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THE ARGONNE LIBRARY BOOK ACQUISITION SYSTEM

Charles Harrison, Jr., and William J. Snow



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ARGONNE NATIONAL LABORATORY
9700 South Cass Avenue
Argonne, Illinois 60439

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Charles Harrison, Jr., and William J. Snow

Applied Mathematics Division

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ABSTRACT

The system described here is designed to handle most of the routine clerical operations necessary to maintain a record of books processed by a library.

The system is logically divided into two programs. Book, vendor and request information is processed by one program and most report generating is done by the other. Both programs access the same files and respond to control card input as well as to record settings produced by the programs when communicating with each other.

Through the use of control cards the user can update the files containing all book information and all vendor information. The user can also control when the system will produce selection lists, purchase orders, in-process lists, accounting reports and expedite letters.

I. INTRODUCTION

The purchasing of books by a library represents a time-consuming and tedious clerical process. The lists of books being considered for purchase must be distributed to the librarians for their perusal. The special requests for purchases from scientists must be forwarded to the Acquisition Librarian. Vendor information such as discount rates, amount in account if it is a deposit account, and the time interval between ordering and receiving a book must be constantly referenced. The status of the book, once it is in process, is monitored until it is on the shelf in a library or in a scientist's hands. Finally, funds must be disbursed to pay for the purchases made.

It is obvious that any system which will automate some of these clerical functions will result in a more efficient library book purchasing operation. The Argonne Library Book Acquisition System does provide this automation.

The system maintains a file of all the vendors used by the library. All dynamic information is updated automatically when purchase orders or expedite letters are written. Net costs are computed using the discount or service charge contained in the vendor's record. The file itself is practically stable, but continued cross reference with it is necessary for report generating.

All of the books considered for purchase by a library are maintained on another file by the system. This file permits the library to keep track of the progress a book has made in the acquisition cycle. The date the book entered the file is the date the system added the data for the book to the file. The system uses this date to delete, automatically, those books in which no interest has been shown.

Individual orders for books are kept in this file as trailers to the book record. No redundant information need be stored, since cross-referencing is built into the system.

Error checking as to incomplete, truncated, or missing information is inherent in the system. Error messages put out by the system inform the librarian when either a book cannot be processed further or a vendor cannot be used.

II. FILE DESCRIPTIONS

The system maintains six general files, S_1 , S_1^1 , S_2 , S_2^1 , S_3 , and S_4 . S_1 contains vendor information. S_2 contains a collection of book bibliographic and request information. S_1^1 and S_2^1 are modified directories for files S_1 and S_2 , respectively. S_3 contains the S_2 data that have been processed by the system in the past. These five files are organized using the IBM System/360 Basic Direct Access Method (BDAM) on direct access storage devices. The sixth file, S_4 , is a backup file which contains files S_1 , S_1^1 , S_2 and S_2^1 . This file is maintained on tape and processed by the Basic Sequential Access Method (BSAM).

The system, since it is written in PL/1, allows the format of the data sets to be best described through the utilization of structural organization. A structure can be considered to be a hierarchial collection of non-homogeneous data. This type of data organization lends itself well to the information required for a computerized book acquisition system.

A. Vendor Directory

The purpose of the Vendor Directory File, S_1^1 , is to keep a record of the identification numbers and relative record numbers of the vendors maintained in the Vendor file. The file has only one record.

B. Vendor Master

The purpose of the Vendor Master file, S_1 , is to store the names and mailing addresses of the vendors used by the Library Services Division when purchasing books (see Appendix A). In addition to mailing information, vendor code, and record sequence number, the file includes

- 1) the purchase order number, the number against which all books purchased from this vendor are to be charged;
- 2) an indication as to whether or not a deposit account has been established with the vendor;
- 3) the amount of the deposit made with the vendor, if this is a deposit account;
- 4) the per cent discount or service charge allowed by the vendor (for certain vendors this will be the actual amount of the service charge); and
- 5) an interval, in days, used to determine when an expedite letter should be written to the vendor.

C. Book Directory

The purpose of the Book Directory File, S₂¹, is to keep a record of the identification numbers and relative record numbers of all of the books being processed in the Book Master File. This file has one record because automatic purging of the Book Master File limits the number of books active in the file to less than 3200.

D. Book Master

The Book Master File, S₂, contains the authors and titles of all of the books being processed by the system (see Appendix B). Supplemental information consists of bibliographic data and information on requests for the book. The bibliographic data includes

- 1) the place of publication;
- 2) the publisher's name;
- 3) the publisher's code;
- 4) the date the book is expected to become available for publication;
- 5) two groups of flags indicating the status of the record;
- 6) the unit list price supplied from the publisher's or vendor's advertisement, etc.;
- 7) the citation, the reference source where the bibliographic information has been verified;
- 8) the Library of Congress catalog card order number;
- 9) the code of the vendor to be used when ordering the book;
- 10) the name of the vendor;
- 11) an indication of whether or not the vendor requires prepayment of a book that is to be purchased;
- 12) the ANL subject code, which is an indication of the subject matter of the book;
- 13) the call number of the book, or some comment which may be useful for internal library operations;
- 14) the serial code when some serials are treated as books;
- 15) the library code for the library to which the first copy will be assigned;
- 16) the date the book entered the file or was put on a selection list;
- 17) the book identification number; and
- 18) the record sequence number.

The request information appears in the form of ten request trailers, which include

- 1) a group of flags indicating the status of the request;
- 2) the invoice number used on the purchase order;
- 3) the purchase order number;
- 4) the item number;
- 5) the number of books ordered on the purchase order;
- 6) the date the purchase order was written;
- 7) the requester's name, address and division;
- 8) the account number used for internal budgeting;
- 9) the date after which an expedite letter should be written;
- 10) the date the book was received;
- 11) the date the book was cataloged;
- 12) the date the book was included in accounting report;
- 13) where the first copy was sent;
- 14) to whom the book was assigned; and
- 15) the call number assigned to the book.

E. History

This file, S₃, is used for storing the records of all the books that were ordered through the system and were subsequently received and cataloged by the Library. A two-year record of such transactions is kept in this file.

III. FILE MAINTENANCE

The majority of file maintenance is done through card input to the system. Control cards are used to direct the system to perform certain operations on the various files. Updating information is mostly entered in the form of data cards. Certain information is passed to the file as a result of the system taking an action.

The input parameter stream is analyzed and various operations are performed on the data sets S_1 and S_2 . The input data stream can consist of any combination of vendor data, bibliography data, and request data. The input data is sorted and processed sequentially. Entries can be added, modified, replaced, or deleted. All items within each entry are referenced by keys appearing with free field format. The entire input stream is analyzed for errors and appropriate diagnostic messages are printed (see section IV.B, Input Data Format).

Each time an entry in a file is called for and processed, the entry is checked for completeness and/or errors and all status information is updated. If any items are missing, incorrect, or truncated, error diagnostics will so indicate. There will be considered herein two types of errors, FIXED and CURRENT. Fixed errors are those indicated through permanent flags within the master file that are set and unset according to various criteria. Current errors are ones that occur during a current execution of the program and are not permanently recorded (see Appendix C). For a missing item, blanks or, in the case of numbers, zeros will be inserted in the area for that item. However, if the input for an item is too long, it will be truncated according to the predetermined storage specifications. All insignificant leading and trailing blanks are deleted for each item upon input.

In order to be able to understand the current status of each entry and the action that is to take place currently or during subsequent cycles, status flags in S_2 are set and unset by the programs (see Appendix B).

For each entry in the S_2 file, there exists a bibliographic section and up to ten trailers, each trailer representing a particular

request. For clarity we shall refer to each entry as consisting of two parts; the first part is bibliographic data and the second is request information.

The author and title for each book are stored in the file in a maximum of six lines. Each line can contain up to 48 characters. The first character of each line is either the character "T" or the character "A," referring to either a title or an author line, respectively. This information is examined and properly formatted in the record so that no words are split at the ends of lines.

The vendor mailing address in S_2 is stored in the same manner as the author/title in S_1 except that the maximum number of 48-character lines permitted is five instead of six. The user formats the lines of the vendor address by placing a "\$" at the beginning of each line of input. The "\$" is not stored in the S_1 file.

Expedite letters will be printed automatically if so indicated on control. An expedite letter, if called for, will only be printed if the current date is the same as or later than the expedite date and the order has not been filled. If a letter is printed the entry is updated by changing the expedite date according to the expedite interval and incrementing the expedite counter by one.

A. Control Cards

The control cards contain certain key words that control the program. These words specify the various options available to the user and can be punched with free field format. These words, with the required minimum letter combinations in capitals, are as follows:

1. HIStory
2. DELETE
3. DAta
4. PRint
5. VEndor
6. BOok
7. DICTIONary
8. FILEs
9. EXpedite letters
10. ACCounting

The required letter combinations must be present; other letters or words may be included if desired.

There exists a predetermined hierarchy of this control information. The order of evaluation of these words is as listed above; however, the presence of certain words will terminate control card processing and any other words will be ignored. The following is an explanation of the action produced by each control word.

(1) HISTORY

The presence of this word in the control card directs the program to delete certain bibliographic records from the Book Master File, update the Book Directory File, and add these book records to the History file. Records to be processed during this cycle are flagged by the program that generates reports. All other words are ignored during the History cycle.

(2) DELETE

This word in a control card results in a deletion from the Book Master File of user-specified bibliographic records. The user indicates which records are to be deleted through data cards which follow the control card in the input stream. There must be a data card for each record to be deleted. Columns one through five must give the entry identification number and column 10 must contain the letter "D." Records deleted in this cycle are lost to the system. The Book Directory File is updated to reflect the loss of these records.

(3) DATA

This control word informs the program that Master File (Vendor or Book) input information follows on cards. If no other words are present in the control card there will first be an automatic deletion of those Book Master File records flagged for removal by the report generation program of the system. The input data is used to add new records or modify existing records on either or both Master files (see Section IV.B). Directory File(s) are appropriately updated.

All entries (Vendor or Book) which are added, modified, deleted, or passed to the History File are printed.

(4) PRINT

This word indicates that an edited listing of one or more of the files is to be printed. This word must be followed by one or more of the words which specify which files are to be printed. The absence of PRINT means that any combination of words (5), (6), (7), and (8) that appears will be ignored.

(5) VENDOR

This word in conjunction with the word "PRINT" will result in a listing of the Vendor Master File. "VENDOR" alone results in no action.

(6) BOOK

A listing of the Book Master File is produced when "PRINT BOOK" is punched in the control card. "BOOK" alone results in no action.

(7) DICTIONARY

Both the Vendor and Book Directories are printed if the control card contains the words "PRINT DICTIONARY." "DICTIONARY" alone is ignored by the program.

(8) FILES

This word has the same effect as both VENDOR and BOOK; both Master Files will be printed. "FILES" alone is ignored.

(9) EXPEDITE LETTERS

This keyword directs the program to write form expedite letters (see Appendix D) to every vendor whose book order has not been filled within the stored expedite interval. The date the item was ordered, the expedite interval, and the current date are used to determine whether or not the letter is to be written.

(10) ACCOUNTING

This word in a control card will cause the program to produce an accounting list. The periods to be covered are specified in a parameter card that follows the control card. The dates used must be in the standard date format specified in section III.B. The accounting list is actually a table of the number of items and total cost charged to each

library or against each cost code for the periods specified in the parameter card. Subtotals for all libraries and all divisions are computed. Finally, a total of items purchased and their cost is computed for each period.

B. Input Data Format

Input data is usually presented to the system with a particular report in mind. Certain information is needed for some reports, so the input data format is separated into cycles which correspond to the reports generated. A cycle is a processing step taken by the library in handling books.

Input data is used to update the Master file only. Later, in a subsequent pass by the system, the desired report is generated.

The input to the program consists of punched cards containing the information to be processed. The first card is the control card, which contains information that controls the options available to the user. (See Section III.A.) The remaining cards can be of any of three types, vendor data, bibliographic data, or request data. The first ten columns of each card are identification fields. (See Table 1.) The remaining columns are devoted to the information to be processed. This data has free field format. The information is collected through the use of identifying keys which precede each item. These keys consist of three characters; the first character must be a "-" (not), and the remaining two characters describe the item that follows. A "-" (not) must follow the last item on the last card of each entry.

The input data can consist of any or all combinations of (1) vendor data, (2) bibliographic data, or (3) request data in any order, provided that the cards are sequenced within each entry. All input data is sorted, where the sort field consists of columns 1 through 9 on each card. Due to the fact that an "*" is required in column 1 on all vendor data these data will sort low. Therefore, the vendor file will be updated before the Book Master File. The final card must contain all 9's in columns 1 through 9, which specifies an end of input; this card does not contain any data.

All dates must be punched using the following format:

Month Day Year
XX/XX/XX

The program deletes the slashes and stores only the six-character date; however, the slashes are reinserted on all output.

VENDOR DATA		BOOK DATA	
Column		Column	
1	*	1-5	ID
2-5	ID	6-7	REQUEST NUMBER (Blank if Bibliographic Data)
6-7	BLANK	8-9	CARD SEQUENCE
8-9	CARD SEQUENCE	10	SPECIAL ACTION CODE
10	SPECIAL ACTION CODE		

Table 1
Columns 1 through 10 of Vendor or Book Data Cards

The following tables define the input data formats for the various card types.

1. Vendor File

Each card is to be punched as follows.

Card Columns	Parameter																				
1 - 5	Vendor Code. The first character of the vendor code (column 1) must always be an asterisk (*). The remaining four characters can be any combination of letters which has a mnemonic value for the particular vendor. Care must be taken to ensure that the letter combination chosen is not already in use for a different vendor presently in the file. e.g.: TAYLOR-CARLISLE'S BOOK STORE = *TCBS																				
6 - 7	Columns 6 and 7 are not presently used and are to be left blank.																				
8 - 9	Card Sequence Number. Numbers <i>only</i> are permitted in columns 8 and 9. Letters or alpha characters are not permitted. The program will accept the sequence numbers 01 through 99. Proper sequencing is very important to the order and accuracy of the information, and the sequence numbers should be carefully assigned. <div style="text-align: center;"> <table> <tr> <td>1</td> <td>5</td> <td>89</td> <td>¹1</td> <td>¹4</td> </tr> <tr> <td>*ABEL</td> <td>01</td> <td>7</td> <td>VMR.</td> <td></td> </tr> <tr> <td>*ABEL</td> <td>02</td> <td>TN:</td> <td>M</td> <td></td> </tr> <tr> <td>*ABEL</td> <td>03</td> <td></td> <td></td> <td></td> </tr> </table> </div>	1	5	89	¹ 1	¹ 4	*ABEL	01	7	VMR.		*ABEL	02	TN:	M		*ABEL	03			
1	5	89	¹ 1	¹ 4																	
*ABEL	01	7	VMR.																		
*ABEL	02	TN:	M																		
*ABEL	03																				

Card Columns	Parameter
10	Column 10 is not presently used and is to be left blank.
11 - 80	<p>Vendor Information. Columns 11 through 80 make up a free field which is to contain all of the required information about the vendor. "Vendor Keys" must always precede each item of data. These are three-character keys as follows. (Note that the first character of a vendor key is always a "not" (¬)).</p> <p>¬VM - Vendor Mailing Address. The vendor mailing address is allowed five lines. The first can contain up to 48 characters. Each remaining line must begin with a \$ sign and can contain up to 47 additional characters. The use of the \$ sign will automatically format the printout, so all lines can be placed on a single card if space permits.</p>
<p>† ¬VMR. ABEL AND COMPANY, INC.\$P.O. BOX 4245\$PORTLAND, OREGON 97208\$AT TN: MR. DONALD G. STAVE¬VNR. ABEL¬</p>	<p>8 0</p>
	<p>¬VN - Vendor Name. The vendor name is allowed 20 characters. It should be an abbreviated, easily recognizable form of the vendor's complete name. e.g.: American Mathematical Society = AM MATH SOC ¬VNR. ABEL</p> <p>¬PO - Purchase Order Number. The purchase order number is allowed six characters, either alpha or numeric, in any combination. It should only be included for those vendors who have been assigned a unique purchase order number. If no purchase order number is entered, the blanket purchase order number used for all small transactions will be automatically assigned.</p>
	<p>¬P0655477</p> <p>¬DP - Deposit Account. The vendor key for deposit account should only be used for those vendors that the library has established a deposit account with. When required, this information is always entered in the same manner (with a "1"): ¬DP1 will indicate the presence of a deposit account for any given vendor.</p>
	<p>¬DP1</p> <p>¬SV - Start Value. This is the dollar value used to start a deposit account; it is used only in connection with the "¬DP" vendor key discussed above. Numbers only are permitted. The decimal</p>

Card Columns	Parameter
--------------	-----------

11 - 80
(cont'd)

point is fixed to allow a maximum of six figures to the left and two figures to the right of the decimal point.

-SV000045.00

-PD - Per Cent Discount. Three characters are reserved to indicate the per cent of discount or service charge allowed by each vendor. *This vendor key must appear with each entry in the vendor file.* If a vendor does not allow the library a discount or service charge, three zeroes must be entered. A service charge is always entered as a quantity greater than 100, while a per cent of discount must always be entered with leading zeroes. For example, a service charge of 13% must be entered as -PD113, while a discount of 13% must be entered as -PD013.

-PD113 -PD013

For the vendor whose code is *ABEL or *RACO, the actual amount of the service charge should be entered as the per cent discount. For example, a service charge of \$1.25 would be entered as -PD125.

-XI - Expedite Interval. An expedite interval *must be assigned for each vendor placed in the vendor file.* It is the number of days from the order date to the date when an expedite letter will be printed if the order has not been filled. It will always be assigned by the Acquisitions Librarian, and it must always be punched into the card as three numbers. Leading zeroes may be necessary to complete the number. For example, an expedite interval of 30 days would be punched as -XI030, never as -XI30.

-XI042

A "not" (-) must be punched following the data on the last card of each entry.

1	8901 ¹¹	*ABEL 01 -VMR. ABEL AND COMPANY, INC.\$P.O. BOX 4245\$PORTLAND, OREGON 97208\$AT	8 0
*ABEL	02	TN: MR. DONALD G. STAVE-VNR. ABEL-PO655477-PD195-XI042-	

2. Bibliographic Record

SELECTION CYCLE: When a book is to be considered for purchase by the Library, all bibliographic information about the book is to be key-punched into cards for input to the computer. Each card is to be punched as follows.

Card Column	Parameter
1 - 5	<p>I.D. Number. The five-character I.D. number for the book file is to be assigned sequentially beginning with 00001. As long as any book remains in the active file, both the book and all information pertaining to it will be indexed and acted upon only through this I.D. number. Therefore, it is extremely important that these numbers be accurately assigned and that they not be duplicated.</p> <p style="text-align: center;">1 5 00316</p>
6 - 7	<p>Request Number. Columns 6 and 7 are reserved for use during the Purchase, Check-In, and Final Status Cycles, and will be discussed in those sections of this manual. They are to be left blank unless the book is being ordered or processed in some manner.</p>
8 - 9	<p>Card Sequence Number. Numbers only are permitted in columns 8 and 9. Letters or alpha characters are not permitted. The program will accept the sequence numbers 01 through 99. Proper sequencing is very important to the order and accuracy of the information, and the sequence numbers should be carefully assigned.</p> <p style="text-align: center;">1 56789 00316 01 00316 02 00316 03</p>
10	<p>Column 10 is not presently used and is to be left blank.</p>
11 - 80	<p>Bibliographic Information. Columns 11 through 80 make up a free field which is to contain all of the required bibliographic information. "Book keys" must always precede each item of data. These are three-character keys as follows. (Note that the first character of a book key is always a "not" [-].)</p>

Card Column	Parameter
11 - 80 (cont'd)	<p>-AA - Author. The author's name is to be entered here in accordance with normal ANL Library practice; last name, first name, middle initial.</p> <p>Note that there are no individual length restrictions placed on the number of characters allowed for author or title. Either entry may vary in length; however, the combined author and title (-AA plus -TT) entries cannot exceed 288 characters in length. This is very important, since they may be placed in the file at different times.</p> <p>-AAADAM, WILLIAM S.</p> <p>-TT - Title. The title entry should be as complete and accurate as possible. Abbreviations should be used only when necessary because of length restrictions. Length is restricted only as noted above.</p> <p>-TTMICROSCOPIC ANATOMY OF THE DOG.</p> <p>-PL - Place. The twenty-character place of publication of the book should be entered here in accordance with normal ANL Library practices. The name of the city (only) is usually sufficient.</p> <p>-PLSPRINGFIELD,</p> <p>-PB - Publisher. The entry for publisher is allowed 20 characters. It should be a shortened, easily recognizable form of the publisher's complete name. This is true even when the publisher's complete name contains 20 characters or less. For example, the complete name "Pergamon Press, Inc." contains exactly 20 characters, but the shortened form PERGAMON is all that should be used.</p> <p>-PBTHOMAS</p> <p>Note that the two items -TT and -PB are the only two items required to place a book in the file and have it printed on the selection list. Conversely, if either the Title (-TT) or the Publisher (-PB) is omitted, the entry will not be printed on the selection list, regardless of how much additional information is present. Other data can be added to the file at a different time, if that is more convenient.</p>

Card Column	Parameter
11 - 80 (cont'd)	<p>-PC - Publisher Code. The publisher code can be any combination of letters, up to a <i>maximum of five</i>, which has a mnemonic value for its particular publisher. Care must be taken to ensure that the letter combination chosen is not already in use for a different publisher presently in the file. A publisher code <i>must</i> be supplied for every entry. For example, PERGAMON PRESS, INC. = PERG.</p>
	-PCTHOM
	<p>-DU - Date Available. This is the date the item is expected to become available for purchase. It must always be entered in the same manner, using two-number designations for month, day, and year, separated with slashes.</p>
	-DU12/31/69
	<p>-U\$ - Unit List Price. This is the dollar value expected cost from publisher's or vendor's advertisements, etc. If it is not supplied, an estimated average unit cost will be automatically assigned. Numbers only are permitted. The decimal point is fixed to allow a maximum of four figures to the left and two figures to the right of the point.</p>
	-U\$17.50
	<p>-RF - Citation. The reference source where the bibliographic information was verified should always be supplied. It must always be abbreviated because of the twenty-character length limitation, but it should always include the title, date, and page number of the citation.</p>
	-RFPW,8/15,F.3
	<p>-LC - LC Card Number. If known, the order number for the Library of Congress catalog card should be supplied. Twelve characters are permitted.</p>
	-LC69-21356
	<p>-VC - Vendor Code. This must be the name vendor code which has been entered in card columns one through five in the vendor file. Its first character must always be an asterisk (*).</p>
	-VC*ABEL

Card Column	Parameter
11 - 80 (cont'd)	<p>-VN - Vendor Name. The vendor name is also the same vendor name which has been entered in the vendor file. It should be an abbreviated, easily recognizable form of the vendor's complete name. For example, American Mathematical Society = AM MATH SOC.</p> <p>This vendor name <i>must</i> always exactly match the vendor name already assigned in the vendor file.</p> <p style="padding-left: 40px;">-VNR. ABEL</p>
	<p>-PP - Prepay. This book key is to be used only when it is known that a vendor requires prepayment of an item that is to be purchased. When required, it is always entered in the same way, with a "1." "-PP1" is sufficient to indicate that prepayment is necessary.</p> <p style="padding-left: 40px;">-PP1</p>
	<p>-AS - ANL Subject. The ANL subjects are very broad subject divisions which are designed by pre-assigned codes. At the present time these codes and divisions are as follows:</p> <ul style="list-style-type: none"> B - Biology and Medicine C - Chemistry E - Engineering H - Health and Safety I - Instruments and Electronics M - Mathematics and Computers P - Physics R - Reactor Physics or Reactor Engineering S - Space Sciences T - Metallurgy Z - Miscellaneous <p>They are meant to be some indication of the subject matter dealt with by the book, journal, etc., and should be supplied with each item placed in the file. Two characters are allowed for the ANL subject.</p> <p style="padding-left: 40px;">-ASB</p>
	<p>-CC - Call Number/Comment. When the call number of the book being selected or ordered is known, it should be entered here. This book key also provides an opportunity for inclusion of some comment which may be useful for internal library operations. Twenty-six characters are allowed.</p> <p style="padding-left: 40px;">-CCQR123.A456</p>

Card Column	Parameter
11 - 80 (cont'd)	<p>¬SC - Serial Code. Due to industry variations in serial publications, some serials are shelved and treated as books. The serial code is a preassigned two-character code which is intended to provide an indication of the way these items are normally processed in the ANL Library. At the present time, these codes are as follows:</p> <p>SO - Works listed in the Argonne List of Serials only.</p> <p>SX - Works listed in the Argonne List of Serials, but with cross references in the card catalog.</p> <p>SB - Works listed in the Argonne List of Serials, but shown as having been cataloged and shelved together in a particular location.</p> <p>BX - Works listed in the Argonne List of Serials, but as cross references only. Each volume is treated and cataloged as a monograph.</p> <p>When required, the serial code is always entered in the same manner, simply the book key followed by the serial code.</p> <p>¬SCSB</p> <p><u>Note:</u> These serial codes will not frequently be required, and are to be assigned by the Acquisitions Librarian only.</p> <p>¬FC - First Copy To. This consists of a three-character identifier of the library to which the first copy is to be sent.</p> <p>¬ - End of Entry: A "not" (¬) must be punched following the data on the last card of each entry.</p>

It should be noted that although only two items, Title and Publisher, are required in order to have a book printed on the selection list, *all available* bibliographic information should always be supplied when the book is first entered.

1 5 8901
00316 01 -AAADAM, WILLIAM S.-TTMICROSCOPIC ANATOMY OF THE DOG.-PLSPRINGFIELD,¬P
00316 02 BTHOMAS-PCTHOM-DU12/31/69-U\$17.50-RFPW,8/15,P.3-LC69-21356-VC*ABEL-¬VNR
00316 03 . ABEL-PP1-ASB-CCQR123.A456-¬SCSB-¬

3. Request Records

PURCHASE CYCLE: When a book has been selected by the librarians and is to be purchased by the library, a request record must be generated for each book to be purchased. To accomplish this, all information about the requester is to be keypunched into cards for input to the computer. Requests for books that are not in the master file can also be accommodated if the bibliographic information for the book is keypunched into cards which will precede the request cards for that book. Each request card is to be punched as follows.

Card Column	Parameter
1 - 5	I.D. Number. This is the same five-character I.D. number which was assigned to the book when it was first placed in the file during the selection cycle. The book will not properly process during the purchase cycle unless this number is exactly reproduced. Always refer to the book selection list for the correct identification number of a book.
6 - 7	Request Number. Numbers only are permitted in columns 6 and 7. Letters or alpha characters are not permitted. The program will accept the request numbers 01 through 10. This means that a maximum of ten requests are allowed for any one I.D. number (or book, since an I.D. number uniquely represents one entry in the book file). If more than one card is required, each card must be assigned a sequence number in card columns 6 and 7. Once a request for a copy of a book has been assigned a request number and placed in the records, both the request and all information pertaining to it will be indexed and acted upon only through this request number and the book's I.D. number. Therefore, <i>the request number cannot be duplicated within any one I.D. number.</i> For example, the request number 02 may appear in many different I.D. numbers, but within a single I.D. number only one request number 02 is possible.
8 - 9	Request Card Sequence Number. The Sequence Number in the request records is used only to sequence the number of cards required to contain the data being supplied to any one request record at any one time. It is important to recognize that the sequence number now modifies the request number which lies to the left of it in column 6 and 7.

1 89
003160101

Card Column	Parameter
8 - 9	<p>Sequence Number (cont'd)</p> <p>In the illustration on page __, the information being supplied for request number 01 required two cards; therefore, two sequence numbers, 01 and 02, are used. Request numbers 02 and 03 required only one card each.</p>
10	<p>Column 10 is not presently used and is to be left blank.</p>
11 - 80	<p>Request Information. Columns 11 through 80 make up a free field which is to contain all the required purchase information. "Book keys" must always precede each item of data. These are three-character keys as follows. (Note that the first character of a book key is always a "not" [-].)</p> <p>-RQ - Requester Name. The twenty-character name of the requester will usually be the number or letter designation of the branch library requesting the book: CTL, 203, 213, etc.</p> <p style="text-align: center;">-RQ202</p> <p>A personal name should be used only when the book being ordered is to be assigned to an individual and individual's division is to be back-charged for the cost of the book.</p> <p style="text-align: center;">-RQLIPINSKY, RICHARD N.</p> <p>-RA - Requester Address. The requester address is required only when the book being ordered is to be an assigned copy and a personal name has been entered as discussed above. There can be no blank characters in the address; nine characters are allowed.</p> <p style="text-align: center;">-RA202,CA159</p> <p>-RD - Requester Division. <i>The requester division must appear</i> in every request record. For all books purchased through the normal selection process of the Library, the division will be simply "LIB." Three characters are allowed.</p> <p style="text-align: center;">-RDLIB</p> <p>If the book ordered is to be an assigned copy, as discussed above, the correct division must be supplied.</p> <p style="text-align: center;">-RDBIM</p>

Card Column	Parameter
11 - 80 (cont'd)	<p> -QY - Quantity. <i>The quantity must appear</i> in every request record. Numbers only are permitted to represent quantity. Under normal circumstances, a separate request record will be generated for every copy of every book purchased and quantity will equal "1." </p> <p style="text-align: center;">-QY1</p> <p> Note that the preceding two items (-RD and -QY) are the only two request items required to proceed with the purchase cycle. Once these two items have been supplied, a library order slip (ANL Form No. LIB-56) will be automatically completed for the book. Conversely, if either the requester division (-RD) or the quantity (-QY) is omitted, the library order slip will not be completed, regardless of how much additional information has been supplied. </p> <p> All information necessary to purchase the book should be in the file before division and quantity are supplied, in order to avoid printing an incomplete order slip. </p> <p> -RC - Requester Cost Center. The Requester Cost Center is required only when the book being ordered is to be an assigned copy as discussed above. However, when the book is to be an assigned copy, and the requester division is anything other than LIB, the requester cost center must be supplied or the library order slip will not be completed. When this information is required, the requester cost center is to be obtained from the Acquisitions Librarian. </p> <p style="text-align: center;">-RC0011003110436</p> <p> -RX - Comment. This book key is used to enter a comment concerning this particular request when required. The comment must be limited to a maximum length of twenty characters. There can be no more than one blank character in the comments field. </p> <p style="text-align: center;">-RXRES.FOR G.GOODMAN</p>

Card Column	Parameter
11 - 80 (cont'd)	<p>¬TV - Request Vendor Code. This is the same vendor code which has been entered in card columns one through five in the vendor file. For any vendor, this code must always exactly match the vendor code already assigned in the vendor file.</p>
	¬TV*ABEL
	<p>Note that the vendor code should be entered in the request record only when the Acquisitions Librarian has decided to purchase the book from a vendor different from the one entered in the Bibliographic Record for the book, or when no vendor was entered in the Bibliographic Record for the book.</p>
	<p>¬IN - Invoice Number. Under normal circumstances, the six-character invoice number is generated and assigned automatically during the purchase cycle. It is to be entered here only when the Acquisitions Librarian has ordered the book and assigned an invoice number manually, prior to this computer run.</p>
	¬IN000002
	<p>¬PO - Purchase Order Number. Six-character Purchase Order Numbers have been assigned in the vendor file, and under normal circumstances the correct number will be automatically chosen from that source. The purchase order number should be entered here only when it is a unique number which is to be used for this transaction only, or when it is a new number which has not yet been placed in the Vendor File.</p>
	¬PO123456
	<p>¬IT - Item Number. Under normal circumstances, the six-character Item Number is generated and assigned automatically during the purchase cycle. It is to be entered here only when the Acquisitions Librarian has ordered the book and assigned an item number manually, prior to this computer run.</p>
	¬IT000002

Card Column	Parameter
11 - 80 (cont'd)	<p>→OD - Order Date. Under normal circumstances, the Order Date is generated and assigned automatically during the purchase cycle. It is to be entered here only when the Acquisitions Librarian has ordered the book manually, prior to the computer run. When required, the date is always entered in the same manner; using two-number designations for month, day, and year, separated with slashes. For example, the date January 1, 1968 would be entered as 01/01/68, never as 1168, 1/1/68, or 1-1-68. This method of entering the date is to be strictly adhered to whenever the date is placed in a request record. Consistency in entering the date in the purchase, receiving report, and final-status cycles is important.</p> <p style="text-align: center;">→OD12/31/68</p> <p>→XD - Expedite Date. Under normal circumstances, the Expedite Date is automatically computed from the expedite interval assigned to each vendor in the vendor file. It is to be entered here only when the Acquisitions Librarian decides that the order should be expedited in a shorter or longer interval than that specified in the vendor file. When required, the date is always entered in the same manner, using two-number designations for month, day, and year, separated with slashes.</p> <p style="text-align: center;">→XD12/31/69</p> <p>→ - End of Entry. A "not" (→) must be entered following the data on the last card of each entry.</p>
1 567890 ¹¹ 003160101	→RQ202→RDLIB→QY1→RXRES.FOR: G.GOODMAN→TV*ABEL→IN000002→PO123456→OD12/3
003160102	1/68→XD12/31/69→
003160201	→RQLIPINSKY, RICHARD N.→RA202,CA159→RDBIM→QY1→RC0011003110436→
003160301	→RQ200→RDLIB→QY1→

RECEIVING REPORT CYCLE: When a purchased book has been received by the Library, certain information must be recorded in order to update the computer file. This information is to be written in the space provided in the right hand end of the Receiving Report Card, which is the third copy of the library order slip printed during the purchase cycle. The information is then to be keypunched into the same Receiving Report Card.

					Receiving Report	
01/22/69		100022			ID #	REQ #
					98765	01
BAYER, FREDERICK H.					Date Rec: 02/12/69	
THE FREE-LIVING LOWER INVERTEBRATES					Date to Cat: 02/13/69	
NEW YORK,		MACMILLAN,	4/68		Date to Acct: 02/18/69	
586099	000007	1	11.95	10.50	List \$	11.95
TAYLOR-CARLISLE'S BOOK STORE, INC.					Net \$ 10.50	
115 EAST ZERO STREET					L.C. #	
NEW YORK, NEW YORK 10010						
ATTN: MR. BARRY BERNSTEIN						
RECEIVING REPORT - KEYPUNCH THIS CARD WITH INFORMATION ABOVE RIGHT						

The information should be keypunched exactly as it appears at the right, and in the same order in which it is recorded. Beginning in card column one at the left hand end of the card as in normal keypunching operations, each card is to be punched as follows.

Card Column	Parameter
1 - 5	I.D. Number. This is the same I.D. number which was assigned to the book when it was first placed in the file during the selection cycle. It should be keypunched exactly as it has been recorded at the upper right end of the card.
6 - 7	Request Number. This is the same request number which was assigned during the purchase cycle. It should be keypunched exactly as it has been recorded at the upper right end of the card.

Card Column	Parameter
8 - 9	<p>Sequence Number. Numbers only are permitted in columns 8 and 9. Letters or alpha characters are not permitted. The sequence number is used here only to sequence the number of cards required to contain the receiving report data being supplied to any one request record. Under normal circumstances, during both the receiving report and final status cycles one card will be sufficient to contain the required data. However, should more than one card be required, the program will accept the sequence numbers 01 through 99. Proper sequencing is very important to the order and accuracy of the information, and the sequence numbers should be carefully assigned.</p>
10	<p>Column ten is not presently used and should be left blank.</p>
11 - 80	<p>Receiving Report Information. Columns 11 through 80 make up a free field which is to contain all of the information required to complete the receiving report. "Book keys" must always precede each item of data. These are three-character keys as follows. (Note that the first character of a book key is always a "not" [-].)</p> <p>¬DR - Date Received. The date the book is received by the Library must always be entered in the same manner, using two-number designations for month, day, and year, separated with slashes. For example, the date January 1, 1968 should be entered as 01/01/68, never as 1168, 1/1/68, or 1-1-68.</p> <p style="text-align: center;">¬DR12/20/69</p> <p>¬DC - Date to Cataloging. The date the book is sent to the Cataloging Department is to be entered here exactly as described above under date received.</p> <p style="text-align: center;">¬DC12/21/69</p>

Card Column	Parameter
11 - 80	<p>→DA - Date to Accounting. The date the invoice for the material received is sent to the Accounting Department is to be entered exactly as described above under date received. This date will be entered only to confirm that our invoice has already been sent to Accounting. Under normal circumstances, the Date to Accounting will be automatically generated during the accounting cycle.</p>
	→DA12/23/69
	<p>→U\$ - Unit List Price. This is the same unit list price which was entered in the Bibliographic Record. It is to be entered here only if the vendor has changed this price on the invoice. Numbers only are permitted. The decimal point is fixed to allow a maximum of four numbers to the left and two numbers to the right.</p>
	→U\$17.00
	<p>→N\$ - Unit Net Price. The Unit Net Price must always be entered at this time. Numbers only are permitted. The decimal point is fixed to allow a maximum of four numbers to the left and two numbers to the right.</p>
	→N\$18.00
	<p>→LC - LC Card Number. When the book is "in-hand," it should be checked for the LC Card Number. If found, it should be checked against the LC number previously entered in the Bibliographic Record. If it is not already a part of the Bibliographic Record, and it is found in the book, the LC Card Number must be entered here. There can be no blanks within the card number. Up to twelve characters are allowed.</p>
	→LC69-123456
	<p>→ - End of Entry. A "not" (→) must be punched following the data on the last card of each entry.</p>

FINAL STATUS CYCLE: Once the book has been cataloged and is to be released and shelved with the collection, certain information must be recorded in order to complete the computer file. This information is to be written in the space provided at the right hand end of the Final Catalog Status Card, which is the third copy of the library order slip printed during the purchase cycle. The information is to then be key-punched into the same Final Catalog Status Card.

01/22/69	100022	ID #	REQ #
202 LIB		98765	01
		Call No.:	
BAYER, FREDERICK M.		QL362, B357	
THE FREE-LIVING LOWER INVERTEBRATES.			
NEW YORK,		MACMILLAN,	4/68
B	PW, 3/11/68, P.53	Assigned to: <u> B </u>	
TAYLOR-CARLISLE'S	586039	7	1
Charge to: _____			
FINAL CAT. STATUS - KEYPUNCH <u>THIS</u> CARD WITH INFORMATION ABOVE RIGHT			

The information should be keypunched, exactly as it appears at the right, and in the same order in which it is recorded. Beginning with card column one at the left hand end of the card, as in normal key-punching operations, each card is to be punched as follows.

Card Column	Parameter
1 - 5	I.D. Number (five characters)
6 - 7	Request Number
8 - 9	Sequence Number
10	Blank
NOTE: The parameters for card column 1 through 10 are exactly the same as those for card columns 1 through 10 of the receiving report cycle. Refer to the previous section for their complete descriptions.	

Card Column	Parameter																								
11 - 80	<p>Catalog Status Information. Columns 11 through 80 make up a free field which is to contain all of the information required to complete the file on each entry. "Book keys" must always precede each item of data. These are three-character keys as follows. (Note that the first character of a book key is always a "not" [¬].)</p>																								
	<p>¬CN - Call Number. This is the Class Number/Cutter Number/Copy Number combination which has been assigned to the book by the Cataloging Department. It is to be keypunched exactly as it has been recorded by the cataloger at the upper right hand end of the card. No more than twenty-two characters may be used.</p>																								
	<p>-CNQR123.A456</p>																								
	<p>¬AT - Assigned To. This is the two-character letter designation of the branch library to which the book has been assigned. It is to be keypunched exactly as it has been recorded by the cataloger at the upper right hand end of the card.</p>																								
	<table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th><u>Code</u></th> <th><u>Library</u></th> <th><u>Code</u></th> <th><u>Library</u></th> <th><u>Code</u></th> <th><u>Library</u></th> </tr> </thead> <tbody> <tr> <td>A</td> <td>CTL</td> <td>CE</td> <td>205</td> <td>O</td> <td>223</td> </tr> <tr> <td>B</td> <td>202</td> <td>D</td> <td>208</td> <td>P</td> <td>203</td> </tr> <tr> <td>C</td> <td>200</td> <td>H</td> <td>362</td> <td>T</td> <td>212</td> </tr> </tbody> </table>	<u>Code</u>	<u>Library</u>	<u>Code</u>	<u>Library</u>	<u>Code</u>	<u>Library</u>	A	CTL	CE	205	O	223	B	202	D	208	P	203	C	200	H	362	T	212
<u>Code</u>	<u>Library</u>	<u>Code</u>	<u>Library</u>	<u>Code</u>	<u>Library</u>																				
A	CTL	CE	205	O	223																				
B	202	D	208	P	203																				
C	200	H	362	T	212																				
	<p>-ATB</p>																								
	<p>¬ - End of Entry: A "not" (¬) must be punched following the data on the last card of each entry.</p>																								

C. Record Status Indicators

During data processing the program assigns values to certain status flags that are internal to the entry. These flags, which appear in S₂, are used in some cases instead of the actual fields to determine information availability. (See Appendix B.) These flags are as follows.

BIBLIOGRAPHY FLAGS

- (F1) = 1 Any error in this entry (including requests)
- (F2) = 1 A change has occurred
- (F3) = 1 Enter to selector cycle
 - = 2 Enter to purchasing cycle
 - = 3 Enter to accounting cycle
 - = 4 Enter to history cycle
- (F4) = 1 Error in bibliography part of entry
- (F5) = 1 Ready to be entered in selector list
- (F6) = 1 Any change has occurred in bibliography part of entry
- (F10) = 1 Missing title
 - = 2 Title has been truncated
- (F11) = 1 Missing publisher
 - = 2 Publisher has been truncated
- (F12) = 1 Missing unit cost
- (F13) = 1 Missing vendor code
 - = 2 Vendor code has been truncated
- (F14) = 1 Missing ANL subject code
 - = 2 ANL subject code has been truncated
- (F15) = 1 Missing author

REQUEST FLAGS

- (F1) = 1 Major error in this request, can't order
- (F2) = 1 Enter to next purchasing cycle
- (F3) = 1 Enter to next accounting cycle
- (F4) = 1 A change has occurred in this request
- (F10) = 1 Missing quantity
- (F11) = 1 Missing division or library
 - = 2 Division has been truncated
- (F12) = 1 Missing requester
 - = 2 Requester's name has been truncated

- (F13) = 1 Cost code has been truncated
- (F14) = 1 P.O. is present but item number or order date or
invoice number (confirming) is missing
= 2 Invoice number has been truncated
- (F17) = BLANK Use vendor located in Bibliography record
= 1 Use vendor located in this request record
= 2 No vendor present in either bibliography record or
this request record

Information as to the performance of any one operation on the computer is in the form of flow messages. Along with these messages, a sorted list of the input data, the total number of entries (NE), and the total number of cards submitted (NCARDS) for the current job will be printed. Following this will appear all the entries currently acted upon that were either deleted, modified, replaced, or added to the file, plus any special output called for by the control information. All data for each entry in sets S_1 and S_2 are printed in a way as to be self-evident to the reader. For examples of the printed output, see Appendices F and G.

Output information printed will be the Vendor Master File entries affected by the input data. The Book Master File entries processed during this run are printed next. Each Book entry is printed in two parts, bibliographic information and request information. (See Appendices F and G.) Data fields are properly identified; however, the error diagnostics must be interpreted. They are described in Appendix C.

IV. REPORT GENERATION

Reports are generated by the system under the direction of another set of control cards. The format of each report and the number of copies produced are built into the system. The form used for each report is handled external to the system, as is the printing of multiple copies of any of the reports generated.

The report generation control cards are similar to the file maintenance control cards. The control words, with their required minimum letter combinations in capital letters, are as follows:

1. SELEction lists
2. INV #nnnnnn
3. in-PROCEss lists
4. CONSolidated invoices

Any combination of these control words may be used to produce as many of the different types of reports as the user desires. The user may include any additional information which is of special interest to him, since the system ignores all but the specified minimum letter combinations. For example, the control card

"PRINT SELECTION LISTS AND WRITE PURCHASE ORDERS INV# 001457"
tells the system to generate the Selection lists and to write Purchase orders using 001457 as the starting invoice number. The key characters are "SELE" and "INV#001457."

Every entry in the file is inspected to see if it meets the criteria required for each report requested by the control card. An entry may be included on more than one report and processing during a run is reflected in the reports created after a complete pass through the file.

If a book that should be included in a desired report but is not discovered by the system during its initial scan of the file preparatory to generating a report, the book identification number and the reason for exclusion are printed (see Appendix C).

All reports are arranged in order, and the system builds tables of keys for each report as it scans the file. Selected information from the entries to be included in a report is used to build these keys. For example, the ANL code, 22 letters of the author's name and the record

sequence number from an entry would go into the table of keys used to arrange the selection list. If the keys are sorted in alphabetical order and the records accessed according to these keys, the desired arrangement of the report is achieved.

As an aid to the user the system identifies and lists the sorted keys. The identifications of the keys are

SORTED SELECTION KEYS
 SORTED PURCHASE ORDER KEYS
 SORTED IN-PROCESS LIST AUTHOR KEYS
 SORTED IN-PROCESS LIST PUBLISHER KEYS
 SORTED CONSOLIDATION LIST

The following is a description of the Reports generated.

A. Selection Lists

All of the entries in the Book Master File that have not been included on a previous Selection list or have not been ordered and for which there is complete title and publisher information will be used in creating the Selection lists. (See Appendix H.)

The primary sorting of the Selection lists is done on the ANL Subject code (see Section III.B.2) contained in the desired records. These are internal system codes which represent the subjects treated by the books; they are assigned by Library Services Division personnel and are repeated here for completeness.

The codes and their subjects are as follows:

B	Biology and Medicine
C	Chemistry
E	Engineering
H	Health and Safety
I	Instruments and Electronics
M	Mathematics and Computers
P	Physics
R	Reactor Physics or Reactor Engineering
S	Space Sciences
T	Metallurgy
Z	Miscellaneous
99	Invalid Subject Code (usually assigned by system)

B. Inv# nnnnnn

Purchase orders (see Appendix I) will be generated when this control word combination appears on the control card. The invoice numbers used are sequential and will begin with the six-digit number following the "INV#" control word in the control card.

Every Book Master File entry will be checked against purchase order criteria. A purchase order will be written for every request in the file which has not been already ordered by the system and for which there exists in the entry complete information, including the title of the book, the publisher's name, the vendor code for a vendor file entry, the requester's division, and the number of copies requested.

Purchase orders are grouped alphabetically by vendor. Within each vendor group the publishers are grouped alphabetically. Finally, under each publisher there is an alphabetical arrangement of authors. Pre-printed multiple-copy forms are used for purchase orders.

C. In-Process Lists

The In-Process Lists (see Appendix J) give the status of books after they have been ordered. An entry in the file for which a purchase order has been written, a book has been received, or a book has been cataloged is "In Process."

In an attempt to make the in-process lists more useful, two different lists are prepared. One of the lists arranges the books in process by author. The other list groups the books by publisher.

A backup tape (S₄) is produced every time the in-process lists are prepared, i.e., the Vendor and Book Directory Files and the Vendor and Book Master Files are written on tape after all file processing is complete.

D. Consolidated Invoices

The Consolidated Invoices report (see Appendix K) is a summary by invoice number of all the books purchased since the last report was generated. Certain partial totals that aid in billing are produced.

E. File Updating

In addition to generating reports, the program updates certain fields in the Vendor and Book Master Files which are used by both the file maintenance and report generating programs. (See Appendices A and B.) Following is a list of the fields updated during a report generation run of the system.

- 1) The "DATE ENTERED FILE" is replaced by the current date when a book is placed on a selection list.
- 2) Status flag F5 is changed to "2" when the book is placed on a selection list.
- 3) The order date, if blank, is replaced by the current date when a purchase order is written for a request.
- 4) The expedite date is changed as a result of adding the vendor's expedite interval to the order date when a purchase order is written for a request.
- 5) Request status flag FLT2 is changed to "2" when a book has been ordered.
- 6) The invoice number and item numbers each become one greater than the last numbers used when a book has been ordered.
- 7) Status flag FL3 is changed to "D" if a book has not been ordered within 42 days of the date it entered the file.
- 8) Request status flag FLT5 is changed to "2" if book has been on four separate in-process lists.
- 9) Status flag FL3 is changed to "H" if all of the request status flags for a book are "2."
- 10) Request status flag FLT3 is changed to "2" when a request has been included in a consolidated invoices report.

V. SUMMARY

The system has been in operation for about a year now and much experience has been gained. Design of the system was done in collaboration with Library management personnel. Testing of the system was done in collaboration with Library clerical personnel. The system includes much sophistication and is very complex. However, implementation did not befuddle the clerical user.

In practice, the many-part purchase order form had too many parts. The very detailed edited printing of the bibliographic records need not have been so detailed for the purpose to which these printed records were put. These "faults" are minor.

The record-keeping capabilities of the system relieved the clerks of many of their look-up tasks. A one-time keypunch of the information saved the clerks many typings of the same data for the reports generated by the Library. Automatic expedite letter writing by the system eliminated entirely the need for the clerks to somehow keep track of when a letter should be written and to subsequently type it.

The system was designed to be used on the IBM 360-50/75 computer at Argonne National Laboratory. The basic design can be used to implement such a system on a smaller computer. The system is complicated in design but is simple in structure. This feature makes it possible to modify the system without too much difficulty.

VI. ACKNOWLEDGMENTS

The authors acknowledge the assistance of Messrs. James C. Andrews and Hillis Griffin of the Library Services Division in specifying the areas of conformity required by a computer-based system. Thanks is also given to Dr. S. M. Prastein of the Applied Mathematics Division, who helped with the system specifications. A special thanks is extended to Miss Penny Coyne and Mrs. Dellanne Breen of the Library Services Division, who thoroughly tested the system and proved its workability.

A P P E N D I C E S

APPENDIX A. Vendor Record Description

(S₁) VENDOR DATA

ITEM	DESCRIPTION	STORAGE ALLOCATION IN BYTES	QUANTITY
VEN_CODE	Vendor Identification	5	1
VEN_MAIL_ADDR	Vendor Mailing Address	240	1
VEN_NAME	Vendor Name	20	1
PO_NO	Purchase and Order Number	6	1
IT_NO	Item Number	8	
START_VALUE	Total Amount of Money Available for This Vendor	8	1
DEPOSIT_ACC	Deposit Account	1	1
VEN_MISC1	UNUSED	24	1
VEN_MISC2	UNUSED	24	1
PERCENT_DISCOUNT	Percent Discount	3	1
VENSEQ	Sequential Location in S ₁	2	1
EXINT	Expedite Interval	3	1
VEN_MISC3	UNUSED	6	1

APPENDIX B. Bibliography/Request Record Description

(S₂) BIBLIOGRAPHY/REQUEST INFORMATION

ITEM	DESCRIPTION	STORAGE ALLOCATION IN BYTES	QUANTITY
ID_NUMBER	Book Identification	5	1
DATE_ENTERED_FILE	Date That This Book First Entered S ₂ (M,D,Y)	6	1
FL1	1 => Error in This Entry	1	1
FL2	1 => Modification Occurred	1	1
FL3	D => Delete This Entry	1	1
	H => Delete and Pass to History File		
FL4	1 => Error in Bibliography Section of This Entry	1	1
FL5	1 => Ready to be Entered in Selector List	1	1
	2 => Has been Selected		
FL6	1 => Modification Occurred in Bibliography Section of This Entry	1	1
LC_IDENT	Library of Congress Identification	20	1
AUTH_TITLE	Author-Title	288	1
PLACE	Place of Publication	20	1
PUBLISHER	Publisher's Name	20	1
DATE_DUE	Date Due (M,D,Y)	6	1
UNIT_COST	Unit Cost	6	1
CITATION	Citation/Reference	20	1
LC_CARD_NO	Library of Congress Card Number	12	1

ITEM	DESCRIPTION	STORAGE ALLOCATION IN BYTES	QUANTITY
PUB_TITLE_NO	Publisher Title Number	15	1
VENDOR_CODE	Vendor Identification	5	1
VENDOR_NAME	Vendor Name	20	1
PRE_PAY	D => Deposit Account C => Cash with Order	1	1
ANL_SUBJECT	Subject Code	2	1
CAL_NO_COMMENT	Call Number and/or Comments	26	1
SERIAL_CODES	Serial Codes	2	1
FL10	1 => Missing Title 2 => Title Truncated	1	1
FL11	1 => Missing Publisher 2 => Publisher Truncated	1	1
FL12	1 => Missing Unit Cost	1	1
FL13	1 => Missing Vendor Code 2 => Vendor Code Truncated	1	1
FL14	1 => Missing ANL Subject Code 2 => ANL Subject Code has been Truncated	1	1
FL15	1 => Missing Author	1	1
SEQ	Sequential Location in S ₂	4	1
TRAILER_COUNT	Total Number of Requests	2	1
LAST_TRAILER	Highest Request Number	2	1
FLT1	1 => Major Error in This Request, Can't Order	1	10

ITEM	DESCRIPTION	STORAGE ALLOCATION IN BYTES	QUANTITY
FLT2	1 => Enter to Next Purchasing Cycle	1	10
FLT3	1 => Enter to Next Accounting Cycle	1	10
	2 => Has Entered Accounting Cycle		
FLT4	1 => Modification Occurred in This Request	1	10
FLT5	1 => Delete and Pass to History Cycle	1	10
TRAIL_NUMBER	Request Number	2	10
INVOICE_NO	Invoice Number	6	10
PO	Purchase Order Number	6	10
ITEM_NO	Item Number	6	10
QUANTITY	Quantity	3	10
ORDER_DATE	Date Ordered (M,D,Y)	6	10
JULIAN_ORDER_DATE	Julian Order Date	3	10
REQUESTER	Requester	20	10
ADDRESS	Requester's Address	9	10
DIVISION	Requester's Division	3	10
ACCOUNT	Requester's Cost Code	13	10
COMMENT	Comment	20	10
EXPEDITE_COUNT	Expedite Counter	1	10
LAST_EXPEDITE_DATE	Expedite Date (M,D,Y)	6	10
DATE_RECEIVED	Date Received (M,D,Y)	6	10
NET_PRICE	Net Price	6	10
DATE_TO_ACT	Date to Accounting (M,D,Y)	6	10

ITEM	DESCRIPTION	STORAGE ALLOCATION IN BYTES	QUANTITY
DATE_TO_CATALOGING	Date of Cataloging (M,D,Y)	6	10
DATE_TO_CATALOGING_JUL	Julian Date of Cataloging	3	10
CAT_EXP_COUNTER	Catalog Expedite Counter	2	10
CALL_NO	Call Number	25	10
FIRST_COPY_TO	First Copy to	3	
FLT10	1 => Missing Quantity	1	10
FLT11	1 => Missing Division or Library	1	10
	2 => Division has been Truncated		
FLT12	1 => Missing Requester	1	10
	2 => Truncated Requester		
FLT13	1 => Division Not Library and No Cost Code	1	10
	2 => Cost Code Truncated		
FLT14	1 => P.O. is Present But Item No or Order Date or Invoice No (Confirming) is Missing	1	10
	2 => Invoice No. Truncated		
FLT15	UNUSED	1	10
FLT16	UNUSED	1	10
FLT17	BLANK => Use Vendor Located in Bibliography	1	10
	1 => Use Vendor Located in This Request		
	2 => No Vendor in Either Bibliography or Request		
IN_PROCESS_CTR	Count of in-process reported	1	10
TVEN_CODE	Vendor Code (special)	5	10
ASSIGNED_TO	Book Assigned to	2	10

APPENDIX C: Error Messages

1. Definitions

Current errors are errors that occurred during any one running of the program and are not permanently stored.

Fixed errors are errors that occurred during the present running of the program or any previous running. These are stored permanently in the file and can only be unset by corrections.

Major errors are those that prohibit the processing of the book in question.

Minor errors do not affect the processing of a book.

2. Bibliographic Fixed Major Errors

- a) MISSING TITLE
- b) TITLE HAS BEEN TRUNCATED
- c) MISSING PUBLISHER
- d) PUBLISHER'S NAME HAS BEEN TRUNCATED

3. Request Record Fixed Major Errors

- a) MISSING QUANTITY
- b) MISSING REQUESTER

4. Report Generation Errors

- a) BOOK NO. (ID#) CAN NOT BE SELECTED: MISSING TITLE
- b) BOOK NO. (ID#) CAN NOT BE SELECTED: MISSING PUBLISHER
- c) ORDER FOR BOOK NO. (ID#) FOR (DIV) CAN NOT BE WRITTEN: TITLE IS MISSING
- d) ORDER FOR BOOK NO. (ID#) FOR (DIV) CAN NOT BE WRITTEN: PUBLISHER IS MISSING
- e) ORDER FOR BOOK NO. (ID#) FOR (DIV) CAN NOT BE WRITTEN: NO QUANTITY WAS GIVEN
- f) ORDER FOR BOOK NO. (ID#) FOR (DIV) CAN NOT BE WRITTEN: MISSING DESTINATION DIVISION
- g) ORDER FOR BOOK NO. (ID#) FOR (DIV) CAN NOT BE WRITTEN: MISSING VENDOR
- h) ORDER FOR BOOK NO. (ID#) FROM VENDOR (VENDOR CODE) HAS NO MATCHING VENDOR RECORD
- i) ORDER FOR BOOK NO. (ID#) FOR (DIV) CAN NOT BE WRITTEN: MISSING VENDOR MAILING ADDRESS

APPENDIX D: Sample Expedite Letter

LIBRARY SERVICES DEPARTMENT
ARGONNE NATIONAL LABORATORY
9700 SOUTH CASS AVENUE
ARGONNE, ILLINOIS 60439

11-25-70

TAYLOR-CARLISLE'S BOOK STORE, INC.
115 EAST 23RD STREET
NEW YORK, NEW YORK 10010
ATTN: MR. BARRY BERNSTEIN

GENTLEMEN:

WE SHOULD APPRECIATE IT IF YOU WOULD EXPEDITE SHIPMENT OF THE MATERIAL
DESCRIBED BELOW:

ORDER DATE: 11-25-69

NOTICE NO. 1

P.O. NUMBER=586059 INVOICE NUMBER=000085

AUTHOR: BERRY, ROBERT W.

TITLE: THIN FILM TECHNOLOGY.

PUBLISHER: VAN NOSTRAND

PROMPT DELIVERY WILL BE GREATLY APPRECIATED. IF THIS MATERIAL IS NOT
PRESENTLY AVAILABLE, PLEASE ADVISE ANTICIPATED SHIPPING DATE.

THANK YOU FOR YOUR HELP IN THIS MATTER.

SINCERELY YOURS,

E.F. SMITH
ACQUISITIONS LIBRARIAN

APPENDIX E: Sample Vendor Information Output

VENDOR FILE

PAGE 001

CURRENT DATE (06-17-70)

ID	VENDOR NAME	VENDOR MAILING ADDRESS	FI	%D	PO NO.	DP	START VALUE	IT NO.
*ABEL	R. ABEL	R. ABEL AND COMPANY, INC. P.O. BOX 4245 PORTLAND, OREGON 97208 ATTN: MR. DONALD G. STAVE	042	195	655477		\$.00	00000919
*ACAD	ACADEMIC	ACADEMIC PRESS, INC. 111 FIFTH AVE. NEW YORK, NEW YORK 10003	090	10			\$.00	
*AICE	AM INST CHEM ENGRS	AMERICAN INSTITUTE OF CHEMICAL ENGINEERS 345 EAST 47TH STREET NEW YORK, NEW YORK 10017	042	000			\$.00	
*AIPH	AM INST PHYSICS	AMERICAN INSTITUTE OF PHYSICS, INC. 335 EAST 45TH STREET NEW YORK, NEW YORK 10017	042	000			\$.00	
*AMAT	AM MATH SOC	AMERICAN MATHEMATICAL SOCIETY P.O. BOX 6248 PROVIDENCE, RHODE ISLAND 02904	042	000			\$.00	
*AMCM	AM CHEM SOC	AMERICAN CHEMICAL SOCIETY 1155 16TH STREET, N.W. WASHINGTON, D. C. 20036	042	15			\$.00	
*AMWL	AM WLDG SOC	AMERICAN WELDING SOCIETY 345 EAST 47TH STREET NEW YORK, NEW YORK 10017	042	000			\$.00	
*ANNR	ANN REVS	ANNUAL REVIEWS, INC. 4139 EL CAMINO WAY PALO ALTO, CALIFORNIA 94306	042	000			\$.00	

APPENDIX F: Sample Bibliographic Information Output

BIBLIOGRAPHIC INFORMATION

PAGE 001

ID_NUMBER=(00322)

		E R R O R S	
		CURRENT	FIXED
DATE ENTERED FILE	(07-15-70)		
CURRENT DATE	(07-15-70)		
LOCATION IN FILE=0210	0 1 2 3 4 1234567890123456789012345678901234567		
TITLE	(FAST REACTORS AND THE UNIVERSITY)		
AUTHOR	()		MISSING
PUBLISHER	(AM SOC ENGR EDUC)		
PUBLISHER CODE	(A SEE)		
PUBLISHER TITLE NUMBER	()	MISSING	
PLACE	(WASHINGTON)		
CITATION	()	MISSING	
VENDOR CODE	(*ASEF)		
VENDOR NAME	(AM SOC ENGR EDUC)		
LC IDENT	()	MISSING	
LC CARD NUMBER	()	MISSING	
ANL SUBJECT	(R)		
SERIAL CODES	()	MISSING	
UNIT COST	\$1.50		
CALL NO/COMMENT	()		
PRE PAY	()		
DATE DUE	00/19/70		

APPENDIX G: Sample Request Information Output

REQUEST RECORDS

PAGE 002

ID_NUMBER=(00322)

CURRENT DATE (07-15-70)

	REQUEST NO.=01	ERRORS C F	REQUEST NO.=02	ERRORS C F	REQUEST NO.=03	ERRORS C F
	1234567890123456789012345		1234567890123456789012345		1234567890123456789012345	
REQUESTOR NAME	JOE		RAYMOND GOLD		W.C. REDMAN	
REQUESTOR ADDRESS		MIS	316		316	
REQUESTOR DIVISION	LIR		AP		AP	
QUANTITY	(003)		(001)		(001)	
REQUESTOR COST CENTER		MIS	0011609116436		0011609116436	
COMMENT		MIS		MIS		MIS
REQUEST VENDOR CODE		MIS		MIS		MIS
INVOICE NUMBER		MIS		MIS		MIS
P.O. NUMBER	682765		682765		682765	
ITEM NUMBER		MIS		MIS		MIS
ORDER DATE						
EXPEDITE DATE						
EXPEDITE COUNT	(0)		(0)		(0)	
DATE RECEIVED	04/03/70		04/03/70		04/03/73	
DATE TO CATALOGING	04/04/70					
DATE TO ACCOUNTING	07/15/70		07/15/70		07/15/70	
NET PRICE	(\$1.50)		(\$1.50)		(\$1.50)	
CALL NUMBER	TK9203.F10741			MIS		MIS
ASSIGNED TO	0					
FIRST COPY						

APPENDIX H: Sample Selection List

BOOK SELECTION LIST		01/7/71	PAGE	3											
BIOLOGY AND MEDICINE															
02908	COCCHI, UMBERTO EINFÜHRUNG IN DIE RONTGENDIAGNOSTIK, 20. AUFL. THIEME	1971	\$15.95	*PABL	03008	CTL	200	202	203	205	208	212	223	362	TOTAL
02908															
02925	CONROY, R.T.W.L. HUMAN CIRCADIAN RHYTHMS CHURCHILL	1972	\$2.00	*PABL	02925	CTL	200	202	203	205	208	212	223	362	TOTAL
02925															
02927	CURRENT TOPICS IN PATHOLOGY, V.53, ED. BY H.W. ALTMANN SPRINGER	1970	\$18.70	*PABL	02927	CTL	200	202	203	205	208	212	223	362	TOTAL
02927															
02928	DAVIDSON, CHARLES S. LIVER PATHOPHYSIOLOGY: ITS RELEVANCE TO HUMAN DISEASE LITTLE	1971	\$10.00	*PABL	02928	CTL	200	202	203	205	208	212	223	362	TOTAL
02928															
03011	DENDLIN, H. PULMONARY EMBOLISM MASON	1971	\$13.50	*PABL	03011	CTL	200	202	203	205	208	212	223	362	TOTAL
03011															
03013	DOERF, WILHELM SPEZIELLE PATHOLOGISCHE ANATOMIE, 2 SPRINGER VERL.	1973	\$1.00	*PABL	03013	CTL	200	202	203	205	208	212	223	362	TOTAL
03013															
03014	DURCHLEITUNGSSTÖRUNGEN: MESSMETHODIK UND PHARMAKOTHERAPIE, RAUBASIN, INTERNATIONALES SYMPOSIUM, H.F.C. V.F. EHRINGER SCHATTAUER	1972	\$24.85	*PABL	03014	CTL	200	202	203	205	208	212	223	362	TOTAL
03014															

APPENDIX I: Sample Purchase Order

74-90895 01/16/71 003541

01/16/71

003541

00521 04

M.T. MATTHIES AMD
 221-B228
 ATN: R.E. KING 1450900145436

LEEDS, HERBERT D.

COMPUTER PROGRAMMING FUNDAMENTALS; BASED ON
 THE IBM SYSTEM/360

LEEDS, HERBERT D.

COMPUTER PROGRAMMING FUNDAMENTALS; BASED ON
 THE IBM SYSTEM/360

MCGRAW

1970

655477

000081

1

\$13.95

MCGRAW

1970

99

R. ABEL AND COMPANY, INC.
 P.O. BOX 4245
 PORTLAND, OREGON 97208
 ATTN: MR. DONALD G. STAVE

00521

RICHARD ABEL

655477

81

1

APPENDIX J: Sample of In Process List (by Publisher)

LIBRARY IN-PROCESS LIST	WEEK ENDING 05/06/70	PAGE 17
** AM INS AERO & ASTRO **		
CHENG, SIN-I. NUMERICAL SOLUTIONS OF STEADY AND TIME DEPENDENT NAVIER-STOKES EQUATIONS. AIAA PAPER 70-2. AM INS AERO & ASTRO, . \$12.53		ID-00672
INV-000469 IN PROCESS		208
INV-000469 IN PROCESS		208
NAKAYAMA, PAUL I. TURBULENCE TRANSPORT EQUATIONS AND THEIR NUMERICAL SOLUTION. AM INS AERO & ASTRO, . \$12.53		ID-00670
INV-000472 IN PROCESS		208
** AM INS CHEM ENGRS **		
AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. DIRECTORY OF CHEMICAL ENGINEERING FACULTIES, 1969-70. AM INS CHEM ENGRS, . \$5.00 LOCN ASSIGNED COPY		ID-00592
** AM MANAGE ASSOC **		
REEVES, ELTON T. DYNAMICS OF GROUP BEHAVIOR. AM MANAGE ASSOC, 3170. \$11.00		ID-00617
INV-000381 R. ABEL	PO-655477	DD-03/17/70 CTL
** AM MANAGE. ASSOC. **		
AMERICAN MANAGEMENT ASSOCIATION. TECHNIQUES OF INVENTORY MANAGEMENT. AM MANAGE. ASSOC., . \$12.50		ID-00616
INV-000380 R. ABEL	PO-655477	DD-03/17/70
FDR- NELSON, M.C.	(SPM)	
** AM NUCLEAR SOC **		
CONFERENCE ON REMOTE SYSTEMS TECHNOLOGY. 16TH, IDAHO FALLS, 1969. PROCEEDINGS. AM NUCLEAR SOC, 1969. \$10.00		ID-01069
INV-000866 IN PROCESS		212

APPENDIX J: Sample of In Process List (by Author)

LIBRARY IN-PROCESS LIST	WEEK ENDING 03/17/71	PAGE 1
ADAMS, JOHN A.S. GAMMA-RAY SPECTROMETRY OF ROCKS. (METHODS IN GEOCHEMISTRY & GEOPHYSICS, 10) ELSEVIER, 1970 \$21.00 LOCN - 200		ID-03656
ALTMAN, KURT I RADIATION BIOCHEMISTRY; V. 2: TISSUES AND BODY FLUIDS, BY G. GERBER ACADEMIC, 1970 \$17.50 LOCN - 202 QP82.2.R3A468		ID-03652
ARTHURS, A.M. COMPLEMENTARY VARIATIONAL PRINCIPLES. (OXFORD MATHEMATICAL MONOGRAPHS) OXFORD U PR, 1970 \$6.50 LOCN - 362		ID-03645
BELL, R APPLICATION OF STEPPING MOTORS TO MACHINE TOOLS MACHINERY PUB CO, 1970 \$3.60 LOCN - 208		ID-03639
BIOSPHERE, A SCIENTIFIC AMERICAN BOOK FREEMAN, 1970 \$6.50 LOCN - CTL		ID-03650
BROMLEY, DAVID ALLAN FACETS OF PHYSICS ACADEMIC-1970, \$11.50 LOCN - 203		ID-03633
BUEHLER, CALVIN A SURVEY OF ORGANIC SYNTHESIS WILEY-INTERSCIENCE, 1970 \$27.50 LOCN - 200		ID-03637
CHAKRAVARTI, P.C. INTEGRALS AND SUMS; SOME NEW FORMULAE FOR THEIR NUMERICAL EVALUATION OXFORD U PR, 1970 \$7.25 LOCN - 203		ID-03663

APPENDIX K: Sample Consolidated Invoice

ARGONNE NATIONAL LABORATORY
LIBRARY SERVICES DEPARTMENT

CONSOLIDATED INVOICE/
RECEIVING REPORT
03/17/71

PAGE 2

R. ABEL
PORTLAND, OREGON

P.O. NO. 22222

LIBRARY INVOICE #	LIST PRICE	DEALER COST	+	SERVICE CHARGE	=	NET COST
03664	\$10.00	\$6.30	+	\$1.95	=	\$8.25
	(VEND INV # 00350852			REC'D 02/23/71)		
SPENCER, DANIEL LLCYD TECHNOLOGY GAP IN PERSPECTIVE; STRATEGY OF INTERNATIONAL TECHNOLOGY TRANSFER						
03665	\$16.00	\$10.97	+	\$1.95	=	\$12.92
	(VEND INV # 00300517			REC'D 02/23/71)		
MANN, J.Y. BIBLIOGRAPHY ON THE FATIGUE OF MATERIALS, COMPONENTS AND STRUCTURES; 1838-1950						
03668	\$9.95	\$8.26	+	\$1.95	=	\$10.21
	(VEND INV # 00353381			REC'D 02/23/71)		
VERNBERG, F. JOHN ANIMAL AND THE ENVIRONMENT						
03669	\$44.50	\$30.11	+	\$1.95	=	\$32.06
	(VEND INV # 00396421			REC'D 02/23/71)		
CONLEY, ROBERT T THERMAL STABILITY OF POLYMERS, V.1. (MONOGRAPHS IN MACROMOLECULAR CHEMISTRY)						
03671	\$30.02	\$21.30	+	\$1.95	=	\$23.25
	(VEND INV # 00309831			REC'D 02/23/71)		
USES OF CYCLOTRONS IN CHEMISTRY, METALLURGY AND BIOLOGY; PROCEEDINGS, ED. BY C.B. AMPHLETT						

TOTAL P.O. NO. 333333 = \$159.37

ARGONNE NATIONAL LAB WEST



3 4444 00011230 0

