

journal of library automation



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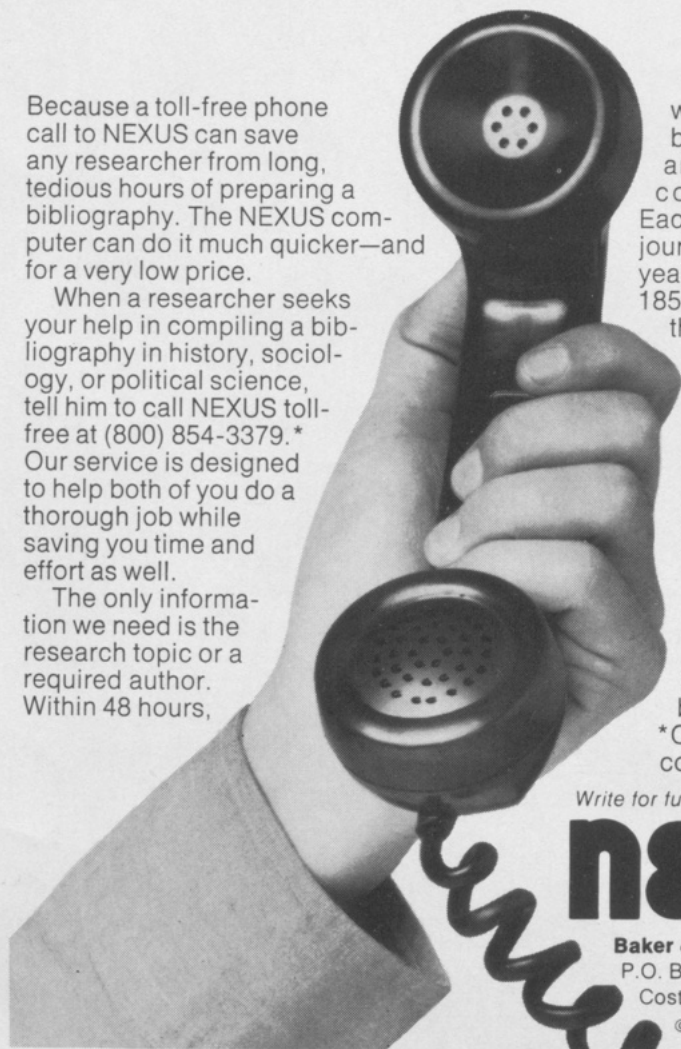
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Library Automation: The Second Decade

Many of the premises upon which research libraries based their decisions to build in-house library systems staffs to automate their internal operations in the late of 1960s are no longer valid. Important advances in automation have been made, including the widespread acceptance and use of the MARC format and distribution service, the general success of the cooperative network concept, and the availability of package systems. In addition, many library growth rates such as numbers of users and transactions, volumes received, size of library staffs, and above all, library budgets, have begun to level off or decrease. These developments are causing many libraries to reassess and reformulate their approaches to automation.

In order to illustrate the profound change that has taken place in library automation in the last ten years, it may be useful to contrast the beginnings of library automation in the pioneering decade of the 1960s with the early days of flying the mails in the 1920s. The French author-aviator, Antoine de St. Exupery, captures the feeling of excitement, experimentation, ferment, and accomplishment that characterized that period in his book *Night Flight* (1931). The early aviation exhibits in the Smithsonian Institution communicate something of that same feeling. Those systems librarians who worked in the 1960s may remember what it was like and see the similarities between the two periods.

In the pioneering period of commercial aviation the pilots had considerable freedom to select the best route to their destination; they would follow roads and rivers and "navigate by the seat of their pants." The pilot was up there alone, with no direction or control from the ground. He felt like an eagle, and success depended on his personal initiative and courage. It was a glorious era and a glamorous calling, but it did not last long. The aircraft developed rapidly and became increasingly complex, efficient, and expensive. The pilots needed more and longer training, and the qualities of personal initiative and courage became less important than technical knowledge and the willingness to follow set procedures and orders with precision and skill and to function as a good team member. The early mail pilots were flying poets and adventurers. Today's airline pilots are highly skilled and seasoned executives.

In the early period of library automation, the systems people were en-

couraged to question all existing library technology and procedures and enjoyed considerable freedom because the administrators for whom they worked knew little about computers or systems analysis and were somewhat in awe of the whole business. Some of the best and most creative systems people did the whole job, from selecting the task to be done to designing, programming, implementing, and sometimes actually operating the computer and coaxing the output off the printer. It was an exciting, creative, and glamorous job, but it has undergone a profound change in a few short years.

What happened in aviation also happened in the library automation field. The day of the one-man or small group library systems development effort is past. The jobs to be done and the equipment required have become complex and expensive, and it requires a team of highly qualified computer specialists to design and implement a viable system. With the increasing sophistication and success of computerized systems for libraries, the need for systems groups in individual libraries is diminishing. The systems librarians of the 1970s are losing much of their old independence and glamour and are becoming more highly professionalized like airline pilots. There will be fewer of them, and they will be, characteristically, managers or members of a team working not for one particular library, but more likely for a library consortium or a national library group. In addition to designing original systems, they will increasingly work on transferring, adapting, and installing systems and software which have been developed by other centers and commercial vendors.

The era of localized library automation has effectively come to an end. Experience has shown that it is not economically feasible for any but the very largest libraries to afford the heavy costs of developing, maintaining, and operating complex localized computer-based systems. Many libraries are quietly abandoning this approach in favor of joining networks such as OCLC or its affiliates or purchasing turnkey mini-computer systems from commercial vendors for specific applications. It is now quite acceptable, even for a large library, to have no in-house automation program and staff. In-house systems librarians are not essential to implement the local interfaces to these centralized networks or to install the turnkey systems. Indeed, they may tend to inhibit such installations by their reluctance to accept the package systems as they are or to give up the existing local automated systems to which they may have a personal commitment. The operating library staff, if given proper encouragement and support, can readily learn to implement and operate these systems and feel a sense of achievement and pride in having done so.

Neither library automation nor library systems people are passing from the scene. What is passing is the localized systems approach that characterized the last decade and provided the knowledge and experience upon which the advanced library automation of the 1970s is based.

RICHARD DE GENNARO

The University of Chicago Library's JRL 1000 Circulation Terminal and Bar-Coded Labels

Rob McGEE: The University of Chicago Library, Chicago, Illinois.

The University of Chicago JRL 1000 Circulation Terminal consists of a hand-held light-pen scanner, a thirty-one-column alphanumeric printer, a custom-built electronics interface that permits optional use with a CRT/keyboard, a custom-built power supply, and a custom-built metal cabinet. The terminal was developed for use in an on-line circulation system that is being implemented as one of the applications of Chicago's Library Data Management System. This paper describes the JRL 1000's rationale and development, and related work with vendors to adapt and test bar-coded labels as book and borrower identification.

INTRODUCTION

The JRL 1000 Circulation Terminal (Figure 1) is designed especially for on-line, interactive library systems. It permits simple, quick, and error-free input of bar-coded data (e.g., a "charge" command, user ID, and book numbers) with a light-pen, and rapid printout of alphanumeric responses (e.g., charge slips) on thirty-one-column, tear-off paper. Its principal components are:

- A hand-held light-pen scanner that reads bar-codes.
- A thirty-one-column, alphanumeric, impact matrix printer rated at 110 characters/second.
- Custom-built electronic interfaces that serve as controller for these units, as well as for a CRT/keyboard with which the JRL 1000 may optionally be used.
- A custom-built power supply designed to avoid the need for a cooling fan.

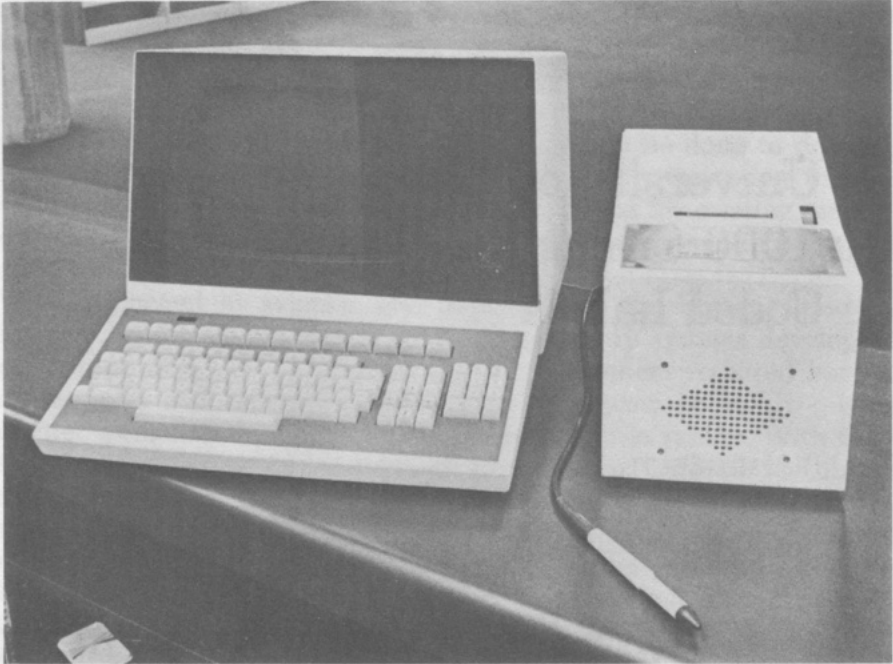


Fig. 1. The JRL 1000 Circulation Terminal (Shown with CRT/Keyboard).

- A four-inch speaker that can serve as an intercom device between the JRL 1000 and a central switchboard.

The University of Chicago Library developed the JRL 1000 because it could find no commercial device that satisfied its requirements for an on-line circulation terminal. The basic novelties of the JRL 1000 are that it interfaces a bar-code scanner and alphanumeric printer, houses these and other components in a special cabinet, and can be used as a stand-alone terminal or in conjunction with a CRT/keyboard. The JRL 1000 has a standard RS-232 interface.

Concurrent with development of the JRL 1000, the library undertook a major effort with several vendors to adapt and test bar-coded labels as machine-readable book and borrower identification. The following sections deal first with the terminal, then with labels.

HISTORY

From 1966 to 1971 the University of Chicago Library Systems Development Office, with grants from the National Science Foundation, carried out a project (phase I) to develop an integrated, computer-based bibliographic data processing system for a large university library.^{1,2} One of the tasks of that early work was to investigate devices that might serve as terminals in an on-line circulation system. By 1968 the Systems Development Office concluded that magnetic card and optical scanning technologies were then too expensive and not yet ready for application to libraries.

Nor did the use of punched book cards seem attractive. There seemed to be no inexpensive or convenient way to interface punched card readers with keyboards and printers, and nothing prevented easy removal or exchange of book cards. Out of continuing investigation came the belief that an ideal terminal for an on-line circulation system would consist of a display screen, an alphanumeric keyboard, an alphanumeric printer, and the capability to machine-read book and borrower identification. A later section explains why.

When the University of Chicago Library Data Management Project (LDMP) began in 1971 (phase II of the library automation work at Chicago) with funds from the Council on Library Resources and the National Endowment for the Humanities, the search was renewed for an economically feasible device with those ideal characteristics.³ The LDMP solicited vendors who had stated an interest in hardware systems for library circulation control. Terminals that read magnetic cards or labels were eliminated when no one would guarantee how long the magnetic coding on media put into books would last. The LDMP evaluated several proposals for devices that would optically read bar-coded labels, and for one other kind of terminal that would read nonmagnetized strips of metal foil—even through the cover of a book. The criteria for evaluation included the costs and capabilities of terminals, the expenses and other characteristics of book and borrower identification, and the implied procedures and costs of putting machine-readable identification into an existing collection of books. The LDMP concluded that no vendor offered a wholly satisfactory terminal or system and that the library should try to develop its own, using bar-coded labels, hand-held light-pen scanners, alphanumeric printers, and CRT/keyboards.

The bar-code technology looked right for libraries; library circulation systems based on it were already being advertised by U.S. and British vendors, and other systems were under independent development at the University of South Carolina and SUNY-Albany.^{4,5} The vendors offered entire turn-key systems—computers and programs—but *not* separate terminals.

In April 1973 the library received an extraordinary gift of \$350,000 from the Joseph and Helen Regenstein Foundation for purchase of hardware necessary to implement the Library Data Management System. The foundation's generosity already had enabled construction of the Joseph Regenstein Library; the latest gift made possible there a state-of-the-art computerized library system. After years of waiting, the library found itself able to build a suitable terminal for an on-line circulation system.

The first two components selected were a hand-held light-pen scanner that reads bar-code (Monarch Marking Systems' 2243 Scanner) and a CRT/keyboard (Beehive Terminals' SuperBee II with Edit). The LDMP talked to others who had chosen the 2243 scanner for their library systems: Ken Simons at the University of South Carolina, John Linford at SUNY-Albany, and Béla Hatvany of Computer Library Services, Inc. (CLSI). Af-

ter cursory investigation of other bar-code systems, Chicago extensively investigated Monarch Marking Systems' products. From examinations during February through December 1973, the LDMP determined the technical and cost feasibility of building a terminal with the scanner and of adapting bar-coded labels to books and borrower ID cards.

The SuperBee II was preferred because it seemed to have more desirable features and capabilities and a better appearance than any other known CRT/keyboard in its price range, and because it is similar to and made by the same company as the OCLC 100 terminal that the library intended to use in technical processing operations.

At this point the LDMP solicited several companies to build a terminal based on an interface of these two components and an as yet unspecified printer. A vendor was finally located who worked on the problem for several months before giving up because of greater technical problems than anticipated, and the rise of projected costs beyond the library's limits. When this vendor withdrew, the electronics shop of the University of Chicago's Enrico Fermi Institute stepped in. Customarily the electronics shop develops one-of-a-kind devices for university scientists; but it had served as the library's consultant in monitoring work with the vendor, and agreed to take on the job when the vendor failed.

The electronics shop joined the library in the search for a printer. For months the LDMP had searched for a reliable, fast, inexpensive device that would produce from continuous-feed paper stock a narrow-column alphanumeric printout that users of a terminal could easily tear off for themselves. Ticket printers were too expensive, and the marketplace for narrow-column printers was in flux: e.g., low speed (15 to 30 characters/

Table 1. Vendors of Major System Components

Beehive Terminals
870 West 2600 South
P.O. Box 19244
Salt Lake City, Utah 84119
Phone: (801) 487-0741
Contact: Clint Pickett
Product: SuperBee model SB2

Monarch Marking Systems,
A Subsidiary of Pitney Bowes
P.O. Box 608
Dayton, Ohio 45401
Phone: (513) 866-7401
Contact: Richard B. Berryman
Products: 2243 Scanner, Bar-coded Labels

Victor Comptometer Corporation
Component Products
10001 Derby Lane
Westchester, Illinois 60153
Phone: (312) 343-5503
Contact: Kenneth Krohmer
Product: Model IPM 130 Dot Matrix
Impact Print Mechanism

Identatronics
2100 Lehigh Avenue
Glenview, Illinois 60025
Phone: (312) 724-2827
Contact: Ronald C. Fritz
Products: ID Card Equipment and Supplies

second) devices that use print drums or wheels were available with necessary interfaces at high costs, typically in a \$900 to \$1,200 range; faster, lower-cost matrix printers were emerging as components of other kinds of equipment, but typically then were not separately marketed, or were of-

Table 2. *Estimated Average Cost to University of Chicago Library of Manufacturing a Single JRL 1000, Exclusive of Developmental Costs*

1. <i>Major purchased components*</i>			
1.1. Light-pen assembly, logic board, and interface and analog board for a Monarch 2243 scanner			\$ 425
1.2. Victor Comptometer model 130 IPM print mechanism.			\$ 211
2. <i>Components and services provided by University of Chicago or obtained on contract†</i>			
2.1. Assemble University of Chicago circuit board materials			\$ 200
labor			\$ 65
2.2. Produce panels for cabinet materials			\$ 15
labor			\$ 85
2.3. Materials for power supply and cabinet fixtures			\$ 160
2.4. Wiring of cabinet's backplane			\$ 65
3. <i>Estimated average University of Chicago time for check-out, test, tuning, and assembly of components‡</i>			
3.1. Light-pen and scanner circuit boards	2 hours @	\$16.78	\$ 34
3.2. U. of C. circuit board	8 hours @	\$16.78	\$ 134
3.3. Print mechanism	3 hours @	\$16.78	\$ 50
3.4. U. of C. power supply	8 hours @	\$14.40	
	8 hours @	\$16.78	\$ 249
3.5. U. of C. cabinet and fixtures			
3.6. Test of unit	2 hours @	\$16.78	\$ 34
			\$1,794

* 1973 unit price for quantity of twenty-five.

† Based on costs between November 1973 and October 1974 of materials from U. of C. stock-rooms and outside vendors, and of labor from several U. of C. departments and outside vendors.

‡ Based on October 1974 hourly rates to library of electronics shop personnel.

ferred without sufficient electronics. The electronics shop surveyed the alternatives and agreed with the LDMP that Victor Comptometer's dot matrix impact print mechanism (IPM model 130) was the best printer of its type and price for the library's application: a thirty-two-column printer rated at 110 characters/second, with tear-off output. (Ultimately, one character of the printer buffer was allocated as a control character, reducing the JRL 1000's printable line to 31 characters.) However, it lacked both an interface and the electronics necessary to generate and handle an alpha-numeric character set—only the print mechanism itself was available. The electronics shop agreed to take on these further developments. Once this set of components was selected, the electronics shop designed a cabinet to house the scanner, printer, a speaker, and necessary electronics.

The University of Chicago Library has now built twenty-five JRL 1000s for its own use. Table 2 documents the LDMP's best estimate of the average, recurring cost to the library of their manufacture, exclusive of one-time costs for design and development.

The sections immediately following discuss the functional design of the JRL 1000 and the library's requirements for a circulation terminal. Labels are discussed subsequently.

FUNCTIONAL DESIGN OF THE JRL 1000

This section gives an overview of how the JRL 1000 functions: its configuration, characteristics of data transmission, interface, control unit, and interactions among scanner, printer, CRT/keyboard, and control unit.

Configuration

The principal components of the JRL 1000 are its control circuitry, light-pen scanner, and matrix printer. When a JRL 1000 is coupled with a CRT/keyboard, that configuration is called a "public services terminal." The control circuitry is identical for both configurations, and is referred to as the "control unit." Figure 2 shows relationships of components to the line interface.

Data Transmission

Transmission of data to and from the control unit is serial asynchronous. Characters are transmitted in seven-bit (plus an even-parity bit) ASCII code.

Interface

The JRL 1000 has built-in line-driving capabilities that permit transmissions across a line distance of 1,000 feet, with connection at the computer via a full duplex 20 milliamperes current loop interface. The JRL 1000 can transmit data at any rate up to a maximum of 9,600 baud. Remote JRL 1000s may also be connected via the EIA standard RS-232 interface.

All asynchronous ASCII transmissions to the JRL 1000 from the computer are prefixed by a SYNCH character. The control unit interprets the SYNCH character as the beginning of a new message. The CONTROL character establishes the type of operation to be performed, e.g., print a line, display a message on the CRT, enable the light-pen scanner. This organization allows the JRL 1000—with or without the CRT/keyboard—to operate with one set of data lines to the computer, thus avoiding the need for multiple lines, sets of modems, and computer ports.

Light-Pen Scanner

Upon detecting any transmission of data, the control unit disables the scanner from transmitting data from its buffer. The scanner remains disabled until the computer sends the control unit an enable command. Upon a successful scan by the light-pen, the control unit reads out the scanner's buffer to the computer, and the JRL 1000 emits an audible tone to notify the operator of a "good read."

The control unit optionally may be strapped to transmit the contents of the scanner's buffer directly to the CRT, as well as to the computer. In this configuration, the control unit generates a control character that positions the cursor at the beginning of the next line on the CRT, where readout from the scanner is displayed.

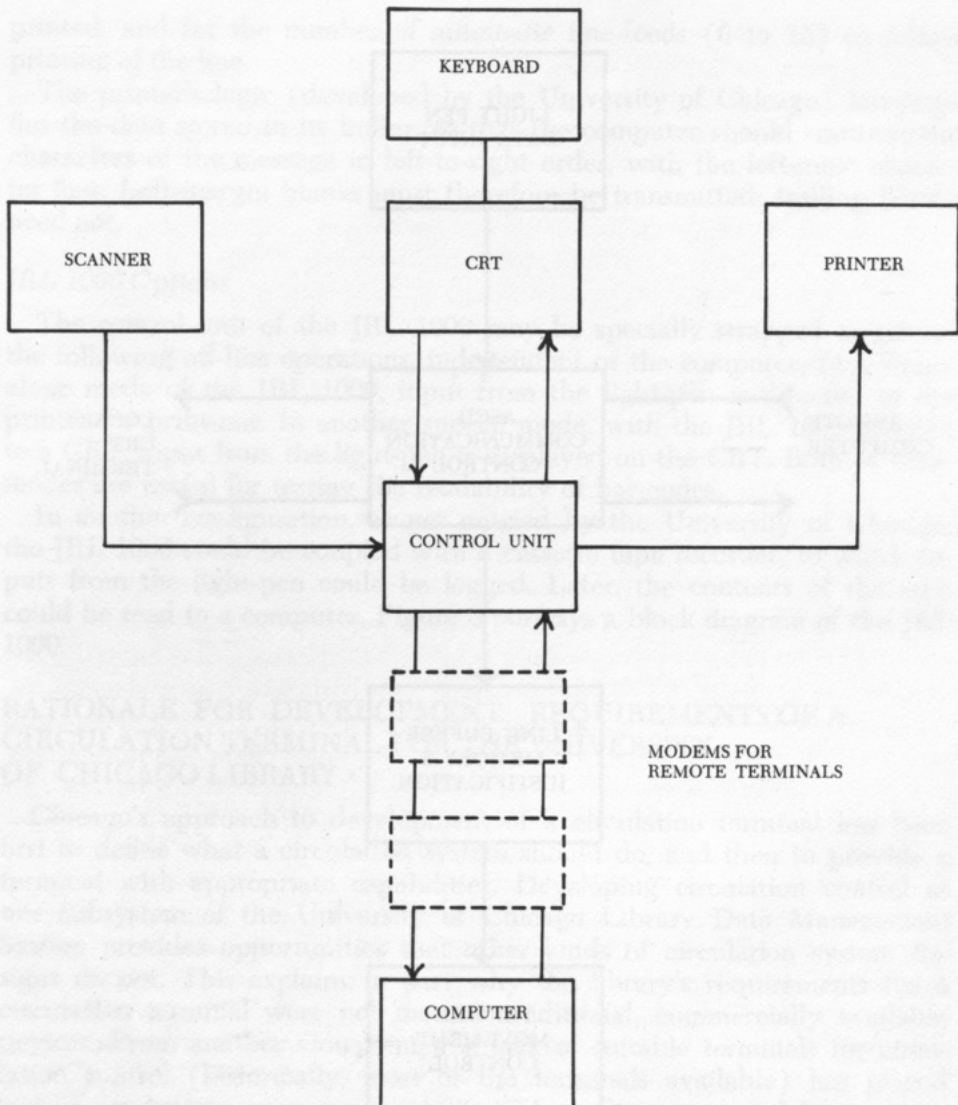


Fig. 2. Relationships of JRL 1000's Components to the Line Interface.

CRT/Keyboard

The control unit disables the keyboard during transmission of data from the scanner. At all other times input from the keyboard can be transmitted to the computer.

Printer

The printer has a 32-character buffer. The first character of a transmission from the computer to the printer is a CONTROL character that specifies a ribbon-position for the color of the line (red or black) to be

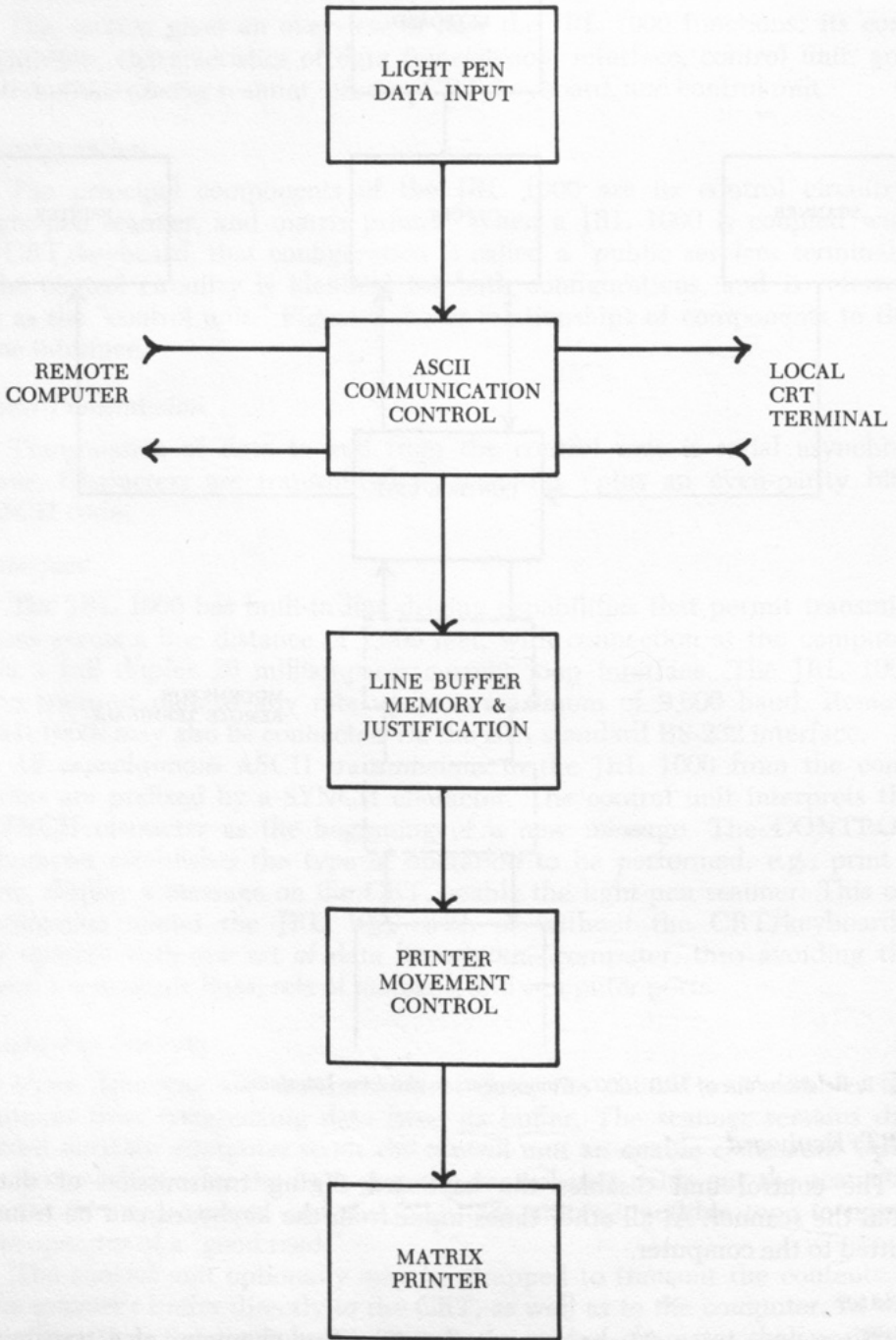


Fig. 3. Block Diagram of JRL 1000.

printed, and for the number of automatic line-feeds (0 to 15) to follow printing of the line.

The printer's logic (developed by the University of Chicago) left-justifies the data stored in its buffer, so that the computer should transmit the characters of the message in left-to-right order, with the left-most character first. Left-margin blanks must therefore be transmitted; trailing blanks need not.

JRL 1000 Options

The control unit of the JRL 1000 may be specially strapped to permit the following off-line operations, independent of the computer. In a stand-alone mode of the JRL 1000, input from the light-pen is directed to the printer for print-out. In another special mode, with the JRL 1000 coupled to a CRT, input from the light-pen is displayed on the CRT. Both of these modes are useful for testing the readability of bar-codes.

In another configuration, as yet untried by the University of Chicago, the JRL 1000 could be coupled with a cassette tape recorder, to which inputs from the light-pen could be logged. Later, the contents of the tape could be read to a computer. Figure 3 portrays a block diagram of the JRL 1000.

RATIONALE FOR DEVELOPMENT: REQUIREMENTS OF A CIRCULATION TERMINAL FOR THE UNIVERSITY OF CHICAGO LIBRARY

Chicago's approach to development of a circulation terminal has been first to define what a circulation system should do, and then to provide a terminal with appropriate capabilities. Developing circulation control as one subsystem of the University of Chicago Library Data Management System provides opportunities that other kinds of circulation system designs do not. This explains in part why the library's requirements for a circulation terminal were not met by traditional, commercially available devices. From another viewpoint, the lack of suitable terminals for circulation control (historically, most of the terminals available) has placed serious constraints upon the capabilities of resulting systems.⁶ In a survey of on-line circulation systems, the Library Data Management Project found that only in the last few years have system designs overcome the limits of devices that vendors have offered as "circulation terminals."⁷

The following sections discuss basic interactive functions Chicago desires of an on-line circulation system and the capabilities appropriate for a terminal to perform them.

Charge

To record charges it is necessary to input data that identify borrowers and books. It is highly desirable for these data to be machine-read so that their transfer will be quick and error-free. If data are not machine-read,

they must be manually input. Manual input occurs even in systems with machine-readable identification, because users inevitably forget ID cards and also charge materials that do not have machine-readable identification (e.g., microforms, uncataloged pamphlets). It is desirable for the charge function to produce printed transaction evidence that identifies the user, the book, and its due date, for both users' convenience and inspection of materials at library exits. It is further desirable to block loans either to "delinquent" patrons who have committed serious infractions or of materials that for special reasons should not be charged (e.g., pieces on save).

For all this the charge function therefore requires a terminal with (1) the capability to machine-read borrower and book identification, (2) the availability of a keyboard device to manually input identification data, (3) the capability to produce printed transaction evidence, and (4) the capability to signal and explain the conditions that block loans. The last calls for an output capability that sometimes is best met by a display screen, although a fast printer may suffice.

Self-Charge

Patron self-charge requires that charge transactions be simple, error-free, and convenient. The use of machine-readable identification for borrowers and books is preferred. The other requirement is to produce printed evidence of valid charges, for reasons mentioned above.

Terminals suitable for patron self-charging should therefore have (1) the capability to machine-read borrower and book identification and (2) the capability to produce printed transaction evidence.

In some situations it may be unwise to attempt extensive blocks of patrons' self-charges: their reaction might be to take books out anyway. If production of transaction evidence is the primary response of the system to a self-charge, then a printer should be a sufficient output device, and a display screen is unnecessary.

Renewal

The data processing requirements of making a renewal are simple: an existing charge record must be identified and updated. This can be done with the capabilities already described for the charge and self-charge transactions. However, to make renewals without a book or borrower present—e.g., renewals by telephone, mail, or renewal-box request—a keyboard is needed to manually input data not present in machine-readable form.

Therefore, depending upon the kinds of renewal services offered, the following capabilities are required of a terminal. A self-renewal service, or a service that forces users to present both ID cards and books, would require a terminal with only (1) the capability to machine-read borrower and book identification and (2) the capability to print transaction evidence. A service that permits users to renew without book or ID card would additionally require (3) a keyboard, and possibly (4) a display screen, if

interactions with the system are needed to determine which loan is being renewed. Here is a very good example of how the capabilities of a circulation terminal can determine the level of library service.

Discharge

The data processing requirements of making a discharge are the same as for renewal: an existing charge record must be identified and updated. Access to the loan record usually can be made with the book's identification; user identification is not normally a required input. Because some discharged books need to be specially identified and routed (e.g., pieces on save), the capability to display messages is needed.

For discharge the following capabilities are therefore required of a terminal: (1) the capability to machine-read book identification; (2) the capability to print discharge evidence upon request, and routing instructions for books with special destinations; and (3) a keyboard for discharge of books whose machine-readable identification is missing, or for discharge of materials that never had machine-readable identification (e.g., microforms, pamphlets).

Query

Implementing circulation control as but one part of an on-line data base management system presents unique opportunities for file inquiry. The design of the University of Chicago Library Data Management System permits a suitable terminal to serve as a point of access to remote files of acquisitions, cataloging, holdings, and circulation information. The capability to remotely access centralized files is a fundamental strength; this is the same concept that enables the circulation system at Ohio State University and the cataloging system of the Ohio College Library Center to improve library performance radically.⁸ It is this capability that makes circulation stations much more powerful public service points than ever before.

To take full advantage of opportunities for query requires a device that permits input of a variety of alphanumeric search keys such as call number, author, title, author-title code, and so forth; and then rapidly to display and interact with responses that sometimes may involve large amounts of data. As the Library Data Management System grows, it will serve progressively as an on-line catalog.

The kind of terminal device appropriate for this opportunity should have (1) a full case alphanumeric keyboard, for input of queries and instructions to the system and (2) a screen for rapid and convenient display and manipulation of data. It is also desirable to have (3) a printer so that users can have printouts of whatever information is appropriate.

Save (Hold-Recall)

To place a save or to recall a book in circulation requires information on the library's holdings for titles, and then the circulation status of want-

ed physical pieces. Often any of several books may satisfy a user's need; therefore the capability to query library holdings and search the circulation file are requirements for this service. To do this requires the same capabilities of a terminal that have just been described for querying. In addition, when users make requests in person, it may be desirable to machine-read their identification to make these transactions.

Terminals used to place saves should therefore have (1) a full alphanumeric keyboard, (2) a display screen, and (3) the capability to machine-read user identification. The ability to produce a printed record of the save, for the user, is desirable.

File Conversion

The design of the Library Data Management System and the strategy for its implementation call for gradual conversion of retrospective bibliographic records. Because its retrospective data base is large, the library cannot afford a one-time conversion of the shelflist. An attractive strategy is therefore to convert bibliographic records for as many as possible of the retrospective pieces that circulate. For some levels of conversion (e.g., input of call numbers for retrospective books entering the new system for the first time), the idle time of circulation attendants at public service terminals will be used. This requires a device with capabilities previously found needed: (1) a full case alphanumeric keyboard and (2) a display screen, to review and correct data before addition to system files. Editing features are desired of terminals used for input, review, and correction of bibliographic data. Editing capabilities, therefore, are justified for terminals used to convert retrospective data, especially in large libraries where this is a major cost factor and a necessary step of evolving an on-line catalog.

Summary of Required Capabilities

Table 3 summarizes the foregoing discussion. For each function it shows with entries of "yes" the capabilities required of a terminal. Entry of "desirable" shows a capability is wanted but not essential. "Useful" indicates a capability is not essential to a function, but that it can be used to advantage if available.

From a different perspective, let us briefly review the usefulness to the University of Chicago Library Data Management System of capabilities for its public service terminals.

• Alphanumeric Keyboard

Having a keyboard places minimum restrictions upon the use of a terminal as an input and query device. In all transactions except those performed by patrons for themselves, a keyboard is either desirable or required in order to input alphanumeric data that for any reason are not present in machine-readable form. This is especially important as a backup or alternative mode for entry of transaction data, when ma-

Table 3. Summary of Requirements for a Circulation Terminal

Functions	Capabilities Required of Terminal Device				Capability to Machine-Read Borrower and Book ID
	Alphanumeric Keyboard	Display Screen	Editing Features	Alphanumeric Printer	
Charge	Yes	Desirable		Yes	Yes
Self-Charge		Useful		Yes	Yes
Renewal	Desirable	Desirable		Yes	Yes
Discharge	Desirable	Useful		Yes	Yes
Query	Yes	Yes	Useful	Desirable	Useful
Save (Recall/Hold)	Yes	Yes	Useful	Desirable	Desirable
Data Conversion	Yes	Yes	Yes		

Yes: The capability is required.

Desirable: The capability is wanted but not essential.

Useful: The capability can be used to advantage, but is not essential.

chine-readable identification is unavailable for either a borrower or a book.

- Display Screen

For interactive transactions, the capability to display rapidly large amounts of information is especially important in making file searches and providing instructions and messages to system operators and patrons. In the work of data conversion, it is extremely valuable to proofread displays of inputs and correct them before they are released and added to system files. Within the context of the Library Data Management System, there is the opportunity for terminals at public service points to serve as general-purpose interactive devices for any desirable access to the library's data bases, and not just narrowly for the traditional circulation functions of charge, discharge, etc.

- Alphanumeric Printer

The purpose of a printer for a circulation terminal is to provide users with copies of information they may take away. The primary uses are to provide patrons with transaction evidence so that they may have proof of charges, discharges, renewals, saves, and so forth, and with hardcopy of messages the library has for them. Generally, the printer complements the display screen capabilities, since it provides library staff with hardcopy of the data they need for tasks such as searching manual files, tracing missing books, paging requested material, and so forth. The faster the printer, the better it can serve in lieu of a display screen.

- Capability to Machine-Read Book and Borrower Identification

It is desirable that frequently repeated inputs for transactions be machine-readable, to make them quick and error-free. In a system that yearly performs millions of transactions with borrowers and books, it is important to identify them by machine-readable inputs. Alternatively, identifications must be made by time-consuming, error-prone entries with a keyboard. Having machine-readable borrower and book identification therefore enables rapid and accurate charges, discharges, and renewals, and also makes self-charging and self-renewal feasible.

ADAPTION AND TEST OF BAR-CODED LABELS

This section summarizes work by the library and several vendors during 1973 and 1974 to adapt and test bar-coded labels as machine-readable book and borrower identification.

Chicago's Requirements for Bar-Coded Labels

The Library Data Management Project's basic concept of book labels is that they should be inexpensive, and quick and easy to apply. When an unlabeled book is charged out through the new circulation system for the first time, one of several matching labels is applied permanently to it, and another to its charge card. (Fortunately, most of the library's books contain manual charge cards that have been used in manual circulation systems.) The book is then charged out by its newly assigned identifier, the "label number." The charge card, no longer needed, is removed to a "data conversion process," where, as soon as time permits, an operator will input its call number and label number, which the Library Data Management System will permanently associate and store.

This design avoids two common and costly problems of implementing an automated circulation system: the requirement for every book in the collection to receive machine-readable identification before implementation, and the need to convert call numbers to machine-readable form in advance. It assumes the capability of the Library Data Management System to store permanently the pairs of call numbers and label numbers, and to provide access by either key.

To follow this strategy, label number should be a numeric-only, check-digit identifier such that any label number can be assigned to any book. If random assignment is impossible, then certain labels must be matched to certain books, with the attendant procedures, sets of ordered labels, and labor costs. Label identifiers should be check-digit numbers, to permit easy manual input with keyboard devices and automatic detection of errors in transcription or electronic transfer. The ability to key-stroke label numbers is backup to failure of bar-code scanning.

Chicago also requires that each book label be produced in triplicate: one "inner label," for application inside the back cover; one "outer label," for application on the outside of the back cover; and one label for data conversion, for application to the charge card.

Why the need for an outer label? Obviously, an outer label can be read with the book cover closed. This is possible for transactions that do not require insertion or removal of printed evidence, or inspection of an opened book. When portable scanners become a reality, an outer label will facilitate inventory at the shelf. When fixed-position scanners (in contrast to hand-held scanners) become cost-feasible, an outer label will permit a conveyor-belt check-out operation in which books are moved past a stationary read head.

Finally, there is a set of physical requirements that are easy to stipulate,

but more difficult to specify and measure. Labels must be durable for the lifetime of books to which they are applied. The components of the label—in this case ink, paper, and adhesive—must be of sufficient quality to assure this. As discussed below, these criteria, in addition to those of an outer label, have been the most difficult to fulfill, and their fulfillment the most difficult to verify.

Chicago's requirements for a bar-coded ID card proved much simpler: the library and the university administration agreed to have ID cards labeled and then laminated. The remaining problem was to ensure that laminated labels would scan successfully with a light-pen.

Previous inquiries by the Library Data Management Project found that most contacts believed a bar-coded label attached to the outside of an ID card eventually would wear off, or become so marred that scanning would degrade. With the agreement to label-then-laminate, the library made no further investigations of attaching labels to the surface of ID cards.

Adaption of Labels to Books

In the course of working with Monarch Marking Systems to find a satisfactory label, the Library Data Management Project became especially concerned with three factors: (1) the quality of the labels' adhesive, (2) the technical feasibility of an outer label, and (3) the ink-smear problems of labels produced on computer-driven, high-speed printers. The last is more than an aesthetic nuisance; in cases of severe ink rub-off, bar-coded labels may be rendered unscannable.

The ink-smear problem can be avoided by electing to print labels on a manually-operated device that directly applies liquid ink, without use of a print ribbon. However, the library refused this solution in the belief that it would prove too costly and awkward to print millions of check-digit labels on a hand-operated machine. Monarch agreed and began a long search to remedy the ink-smear problem.

After eliminating various combinations of paper, ink, and print ribbons, Monarch advised the LDMP that the most immediate and promising solution would be to overlay the surface of the label after printing with a thin coat of varnish. The Library Data Management Project agreed, hoping that the overlay would not only prevent ink-smear, but enhance the durability of the label's surface. Monarch began work to produce prototypes.

During this period, the Library Data Management Project had growing concern for the issues at stake in development of a bar-coded label suitable for library books. With librarians across the country expressing intense interest in bar-code systems, there was the possibility of American libraries beginning massive labeling programs without satisfactory labels.* It seemed prudent to enlist an impartial authority. The Library Data Management Project asked the American Library Association's Library Technology Project if it would sponsor further development and testing of la-

bels. Howard Pasternack of LTP responded that it did not have resources for immediate participation and suggested contacting Walter Wozniak of Chicago Paper Testing Laboratory, with whom ALA had previously worked to evaluate spine labels for books. Through the services of Herman Fussler, similar overtures were made to the Council on Library Resources. Because of time limitations, no formal or informal proposal was made.

Upon contacting Walter Wozniak of the Chicago Paper Testing Laboratory, the Library Data Management Project found immediate understanding and appreciation of the problem. Easy agreement was reached on what properties of labels to test, and how.

In April 1974 Monarch furnished prototypal varnished labels. Surface abrasion tests showed them prone to ink-smear and rub-off. Shortly thereafter, at a meeting in Chicago with Monarch Marking Systems and Chicago Paper Testing Laboratory, it was decided that Monarch should investigate the possibility of overlaying labels with a polyester film. This approach later proved impossible with Monarch's current manufacturing process, in which the overlaying substance is applied last, after labels are die-cut from continuous stock and then printed. Although labels may be easily peeled from stock coated with varnish, this would be impossible with a continuous overlay of polyester film.

The Library Data Management Project then suggested the use of a polyester "overlabel" that could be applied on top of a paper label of smaller dimensions. The overlabel would have two purposes: to protect the paper label from surface wear, and to secure the outer label more firmly. The Library Data Management Project still believed that paper labels should be varnished, to avoid ink-smear during handling prior to "overlabeling." Besides, it was suspected that paper labels applied to the inside cover of a book might not require a polyester overlabel, but certainly would need an overlay of varnish.

Monarch continued to develop its process of varnishing labels and began work to determine which of the twenty-five or so kinds of polyester labels it was familiar with would serve best as an overlabel. On 24 May 1974, Monarch submitted final samples.

Adaption of Labels to ID Cards

In May 1973 the Library Data Management Project had asked the University of Chicago's prospective ID card vendor, Identatronics, to collaborate with Monarch in furnishing samples of an ID card with a bar-coded

* At least two U.S. vendors are selling circulation systems based on bar-code technology: Checkpoint Systems, Inc., 22 Springdale Rd., Cherry Hill, New Jersey 08003 (609) 424-3035; and CLSI, 81 Norwood Ave., Newtonville, Massachusetts 02160 (617) 965-6310. Checkpoint uses bar-code technology provided by Plessey Telecommunications, Data Systems, Sopers Lane, Poole, Dorset, BH177ER, England. CLSI has adapted bar-code labels and scanners supplied by Monarch Marking Systems, P.O. Box 608, Dayton, Ohio 45401 (513) 866-7401.

label beneath its laminated surface. This was done, and Monarch conducted tests that confirmed the card's workability, with the caution that the optical properties of some laminates can interfere with scanning. Nearly a year later, as development of the varnished label neared conclusion, the library acquired equipment and supplies to make sample ID cards with varnished labels for the tests described below.

Tests of Labeled Books and ID Cards

In May 1974 the Chicago Paper Testing Laboratory began a battery of tests commissioned by the library. The report of results is abstracted as Appendix 1.

Upon return of tested materials, the library found that bar-coded labels successfully scanned with the JRL 1000.

Chicago's Use of Labels

Beginning in September 1974, the University of Chicago issued a new student ID card shown in Figure 4. The card contains a bar-coded label and color photograph beneath its laminated surface. By November 1974, the library had labeled nearly 100,000 books. The paper book label is shown in Figure 5; the polyester overlabe in Figure 6; the specifications for book labels in Figure 7.

CONCLUSION

The University of Chicago Library feels a strong obligation to make the JRL 1000 Circulation Terminal available to other libraries—considerable interest has been shown. To preserve its status as a private, nonprofit institution, the University of Chicago may not itself manufacture and supply terminals for other institutions. Therefore, at the time of this writing (November 1974), the university is seeking to establish a vendor to provide the terminal to other libraries.

The library's circulation system is still under development. It is expected to become operational during winter 1975. When the system is completed, documentation will be made available.

The bar-coded label described herein is a first-generation product. Improved labels are soon to be marketed by Monarch Marking Systems.

ACKNOWLEDGMENTS

Thomas A. Nunamaker, supervisor of the electronics shop of the University of Chicago's Enrico Fermi Institute, is responsible for the electronic and mechanical design of the JRL 1000 Circulation Terminal. Randall M. Lee and James A. Renkel of the university's computation center assisted in functional design of the terminal, and in its description as reported here.

Preparation of this document has been supported by CLR/NEH Grant No. EO-262-70-4658.

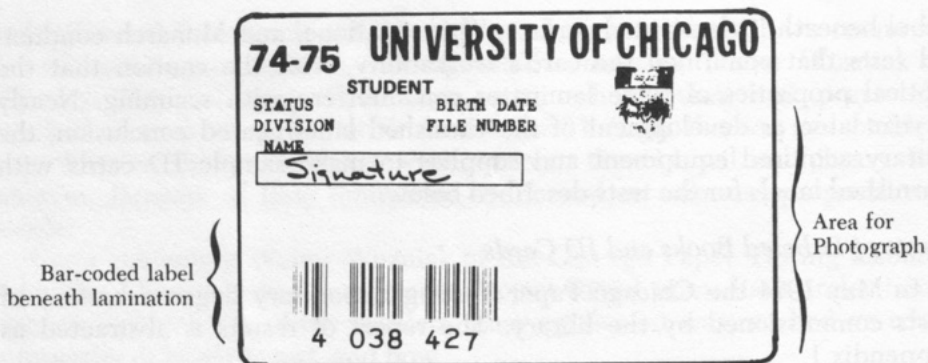


Fig. 4. Bar-Coded, Laminated ID Card (Actual Size).

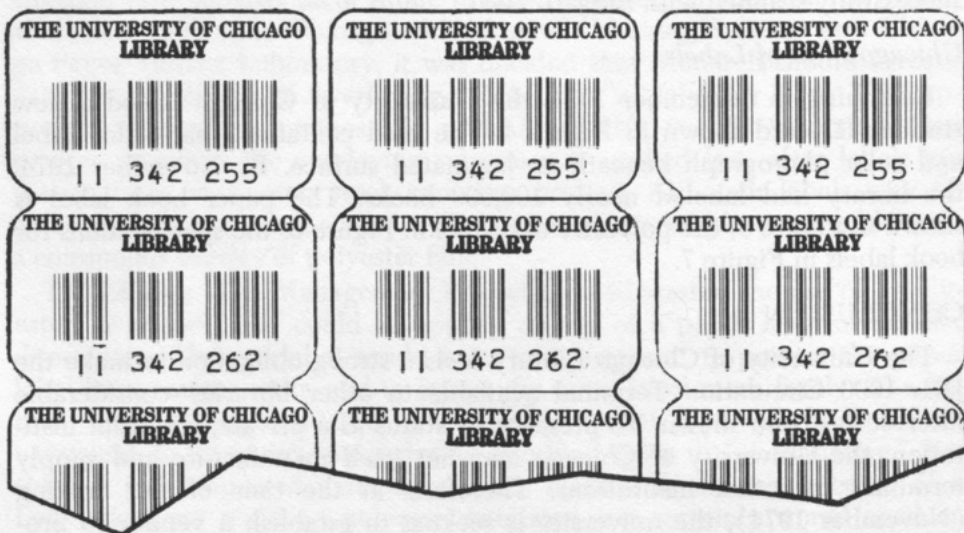


Fig. 5. Varnished Paper Labels on Continuous-Form Stock (Actual Size).

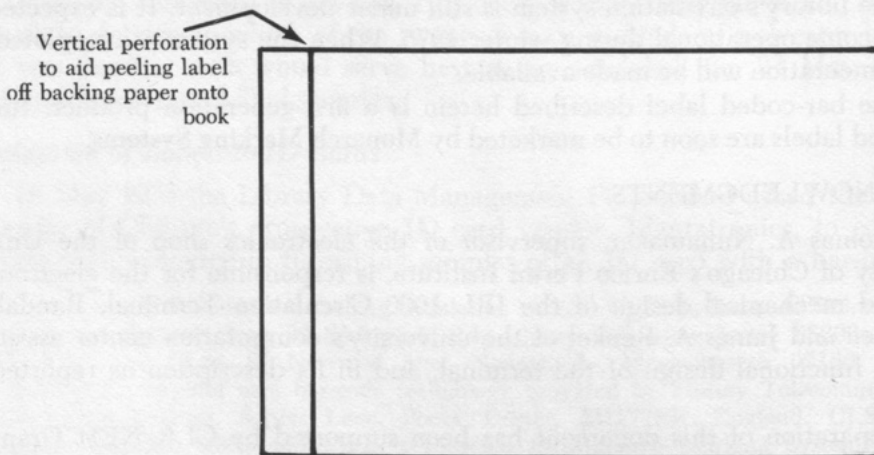
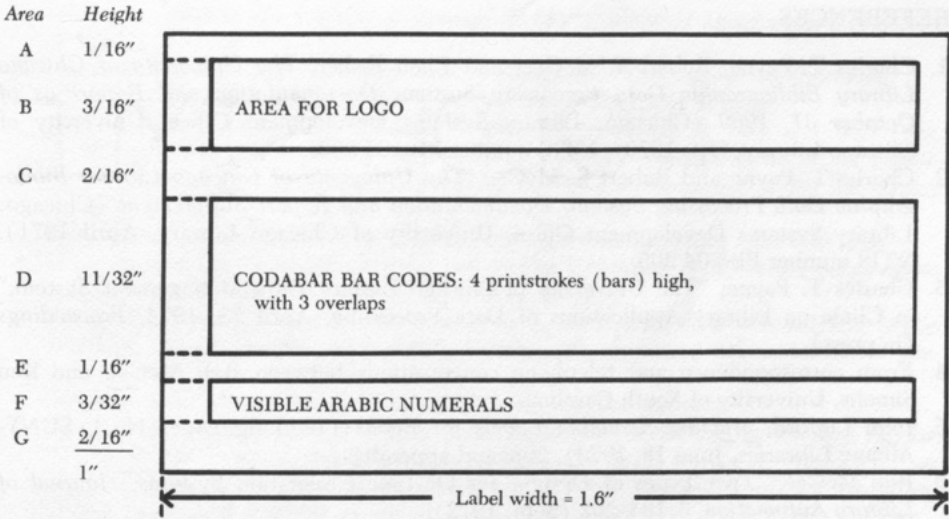


Fig. 6. Clear Polyester Label on Backing Paper (Actual Size).



Specifications for areas of label

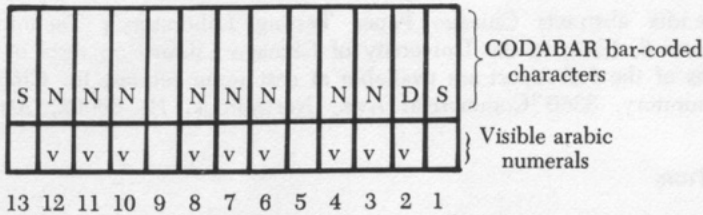
1. Unprinted areas (areas A, C, E, and G) must be clear of smudges, smears, stains, markings, patterns, either from printed areas or from process of manufacture of either the paper itself or the label.
2. Characters of the logo, CODABAR bar codes, and visible arabic numerals must be printed clearly and distinctly, without smudging and smearing.

Specifications for CODABAR Bar Codes and Visible Arabic Numerals

S = start/stop character

NNN NNN NN = consecutive part of label number

D = check-digit part of label number



1. CODABAR bar-coded characters shall be 4 printstrokes (bars) high.
2. Start/stop characters will appear only as CODABAR characters; they will not appear as either visible arabic numerals or roman alphabet characters.
3. Start character will appear immediately to the left of the first N value; stop character immediately to the right of the D value.
4. The CODABAR character string is right-justified to position 1; leading zero(es) do not appear. Visible arabic numerals are right-justified to position 2.
5. No more than three visible arabic numerals appear side-by-side. CODABAR position 5 or 9 may contain a start code; otherwise both are blank.

Fig. 7. Specifications for Book Labels.

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APPENDIX 1

Abstract of Report on Tests of Bar-Coded Labels

This appendix abstracts Chicago Paper Testing Laboratory's Technical Report No.12309, June 6, 1974, to the University of Chicago Library on tests of bar-coded labels. Copies of the full report are available at cost upon request to: Chicago Paper Testing Laboratory, 3360 Commercial Ave., Northbrook, IL 60062, Attn: Walter Wozniak.

Laboratory Tests

Laboratory tests were performed on samples of varnished printed labels and Mylar film submitted by Monarch Marking Systems. The tests were performed on paper labels before and after aging, with and without Mylar overlabs. Labels were affixed to books, aged for six days at 158°F., and evaluated for adhesion and appearance.

Prior to testing, all specimens were conditioned at standard TAPPI temperature of 73°F. and 50 percent relative humidity. The laboratory tests were performed in accordance with standard test methods.

Comments

- Test results show that aging (six days at 158°F.) increases the adhesiveness of the paper label and the Mylar overlabs.
- No evidence of peeling, curling, significant color change, or delamination was ob-

served on outer or inner labels at the end of the accelerated aging period (six days at 158°F.).

- The results of the surface abrasion test (Gardner Rub Test) show the following:
The varnished paper label exhibits good rub resistance up to 50 rubs.
The varnished paper label exhibits severe ink smearing at 100 and 300 rubs. At 300 rubs the aged varnished paper label exhibits considerably more ink smearing than the unaged label. This is probably due to the hardening of the ink during the aging period.
The Mylar overlabel exhibits no surface marring or ink smearing after 600 rubs.
- The results of the one-hour abrasion test in the Universal Book Tester (equivalent to thirty-four library circulations) show the following:
The inner labels (affixed to inside of cover), both with and without the Mylar overlabel, do not exhibit any peeling, curling, ink smearing, delamination, or surface marring due to abrasion.
The outside Mylar overlabels do not exhibit any surface marring.
The outside varnished paper labels, without Mylar overlabels, depending on the weight of the book, type of cover material, and type of cover (hardcover or paperback) sustain a wide range of surface damage, consisting of ink smearing, peeling, curling, and abrasion.
- The laminated ID cards which were aged six days at 158°F. did not exhibit any delamination, blistering, or discoloration due to the aging process.

Conclusions

On the basis of the tests performed, some of which are comparatively severe, the indications are that the labels should adhere to the book covers for a prolonged period of time. Since no previous work of this nature has been carried out, it is not possible to establish a precise shelf life of the label; however, the tests indicate that under the accelerated aging conditions employed, the adhesiveness of the labels, and especially the Mylar film, is increased.

The tests also indicate that it would be advisable to use Mylar overlabels on the outside cover to increase adhesiveness, and prevent surface damage due to normal usage or malicious tampering.

CONSER: An Update

Richard ANABLE*: Council on Library Resources, Washington, D.C.

The purposes of this paper are to explain what the CONSER Project is, to answer some of the questions that have been raised concerning it, and to make some general comments on the problems associated with this type of project. This paper will not attempt to review in detail the history and operational facets of the project since these are available elsewhere.

WHAT IS THE CONSER PROJECT?

CONSER (CONversion of SERials) is a cooperative effort to establish a data base of bibliographic records on serials publications that can be used at the very least by the generators and maintainers of union lists of serials. The data base will also be usable on the local, regional, national, and international levels as a source of authoritative bibliographic information and as a base file for maintaining machine-readable serials files. The bibliographic information will be authenticated as far as possible by the Library of Congress (LC) and the National Library of Canada (NLC); these libraries will also maintain the data base when the project has been completed. It is expected that the project will last at least two—perhaps three—years and will result in a file of between 200,000 and 300,000 titles.

CONSER will use the LC MARC Serials (LC MARC-S) format, expanded to accommodate some of the data elements of the Canadian MARC serials (CANMARC-S) format, and the International Serials Data System (ISDS). The preliminary work on CONSER identified some conflicts among these formats, and the resulting suggested expansions and modifications have been forwarded by the Library of Congress to the American Library Association's Committee on Representation in Machine-

* Lawrence Livingston and George Parsons of the Council on Library Resources staff are also associated with the CONSER project.

Readable Form of Bibliographic Information (MARBI) for review. It should be noted that it is not the intent of the project to establish, de facto or otherwise, new standards.

The Anglo-American Cataloging Rules (AACR) as amended will be followed in the establishment and authentication of certain aspects of the cataloging for the project. Additional data, such as key title and the International Standard Serial Number (ISSN), will be established and authenticated through the ISDS. The project is managed by the Council on Library Resources (CLR) and uses the Ohio College Library Center (OCLC) on-line cataloging system (*sans card production*). It will use the Minnesota Union List of Serials (MULS) data base as its base file.

Nine institutions are involved in the initial phase of the cooperative project: the Library of Congress, the National Library of Canada, the National Library of Medicine, the National Agricultural Library, the State University of New York/New York State Library, the libraries of the universities of California and Minnesota, and of Yale and Cornell universities.

PARTICIPATION

Participation in the planning and the related preliminary work of CONSER has been significantly broad. It has included not only representatives of the institutions named above but also individuals chosen solely for their expertise and interest. The names of those who have been involved are given in a recent *Library of Congress Information Bulletin (LCIB)*, and in the listing of members of subcommittees established by the Ad Hoc Discussion Group on Serials Data Bases. Representatives of the Subgroup on the Union List of Serials of the Canadian Union Catalog Task Group, whose membership is shown in *LCIB*, also contributed indirectly to the planning. While participation in the meetings was primarily on an invitational basis, the sessions were open. CONSER receives guidance from an advisory group which draws its membership from organizations representing the library and the indexing and abstracting communities. Members of this group are also named in *LCIB*.

In some instances, expenses of the participants in the planning and working meetings have been borne by their institutions. In addition, three institutions—the University of California, the State Library of New York, and the Five Associated University Libraries (FAUL)—contributed directly to meeting costs. The remaining expenses have been contributed by the Council on Library Resources.

The choice of the specific institutions to participate in the actual conversion effort was based on a number of factors. These included the number of serials titles held, the quality of cataloging, and the ability of an institution to absorb a portion of the local costs. It is anticipated that additional institutions will be added to the nine listed above as the project progresses. The International Serials Data System will participate initially

through the national centers in the United States and Canada (National Serials Data Program and the ISDS/Canada).

WHY THE COUNCIL ON LIBRARY RESOURCES AS MANAGEMENT?

The Ad Hoc Discussion Group on Serials Data Bases, which conceived the idea of the CONSER project, was not in a position to carry the idea to its final conclusion. It had no legal status and no permanent staff. It could not collect or distribute funds; it could not be involved in contractual negotiations. That the Council on Library Resources was in the best position at that time to manage this effort was the collective decision of the Ad Hoc Discussion Group with the support and agreement of the Library of Congress, the National Library of Canada, the Association of Research Libraries (ARL), and CLR. Further, various members of the staff at the council have had long involvement with the National Serials Data Program and the International Serials Data System. They were also in a unique position to evaluate the systems requirements and the qualifications of the various entities that were being considered to host the CONSER project.

THE QUESTION OF TIMING

It has been suggested by some that it would be well to delay a program of this sort until a later date. In view of the ever-increasing number of redundant and independent serials conversions projects on the local and regional levels, further delay would appear to be wasteful of both time and money. Most of the projects that have been undertaken thus far are incompatible in terms of bibliographic data, systems, and formats. For the most part, the resulting records have been very shallow in bibliographic depth and have not been well tagged (i.e., the data elements were not well defined). The MULS file is a notable exception. There has been little communication among creators and/or maintainers of the serials files.

On the national level, in both the United States and Canada, tape distribution services covering serials publications are either planned or in operation, but these concentrate on new titles and title changes. CONSER, on the other hand, will include retrospective titles, including current and ceased publications.

A very important aspect of most serials catalogs is that they are usually in a book or list form with the entire file regenerated (displayed) periodically. Hence it is desirable to have the entire file in machine-readable form, with all records in the same (or similar) format. Tape services are available that offer serials records in a newer, more comprehensive format, but their titles represent only a very small proportion of the titles in any given file. Consequently, the use of such tape services is limited.

What was and is needed is a source data base that contains a major portion of most local and regional files in a single, nationally acceptable format. This is what CONSER is attempting to build. The idea, then, is to

consolidate a number of conversion efforts, to reduce the amount of work that any one institution has to do, and to produce a file that is usable by the library and indexing and abstracting communities. The sooner this is done, the less expensive it will be for the library community as a whole. It is recognized that both the National Library of Canada and the Library of Congress have committed themselves to participation in the International Serials Data System. It is also recognized that the ISDS has the same problems that LC and NLC have; that is, all three are barely able to concentrate on the new titles and title changes. The successful implementation and maintenance of the ISDS is of vital concern to all types of serials control on this continent, for it holds the promise of a wealth of ongoing information on serials in an international standard format. The availability of the CONSER file should be of great assistance to that effort, for it is the intent of the CONSER project to remain as compatible as possible with the requirements of ISDS and to make the results of the conversion effort available to it.

Following the announcement by Lawrence Livingston at the winter meeting of the Association of Research Libraries in January 1974, the planning for CONSER began in earnest. This included negotiations with the Ohio College Library Center, leading to a signed contract as well as a determination of how the participants would interact with the system, how the data would be authenticated, what conventions would be used for the input of data, and other related decisions.

It had been hoped that CONSER would be started in a test mode in the third quarter of 1974. However, the planning and contract negotiations took longer than anticipated. The project is now scheduled to be fully operational in the second quarter of 1975.

BIBLIOGRAPHIC CONVENTIONS

Within the CONSER project, the Anglo-American Cataloging Rules as revised are preferred, since they are essentially the standard for current cataloging that is subscribed to on this continent. However, it is also noted that these rules (AACR) have been in existence only since 1967 and have not been adopted in their entirety by either the Library of Congress or the rest of the North American library community. Two prime areas of disagreement were the policy of superimposition with regard to form of names and retention of the latest-title convention.

While the Library of Congress in 1971 did drop the latest-title convention in favor of AACR successive-title convention, the majority of the serials cataloging done prior to those dates, at the Library of Congress and elsewhere, was done under the older ALA cataloging rules for author and title entries. The net result is that the majority of the records cataloged to date are under latest-title convention. This fact, together with the problems associated with the breaking of existing holding statements and the required recataloging, is the reason for a policy decision to allow both

forms of cataloging in the CONSER project data base. There will then be an allowed duplication of records in the file, some cataloged under the latest-title convention, and some under the successive-title convention. The successive-title convention is preferred for all records and is required for any new cataloging.

With regard to form of entry, again the participants will be able to use the form that they have already recorded. However, the "centers of responsibility" will authenticate the names entries according to the AACR. This shifts the recataloging load from the participants to the centers of responsibility. CONSER is also committed to remain as compatible as possible with the ISDS data element requirements.

It is also hoped that from the resulting record a description of the serial can be displayed in a manner consistent with the final International Standard Bibliographic Description for Serials.

In trying to achieve these goals, some technical and philosophical problems have been detected. Many of them have already been resolved; some problems remain. The format problems have been mentioned above, as well as the route taken to solve them. The bibliographic problems are of a different nature, although similar routes for solution are being taken; that is, asking those responsible for the revision of standards to make specific modifications. While the CONSER project may have brought these problems to the fore, they are not CONSER's alone. The problems exist with or without automation. They are the result of conflicting sets of rules and of the interpretive processes that are required to implement those rules. A companion article to be published in *Library Resources & Technical Services* deals with these bibliographic considerations in more depth.

SUMMARY

The CONSER project is an attempt to establish a relatively comprehensive bibliographic data base of serials records in machine-readable form. It is an international cooperative effort. The results of the project will be available through the Library of Congress and the National Library of Canada.

The project itself is not a long-range solution to the problems associated with the bibliographic control of serials in North America. It is one step toward the solution of some of those problems, not only in terms of the promised products but also in terms of the manner in which CONSER was conceived and nurtured; that is, it is a cooperative effort on the part of a number of institutions geographically and politically separate. This type of interinstitutional cooperation should be encouraged; its very existence is a credit to those institutions that are either participating in the project or have encouraged the concept.

Stanford University's BALLOTS System

Project BALLOTS and the Stanford University Libraries.

The library automation program at Stanford University is called BALLOTS (Bibliographic Automation of Large Library Operations using a Time-sharing System). BALLOTS is an on-line, interactive system that has been supporting the day-to-day acquisition and cataloging operations of the Stanford University Libraries since November 1972. This article describes the background and functional capabilities of the system and the hardware environment in which it operates. Line managers in the library who are responsible for running the BALLOTS system discuss its impact on library procedures and staff. Prospects for extending BALLOTS to network use are summarized.

BACKGROUND

In early 1967, following a period of rapid growth in library staff and in the volume of items processed, Stanford University received a grant (and a subsequent extension) from the U.S. Office of Education (USOE) to create a flexible and reliable on-line system for bibliographic control. The focus was on supporting library technical processing in order to reduce the clerical workload by placing the burden of repetitive tasks on a machine system; using a time-sharing computer already serving several groups of users; creating an on-line system with multifile and multiindex capabilities; and using video display units. The design of the system was to allow for its extension, in phases, from technical processing support to other areas of library operations and eventually to other libraries. Additionally, a long-term project goal was to reduce per-unit costs for acquisition and cataloging while allowing the library to handle more materials without a proportional increase in the size of the staff.

Under the two USOE grants, a prototype acquisition system (BALLOTS I) was designed and implemented by BALLOTS in collaboration with SPIRES (Stanford Public Information Retrieval System), a Stanford project funded by the National Science Foundation.¹ BALLOTS I was op-

erated for a nine-month period in 1969 in the Stanford University Libraries. At the end of this period, the system was evaluated and the design of the production version begun. User response to the prototype system was excellent. Library personnel who were borrowed part-time from library departments in order to staff specialized data preparation and input units learned to operate the system in one-third the planned training time. Typewriter terminals were used because at that time no economical or suitable video display unit was found, but these terminals proved to be noisy and slow. User-initiated backup procedures were required to ensure file protection—a practice that proved inadequate. The BALLOTS I prototype system was too costly for production operations.

After the prototype evaluation, the requirements for the production system were clear: (1) reliability—minimum downtime; (2) rapid recovery time; (3) file integrity—procedures had to be designed into the software that would protect all files from user-, program-, or equipment-initiated failure; (4) cost acceptability—in the long run, the system would have to be able to handle an increasing volume of work at a cost equivalent to or less than the cost of a manual system handling comparably increasing workloads; (5) procedural integration—the system had to be integrated into the day-to-day work of the acquisition and cataloging departments rather than segregated in specialized units.

In 1972, BALLOTS applied for and received a two-year joint grant from the Council on Library Resources and the National Endowment for the Humanities to implement a series of ten cumulative technical processing “modules” or sets of capabilities.² This work resulted in the operational BALLOTS II production system described below.

The development cycle for each system module included the following steps: (1) determine the system requirements; (2) prepare written specifications; (3) update these specifications in response to library and programmer review; (4) program (including design, coding, checkout, and documentation); (5) perform system acceptance testing (both systems analyst and library user testing); (6) train users; and (7) begin production. Because of the extensive acceptance testing before production, parallel operations in the library were not carried on after the onset of production.

Currently, the BALLOTS staff is organizationally part of the Stanford Center for Information Processing (SCIP), reporting to the associate director for library and administrative computing. The project director and staff also have a dotted-line relationship with the Stanford University Libraries and are represented on the library’s organization chart as the Automation Department.

SYSTEM OVERVIEW

BALLOTS II (hereafter referred to simply as BALLOTS) has been in continuous production at Stanford since November 1972, when the first module was implemented, providing comprehensive on-line technical pro-

cessing services in the Stanford University Libraries.

For the Acquisition Department, the system supports the ordering, claiming, canceling, receiving, and in-process control of monograph materials arriving on regular or standing orders; the receiving and in-process control of materials received on approval or blanket plans, by exchange, or gifts; the ordering, claiming, and canceling of serials; and the procurement control of out-of-print materials. Claiming for serials includes automatic follow-up until the first piece of a new subscription is received; claiming for all other materials (including standing orders for terminal sets) includes automatic follow-up of orders on a regular schedule until the entire order is filled or canceled.

For the Catalog Department, the system supports the in-process control, cataloging, and records maintenance of all materials (monographs, serials, terminal sets, microtexts, etc.) cataloged in the roman alphabet, including transliterated Cyrillic. The system also enables one to establish automatic, repeated standing searches against the BALLOTS MARC file; this capability will be described later.

As one result of each day's on-line activity in the library, the following morning the library receives all the printed documents required in processing. Se-Lin spine labels are printed at a computer typewriter terminal in the library.

The BALLOTS system uses programmable CRT (cathode ray tube) terminals in the library that are connected to an IBM 360 model 67 computer, approximately one mile away. This computer also supports the faculty and student academic and research computing. About 2,000 computing jobs, in addition to BALLOTS, are run on this computer each day. The on-line portion of BALLOTS utilizes approximately 3 percent of the computer capacity during normal working hours.

FILES AND INDEXES

The system supports several on-line files accessible through a powerful set of indexes. Currently, in addition to the BALLOTS MARC file, there are three generic types of files that may be created: (1) in-process—containing bibliographic and acquisition or in-process control information; (2) catalog data—containing bibliographic and holdings (shelving location, copy number, and call number) data; and (3) reference—containing see, see also, and explanatory references to catalog data. At this time, two libraries (the Stanford University Libraries system and the Meyer Undergraduate Library) have their own in-process, catalog data, and reference files. For a particular library, the in-process, catalog data, and reference records appear to belong to separate files. In fact, there is a single file; index qualifiers specify the library to which a record belongs and whether the bibliographic record being searched is in process, has been cataloged, or both, or if it is a reference entry that refers to another form of entry used in catalog data file records.

The characteristics and use of the MARC and other files are discussed below, followed by a discussion of each index.

MARC File

The MARC file is updated once a week with records received from the Library of Congress (LC) on magnetic tape. LC MARC tapes are converted into BALLOTS internal format and incorporated into the MARC file and its indexes. Records may be copied from the MARC file for inclusion in the in-process or catalog data file, and they may be altered in the in-process or catalog data file, but they are never changed (by the user) in the MARC file. If a revised MARC record arrives, the first record is deleted and replaced by the revised version. This automatic replacement of MARC data occurs only in the MARC file.

There are four indexes to the MARC file that may be used alone or in combination to search the file. These are

1. personal name,
2. corporate/conference name,
3. title word, and
4. Library of Congress card number.

In-Process File (IPF)

The IPF contains bibliographic and acquisition information for items on order or in process. If a title is ordered from a record found in the MARC file, the IPF entry for that book will contain a copy of the MARC record (either unmodified from MARC or modified at time of order by the user) and the acquisition information input at time of order. If a record is not found in the MARC file for the title to be ordered, and the title is not an added copy to a book already in the system (i.e., a record for the title does not already exist in the IPF or the catalog data file), then the Acquisition Department enters the most reliable bibliographic description available for the item. When the bibliographic description of an item is input, its source is indicated for later use in cataloging.

If the book ordered is an added copy to a title already in the catalog data file, the catalog data file record is used to order the added copy. Acquisition data are added and the catalog data file record can then be retrieved as an IPF record. Every physical item ordered or in process is represented by a separate set of data elements in the IPF record for that title, so that partial receipts, partial claims, and other partial record transactions can be handled. Status information attached to each item clearly indicates the location of each item or items in the stream of technical processing activities.

When all the technical processing for a title in the IPF is completed (i.e., the items in process are cataloged or the order canceled), the IPF status of the record is deleted from the indexes to the record, the acquisition information is deleted, and only a catalog data file record remains.

The IPF has five indexes that can be used alone or in combination to search the file. Four of these indexes are the same as those for the MARC file, and function in exactly the same manner. The additional fifth index is

5. BALLOTS record identification number.

Catalog Data File (CDF)

The CDF contains complete bibliographic descriptions and holdings information (i.e., the copy number and shelving location of each copy) for items cataloged. The IPF record becomes a CDF record at the time the book is cataloged through the automated system. The bibliographic descriptions of items cataloged may come from various sources, e.g., MARC records, LC or NUC book catalog copy, Title II cards, LC proof slips, or original cataloging efforts. All bibliographic descriptions except MARC copy are keyed into the system by the user, either at the time of acquisition or at the time of cataloging. These records are reviewed during cataloging and are upgraded or modified as necessary to conform to cataloging conventions.

The CDF has the same indexing scheme as the IPF plus two more valid indexes

6. Library of Congress subject heading, and
7. call number.

Reference File (REF)

The REF file contains all the references required to locate a title in the catalog data file. These records are of three basic types: (1) see references, (2) see also references, and (3) explanatory/history references. The REF indexes are

1. personal name,
2. corporate/conference name,
3. title word,
4. subject heading, and
5. BALLOTS record identification number.

Standing Search Request File (SSR)

A library may, using this file, institute an automatic regular search of the MARC file for entries expected to appear in a future weekly LC MARC tape. These automatic searches of the MARC file may be repeated for any number of months specified by the user. With this file, a library has the option of delaying original cataloging until an expected MARC record arrives and is added to the MARC file.

Indexes

Each BALLOTS file is accessible through a variety of indexes (see Table 1).

Table 1. *BALLOTS Files and Indexes*

Files	Index						BALLOTS Record ID Number
	LC Card Number	Personal Name	Corp/Conf Name	Title Word	LC Subject Heading	Call Number	
MARC	X	X	X	X			
Catalog Data	X	X	X	X	X	X	X
In-Process	X	X	X	X			X
Reference		X	X	X	X		X

1. Personal name (PN) index. If values exist in a record for any personal author data elements, the personal name portions of those values (i.e., excluding dates and relators like joint author or title) are indexed in the PN index. Title portions of author/title entries are indexed in the title word index. A series statement personal name is indexed only if it is traced in the same form.
2. Corporate/conference (CN) name index. The CN index is a "word" index. In a word index, every significant word in the value of an indexed data element is indexed. Frequently occurring words, such as institute, are not indexed. Title portions of author/title entries are indexed in the title word index. A series statement corporate or conference author is indexed only if it is traced in the same form.
3. Title (T) word index. The T index is a word index like the CN index.
4. Library of Congress card (CRD) number index. The one BALLOTS data element indexed in this index is the LC card number, and only the numeric portion (excluding revision, prefix, and suffix notations) is indexed. It is indexed for MARC, IPF, and CDF records.
5. The BALLOTS identification (ID) number index. Each record in an IPF, CDF, or REF file has a unique ID number that is added to the record when the record is created. The final digit is a check digit.
6. Subject (S) index. Only topical and geographic subject headings are included in this index for records in a CDF or REF file. The subject index is not a word index; the whole subject heading is treated as a single index term.
7. Call number (CAL) index. The CAL index is valid only for records in a CDF. The only data element indexed is the holding library's call number.

SEARCHING THE BALLOTS FILES

The BALLOTS search logic can be quite simple or quite elaborate. Simply stated, the user at the terminal keys a search request composed of the basic command "find," a valid name of the index to be used, and a value or values to be located. "Find t fire" will cause the system to gather a list of the records in the file that conform to this criteria—i.e., those that have the word "fire" somewhere in a data element indexed in the title word index (T). By using Boolean operators ("and," "or," "not") and requesting

searches of more than one index at a time, the user can make his search broad or specific, depending on his purpose in searching the files.

An author's name in the personal name index can be searched for in a variety of forms. For example, the following variations, or any combination of them, would be accepted as valid search terms and would locate the same record:

White, J.E.M.	(initials)
White, M.	(some initials omitted)
White, J E M	(initials without periods)
white, jon ewbank manchip	(capitalization ignored)
J.E.M. White	(surname first or last)
Manchip White, J.E.	(surname first or embedded)
White, Jo Ewb Man	(implicit truncation of forenames)
Whi#, J.E.M.	(explicit truncation of surname through use of pound sign)

The BALLOTS system makes extensive efforts to recognize different versions of a personal name because the exact form of an author's name is not always known.

A user may truncate an index value using the pound or number sign; e.g., "find CN librar# automation" will retrieve all the entries in the corporate/conference index beginning with "librar" (libraries, library, librarian, etc.) and the word automation. The words need not occur in that order since each word is indexed separately. As another example, "find CAL QD450#" will retrieve all records indexed in the call number index with a call number that begins with QD450.

A subject heading search can be made as specific or as general as desired by the user. For example, "find subject Art#" will retrieve all entries in the subject index that have "art" as the first three letters (artists, artistic, art nouveau, etc.). This, of course, is liable to result in unmanageable output, so the user could specify a further criterion—"find subject Art# 19th Century," which would retrieve all the entries in the subject index with the character string "19th Century" coming somewhere after the string "art." When the truncation symbol is used to stand for words interior to the subject heading, there is implicit truncation at the end of the subject heading.

Each index term is qualified to indicate to which logical file (MARC, IPF, CDF, or REF) and to which library the associated data belongs. The user can specify the files he intends to search, or BALLOTS will establish a default sequence of files. If the initial search of a file yields no results, the system automatically goes on to search the next file in the sequence. If a single record is found in a file, the system automatically displays it for the user. If more than one record is found that meet the search criteria, the system informs the user of the number of records matched. At this point, the user can narrow the search by specifying additional requirements in an interactive session with the system. If he derives too few or

zero results as a consequence of his commands, the system will retain the last non-zero result obtained, or the user may issue the "backup" command to reinstate the most recent result stack.

The user can now give the command "display," and BALLOTS will show him the first record of the result stack (the records retrieved in the search) on the CRT terminal screen. Paging commands can be used to see each record in turn, moving forward or backward through the result stack.

The display of data in searching is organized to be as meaningful as possible for the specific task. Data can be displayed on a variety of CRT screen formats. Depending on his choice of display format, the user can browse through search results at the level of the bibliographic information or at the level of the acquisition or holdings information.

TECHNICAL PROCESSING SUPPORT

BALLOTS technical processing support is divided into nine computerized functions: ordering, receiving, non-purchase-order material receipt, claiming and canceling, cataloging, in-process material distribution, catalog records maintenance, reference input and maintenance, and standing search removal. In addition, there is a tenth function that supports Meyer Undergraduate Library reserve book processing.

The user interacts with the system in each function at the CRT terminal by means of a unique "protocol," i.e., a prescribed and ordered set of user commands and display and input formats. Each protocol has two parts or modes: searching (discussed above) and record input/update. The protocol guides the user through his work, provides him with the appropriate subset of data, and ensures that all the necessary steps in the task are completed. By using a protocol to support particular technical processing activities, the system can (1) optimize the normal sequence of actions, (2) enable the user to deal with any exceptional situations that might arise, and (3) disable all actions that are extraneous or detrimental to a given activity. The protocol sets up boundaries to orient the user. Through the use of protocols, the system makes it as evident as possible what can, cannot, should, and should not be done at a particular point in a function.

In the input/update mode, information is presented to the user on the input/update CRT screen formats. Each protocol has a set of input/update formats for bibliographic information, for holdings information (call number, shelving location, etc.), and for acquisition information. The formats are designed to present as much recognizable information and as many valid associations as possible to the user. Data are always displayed in the same order and position, and wherever possible, each data element is prefaced with a mnemonic tag. In the design of these formats, careful attention was paid to spacing and alignment to clarify visually the distinction between tags and data.

The user is prompted with the commands for the most common route through a protocol, as a default option. Each screen format contains a

```

      BFI      MRC      73-149449      ORDER      S      EAM-LOG
FIN PN BROWN, TOM AND T OIL AND ICE -RESULT:      I BOOK IN MRC
ORI
Brown, Tom, 1941-
  Oil on ice; Alaskan wilderness at the crossroads, by Tom Brown. Edited, with
  an introd., by Richard Pollak. San Francisco, Sierra Club [1971]
  159 p. map. 21 cm. (Sierra Club Battlebook) $1.95

  1. Environmental Policy - Alaska. 2.Oil and Gas leases - Alaska. I.TITLE
73-149449
CAL:HC109.A47E57
HC109.A47E53 301.3/1/09788 0871560461
SST:3S CP:CAU L:ENG REC:AM MS:C

```

Fig. 1. Full Bibliographic Display Format.

command field (line 3 of 24) in which the system prompts a default command that will produce the next step in the main line of that protocol. Thus, the user does not need to take any special actions to deal with the usual cases. In Figure 1, the format name ("ORI"—order input) to order a copy of the title is prompted by the system in the command line. Figure 2 is a sample of the bibliographic input/update format that a user would call for in order to alter some bibliographic information.

The command prompts are independent of the particular screen format on which they appear, since the same format may be used in several different protocols. For example, the format for input of basic bibliographic information (Figure 2) may be used to produce a purchase order or to produce a set of catalog cards. In other cases, a format that is required in one protocol may be optional in another.

The user can also instruct the system by command to take one of the options in a protocol. When it is necessary to depart from the common route, the user simply overwrites the prompted command with some other command.

BALLOTS programs perform on-line editing of the data elements on input/update formats. By testing the input data element values according to certain rules or against internal files of valid codes, the system immediately determines whether or not they are valid. After editing the data, if an error is detected, the system redisplay the input/update format, beginning with the first line in which an error occurs. The correct lines above this point are not redisplayed, although the user can have this done upon

BII	S-IPF	73-149449	ORDER	S	EAM-LOG
ORI					
SST 35	REC AM	CP CAU	L ENG	TSTI Y	
TSUT					
ME- PN Brown, Tom, 1941-					
TST Oil on ice;					
TSSB Alaskan wilderness at the crossroads,					
TSRT by Tom Brown. Edited, with an introd., by Richard Pollak.					
ED					
PP San Francisco, Sierra Club					
D [1971]					
PG 159 p.					
ILL map.					
SZ 21 cm.					
LPR					
CRD 73149449	CRDS		NUC		
LC HC109.A47E57				MS C	
LCA					
DC 301.3/1/09788					
ISBN 0871560461					
SUP				GPC	
PUX					
RIP					

Fig. 2. *Bibliographic Input/Update Format.*

Bibliographic information for a new title may be updated, as required, in the ORDER function.

command, if needed. A two-digit code, indicating the nature of the error, now appears in front of each invalid field. When the errors have been corrected, the format is transmitted a second time and the data are then accepted.

When all the formats needed to perform a function have been filled in by the user and accepted by the system, the transaction is considered complete. The system then responds "ENTRY PROCESSED—ID = <number>—PDQ = <number>." If the bibliographic record is from the MARC file or has just been created, a machine-generated ID number is assigned to the record, and the record will be added to the appropriate file. If a record already in a BALLOTS file is used, the additional order or catalog information is appended to the existing record. A Print Data Queue (PDQ) number is a key assigned to the entry for overnight batch processing of a transaction where printed outputs are to be produced.

The user has immediate access to all the information input in a day and can examine an updated or just-created record as soon as the system has accepted its entry. Access to new records is limited to the use of the ID index until the following day. From then on, the records can be located through any of the available indexes.

All printed outputs except the Se-Lin spine labels are printed on a high-speed printer at the Academic Computing production services center. Members of production services support BALLOTS production around the clock. During BALLOTS on-line production hours, from 8:30 a.m. to

5:00 p.m. Monday through Friday, when the library staff are searching BALLOTS computerized files and inputting data at the CRT terminals, operators and library staff communicate with each other via telephone about problems with hardware and software. The operators notify the library if any part of the system must be taken out of service. Production services is also responsible for seeing that the terminals are working properly. All BALLOTS batch production programs are run during Academic Computing's third shift (midnight to 8:00 a.m.). These jobs are run on a regular daily, weekly, and monthly schedule. A courier delivers printed outputs to the library every morning.

LIBRARY VIEW

The Acquisition Department

When BALLOTS was in the design stage, the Acquisition Department was promised a system that would, to a large extent, eliminate the paper in-process file, which, owing to its single access point, generally hindered order searching. In this regard, BALLOTS was eminently successful. The bibliographical searchers and the receiving, claiming, and canceling personnel no longer plow through copies of orders that represent in-process materials; no manual files are retained. The variety of access to BALLOTS files has added to the efficiency of the search process and has significantly reduced the repetitive, error prone typing of data. Additionally, typing orders and interfiling order slips are tasks that are no longer required; orders, requester notices, etc., are now generated by the computer. Claims and cancellations to vendors are now machine-generated (largely automatically), thereby decreasing the manual staff input formerly required. The BALLOTS automatic claim support has increased the service that now can be offered to requesters by ensuring timely, regular claims for materials, rather than waiting for serendipity. All of this translates into a staff saving of six positions or 33 percent of the Order Division.

Contrary to expectations, the imminent implementation of BALLOTS and the required training in late 1972 did not intimidate the staff. In time, everyone in the Order and Gift and Exchange divisions was fully trained in the system, even a person six months from retirement. People in the Serials and Binding and Finishing divisions were trained as required. Although the rate of learning varied, no one failed to master the use of BALLOTS.

Work processes have changed since BALLOTS became operational, with batching of tasks the most notable change. A limited number of available CRT terminals has necessitated scheduling terminal use and thus the batching of work. It has been possible to broaden searchers' duties; where they were formerly restricted to "African" or "science" searching, these narrow specialties may now be eliminated in favor of a general list of duties. Also, searchers now assume some responsibilities for claims and

cancellations. The old routine of acquisition processing is now far from routine.

Although ordering and receiving backlogs have essentially been eliminated, there are new challenges for library administrators who must manage formerly manual departments that are now almost totally integrated with the BALLOTS services. First, the distinctions between acquisition and cataloging have blurred, and a departmental procedural integration is now underway. Nothing less than processing certain types of materials at time of receipt and producing catalog cards and spine labels will certainly become part of the Acquisition Department. Books may then bypass the Catalog Department and go from the receiver to the Binding and Finishing Division for stamping and labeling.

A second challenge is the value that staff place on their services once they are fully trained in the BALLOTS system. A significant learning process is required to master the BALLOTS acquisition functions; but does such learning significantly alter the personnel classification and pay of a bibliographical searcher? This is a question that has not yet been fully resolved.

The Catalog Department

In the past year, the Catalog Department has evolved from technical services based on manual procedures plus some automation support to an automated technical processing operation with some residual manual support. All staff members have been trained to use the BALLOTS system in some capacity and every functional unit utilizes the system in its daily work.

In 1973-74, the production level increased 3 percent over the previous year, and the arrears were reduced by 5.7 percent. These advances were made despite a 5.6 percent reduction in the effective work force for the entire reporting period. BALLOTS was a major factor in the increased productivity of the department. With the implementation of each module, production dropped during the periods of acceptance testing and staff training. Following a month of adjustment, there was a steady increase in production until implementation of the next module.

As of November 1974, approximately 80 percent of all titles cataloged were cataloged through BALLOTS (includes original cataloging and copy processing). Of all added copies processed, 30 percent were processed through BALLOTS and 36 percent of the added volumes were BALLOTS processed. By early 1975, BALLOTS is expected to process 90 to 95 percent of all titles handled by the department. Much manual processing was still necessary when the department began using the first module (BALLOTS MARC), but with the added capability of each successive module the only categories currently processed manually are manuscripts, sheet maps, and nonroman, nontransliterated languages.

Card preparation functions have been most affected by BALLOTS. Card duplication, heading typing, card set preparation, and card arranging were

major activities in the manual system. These functions have been nearly eliminated, producing a positive offset of 5.5 FTE. All residual card duplication has been transferred to the Photoduplication Division, relieving the Catalog Department of all card duplication. Mainly as a result of BALLOTS card production capability, fourteen typewriters were released from the department for use elsewhere in the library.

Involvement in BALLOTS development, testing, and training was a time-consuming but essential activity for several key members of the department. Work with BALLOTS staff in the development effort on each module, review of system specifications, development of training materials, acceptance testing, and hands-on training had a considerable impact on the work and availability of these key staff members. Several staff members were involved full-time and several others part-time for one to two months with each module that had a major effect on cataloging procedures.

Work patterns have changed as a result of on-line bibliographic processing. Access to the terminals is scheduled for staff throughout the day with open periods at noon and in the late afternoon. This scheduled access requires that work be batched and well-organized before the staff member comes to the terminal, and it affects each staff member's sequencing of preparatory work and other departmental activities.

Catalogers have the option of keying in their original cataloging or giving worksheets to support staff for input. The criterion for a cataloger's continued use of the system should be the manner in which the cataloger utilizes the system. If it is used only for input of bibliographic records, the input should be done by support staff. If the cataloger uses on-line files as a cataloging aid, this use should continue.

Differences in file organization between manual and machine systems have forced a reexamination of reference structure and search strategies. The card catalog tends to bring files together through reference structure and inverted entries. Machine file indexes are structured in such a way that files are split. The differences in required reference structure and search strategy between the two types of files have made necessary the training and reorientation of the staff in the maintenance and effective use of the machine-based files.

Several other areas affected by BALLOTS are discussed below, though the listing is by no means exhaustive:

1. Titles with MARC copy—are processed earlier in the flow of work, reducing the handling and the processing time lag. A procedure will soon be initiated to process these books in the Acquisition Department receipt function. The books will then bypass the Catalog Department and go directly to end processing.
2. BALLOTS distribution function—provides an on-line control of books in the department, to the level of a cataloger's desk if necessary, greatly reducing the frequency and time necessary for requests for books in process.

3. Standing search requests—provides a more systematic approach in matching LC copy with books on the holding shelves and reduces the required staff time for this function.
4. Title II filing—has been reduced by about one-third since cards are not filed if the title is included in the on-line MARC file. With an expanded MARC scope, Title II filing may be eliminated altogether.
5. Statistical counts—have been simplified as a result of BALLOTS-generated statistics.

The Catalog Department staff have enthusiastically accepted the BALLOTS system and generally adapted quite well to an on-line environment. The system has had a very positive impact on the department.

The Total Library

The possibility of realizing labor savings was conceived in the original BALLOTS design. To measure the savings, four offset studies have been conducted. The first was a theoretical model done prior to implementation; it estimated labor savings of \$160,000. The second, third, and fourth studies were done at progressive intervals during the implementation of BALLOTS as a production system. Each of the latter studies addressed itself only to modules in BALLOTS that were in full production at the time of the study. As each new module introduced new facilities and services, the tendency has been for the offset to increase with each study. However, in comparison with the original estimate of \$160,000, the results have been modest. Currently, the offset is estimated at 11.5 FTE positions, all at a clerical level, equivalent to about \$88,074 when 15 percent staff benefits are included. (This figure is based upon a beginning salary level; offset is actually higher if longer term employees are considered.) Some additional offset is expected.

It may be thought that BALLOTS has realized no offset in professional time. This is not true in that certain activities assigned to professionals were eliminated through procedural changes (e.g., proofreading of over-typed headings on cards). Strictly speaking, these changes were not required by automation, but in fact were implemented in connection with it. Of course, much of the beneficial offset realized by these procedural changes has in itself been offset by the time required to train and supervise the support staff. But this will not go on forever at the intensive pace that was required during development. Indeed, the greatest evidence that significant additional offsets will be realized is the fact that throughout the development of, training for, and installation of numerous modules, production has consistently risen as staffing has declined. As the system stabilizes, less training and supervision will be needed, and additional procedural changes will be implemented. Foremost among the latter is physical repositioning and procedural integration of acquisition and cataloging to permit a straight-through flow of library materials. It is expected that this physical move will be followed by significant organizational change, aimed at

obtaining additional efficiencies. No organizational changes are planned until the integrated operation has been sufficiently studied and observed to know what new procedures will make best use of the staff and the system. In combination, it is hoped that such changes will produce maximum realizable offset.

HARDWARE AND SOFTWARE

The BALLOTS CRT terminals are located in the Stanford main library in the Acquisition and Catalog departments. These terminals are connected via twisted pair cables to a multidrop box (Stanford-built modem) that acts as a shared data set, and then to a PDP-11/40 minicomputer in the academic computing branch of the Stanford Center for Information Processing (SCIP). The PDP-11, in turn, is connected to an IBM 2701 parallel data adapter which is connected to a selector subchannel on the 360/67 computer. The 360/67 runs BALLOTS along with general time-shared and batch campus computing jobs. BALLOTS runs as a sub-processor under ORVYL, the time-sharing monitor developed at Stanford. ORVYL uses the virtual memory capabilities of the 360/67. MILTEN, the terminal executive, is currently able to connect simultaneously about 125 interactive terminals of various types through both an IBM 3705 and the PDP-11 front-end communications controllers. The PDP-11 supports all the high-speed CRT display terminals. Simple display terminals such as the Tektronix 4023 are supported one to a line, while the intelligent terminals used by BALLOTS are multidropped—several terminals share a line. The BALLOTS files are stored on CDC 23142 double-density direct-access disk drives. The high-speed printer used for these jobs is an IBM 1403, which prints at about 350 lines per minute when an upper-lower case print chain is mounted.

The PDP-11 provides polling, buffering, translation, device transparency, terminal program loading, and some diagnostic capabilities. Whereas the 360/67 can interrupt the PDP-11 whenever the 360/67 has data to send, communication between the terminals and the PDP-11 is done on a polled basis. The PDP-11 continually asks each terminal if it has data to send. If a terminal is not active, the PDP-11 places it in a lower priority status and polls it less often than the active terminals. Once the terminal becomes active, it requires the more frequent polling status. The PDP-11 buffers the transfer of data back and forth between the terminals and the 360/67. In order to save core in the PDP-11, data can be transferred from the buffers in the PDP-11 directly to memory in the BALLOTS subprocessor within the time-sharing monitor. Therefore, as opposed to the implementation of the low-speed typewriter terminals, the PDP-11 implementation does not require buffering within the terminal executive (MILTEN) to handle the data.

The 360/67 sends and receives all data in EBCDIC character code. The PDP-11 does the translation for ASCII character code terminals. The

PDP-11 also translates control codes, such as "clear screen" and "home cursor," to fit the particular needs of each terminal. This provides a degree of device transparency to the programs in the 360/67. The PDP-11 contains a copy of the program that runs in the BALLOTS programmable terminals. On request from one of those terminals, the PDP-11 can transmit a fresh copy of the program. This is necessary because the memory in the terminals does not retain the program when the power is turned off. The PDP-11 also supports rudimentary diagnostic and statistical services for the display terminal system.

The terminal used in the BALLOTS system is the Sanders PDS 804 programmable CRT terminal. This terminal includes a microprocessor and 4,096 bytes of programmable memory that permit specific computer programs to be loaded directly into the CRT terminal. These programs control the display of data, the keying, and the communication of the data to the main computer. This terminal can display 1,920 upper- and lowercase characters on a screen, in twenty-four eighty-character lines. Specific functions have been assigned to certain keys (such as the paging keys for displaying records retrieved from a search) to adapt the Sanders terminal to the uses of BALLOTS.

The terminal is programmed so that specified segments of lines on the screen or ranges of lines on the screen can be considered as a single data element field. These fields may be either protected or unprotected. A protected field is one in which the user cannot input data, although the system may display data there. During input at the keyboard, the cursor is prevented from entering protected fields; this constraint is part of the control program loaded in the terminal. (The cursor is a blinking underline character that indicates to the user his position on the screen.)

It should be pointed out that all of the features described here are programmed into the terminal and are not part of the hardwired logic of the terminal. This feature permits easy and convenient changes of screen design. Flexibility was one of the primary reasons for choosing a programmable terminal.

PRODUCTION COSTS

BALLOTS operating and maintenance costs are covered in the Stanford University Libraries budget. Operating costs are of five types: (1) file build and update costs, (2) on-line costs, (3) batch costs, (4) CRT terminal rental, and (5) CRT terminal connect time.

1. File costs (not including Library of Congress MARC tape subscription) consist of (a) costs for converting the MARC tapes to BALLOTS internal format, building the BALLOTS on-line MARC file and indexes, and dumping the file to tape; (b) costs for adding records to and updating the other BALLOTS on-line files and dumping these files to tape; (c) file storage costs on CDC 23142 double-density disks (\$800 per month per IBM 2314 equivalent disk); and (d) general file maintenance activities, such as restoring a file.

2. On-line costs are calculated by adding up the computing accounts used by the library for work on the CRT terminals. This on-line activity includes searching the files, ordering, cataloging, establishing standing search requests for MARC records not yet received on the weekly tapes, and so on. These costs vary directly with the number of library transactions.
3. Batch costs are both fixed and variable. The fixed batch costs include the costs of mounting special forms on the high-speed printer; mounting a reserved disk pack for overnight processing; and renting the IBM 2741 typewriter terminal used to print spine labels. The variable batch costs are incurred for sorting, formatting, and printing the outputs for the library; for matching the standing search requests (SSR) file against the MARC file weekly; for purging the SSR file of outdated requests monthly; for running the weekly automatic claim program to determine orders for which claims must be produced; and for running monthly management statistics reports.
4. BALLOTS CRT terminals are rented for \$270 per month with 4,096 bytes of memory. Purchase price of the Sanders 804 is approximately \$8,000.
5. CRT terminal connect time is a fixed monthly charge of \$1,200 for each group of from one to ten CRT terminals connected to the IBM 360/67 through the PDP-11 minicomputer.

The total monthly production and maintenance charges for November 1974 were \$34,255. Of this, file costs were 56.2 percent; on-line costs were 18.5 percent; batch costs were 14.5 percent; CRT terminal rental costs were 7.3 percent; and terminal connect-time charges were 3.5 percent. System and procedural fine tuning and improvements underway and planned will reduce this monthly cost. In the long run, sharing common costs such as file building will reduce the cost to each library participating in a network. In addition, dividing and sharing original cataloging efforts and keying for non-MARC LC copy will mean direct savings. Currently, the Stanford University Libraries pay the entire cost of running and maintaining the system.

FUTURE PLANS

The application of computer technology to library operations, and the development of regional and national networks of libraries based on this technology, promise to provide help in solving the dilemma of tightening budgets versus increasing demands for libraries to serve their clientele more fully. In contrast to manual library systems, which make widespread sharing of library resources cumbersome and slow, automated library systems have the potential advantage of being used rapidly and simultaneously by more than one institution. When an automated system is shared by a network of libraries, the price tag of the system to each user is reduced and the rising costs of the highly labor-intensive library environment are curbed.

The benefits of automated library systems are not just economic. Shared computer systems provide libraries with access to more than the resources of their own collections. Libraries in a network can share the entire network's joint bibliographic resources with students, faculty, staff, and the community at large. Resource sharing can be optimized through coordinated purchasing and interlibrary loans, facilitated by network files accessible to all libraries in the region and by direct communication with other library networks.

Stanford has been exploring with in-state groups the possibility of a California library automation network. The plan is to utilize BALLOTS as the on-line vehicle for a network that would incorporate the major complementary capabilities and data bases of other existing systems in the state. In addition, BALLOTS has been asked by out-of-state groups to explore the possibility of communication between the California network and other networks and bibliographic centers in the western region, where the feasibility, logical rationale, and need for the benefits of such communication all exist.

BALLOTS' approach is to seek to pool resources in order to form a reliable, flexible, and economical network to support and improve the services provided in common by every type of library in the state—public, private, large, small. The plan is to make this a regional network, adhering to national standards and capable of communicating with other systems and networks in California and other states.

CONCLUSION

The BALLOTS system design includes several unique features. The most notable of these are the flexible interactive searching capability; the standardized screen formats; the protocol structure and the command language associated with it; the programmable CRT terminal that aids the user in input and display; and the fact that an entire screen full of data is entered and processed at one time, rather than just one data element at a time.

The BALLOTS system is intended to provide a library tool used in the library's daily production environment. The system was designed with the help of the library and is being used by the regular library staff. The BALLOTS system is designed to stimulate the user's motivation. The system supplies routine data wherever possible, thus saving the user a great deal of repetitive keying. The on-line editing functions of the system verify the codes and either generate the appropriate data or return an error code to the user. The user receives positive confirmation each time a task is completed and a record is added to or updated in the file. Each format carries a control line identifying the function, file, and record in use. The user can refer to this information if he gets lost or confused. As a result of this careful user interface analysis and planning, no special terminal operators are required in the library. Throughout, continual efforts were

made to create a system as convenient and useful as possible to the library staff.

To date, the BALLOTS system has encountered ready acceptance by its users in the library, who find the system easy to learn and use. One of the major advantages of the system is that with a minimum of clerical effort (the searching and keying done at the CRT terminal), the library can obtain for each title searched a purchase order, vendor invoice, first and second claim notices, cancellation notices, a catalog data slip, two spine labels, catalog cards, etc.

At a number of points in the system, smoothing the way for the user has meant increasing the complexity of the BALLOTS analysts' and programmers' tasks. This paper has made no attempt to describe the program structure underlying BALLOTS operations.³

ACKNOWLEDGMENTS

The system that this paper describes was designed, developed, and implemented by the project BALLOTS staff: Marlene Amiot, Hanan Bell, Glee Cady (former staff member), Gilbert Chang (former staff member), Wayne Davison (former staff member), Hank Epstein, Jennifer Hartzell, Tim Logan, Donn Martin, Charla Meyer, Eleanor Montague, Baxter Moyer, Norman Roth, and Lennie Stovel. Ralph Hansen, Lawrence Leonard, and Allen Veaner of the Stanford University Libraries provided section VI, "Library View." The preparation of this paper was coordinated by Eleanor Montague.

Library staff members whose help and support were invaluable include: Karen Bendorf, Jennette Hitchcock, Robert Hurowitz, Thomas Leonhardt, Frederick C. Lynden, Charlotte Mercado, Richard Pollard, Margaret Yanagihara, and David C. Weber, director of the Stanford University Libraries.

The search routines and file service routines used in BALLOTS were developed by members of the SPIRES project (Stanford Public Information Retrieval System); the work of Richard Guertin, William Kiefer, and John Schroeder has been vital to the success of BALLOTS.

REFERENCES

1. SPIRES is a generalized information storage and retrieval system. During BALLOTS' development phase, BALLOTS collaborated with SPIRES to define and develop overlapping requirements between the two systems. SPIRES development provided access to and retrieval of bibliographic records created through on-line transactions (e.g., BALLOTS activity) or furnished from outside sources (e.g., MARC). All BALLOTS on-line files have been made available publicly through SPIRES. Nearly any terminal in the United States capable of dialing Stanford's IBM 360/67 computer can search these files. Additional information on searching via SPIRES is available in a document entitled "A Guide to BALLOTS Files."
2. U.S. Office of Education, Department of Health, Education and Welfare grants OEG-1-7-071145-4428 and OEG 0-70-5237 ran from June 1967 to March 1971 and totaled \$1,168,890. During that time, Stanford direct expenditures totaled \$238,700.

From March 1971 to September 1972 Stanford funded all continuing development of BALLOTS, which represented direct expenditures of \$283,580. In September 1972 a joint council on Library Resources and National Endowment for the Humanities grant was awarded in the amount of \$650,000. This grant ended in November 1974.

3. For a description of BALLOTS software, see *Final Report of the BALLOTS Project to the National Endowment for the Humanities: September 1, 1972—August 31, 1974*. (Library Computing Services (BALLOTS Project), Standard Center for Information Processing, Stanford University, Stanford, California.)

HIGHLIGHTS OF ISAD BOARD MEETINGS

1975 Midwinter Meeting
Chicago, Illinois

Monday, January 20, 1975

The meeting was called to order by President Frederick Kilgour at 2:15 p.m. The following were present: BOARD—Frederick G. Kilgour, Lawrence W. S. Auld, Henriette D. Avram, Susan K. Martin, Ruth L. Tighe, Donald P. Hammer (ISAD Executive Secretary), and Susan O'Neil, Secretary, ISAD. COMMITTEE CHAIRMEN—John Kountz and Helen Schmierer. GUESTS—Fred Blum, Margaret Chisholm, Roberto Esteves, Pearce Grove, Alice Ihrig, Vincent Jennings, Roseanne LaPaglia, Ronald Miller, and Charles Stevens.

APPROVAL OF MINUTES OF NEW YORK CONFERENCE MEETINGS.

MOTION. It was moved by Susan Martin that the minutes be approved with the stipulation that all appropriate editorial corrections be made.

SECONDED by Lawrence Auld. CARRIED.

ISAD LIAISONS. Mr. Stevens asked for instructions from the ISAD Board as to what his representation to the Legislative Committee means in terms of his interaction with the board. Mr. Hammer said that to his knowledge no written guidelines exist, and Mr. Kilgour confirmed this belief, adding that Mr. Stevens was expected to bring any matters of concern to the board. Mr. Blum inquired whether the liaison to the Freedom to Read Foundation should submit a written report. Mr. Kilgour answered that a written report would be preferable, unless for specific reasons Mr. Blum wished to report orally.

BYLAWS AND ORGANIZATION COMMITTEE. Helen Schmierer reported that in amending the ISAD bylaws, she found a number of areas that were not particularly well-stated. Citing *Robert's Rules of Order*, Ms. Schmierer pointed out that a series of changes of bylaws calls for a proposal for a complete rewriting, termed a "bylaws revision." A bylaws revision must be viewed in the process of a vote as a separate document, i.e., as a complete rewriting of the bylaws. It cannot be used to amend previously existing bylaws. It must be accepted or rejected in its entirety; if bylaws

revisions are rejected by vote, the old bylaws remain in effect. Her opinion, in reviewing the matter, was that a revision was required in the case of ISAD, unless the board indicated for some reason that this would not be necessary.

Publication in the division's journal constitutes official notification to the members; distributing copies via the mail is also official notification. General practice is that copies are published or otherwise distributed thirty days prior to their being voted upon. If ISAD chose a mail vote, mailed ballots would be sent to the members with the regular ALA ballot in early May, indicating that the proposed revision be published or otherwise distributed in early April. If a vote were to be taken at the membership meeting in San Francisco, however, the bylaws could be published in a later edition of *JOLA*, or otherwise distributed thirty days prior to the San Francisco meeting.

In summary, three major questions were posed to the board: (1) Should there be a complete revision of the ISAD bylaws or should there be a list of proposed amendments? (2) How should the document, once prepared, be distributed? and (3) Is the board satisfied with the statement of scope and purpose of ISAD as presently stated in the bylaws?

Mr. Kilgour said that he was in favor of complete revision; the board concurred. Ms. Schmierer asked that the feeling of the board be recorded in the minutes.

Ms. Tighe stated her preference for a mail vote, on the basis of the fact that the full membership would be unlikely to appear at the San Francisco meeting. A mail vote would be certain to reach all members. However, it would have to be made abundantly clear that while amendments could be made subsequent to the mailing, in the process of the mail vote there is no opportunity for amendment. Mr. Kilgour asked whether the revision could be presented to the membership meeting, and ballots mailed subsequently. Ms. Schmierer pointed out that if the ISAD revision were not made part of the regular ALA ballot, the bylaws would not take effect until July 1976. It would, however, be less expensive than a separate mailing.

Ms. Martin assured Mr. Kilgour that the proposed revision could be published in *JOLA*. Relative costs were discussed, and Mr. Kilgour said that he would in any event prefer a separate mailing of the document. Members could then take their copies to the meeting, offer their opinions, and actually make changes at the meeting. A mail vote, Mr. Hammer estimated, would cost \$450 in postage alone. Ms. Schmierer estimated the cost of publication to *JOLA* at \$800, or \$100 a page.

Mr. Kilgour expressed the consensus of the board: the board would review the document during the course of the Midwinter Meeting, agree on a final version, submit it to Ms. Martin for publication, with an appropriate introduction, in the March issue of *JOLA*. When the ALA ballot is sent out, a separate sheet will be provided for the ISAD bylaws on which an affirmative or negative vote may be recorded.

ALA CENTENNIAL CELEBRATION. Mr. Kilgour called upon Ms. Alice Ihrig, who discussed the ALA Centennial. The theme will be "Celebrate," and the conference will be held in Chicago on July 18-24, 1976, during America's bicentennial celebration. Persons attending the Centennial should have an opportunity to visit, among other things, automated library systems currently operating in the Chicago area. Ms. Ihrig urged ISAD members to identify people who would be willing to share their particular area of expertise with others, and encouraged ISAD to come up with an ingenious way to show how it relates to the other divisions, and to celebrate in whatever way seems appropriate for itself. The Arrangements Committee would be willing to do whatever work, or solve whatever problems ISAD might have in putting together a celebration exhibit or program. Also anxious to assist in any way, she added, are Peggy Sullivan, the Centennial Conference Local Arrangements Committee chairman, and the ALA liaison, Peggy Barber. Ms. Martin congratulated Ms. Ihrig on work well done, and Mr. Kilgour thanked her for attending the board meeting and outlining for ISAD the Celebration agenda.

AUDIO-VISUAL SECTION INTERIM OFFICERS APPOINTED. Mr. Kilgour, Mr. Hammer, and Mr. Grove reviewed for the board the status of the Audio-Visual Section officers. It was the duty of the board to appoint an interim chairman, an interim vice-chairman, and three interim nominating committee members. The latter would nominate people who would be voted upon at the San Francisco organizational meeting. The two temporary officers would be responsible for an organizational meeting and a program meeting in San Francisco. They would leave office at the close of the San Francisco meeting, and the elected officers would assume their offices at that time. Mr. Kilgour then introduced the two people suggested by Mr. Grove to serve as interim officers: Dr. Margaret Chisholm, Dean, University of Maryland School of Library and Information Science, and Professor Robert Broadus, Professor of Library Science, Northern Illinois University, DeKalb, Illinois.

MOTION. It was moved by Lawrence Auld that Dr. Chisholm and Mr. Broadus be appointed as chairman and vice-chairman, respectively.
SECONDED by Henriette Avram. **CARRIED.**

Nominating Committee. Mr. Kilgour announced that the Nominating Committee for the Audio-Visual Section would be: Dr. Blanche Woolls, University of Pittsburgh, Chairman; Dr. Herman L. Totten, University of Oregon; and Pearce S. Grove, Eastern New Mexico University.

ALA COUNCIL #20—RESOLUTION ON DIVISION MEMBERSHIP AND PUBLISHING SERVICES. Mr. Hammer said that any questions regarding Document #20 should be directed to Mr. Kilgour, who would pass them on to the author, Gerald Shields. Discussion ensued on the topics of the

use of divisional mailing lists, the definition of divisional publications, and certain ambiguous phrases in the resolution. Mr. Kilgour said that he would ask Mr. Shields for further interpretation of the resolution.

AUTOMATION INFORMATION CLEARINGHOUSE PROPOSAL—RTSD. Mr. Hammer stated his view, already conveyed by him to RTSD Executive Secretary Carol Kelm, that it is the function of ISAD rather than RTSD to provide a clearinghouse for information on library automation projects and systems. He noted that many requests for various types of information come into his office daily. Members and nonmembers alike are provided with this service by the ISAD office. In this sense, ISAD already operates a clearinghouse and provides advice, information, and materials, most of it free of charge.

Mr. Kilgour called for a resolution supporting Mr. Hammer in regard to the clearinghouse proposal. Ms. Martin suggested that the ISAD Board of Directors communicate to the RTSD Board of Directors its concern with the proposal to establish a clearinghouse for information concerning automation of technical services operations. Mr. Kilgour asked whether any member of the board could quote the precise statement of ALA policy on this issue. Mr. Hammer cited the statement from the ALA Bylaws as follows: "Each division shall represent a field of activity and responsibility clearly distinct from that of other divisions." (ALA Bylaws, Article 6, Section 2A). Mr. Kilgour recommended that Ms. Martin refine her statement on the basis of the ALA Bylaws and present it as a motion at a later meeting.

INFORMATION RETRIEVAL COMMITTEE—RASD. Mr. Hammer related that the RASD Information Retrieval Committee had inquired about the possibility of a joint information retrieval unit between the Information Retrieval Committee and the ISAD/COLA Discussion Group. He produced copies of the correspondence between Jean Coberly (University of Houston) and Brian Aveney (University of California). Mr. Hammer reminded the board that William Studer (Indiana University) is the ISAD representative to the RASD Information Retrieval Committee, and that such contacts should be handled through him. Mr. Aveney had informed Ms. Coberly that the role of COLA was that of a discussion group and as such it could not take upon itself any other function. Mr. Hammer said that it was a matter for the ISAD Bylaws and Organization Committee to decide whether or not ISAD should establish a committee or other unit concerned with information retrieval. Mr. Kilgour observed that it was the sense of the board to refer the matter to the Bylaws and Organization Committee.

CAMPAIGN TO RECRUIT NEW MEMBERS. Mr. Hammer informed the board that ALA had provided \$12,000 for a campaign to recruit new members. After discussing the problem of how to equitably divide this amount among the divisions, the executive secretaries had decided to

produce a general ALA recruitment leaflet in which each division was represented. Each division also produced an additional leaflet for its own use.

Copies of an ALA membership sampling survey carried out by the Office for Research were then distributed to the board; Mr. Hammer observed that on the basis of the study, ISAD would lose 50 percent of its membership under the new ALA dues structure. Some divisions are projected to lose up to 70 percent of their members. However, ALA has agreed to support all divisions for a two-year period at their present levels of funding. Even though ISAD is not in imminent danger of folding, it is still incumbent upon the division to initiate a recruiting program. It was Mr. Hammer's opinion that such recruitment work would appropriately be delegated to a special task group within ISAD.

It was the sense of the board that the division's programs should be structured in order to provide adequate reason for old members to remain active and for new members to join. No further decision was made.

Tuesday, January 21, 1975

The meeting was called to order at 2:15 p.m. by President Frederick Kilgour. The following were present: BOARD—Frederick G. Kilgour, Lawrence W. S. Auld, Henriette D. Avram, Susan K. Martin, Ruth L. Tighe, Donald P. Hammer (ISAD Executive Secretary), and Susan O'Neil, Secretary, ISAD. COMMITTEE CHAIRMEN—Philip L. Long, S. Michael Malinconico, Helen Schmierer, and David L. Weisbrod. GUESTS—Don L. Bosseau, Dee Brooks, Raymond DeBuse, Paul Fasana, Jonatha A. Johnson, Ake Koel.

NOMINATING COMMITTEE REPORT. Mr. Kilgour called upon David Weisbrod to present the Nominating Committee report.

The Nominating Committee nominated for vice-president and president-elect the following candidates: John F. Knapp (Blackwell's of America) and Joseph A. Rosenthal (University of California, Berkeley). For Board of Directors, member-at-large; Maurice J. Freedman (the New York Public Library) and Judith Hopkins (University of Michigan School of Library Science).

MOTION. It was moved by Ms. Martin that the nominations be accepted.
SECONDED by Ms. Tighe. **CARRIED.**

ALA MEMBERSHIP IN THE COMMITTEE OF CORPORATE TELEPHONE USERS. Mr. Kilgour called upon Mr. Long, who reported that the Telecommunications Committee had, in New York, recommended to the board that ALA join the Committee of Corporate Telephone Users. Mr. Long had, at that meeting, presented a brief statement regarding the na-

ture of the CCTU and its utility for the library community. Members of the board had felt at that time that they would like further information upon which to base their decision. In the interim, therefore, the board had received data concerning the activities and bylaws of the CCTU. Mr. Long felt that these materials supported the recommendation of the Telecommunications Committee that the membership of ALA would be well served in joining the CCTU in its efforts to combat unreasonable and quite expensive modifications which the telephone authorities make in tariffs filed both for voice and data communications purposes. He observed that ALA itself is a user of the WATS service; Mr. Kilgour noted that the Ohio College Library Center is now a member of CCTU, and that an increasing number of libraries are now using WATS lines for either voice or data communications.

Ms. Martin questioned a section of the CCTU bylaws which stated that, over and above the \$500 membership fee, the CCTU may request further contributions as deemed necessary to meet expenses. Mr. Kilgour said that to his knowledge no additional funds had been requested by the CCTU during the past two years. Mr. Long stated that any change in the \$500 fee would require a change of bylaws. Mr. Kilgour added that the ISAD Board of Directors need not determine the source of funds; its role was simply to make a recommendation to ALA, which would then determine whether the membership was worth the fee.

MOTION. It was moved by Ms. Tighe that the ISAD Board of Directors recommend to the Executive Director of ALA that ALA become a member of the CCTU. SECONDED by Ms. Avram. CARRIED.

COSPONSORED INSTITUTES WITH THE LARC ASSOCIATION. Mr. Kilgour reviewed the background of the LARC proposal: LARC had proposed cosponsoring six institutes a year with ISAD. Mr. Bosseau pointed out that two benefits of cosponsored institutes would be more working capital and larger audiences. However, he wondered whether six institutes would be more than the ISAD office could handle. Ms. Martin expressed the hope that, should ISAD enter into such an arrangement with LARC, all financial arrangements be clearly worked out and that the wording of the proposal be changed to provide clarification. Mr. Kilgour suggested that the proposal as a whole demanded more time and consideration than the board could give at that time.

Mr. Bosseau explained that the LARC office would handle the paperwork; he referred to the passage in the proposal which stated that ISAD would select the topics of the institutes and invite the speakers. LARC would handle the logistical arrangements. Mr. Malinconico said that the Program Planning Committee would like to make a recommendation to the ISAD Board after its next meeting.

Mr. Hammer pointed out that in cases where institutes lose money, co-

sponsors should bear an equal share of the loss. The LARC proposal called for ISAD alone to sustain any losses.

MOTION. It was moved by Ms. Martin that the ISAD Board of Directors thank Mr. Patrinostro (the LARC Association) for his letter and proposal; that it ask the Program Planning Committee to communicate to LARC ISAD's plans for institutes for the foreseeable future; and that it refer the LARC document to the Program Planning Committee for its recommendation, with the expressed feeling of the board. SECONDED by Lawrence Auld. CARRIED.

PROGRAM PLANNING COMMITTEE REPORT (Exhibit 1). On behalf of the committee, Mr. Malinconico requested clarification on reversion of funds to the general ALA fund, in light of the fact that divisions are to be considered self-supporting and that no formal guidelines could be found regarding reversion of profits from preconferences or other institutes to the general fund. Mr. Hammer stated that the problem had been resolved in Council that morning when Council Document No. 22 was passed, which stated,

Seminars, institutes and preconferences sponsored by ALA divisions must be self-supporting. All direct and indirect costs must be deducted from the revenues before consideration can be given to the disposition of any surplus. Surplus funds generated by such seminars, institutes or preconferences may be retained by the sponsoring divisions.

Mr. Malinconico reported that the Program Planning Committee's plan to re-run the Serials Institute on the West coast had been postponed. It is hoped that the institute will be held in November, cosponsored with the California Library Association.

The board gave Mr. Malinconico copies of the material distributed by Ms. Ihrig. Mr. Kilgour elaborated briefly on the centennial celebration theme, and directed Mr. Malinconico to contact the Centennial Celebration Committee and the ALA liaison.

Mr. Malinconico then asked for assistance from the board in formally delineating the role of the Program Planning Committee vis-a-vis the new sections and committees of ISAD. The Program Planning Committee would like to coordinate the information content of any formal programs planned by sections or committees; however, it does not wish to become involved in the logistics. Mr. Malinconico further requested that the board provide the Program Planning Committee with a statement or directive to the effect that programs planned by committees or sections of ISAD must first be submitted to the Program Planning Committee for review.

MOTION. It was moved by Ms. Tighe that any program being formulated by a unit within ISAD be coordinated with the Program Planning Committee, and that this policy be included in the future ISAD pro-

cedural manual. SECONDED by Ms. Martin. CARRIED.

ISAD BYLAWS COMMITTEE. Ms. Schmierer distributed copies of the proposed bylaws to the members of the board. She said that the board would probably wish to discuss the proposed bylaws at greater length at its final meeting of the week. Upcoming would also be a proposal for a standard form for bylaws of sections, designed to be compatible with the division bylaws. The main section of the revision was simply a reiteration of the old bylaws. Into the objectives has been incorporated the object as indicated in the 1968 bylaws and some other versions of the bylaws extant. Ms. Schmierer drew the board's attention to the fact that it was the finding of the board within the past two years that the phrase "related technological developments" was seen as covering such activities as cable and audiovisual. Ms. Martin asked the Bylaws and Organization Committee to add appropriate words or phrases so that video and cable communications and audiovisual would be adequately covered in the "Object" section of the bylaws. Ms. Martin's suggestion was the sense of the meeting.

Ms. Schmierer reported that the term "communications technology" was under consideration, as it was a broad term and left open possible technological developments in the future. She assured the board that the committee would give its attention to the terminology.

VIDEO AND CABLE COMMUNICATIONS SECTION INTERIM OFFICERS APPOINTED. Mr. Kilgour announced that respectively for chairman and vice-chairman, Roberto Esteves (San Francisco Public Library) and Loretta Tiemann (Lincoln City Libraries, Lincoln, Nebraska) had been named.

MOTION. It was moved by Ms. Tighe that the interim officers be accepted. SECONDED by Ms. Martin. CARRIED.

Nominating Committee. Mr. Kilgour announced that the Nominating Committee for the Video and Cable Communications Section would be: Larry Molumby (Washington, D.C. Public Library); Larry Dickter (Cable Television Information Center, Washington); and Louise Mortimer (Model Secondary School for the Deaf, Washington).

MARBI CHAIRMANSHIP. Ms. Avram stated that because of the great amount of work and because there were only two meetings a year, the RTSD/ISAD/RASD Committee on Representation in Machine-Readable Form of Bibliographic Information (MARBI) could best be handled by a person familiar, on the basis of experience, with the administrative procedures. Therefore, she proposed a two-year term for the chairman of MARBI, rather than the present one-year term.

It was RESOLVED by Ms. Martin that the chairman of MARBI hold office for a two-year, rather than a one-year, term. SECONDED by Lawrence Auld. CARRIED.

Thursday, January 23, 1975

The meeting was called to order by President Frederick Kilgour at 2:10 p.m. The following were present: BOARD—Frederick G. Kilgour, Lawrence W. S. Auld, Henriette D. Avram, Susan K. Martin, Ruth L. Tighe, Donald P. Hammer (ISAD Executive Secretary), and Susan O'Neil, Secretary, ISAD. Executive Committee Chairman Video and Cable Communications Section (VCCS), Roberto Esteves; and Bylaws and Organization Committee Chairman, Helen Schmierer.

RTSD PROPOSAL FOR A CLEARINGHOUSE ON AUTOMATION FOR TECHNICAL SERVICES. Mr. Kilgour called upon Ms. Martin, who reported that in her search through the ISAD bylaws and the ALA constitution and bylaws, she had been able to find nothing more specific than the fact that a type-of-library division shall not establish committees in the area of interest of a type-of-activity division. None of the sources referred to a conflict of interest between two type-of-activity divisions; however, the ALA bylaws do indicate that the type-of-activity divisions have specific responsibilities for conduct of activities and projects within their areas of responsibility. Further questions on the subject will have to be directed to the ALA Committee on Organization.

BYLAWS AND ORGANIZATION COMMITTEE. Ms. Schmierer reported that her committee was aware of the fact that, based on the 1968 bylaws, there should be separate Bylaws and Organization committees; however, the major work of the group at the 1975 Midwinter Meeting was the preparation of the revised bylaws. Once the bylaws are adopted, a substantial amount of the work of the committee will be to draft an organization manual.

Meanwhile, the committee feels strongly that the establishment of new sections and committees be cleared through the Bylaws and Organization Committee. There should be organizational meetings called for the two new sections during the San Francisco conference for those who wish to become members of the sections. Their temporary officers should be elected; then bylaws should be written and approved. Ideally, a draft version of the bylaws would be written by the Bylaws and Organization Committee in time to be presented to the membership in San Francisco. In a second organizational meeting in San Francisco, the bylaws could be approved. At that time, it would be possible to elect officers by voice vote for the sections for the following year. Subsequently, the sections' officers would be elected on the regular ALA ballot.

Mr. Kilgour stated that he believed that thus far correct procedures had been followed, and asked Mr. Esteves to make certain that the procedures of the VCCS at the San Francisco meeting were approved by the Bylaws and Organization Committee. Ms. Schmierer recommended that all infor-

mation about the new sections, particularly that there are now temporary officers, be published in *JOLA*. Ms. Martin took note of the recommendation. In answer to a question by Mr. Auld, Mr. Hammer stated that there would be a news release in *American Libraries* and other professional journals.

Ms. Schmierer presented about eight pages of revised bylaws, based on the previous meetings with the ISAD Board.

ESTABLISHMENT OF THE INDUSTRY-LIBRARY RELATIONS COMMITTEE. Ms. Schmierer brought up the matter of the establishment of a committee concerned with misleading claims in advertising. Such a committee had been discussed by the board at its New York meetings. The Bylaws and Organization Committee was recommending that the committee be established and its name be the "Industry-Library Relations Committee."

She then read the following functions:

To review and advise on all matters of industry-library relations in the division's area of interest and to promote mutual understanding. To obtain information on industry practices as they affect libraries and to take appropriate action to ensure an acceptable performance by both libraries and industry.

She then moved that the committee be established with functions as specified in the above statement.

SECONDED by Larry Auld.

CARRIED.

GREGORY NEWSPAPER PROJECT. Mr. Hammer presented the proposal of the Organization of American Historians to obtain bibliographic information which will result in having newspapers encoded in a MARC format, residing in a national data base under the control of the Library of Congress.

MOTION. It was moved by Mr. Auld that the ISAD Board of Directors endorse the project, but that it communicate the fact that it does not have the ability to review the budget request. SECONDED by Ms. Martin.

CARRIED.

EXHIBIT 1

PROGRAM PLANNING COMMITTEE REPORT

During the 1975 Midwinter Meeting of the ALA, the ISAD Program Planning Committee held two formal meetings and one informal meeting. The following is a summary of the committee's activities.

1. *Networks and Networking Institute.* This institute is scheduled for 27 and 28 February 1975 in New Orleans. We have at this time had four firm commitments from vendors to display: OCLC, BIBNET (IDC), Bro-Dart, Inc., and System Development Corp. (SDC). Don Hammer will follow up by contacting BALLOTS and New York

Times Information Bank representatives in order to see if they would also be interested in participating. We shall attempt to integrate at least one session of exhibits with informal round table discussions.

The original recipients of invitations to exhibit will be resolicited with an invitation to supply only promotional literature for display in the exhibit area. The fee for literature display only will be \$25.00.

The committee has chosen February 15 as the decision date for possible cancellation of the institute. If fewer than 30 registrants are received by that date we would recommend cancellation.

2. *Repeat of Atlanta Serials Institute.* A repetition of the serials institute given in Atlanta in 1974 is planned for the West coast. The committee is exploring the possibility of obtaining cosponsorship from the California Library Association (CLA). The committee plans to coordinate very closely with CLA. The program is planned to be very similar to the Atlanta program with perhaps fewer speakers. As a replacement for some of the speakers a tutorial on the MARC serials format will be offered.

Final plans for this institute will be made at the beginning of March.

3. *San Francisco Annual Conference.* There will be five separate programs presented at the 1975 Annual Conference.

- a. *Video and Cable Communications Section Program.* The committee met with a representative of VCCS who outlined plans for a comprehensive series of programs associated with the annual meeting. No formal program plans were presented; however, since no known content conflict was anticipated, the committee endorsed the plans. VCCS will attempt to provide the committee with an outline of the planned programs.

VCCS has obtained \$400.00 from the ALA special program fund. They will produce three programs in conjunction with the meeting, as well as an all-day exhibit at the San Francisco Public Library.

- b. *NCLIS Program.* A program on the second National Commission on Libraries and Information Science (NCLIS) report will be presented at the 1975 Annual Conference. Four speakers are planned: two chosen from among those who have been commissioned to write papers on the report (letters have been seeking expressions of interest), one member of the NCLIS (Carlos Cuadra will be contacted), and one speaker to provide reaction (the committee will attempt to select a spokesman from among *public* library administrators).
- c. *IFO/ISAD Program.* A program on Data Base Privacy jointly sponsored by the ALA Office for Intellectual Freedom (IFO) and ISAD will be presented. IFO has assumed responsibility for the program. Brett Butler will work closely with IFO to provide whatever assistance is necessary in putting the program together.
- d. *Standards.* The committee met with the chairman of the Committee on Technical Standards for Library Automation, who presented an outline of a program on standards and standardization. The committee reviewed the content, found it not to conflict with other programs and endorsed its content.
- e. *ISAD/LED Committee on Education for Information Science.* "The Development of Instructional Modules for Information Science" is the title of this program. The program will consist of three speakers, one to discuss the "how to" aspects of instructional modules and two speakers to present existing modules.

4. *Video Cable Workshop.* A Video Cable Workshop is planned as a preconference institute in conjunction with the 1976 Annual Conference. The workshop will be closely coordinated with VCCS.

5. *Information Data Bases Institute.* Peter Watson of the Reference and Adult Services Division (RASD) approached ISAD regarding its interest in jointly sponsoring an

institute on information data bases (SDC, Lockheed, NY Times, etc.). The committee indicated that it was considering such a program for fall 1975. The committee will attempt to organize a program cosponsored with either RASD or with the Special Libraries Association (SLA) (SLA will be approached by the committee regarding co-sponsorship).

6. *NFAIS Institute Endorsement.* The committee was approached by the National Federation of Abstracting and Indexing Services to request joint sponsorship of a program on indexing and information retrieval. An outline of the program was provided. The committee agreed to endorse the program and have ISAD named as cosponsor. The institute will be held in 1975 (no definite date was given). ISAD's total involvement will be to lend its name as cosponsor and to supply its mailing list to NFAIS.

7. *Future Programs.* The committee has tentatively identified four programs for future consideration: (1) Introduction to Library Automation, (2) Further MARC Institutes, (3) Mini vs. Maxi Computers for Automated Library Systems, and (4) The Future and Nature of the Catalog in the Context of EDP Technology. No firm dates were decided on for these programs.

8. *J. Morris Jones—World Book Encyclopedia—ALA Goals Award.* The committee will consider the possibility of a program, which can be funded by the J. Morris Jones award.

EXHIBIT 2

COMMITTEE ON REPRESENTATION IN MACHINE-READABLE FORM OF BIBLIOGRAPHIC INFORMATION (MARBI) REPORT

The Committee welcomed Edwin Buchinski, Chief, Canadian MARC office, as the officially designated representative of the National Library of Canada to MARBI.

A total of thirty proposed changes to the MARC format were submitted to MARBI in its role as MARC Advisory Committee to the MARC Development Office by the Library of Congress MARC Development Office. These dealt primarily with modifications requested by the National Serials Data Program, the National Library of Canada and the CONSER Subcommittee on Working Communications to accommodate the CONSER project.

Of the thirty proposed, the LC MDO withdrew three proposals; the remaining twenty-seven were all approved, though some were modified in the process, and others were passed with qualifications.

A concern, expressed by the MARBI members and the LC MDO liaison throughout MARBI's deliberations, over the lack of principles or guidelines in terms of which proposed changes to the format could be assessed, led the MARBI chairman to appoint Charles Husbands as chairman of a MARBI subcommittee charged with addressing this issue.

A second subcommittee was formed to review, at LC MDO's request, the final draft of the MARC music format. MARBI was also asked to advise the LC MDO on the manner of distribution for Canadian MARC records through the MARC Distribution Service. MARBI will solicit comment from the library community and respond to the LC MDO accordingly.

It was moved, seconded, and passed that MARBI request the Library of Congress to consider the design problems found in the 6xx area of the format; aspects which require attention were included in the motion.

The committee met for a total of 14½ hours during Midwinter 1975.

Revised Bylaws of Information Science and Automation Division

The Information Science and Automation Division adopted bylaws at its organizational meeting of 1966 and in 1968 approved a revised version of the 1966 bylaws. Because some provisions of the 1968 bylaws are outdated due to changes in the ALA Constitution and Bylaws, in 1974 the ISAD Board of Directors requested that the ISAD Bylaws and Organization Committee review the 1968 bylaws and propose necessary amendments. The ISAD Bylaws and Organization Committee did so and made its report to the ISAD Board of Directors at the 1975 Midwinter Meeting. At that meeting, the ISAD Board of Directors approved the revision submitted by the committee and directed that the following revision be submitted for approval of the membership of the division.

The membership will vote on these bylaws as part of the 1975 ALA election and the vote will be requested on the ISAD ballot. Please read the revised bylaws and record your approval or disapproval of them on the regular ISAD election ballot when it arrives.

The members of the ISAD Bylaws and Organization Committee are: Lois M. Kershner, Harriet Rebuldela, Stephen R. Salmon, and Helen F. Schmierer, chairman.

BYLAWS OF THE INFORMATION SCIENCE AND AUTOMATION DIVISION

Article I. Name

The name of this organization, a division of the American Library Association, shall be the Information Science and Automation Division. As used hereafter, the word "Division" shall mean all current members in good standing of the Information Science and Automation Division.

Article II. Object

The Information Science and Automation Division shall concern itself with the development and the application of automated systems including systems analysis and design,

electronic data processing techniques, communications technology, and related technological developments, in all areas of library work. Within this field, the Division shall foster research, promote the development of appropriate standards, disseminate information, and provide a forum for the discussion of common problems.

Article III. Membership

Sec. 1. *Members.* Any member of the American Library Association who shall elect membership in this Division according to the provisions of the Bylaws of the American Library Association thereupon shall become a member of this Division.

Sec. 2. *Classification.* Membership classes of the Division shall consist of the same classes as those of the American Library Association.

Sec. 3. *Honorary members.* Honorary members shall be those honorary members of the American Library Association nominated to such membership in this Division by the Board of Directors and elected for life by the membership.

Sec. 4. *Dues, rights, and privileges.* All members of the Division shall be eligible for membership in any one or more of the sections. Only personal members shall have the right to vote and to hold office. Dues for this Division paid to the American Library Association shall constitute the dues of members. The date of payment of dues to the American Library Association shall be considered the date of payment of dues to this Division. The designation by a member of the American Library Association, on its membership form, of this Division as a division to which the member wishes to belong shall be considered as election of membership in this Division.

Sec. 5. *Membership, fiscal, and conference years.* The membership, fiscal, and conference years shall be the same as those of the American Library Association.

Article IV. Officers, Terms of Office, and Duties

Sec. 1. *Officers.* The officers of this Division shall be a president, a vice-president (who shall also be the president-elect), and an executive secretary.

Sec. 2. *Terms of office.* All officers and elected members of the Board of Directors shall serve until the adjournment of the general meeting at which their successors are announced. Procedures for filling vacancies in the offices of president and vice-president are specified in Article V, Sec. 3.

(a) *President.* The president shall serve for one year. He shall not be eligible for the office of president or president-elect for a period of at least one year following his service as immediate past president.

(b) *Vice-president.* The president-elect shall serve for the first year after election as vice-president, the second year as president, and the third year as immediate past president.

(c) *Executive secretary.* The executive secretary shall be appointed by the Executive Director of the American Library Association with the concurrence of the Board of Directors of this Division, and shall serve at the pleasure of the Executive Director.

Sec. 3. *Duties.* Except as otherwise provided in the bylaws, the duties of the officers shall be such as are specified in the parliamentary authority adopted by the Division.

(a) *President.* In addition to his regular duties, the president shall see that the bylaws are observed by the officers and members of the Board of Directors and that the orders of the Board of Directors and of the Division are carried out. He shall recommend to the Board of Directors such action as he deems to be in the interest of the Division. He shall perform such other duties as the Board of Directors may assign to his office.

(b) *Vice-president.* In addition to his regular duties, the vice-president shall perform such duties as the Board of Directors may assign to his office.

(c) *Executive secretary.* In addition to his regular duties, the executive secretary shall submit an annual report to the Division and other reports as required by the Board of Directors. He shall perform such other duties as the Board of Directors may assign to his office.

Article V. Board of Directors

Sec. 1. *Composition.* The Board of Directors shall consist of the officers of the Division, the immediate past president of the Division, the presiding officer of each section of the Division, and three directors at large. *Ex-officio* members of the Board including the executive secretary, the editor of the Division's journal, the chairman of the Bylaws and Organization Committee, and other *ex-officio* members as shall be from time to time so designated by action of the Board shall not have the right to vote.

Sec. 2. *Powers and duties.* The Board of Directors shall have authority over the affairs of the Division during the period between meetings of the Division provided, however, that none of its acts shall conflict with or modify any actions taken by the Division. The annual and any other budget requests shall be subject to the approval of the Board of Directors. The Board of Directors shall perform such other duties as are specified in these bylaws, and shall report upon its work at the general meeting of the Division.

Sec. 3. *Vacancies.* Vacancies in the elected membership of the Board of Directors shall be filled as follows:

(a) *President.* If the office of president becomes vacant, the vice-president shall succeed to the office of the president and shall serve in that capacity until the expiration of the year for which he (the vice-president) was elected president, except as provided for in Article V, Sec. 3(b).

If the offices of both the president and

vice-president become vacant within the same year, the Board of Directors shall appoint one of its members to act as president until a president is duly elected. At the next election two candidates shall be elected, one to take the office of president and to serve for one year, the other to serve as vice-president (president-elect).

(b) *Vice-president.* If the office of vice-president becomes vacant, two candidates shall be elected at the next election, one to take the office of president immediately and to serve for one year, the other to serve as vice-president (president-elect). If the vacancy occurs between the close of nominations and the adjournment of the general meeting, the vacancy shall be considered as having occurred in the office of the president in the following year in which case two candidates shall be elected at the election in the following year, one to take the office of president and to serve for one year, the other to serve as vice-president (president-elect).

(c) *Directors at large.* If the office of a director at large becomes vacant, a director at large shall be elected at the next election to complete the unexpired term.

(d) *General provisions.* If the successful candidate for an elective office dies or withdraws between the close of nominations and the adjournment of the general meeting, the resulting situation shall be considered as a vacancy having occurred during the term for which he was elected.

Sec. 4. *Terms of office.* Directors at large shall serve for three years. They shall be elected for terms expiring in different years. Directors shall not be eligible for consecutive terms.

Sec. 5. *Officers.* The officers of the Division shall *ex-officio* be the officers of the Board of Directors.

Sec. 6. *Meetings.* The Board of Directors shall meet in conjunction with each general meeting of the Division and of the American Library Association. Special meetings may be called by the president, and shall be called upon the written request of a majority of the members of the Board.

Sec. 7. *Quorum.* A majority of voting members shall constitute a quorum of the Board of Directors.

Sec. 8. *Votes by mail.* Votes may be taken by mail as provided in Article VII, Sec. 7.

Sec. 9. *Rules of order.* The Board of Directors may adopt rules for the transaction of its business, provided they shall not conflict with the bylaws of the Division.

Sec. 10. *Duties of members.* Each member of

the Board of Directors shall perform the duties attached to his membership on the Board. In the case of continued failure of a director to participate in the deliberations of the Board, the Board may, by vote of three-fourths of its members, declare the office of such director vacant.

Article VI. Meetings

Sec. 1. *General meeting.* The Division shall hold a general meeting of the Division at the time and place of the annual conference of the American Library Association.

Sec. 2. *Special meetings.* Special meetings may be called by the Board of Directors and shall be called by the president upon the written request of fifty members of the Division. At least thirty days notice shall be given and only business specified in the call shall be transacted.

Sec. 3. *Quorum.* Fifty members shall constitute a quorum.

Sec. 4. *Votes by mail.* Votes by mail may be authorized by the Board of Directors between meetings. Such mail votes shall be conducted under the same requirements as votes at meetings.

Mail ballots shall be conducted by the executive secretary in such manner as the Board of Directors shall determine. A copy of the ballot shall be mailed by the executive secretary to each member simultaneously. The Board of Directors shall have the authority to set the time limit during which votes will be recorded, but if no such time limit is set, no vote shall be counted unless received within thirty days from the day the text of the ballot or question voted upon was mailed properly addressed to those entitled to vote on the matter involved. A proposal is carried if it receives the same proportion of affirmative votes from among all votes cast as would be required to carry the same proposal if voted upon at a meeting. Unless otherwise specified in the proposal, if carried, it becomes effective upon publication of the result of the ballot.

In the case of a vote by mail the Board of Directors may designate publication of the ballot or questions submitted in the official journal of the Division as the appropriate method of submitting the matter to the members for their determination.

Article VII. Committees

Sec. 1. *Standing and annual committees.*

(a) *Bylaws and Organization Committee.* The Bylaws and Organization Committee shall advise the Board of Directors and

through it the Division and sections on the establishment, functions, and discontinuance of sections, committees, and other groups, as the needs of the Division and sections may require. The chairman of the Bylaws and Organization Committee shall serve as an *ex-officio* member of the Board of Directors.

(b) *Establishment.* The Board of Directors may establish other standing and annual committees to consider affairs of the Division which require continuous or repeated attention by the members. The Bylaws and Organization Committee shall recommend the name and size of each such committee, and may recommend special regulations for its appointment, composition, and term of office of members.

(c) *Composition.* Unless otherwise provided for by these bylaws or by action of the Board of Directors, each standing and annual committee shall be composed of an odd number of not less than three members, each of whom shall be an active member in good standing of the Division.

(d) *Terms of office.* Unless otherwise provided for by these bylaws or by action of the Board of Directors, members of standing and special committees shall be appointed for terms of two years, and may be appointed for a second term but in no case shall a person serve on a committee for more than four consecutive years. The terms of approximately one-half the members shall expire each year. Members of annual committees shall be appointed for terms of one year.

(e) *Individual committees.* The standing and annual committees include the following committees, with functions, size, and such special regulations as may be deemed necessary to be determined by the Board of Directors:

Bylaws and Organization Committee	Standing
Nominating Committee	Annual
Program Planning Committee	Standing

Sec. 2. *Special committees.* Committees not authorized as standing or annual committees are special committees. Special committees may be authorized by the Division or by the Board of Directors. Each special committee shall continue in existence until its purpose is accomplished or it is discharged by the Division or by the Board of Directors.

Sec. 3. *Intersectional committees.* Intersectional committees of sections within the Division and other intra-Division commit-

tees may be established as required by the groups concerned upon the recommendation of the Bylaws and Organization Committee and the approval of the Board of Directors.

Interdivisional committees and other committees formed with units that are outside the Division and that are within the Association may be established only as provided for in the Bylaws of the American Library Association.

Sec. 4. *Joint committees.* The Division or Board of Directors may recommend to the Committee on Organization of the American Library Association that joint committees, either standing or special, be established with other organizations when the functions of the proposed committee cannot appropriately be delegated to a single Division or section committee. Joint committees with organizations outside the American Library Association shall be established only as provided for in the Bylaws of the American Library Association.

Representation of the Division in organizations outside the Association may be authorized by the Division or the Board of Directors, with the approval of the American Library Association.

Sec. 5. *Notification.* The executive secretary shall inform the Committee on Organization of the American Library Association annually of the establishment and functions, or discontinuance of any standing, annual, special, intersectional, or joint committee of the Division and of its sections. He shall have published annually a complete list of existing committees, together with their functions and membership, for the information of the Division.

Sec. 6. *Appointments.* Unless otherwise provided for by these bylaws or by action of the Board of Directors, each committee member and representative shall be appointed, with the approval of the Board of Directors, by the vice-president (president-elect), or the president, under whose term of office as president the member shall commence his service, and shall serve until the adjournment of the meeting at which his successor is appointed.

Vacancies on committees shall be filled by the president with the approval of the Board of Directors.

Sec. 7. *Votes by mail.* Committee votes may be taken by mail, provided all members are canvassed simultaneously. In case of dissent among members, a second vote shall be taken after each member has been acquainted with the views of every other.

Each committee shall have the authority to set a time limit within which the votes of its members shall be recorded, but if no such time limit is set, no vote shall be counted unless received within thirty days from the day the text of the matter to be voted upon was mailed properly addressed to those entitled to vote.

Sec. 8. *Reports.* Unless otherwise specified in these bylaws, or in the act authorizing a committee, each committee shall report on its work at the general meeting of the Division in the following manner:

Committees shall transmit their reports to the executive secretary not later than thirty days before the general meeting of the Division.

Reports containing recommendations for action by the Division shall be presented at the general meeting. If a copy of a report was distributed to the membership either before or at the beginning of the meeting, and unless a majority of the members present and voting demand a reading of the report, its presentation may be limited to a summary of the findings and a reading of the recommendations.

Other reports shall be published in full or in summary or be transmitted otherwise to the membership not later than four months after the general meeting. Such reports shall be cited, and their disposition announced, at the general meeting.

Article VIII. Sections

Sec. 1. *Establishment.* Any group of fifty or more members of the Division or of the American Library Association, whose special field of interest falls within the Division but is distinct from that of any existing section, may be established as a section upon written petition, and upon approval by the Division. Members of a group in the American Library Association who are not members of the Division and who are newly affiliating with the Division as a section must become members of the Division within six months after such affiliation or lose their membership in the section.

The name of the section shall clearly indicate its field of interest.

Sec. 2. *Membership.* Any member of the Division may affiliate with as many sections as he may wish, and shall enjoy all privileges of membership in each section he may join. The designation by a member of this Division, on the American Library Association membership form, of any section as a section to which the member wishes to be-

long, shall be considered as election to membership in that section by such member.

Sec. 3. *Relation to the Division.*

(a) *Autonomy.* Each section shall define its own functions, subject to the approval of the Division, and shall manage its own affairs, provided, however, that no section shall adopt bylaws or other rules for the transaction of its business which are inconsistent with those of the Division, or engage in any activity in conflict with the program of the Division.

(b) *Representation on the Board of Directors.* The presiding officer of each section shall be a voting member of the Board of Directors of the Division. If the presiding officer of a section is unable to attend a meeting of the Board of Directors, he shall notify the executive secretary promptly, and the presiding officer-elect of that section shall become a voting member of the Board of Directors for that meeting. If the presiding officer-elect of the section is unable to attend a Board of Directors meeting as a substitute voting member for the presiding officer of the section, he shall notify the presiding officer and the executive secretary promptly; under these circumstances the section presiding officer may designate a substitute voting member from the governing body of the section which he represents.

Sec. 4. *Finance.* Each section shall receive allotments made on the basis of need as approved by the Board of Directors.

Sec. 5. *Jurisdiction.* The Bylaws and Organization Committee shall decide conflicts of jurisdiction between or among sections, subject to the approval of the Board of Directors.

Sec. 6. *Discontinuance.* The Bylaws and Organization Committee shall recommend that a section be dissolved when, in its opinion, the usefulness of that section has ceased. If the recommendation is adopted by the Division, the section shall be dissolved.

Article IX. Discussion Groups

Sec. 1. *Establishment.* Any group of ten or more members of the Division interested in discussing common problems which fall within the object of the Division may form a discussion group upon written petition from the group and upon approval of the Board of Directors. The petition shall include the purpose of the group and the requirements for membership, if any.

Sec. 2. *Membership.* Membership is open to

members of the Division who are interested in the purpose of the group and who fulfill the requirements for membership in the group.

Sec. 3. *Officers.* Each group shall elect a chairman annually. In addition to his regular duties, the chairman shall see that the group's activities are limited to discussion of common problems within the purpose of the group, that the group engages in no activity in conflict with the program of the Division and its sections, and that the Division bylaws are observed by the group.

Sec. 4. *Discontinuance.* The Bylaws and Organization Committee shall recommend that a discussion group be dissolved when in its opinion the usefulness of that group has ceased. If the recommendation is adopted by the Board of Directors, the group shall be dissolved.

Article X. Nominations and Elections

Sec. 1. *Nominations.* The Nominating Committee shall present candidates for the positions of vice-president (president-elect) and directors at large when required. Other nominations for these offices may be submitted in writing by any ten members and shall be filed with the executive secretary. Any such nominations shall be included on the official ballot.

No candidate shall be presented whose written consent has not been filed with the executive secretary. No candidate shall be presented who is not a personal member in good standing of the Division at the time of his nomination.

Sec. 2. *Nominating Committee.*

(a) *Composition.* The Nominating Committee consists of three members of the Division. No member of the Board of Directors shall be appointed to the Nominating Committee.

(b) *Terms of office.* The Nominating Committee shall be appointed for a one-year term, ending with its final report to the membership, by the vice-president (president-elect) under whose term of office as president its final report will be made, and with the approval of the Board of Directors. Members of the Nominating Committee, upon expiration of their terms, shall not be eligible for immediate reappointment.

(c) *Duties.* The Nominating Committee shall present at least two candidates for each office to be filled at the next election. It shall select the candidates in such manner as to assure as broad a representation as possible of different types and sizes of

libraries, types of service, and of the geographic distribution of the membership.

The Nominating Committee shall report nominations to the executive secretary, and the executive secretary shall notify each member by mail of the nominations for elective office in the Division at such time as is prescribed by the Bylaws of the American Library Association.

Sec. 3. *Elections.*

(a) *Ballot.* Elections shall be held by mail ballot. The executive secretary shall mail a copy of the ballot to each member of the Division. The ballot shall be returned to the executive secretary at such time as is prescribed by the Bylaws of the American Library Association.

(b) *Election results.* Candidates receiving a plurality of the votes cast are elected and shall be so reported at the next general meeting. In case of a tie vote the Election Committee of the American Library Association shall decide the election by lot.

Sec. 4. *Extraordinary circumstances.* If, for reasons beyond the control of the Division, no general meeting is held in any one year, terms based on the date of the general meetings shall be determined by the anniversary of the last general meeting at which an election was reported, unless a different date is authorized by the American Library Association. The election results shall be mailed to each member.

Article XI. Amendment of Bylaws

Sec. 1. *Proposals.* Amendments to the bylaws may be proposed by the Board of Directors or, in writing to the Board of Directors, by any Division committee, by the governing body of any section, or by petition signed by ten members. Proposed amendments shall be presented in writing to the executive secretary at least ninety days prior to the date at which they are to be acted upon; they shall then be referred by him to the Bylaws and Organization Committee, which shall report upon them to the Division membership.

Sec. 2. *Notice.* The text of any proposed amendment shall be mailed to each member of the Division at least thirty days prior to the meeting at which it is to be acted upon.

Sec. 3. *Voting.* The bylaws may be amended by a two-thirds majority vote of those members participating in the vote to amend. The vote shall be taken either at the general meeting of the Division, or by mail, and, if by mail, preferably as a part of the mail vote for election of officers.

Sec. 4. *Adoption.* A proposed amendment or new bylaw becomes effective when it has been approved.

Article XII. Publications

Sec 1. Publications may be authorized by the Board of Directors as provided for in the Bylaws of the American Library Association. The Division's journal shall be *Journal of Library Automation*.

Sec. 2. *Editors.* Editors for Division publications shall be appointed by the Board of Directors. The editor of the Division's journal shall be appointed for a three-year term, renewable for three-year terms by approval of the Board.

Article XIII. Notice by Mail

Publication of notices in the journal of the Division or the Association shall be considered sufficient to fulfill the requirement of notice by mail.

Article XIV. Parliamentary Authority

The rules in the latest edition of *Robert's Rules of Order (Newly Revised)* shall govern the Division in all cases to which they are applicable provided they are not inconsistent with the bylaws of the Division or with the Constitution and Bylaws of the American Library Association.

TECHNICAL COMMUNICATIONS

ANNOUNCEMENTS

The Information Science and Automation Division of the American Library Association Adopts New Video and Cable Organization at Midwinter Conference

The Video and Cable Communication Section was formally ratified by the Board of Directors of the Information Science and Automation Division of the American Library Association during the recent ALA Midwinter Meeting in Chicago, January 18-25.

Resulting from a two-year study, the new section will derive much of its beginning impetus from a core of 400 librarians who, until this section was formed, worked on a task force basis with the Social Responsibilities Round Table of ALA.

The new section has planned an initial general membership meeting at the ALA Annual Conference in San Francisco, June 29-July 4, to outline the future direction of the section. Tentative discussion has outlined four areas of present concern for the organizers of the section: *technological developments*, to include surveys and recommendation of standards during the evolution of video equipment; *legislation and regulation*, to track Federal Communication Commission, state and local regulations on cable technology; *distribution and exchange*, to survey sources of video programming and to solve the problems of videography, interlibrary exchange, and copyright; and finally *programming*, to provide continuing education programs and workshops for librarians interested in video and cable communication.

In addition to the membership meeting to be held Monday, June 30, the new section will sponsor two programs at the Annual Conference. A video equipment and production workshop will be held on

Tuesday, July 1. Participants may choose to attend any of three concurrently held workshops, one on video playback equipment, one on simple portapak production, and another on sophisticated production techniques.

Attendance at these workshops will be by reservation only. For further information contact Craig Schiller, California Video Resource Project, San Francisco Public Library, San Francisco, CA 94102.

On Wednesday, July 2, a full day of video presentations and discussions will be held in the SFPL Lurie Room. Topics will include: the library in franchising; copyright and the library's use of video; video services to the deaf; electronic arts and humanities, and many more.

Roberto Esteves, director of the California Video Resource Project, has been elected as interim chairperson of the new section until formal election can be held this summer. Mrs. Loreta Tiemann of Lincoln City, Nebraska Libraries, is acting as interim vice-chairperson.

The nominating committee consisting of Mr. Larry Molumby, Washington, D.C. Public Library; Mr. Larry Dickter, Cable Television Information Center, Washington, D.C.; and Louise Mortimer, Model Secondary School for the Deaf, Washington, D.C., is now seeking interested librarians who are members of ISAD to run for office in this new section.

Clinic on the Use of Computers in Literature Searching and Related Reference Activities in Libraries

The twelfth annual Clinic on Library Applications of Data Processing will be conducted by the Graduate School of Library Science, University of Illinois, from Sunday, April 27 to Wednesday, April 30, 1975. The theme of this clinic will be "The Use of Computers in Literature Searching and Related Reference Activities in Libraries."

Over the last decade, we have witnessed a very rapid growth in the availability of machine-readable data bases and of information retrieval systems for the exploitation of such data bases. The rapid developments in this area have put machine literature searching capabilities within the reach of many libraries. Many data bases can already be accessed on-line by individual libraries. Service from other data bases can be obtained from the producer of the data base or from one of the scientific information dissemination centers.

We are now beginning to see the development of regional information centers, designed to make a wide range of machine-readable files accessible to all the libraries in a designated geographic region. In addition, the minicomputer has put data processing capabilities within the reach of even quite small libraries, allowing such libraries to develop their own special data bases and to exploit these on behalf of a particular user group. One result of these activities has been the emergence of the "information services librarian," a professional librarian who specializes in the exploitation of machine-readable files. It is these activities, and their impact on the reference functions of libraries of all types, that will be discussed at the 1975 clinic.

F. W. Lancaster, professor of library science, is chairman of the clinic. Further information may be obtained from Mr. Brandt Pryor, Office of Continuing Education and Public Service, University of Illinois, 116 Illini Hall, Champaign, IL 61820.

Plans Unveiled to Issue LC Subject Headings in Microform

The eighth edition of *Library of Congress Subject Headings*, consisting of a cumulation of the seventh edition and all supplements issued through 1973, will be issued in microform on an experimental basis. The microform edition will consist only of the headings and references, and will be issued in addition to the two-volume printed eighth edition, which will include an extensive introduction and a list

of "Subject Headings for Children's Literature." The printed edition is scheduled for publication in mid-1975.

The Library of Congress has awarded a contract to Butler Associates, Stanford, California, to conduct a twelve-month pilot study which will involve the distribution to participants of microform test materials in one of several different microformats.

The study, which is being coordinated by the MARC Development Office, will assess user receptivity to these microforms, investigate various kinds of microformats suitable for use in a technical processes environment, and determine whether the publication of Library of Congress reference tools, such as *Library of Congress Subject Headings*, in continuously updated microform editions at regular intervals is practical. At the conclusion of the study, a final report will be compiled, including some general background on the state of the art, a description of the interaction of equipment and microformat in the design of a publishing system, and reports of the field site experiments.

The microform edition of the headings and references is expected to be available for distribution six to eight months before the printed eighth edition of *Library of Congress Subject Headings*. Libraries that are not participating in the pilot study may purchase the experimental microform at an additional charge from the Card Division when they order the printed edition. The microform will be sold only in conjunction with the printed edition and will not be available separately. If the experimental offering of the eighth edition in microform proves successful, it is possible that new microform issues cumulating headings through later years will be prepared and sold separately.

An announcement on the price, microformat, and expected date of distribution will be made as soon as all arrangements have been completed. The pilot study and experimental offering of the subject heading list have been initiated as part of a continuing effort at the Library of Congress to disseminate its bibliographic products as quickly as possible.

*Chemical Abstracts Service
Assumes ASTM CODEN Assignment*

Effective January 1, 1975, Chemical Abstracts Service (CAS) assumed responsibility for community-wide assignment and dissemination of ASTM CODEN for periodical and nonperiodical publications. The CODEN system is being transferred to CAS by the American Society for Testing and Materials, which has sponsored the system since 1955.

CODEN, which are used in lieu of full or abbreviated titles of publications in processing and storing bibliographic data in many computer-based information handling systems, are unique, unambiguous codes that identify publications. Each CODEN consists of five characters plus a check character that permits computer detection of errors in the code. Once assigned, a CODEN serves as a permanent identifier for a specific title. If the title of a serial publication is changed, a new CODEN is assigned. The original CODEN continues to identify the earlier title.

Requests for assignment of CODEN or inquiries about CODEN should be directed to Chemical Abstracts Service, CODEN Section—Department 32, The Ohio State University, Columbus, OH 43210.

Requests for CODEN must be accompanied by evidence of the existence of the publication for which the CODEN is requested, normally in the form of a surrogate of the cover, masthead, or title page or other original identifying information. A service fee of \$1.00 for each CODEN requested must also accompany the request.

*Cost Analysis Survey
of Technical Services*

The Technical Services Costs Committee of the Resources and Technical Services Division of ALA is seeking to update the bibliography by Mary Tesovnik and Florence DeHart, "Unpublished Studies of Technical Service Time and Costs: A Selected Bibliography," which was published in *Library Resources & Technical Services*, 14:56-57, Winter, 1970. Cita-

tions and/or copies of such reports are requested to be sent to Martha W. West, Associate Professor, Department of Librarianship, San Jose State University, San Jose, CA 95192.

COMPUTERS/ PROGRAMMING

*Library Programming Considerations:
A Note on COBOL*

Although it seems quite obvious that library data processing applications are more "business-oriented" than "scientific-oriented," and that application programs would be written in a business-oriented programming language rather than a scientifically-oriented language, this is not always the case. Most libraries initially developing computer-based applications (circulation, serials, etc.) do not have the resources to employ a full-time programming staff and must therefore rely on such personnel available in other areas. Frequently, these programmers are scientifically oriented and tend to develop algorithms in the FORTRAN language. Such was the case at Mississippi State University.

Mitchell Library at Mississippi State developed a computer-based circulation system in 1967, which is still in operation with only minor changes.¹ The system is designed around the IBM 357 system which is used to produce charge and return cards. The charge and return cards are processed with a Univac 1106 computer using several FORTRAN programs as well as Univac utility routines. The programs update the master file of books in circulation, collect monthly and annual statistics by borrower type and Dewey classification, detect uncollected fines, and examine the master file for overdue items. In addition, the following listings are produced:

- Revised master list of books in circulation.
- Overdue and fine letters.
- Daily, monthly, and annual statistical printouts.
- List of mispunched or invalid update cards.

Table 1. A Comparison of COBOL and FORTRAN Processing Times (Time in Minutes and Seconds)

Run No.	No. of Updates	No. of Overdues	CPU Time		I/O Time	
			COBOL	FORTRAN	COBOL	FORTRAN
1	4117	344	1:14	7:14	6:01	7:09
2	4354	389	:55	7:56	5:36	7:42
3	4457	450	:55	7:40	5:52	8:00
4	5160	435	:58	8:32	6:02	7:55
5*	3442	467	:48	7:41	5:25	7:58
6*	4482	513	:53	8:35	6:09	8:05
7*	4805	601	:57	9:01	6:14	8:15
8*	2498	584	:43	7:39	5:57	8:02

* Using a COBOL indexed sequential borrower name and address file.

- Mismatched records list (from merging the master file with the updates).
- "Self check-list" of overdue items.
- Copies of overdue and fine records.

An important point in this process is that borrowers are keyed by a ten-digit identification number while books are keyed by a forty-eight-character call-number string. A FORTRAN-based sort and compare of a forty-eight-character string is cumbersome at best.

Recently a project was undertaken to rewrite existing programs in COBOL. All inputs, outputs, and files were to remain the same. Test runs comparing the FORTRAN programs with the COBOL programs have shown a surprising improvement. Table 1 gives the results of eight comparisons; each comparison shows the number of update records processed, the number of overdue records detected, and the processing and input/output time for both COBOL and FORTRAN. On four runs an indexed sequential file was used for the COBOL name and address file, but there was no significant difference in the result.

Since the results show a consistent 50 percent decrease in total computer time for the COBOL programs, it seems reasonable to conclude that COBOL is the more efficient language in this particular application. Based on these results, new applications in the library will be implemented in COBOL. (Other advantages—such as program readability—also exist.)

It should be cautioned that this comparison should not be generalized. Appli-

cations of a different nature, different computers, or different language processors may render different results. However, similar applications utilizing a Univac 1100 series computer and the standard (Fieldata) language processors should yield similar comparisons.—*Patti Sue Foil, Library Applications Programmer, Tramel Computing Center, Mississippi State University and Bradley D. Carter, Assistant Professor, Department of Computer Science, Mississippi State University.*

REFERENCE

1. B. D. Carter, "The Design of the Circulation Control and Serials Record System for the Mississippi State University Library" (master's thesis, Mississippi State University, 1968).

REGIONAL PROJECTS AND ACTIVITIES

SOLINET, NELINET, and now, MILINET? Well, perhaps. There have been rumblings recently around the Midwest that such an organization was being developed, but is there any truth in these rumors? Yes. A group of academic librarians in the midwestern states of Michigan, Wisconsin, Minnesota, Ohio, Indiana, Illinois, Iowa, the Dakotas, and Nebraska have been meeting to explore the possibilities of developing a midwestern consortium, tentatively labeled MIDLNET or MILINET. Discussions over a two-year

period within an ever expanding group have resulted in a conviction that a regional library network is necessary to the Midwest. A funded study, aimed at determining the nature and role of a library network organization, is now under way, and the intent is to establish the network upon completion of the study.

At present the group is only informally organized and in the process of developing an internal structure which is now comprised of a Steering Committee: W. Carl Jackson (Indiana University), chairman; T. John Metz (University of Wisconsin, Green Bay), secretary; Charles Sage (Iowa State University); Ralph Hopp (University of Minnesota); John McGowan (Northwestern University); James Riley (Federal Library Committee); and an Advisory Committee, composed of a larger group (thirty-two) of interested observers and participants, most of whom were involved in the earlier discussions. Although the membership presently contains a heavy representation of academic libraries, the final plan will not rule out participation of any type of library. In addition, the consortium will be concerned to interface with other state networks now under development in several states and with whatever emerges as a national network.

The objective of this developmental stage is not to determine whether, in this area of rich library resources, there are advantages to be had in a cooperative venture for this seems self-evident. The real question focuses on the type of organizational structure which should be established and the kinds of programs it should undertake. To aid in answering these questions, the group has named Mrs. Barbara Markuson as principal investigator. With her assistance, the Steering and Advisory committees will attempt to answer questions such as: What legal structure should the organization assume—interstate compact or interstate nonprofit corporation? What membership structure should be established? What should be the objectives of the organization—development of a computer-based or other kind of bibliographic network, cooperative re-

search facility, or some other goal? All of these questions are still to be answered by the implementation study funded by the members of the Committee on Institutional Cooperation (a consortium of the "Big Ten" Universities and the University of Chicago) and a number of other interested colleges and universities. The study and the activities of the Steering and Advisory committees are being coordinated through the CIC office in Evanston, Illinois.

This organizational effort did not stem originally from the MIDLNET or MILNET committees, but evolved from an idea conceived by an organization of Wisconsin librarians (COWL) under the leadership of T. John Metz. In 1972 they began exploring the idea of establishing a cooperative bibliographic network within the state, but decided that a larger area was required and embarked on discussions with libraries in Iowa, Minnesota, and northern Illinois.

At this point a concept of the Upper Midwest Regional Library Network began to evolve. About a year and a half ago the Council of CIC librarians began similar discussions and were then invited to a meeting of the Upper Midwest group in Minneapolis. From this meeting, the area was expanded to its present geographical size. There has been some interest in further expanding the list of participants; however, the Steering Committee, aware that the results of the study will probably influence the membership structure, has decided to await completion of the survey and the development of a more formal organization. The committee will attempt to keep interested librarians apprised of its progress and, in particular, to provide a status report as organization plans seem to be consolidating (a very optimistic target date is summer 1975). Any inquiries for the present may be directed to Dr. Frederick H. Jackson, Committee on Institutional Cooperation, Suite 970, 1603 Orrington Ave., Evanston, IL 60201, or to W. Carl Jackson, Dean of University Libraries, Indiana University, Bloomington, IN 47401.

Council for Computerized Library Networks

Ronald F. Miller, director of NELINET, has announced that the Council for Computerized Library Networks (CCLN) has recently completed its organizational phase and is now ready to receive member applications from operating networks.

CCLN, according to Mr. Miller, chairperson of the ten-network organization, provides a forum in which colleagues may identify common problems relating to library network development and operation, and coordinate solutions to them. Its primary purpose is to furnish an avenue through which computerized library networks can be built and administered.

Charter memberships in CCLN include the following: Cooperative College Library Center, Inc. (CCLC), Federal Library Committee (FLC), Five Associated University Libraries (FAUL), Interuniversity Council of the North Texas Area (IUC), New England Library Information Network (NELINET), Ohio College Library Center (OCLC), Pennsylvania Area Library Network (PALINET), Pittsburgh Regional Library Center, Inc. (PRLC), Southeastern Library Network (SOLINET), and the State University of New York (SUNY).

Membership is open to organized regional library groups, library consortia, and library networks which promulgate, participate in, and actively support the development of an integrated computerized library network for the purpose of sharing human, technological, and bibliographic resources in either the public or not-for-profit sectors. Such groups shall be composed of two or more formally organized but administratively independent library agencies.

Other officers in the new organization are: vice-chairperson—Charles Stevens, SOLINET; secretary—John W. Aubry, FAUL; and treasurer—Anthony A. Martin, PRLC. Computerized library networks wishing additional information concerning CCLN may send their inquiries to: Mr. Ronald F. Miller, Chairperson, CCLN, c/o New England Board of Higher Education, 40 Grove St., Wellesley, MA 02181.

INFORMATION RETRIEVAL

ISI Puts World's Largest Social Sciences Journal Literature File On-Line Through Lockheed Information Systems

The Institute for Scientific Information (ISI) has announced that it is now working with Lockheed Information Systems (LIS) to provide information specialists and researchers with on-line, interactive, computer searches of the journal literature of all the social science disciplines. Operational since September 1974, the ISI/LIS service is called SOCIAL SCISEARCH and is designed to give quick, easy, and economical access to the world's largest social sciences journal literature file.

Covering every editorial item from about 1,200 of the world's most important social sciences journals, plus selected social sciences items from 2,500 other journals in the natural and physical sciences, the service offers a searchable file of over 300,000 items published from 1972 through the present. Each month, approximately 7,000 new items are added. There are also plans to add, early in 1975, coverage of the 1971 literature.

To assure maximum retrieval effectiveness, the data base can be searched in several ways. Included are searches by key words, word-stems, word-phrases, authors, and organizations. One of the search techniques utilized—citation searching—is based on the fact that authors' references (citations) to previously published material indicate subject relationships between the earlier and the later publications. In citation searching these relationships can be used to locate additional items about a subject if an earlier publication on the same subject is known by the searcher. Through citation searching, it is frequently possible to avoid terminology problems that would cause a conventional subject-indexed search system to miss relevant information. This is particularly important in the social sciences, where terminology tends to be less precise than that found in the natural sciences.

The Lockheed retrieval program, DIA-LOG, permits subscribers to conduct ex-

tremely rapid searches through two-way communications terminals located in their own facilities. After examining the preliminary results of their inquiries, searchers are able to further refine their questions, to make them broader or narrower. This exchange between the searcher and the computer (located in Palo Alto, California) is conducted with simple, English-language statements. Because Lockheed's system is tied in to a nationwide communications network, most subscribers are able to link their terminal to the computer through the equivalent of a local phone call.

For every item retrieved through a search, subscribers receive a complete bibliographic description that includes all authors, journal citation, full title, a language indicator, a code for the type of item (article, note, review, etc.), an ISI accession number, and all the cited references contained in the retrieved article. If copies of articles located through SOCIAL SCISEARCH cannot be obtained conveniently through a library, subscribers have two options: they can write for a reprint using the authors' mailing addresses provided; or, they can use the accession number to order copies of the articles through ISI's Original Article Tear Sheet (OATS) service. Articles can be requested from OATS through the mail, telephone, or telex, or through a special on-line command entered after search results are evaluated.

ISI, in response to requests to put its Social Sciences Citation Index on line, joined with Lockheed, who wanted a very current, large-scale, social sciences journal literature file to complement the other data bases it already offered including: COMPENDEX (engineering); INSPEC (physical sciences); CHEMCON (chemistry); CAIN (agriculture); EXCEPTIONAL CHILDREN ABSTRACTS; PSYCHOLOGICAL ABSTRACTS; INFORM (business); ERIC (education); and NTIS (government reports). With the addition of the ISI data base, LIS now offers new coverage in the areas of anthropology, archaeology, area studies, criminology and penology, economics, ethnic group studies, geography, history, infor-

mation and library science, law, philosophy, political science, sociology, statistics, urban planning, and other social science disciplines.

For further information, contact Melvin Weinstock at the Institute for Scientific Information, 325 Chestnut St., Philadelphia, PA 19106, (215) 923-3300.

OSIS Notes

The National Science Foundation supports a variety of research efforts designed to identify more effective ways of meeting the information needs of urban users. Four current projects are particularly noteworthy.

The first is an experiment to bring on-line searching capabilities to the public through local public libraries. This project is based on the use of the Lockheed DIALOG retrieval system which includes abstracts or indexing to literature in the sciences, engineering, agriculture, business, and education. Over twenty bibliographic data bases are now available. On-line terminals began operating in four participating California libraries in early September 1974. These are: the Redwood City Public Library, Santa Clara County Library (Cupertino), San Mateo County Library (Belmont), and San Jose Public Library.

After about two months, and with little publicity, the San Jose Library and the Redwood Library are averaging over 100 searches per month. There are about fifty searches per month at the other two terminals. Staff of county and city governments and those from small businesses are the chief users. During the first year, while services are being tested, there are no charges. User charges will follow, once data on demand, utility, and probable economic feasibility have been estimated.

The purpose of the project is to determine if sufficient demand can be aggregated from infrequent or low volume users to support advanced retrieval services at public libraries or other organizations. If successful, various combinations of information companies and local service groups might develop.

The Office of Science Information Ser-

vice is also supporting a second effort to bring information services to the public, and especially to small to medium-sized industrial firms. In this case, the Pennsylvania Science and Engineering Foundation (PSEF) is the organizing agent. Using the LEADERMARK system of Lehigh University for its information base, PSEF is seeking to determine cost/effective means for marketing information to firms throughout Pennsylvania. Both experiments include independent assessments.

The National Science Foundation, through its research directorate, has also helped twenty-six of the largest cities in the United States and six of the nation's largest urban counties to join in a major effort to increase the use of modern technology in solving their operating problems. The program, called the Urban Consortium for Technology Initiatives, will be operated by Public Technology, Inc. (PTI), a nonprofit research and development organization based in Washington, D.C.

A major objective of the program is to put together a national inventory of the problems on which research is needed and to provide cities with the broad array of operating technologies they can use but do not have, such as advanced firefighting, telecommunications, and waste collection equipment. Another objective is to bring federal agencies, industry, and universities into a cooperative research and applications effort to put new technology and program techniques into operation in areas of lagging municipal productivity, or where significant cost savings might be effected.

Urban areas should benefit from still another NSF initiative. In this case, the Office of Science Information Service and the Office of Exploratory Research and Problem Assessment are combining to support technology assessments of the potential substitution of telecommunications for transportation. Results are expected to illuminate technological options, their impacts, and to help guide decision-making in this area.

Education and Commercial Utilization of a Chemical Information Center

The Association for Library Automation Research Communications (LARC) has published a summary report entitled "Four Year Summary—Education and Commercial Utilization of a Chemical Information Center," a project funded by the National Science Foundation (NSF) and monitored via the NSF Office of Science Information Service. The report—published in two parts as Volume Seven, Issues one and two of the LARC reports—summarizes work carried out by the IIT Research Institute during the period June 25, 1968 to June 25, 1972.

The major objective of the IITRI Computer Search Center (CSC) is to educate and link industry, academia, and government institutions to chemical and other scientific information systems and sources. The CSC was developed to meet this objective and is in full operation, providing services to users from a variety of machine-readable data bases with minimal restrictions and a high degree of flexibility. A new modular machine-independent PL/1 software system was developed for handling virtually any bibliographic-type data base. CSC's transferable programs have run at fifteen different computer facilities with different hardware computer models, versions of OS, peripherals, and releases of the PL/1 compiler. All data bases are converted by a preprocessor to standard IITRI format which employs a directory and character string type of file structure and are searched by a software system that employs the novel IITRI-developed Least Common Bigram search screen technique.

Copies of the report are available from the LARC Association, P.O. Box 27235, Tempe, AZ 85282.

Citation: Schipma, Peter B. *Four Year Summary: Educational and Commercial Utilization of a Chemical Information Center*. 1974. Part 1, 201 pages, Part 2, approximately 180 pages. (LARC Reports, Volume 7, Issues 1 and 2)

POT POURRI

Future Sites Announced for National Computer Conferences

Based on a recent decision of the National Computer Conference Board, New York and Dallas will be the future sites for the 1976 and 1977 National Computer Conferences.

1976 will see the return of the NCC to the New York Coliseum during the week of June 7-10. The 1977 National Computer Conference will be held in Dallas, Texas, June 13-16.

The '75 NCC will be held in Anaheim, California on May 19-22. Approximately 30,000 computer specialists, users of data processing equipment and services, government officials, administrators, corporate executives, and educators from the U.S. and abroad are expected to assemble in the newly expanded Anaheim Convention Center.

The National Computer Conferences—sponsored by the American Federation of Information Processing Societies, Inc., the Association for Computing Machinery, the Data Processing Management Association, the IEEE Computer Society, and the Society for Computer Simulation, Inc.—are the world's largest gatherings of computer specialists and EDP users. Further information on the NCC may be obtained by writing or calling AFIPS Headquarters, 210 Summit Ave., Montvale, NJ 07645, (201) 391-9810—or, outside of the New Jersey area call toll-free (800) 631-7070.

International Conference on University Applications of Satellite and Cable Technology

A major international conference on "University Applications of Satellite and Cable Technology" has been scheduled for June 3-5, 1975 on the University of Wisconsin campus.

Cosponsored by the University of Wisconsin, University of Minnesota, and the Midwest Universities Consortium for International Activities (MUCIA), the conference is designed to initiate ongoing discussion among those in universities, busi-

ness, and government on the development and uses of satellite and broadband cable systems for higher education and public service purposes. Leaders in the satellite and cable fields will make key presentations, and more than 300 people with interests in educational communication are expected to attend.

In addition to the presentation of papers and discussions, the conference will feature demonstration projects showing national and international educational satellite applications. The interface between existing and proposed satellite systems and new innovations in broadband cable communication technology will also be demonstrated.

Guidelines for conference paper proposals and additional conference information can be obtained by writing to Dr. Lorne A. Parker, Department of Communication, Instructional Communications Systems, University of Wisconsin-Extension, Old Radio Hall, Madison, WI 53706.

Common Carrier Tariffs—A Vital Reference Resource for the Telecommunications User

The rate and policy schedules of the communications common carrier have long been regarded as privileged material. Historically, it was as difficult to obtain a copy of the carrier's "tariff" as it was for Don Quixote to conquer windmills.

A typical trail of an individual's attempt to obtain common carrier tariff material ran (1) customer representative, (2) common carrier's business office, (3) public library, ending with (4) the applicable regulatory agency—there, only to discover that (a) a copy service was not available, (b) there was a limit on the number of pages per *written* request, (c) reproduction charges were not uncommonly \$.50 to \$1.00 per page and, (d) if one didn't know exactly the section and page number(s) of the material, little-to-no guidance was available.

Until Center for Communications Management, Inc. (CCMI) undertook its quest to develop a national common carrier reference library almost three years ago, tariffs were almost inaccessible to the aver-

age telecommunications user. This library of common carrier tariffs is now complete—covering interstate, international, and statewide common carrier services. Individuals, corporations, organizations, and government agencies may now purchase copies of tariffs for virtually any common carrier service through CCMI's "National Tariff Library." Additionally available through CCMI's Tariff Library is a weekly updating service. Client-tailored library research is also available.

The common carrier's tariffs contain the rate and policy details of every service and piece of equipment offered under its "common carrier charter." To the professional in the telecommunications field, the tariff is as important as the "tax guide" is to the accountant.

- As a shopping list—a comprehensive catalog of current telecommunication services, equipment, payment options, etc.
- For comparative analysis to determine lowest cost service alternatives: e.g., DDD vs. WATS, etc.
- In corporate planning: e.g., cost of relocation, availability of services, new product/service evaluation, etc.
- For auditing telephone company charges.

CCMI's common carrier library was developed to fill the tariff information void through rapid, accurate, and inexpensive access to these vital reference materials. The initial activity of library subscribers has been much greater than expected, suggesting that the information gap is even greater than originally suspected.

Inquiries regarding CCMI's National Tariff Library should be directed to "Tariff Coordinator," Center for Communications Management, Inc., P.O. Box 324, Ramsey, NJ 07446.

For additional information, contact Minor S. Huffman, Jr. at the above address or via telephone at (201) 825-3311.

INPUT

To the Editor:

William Saffady, in his article on computer-output-microfilm, is correct in con-

cluding that COM has a bright future in public service. In fact, it is probably better suited for public use than it is for staff use.

However, in selecting 16mm roll film, on cassettes, he appears to ignore a number of important considerations. Based upon several years experience with a number of COM catalogs, we have observed the following: (1) Modern microfiche readers are certainly no more difficult to use than most microfilm readers and are certainly no more difficult to use than cassette readers; (2) No mention is made of comparative costs between 42x microfiche and 24x roll film. Our service bureau indicated that the latter would be more expensive, particularly when you add the cost of duplication and cassettes; (3) It is relatively simple and inexpensive to operate an in-house microfiche duplicating service. This allows us to provide free copies of all or parts of our various COM catalogs to faculty and students; (4) Microfiche readers are considerably less expensive than microfilm readers and are available in portable models; (5) Microfiche readers are commonly available around campus and can be checked out of the library for home or office use. Microfilm readers, particularly those capable of handling cassettes, are not available; and (6) Although microfilm reader-printers are available on campus, they are not designed to handle cassettes.

Rather than look at a specific COM application, e.g., serials, the library should consider the wide range of applications and how well the medium integrates into the normal university routine.

*Philip J. Schwarz
Automation Development Librarian
University of Wisconsin
Menomonie*

To the Editor:

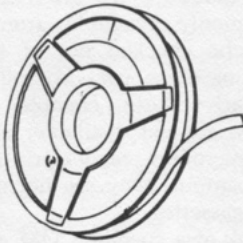
I strongly agree with William Saffady's argument ("A COM Serials List for Patron Use" December 1974) that COM applications are feasible in library public services as well as staff/processing activities. However, the statement that "microfiche is clearly unsuitable for a list of over 1,400

pages" and the emphasis on use of 16mm cassettes instead of fiche are debatable. At Mankato State College (Minnesota), the COM-generated alphabetical listing, by title, of serials owned by the library appears on four microfiche (42x). Our initial fear that several fiche would render user access confusing and inconvenient proved unfounded. Simple instructional signs eased the transition from paper to fiche, and the contents of individual fiche are easily labeled or displayed to facilitate the use of fiche for large periodical collections.

Computer-generated lists of other,

smaller collections (e.g., films, theses, etc.) also can appear on easily managed fiche to be displayed at the same locations as serials. And excellent fiche readers are much less expensive than comparable cassette readers, thus vastly reducing the costs of distributing viewing equipment in suitable locations throughout a library and campus.

Michael Gabriel
Government Publications
Serials and Microforms
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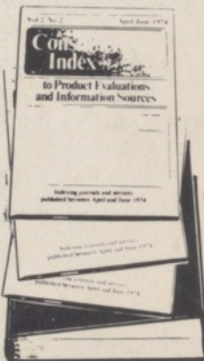
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