criteria for a successful operation are: (1) the code must contain 17 positions, and (2) each document must have a unique code.

The MSEIP retrieval code is assigned on the basis of the special reference code. A reference code, as indicated earlier, is assigned to all library materials and is based on predetermined categories. The retrieval

code has a different format for each reference code category. It is a 17-position code, the first character of which is the reference code. If names or numbers do not fill the allotted positions, spaces (indicated by Δ) are inserted to bring the other characters into line. The 17th position of the retrieval code must have a character punch. A unique retrieval code must be assigned to each item indexed in the system. This unique code is necessary in order that the computer program is able to properly sort the various author, title, and source cards. The format of each reference code is defined as follows:

Code A - Books and Shelf Materials - Option 1

Code A-XXXXXXXXXXXXX-

A- An "A" reference code followed by a hyphen (-) represents books and shelf materials.

XXXXXXXXXXXXX- A 14-position field followed by a hyphen containing the numbers assigned to the publication by the Library of Congress. If the book is a compilation or if chapter titles are to be indexed, a unique code must be assigned to each entry, thus allowing all entries to be grouped together in the bibliography. In this unique code, the two positions following the Library of Congress number, or the last two positions in the field, contain a hyphen and an alpha character. This allows for 24 entries within a given "A" code (I and O are not used because they resemble numerals).

Example: Code A - Option 1

Data Processing for Educators, by
Alvin Grossman and Robert L. Howe

Code A-LB1028G7.4ΔΔΔΔ-

A-	Books and Shelf Materials
LB1028G7.4ΔΔΔΔ-	Library of Congress classification number

Code A - Option 2 (For an "A" resource which does not have a Library of Congress number, or if the Library of Congress number is not available.)

Code A-XXXXXX-YY-ZZZZ-

A- An "A" reference code followed by a hyphen represents books and shelf materials.

XXXXXX- A six-position field, followed by a hyphen, containing the first four letters of the author's last name and his first and second initials. If the book has been assigned a code number by an authorized source, such as the U.S. Government Printing Office, this six-position field contains the source abbreviation followed by a hyphen, and the remaining seven positions contain the assigned code followed by a hyphen.

YY- A two-position field, followed by a hyphen, containing the year of publication.

ZZZZ- A four-position field, followed by a hyphen, containing the accession number assigned sequentially to each book written by a single author.

If the book is a compilation, or if chapter titles are to be indexed, the hyphen in the 12th position of the retrieval code is replaced by an alpha character (I and O are not used).

Example: Code A - Option 2

The Computer in American Education,
edited by Don D. Bushnell and Dwight W. Allen

Code A-BUSHDD-67-0001-

A-	Books and Shelf Materials
BUSHDD-	First four letters of author's last name (BUSH) and first and second initials (DD).
67-	Year of Publication
0001-	Accession number of this book (relative to other books by Don D. Bushnell).

Code B - Vertical File Materials

Code B-PXXYYYYY-ZZZZZ-

B- A "B" reference code followed by a hyphen represents vertical file materials. (Vertical File Specifications are given on page 22.)

- P A one-position field containing the file identification number.
- XX A two-position field containing the numbers or letters of the super-class.
- YYYYY- A five-position field, followed by a hyphen, containing the first five letters of the class.
- ZZZZZ- A five-position field, followed by a hyphen, containing the first five letters of the sub-class.

If two or more file folders are needed for similar materials, for each folder using like codes, the last Z position (position 16) of the sub-class is omitted and a numeral is used in its place to indicate the folder's sequential number 2, 3, etc.

If more than one source contained in a single folder warrants individual coding, or if one resource in a single folder warrants more than one coding, the last position (position 17) which contains a hyphen is replaced by an alpha character. In each folder the second piece is given an "A" character, the third piece a "B", etc.

Example: Code B

Code B-3ΔOOOTHER-NEWJ2A

B-	Vertical File Materials
3	File identification number
ΔO	Super-class of O (deltas, Δ, are used to indicate blank positions in the code)
OTHER-	Class of Other
NEWJ	Sub-class of New Jersey
2-	Second folder
A	Second document in folder

Code C - USOE Publications

Code C-XXXXXXXXXXXXXXXX-

C- A "C" reference code followed by a hyphen represents USOE publications.

XXXXXXXXXXXXXXXX- A 14-position field followed by a hyphen containing the document number assigned by the U.S. Government Printing Office.

Example: Code C

Code C-FS5.212:12029A-

C- Reference Materials
FS5.212:12029A- USOE Government Printing Office
document number

Code D - Periodicals

Code D-PPPP-XX-YY-ZZZ-

- D- A "D" reference code followed by a hyphen represents periodicals.
- PPPP- A four-position field followed by a hyphen containing the periodical title abbreviation. A master listing of all periodicals and their abbreviations is maintained and available for user reference (see page 25).
- XX- A two-position field followed by a hyphen containing the year of the publication.
- YY- A two-position field followed by a hyphen containing the issue number.
- ZZZ- A three-position field followed by a hyphen. If this is an article, the page number on which the article begins is given. If it is a complete issue, this field contains zeros.

If a group of periodicals is not to be coded by individual issue, the XX, YY, and ZZZ positions are to be filled with zeros. This would indicate only that the magazine is available in the library.

Example: Code D

Code D-AEDS-68-07-003-

D- Periodicals
AEDS- Periodical title abbreviation: AEDS
Monitor
68- Year of publication
07- Issue number
003- Beginning page number of particular
article

Code E - Technical Manuals

Code E-XXXXX-YYYYYYYY-

E- An "E" reference code followed by a hyphen represents technical manuals.

XXXXX- A five-position field followed by a hyphen containing the abbreviations of the company producing the manual. A master listing of all companies and their abbreviations should be maintained for user reference.

YYYYYYYY- An eight-position field followed by a hyphen containing the number assigned to the manual by the publishing company.

Example: Code E

Code E-IBM△△-A24-3090-

E-	Technical Manuals
IBM△△-	Company abbreviation: International Business Machines Corp.
A24-3090-	Document number assigned by IBM

Code F - MSEIP Materials

Code F-PPP-XXX-YYY-ZZ-

F- An "F" reference code, followed by a hyphen, represents MSEIP materials.

PPP- A three-position field, followed by a hyphen, containing the drawer identification code (see Vertical File Specifications, file number one).

XXX- A three-position field, followed by a hyphen, containing the main classification code.

YYY- A three-position field, followed by a hyphen, containing the sub-classification code.

ZZ- A two-position field, followed by a hyphen, containing the accession number within the sub-classification, or zeros if materials are not coded separately.

Example: Code F

Code F-ADM-PUB-ONL-OO-

F-	MSEIP Materials
ADM-	File identification (administration drawer)
PUB-	Main classification (publications)
ONL-	Sub-classification (ON-LINER)
OO-	Material in folder not coded separately

Code G - Audiovisual Materials

Code G-XX-YYYY-AAAAAA-

- G- A "G" reference code, followed by a hyphen, represents audiovisual materials.
- XX- A two-position field containing the code for the type of audiovisual material (see page 28).
- YYYY- A four-position field, followed by a hyphen, containing the accession number within type.

Example: Code G

Code G-FI-0004-

G-	Audiovisual Materials
FI-	Film
0004-	Accession number
AAAAAA-	Blank spaces

Procedure for Classification and Coding

The first step in the MSEIP system is the classification and assignment of codes as new materials enter the library. The second step is completion of the MSEIP-KWIC Information Coding Sheet designed to facilitate the recording and keypunching of library information. The coding sheets are completed by recording the following information: (1) retrieval code, (2) author, (3) title, and (4) source.

Retrieval Code

The retrieval code is recorded at the top of the coding sheet; this code is keypunched in positions 61 through 77 on each of the data processing cards which are prepared for a particular document and are numbered on the coding sheet.

Author(s) - Corporation Name

The author or corporation name is recorded next. This carries the author's surname first, a space, and then his first and second initials with spaces between. If there are several authors, as many as three may be placed on one card by beginning the last names in positions 1, 21, and 41. Corporation names are treated as authors if no author is given. Since corporate names are often more than 18 characters long, the presence of a character in column 19 or 20 (or both) is an indication of a single corporate card rather than a multiple personal author card.

If no author is recorded, the words "BLANK CARD" or the letters "NA" are written in this section of the coding sheet, so that a blank author card will be prepared.

Title

The third item to be recorded on the coding sheet is the title. This is the full title of the document with no words omitted and abbreviations used only in accordance with established rules. If additional cards are needed, the title continuation is indented two spaces. The end of the title must be indicated by a period and the symbol #. No space is left between the last character of the title and the period. The titles may be followed

by such explanatory additions as are desired or other words which may be descriptive of the material. These descriptors are enclosed by slashes (/) with no space after the symbol # or between the slashes and first or last characters (see next example).

In order to avoid unwanted index entries, terms normally written as two or more words may be transformed into a single word by the use of hyphens. Thus, "Van der Woals" is written "Van-der-woals." Conversely, normally hyphenated words may be forced to index separately by omitting the hyphen or by introducing a space after the hyphen.

Source

The fourth item to be recorded is the source. This is the name of the publisher, the location, date of publication, pages, etc. This information will be spaced for readability and additional cards must be indented two spaces. (See "Source Master for MSEIP Library Resources," page 31.)

On the right side of the coding sheet the card number in type is recorded (positions 78 and 79). This is a sequential numbering of the cards within type (includes author, title, and source cards).

Example:

The "MSEIP KWIC Information Coding Sheet" is completed for:

Rocky Mountain Educational Laboratory. An Effective Behaviors Project Report. Denver or Salt Lake: Rocky Mountain Educational Laboratory, July 1967. MSEIP Retrieval Code: B-2 RREGIO-RMEL2-

Procedure for Correcting and Updating Files

Additions

As new materials are added to the library, an MSEIP KWIC coding sheet is completed for each item to be indexed. The sheets are accumulated until the volume merits an updating of the files; at that time a count is taken of the number of cards to be punched from the coding sheets. This provides a control total which is attached to the batched coding sheets. The batched sheets are then ready for keypunching (see Figure 6).

Deletions

If it becomes necessary to delete a set of cards (a set of card types one, two, and three containing a single retrieval code), positions 61 through 80 of the coding sheet are completed identically to the cards being deleted (that is, the retrieval code, the card number in type, and the card type). An asterisk (*) is placed in columns 1 and 2 on the first lines provided for the author, title, and source of the coding sheet. These coding sheets are batched with the additions and a card count is used as a control total.

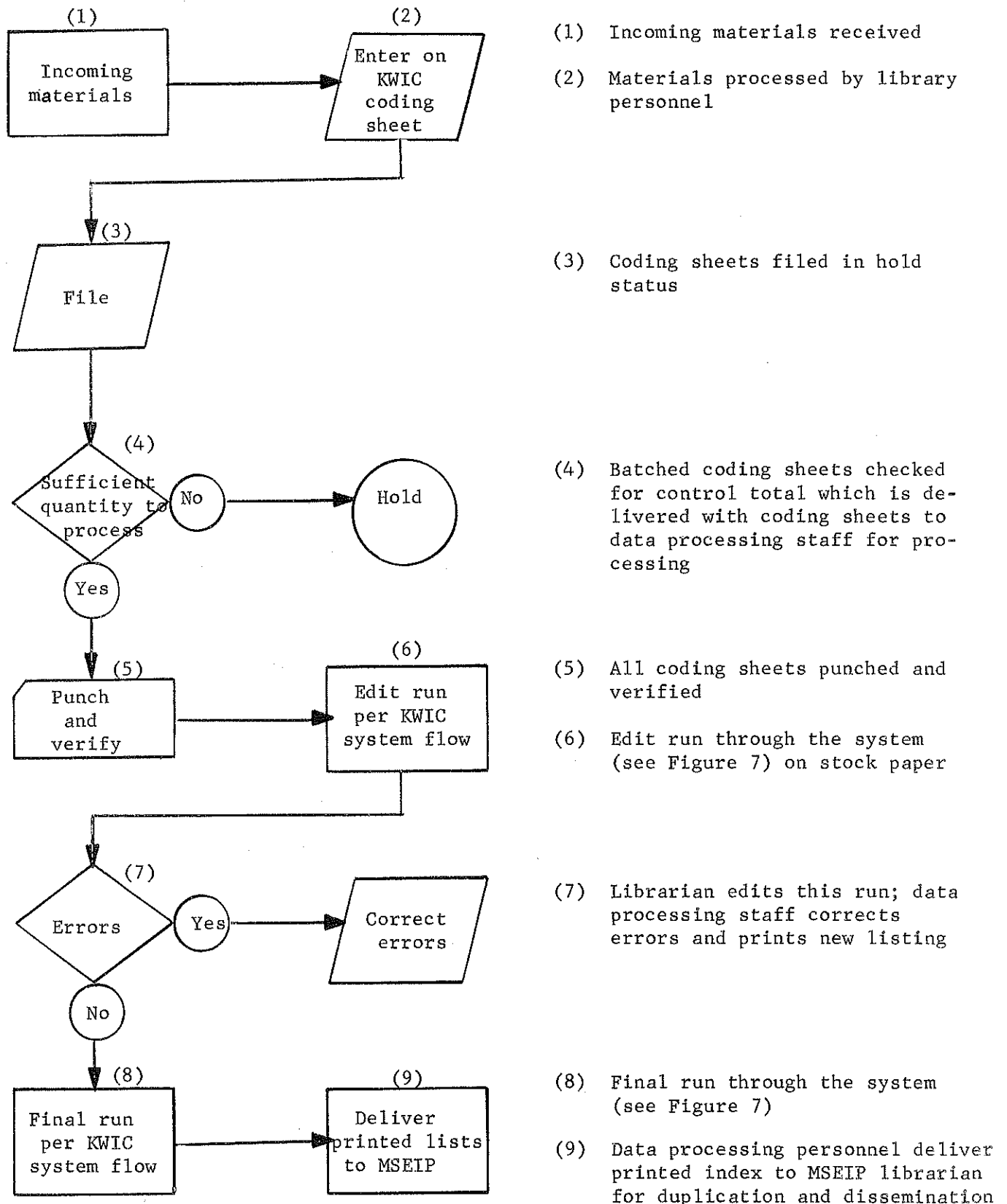
Changes

Errors of any kind in the file can be corrected by deleting the record in error and making an addition containing the corrected record.

File Updating

This procedure is handled by the computer operators. All update cards are sorted in sequence by retrieval code, card number, and type. The

Figure 6. Flow Chart of Data Processing Procedures



master file is stored on tape. The update cards are run against the master file making the deletions and additions then stored as a back-up file to the master file.

Vertical File Specifications

The vertical file materials in the MSEIP library are initially categorized according to file identification. The following description of the MSEIP vertical files is included for possible use by other libraries.

File Identification

The entire set of files is divided into five special files with one or more drawers. These special files are given identification numbers which are incorporated into the MSEIP retrieval code.

File 1: Contains all MSEIP materials; presently consists of three drawers.

File 2: Contains materials on related projects and organizations; presently consists of two drawers.

File 3: Contains general reference materials, not classified into one of the other files; presently consists of three drawers.

File 4: Contains materials concerning or directly related to Iowa; presently consists of two drawers.

File 5: Contains materials from the 12 states participating in the MSEIP (Iowa excluded).

File 6: Contains materials from the USOE.

Files 1 and 6 have different reference codes than the other four files; therefore, the materials in these two files are uniquely arranged.

File 1. The arrangement of materials in File 1 is described under reference code F, page 15. The first field following the reference code indicates the drawer identification code; the second field indicates the main classification code and is designated on white tabs within each drawer; the third field contains the sub-classification code which is the individual folder titles within the main classifications; and the last field contains the accession number within each sub-classification (or document number within each folder). The drawer identification codes and the main classification codes are indicated under "MSEIP Materials Abbreviations," page 27.

Files 2, 3, 4, 5. The materials in Files 2, 3, 4, and 5 (reference code B, Vertical File) are arranged by super-class, class, and sub-class which are described as follows:

Super-class: The first major breakdown within each file (yellow tabs in MSEIP files).

Files 2 and 3 use alpha characters (A, B, C, etc.). This corresponds with the first letter of class.

Files 4 and 5 use numeric characters (1, 2, 3, etc.) with zeros before single letter numbers. This corresponds with the alphabetical sequence of super-classes in the file.

Class: First breakdown within each super-class. Description of subject or author in alphabetical sequence (white tabs in MSEIP files).

Sub-class: Breakdown within each class. Description of subject, author, or title in alphabetical sequence (file folder labels in MSEIP file).

Example:

Code B-2 EESEA -TIDWE-

B-	Reference code for vertical file
2-	File identification code for related projects and activities
E-	Super-class code of "E" (alphabetical sequence)
ESEA -	Class code of ESEA
TIDWE-	Sub-class code, first five letters of author's last name (Tidwell).

Code B-512MISC -BUREA-

B-	Reference code for vertical file
5-	File identification code for participating states
12-	Super-class code for Wisconsin
MISC -	Class code for Miscellaneous
BUREA-	Sub-class code for subject: Bureau of Business Research and Services, University of Wisconsin

File 6. The arrangement of File 6 is described under reference code C, USOE Publications, of the retrieval codes, page 13. It carries the reference code assigned by MSEIP and the document code assigned by the USOE.

The retrieval code is recorded on each document in the files and on each file folder.

Magazine Abbreviations

The following magazine abbreviations are used in the MSEIP retrieval code for periodicals.

<u>Title</u>	<u>Abbreviations</u>
The Accreditor	ACCR (not coded separately)
AEDS Journal	see Association for Educational Data Systems Journal
AEDS Monitor	see Association for Educational Data Systems Monitor
American Education	AMED
American School and University	AS&U
Association for Educational Data Systems Journal	AEJO
Association for Educational Data Systems Monitor	AEDS
Automatic Data Processing Newsletter	ADPN
Business Automation	BUAU
Changing Times	CHTI
Computers and Automation	COAU
Datamation	DATA
Data Processing Digest	DPDI (not coded separately)
Data Processing for Education	DPED
Data Processing Magazine	DPMA
Data Processor	DAPR
Education Age	EDAG
Education Digest	EDDI
Education Recaps	EDRE (not coded separately)

<u>Title</u>	<u>Abbreviation</u>
Educational Record	EREC
Educational Leadership	EDLE
Educational Data Processing Newsletter	EDPN
Educational Technology	EDTE
Grant Data Quarterly	GRDA
Harvard Business Review	HABU
Journal of Data Management	JDMA
Journal of Educational Data Processing	JEDP
Monthly Catalog	MOCA (not coded separately)
The Office	OFFI
Research in Education	REED (not coded separately)
The School Administrator	SCAD (not coded separately)
School Business Affairs	SCBA
School Research Information Service Quarterly	SRIR
SRIS Quarterly	see School Research Information Service Quarterly

MSEIP Materials Abbreviations

The following is reference code F, drawer identification and main classification codes:

<u>Drawer 1. Administration</u>	<u>ADM</u>
1. Administrative Assistant	ADA
2. Advisory Committee	ADV
3. Central Staff	CEN
4. Chief State School Officers	CSS
5. Consultants	CON
6. Coordinating Committee	COO
7. Data Processing	DAT
8. Director	DIR
9. Editor	EDI
10. Finances	FIN
11. Joint Meetings	JOI
12. Library	LIB
13. Publications	PUB
14. Policy Committee	POL
15. Public Relations	PRS
16. State Coordinators	STA
17. Speeches and Presentations	SPE
<u>Drawer 2. Subsystems</u>	<u>SUB</u>
1. Facilities	FAC
2. Finance	FIN
3. General	GEN
4. Instructional Programs	INS
5. Personnel	PER
6. Pupils	PUP
<u>Drawer 3. Field Development</u>	<u>FDE</u>
1. All States	ALL
2. Colorado	COL
3. Illinois	ILL
4. Indiana	IND
5. Iowa	IOW
6. Kansas	KAN
7. Michigan	MIC
8. Minnesota	MIN
9. Missouri	MIS
10. Nebraska	NEB
11. North Dakota	NDA
12. Ohio	OHI
13. Operations	OPE
14. South Dakota	SDA
15. Wisconsin	WIS
<u>Drawer 3. Technical Development and Operations</u>	<u>TDO</u>
1. Operations	OPE
2. Technical Development	TDE

Audiovisual Materials Abbreviations

The following abbreviations are used to distinguish the various types of audiovisual materials in the retrieval code:

FI - Film

FS - Film Strip

SL - Slides

TA - Tape Recordings

TR - Transparencies

Word Abbreviations

The following word abbreviations are used in the title entry. They are not used in the author or source entries except in the following cases: IBM for International Business Machines Corporation may be used in the author and source entries; U.S. for United States, and MSEIP for the Midwestern States Educational Information Project may be used in the source entries.

Acct	Accounting, Accountant
Adm	Administrator, Administration
Assoc	Association, Associations
A-V	Audiovisual
Bibl	Bibliography
Comp	Computer, Computers
Coun	Counseling, Counselors
Corp	Corporation
Cum-Record	Cumulative Record
D P	Data Processing, Electronic Data Processing, Automatic Data Processing, Educational Data Processing, EDP, ADP
Educ	Education, Educational
Elem	Elementary
Equip	Equipment
FY	Fiscal Year
High Sch	High School
Iden	Identification
Info	Information
Inc	Incorporated
Instruct	Instruction
Intro	Introduction
Jr High Sch	Junior High School
Mach	Machine, Machines
Math	Mathematics, Mathematical
Natl	National
P M	Personal Material
Represent	Representative, Representatives
Retr	Retrieval
Sch	School, Schools
Sched	Scheduling, Schedule
Sec	Secondary
Sen High Sch	Senior High School
Stat	Statistics, Statistical
Sys	System, Systems
TV	Television
Univ	University

Organizations, Projects, and Special Abbreviations

AASA	American Association of School Administrators
AEDS	Association of Educational Data Systems
ARIES	Applications Research in Electronic Systems
ASBO	Association of School Business Officials
CCSSO	Council of Chief State School Officers
CEDS	Committee on Educational Data Systems
DPMA	Data Processing Management Association
DPI	Department of Public Instruction
ERIC	Educational Research Information Center
ESEA	Elementary and Secondary Education Act of 1965
IBM	International Business Machines Corporation
MSEIP	Midwestern States Educational Information Project
NDEA	National Defense Education Act
NEA	National Education Association
NEEAP	New England Educational Assessment Project
PERT	Program Evaluation and Review Technique
SEA	State Education Association(s)
SDE	State Department(s) of Education

Source Master for MSEIP Library Resources

The following format is used by the MSEIP in the completion of the source section of the coding sheet for all library resources. This format was established for use by MSEIP personnel and is not mandatory in the system. However, the format in the index should be consistent.

Books: Publisher, City, Date
Number of pages, number of copies if more than one
Chapter Titles: Title of Book, pages of chapter.

Vertical Files: Publisher, City, Date
Number of pages, number of copies if more than one
Chapter Titles: Title of Document, pages of chapter.

USOE Publications: U.S. Government Printing Office,
Office of Education,
Washington, D.C., Date
FS5.2 number, number of pages,
Number of copies if more than one.

Periodicals: Title of magazine, date, pages of article when applicable.

Technical Manuals: Publisher, City, State, Manual number, number of pages, number of copies if more than one.

MSEIP Materials: MSEIP, Iowa State Department of Public Instruction, Des Moines, date, number of pages.

Audiovisual Materials: Publisher, City, State, date, number of minutes, black and white or color, millimeter, number of copies if more than one, additional materials if applicable (such as discussion manual).

III. COMPUTER FLOW

The MSEIP indexing procedures are initiated in the Project library. Figure 6, the Flow Chart of the Data Processing Procedures, indicates the activities that must be accomplished in order to place resources in the index.

Keypunch Procedures

The batched coding sheets are received by the data processing department with a control total tape containing the number of cards to be punched. Three types of cards are punched from each coding sheet: (1) author, (2) title, and (3) source. At least one card of each type must be punched. Every card after the first in each type must be indented two spaces.

Columns 1 through 60 of each card will contain alphanumeric information. Columns 61-77 is the same for every card on the coding sheet and contains the retrieval code: column 61 contains an alphabetic character; column 62 contains a hyphen; columns 63 through 77 contain alphanumeric information. Columns 78 and 79 contain the number of cards in a particular type and should always contain leading zeros. Column 80 indicates the numeric type code: 1 for author, 2 for title, and 3 for source.

After keypunching is completed, the cards should be counted to verify against the control total. The cards should also be key verified for accuracy. They are then ready for computer operations.

Computer Programs

The Flow Chart of the KWIC Computer Programs is illustrated in Figure 7. Following the flow chart are the descriptions of the computer programs, including: (1) KWIC #1 File Maintenance Run, (2) KWIC #2 Sort and Bibliography Run, (3) KWIC #3 Create Keyword Tape, (4) KWIC #4 Create Full Keyword Tape, (5) KWIC #5 Sort, (6) KWIC #6 Sort, and (7) KWIC #7 List, Author List, and Keyword Frequency List.

Figure 7. Flowchart of the KWIC Computer Programs

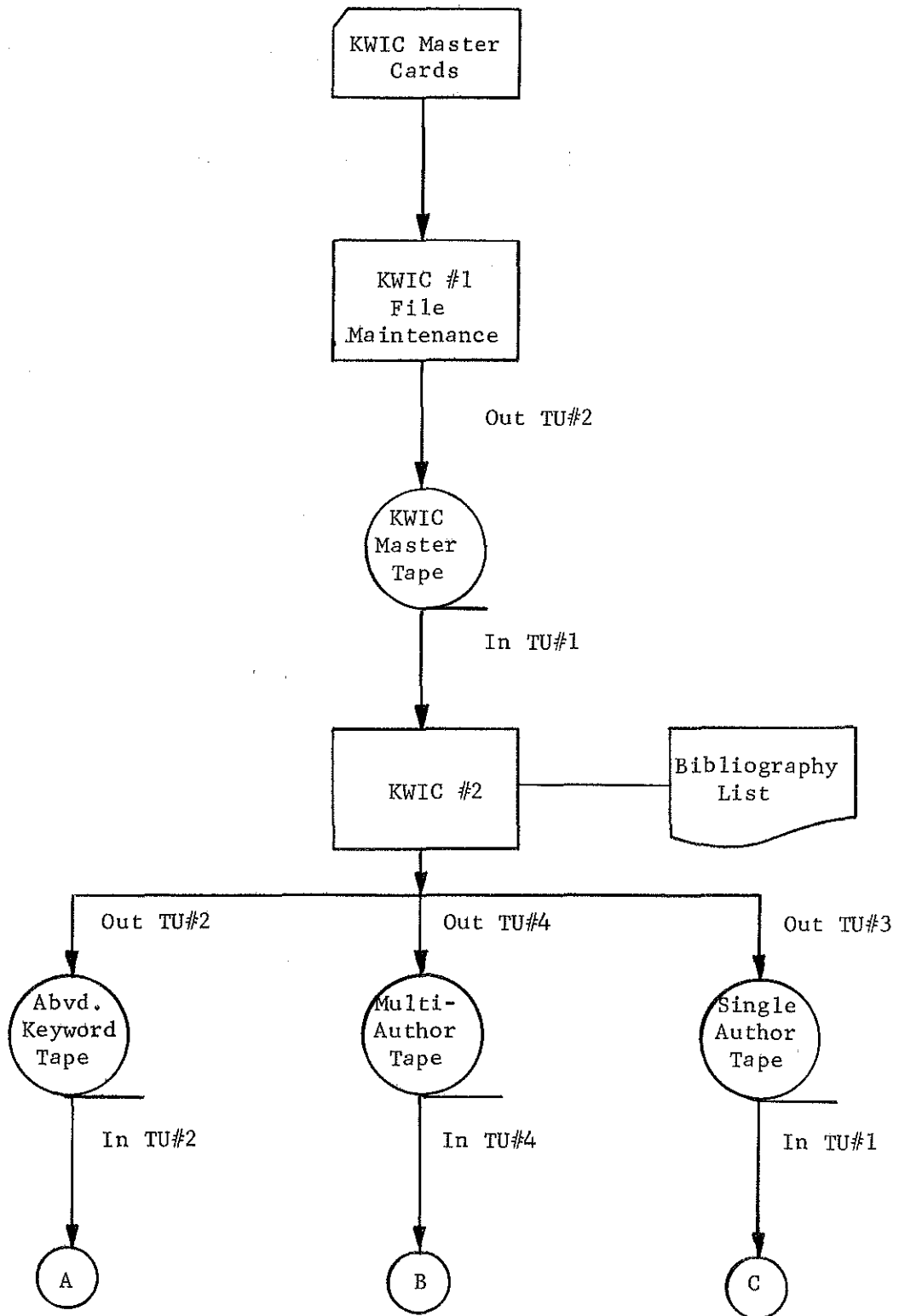
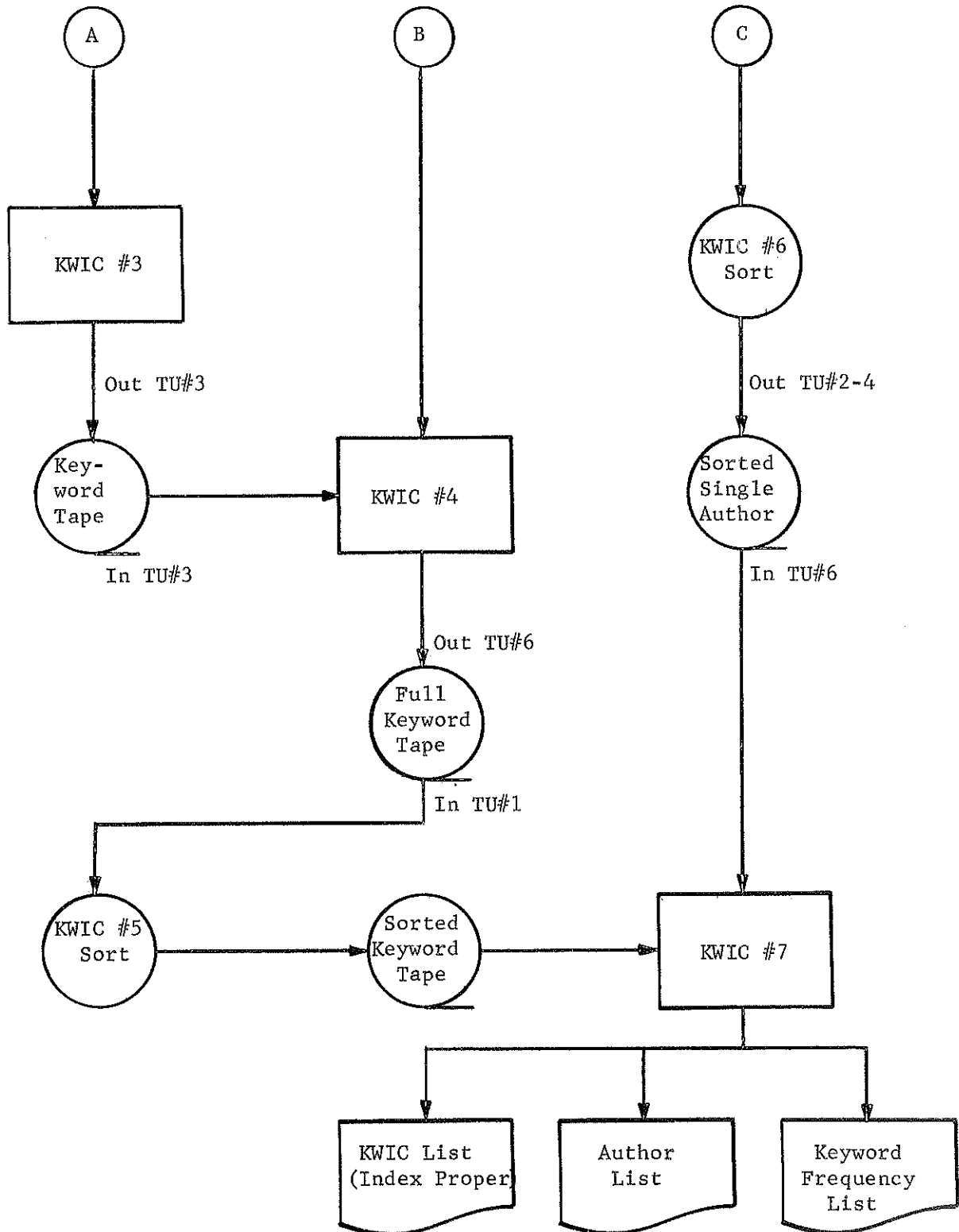
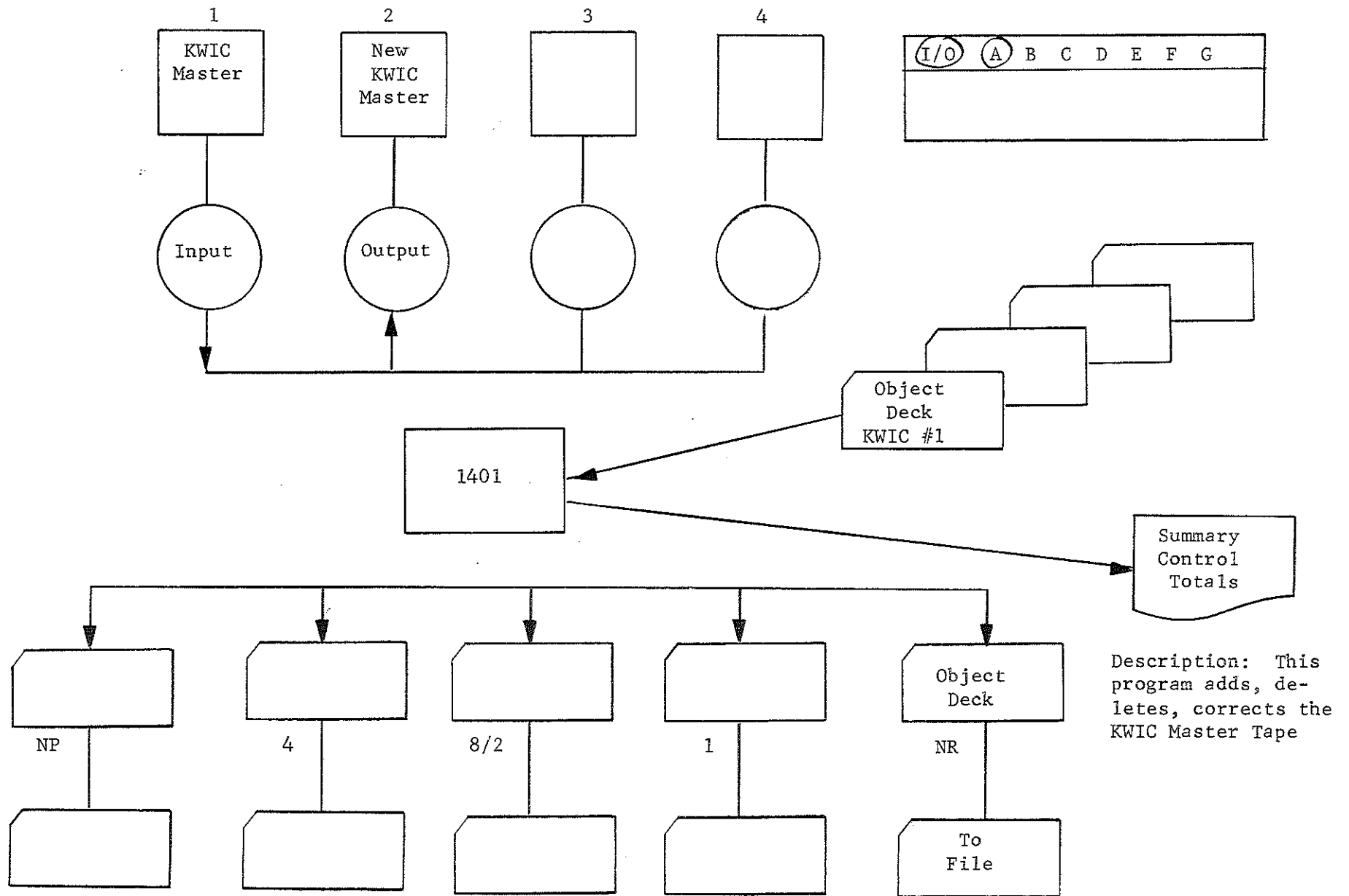


Figure 7. (Continued)



KWIC #1. File Maintenance Run

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KWIC #2: Bibliography List

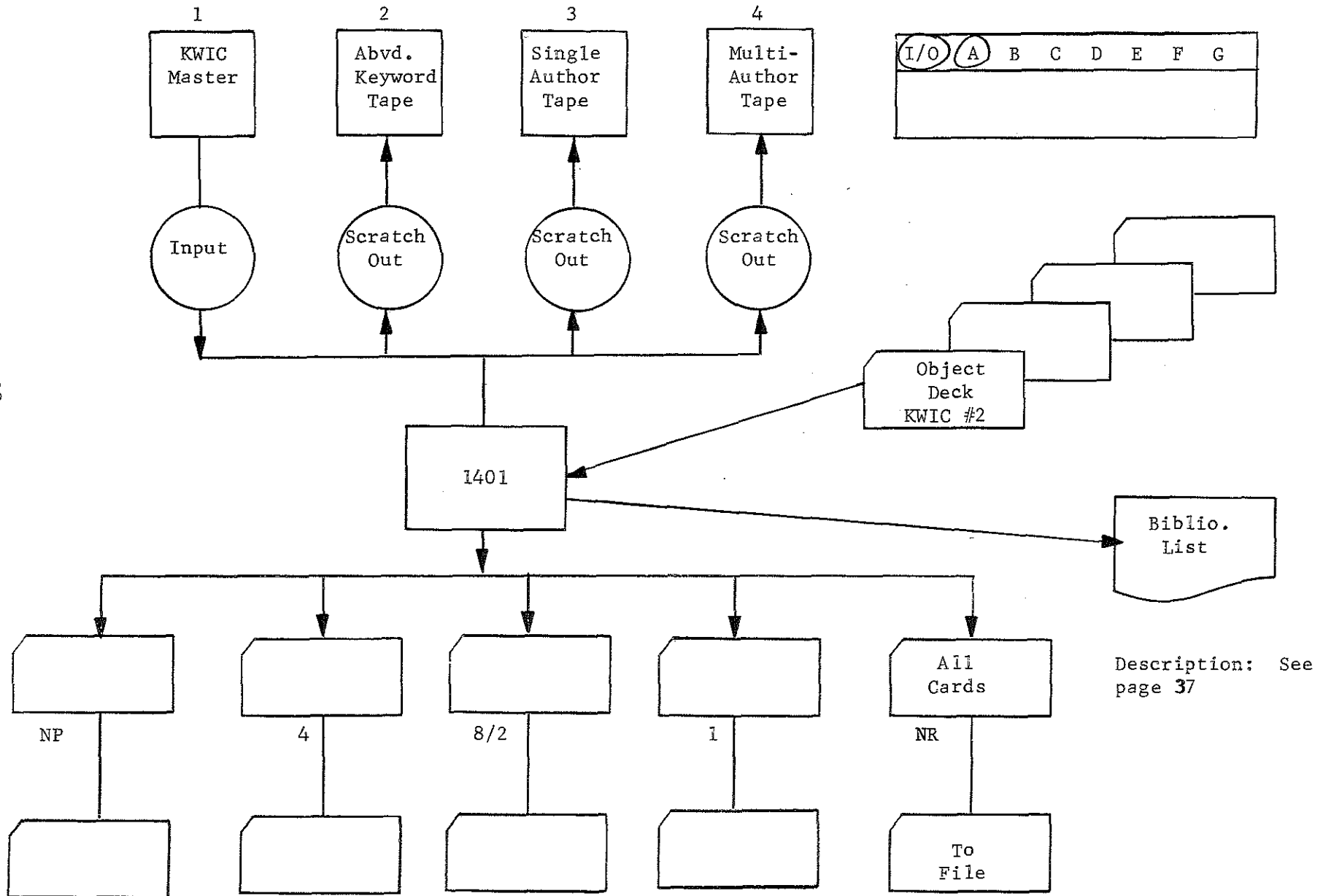
The bibliography consists of a listing of the bibliography record file. It includes the name of the author(s), title and descriptors, and source data. The order of the bibliography listing in the MSEIP System is based on the retrieval code. Each item is preceded by the retrieval code used in the corresponding entries of the KWIC index proper and author index.

Sample Bibliography Computer List

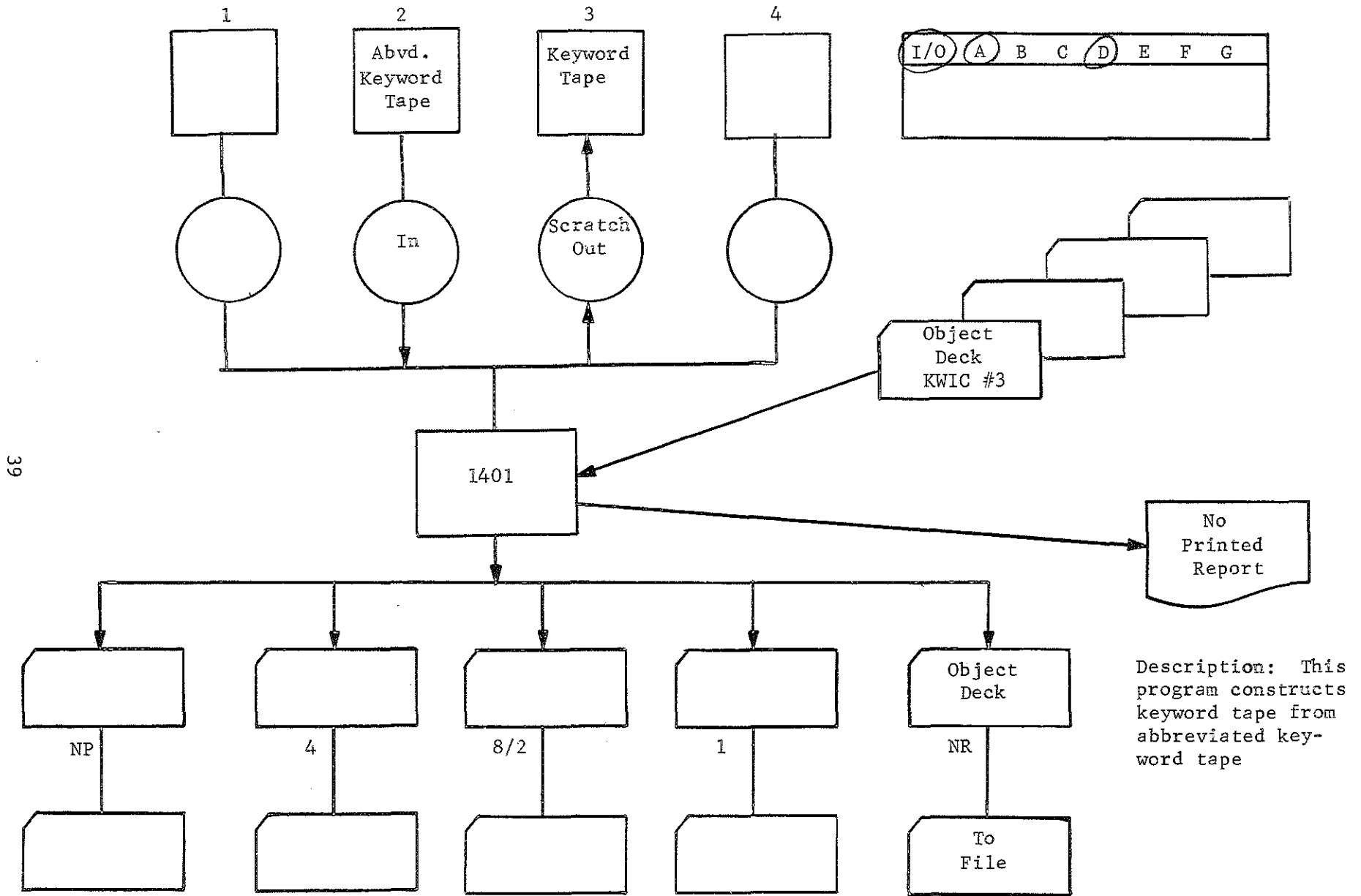
- A-LA210A6.25 - AMERICAN ASSOCIATION OF SCHOOL ADMINISTRATORS
IMPERATIVES IN EDUC.#/UNITED STATES-1945,
AIMS AND OBJECTIVES/
AMERICAN ASSOCIATION OF SCHOOL ADMINISTRATORS,
WASHINGTON, 1966, 180P.
- A-LB1028G7.4 - GROSSMAN A HOWE R L
D P FOR EDUCATORS.#
EDUCATIONAL METHODS INC., CHICAGO, 1965, 138P.
- A-LB1028L6.5 - LOUGHARY J W
MAN-MACHINE SYS IN EDUC.#/INSTRUCT, RESEARCH,
PUPIL PERSONNEL SERVICES, BIBL/
HARPER AND ROW, NEW YORK, 1966, 242P.

KWIC #2. Bibliography List

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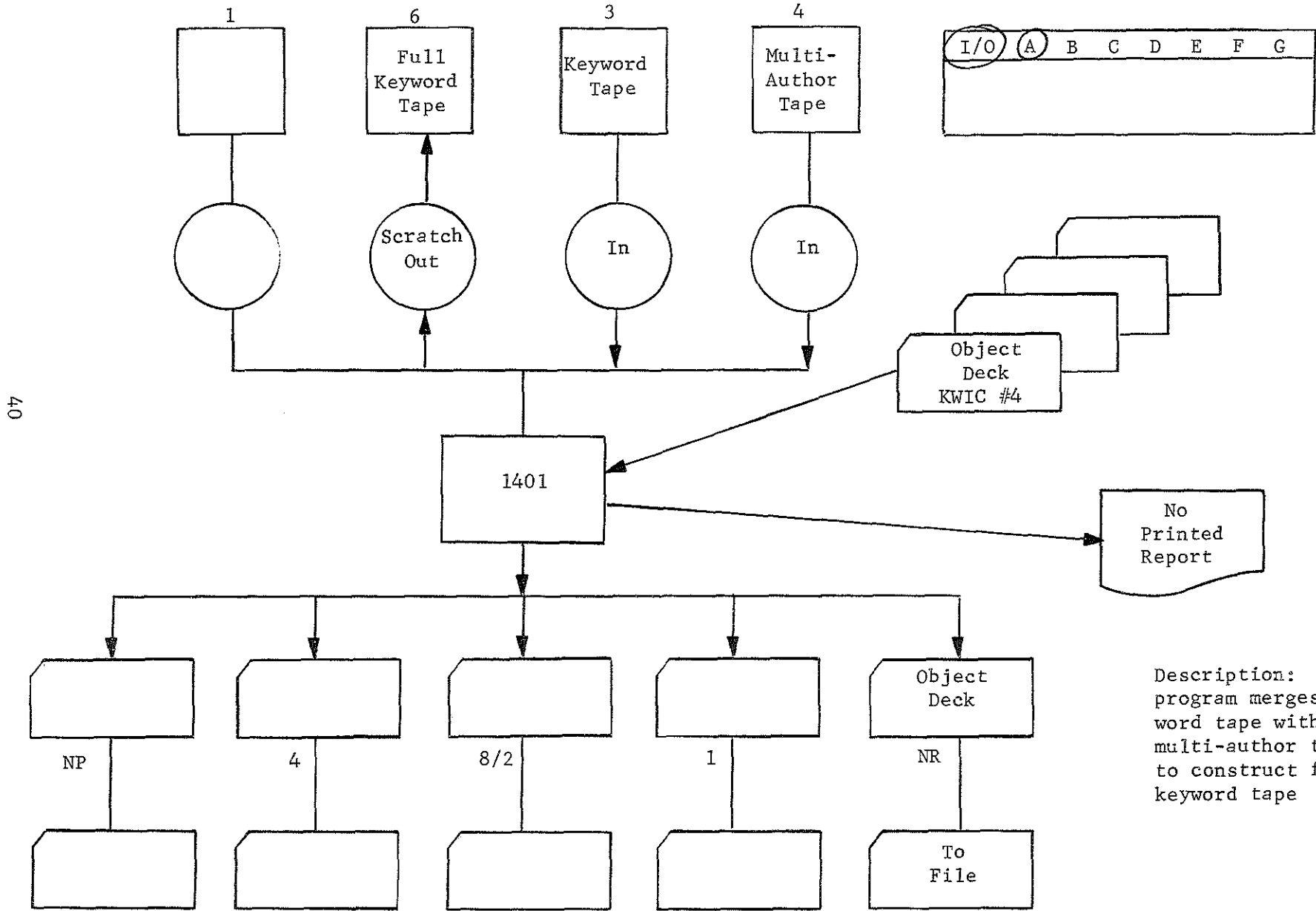
KWIC #3



39

Description: This program constructs keyword tape from abbreviated keyword tape

KWIC #4

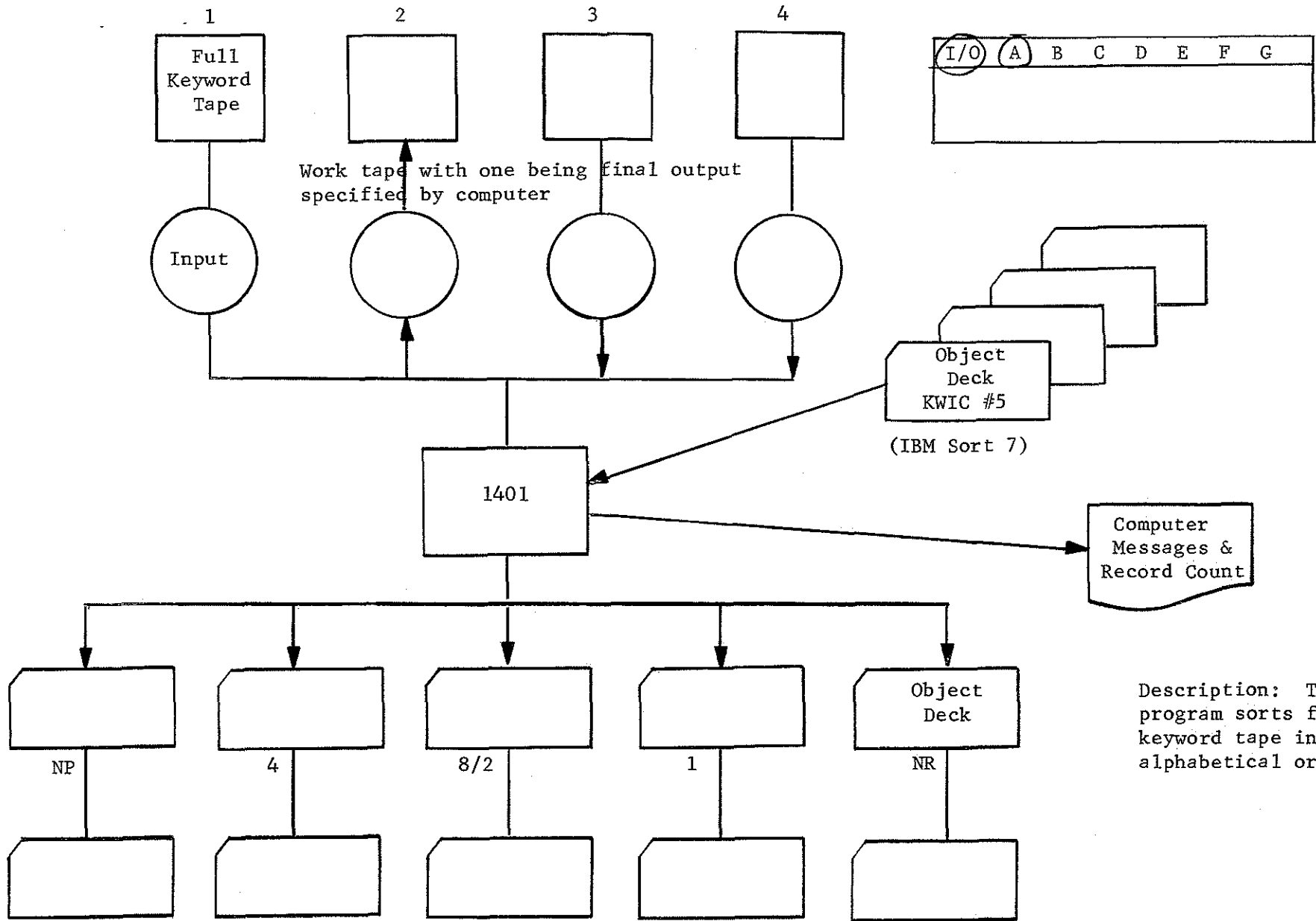


40

Description: This program merges keyword tape with multi-author tape to construct full keyword tape

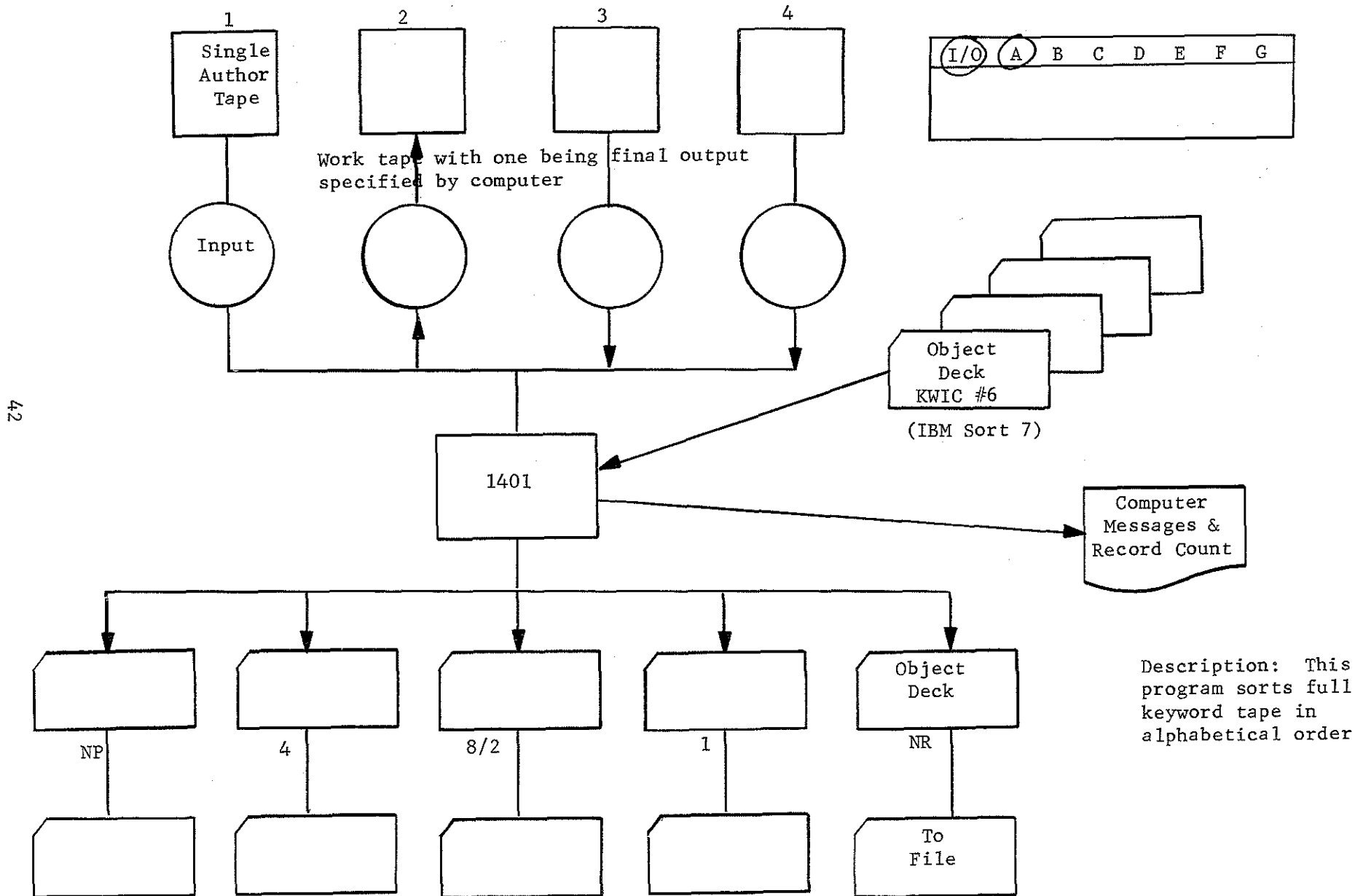
KWIC #5

41



Description: This program sorts full keyword tape in alphabetical order.

KWIC #6



KWIC #7. Index Proper

The KWIC index proper is a document index in alphabetical order by title keywords. Each document is entered once for each of its title keywords, and the keywords are aligned so that their alphabetical sequence may be easily observed. For each entry, some or all of the other words in the title, which immediately precede and/or follow the keyword, are shown. To the right of each entry in the KWIC index proper appears the retrieval code. This code directs the user to the proper bibliographical entry where complete information regarding title, author, and source is found.

Sample Index Proper Computer List

THE SHAPE OF THINGS TO COME.#/COMMUNITY COLLEGES/	A-LB2321C3.3-A -
SYS CONCEPT.#/DIRECTOR, COMM/	F-D COMM-03-703-
MENT FORM.#/DIRECTOR, COMM/	F-D COMM-02-703-
#	A-LB2321C3.3-E -
SOME COMMENTS ON THE HOUSING OF STUDENTS.	F-D COMM-01-703-
STAFF PLANNING AND COMMITTEE ACTIVITY.#/DIRECTORCC/	D-DATA-66-11-022-
THE COMP UTILITY.#/ COMMUNICATION NETWORKS, MARKET POTEN	E-IBM -E20-8158-
LIBRARY.#/DATA COMMUNICATIONS CONCEPTS, COMMUNICAT	E-IBM -E20-8158-
MMUNICATIONS CONCEPTS, COMMUNICATIONS FACILITIES/ & CO	A-LB2321C3.3-A -
PE OF THINGS TO COME.#/ COMMUNITY COLLEGES/	A-LC87C3 -
OF EDUC IN THE LOCAL COMMUNITY.#/PUBLIC RELATIONS, SCH,	A-LB2823-5H4.9 -
NESS ADM IN THE SMALLER COMMUNITY.#/PUBLIC SCH/ SCH BUSI	D-DPMA-65-10-018-
SIMULATING A COMP - USING A COMP.#/EMULATION/	D-DATA-66-08-025-
COMP IN RETAILING.#	D-DATA-66-09-022-
HE VIEW FROM ENGLAND.#/ COMP MARKET/ EUROPEAN EDP - T	D-DATA-66-11-022-
S, MARKET POTENTIAL& THE COMP UTILITY.#/COMMUNICATION NETWORK	D-DPMA-65-10-018-
LATING A COMP - USING A COMP.#/EMULATION/	D-DATA-66-10-022-
SYSTEM.#/FACILITATING COMP, MULTI-LEVEL LANGUAGE AUTOMATI	C-FS5.214.14121 -
/STUDIES, COMPARATIVE EDUC/	D-DATA-66-11-022-
ORKS, MARKET POTENTIAL COMPETITION/ & NETW	C-FS5.220.20055 -
THE DROPOUT.#/PROBLEMS, COMPUTATIONS, DEFINITIONS/	B-3-DDATAP-CAPAB-
ITUTE/ CAPABILITIES IN COMPUTER SCIENCE.#/IIT RESEARCH INST	F-D COMM-03-703-
MSEIP OPERATIONAL SYS CONCEPT.#/DIRECTOR, COMM/	F-PERPOS -01-702-
FUNCTIONS, UNIT RECORD CONCEPT& DECEMBER 1966.#/UPDATE SEA	F-PERPOS -01-612-
FUNCTIONS, UNIT RECORD CONCEPT/ & TO DECEMBER 1966.#/SEA	F-CC MIN -01-701-
ACTIVITIES, SUBSYSTEM CONCEPT/& OF SEA, STATE COORDINATORS	F-PERPOS -02-703-
FUNCTIONS, UNIT RECORD CONCEPT, IN SERVICE EDUC/	E-IBM -E20-8158-
./#/DATA COMMUNICATIONS CONCEPTS, COMMUNICATIONS FACILITIES/	C-FS5.221.21033 -
1965.#/SITES, CLASSRO& CONDITION OF PUBLIC SCH PLANTS 1964-	

KWIC #7. Author Index

The author index is an alphabetical listing of all authors of all documents appearing in the bibliography. Each entry carries the same retrieval code as shown in the bibliography and KWIC index proper.

Sample Author Index Computer List

D-DPMA-65-11-019-	BARTON L D
A-LB885B7.9	- BRUNER J S
C-FS5.212.12023	- BURCHINALL G
A-Z711B9.3	- BURKE A J
A-Z711B9.3	- BURKE M A
A-LB1043N3.35	- BUSHNELL D D
A-LC87C3	- CAHIL R S
A-LB2806.5	- CAMPBELL R F
A-LB2831.5C3	- CASTETTER W B
D-DPMA-65-09-018-	CATTANEO E R
A-LB2321C3.3	- CHAMBERS M M
A-LB2321C3.3-A	- CHAMBERS M M
A-LB2321C3.3-E	- CHAMBERS M M
A-LB2321C3.3-D	- CHAMBERS M M
A-LB2321C3.3-C	- CHAMBERS M M
A-LB2321C3.3-B	- CHAMBERS M M
A-LB2805G7.43	- CLARK D L
D-DATA-66-10-022-	CLEM P L JR
C-FS5.221.21033	- COLLINS G J
A-LB2823-5H4.9	- COLMEY J W
B-501STATE-DIREC-	COLORADO STATE DEPARTMENT OF EDUCATION
B-501DATAP-DEVEL-	COLORADO STATE DEPARTMENT OF EDUCATION
A-LB2806.5	- CUNNINGHAM L L

KWIC #7. Keyword Frequency List

The frequency statistics word list is a fourth listing produced by the KWIC system; although it is a product of the system, it is not considered part of the index and is not distributed with the KWIC index. This list presents each keyword and the number of times it appears in the KWIC index proper.

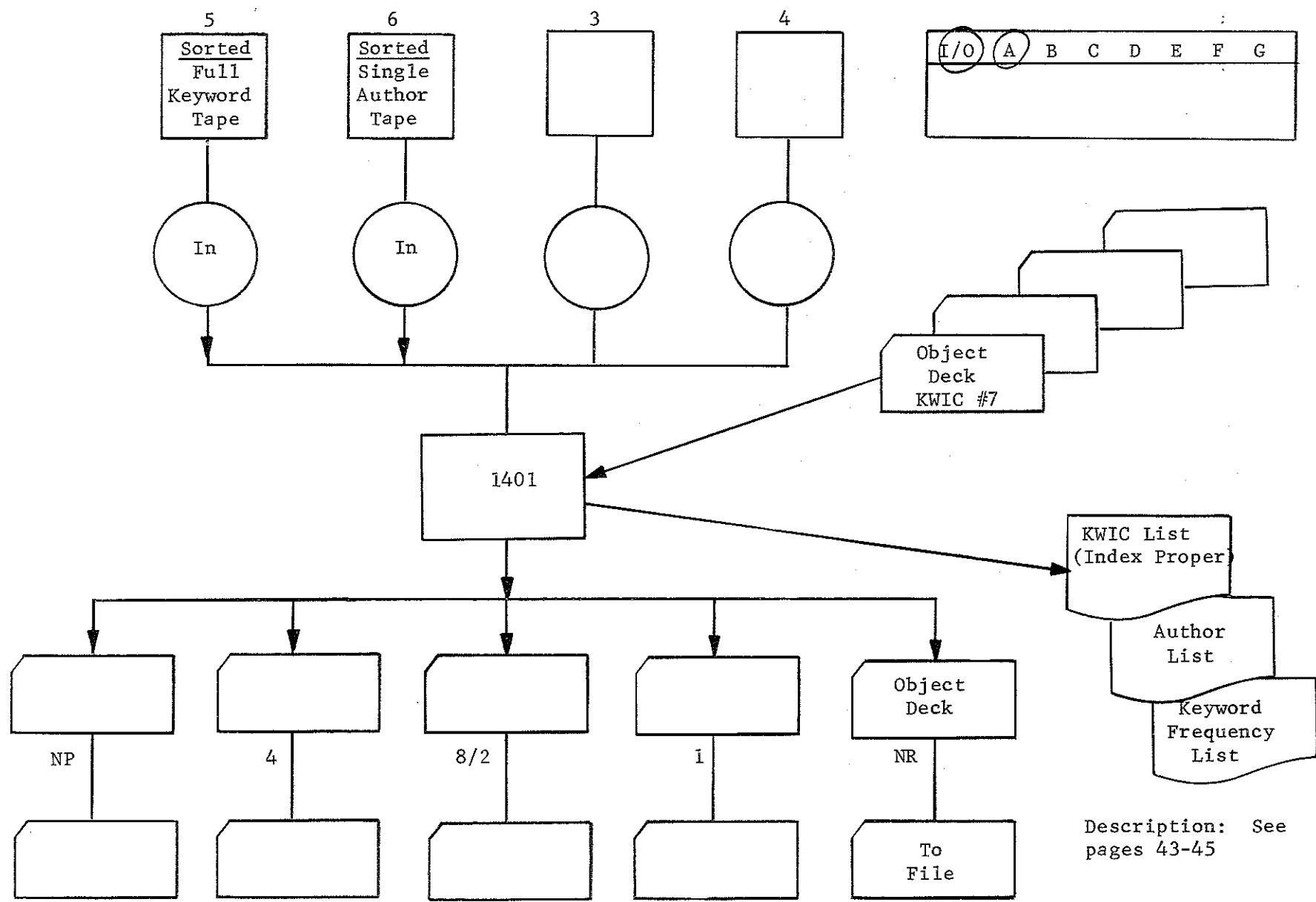
This list is used in the analysis of the significance of keywords. The more times a word appears, the less valuable it is for reference purposes. Therefore, any word can be deleted from the KWIC index proper by adding it to the Nonsignificant Word List; that is, a list of words used by the program to differentiate between keywords and nonsignificant words in the titles. Any word not included in this Nonsignificant Word List is considered significant.

Sample Keyword Frequency Computer List

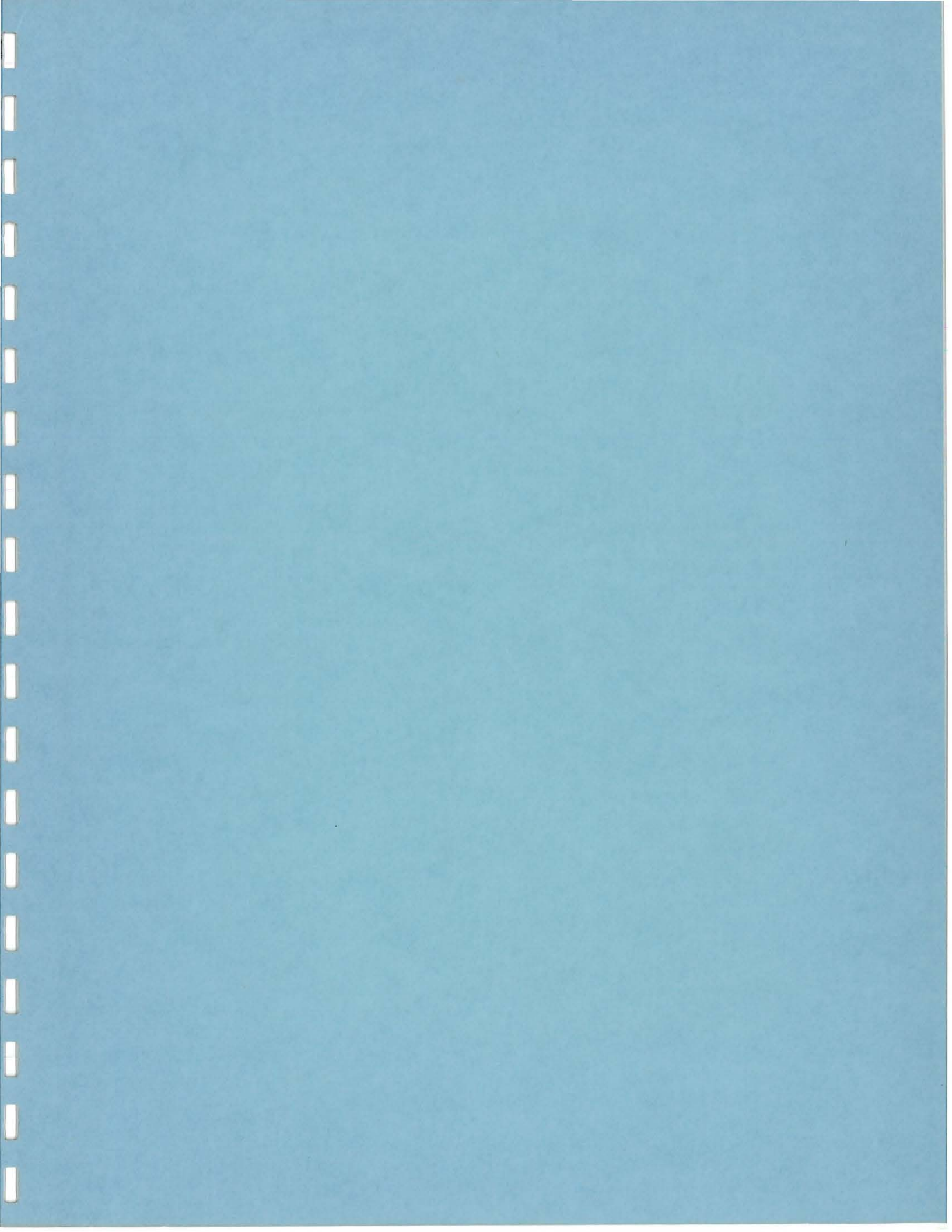
COORDINATORS	1
CORP	1
CORRESPONDENCE	1
COUNCIL	1
COUNTY	1
CRITERIA	1
CURRENT	1
CURRICULUM	1
CUSTODIANS	1
D	6
DATA	3
DECEMBER	3
DECISION-MAKING	1
DEFINITIONS	2
DEGREES	2
DELTA	1
DEPARTMENTAL	1

KWIC #7

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Description: See pages 43-45



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3 1723 02121 7682