

Information Technology and Libraries

June 1983

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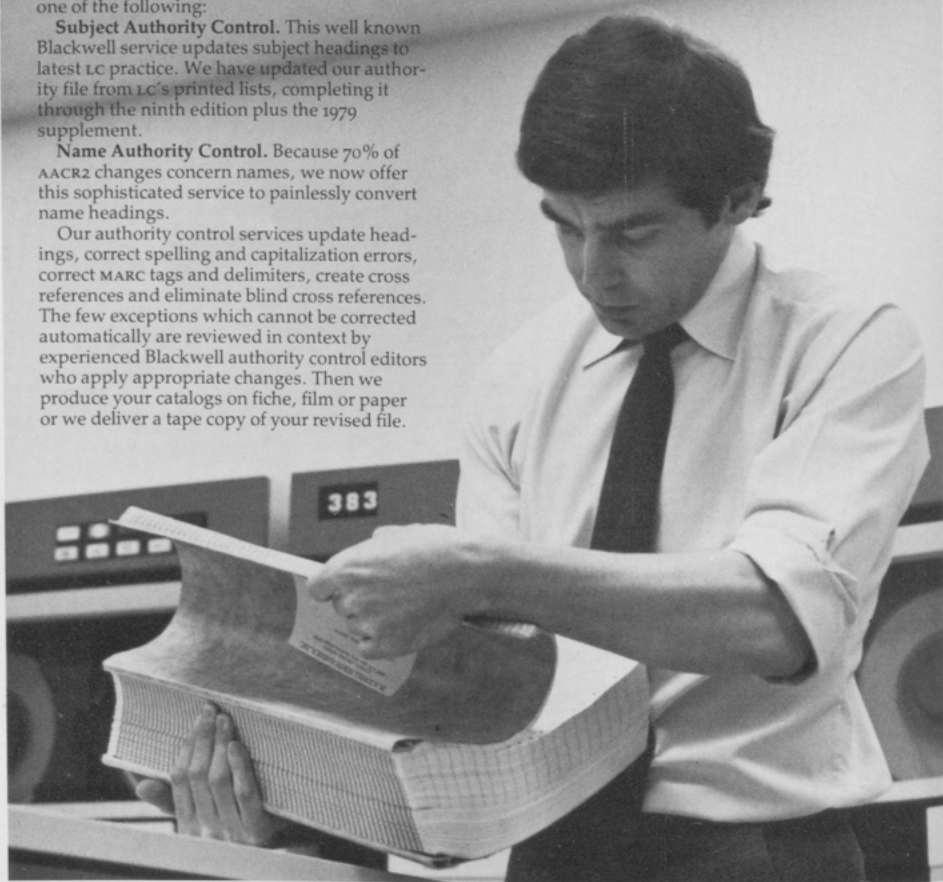
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Vendor Support: Expectations and Realities

In 1982, B Kenney, then president of LITA, initiated the Automation Vendor/User Discussion Group as a forum for exploring the relationships and responsibilities between vendors and libraries contracting for automated systems. The need for such a forum was validated at the San Antonio ALA Midwinter discussion group session, where Chair Richard Rowe's straw vote showed that a high percentage of librarians in attendance were somewhat unhappy to very unhappy with vendor performance on one or more automated library systems. Clearly there is a disparity between librarians' expectations and the current delivery of such support. Why should this be, and what can be done about it?

The history of contractual vendor-supplied hardware/software development for automated library systems is relatively short. Most vendors currently offering such systems and support have been in the library automation arena fewer than fifteen years, many fewer than ten years. Vendors have learned the complexities of library automation as they have developed and marketed the systems, and librarians have learned project management on the job. In spite of the fact that these systems are often marketed as "turnkey," which implies "complete and fully operational," in actuality most evolve over a period of time while being actively marketed and go through various upgrades and releases during the life of a contract or implementation. A vendor can spread the research-and-development costs of a system across numerous libraries, thus offering a cost-effective approach to library automation as compared to local development. However, contractual arrangements for systems development do not remove all risks of software development, nor do they supply easy answers to maintenance of systems geographically distributed across the country. While the vendor is ultimately responsible, librarians must be informed as to the actual conditions they will face if they choose to automate with a vendor-supported system. They must be realistic about the current state of development of a system when they contract.

The purpose of the San Antonio topic, "Great Expectations: Ongoing Vendor Support of Automated Library Systems," was to share various perspectives and cumulative experience with vendor systems and to try to identify possible ways of improving the implementation process and ongoing support. Among the ideas raised by speakers and participants were the following:

1. Library specifications should be quite detailed, in order that vendors know in writing what the library wants and needs. In critiquing vendor performance, librarians should be sure to compare performance to the original specifications, not to a changing set of criteria. Where conditions have changed or unforeseen developments have occurred, they should be acknowledged by both sides in writing, and expectations should be revised. Verbal commitments lead to misinterpretation and misunderstanding.

2. Specifications and contracts should be written as a guide to promoting success of a project, not as a confrontational weapon. Penalties, liability clauses, and performance bonds are a last resort and connote failure of a project, regardless of who is to blame. The contract should be a tool for ensuring the completion of a project, with sufficient check-

points to keep both parties moving forward in general agreement as to progress. Frequent checkpoints, periodic project review by outside consultants, and formal consultation sessions between library and vendor staff are methods for enhancing this process.

3. Library administration might want to include a "resolution of disputes" clause in the contract, whereby the chief administrative officers of the library and the vendor company are responsible for working out a solution to any dispute or conflict. Should they be unable to reach agreement, the dispute would go to arbitration.

4. Librarians must acknowledge the true costs of training, documentation, and maintenance, and must expect to pay for them. Unrealistic demands for these at little or no cost result in inadequate support from the vendor. Within the data processing industry, annual maintenance of a system is estimated at 8-10 percent of original purchase price.

5. Vendors must recognize the impact these systems have on the daily operation and efficiency of the library and should be realistic in: (a) quoting sufficient hardware to ensure reliable performance; if software is under development and hardware resources estimated, this should be clearly indicated in case additional hardware is required later; (b) providing detailed, accurate, and up-to-date documentation; (c) providing same-day, preferably four-hour, turnaround on repair of hardware if the online system is to be credible; (d) accepting that there will be library staff turnover and that retraining should be planned; (e) being forthright in forecasting delivery schedules of hardware and software and levels of staff required to operate and maintain the system; (f) fixing software bugs in a timely manner; (g) doing adequate testing of software enhancements before releasing them to operational sites; (h) staffing service desks with people who can communicate with nonprogrammers.

6. Libraries must accept their responsibility for staff training, staff performance, documentation of problems, and general project management.

It was suggested that additional guidelines for the preparation of specifications, contracts, and case studies of contract management, including both successful and unsuccessful techniques, would be useful in closing the gap between expectations and performance. Both parties must strive to improve the quality of project management as a necessary component of a successful system. Most vendor systems are continuing to evolve, to be enhanced, and to include new software subsystems. Systems often are sold on the basis of long-term software support and improvements. Thus, automated vendor systems must be viewed as a shared responsibility between the library and the vendor, with the specifications and contracts defining those roles and responsibilities. An adversary relationship can only be counterproductive to both sides.

NANCY L. EATON

Director of Libraries, University of Vermont

EDITOR'S NOTES

Thanks

This issue was put to bed while the editor was on a two-month working sabbatical in the Office of Research at OCLC. We would like to thank Dr. Neal Kaske, Charles Hildreth, and Dr. Karen Markey for taking time from busy schedules to review manuscripts and offer comments. Cindy Heffelfinger was most gracious in typing, copying, and preparing materials for forwarding to ALA.

Commentary

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Status of Processing Services Automation in the Library of Congress*

Henriette D. Avram, Mary S. Price, Josephine S. Pulsifer, and
Barbara J. Roland

A brief statement of the status of automation within Library of Congress' Processing Services as of 1983, what is currently in progress or scheduled for the near future, and what remains to be accomplished. Both LC internal operations and products and services to its constituents are covered.

Automation in the Library of Congress (LC) had its official beginning in the late 1950s when a team made up of LC staff investigated the potential of the technology for LC operations. It was this effort that led to the study funded by the Council on Library Resources (CLR), whereby a team of experts analyzed LC operations in depth and recommended a plan of action. The rationale behind the plan and the recommendations were published in a report entitled *Automation and the Library of Congress*,¹ and in 1964 LC established an office with responsibility to carry out the plan.

It became evident in a relatively short period of time that the "total system" envisioned by the team of experts was not possible in such a complex information system as LC. In addition, LC's commitment to the

development and implementation of MARC gave empirical evidence of the complexities of applying the technology to information processing. Since this experience principally affected technical processing, Processing Services redefined its plans for automation in 1971 to include: (1) continuing support to the library community through its distribution service; (2) support to units within LC through the development and implementation of short-range projects; and (3) continuing development and implementation of modules of an integrated technical processing system to assist in placing items under bibliographic control for LC's staff and clients.

The following report constitutes a brief statement of where we are in 1983, what is in progress, the positive effects of this progress, and what remains to be accomplished. As appendixes, we have also included the following, somewhat more detailed information:

- A. Systems in Operation or Scheduled for Near-Term Implementation
- B. Distribution Services and Products
- C. Automation Tasks Not Yet Scheduled

*This report was written as an internal Library of Congress document. However, it appeared likely that the content of the report would be of interest outside of the Library, especially since there has been no overview of Processing Services automation published since 1972. That being the case, only minor editing has been performed in order that publication be as timely as possible.

Henriette D. Avram is director for Processing Systems, Networks and Automation Planning, Mary S. Price is assistant director for Processing Systems, Networks and Automation Planning, Josephine S. Pulsifer is senior automation planning specialist, and Barbara J. Roland is chief, Automation Planning and Liaison Office, at the Library of Congress. Manuscript received March 1983; accepted March 1983.

CATALOGING

From the beginning, the development of automated systems for technical processing activities in LC has given major emphasis to providing computerized support for cataloging operations. This priority attention was due in part to the fact that sharing LC's cataloging data has always been Processing Services' most significant service to the library community. Furthermore, the cataloging operation has been a far more integrated operation than the various acquisition operations and therefore more amenable to the systematic application of new technologies.

With the implementation of the music system, all LC cataloging within the responsibility of Processing Services will be available in machine-readable form on a regular and current basis, in an integrated set of formats, and through an integrated set of applications. The only exceptions to the online applications are audiovisual cataloging, which is still an offline system, and the serials application, which is still dependent upon CONSER. The inclusion of Japanese, Arabic, Chinese, Korean, Persian, Hebrew, and Yiddish (JACKPHY) language cataloging data is still under consideration, recognizing that Chinese, Japanese, and Korean (CJK) vernacular records will be input into the Research Libraries Information Network (RLIN) system in 1983.

This unanimity of approach makes it possible to use the same hardware and the same basic software for creating, maintaining, and accessing records—as well as for producing machine-readable, COM, and printed products.

Considerable progress has already been made in the area of authorities, in that both name and subject authorities are in machine-readable form. Series authority records have been included in the name authority system beginning in December 1982.

The ability to generate a variety of cataloging products from these machine-readable bibliographic and authority records has made the production process more cost-effective than in the past.

Although the increased availability of machine-readable LC cataloging (either

directly or via networks) has contributed to more effective processing outside libraries, the cost of cataloging within LC remains relatively high. With increasing availability of authority records, and the technology, LC use of cataloging from other libraries for its own use and the distribution of this data in machine-readable form to others is growing rapidly, thus at long last making possible a cost reduction at LC and also expanding the number of records LC catalogs and distributes.

Cooperative cataloging projects involving machine-readable data reflect a considerable evolution from the earliest projects to those currently under development. COMARC (COoperative MARC) involved extensive and costly review and updating of LC's own records as converted to MARC by other libraries. For the Northwestern Africana project, Northwestern University employed a person to check records in LC and create the required authority records. The first Name Authority Co-op (NACO) project operations involved participants looking up authority data in published sources and mailing authority records to LC for input. Selected NACO participants now have online search access to LC files, but still mail needed authority records to NACO for subsequent input. By the spring of 1983, we expect the Harvard University and University of Chicago libraries to be both searching and inputting/updating bibliographic and authority records to the LC system.

The CONSER project allows for cooperative online input of serial data to the Online Computer Library Center (OCLC) by LC and eighteen other libraries. Although nearly 35 percent of LC's current cataloging is now based on data contributed by these other institutions, the project still suffers from a costly authentication process. However, alternative methods are being considered by the Serial Record Division for alleviating this situation.

By the first quarter of 1984, the Linked Systems Project (LSP) should be in operation providing computer-to-computer communication among the Washington Library Network (WLN), Research Libraries Group (RLG), and LC and making possible a centralized name authority file at LC to which selected libraries throughout the U.S. will contribute.

Total Online Searching for Cataloging Activities (TOSCA) is expected to go into effect in mid-1983. Under this program, catalogers will for the first time rely almost exclusively on the online catalog for searching. TOSCA will bring the bibliographic and authority files into much greater proximity to the catalogers, thereby saving much "travel time" to the card catalogs. In addition, limiting catalog use to the online catalogs will make for greater consistency between cataloging records supplied by cooperating libraries and those done in-house. Additions and corrections to the files will continue to be made by MARC Editorial Division (MARC Ed) staff, with the exception of music records, which will be updated by the music and audiovisual catalogers, as appropriate.

ACQUISITIONS

In contrast with cataloging activities, acquisitions activities have been accorded a smaller piece of the automation pie. This is certainly due in part to the fact that the initial impetus for MARC was pressure on LC from outside agencies. The Library Order Information System (LOIS), based on the Yale University Library system, was completed in 1976, but was limited to purchased acquisitions in the Order Division.

Adaptation of the LOIS system to the Exchange and Gift Division (E&G) operations was given some preliminary consideration and tentatively considered feasible, but no resources were available at the time.

Cataloging records for Cataloging in Publication (CIP) titles have been input to the MARC system since the beginning of the program and the records updated when the published item is received. Brief records for preassigned card number titles are input to the Automated Process Information File (APIF) system to allow access to these titles prior to their receipt in the library, and are updated when the item is received.

The Overseas Operations Division is responsible for the Overseas Data Entry Project, in which records will be input online by the LC office in New Delhi, sent to LC for loading into the APIF file, and updated upon receipt of the item in LC.

Work is now under way on pilot projects to evaluate two serial control systems. The F. W. Faxon Company and the University

of California-Los Angeles serial control systems are being installed at LC to determine whether one or the other could be adapted to LC's needs.

The relatively few projects that have been done in the acquisitions areas are listed in Appendix A. It should be realized that all acquisitions offices benefit from being able to search the online bibliographic and authority files.

RETRIEVAL

The ability to retrieve machine-readable records efficiently and accurately has been of considerable benefit to all work areas within Processing Services.

Retrieval capabilities in LC include both offline and online retrieval. The offline Retriever, used to select records from the file based on a wide variety of criteria, is primarily used to respond to requests from outside agencies. Their requests are processed through the Cataloging Distribution Service (CDS).

The Multiple Use MARC System (MUMS) online retrieval system provides for compression key searches (author/title, title, and personal name keys), number searches (ISBN, ISSN), and component word searches (which permit retrieval of records using one or more individual words contained within the record). Currently certain files are indexed immediately and other files are indexed only periodically. By the spring of 1983, all online files will be indexed for all appropriate search types immediately following input of a record. Thus, in the future, indexes will always be up to date, thereby increasing the reliability of the online catalog as a means of accessing LC's collection. At the same time, new fields added under AACR2 will be added to the searchable/displayable record and it will be possible to display various combinations of data (e.g., bibliographic records only, authority records only, bibliographic records with references, or bibliographic records with both headings and references).

DISSEMINATION OF BIBLIOGRAPHIC PRODUCTS

LC's long-standing commitment to disseminate bibliographic data has undergone marked changes in the past fifteen years.

From the distribution of hand-set printed cards and shingled book catalogs, LC has developed a cataloging distribution service that provides bibliographic data and authority information in machine-readable form as well as in a wide variety of computer-produced products. Many of these distribution services and products are listed in Appendix B.

To manage this effort, CDS has developed its Customer Information Management System (CIMS), providing online input, update, and retrieval of information needed to support complex distribution activities. The basic system, which was implemented over a short period of time, has greatly improved these aspects of the CDS operation. The combination of the availability of machine-readable data and automated production techniques has made CDS production operations considerably more cost-effective.

For non-MARC cards, the CDS DEMAND system provides high-quality facsimile card images through laser technology. Access is by card number but, with the REMARC shelflist file online, conventional MARC access points will also be available.

The publication of Processing Services' technical publications has been assisted by a mixture of word processing and computer-assisted technologies. The MARC formats are in machine-readable form and available in printed form as are the National Level Bibliographic Record documents and related editing guides. CDS is currently investigating the possibility of implementing a technical publication system for the production of Processing Services' technical publications, such as the MARC formats and the *Cataloging Service Bulletin*.

TECHNICAL PROCESSING SYSTEM

Automation in Processing Services began with the MARC Distribution Service. At that time, it was considered more effective to convert the data to machine-readable form for the distribution system at the end of the processing stream instead of earlier. When, in 1971, Processing Services turned its sights inward, analysis indicated that the greatest benefit to technical processing

would accrue from the automated system if the first function concerned with placing items under bibliographic control, namely the Process Information System, were implemented first, followed by the various stages of the cataloging function in order. In the late seventies, with many modules of that system in place or in the planning stages, further analysis demonstrated the requirement for more-detailed planning. What was needed was a plan, taking into account what had already been automated, detailing the most desirable way to proceed, given limitations in resources. This planning effort of describing and defining the Technical Processing System (TPS) is under way. Charts have been drawn schematically representing Processing Services units and functions at various levels of detail. TPS is concerned with the *entire* processing stream from acquisitions to product generation. TPS could not have been undertaken without the empirical experience gained through the automation efforts to date.

STANDARDS

LC, through Processing Services, is the principal source of bibliographic data for the national and international library communities. With the advent of the MARC Distribution Service, another dimension was added to its traditional support of bibliographic standards, and LC now plays a major role in the services it provides to information agencies throughout the world. LC has led in the development of such standards as formats, character sets, codes, protocols, etc. Members of Processing Services staff are active in the International Federation of Library Associations and Institutions (IFLA), the International Organization for Standardization (ISO), the Conference of Directors of National Libraries, the International MARC Network Study: Steering Committee, UNESCO, the International Serials Data System (ISDS), CLR's Bibliographic Services Development Program (BSDP), CONSER, etc. Staff have also spent considerable time and effort in support of the Network Advisory Committee, which is sponsored by LC.

The documentation—formats, manuals, code lists, etc.—provided by Processing

Services has saved countless resources in many other organizations, both nationally and internationally. As a result of this activity, Processing Services is beginning to realize a benefit from the contributions of bibliographic data by other organizations that conform to appropriate standards and to LC's practices.

CONCLUSION

In general, the goal of the automation of the many activities in Processing Services is to provide timely access to material for staff and users of LC and, as a by-product, to make LC's bibliographic and authority records available to the entire community.

The means of accomplishing this goal is to (1) create within LC a single machine-readable record to be used throughout the processing stream or (2) accept contributed records from selected libraries, both na-

tionally and internationally, for the same purpose.

Both of the above would provide more economic and timely processing of materials and the resultant resource sharing for libraries.

ACKNOWLEDGMENT

As the basis for this report, each division within Processing Services was requested to report on automated systems/procedures in use or being planned for that division. The authors wish to thank all staff members of those divisions for their thoughtful contributions, without which it would have been much more difficult to compile this report.

REFERENCE

1. Gilbert W. King and others, *Automation and the Library of Congress* (Washington, D.C.: Library of Congress, 1963). ■■

APPENDIX A. SYSTEMS IN OPERATION OR SCHEDULED FOR NEAR-TERM IMPLEMENTATION

1. APIF

Records for preliminary and minimal-level cataloging for monographs are input/updated in the APIF system. By the spring of 1983, these records will be "migrated" to the books file, enabling MARC Ed to update these preliminary records to full MARC as is presently done. Acquisitions records for Chinese-language monographs received by the Order Division and for Chinese- and Cyrillic-language monographs received by E&G are input to APIF. These records are updated to preliminary cataloging records when the items are received for cataloging.

2. Audiovisual

Records are input and updated via an offline MARC system. Included are records for both LC holdings and data sheets received from the National Information Center for Educational Media (NICEM).

3. Books

The entire books file is now available for online update as well as input, thus making it easier and more efficient to correct records, and making updated records available to users in a more timely fashion.

4. LOIS

A batch system, with online status reporting, controls the acquisition of purchased materials.

In the future, the system is expected to be upgraded to cover all acquisitions divisions and to interface with Financial Management Office operations.

5. NACO

The NACO project receives and reviews authority records contributed by selected libraries in conformity with LC requirements. Some contributors search LC publications manually; others search LC files online. Contributed records are sent by mail, and input to LC's name authority file. However, in the Harvard University and the University of Chicago projects scheduled to begin in the spring of 1983, searching, input, and update will all be online to LC's files, and both name authority and bibliographic (i.e., books) records will be involved.

6. LSP

LSP, scheduled to become operational in the first quarter of 1984, will provide a communications link between LC, RLIN, and WLN, enabling users of one system to search the files of other systems and records to be transferred from one system to another. The master name authority file will be housed at LC. The system will eventually include the sharing of bibliographic and location records, as well as authority records.

7. Music

An online system for inputting and updating rec-

ords for music (including sound recordings) is under development and expected to be operational in 1983. This is the first system in which catalogers will both create, input, and update full records directly into the automated system.

8. *Name Authorities*

Name authority records are now input and updated online. In December 1982, LC began input of series authority records to the name authority system so that under TOSCA all authority data for descriptive cataloging will be available for online searching. A subsequent release, scheduled for early 1984, will implement the revised authorities format and allow the distribution of full record updates.

9. *NUC*

An online system for input and update of unique NUC records became operational in December 1982. Catalog Management and Publication Division staff will search relevant LC online files and input new records and update existing records. Additional locations will continue to be added to the Register of Additional Locations (RAL) file. A second phase of the system will provide for accepting outside reports in machine-readable form, and for a generalized system for file-to-file record migration.

10. *Overseas Data Entry*

This project will make possible the online input of

records by the LC office in New Delhi. Records will be sent to LC on floppy disks via diplomatic pouch or, possibly, via State Department satellite. The projected beginning date is late 1983.

11. *RLG/CJK*

The RLIN system will be enhanced to support the input, update, and retrieval of records containing vernacular and romanized data elements. In 1983, LC will begin to input its CJK records to the RLIN system. RLIN will return LC's records on tape, and LC will integrate the romanized data elements into its online catalog.

12. *Serials*

LC serials cataloging records, NSDP records, and NST records are input and updated online to OCLC as part of the CONSER program, using an existing OCLC or CONSER record whenever possible. LC and the National Library of Canada (NLC) currently authenticate records input or updated by other CONSER participants. The Government Printing Office (GPO) is expected to become an authenticating agency in the future. OCLC sends all authenticated records to LC on a weekly tape.

13. *Subject Authority*

Subject authority records are still being input offline but an online MUMS system is expected to be ready by late 1984 or early 1985.

APPENDIX B. DISTRIBUTION SERVICES AND PRODUCTS

1. *APIF*

Planning is under way for the distribution of preliminary cataloging records from the APIF file.

2. *Audiovisual*

Audiovisual records are distributed in machine-readable form, and catalog cards are printed for sale. The Audiovisual Catalog will continue to be produced from the machine-readable records but as a quarterly COM register/index catalog beginning in 1983.

3. *Books*

Books records are distributed in machine-readable form and catalog cards are produced for sale. They are also included in the NUC COM catalog.

4. *Books—Canada*

Canadian MARC records received on exchange from NLC are distributed in the USMARC format.

5. *CDS Alert Service*

The CDS Alert Service provides a weekly selection of bibliographic records based on 1,815 subject categories. This service replaces the manually produced proofsheets at a considerable savings in cost and on a more timely basis.

6. *CDS Demand*

LC non-MARC records are available via the CDS DEMAND system using laser- and optical-disk-based image processing technology.

7. *CDS Retriever Service*

The service provides custom-tailored searching of MARC files.

8. *GPO Monthly Catalog*

The GPO Monthly Catalog service includes GPO records as input/updated for use in producing the *Monthly Catalog*.

9. *Maps*

MARC records for maps input by the Geography

and Map Division (G&M) of Research Services are distributed in machine-readable form by CDS. Cards are printed for the G&M card catalog. Map records will be published in a quarterly COM register-index catalog beginning in 1983.

10. Minimal-Level Catalog Records

Distribution of minimal-level cataloging records as a separate distribution service will begin in 1983.

11. Music

Music records will be distributed in machine-readable form and catalog cards produced for sale. Cards will continue to be produced for the *Music, Books on Music, and Sound Recordings* catalog until these records can be accommodated in a register/index COM catalog.

12. Name Authorities

Name authority records will continue to be distributed in machine-readable form with partial record updates for the present. Series authority records were added to the name authorities distribution service beginning at the end of 1982. Distribution of records in the revised authorities format and of full record updates should begin in 1984.

13. NUC

NUC records will be published as a monthly COM register/index catalog, including LC records for books. The RAL will continue as a COM publication, but will be issued quarterly, instead of annually, beginning in 1983.

14. RLG/CJK

LC will make romanized and/or vernacular records of its CJK records available via CDS, if

needed. Records containing the romanized data elements will be included in the NUC COM catalog. Cards containing the vernacular data will continue to be produced as in the past.

15. Serials

CDS distributes the authenticated serial records in machine-readable form. Records are converted to the ISDS format for distribution to the ISDS International Center in Paris. CDS produces catalog cards for sale from the machine-readable records for non-JACKPHY languages; cards for JACKPHY language records are produced by GPO. Records to be published in *New Serial Titles* are selected from the file and the publication produced by CDS.

16. Subject Authorities

Distribution of subject authority records in machine-readable form began in April 1976. A master file and two quarterly tapes were distributed before distribution was suspended because of system problems. The master file is now being distributed once a year. An updatable machine-readable distribution service will be resumed when the MUMS system becomes available. There is also a COM publication that cumulates the whole file each quarter and a printed quarterly publication that cumulates up through the fourth quarter of each year. The entire file is printed periodically as a new edition of *Library of Congress Subject Headings*.

17. UNIMARC

Work is under way for the distribution of LC machine-readable cataloging records to other national bibliographic agencies in the UNIMARC format.

APPENDIX C. AUTOMATION TASKS NOT YET SCHEDULED

Already scheduled extensions of Processing Services automated systems and products have been noted in the body and/or in appendixes A and B. Among the systems anticipated for future development but not yet scheduled are:

1. Update of the MARC bibliographic files to substitute AACR2 name headings by passing the files against the name authority file
2. Conversion of the offline audiovisual input/update system to an online system for input/update and searching
3. Upgrading the offline LOIS order system to an online system to encompass all acquisitions divisions and interface with the Financial Management Office

4. Linking of authority and bibliography records
5. Serials control
6. Automated assistance to shelving
7. Tracking the location of materials through the cataloging process
8. Upgrading the offline Register of Additional Locations (RAL) publication system to an automated holdings information system
9. Online cataloging, i.e., continuous update of the cataloging record from preliminary cataloging through shelving.

This list is neither complete nor in any significant order.

BEACON: H. W. Wilson's Computerized Information System

Davis B. McCarn and Grace H. McCarn

This paper describes the ongoing project to automate the production of the twenty-six indexes and catalogs produced and published by the H. W. Wilson Company. The first publication to be produced using the automated system was the October 1982 issue of Cumulative Book Index; Business Periodicals Index, and Readers' Guide to Periodical Literature; other indexes are being automated starting in 1983. The system, called BEACON, supports data entry and revision of records through the use of an online screen-edit program called SCREED. Users are prompted for data through the use of screen forms that have been tailored to the specific type of data being input or revised such as articles, book reviews, monographs, etc. Batch or online validation are performed, as appropriate, against authority files for names, subjects, periodicals, and publishers. Valid records may be released online.

The H. W. Wilson Company publishes a range of twenty-six indexes and catalogs that are well known throughout the library and information science fields. Widely used in school, public, academic, special, and research libraries as bibliographic tools to locate information in periodicals and monographs, the Wilson publications cover material on a variety of subjects including the arts, sciences, humanities, and law.

As early as the 1960s, the H. W. Wilson Company began exploring ways in which it might automate the production of its indexes, which had always been printed from type produced by Linotype machines. By 1975, the company had implemented a system that still produces *Social Sciences Index* by electronic means. In 1975, looking to expand its automated typesetting capability to its other indexes, Wilson invited a group of outside experts to review the system. The group found that what the company had created for *Social Sciences Index*,

while adequate for the purpose of producing a printed product, was more a word-processing system than a bibliographic system. Specifically, since it did not yield a master bibliographic file, the machine-readable data could not provide the basis of an online retrieval service. At this point, the company concluded that an improved system was required to allow the creation of databases and the potential for new products.

SYSTEM OBJECTIVES

The initial goal of the BEACON system was to develop and install an automated editorial-support system using computerized photocomposition to facilitate the production of the Wilson indexes in their printed form. Both the development and the implementation of such a system were to be accomplished in carefully planned stages so as minimize the risks to current production schedules, allow immediate improvement in the efficiencies of index pro-

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duction, permit the orderly retraining and upgrading of Wilson staff, and accelerate the process of capturing index and catalog information in machine-readable form.

The specific objectives of the system were:

- More timely generation of the Wilson indexes and catalogs, both hard- and soft-bound;
- More efficient methods of controlling materials, capturing input data, and managing the editorial cycles;
- Improved capabilities to extend the coverage of existing indexes, augment or enrich such indexes, add new indexes, and provide new information products;
- Improved abilities to generate production and cost-management information on the editorial process;
- Development of an online inquiry system compatible with the automated editorial system to allow Wilson participation in the emerging national bibliographic network; and
- Maintenance of the present high level of editorial quality during the transition period and in the final system.

With these system objectives in mind, the planning and development process began. The Wilson Company issued a request for proposal in March 1979. The responses to that request were evaluated in late 1979 and a letter contract awarded to LOGICON, Inc., in March 1980 followed by a two-year contract for the full system. The proposal from LOGICON involved the lease from the National Library of Medicine of portions of MEDLARS II; specifically, its file maintenance, retrieval, and publication systems,¹ the revision of these programs to meet Wilson requirements, and the addition of an online input system to allow terminal input, revision, copying, and validation of bibliographic and authority information.

Prior to the final signing of the contract, detailed financial projections were developed for every aspect of the project: system design, acquisition of databases (specifically MARC), hardware and software capabilities, and staffing requirements. At the same time, cost reduction projections were also developed; these indicated that the automated system could be cost-

effective, returning the cost of development within five years. On the basis of these projections, the company approved the development of what is now called the BEACON system.

One of the first tasks undertaken by LOGICON was a series of trade-off studies. One study resulted in the definition of the architecture of the input system. A second study addressed the question of whether the system could or should have the capability of linking bibliographic records to authority terms in its files. As a result of this study and some modeling of the alternatives, it was decided that a linked authority file, however desirable, required far too much of the computer resources for a system that also was to provide an online retrieval capability. It was decided instead that a flexible modification and updating capability—the capability to change all records in a file containing a given word or phrase to a different word or phrase—would be a more economic solution to the problem of authority control.

SYSTEM ARCHITECTURE

The BEACON system can be described as a comprehensive database management system capable of processing variable-length fields and records. It is designed to optimize retrieval of records meeting complex search formulations, and to allow the production of a large number of complex bibliographic publications.

While all fields (called elements) and records can have variable lengths, records are concatenated into fixed-length blocks. Each record contains actual data and a directory to the location of each element in the record; this structure is similar to the MARC format. In order to permit the most efficient access to individual records, the BEACON system employs an inverted file structure for each of its databases.

Each database consists of four data files: the retrieval file, the index term file, the postings file, and the ranging file. The retrieval file contains all of the complete records; the index term file contains all of the access terms for those records; the postings file contains the postings for all access terms. For terms that have only one posting in the database, the system simply finds the

term in the index term file, which addresses the record in the retrieval file. If a term occurs more than once, the system first locates it in the index term file, which then provides an address in the postings file and gives the number of times the term occurs. The postings file, in turn, provides the system with the addresses of all the unit records that must be retrieved for the given term. There is also a special class of access terms called ranging elements that are access points for numerical information in the system, for example, year of publication. The ranging file contains a ranging record for every record in the retrieval file with the numeric values for that record and is used to restrict retrievals to records in a numeric range.

SPECIFICATIONS

All programs in the system rely upon two specifications files to direct most of their actions. The retrieval subsystem has its own file of specifications; the specifications for all the other subsystems—such as data entry, validation, and publication and photocomposition—are contained in a second file. Specifications are central to the operation and maintenance of the BEACON system and have a wide variety of functions. Some of the key specifications and their functions are described below:

Data Elements and Subelements

Elements and subelements—including the type of element, its internal number and mnemonic, and the number of permissible occurrences—are defined to the system through specifications. One element, for example, the personal name of an author (assigned the mnemonic "pau") can have as many as twelve subelements, including the name itself (assigned the mnemonic "paunam"), honorific, numeration, dates, qualifier, etc. Each subelement may exist in three forms: (1) the print version, which is exactly how the data will appear in the publication; (2) a sort version, which is how the element should be filed in the publication, if standard rules cannot generate a correct sort form; and (3) a search version, which is how the element can be located and retrieved in the system, if the subelement is not unique in thirty-nine charac-

ters. Specifications also define the order of input for these data elements in the data-entry subsystem and control which elements the system will automatically display on each screen format.

Files

Like data elements, files are also defined to the system through specifications; the specifications include the type of file to be generated, the unique identifier for the file, the elements to be used for duplicate checking, and other characteristics of the file.

Validation and Mapping

Specifications for validation and mapping define how each element and subelement is to be validated and any mapping instructions that are to be performed. Mapping is a process that automatically moves information from an authority file to a bibliographic file. For example, using only the abbreviation of a periodical, the system can go into the periodical authority file and transfer from it to the bibliographic file such information as full name of the periodical, its ISSN, its country of publication, and the names of those publications that index it.

User Specifications

These specifications define which files and system functions are permitted for each user identification code. For example, some users can only input and revise data, while others can also release or delete records from specific files.

File Generation Specifications

Specifications for file generation define how search categories are to be formed from individual data elements in a record. BEACON has twenty-one different rules to transform elements into search terms. For example, if an element consists of words, the words can be compared against a list of words that are not to be used for retrieval, i.e., a "stopword" list. Search terms are then generated from those words not excluded. As another example, the Dewey number can be extracted and search terms generated for the number up to the decimal point and for the complete Dewey number. Special symbols are deleted from search

terms and all letters converted to uppercase. In several cases, composite keys are created from the transformation and concatenation of several different subelements or elements; for example, the title-author key is constructed from the title text and author name subelements.

Publication Specifications

Publication specifications determine which elements will appear in which publication, how repetitive data will be suppressed in the publication, how cross-references will be generated from name and subject files, and how the results will be typeset by the photocomposition equipment. Since Wilson indexes contain a complex cross-reference structure, the publication system and the specifications that direct its activities need to be extensive and powerful.

Auxiliary Specifications

Auxiliary specifications cover such items as valid mnemonics for searching and indexing, valid values for codes, valid character sets, and stopword lists.

The specification system has not only its own maintenance and print programs, but also a powerful "alias" capability that permits the simultaneous use of the same specifications at different times for different files.

COMPONENTS OF THE SYSTEM

The BEACON system has been organized into subsystems representing functional groupings of software modules. These subsystems are: data entry and revision; validation; release; file generation and maintenance; retrieval; publication and photocomposition; and system support programs.

Data Entry and Revision

The BEACON system allows online data entry and revision through use of the subsystem called SCREED (for SCREEn Editor). Through a set of screen forms tailored to the type of data input, the user is prompted to enter subject descriptors, authors, and other routine bibliographic data. Less commonly encountered elements—the translation of a title, for

instance—are not routinely called for in the display. To enter data in such an element, the user would enter the label (keyword) for this element and input the title translation in the space then provided on the screen. The elements displayed or "masked" (i.e., not displayed) can be easily changed in the system. In addition, the order in which elements and subelements are displayed for the individual record types can also be easily changed to provide users with an efficient, flexible, and "friendly" data entry process. Figure 1 is an example of a SCREED article form containing a record from *Readers' Guide to Periodical Literature*.

The system permits the user to copy records or parts of records from various files and incorporate this material into the file being processed. This capability is particularly useful in maintaining the accuracy and consistency of the data between bibliographic and authority files because it eliminates repetitive keying of records that may be used in more than one file. Thus, several indexes may use data already entered by another editorial unit, but each can independently edit the record to suit its own publication—eg., change the subject headings.

SCREED is designed to work on terminals, such as the IBM 3278, that have twenty-four function keys. Those have been programmed for SCREED and perform such functions as scrolling through a record, selecting and copying elements and records, submitting and releasing records, validating records, and editing the contents of a record. Users are not required to become familiar with a language or syntax in order to enter data or perform a task; rather they can merely position the cursor to a point on the screen and use a function key to complete a task.

Several different kinds of data can be entered using SCREED: bibliographic citations (from monographs or journals) and authority information (names, subjects, and publishers) are the most common. The system now has twenty record types defined in it; each type has a three-letter form code. Proofreading and other editorial changes can also be entered online, including class updates, which are instructions to

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MODE:BROWSE  FORM: ART  BAN: BRDG82000236  REV: RDG24  RTY: ART  ROR: I
DER: 820312 DMR: 820312  perta : Natl Rev  pertf : National Review  percty: us
perisn: 0028-0039  perind: RDG ARG BRD  vip: 34  dpb: F 5 '82  yrp: 1982
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perta : Natl Rev
pertf : National Review
percty: us
perisn: 0028-0038
      SRCH: 00280038
perind: RDG ARG BRD
vip   : 34
dpb   : F 5 '82
yrp   : 1982
      :
lantxt: eng
      :
paunam: Roche, John Pearson
paunf : 1
      :
titlxt: The way some of us were: Cornell, 1946-49
      :
      :
pag   : 108+
act   : featu
      :
subdes: College students/Political activities
subgen: y
subsf : ss
      :
csbnam: Cornell University
csbnf : 2
csbgen: y
-----

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Fig. 1. SCREED Record from Readers' Guide.

the system for changing large quantities of stored information.

Using the input validation module, records may be verified online against the appropriate set of validation rules and authority files. Proof listings of the records, showing all validation failures and potential problems, allow additional editing of incoming data, correction of invalid records, and reviewing of new authority term candidates for possible incorporation into an authority file.

Records in the input edit file are periodically placed in the input edit retrieval file so that all the editorial units can search and browse material that is in process, which helps in the detection of duplicate records within a file. At periodic intervals, groups of records are released, under editorial control, into the designated retrieval file sets.

The data in the system are periodically copied onto magnetic tape. In the event of a severe hardware failure, most of the information could be recovered from these backup tapes. The system's storage media are generally well protected against loss of data due to environmental conditions (such as power failures) or user errors.

Validation

When a record is initially entered or revised using SCREED, the user has the option of using the *validate* function key, which causes the data elements to be validated online. Feedback from validation is supplied to the user in the form of a display containing the labels of elements or subelements in which an error was detected, together with numerical error codes and brief descriptions of the errors. A maximum of

twenty-four errors can be displayed at one time; if the maximum number is reached, a message informs the user that there may be more errors in the record.

There are four types of validation: format validation, content validation, near miss, and duplicate checking.

Format Validation

Certain data elements have a prescribed format to which the user must adhere when editing the element. The ISSN, for example, has the structure "nnnn-*nnnX*," where "n" must be a digit and "X" can be a digit or a letter. Any other format represents a data entry error. When a data element is subjected to format validation, each character is checked against the permissible values for that element. If any character has an illegal value, or if it has too many or too few characters, a validation error message is produced. Typing errors are most commonly detected with format validation. Format validation can also check to see that required elements have been entered in a record.

Authority Validation

Data elements that use controlled terms are checked against the appropriate authority file. The file is searched for the term, and if it is found, no error results. If the term is not found, an error message is generated and the term is added to the authority candidate listing, a collection of terms being considered for future addition to the file. The authority test can also be reversed so as to require that the term *not* be found, a function that helps prevent the addition of duplicate terms to an authority file. The test can also require that before a term can be added to a subject authority file all higher level terms must exist in that file.

Near-Miss Checking

Near-miss checking is a special type of validation for proper names. When a name used in a controlled element does not match exactly but is close—has the same search key as one already in the authority file—a message is generated informing the user that the name entered should be checked for spelling and usage.

Duplicate Checking

In duplicate checking, the system determines if a record that has been entered already exists in the retrieval files (including the input edit retrieval file). The duplicate checking function returns a code (based on the author and title of a bibliographic record and on the controlled term in an authority record) that allows the user to identify and search for any duplicate records so they can be deleted or merged.

Release

The release system performs two functions: it creates a new input edit file containing only those records not released, deleted, or purged; it also creates the files used to update the various retrieval files in the system. In either function, it generates record verification listings with all the validation messages and an "authority candidate listing" for the various bibliographic and authority files. The files for updating of retrieval files contain all the mapping data specified from the authority files and "default" mapping for those elements where there is a usual content for an element, e.g., "eng" is default mapped into the language element, if no information has been provided during the input process. A modified version of the release system is used to check an authority file's consistency.

File Generation and Maintenance

The file generation and maintenance subsystem takes output files generated by the release subsystem and performs the requested maintenance actions. All records are handled as additions, replacements, or deletions. The first step in the process is to effect the maintenance of the unit record files. If a revised record will fit in the location previously occupied by an older version, it is placed there; if it will not fit, an indication to this effect is written to the file and the revised record is written at the end of the file. Once the locations of the new (and old) records are known, the record is processed against the specifications for the generation of index terms. If a record has been deleted or moved, delete terms are generated, and the new and deleted index entries are sorted and processed against the

old index and posting files creating a new index and posting file with the deleted entries removed and the new entries added. The files are maintained as generation data sets under MVS, and thus the prior state is always available as backup; moreover, the databases may be updated without any significant interruption to the data entry or retrieval functions.

Retrieval

The BEACON online search capability is based on the ELHILL 3.2 software obtained from the National Library of Medicine. The BEACON data files have been designed to be fully compatible with the needs of the online retrieval system.

The BEACON retrieval system is a powerful one supporting a full range of capabilities including online and offline prints, logical operators, and other standard capabilities similar to those offered by major information retrieval providers including Lockheed, SDC, and NLM. For a detailed description of the ELHILL retrieval system, see the article "MEDLINE: An Introduction to OnLine Searching."²

Publication and Photocomposition

Citations input by editorial units are formatted by the computer so that the typeset pages of each publication can be generated automatically. The computer determines the number of entries (tracings) a citation should have, the information each entry should contain, the order in which each should appear, and the typographical style to be used. The publication system generates the records to be formatted for each publication and the sort keys that determine where in the publication they will appear. The computerized rules for the generation of sort keys in accordance with the Library of Congress filing rules is an important and complex part of the system. Using the bibliographic information to be published, the authority files (name, subject, and publisher or periodical) are matched to determine other entries in the publication, e.g., cross-references. These are then sorted and merged with the bibliographic file, and duplicates are eliminated.

The photocomposition system is partially independent of the actual typesetting ma-

chine. The system formats the exact paragraphs for printing and assigns codes to reflect the characters and fonts to be set. In addition, the pages are organized, columns balanced, running headings and continued lines inserted, and page numbers assigned. The final step in the process is to take this file and convert it to drive the typesetter, which in Wilson's case is an APS micro-5 photocomposer.

To allow for proofreading, a prepublication proof listing is prepared, either on the photocomposer or on a line printer. Corrections can be made in the bibliographic data and a revised proof listing generated. While Wilson indexes used to appear in a variety of type styles and the photocomposer could handle reasonably close reproduction of styles, the company has decided to standardize on Times Roman. A sample of the photocomposed page from a recent issue of *Cumulative Book Index* is shown in figure 2. Since this is a page from a monthly issue of *CBI*, it does not contain the subject cross-references that would appear in an annual issue. It does have one name cross-reference for "Rhine, Joseph Bank," and this reference was pulled from the name authority file.

Support Programs

The most important of the support programs are those that convert the MARC file of the Library of Congress into a format acceptable to the BEACON system. The MARC records are processed so that the various fields and their tagged subfields are placed into the elements and subelements of the BEACON format. In some cases, fields are translated—i.e., the field identifiers for subject headings are converted to the subject form field in BEACON and some transformations are performed on the document-type field. In other cases, the fields are modified—i.e., ISBD punctuation and trailing blanks are eliminated. This support program was used to convert the Library of Congress subject headings and name authority file so they could be input to the BEACON system and with suitably adjusted specifications, it will also be used to convert the British Library's UKMARC files.

A second support program selects from

- Retina—cont.**
Surgery
 Schepens, C. L. Retinal detachment and allied diseases. v1 \$99 1983 Saunders
- Retinal detachment**
 Schepens, C. L. Retinal detachment and allied diseases. v1 \$99 1983 Saunders
- Retinal detachment and allied diseases.** Schepens, C. L. v1 \$99 1983 Saunders
- Retirement**
 Reichel, J. Retirement is for the birds. pa \$3.95 1982 Moody Press
- United States
- Worley, H. W. Retirement living alternatives USA. pa \$9.95 1982 Columbia House
- Retirement is for the birds.** Reichel, J. pa \$3.95 1982 Moody Press
- Retirement living alternatives USA.** Worley, H. W. pa \$9.95 1982 Columbia House
- Return to freedom: the war memoirs of Col. Samuel C. Grashio USAF.** Grashio, S. C. \$14.95 1982 MCN Press
- Reumann, John Henry Paul**
 (ed) See Schweitzer, A. The problem of the Lord's Supper Reusable space vehicles
- Juvenile literature
- Cave, R. Space shuttle. 1982 Gloucester Press
- Reuter, Hans Joachim**
 Atlas of urologic endoscopic surgery; translated by Roland J. Kohen, Matthias A. Reuter; foreword by Victor A. Politano. Q 252p il col il \$75 1982 Saunders; Thieme, G.
 ISBN 0-7216-7567-0; 3-13-601901-6 LC 81-52134
- Revelation**
 Demarest, B. A. General revelation. 1982 Zondervan
- Revell, Peter**
 Quest in modern American poetry. 245p \$27.50 1981 Vision Press; Barnes & Noble Bks.
 ISBN 0-85478-454-3; 0-389-20238-X
- Review for practical nurses.** Saunders. 4th ed Keane, C. B. pa 1982 Saunders (Philadelphia)
- Review of human physiology.** 2nd ed Winter, H. F. 1982 Saunders (Philadelphia)
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 ISBN 0-918680-16-6 ISSN 0034-6640
- V. I. Australia
- Reviewing basic grammar.** Yarber, R. E. 1982 Scott, Foresman
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- Revolt against Hitler.** Schlabendorff, F. von. 1982 AMS Press
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Fig. 2. Sample Photocomposed Page.

MARC records those monographs that fit the criteria for inclusion in *Cumulative Book Index*, and then inputs them to the input edit file where they can be edited. For instance, the program can find monographs that are in English, that are not gov-

ernment publications, and that have been published within the last two years—three editorial requirements of *CBI*. This same capability will select from MARC records those that should be considered for potential inclusion in other indexes.

HARDWARE

Even before the development phase of the BEACON system was started, it was evident that the then recently announced IBM 4300 series was one of the most cost-effective computers developed in recent years. The selection of an IBM system had the additional advantage of allowing augmentation of computing capacity should it be required. In January 1979, Wilson placed a "first day" order for an IBM 4341 computer, which was subsequently installed at the Wilson Company in July 1981, and has been in use since. The computer has been upgraded to a Group Model 2 with eight megabytes of memory. BEACON also uses both IBM 3350 and 3375 disk units. The system runs under OS/MVS and uses ACF/TCAM for the telecommunications access method. Preliminary indications are that the BEACON system could provide acceptable response times for as many as 100 simultaneous retrieval-service users or for a combination of fewer

retrieval-service users and 50 SCREED users. All programs making up the BEACON system are written in PL/I with assembly language routines for the most time-critical sections.

CONCLUSION

BEACON is a computerized information system that supports the editorial and manufacturing processes involved in the creation of H. W. Wilson Company's indexes and catalogs and makes this information available through electronic means. The BEACON system provides an automated environment for gathering, storing, and managing information. The creation and installation of the BEACON system, meeting the original system objectives, were completed within the original cost projections. The first index produced was the October 1982 issue of *Cumulative Book Index*. Other indexes are being converted as quickly as possible.

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EDITOR'S NOTES

Micro Collectors

J. B. Post, map librarian at The Free Library of Philadelphia, offers this whimsical notion: "some day there will be collectors of old word processors and microcomputers just as we now have old car buffs."

Truncation

The packing slip from the Follet Distribution Center for our review copy of the new ALA title *The Bibliographic Record and Information Technology*, by Ronald Hagler and Peter Simmons, reads: "1 Bibliographic Record."

Prestel Advertising

Peter Graham passed on a communication, "Flats, jobs, prostitutes," from the December 17-24, 1982, *New Statesman*, pages 9 and 10. Apparently, advertisements by job hunters and flat hunters have proven very unproductive. "Of a sample [of job hunters] interviewed earlier this year, not one had received a reply." Prostitutes advertising under "adult entertainment" report greater success, however. *O Telecom! O Mores!*

Radiation, Ergonomics, Ion Depletion, and VDTs: Healthful Use of Visual Display Terminals

R. Bruce Miller

Health hazards associated with the use of visual display terminals (VDTs) are discussed. Guidelines for the safe use of VDTs are given in the following areas: radiation, design of work stations, design of VDTs, illumination, glare, work/rest periods, visual testing, and ion depletion. There is a brief annotated bibliography of recommended reading and bibliographies for those who need more technical information.

The use of CRTs (cathode ray tubes) has been widespread for years, e.g., television picture tubes, scientific and technical instruments, etc. However, the expanding use of VDTs (visual or video display terminals—computer devices that incorporate CRTs and keyboards) has initiated significant concern about the safety of CRTs. The popular media and labor unions have documented a broad range of ailments that can occur to individuals who spend long hours in close proximity to VDTs.

Since it is apparent that automation is here to stay, it seemed necessary to learn about the unseen danger in order to protect myself and my fellow workers. The Technical Standards for Library Automation Committee of the Library and Information Technology Association was also interested in this topic. Their goal was to compile an exhaustive, annotated bibliography about the health hazards of CRTs and to make that bibliography available to the library community. As a member of that committee, I was especially happy to undertake that assignment because it concurred with my own research, which was already under way.

As is often the case, the simple assignment of compiling a bibliography became practically unmanageable. This occurred for several reasons. The first was that, in spite of the relative lack of coverage in library literature, the topic is a hot item in many other fields (especially journalism and data processing). Another reason was that an exhaustive bibliography could be misleading and could direct users to erroneous conclusions unless all of the citations were pursued, e.g., one issue of a journal would cite a radiation hazard and the following issue would discount the previous article; reading only one article would not provide complete information. The final reason surfaced after several hundred articles had been read. It became clear that many of the articles were based upon hearsay and upon secondhand information that had originally come from a limited number of empirical studies.

Although a massive bibliography would provide access to valuable information and would place all responsibility for interpretation and application of that information upon the reader, that approach also would probably not be very useful to the average

reader. It took many months to locate and read hundreds of articles and monographs that were associated with the topic of health hazards and VDTs; this is not a reasonable burden to place upon every user of a VDT. Therefore, I have chosen to reach some conclusions and to recommend some guidelines for the library community. I have made every effort to prepare an unbiased presentation that is based on clearly discernible facts. Unfortunately, the facts are not always clearly discernible. For this reason, even though TESLA should receive credit for initiation of the project, I must be held responsible for the content of the paper.

The goal of this paper is to succinctly present a summary of the health hazards that do and do not exist for users of VDTs, and to provide basic guidelines for the healthful use of VDTs. The purpose of this approach is to provide all readers with the basic facts necessary to evaluate a particular work environment. For those responsible for installing or upgrading any VDT work station, the paper concludes with a brief annotated list of items that are recommended reading (perhaps they should be mandatory). These items provide the complete technical detail that has purposely been omitted from the general guidelines that are presented in the paper. For those who wish to obtain an even broader perspective on the subject, there is also an annotated bibliography that contains citations to several extensive bibliographies about health hazards and VDTs.

RADIATION

Radiation is the most controversial aspect of the topic of health hazards and VDTs. The controversy is centered upon how much radiation is or might be harmful. The formal studies have concluded that there is no radiation danger from VDTs. The following quotes rather eloquently summarize the results of those studies.

Field surveys and laboratory studies of emissions have been made on hundreds of terminals, covering a wide variety of models. Measurements of emissions from older and newer VDT models have not differed significantly. Measurements have been made both under normal operating conditions and under conditions designed to maximize potential emissions, including overvoltage

fault conditions, maximum contrast and screen brightness levels and with the screen filled completely with characters. These radiation studies have all concluded that, even under conditions designed to maximize potential emissions, the levels of all types of electromagnetic radiation emitted are far below accepted occupational and environmental health and safety standard limits of exposure. In many cases, the levels of radiation emitted were below the detection capability of existing measurement instrumentation. Most field surveys have been unable to distinguish emissions of X-radiation from the VDT from normal background levels. Laboratory studies have consistently found X-radiation emissions to be below existing U.S. and European safety standards or guidelines. Levels of both ultraviolet and infrared radiation have also been difficult to distinguish from background levels. Emissions of ultraviolet radiation are approximately an order of magnitude less than the levels emitted by fluorescent lighting and are far below existing U.S. and European exposure standards. Radiofrequency emissions have also been found to be far below (generally less than 1 per cent of) permitted exposure levels.¹

In all cases, the sweep frequencies and their first fifty or so harmonics, and the digital clock frequencies and their harmonics were detected but in no case did the individual levels or the sum of all levels even remotely approach any exposure standards or guidelines used in the United States or by any other nation. No levels of electromagnetic energy at frequencies normally considered microwave (greater than 1GHz) were detected that could be directly associated with any terminal.

Based on current medical knowledge, there is no evidence to indicate, nor is it even a subject of speculation, that the emission levels associated with VDTs will have any deleterious effects on the health of those persons using such devices.²

It would seem unreasonable to quarrel with such unequivocal statements as those that are quoted above. Yet there are numerous articles that do just that. Many of those articles can be dismissed as yellow journalism (or perhaps simply poor journalism) because they clearly misquote or ignore the findings of the formal studies. However, there are two questions that are repeatedly raised that have not yet been adequately answered:

- What are the long-term cumulative effects of continual, albeit minimal, emissions in some ranges of the electromagnetic spectrum?

- What is the impact upon normal background radiation of a large number of VDTs in a confined space?

The answers to these questions may not be known for many years. It is unlikely that any organization can afford to not use VDTs until these questions are answered. What is known about VDTs does indicate that they are safe. Under these circumstances, any formal recommendations regarding radiation to users of VDTs would be inappropriate. However, I offer two suggestions that might provide some benefits and that should require minimal expense or effort:

- Allow any woman who is pregnant to have the option to work away from VDTs during the period of pregnancy.
- Avoid installing large quantities of VDTs in a confined space. (Psychological benefits alone can justify this action.)

ERGONOMICS

The previous section of this paper provided the good news: it is unlikely that the minimal radiation from a VDT will adversely affect your health. The bad news is that operating a VDT can still be hazardous to your health. Extensive reading reveals that virtually any physical complaint can be found in association with the use of VDTs. The most common complaints have to do with vision or the musculoskeletal system. What is responsible for these problems? The answer is superficially simple. Visual and/or postural discomfort are present due to poor ergonomic planning, i.e., illumination around the VDT is inappropriate and the work station is poorly designed. These complaints are not trivial. They can lead to significant loss of productivity and absenteeism. The user's health can be seriously harmed. At the very least, quality of life is not at its best.

A thoughtful individual might observe, "Isn't a VDT work station essentially the same as a typewriter work station? Why do we suddenly have a rash of health problems when we replace typewriters with VDTs?" It is true that a VDT work station is similar to a typewriter work station. However, there are some critical differences. The VDT is often larger and can intrude on a needed work surface. The keyboard and

CRT are typically separated by a greater distance than the keyboard and platen of a typewriter. Lighting, glare, character resolution, contrast, etc., are critical features that affect users of CRTs much more than users of typewriters. These and other factors have aggravated an existing situation to such an extent that more people are affected and that they have more serious afflictions.

A survey of these health complaints will not be pursued here. The reader who is interested can use the reading list and bibliographies at the end of this paper to locate that type of information. However, guidelines for good work station design will be presented here. They are designed to help the user with the greatest VDT interaction. When studying these guidelines, it should be kept in mind that a sophisticated work station with state-of-the-art ergonomic design may not be readily justifiable for the casual user. However, it should also be kept in mind that many of these guidelines are government-enforced standards in some European countries and that legislation is already pending in some states of the United States that would require their use. Also, "doubts about whether all this is necessary are, in practice, quickly countered by increases in productivity and declines in complaints, absenteeism and other symptoms of long-term discomfort and stress."³ Users of an online public access catalog are likely to be more successful and to complain less if comfortable facilities are available. It does seem that a responsibility exists to provide the best possible environment for users of VDTs.

When evaluating the guidelines, keep the type of user in mind in order to determine compliance for a particular situation, i.e., consider the following library users:

- Patron—typically uses the online public access catalog for brief periods.
- Circulation clerk—may spend long hours using a terminal but with constant interruption and with a continual array of physical tasks (stamping date-due slips, using scanning devices for machine-readable identifiers, desensitizing security devices, retrieving items on hold, etc.).
- Records maintenance staff, systems analyst, etc.—at times spends several hours

at a VDT, but tasks are creative and nonrepetitive.

- Data entry operator—usually spends long hours doing repetitive work that requires a narrow mental and physical focus on the task at hand.

The desirable environment for any user of a VDT is one that perfectly fulfills the guidelines. When this level of attainment cannot be met, efforts at improvement should focus where the impact is greatest, e.g., an orthopedically sound chair is much more important to a data entry operator than to the casual or infrequent user of a VDT.

ERGONOMIC GUIDELINES

Design of Work Station

- The viewing distance to the CRT should be adjustable. In most cases a range of 450 to 500mm between the CRT and the operator is sufficient. (See figure 1.)

- The height of the CRT should ideally be adjustable for each operator so that the top of the screen is no higher than the eye

level of the operator. (See figure 2.) If a multilevel terminal table is too exotic for your budget, use a few boards under the CRT portion of the terminal to raise the screen height so that it satisfies most of your users. A specific height is not given here because this dimension is a function of the VDT design and the height of the operator. Most of the work stations that I have personally observed have CRTs that are located too low for the user. This applies to both seated and stand-up work stations.

- The keyboard height should be such that the operator's arms form an angle equal to or greater than 90° at the elbow. (See figure 3.) This can usually be accomplished when the home row on the keyboard is between 740 and 790mm above the floor for sit-down work stations. This is equivalent to a terminal table that is between 650 and 700mm tall.

- Seating should have adjustable seat height, adjustable backrest height, and adjustable tension on the backrest. Casters are important to provide flexibility. The seat

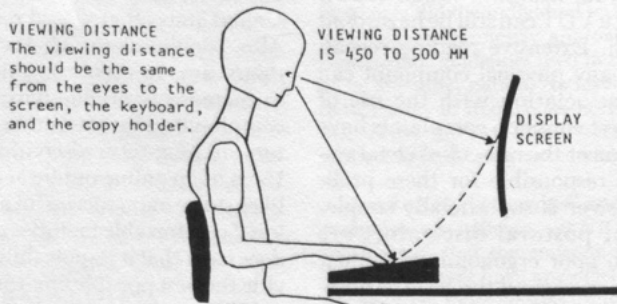


Fig. 1. Viewing Distance.

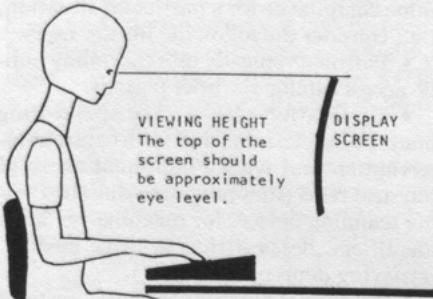


Fig. 2. Viewing Height.

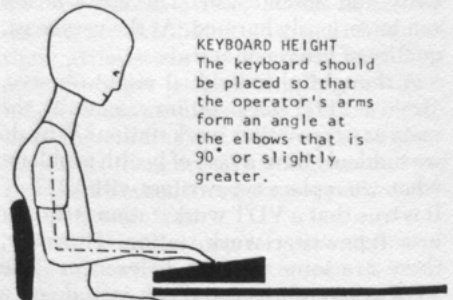


Fig. 3. Keyboard Height.

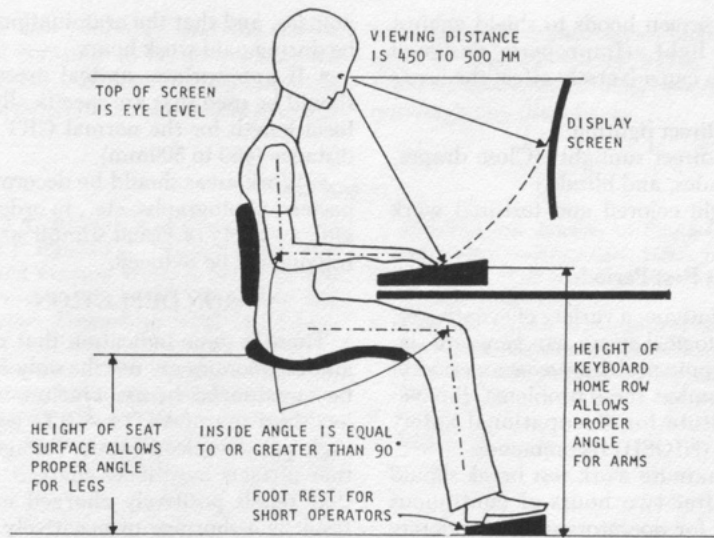


Fig. 4. Critical Dimensions.

height should be such that the operator's legs form an angle equal to or greater than 90° at the knee with feet on the floor. Short users should be provided with a footrest in order to maintain the proper relationship with the work station. Above all each operator should be encouraged to make any adjustments that will enhance comfort.

- There are a wide variety of other considerations for a work-station design that are based on common sense. These include leg clearance, work surfaces, document holders, storage space, cable and wiring security, and climate control.

Figure 4 graphically summarizes some of these guidelines.

Design of the VDT

Obviously the control of the ergonomic considerations in the design of a VDT is beyond the purview of the average user. However, when the user is purchasing a terminal and can choose among the myriad brands, there are several important considerations.

- A detached keyboard is very important to provide the necessary flexibility in the work station.

- A thin keyboard (less than 60mm) is desirable).

- The surface of the keyboard should have a matte finish.

- The keyboard should have a palm rest.
- The key-top surfaces should be concave in order to improve accuracy.

- The keys should provide a feedback signal (tactile or audible click) upon activation.

- The keys should be neutral colors.

- Character height on the screen should be greater than or equal to 3mm.

- The user should be able to adjust both contrast and brightness in order to provide a clear, sharp image.

- There should be no perceptible flicker of the image on the screen.

Illumination and Glare

Illumination around the work station should be in the range of 500 to 700 lux. This is a compromise level that lessens the strain on eyes that have to shift from source document to keyboard to VDT screen, etc. (Use of a VDT for reading only is enhanced by low light levels in the range from 300 to 500 lux. Other visual tasks may require 1,000 to 1,600 lux.)

Glare is a critical problem for users of VDTs and every effort should be made to eliminate any glare or reflections. Following are some hints for overcoming glare:

- Purchase terminals with antiglare screens.

- Add antiglare filters to screens.

- Install screen hoods to shield against extraneous light. (Improperly designed screen hoods can adversely affect the user's posture.)

- Use indirect lighting.
- Avoid direct sunlight. (Close drapes, window shades, and blinds.)
- Use light-colored and textured work surfaces.

Work versus Rest Periods

Postural fatigue, a variety of eye stresses, and psychological strain can generate significant chronic problems over a period of time. To combat these problems, the National Institute for Occupational Safety and Health (NIOSH) recommends:

- "A 15-minute work-rest break should be taken after two hours of continuous VDT work for operators under moderate visual demands and/or moderate work load."⁴

- "A 15-minute work-rest break should be taken after one hour of continuous VDT work for operators under high visual demands, high work load, and/or those engaged in repetitive work tasks."⁵

VISUAL DAMAGE

Very few people have "perfect" vision. The effort of trying to see can result in burning sensations in the eyes, twitching eye muscles, headaches, etc. VDTs exist in an environment with exacting visual demands. When these factors are added together, the result is a high incidence of these symptoms of visual fatigue (all of which are reversible with a short period of rest). There is, to date, no evidence of irreversible visual problems from the use of VDTs. However, to allay anxiety and to identify problems if they should occur, there are recommendations concerning visual examination and corrective lenses.

- Users should have an annual visual examination. NIOSH recommends that those examinations be based upon the standards of the American Optometric Association or upon criteria established by the National Society for the Prevention of Blindness.⁶ There has been lobbying for state legislation to mandate that employers pay for these examinations to the extent that the expense is not covered by personal insurance

policies, and that the examinations should be during paid work hours.

- If appropriate, optical prescriptions should be used that are specifically for the focal length for the normal CRT viewing distance (450 to 500mm).

- Work areas should be decorated with posters, photographs, etc., in order to provide a variety of visual stimuli so that eye fatigue will be reduced.

ION DEPLETION

There is some indication that radiation and ergonomics are not the only factors to be considered in association with the healthful use of VDTs. CRTs generate a high positive electrostatic voltage charge that attracts negatively charged ions and that repels positively charged ions. The result is a shortage of negatively charged particles in the air around a VDT operator. Additionally, the positively charged particles are repelled vigorously enough from the CRT that they are effectively "fired" into the face of the VDT operator. Some sources believe that either a surfeit of positive ions or a shortage of negative ions can result in biochemical changes that affect hormone production. The positive particles that are "fired" at the operator's face can cause skin irritation on some individuals.

It is not yet clear whether or not CRTs constitute a health hazard due to atmospheric ion imbalance. It is clear that the subject area is controversial. Pending additional information, it is again suggested that pregnant women be given the option to avoid VDT work during the period of pregnancy and it is suggested that VDTs should not be installed in large numbers in a confined space (good ventilation helps to maintain a favorable ion balance). Some writers have suggested use of negative ion generators.

CONCLUSION

There are unanswered questions about VDTs and their impact on the health of people who are around them. However, there is some probability that VDT technology (especially display technology) will change radically within the relatively near future. Those changes may eliminate the need to answer many of the questions.

Since it is also probable that the use of VDTs will continue to be ubiquitous, we should pragmatically enhance the situation as much as possible and we should attempt

to diminish as many known hazards as we can. Thoughtful use of VDTs and computer technology can bring benefits that far outweigh any drawbacks.

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3. John Pile, "The New Workstation," *Interiors* 142:127 (Nov. 1982).
4. *Potential Health Hazards of Video Display Terminals* (Cincinnati, Ohio: National Institute for Occupational Safety and Health, 1981), p.70.
5. *Ibid.*
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Recommended Reading

Bergman, Tobi. *Health Protection for Operators of VDTs/CRTs*. New York: New York Committee for Occupational Safety and Health, 1980. 16p.

This pamphlet is often cited in other sources. It is straightforward and very readable. It is written from the viewpoint of protecting the interests of the operators. I recommend it as required reading for the education of all VDT operators.

Brown, Barbara S.; Dismukes, Key; and Rinalducci, Edward J. "Video Display Terminals and Vision of Workers: Summary and Overview of a Symposium," *Behaviour and Information Technology* 1:121-40 (April-June 1982).

From the abstract: "This summary discusses issues raised at a National Research Council symposium on vision and VDT work, held at the request of the National Institute for Occupational Safety and Health. Symposium participants critically reviewed laboratory studies of visual function and field surveys of visual complaints of VDT operators to determine what conclusion can be drawn about the prevalence, severity, causes of, and possible remedies for reported difficulties. Although speakers' perspectives differed, a number of points appeared to gain consensus."

The summary itself contains useful facts and conclusions. The forthcoming publication of the proceedings promises to be a noteworthy text. (Many of the citations in related bibliographies are for papers from this symposium.)

Cakir, A.; Hart, D. J.; and Stewart, T. F. M. *Visual Display Terminals: A Manual Covering Ergonomics, Workplace Design, Health and*

Safety, Task Organization. Chichester, New York: Wiley, 1980. 253p.

If you need a comprehensive education about VDTs, this is the book to use. It is complete, understandable, and full of good illustrations. It is highly recommended as a primary source for anyone who is responsible for VDT work stations.

Grandjean, E., and Vigliani, E., eds. *Ergonomic Aspects of Visual Display Terminals*. London: Taylor & Francis, 1980. 300p.

This text is too technical for the average reader. However, it does supply detailed documentation that supports the conclusions and guidelines that are presented in the body of this paper.

Makower, Joel. *Office Hazards: How Your Job Can Make You Sick*. Washington: Tilden Press, 1981. 233p.

Caution surrounds the recommendation for this book. It provides good information that is easy to read but, in the effort to support the thesis that is obvious from the title, the text is inflammatory at times. This sensationalism tends to obscure some of the very good observations that the author has made.

Potential Health Hazards of Video Display Terminals. Cincinnati, Ohio: National Institute for Occupational Safety and Health, 1981. 75p.

Although this is basically the report of some NIOSH studies in California, it is useful for its explanation of the type of data that were gathered. The resultant NIOSH recommendations synthesize the prevailing attitudes for the healthful use of VDTs.

Wallach, Charles. "A Conversation with Charles Wallach," *Technicalities* 2:3-5 (Nov. 1982).

This article is an interview with an individual who heads ion research for a consulting corporation. It covers the available information on the subject of ion depletion and provides technical details about negative ion generators. It also suggests sources for additional data.

Wolbarsht, Myron L., and Sliney, David H., eds. *Ocular Effects of Nonionizing Radiation*. Bellingham, Wash.: Society of Photo-Optical Instrumentation Engineers, 1980. 202p.

Many of the reports in this book are specifically related to the use of VDTs. Even those reports that are not directly related to the use of VDTs provide good background information for someone who is studying the subject. The content is highly technical but it does supply good documentation.

Bibliographies

Byerly, Greg, and Lindell, Signe. "Terminals in Libraries: Help or Hazard?" *Library Journal* 107:2146-49 (Nov. 15, 1982).

The annotations in this bibliography (forty-eight citations) are incisive and useful. The best description of the bibliography is given by the authors themselves (p.2147): "The purpose of this brief, annotated bibliography is not only to alert librarians to the potential problems of VDT use, but also to provide them with the means to continue their own investigations. As was noted earlier, much that has been written on this issue has appeared outside the library science literature. An attempt was made to select only significant references which are readily accessible. Brief news items were typically not included, but it should be noted that two sources, *Computerworld* and *Editor & Publisher*, as well as columns in various library journals, frequently report ongoing investigations and studies."

Health Hazards of CRT's. Chico, Calif.: Ryan Research International, 1982. 44p.

This bibliography contains nearly 200 citations. It is exhaustive but, due to that thoroughness, it is also nondiscriminating. As a result, there are references to sources that are highly informative and readable, to technical reports that are difficult to decipher, and to news articles that are misleading. If you have the time to pursue these references (some of the source documents are difficult to obtain), this bibliography can provide the broad foundation that is necessary in order to develop a clear perspective of the topic.

Philbin, Paul P. *CRT's and Occupational Safety*. Dublin, Ohio: OCLC Library, 1982. 8p.

This bibliography cites 111 journal articles and twenty-three books, reports, legislative documents, and unpublished reports. Although it contains many of the citations that are found in *Health Hazards of CRT's* (inevitable for lengthy bibliographies), it is slightly more current and the chronological arrangement of the journal articles provides an education if the reader simply reads the titles in sequence.

Search of Information Retrieval Databases

I was able to retrieve citations to about fifty sources not listed in any of the above bibliographies through an online search of some DIALOG Information Services databases (NTIS, COMPENDEX, PSYCINFO, MEDLINE, etc.). The search combined terms such as VDT, CRT, VDU AND ergonomics, human engineering AND ergonomics, human engineering AND radiation, health, safety, stress, etc. Most of the resultant citations were items that are very technical. I recommend to anyone interested in this level of knowledge that they should initiate their own online search into any sources that are available. ■■

Machine-Readable Data Files and Networks

Marilyn Nasatir

Integrating machine-readable data files and microcomputer software (combined as MRDF in this paper) into traditional library and information services by incorporating a MARC format for them into the bibliographic networks will increase access to those materials. Standards for their bibliographic control have been developed and progress is being made in their use. Existing network products and services soon will be extended and applied to MRDF to meet the evolving needs of library and information users.

Machine-readable data files (MRDF) are coded information for computer processing. As used in AACR2, the term *MRDF* "embraces both the data stored in machine-readable form, and the programs used to process that data."¹ In the context of this paper the term is extended to include microcomputer and video-game software. Examples of MRDF are census files, survey data, mathematical models, educational data packages, and simulation games. MRDF are collected by many kinds of institutions, including libraries, media centers, public school systems, data archives, and microcomputer companies. They are used for teaching, research, administrative, home management, and recreational functions. As there is no unified approach to bibliographic control of MRDF, institutions are either stymied by these materials or are forced to develop interim methods of controlling them.

Integrating MRDF into traditional library and information services by incorporating an MRDF format into the existing bibliographic networks will increase access to usable data. This paper examines the development of standards for records of

MRDF, description of MRDF, functions of bibliographic networks applicable to accessing MRDF, and progress in controlling MRDF.

STANDARDS FOR CONTROLLING AND ACCESSING MRDF

The need for standards to enable libraries to control and access MRDF was acknowledged over a decade ago when the Descriptive Cataloging Committee of ALA's Cataloging and Classification Section established the Subcommittee on Rules for MRDF. Over a period of years the subcommittee drafted position papers making recommendations on cataloging MRDF, which became the basis of chapter nine ("Machine-Readable Data Files") of AACR2. AACR2 attempts to integrate the cataloging of MRDF with all other types of materials.

To test the subcommittee's rules, the Classification Action Group (CAG) of the International Association for Social Science Information Services and Technology (IASSIST) conducted a special project in 1976 to catalog a wide variety of MRDF in-

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cluding text files, bibliographic databases, census files, survey data, panel studies, time series, aggregate databases, longitudinal serials files (e.g., annual surveys), computer software, mathematical models, online program lessons, educational data packages, and simulation games.² The participants were aided by Sue Dodd's *Working Manual for Cataloging Machine-Readable Data Files*,³ which has since been revised, expanded, and published as *Cataloging Machine-Readable Data Files: An Interpretive Manual*.⁴

Two of the biggest difficulties encountered by the participants in cataloging MRDF proved to be disagreement on primary source of information and variance of titles. Unlike traditional library materials, MRDF tend to have titles assigned by researchers for their own convenience without concern for standardization or consistency. Many sources of information were used, including codebooks, resource guides, user header labels, online directories, consultation, and the actual files. The titles from these different sources varied, making determination of title problematic.⁵

In response to the subcommittee's experiences as well as recommendations made by the Joint Steering Committee of AACR2, with the appearance of AACR2 imminent, the National Conference on Cataloging and Information Services for MRDF met in 1978 at Airlie House in Warrenton, Virginia, to develop standards for bibliographic control of MRDF. Four of the recommendations of the conference were: (1) for LC to design a MARC format for MRDF; (2) to test AACR2 rules by cataloging MRDF; (3) to define products and services to be derived from cataloging MRDF; and (4) to investigate the feasibility of integrating catalog records of MRDF into existing bibliographic networks.⁶

Responding to the first recommendation, LC's Network Development Office produced *Machine-Readable Data Files: A MARC Format (MRDF/MARC)*.⁷

Answering to the second recommendation, several federal agencies, such as the Bureau of the Census and the General Accounting Office, and a number of other organizations, including the Computer Cen-

ter at Princeton University and the Inter-University Consortium for Political and Social Research (ICPSR) at the University of Michigan, began to catalog MRDF. ICPSR actually expanded upon the second recommendation by creating an automated cataloging system for MRDF, using the Stanford SPIRES database, to test both MRDF/MARC and chapter nine of AACR2.

In response to the third recommendation, ICPSR created for in-house use such products as the guide to their resources, catalog cards, bibliographies, indexes, and authority lists of authors and titles.⁸ In the case of titles, authority lists are useful because of the title variation mentioned above. At the federal level, a task force was established to develop standards for bibliographic citations and abstracts for the production of directories of MRDF. Two examples of applications of these standards are the *Directory of Data Files*,⁹ issued by the Bureau of the Census, and the *Directory of Federal Statistical Data Files*,¹⁰ produced by the Office of Federal Statistical Policy and Standards.¹¹

The fourth recommendation of the Airlie House Conference was to investigate the feasibility of integrating catalog records of MRDF into existing bibliographic networks, or to express this in network terminology, implement a format for MRDF. AACR2 has been implemented for some time, and MRDF/MARC was approved by ALA's MARBI Committee in January 1982 and will be incorporated, following minor changes, into the composite *MARC Formats for Bibliographic Data (MFBD)*.¹² Microcomputer and video-game software did not exist when AACR2 was written and will have to be accommodated in the MRDF format. Ben Tucker, chief, Office for Descriptive Cataloging Policy at LC; Edward Swanson, member, ALA's Committee on Cataloging: Description and Access (CC:DA); Nancy B. Olson, audiovisual cataloger, Mankato State University, and OCLC visiting scholar; and Glenn Patton, cataloging instructional coordinator at OCLC met at OCLC in November 1982 to discuss solutions to the problem of physical description of microcomputer and video-game software. As a result of that meeting,

a special CC:DA Task Force was formed and met in February 1983 to develop a statement of policy regarding the physical description of those materials. This policy, to be published in LC's *Cataloging Service Bulletin*, will constitute national policy until AACR2 can be revised. The necessary changes will be reflected in MRDF/MARC, and a manual of microcomputer software cataloging examples will be published in the Minnesota AACR2 Trainers series.

DESCRIPTION OF MRDF

The content of the data elements in a MARC record is defined by the MARC formats in combination with AACR2. Some of the elements of an MRDF bibliographic record are a data file description showing existence and source of the data; a detailed abstract including the genesis and history of the file in order to link modified files bibliographically; keywords; physical characteristics of tape (e.g., tracks, density, parity, etc.); file and software needed; applicability of the data to solving specific problems or analytic needs; and the link between data files and the software that was created to manage or operate them. These links identify accompanying documentation and compatible software as well as linkage with other files or programs.

Data elements for MRDF can be broken down into six levels as defined by Dodd. Level one, bibliographic identity, includes such elements as author, title, edition, distributor, and notes. Level two, data abstract, is a descriptive summary, abstract, or subject analysis of the contents of the file. Level three, classification, provides the classification codes, indexing, or descriptors. Level four, technical information for access, spells out the physical characteristics needed to access the MRDF, such as recording density or required software. Level five, analysis or use, gives a citation of documentation and related reports as well as such data collection information as how and when the data were collected, the unit of analysis, and sampling procedures. Finally, level six, archiving or maintaining, involves records processing, storage, use, and modifications to the MRDF.¹³

These can be translated into needs of MRDF users as follows. Users need a data

file description showing existence and source of data; that is in levels one and six. Users need a detailed abstract that includes the genesis and history of the file so as to link modified files; that is in level two. Users may want a keyword structure; that is in level three. Users need to know the link between data files and software created to manage or operate them: in level one, in the size of file area, the presence of accompanying documentation is indicated; level two contains citations of accompanying documentation; level four includes software compatibility; and level five has an area for linkage with other files or programs. Users may want to know the applicability of the data to solving specific problems or analytic needs; that is in level five. All of the data elements needed in an expanded bibliographic MRDF record—amounting to an average of 2,500 characters—can easily be accommodated within the more than 4,000 characters allowed for a bibliographic record by the networks.

NETWORK FUNCTIONS APPLICABLE TO MRDF

Bibliographic networks are not only a feasible but a desirable vehicle for controlling and accessing MRDF. They offer a wide variety of services, products, and training for other materials, which can be extended to meet the needs of MRDF users. They also have a built-in mechanism for implementing new formats.

Services

Let us begin with bibliographic network services. As many MRDF users are also users of other types of materials, they will benefit from the same overall system design that the networks already provide. This includes an online union catalog, shared cataloging, authority control, acquisitions and fund control functions, interlibrary loan (ILL), serials control, subject retrieval, and patron access. Each of the networks has some combination of these services and its own variant of any one service. Until MRDF records are integrated, libraries with online catalogs will have no way of displaying the MRDF increasingly collected.

A word should be said about ILL. De-

pending on the access policies of individual institutions, it is not always practical or allowable to lend MRDF or microcomputer software, but ILL can nevertheless be used for the exchange of related documentation, such as codebooks or manuals.

In addition to the above general services, there are special services unique to a particular network. For example, OCLC offers retrospective conversion and reclassification services to convert existing bibliographic and location data to machine-readable form and add them to the online union catalog. OCLC's acquisitions subsystem, including ordering, in-process, and fund accounting, interfaces with the name-address directory, which provides information about libraries, publishers, and vendors, and could easily add MRDF producers and distributors. This combination of services would enable institutions to control, access, and acquire MRDF in the same way that other materials are managed, a capability discussed in a description of a Lawrence University project to integrate the computer into traditional information services.¹⁴ As it is now, there is no systematic way to locate MRDF, and even some of the oldest and largest archives of MRDF can only identify MRDF through informal information networks.¹⁵ This has serious consequences for collection development and use.

Products

Network products that are available for other types of materials and that would serve equally well for MRDF include catalog cards, accessions lists, and archive tapes. An MRDF bibliographic record could be used to generate products, in printed form or on microform, such as union lists, bibliographies, catalog cards, abstracts, and subject catalogs, in addition to tape distribution of MRDF records.¹⁶

Training

The bibliographic networks also provide a training function. In the case of OCLC, most institutions participate through networks that offer training programs and materials. Added to this, OCLC has instructional coordinators who offer workshops and training sessions on the use of the various formats—books, serials, audiovisual

media, maps, manuscripts, music scores, and sound recordings. OCLC will extend this function when it implements MRDF some time next year.

Implementation of Formats

This leads us directly to the bibliographic network function of implementing new formats to support the MARC standard as evidence of applicability to the controlling and accessing of MRDF. At the present time only OCLC has announced its intention of implementing an MRDF format, although, in an internal UTLAS document, Mary Magrega has described the areas of activity involved in the implementation of an MRDF format, namely receipt of data, indexing records, manipulating data for catalog products, and communicating data.¹⁷

All of the bibliographic networks have some sort of cataloging maintenance function that allows them to install changes to their online systems and related offline products in response both to updates distributed by LC and NLC (National Library of Canada) and also to user and staff requests. At OCLC, this function is performed by a special team of catalogers, programmers, technical writers, and quality-control and testing staff who work in close collaboration with a library systems analyst serving as product manager to analyze, specify, install, and announce cataloging maintenance changes, including the implementing of new formats.

PROGRESS IN THE CONTROL OF MRDF

To gauge the present status of the bibliographic control of MRDF, we can look back at the recommendations this author made in an article on the cataloging and classification of machine-readable data files to see which of them have been realized.¹⁸ The results of that exercise are reassuring.

The recommendations were divided into two groups, one aimed at the national level and the other at the institutional level. Heading the list at the national level was the development of standards for documentation and finding aids. There have been several responses to this in addition to the ones listed earlier: uniform standards among federal statistical agencies for ab-

stracts¹⁹; Dodd's levels one through four; Roistacher's *Style Manual for Machine-Readable Data Files and Their Documentation*²⁰; and the American National Standard for Computer Program Abstracts (ANSI X3.88-1981). The recommendation for publishing guidelines in journals as to the form of bibliographic citations to MRDF has been met by Dodd's level two, by the new "authors' guide" to citing MRDF, which appears in the journal *Social Forces*,²¹ and in Dodd's article "Bibliographic Reference for Numeric Social Science Data Files: Suggested Guidelines."²² The specification of physical characteristics of tape, file, and software needed has been accommodated by Dodd's level four, technical information.

Certain other recommendations regarding MRDF that were aimed at the national level will be fulfilled when networks implement the MRDF format. Shared cataloging, which was the initial impetus for the development of the bibliographic networks, will be facilitated. Quality control will be assured, in the case of OCLC, through its Quality Assurance and Bibliographic Maintenance sections, both by its system controls and safeguards and by user responsibility for correcting or reporting of errors. The online communication of accessibility of MRDF, through a bibliographic network supporting the MARC standard, will perform the function of a national program of information services for MRDF.

The recommendation for an abstracting service with codebooks on microfiche, while not in the immediate planning stage, could easily be handled by a network or contracted for by an institution using its archive tapes. That leaves only one recommendation at the national level still unanswered and still needed: the consistent implementing of user header labels, which in turn would produce title-page equivalents for MRDF.

Developments fulfilling the recommendations at the institutional level are as encouraging as at the national level. First and foremost was the recommendation to incorporate MRDF catalog records into a bibliographic network, a need being met by OCLC. A second recommendation was to support parallel systems of eye- and machine-readable library holdings, the

very basis of adding MRDF to the family of formats managed by the bibliographic networks. Of course, this will only be as helpful as MRDF users make it. It will be crucial for institutions of all kinds to contribute to and access a MRDF database to ensure the effective use of MRDF. This will in turn make possible a catalog card and tape distribution service of MRDF records along with records for other materials.

Several other recommendations aimed at the institution level have been or are being fulfilled by the planned implementation of the MRDF format. One is for levels of description, provided for by Dodd. Another is the training of librarians to help determine a patron's need for assistance with data. This is covered by level four on access and also by the fact that librarians will already be experienced in accessing the network database. The recommendation for workshops, as has already been demonstrated, will also be met, and the inclusion by library schools of MRDF cataloging in their cataloging courses will be handled in their online training.

The recommendations to begin cataloging MRDF with holdings for which an institution has archival responsibility and to catalog codebooks separately are really matters best left to individual institutions. There are economic incentives for entering original catalog records into a bibliographic network database, but the treatment of codebooks is not quite so clear. They can be included as accompanying material in order to link them to the MRDF, but they must be cataloged separately if the institution has the codebook without the MRDF, or if the codebook documents more than one MRDF or has been revised independently of the MRDF. Even deciding whether the MRDF or the documentation is entitled to the primary citation, rather than as accompanying material, is up to the discretion of the cataloger on the basis of preponderant evidence. For example, it is certainly the case that a textbook might use as accompanying material MRDF or microcomputer software just as MRDF are accompanied by codebooks and manuals.

Finally, the recommendations for researchers to use a prescribed citation form and that MRDF services be publicized are

both a matter of education. In the one case, creators of MRDF or microcomputer software are encouraged to consult and follow the "authors' guide" to citing MRDF discussed under national recommendations. In the case of publicizing MRDF services, that is a task for MRDF users. The more that users contribute to and access a MRDF database through shared cataloging, the more that records of MRDF can be re-

trieved with less effort, hence the more the data will be used. Communicating the accessibility of usable data, as with more traditional forms of library and information resources, is an integral part of librarianship. In these dynamic times of rapid technological change, participating in the shared knowledge of information sources is essential to meeting the evolving needs of library and information users.

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Communications

MITINET/retro: Retrospective Conversion on an Apple

Hank Epstein

The MITINET/retro (pronounced "mighty-net") system was developed to support retrospective conversion for small and medium-sized school, public, academic, and special libraries that do not have access to bibliographic networks. To use the system, libraries require access to an Apple II Plus or Apple IIe microcomputer, with 48K of storage, DOS 3.3, and one floppy disk drive, the MITINET/retro software (\$85), and a custom-edition COM microfiche catalog of 1,100,000 + LC MARC titles (\$90) or an existing COM union catalog.

If any library with an Apple micro wishes to convert their complete catalog to machine-readable form in the MARC format and to obtain any COM catalog or tape products, MITINET/retro will provide the required interface between the library and the COM vendor. The MITINET/retro system allows the library to supply data in machine-readable form, for use by the COM vendor.

The library needs to have the local holdings data added to an LC MARC record or an existing union catalog record. When the library uses the LC MARC fiche, the vendor copies the full LC MARC bibliographic record and adds the local library data. When the library uses the union catalog fiche, the vendor adds the library's data to an existing union catalog bibliographic record.

Hank Epstein is president of Information Transform, Inc., and has participated in a joint development project with the Wisconsin Department of Public Instruction to develop the MITINET/retro system. MITINET is a trademark of Information Transform, Inc.

This is accomplished with a minimum of library effort and vastly improved accuracy compared to any other current method of retrospective conversion. When retrospective conversion has been completed, the library can purchase COM products and MARC tapes from the vendor.

In Wisconsin, the system was tested in school, public, and special libraries. The libraries' costs included student and staff labor to search the fiche catalog and enter the brief data on the Apple, at an average input speed of thirty-six titles per hour (seven to twenty cents per title for labor costs).

INTRODUCTION TO MITINET/RETRO

The MITINET/retro system is a retrospective conversion tool permitting libraries with a microfiche reader and an Apple microcomputer to convert their bibliographic and holdings files to computer-readable tapes in the MARC format. These computer tapes can then be used:

- by a COM vendor to generate a local or union catalog on microfilm or microfiche.
- by the library to generate a bibliographic title file, an item inventory file, and custom item (book) labels for an online circulation system.
- by the library to generate bibliographic and holdings files for an online union catalog or other type of automated system.

The Basic Process: From Fiche to Floppys to Files

The object of retrospective conversion is to obtain a computer-readable file of bibliographic and holdings data for a library. Fortunately, it is not necessary to enter by hand either the complete bibliographic information or the complete holdings information. A special edition of an LC MARC fiche COM catalog, the fiche reader, the MITINET/retro software, and the Apple

micro provide the necessary ingredients to reduce the cost, time, and labor of retrospective conversion.

The Fiche Catalog

The LC MARC-MITINET/retro special edition fiche COM catalog contains approximately 1.1 million unique titles of English-language books and AV materials, as cataloged by the Library of Congress and distributed as part of the LC MARC distribution service. The bibliographic records were initially converted to machine-readable form by LC and distributed in the form of computer tapes. A COM catalog vendor (Brodart, in this case) converted the data on the tape to a microfiche master and reproduced copies of the fiche, which have been supplied to the library.

The fiche contains English-language books cataloged by LC since 1968, and includes a small amount of pre-1968 titles. The AV materials contain titles cataloged since 1972 for films, filmstrips, videotapes, slides, and kits. LC is scheduled to begin an LC MARC subscription for sound recordings, including phonodisks, cassettes, and cartridges, sometime during 1983. This material is therefore not included on the current LC MARC fiche.

The bibliographic records on the fiche are presented in title order. Each title record contains the full bibliographic record (including authors, titles, subjects, publication data, notes), with an average of 600-750 characters of bibliographic data. Included in the fiche record is the LC Card

Number (LCCN) and an appended check digit (modulus 11). The LCCN with the added check digit is used as a unique record identification number. (See figure 1.)

Matching Titles

For each title in the library's collection, the library searches the LC MARC fiche and records the LCCN and check digit on the catalog card.

MITINET/retro and Floppys

Using the Apple, the library enters the LCCN and check digit, the library's local call number, and copy and location information. (See figure 2.)

The LCCN, with a supplementary check digit entered by the library and immediately validated by the MITINET/retro software, is used by the library to positively identify which of the 1.1 million records on the LC MARC fiche is called for by the library. In most cases, the system will prevent the library from entering an incorrect LCCN for the desired title. This feature of MITINET/retro also reduces the amount of library keying required for unique title matching by more than 75 percent. (Six to ten characters versus thirty to forty-eight characters for an LCCN plus author and title data. For comparison, see figures 2 and 3.)

The MITINET/retro system automatically displays the names of all of the library's branches on the Apple screens after the library has identified the branch names the first time the system was used. From

	Elements Of Food Engineering / by John C. Harper.	
essays,	Harper, John Cline.	
	Westport, Conn. : AVI Pub. Co.	
	c 1976.	
35 (2)	vii, 282 p. : ill. : 24 cm.	
	Bibliography: p. 277-278.	
	Includes index.	
	087055218X	Elem
ation	1. Food industry and trade. 2.	
	Chemical engineering. I Title.	
	TP370 b .H27 664 76-027460 (6)	

Fig. 1. Sample LC MARC Record from LC MARC Fiche. (Note the Check Digit [6], Following the LCCN.)

```

MITINET (WI)      13:RECORD NO & HOLDINGS
STATUS: UNUSED DISK SPACE = 87 RECORDS
REC NO: (75-432561) (8) NEW,CHA,DEL:(NEW)

CALL NO: (690.23 R42      )

ENTER COPY AND LOCATION DATA BELOW:
LOCN.  NO.  LOCN.  NO.  LOCN.  NO.

ART   ( )  MAIN   (2)  WRIGHT ( )
BANT  ( )  MONROE (1)
DENS  (1)  NORTON ( )
EMPIRE ( )  PORTER ( )
FREEMON (1) REFEREN ( )
HAVID  (1)  ROSSMOR (1)
LORIM  ( )  STEVENS ( )

+ = ADD MORE COPY & LOCATION DATA FIRST
R = REVISE INPUT DATA ON THIS SCREEN
A = ADD RECORD TO WISC DATA BASE
D = DELETE THIS DATA (IGNORE INPUT)
O = GO TO OPTION SCREEN

OPTION CODE: (A)

```

Fig. 2. Holdings Screen Filled in by User. (User Input Data Are Shown in Bold; All Other Data Are Presented by the System. Certain Data ["NEW" Above] Are Automatically Displayed by the System to Aid the User, which the User Can Change if Another Option Is Desired.)

```

MITINET (WI)      15:MARC SEARCH INPUT
STATUS: UNUSED DISK SPACE = 86 RECORDS
LCCN/ISBN: (LCCN) (77-024468) BK,AV (BK)

AUTHOR'S NAME/CORPORATE NAME/CONFERENCE
AU/CN/CF/MT: (AU) (LEWY, ANTHONY R.      )

FOUR OR MORE TITLE WORDS. OMIT:A,AN,THE
(HANDBOOK OF CURRICULUM EVALUATION      )

DATE: (1977)  PUB: (WILEY      )

CALL NO: (375.001      )

+ = ADD COPY & LOCATION DATA FIRST
R = REVISE INPUT DATA ON THIS SCREEN
A = ADD RECORD TO WISC DATA BASE
D = DELETE THIS DATA (IGNORE INPUT)
O = GO TO OPTION SCREEN

OPTION CODE: (+)

```

Fig. 3. MARC Search Screen Filled in by User (User's Input Data Shown in Bold).

then on, the library is only required to enter the number of copies held by each branch, by filling in a form on the screen (see figure 2). The system then adds the number of copies held to the branch name and records this copy/location data, the library's call number, and the LCCN on the floppy disk. This feature of MITINET/retro reduces the

amount of library keying required to define local holdings (copy/location data) by approximately 80-90 percent. (One or two characters per branch versus ten or twelve characters if the branch names, and MARC codes, had to be entered.)

When complete, the floppy disks with the library's data are sent by mail to a regional, school district, or statewide database coordinator. The database coordinator will copy the data from all of the floppys onto a computer tape, and send the tape to the COM vendor. In some cases, there may not be a database coordinator, and the libraries will send the floppys directly to the COM vendor.

In any case, when the data are copied to a tape, the floppys are sent back to the originating library. The floppys can then be used to record new data, and the cycle is repeated until retrospective conversion is completed. By using several sets of floppy disks, the library may continually enter data with the alternate sets.

The COM Vendor, the Bibliographic Resource File, and the Library's File

Upon receipt of the computer tape from the database coordinator (or the floppys from the library), the COM vendor will process each MITINET/retro record one at a time on the vendor's computer. For each record, the vendor will match the LCCN against the LC MARC file (the bibliographic resource file) and extract the proper MARC bibliographic record. To this 600-750 character full bibliographic record, the vendor will attach the library's call number and copy/location data for any or all copies of that title.

Something for (Almost) Nothing

Using figure 2 as an example, the result of the library entering 15-30 characters (LCCN, call number, and holdings data) on the Apple is that the library will receive a 600-750+ character record of bibliographic data cataloged and entered in machine-readable form by LC, and also the local library data (call number, copy and location data) entered by the library.

When all retrospective conversion titles have been submitted by the library and

processed by the COM vendor, the library may order a local library COM catalog, a union COM catalog, or a MARC tape for use in other automated library systems. Many other automated library systems such as circulation systems are able to read the LC MARC format tapes generated by the COM vendor.

Hit Rate

In most cases, the library will find 70–95 percent of the current and retrospective titles on the LC MARC database, using the LC MARC-MITINET/retro fiche. The library would then be able to obtain a copy of LC's cataloging and keying (data entry) for 70–95 percent of the library's titles.

Libraries with older collections and large audio collections should have a lower hit rate, toward the 70-percent range. Libraries with newer (1968+) material and large film and video collections should have a much higher hit rate, closer to the 95-percent range. Most libraries will fall somewhere between the two extremes.

Library Costs

MITINET/retro is one of the least expensive methods of retrospective conversion. The major costs to the library are the costs of:

1. Staff time, to: (a) search and identify the correct titles in the LC MARC fiche (approximately 60–100 titles per hour), and (b) key in the brief local library data and LCCN (approximately 40–100 titles per hour). (Note: The combined searching and keying activities result in a total staff time of 24–50 titles per hour. In Wisconsin, where the system was tested, the 11 pilot-test school, public, and special libraries processed an average of 36 titles per hour, using both student and staff labor. The labor costs ranged from seven to twenty cents per converted title.)
2. The Apple microcomputer (which can also be used for other purposes in the library).
3. The microfiche reader (which can also be used for other purposes in the library).
4. Obtaining a copy of the 1.1 million title LC MARC—MITINET/retro custom

edition fiche catalog (approximately \$90; libraries in Wisconsin will receive a copy of the Wisconsin statewide fiche union catalog—WISCAT.)

5. Obtaining a copy of the MITINET/retro software and user manual (\$85 per installation, outside of Wisconsin; selected Wisconsin libraries will receive a copy of MITINET/retro.) (An installation may be a single institution such as a school, public, or special library with its own card catalog. An installation may also be a multi-institution such as a school district, region, or library system with an accurate union card catalog. Each installation may obtain local COM products for the institution, or may merge several installations to form union catalogs. In this way each library in a school district can perform retrospective conversion separately using data from its local card catalog. When completed, the district can order a single union COM catalog or MARC tape for the entire district. Multibranch public libraries could follow the same procedures.)
6. Obtaining a copy of the library's database on MARC tapes or COM products from the COM vendor, when retrospective conversion is complete. Prices vary with products requested.

MARC Tape Costs for LC MARC Fiche Users

The COM vendor (Brodart, Inc.) prices for extracting LC MARC records, adding the library's holdings data (call number, copy, and location) to the library's copy of the MARC records, and processing a MARC tape are approximately eight to ten cents per title, for libraries ordering both MARC tapes and some COM catalog products, and twenty to twenty-three cents per title, for libraries ordering MARC tapes and no COM products.

Wisconsin Statewide Database and Local MARC Tape Costs

In the Wisconsin contract, the COM vendor (Brodart) does not charge for adding a library's holdings to an existing title in the statewide database. The addition of a new title, with the first library's holdings,

to the statewide database (caused by adding an LC MARC title or a library supplied full MARC record) costs seven cents per new title. The Wisconsin state library agency (Department of Public Instruction/Division for Library Services) will pay the seven cents per new title for each title not on the 1.4 million title statewide database, regardless of which library added the new title. Libraries that wish to extract their data from the Wisconsin database and obtain a MARC tape pay six and three-tenths cents per title.

Different COM vendors have different price lists, and prices may vary from contract to contract, so the unit and total costs to libraries in other states will vary.

Conversion from a Card Catalog to a COM Catalog

For a library converting to a microfilm or microfiche catalog (for a single library or a union catalog) instead of the card catalog, MITINET/retro is one of the least expensive methods of obtaining current and retrospective cataloging information. The costs involved with a COM catalog involve the retrospective conversion costs described above, plus the one-time costs of the microform readers, and the ongoing costs of producing the COM catalog.

THE USER'S VIEW: A BRIEF WALK-THROUGH

In order to introduce the use of the MITINET/retro system, this portion of the text will describe the system as the user would see it.

The MITINET/retro user deals with three kinds of floppys: a "program" floppy (where the MITINET/retro programs are stored), "custom-data" floppys (where permanent information about the library is stored), and "library-data" floppys (where the library's holdings and matching data are stored). The "program" floppy contains a series of programs that perform the separate functions listed below:

- creation of "custom data" for the library, based on the user's one-time input of branch names and other permanent data.
- creation of the library's "data" floppy disks, based on the user's input of the matching, searching, and holdings data.

- duplication of the floppys to provide a "backup" copy of the input file for the library.

The user does not need to understand the programming in order to use MITINET/retro. The system asks the user to select options from a menu on the Apple screen, insert certain floppys in the disk drive, and input specific data when requested. By performing these activities the user can take full advantage of the system.

The first time the system is used, the library will input customized data (such as library name, classification scheme, number and names of branches, etc.) for future use. After the custom data are entered and saved on the disk, the library will automatically bypass this step unless the user specifically requests to change some of the custom data.

When beginning a data input session, the user describes the options required for this session. After choosing an option from the menu screen, the user will enter the data for one title. The MITINET/retro system will collect the data, copy the information on to the floppy disk in the form of a partial MARC record, and prompt the user for data for the next title. The user continues this process until another option is required or the user ends the session.

A Closer Look at Three Screens: Holdings Input and MARC Search Screens *Holdings Input*

The most heavily used activity in the MITINET/retro system is the addition of a library's holdings to an LC MARC record (or to the union catalog database). This will account for 75-90 percent of a library's transactions, depending on the type of library and the size of the collection. If a title has been found on the LC MARC or union COM fiche catalog and the user wishes to add the library's holdings to the database record, this can be accomplished by using a single screen (screen 13, see figure 2).

For purposes of the system walk-through, a library with fifteen branches or locations will be used as an example.

The first step in the retrospective conversion process is to search the LC MARC fiche or a union microfiche catalog for titles owned by the library. Assume the library

has completed searching several hundred titles and written the LCCN number and check digit, which identifies a particular title in the LC MARC database, on the catalog card for each title found. (Libraries using a fiche union catalog would copy the vendor's record number instead of the LCCN.)

The user is now ready to enter the holdings information in MITINET/retro. The user fills in the unique fiche record number and the local call number. If the library elects to enter the copy and location information, this information is entered on the screen. In this walk-through example, the library will enter copy and location information in order to obtain a local library database containing detailed holdings data. These detailed holdings data could be used for a future automated circulation system file or a future COM catalog.

The branches or locations presented on the screen are part of the custom data that were initially entered by the library. In this example, the codes for each of the branches (ART, BANT, etc.) are displayed.

Once the custom data are defined during the first use of the system, the user need only input the information requested between the parentheses. In figure 2, the user has entered the entire input to add the library's call number and holdings for six (of their fifteen) branches to a particular LC MARC title. The user input the data shown in bold, a total of twenty-seven characters.

When the fiche record number (LCCN or vendor's number) was entered by the user for the unique title desired, the system immediately verified the check digit. If the user had entered the record number incorrectly, the system would have requested that the user reenter the record number.

The library's call number will be added to the database exactly as the user enters it on the screen. For each branch holding one or more copies of the title, the user enters the number of copies. For branches with no copies of the particular title, the user enters no information.

That's it. That is all the user needs to do to enter the library's holdings into the database. The MITINET/retro system will record the information on the floppy disk in a format that the COM vendor's computer

can read and adds MARC tagging to each of the data fields.

Union Catalog Users: MARC Search Input

Some libraries will use a fiche union catalog, such as a regional or statewide union catalog, instead of the LC MARC fiche. For titles found on the union catalog fiche, the library would follow the process described above, using the vendor's record number instead of the LCCN on screen 13.

In the event these users were unable to find a particular title in the statewide or union catalog, there is still an additional excellent source for obtaining a full bibliographic record: the vendor's LC MARC file. If these libraries do not also have a copy of the LC MARC fiche, they cannot provide a unique fiche ID number (LCCN with check digit). In this case, the user must request the vendor to search the vendor's copy of the LC MARC file, using only the data available from the catalog card or the title page of the book. All major COM vendors subscribe to the LC MARC tapes and maintain their own copy of the LC MARC file.

Screen 15 (figure 3) requests that the vendor search the LC MARC file, and screen 16 (figure 4) adds the library's holdings information (local copy/location data) to the request. The user would fill in the data in-

```

MITINET (WI)                16:MARC COPY INPUT
STATUS: UNUSED DISK SPACE = 85 RECORDS
LEWY, ANTHONY R.             77-024468
HANDBOOK OF CURRICULUM EVALUATION
375.001                       (BK) WILEY 1977

ENTER COPY AND LOCATION DATA BELOW:
LOCN.   NO.   LOCN.   NO.   LOCN.   NO.

ART     ( )   MAIN   (1)   WRIGHT  ( )
BANT    ( )   MONROE ( )
DENS    ( )   NORTON  ( )
EMPIRE  (1)   PORTER  (1)
FREEMON ( )   REFEREN ( )
HAVID   (1)   ROSSMOR ( )
LORIM   (1)   STEVENS ( )

+ = ADD MORE COPY & LOCATION DATA FIRST
R = REVISE INPUT DATA ON THIS SCREEN
A = ADD RECORD TO WISC DATA BASE
D = DELETE THIS DATA (IGNORE INPUT)
O = GO TO OPTION SCREEN

OPTION CODE: (A)

```

Fig. 4. MARC Copy Input Screen Filled in by User (User's Input Data Shown in Bold).

cluding the LC card number, if known, the author's name, a portion of the title, the publication date, and the library's local call number.

Following this input of the search request, the system provides a second screen for the input of the copy/location data, if required by the library. This screen "Screen 16: MARC COPY INPUT" is shown in figure 4. Note that the user input data from screen 15 is repeated in condensed format on screen 16 to remind the user which title is being processed. The user then enters the copy and location data as shown. The system will store the information on the floppy for later processing by the vendor.

As a result of the search request, the vendor will search the MARC file and, if a match to the record is found, they will add the title and the library's holdings to a temporary file. The vendor will send a computer printout (an edit list) to the statewide database coordinator, who will in turn mail each library's portion of the edit listing to the proper library.

The library will be requested to verify

that the title selected by the vendor accurately represents the title owned by the library, a process called "validation editing." If the title is correct, the user will enter a validation (or release code) on a new floppy. The vendor will then release the new title and the library's holdings from the temporary file and transfer all of this data to the union database. When the new edition of the union catalog is produced, the new title and the library's holdings will appear on the catalog.

It is important for the library to verify the title because there is no check-digit validation on an LC card number in this instance. Keying errors of LCCNs could therefore cause an incorrect record to be added to the library's database. The validation step is an opportunity to prevent the inadvertent addition of an incorrect title to the union database and to the local library's database.

End of Session Activities

As the user completes each record throughout the day, the data is stored on the floppy. The same floppy can be used to add additional data, which could be input at a future session. When the floppy is full, or the established weekly or monthly mailing cycle becomes due, the library will send the floppies to the MITINET/retro coordinator or directly to the vendor.

The coordinator will copy the data from the floppies onto a magnetic tape, reproduce the tape, and send one copy of the tape to the COM vendor. The coordinator will also return each of the floppies received during the latest cycle to the originating libraries. Each library will receive the specific floppies that they submitted to the statewide coordinator. The floppies can be used again for new library input data.

CURRENT STATUS

The first version of MITINET/retro has been tested in libraries in Wisconsin, and is being evaluated in several other states and Canada. The current version includes: (1) the addition of a library's holdings to an LC MARC record (or an existing record on a statewide or other union database), and (2) the addition of the LC MARC records and the library's holdings to a union database

TPS Electronics

Interfacing

OCLC®	RLIN®
CLSI®	SCI®
DEC®	IBM®

and others

Providing automated:
floppy disk storage
spine label printing
bar code label entry

4047 Transport
Palo Alto
California
94303
415-856-6833

Booth 406 at ALA in Los Angeles

(for those records not currently on the union database).

At the end of field testing, approximately April 1983, the MITINET/retro system will be initially distributed to more than forty Wisconsin school, public, special, and academic libraries, along with the first edition of the Wisconsin union catalog. The first edition of the Wisconsin COM union catalog (WISCAT) will contain approximately 1.4 million titles (the largest statewide union catalog produced to date) mostly from Wisconsin OCLC tapes and some tapes from local systems. The MITINET/retro system and the special edition LC MARC fiche catalog will also be distributed to libraries in other states and Canada that have ordered copies.

The average school or small to medium public library will only require the use of the Apple for about one hour per week after the initial retrospective conversion is completed. Thus it is possible for a library to share an Apple with another department or library, or use it for other internal applications.

DEVELOPMENT STATUS

While this communication has limited itself to reporting current functions and capabilities, there are two further applications in early stages of development. The first would allow MITINET libraries to enter original cataloging for titles not found on the fiche database or the LC MARC file. The second application would permit libraries to transmit, receive, file, and update ILL requests. These requests would be transmitted between two libraries, or between a library and a regional library system, in a hierarchical interloan protocol.

ADDITIONAL INFORMATION

Information Transform, Inc. (ITI) and the Wisconsin Department of Public Instruction (DPI) developed MITINET/retro as a joint development project. Herbert J. Grover, state superintendent, Wisconsin Department of Public Instruction (DPI), B. Dean Bowles, deputy state superintendent, DPI, and Leslyn Shires, assistant superintendent, Division for Library Services, DPI, provided the encouragement and sup-

port for the development effort. Libraries in Wisconsin desiring more information about MITINET/retro should contact Bob Bocher, statewide database manager, Wisconsin Reference and Loan Library, 2019 South Stoughton Rd., Madison, WI 53716 or call (608) 266-1077. Libraries outside of Wisconsin desiring more information should contact Hank Epstein, Information Transform, Inc., 502 Leonard St., Madison, WI 53711 or call (608) 255-4800. ■■

BISAC Transmission at Concordia Seminary

W. Larry Bielenberg

Concordia Seminary Library is an academic library serving a community of professional and graduate students. The student body currently numbers more than 700 post-baccalaureate students, and degrees are offered at the master's and doctoral levels. The collection numbers more than 160,000 volumes, about 100,000 titles, and is heavily research oriented. The current library materials budget is over \$150,000.

In 1978, the library began a COM conversion project with General Research Corporation; this project is nearly completed for the retrospective collection. In February 1980, development of a non-MARC acquisitions system was begun. The system, using a large microcomputer, was implemented in July 1980. The library staff knew, even as this system was put into use, that it would be highly desirable to implement a MARC-based system to include both acquisitions and cataloging.

Concordia is now using a Helix microcomputer with 256K of core memory, 40 MB of disk storage, and six CRT terminals to implement a MARC format cataloging and acquisitions system. All programming

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Table 1. BISAC Record Format and Source of Information

Subfield Name	Source of Information
<i>FILE HEADER RECORD Type H</i>	
Header Identifier	Always "H"
File Source Address (SAN)	LRF
Nonstandard Differentiator	LRF
File Source Name	LRF
Creation Date	RTC
Time of Transmission	RTC
Name of File	Blank
Format Version	currently "V02"
Recipient SAN	VRF
Nonstandard Differentiator	Blank
Upper-/Lowercase Indicator	"L" = upper- and lower- case
Discretionary Field	Blank
<i>PURCHASE ORDER RECORD Type P</i>	
Record Identifier	Always "P"
Logical Record Length	Calculated
Purchase Order Number	ORF
Customer Identification Number (SAN)	LRF
Customer Identification Differentiator	Blank
Vendor Address Number (SAN)	VRF
Vendor Address Differentiator	Blank
Date of Order	RTC
ISBN Code	Supplied
Default Billing Directory (optional)	Not used
Default Shipping Directory (optional)	Not used
Special Handling Code Directory (optional)	Not used
Purchase Order Descriptors (optional)	Not used
<i>LINE ITEM RECORD Type L</i>	
Line Item Record Identifier	Always "L"
Logical Record Length	Calculated
ISBN	MARC 020
Quantity	ORF
Directories for fields 40-43	Calculated
<i>Tag 40 Line Item Descriptors</i>	
Binding	Blank
Price	ORF
Back Order Code	Not used
Volume/Set	Not used (entered as note)
Discount	Not used
Cataloging Service	Not used
Substitute Code	Not used
Catalog Quantity	Not used
Special Action Code	Not used
<i>Tag 41 Title Elements</i>	
Title	MARC 245
Line Number	ORF
Edition	MARC 250
LCCN Prefix	Not used
LCCN	MARC 010
<i>Tag 42 Author/Publisher Field</i>	
Publisher	MARC 260
Author	MARC 700
Obsolete or Alternate ISBN	MARC 020
<i>Tag 43 Addition Information Field</i>	
Vendor Message (x subfield)	ORF

Table 1. BISAC Record Format and Source of Information (Continued)

Subfield Name	Source of Information
<i>PURCHASE ORDER TRAILER RECORD Type T</i>	
P.O. Trailer Indicator	Always "T"
Total Line Items	Calculated
Total Items Ordered	Calculated
<i>USER TRAILER RECORD Type Z</i>	
Trailer Indicators	Always "Z"
SAN of Originator	LRF
Nonstandard Differentiator	Blank
Date of Termination	Blank
Time of Termination	Blank
Record Total	Calculated
Book Total	Calculated
Purchase Order Total	Always "1"
Line Item Total	Calculated

Legend: LRF = Library Record File, ORF = Order Record File, RTC = Real Time Clock, SAN = Standard Address Number, VRF = Vendor Record File.

is done in ANSI Standard MUMPS. The menu-driven acquisitions system capabilities include: all record keeping for the order system online, full-screen editing, ordering, receiving, want-list maintenance, and fund accounting. The in-process and catalog files may be searched by author, title, ISBN, LCCN, or any combination of these. Acquisitions makes no determination of main entry, so all authors in the in-process file are entered in the 700 tag rather than the 1xx tags of the MARC format.

In the fall of 1982, it was decided to implement transmission of BISAC format records to Midwest Library Service, one of Concordia's principal vendors. Our preliminary programming was done for the fixed-length format. Midwest, however, decided to use the variable-length format, so final implementation is in that format.¹ Test transmission began in early March 1983. All order routines remain the same until time of order. If the vendor is identified as a BISAC vendor, order records will be written into a special file rather than having hard-copy orders generated. Transmission takes place using a 1200 baud, asynchronous, half-duplex, Bell 212A dial-up (TTY) connection. (This is not the BISAC-recommended protocol.)

It is possible to generate all BISAC fields from either MARC-formatted order records or standard information from other system files. However, certain optional

fields have been ignored because of either library or vendor choice. The following fixed fields in the file header record (type H) are not used and are filled with blanks: name of file, nonstandard differentiator, and discretionary field. In the purchase order record (type P), the customer identification differentiator and vendor address differentiator are blanked. In the line item descriptors field (tag 40) only the binding and price subfields are used. In the additional information field (tag 43) all additional information is being placed in an X subfeld (i.e., vendor message). As the format becomes more widely used by vendors for receipt of orders, additional subfields allowed by the format will be utilized by Concordia. However, the early limited audience for transmitted orders does not warrant use of all subfields at this time.

Table 1 illustrates the BISAC record format and source of information as implemented at Concordia. Figure 1 shows an actual sample record.

The BISAC format itself appears to be able to handle our needs at this early implementation. The only serious drawback at this point is the absence of a date of publication field in the records. Concordia is currently placing date of publication at the end of the title in parentheses. Another potential problem for nonmainstream publications, which do not have ISBNs, is the limited ability to specify edition.

```

0000000001111111112222222233333333444444445555555566666666777777778888888899999999
12345678901234567890123456789012345678901234567890123456789012345678901234567890
H309157001650CONC SEM STL 830316123600 V021694243 L R
0000000001111111112222222233333333444444445555555566666666777777778888888899999999
12345678901234567890123456789012345678901234567890123456789012345678901234567890
P005082149 3091570 1694243 8303161T R
0000000001111111112222222233333333444444445555555566666666777777778888888899999999
12345678901234567890123456789012345678901234567890123456789012345678901234567890
L0151 00001400054,105642054TT495TUnderstanding stress and anxiety. (1979.)T82149 S
0000000001111111112222222233333333444444445555555566666666777777778888888899999999
12345678901234567890123456789012345678901234567890123456789012345678901234567890
0123456789012345678901234567890123456789012345678901234567890123456789012345678901
Tharper & Row, (New York :)TSpiegelberger, Charles DonaldT R

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Fig. 1. Sample Record.

Initial programming of the variable format in MUMPS, based partly on previous experience with MARC, was nearly as easy as the fixed format, and no major difficulties were encountered in early transmission of records to the vendor.

REFERENCE

1. "BISAC Variable Length Format, Version V02" (New York: Book Industry Systems Advisory Committee, 1983). (Editor's Note: See "Reports and Working Papers" section of this issue for full text.) ■■

Long Searches, Slow Response: Recent Experience on RLIN

Walt Crawford

RLIN II logs the commands issued during 10 percent of terminal connect sessions. These logs were analyzed in early February 1983 to see what sort of searches take a long time (more than fifteen to twenty seconds) to complete.

To place the results in context, RLIN indexing is described briefly. Figures on general system responsiveness for the days studied are given. Long searches are listed and categorized. Some alternate approaches (to avoid long searches) are suggested.

Analysis showed that most searching is rapid and well done, but that most of the few long searches were easily avoidable. The most frequent cause of long searches was error in choice of index. The few long searches place a heavy load on RLIN II as a system.

RLIN II COMMAND LOGGING

RLIN II ITPS (Integrated Technical Processing System) is the major online system for the Research Libraries Group. It is a large system, written in Pascal, combining acquisitions and cataloging input, up-

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date, and searching, as well as reference searching.

Each time a user logs on to RLIN II, an algorithm is applied which causes 10 percent of the sessions to be logged. For a logged session, RLIN II writes each command issued by the user to a logging file. Each such log entry includes the command, the CPU resources and input/output requirements, and the actual response time in seconds. A session identifier is also included, and log entries are stored in session groups.

Each day, 14,000 to 20,000 commands are logged, including 3,500 to 6,000 searches. These give a reliable picture of system use and performance. A statistical monitoring system analyzes the logs, yielding a graph of response time by percentiles for each half hour. The system also generates summaries of system use and performance by type of command, time of day, and other parameters. These summaries are checked daily for anomalies, allowing quick action to correct problems.

RLIN users see two direct results of logging. A monthly chart showing response time percentiles (median, 75 percentile, 90 percentile, and 95 percentile) for each day of the month is sent to all RLG members and users. Periodically, usually three days each month, library coordinators at RLG produce simplified versions of the detailed logging for each library; these can be used as training aids. (The logging system does *not* include information regarding the identity of the terminal operator.)

SEARCHING ON RLIN

RLIN II uses more than twenty indexes, including several word indexes. Boolean logic may be used to combine words or indexes within a single search command. Right and internal truncation are permitted, but not in the same search. In practice, internal truncation is relatively infrequently used.

Six indexes are involved in almost all long searches: *personal name* (PN and PE), *corporate/conference word and phrase* (CW and CP), and *title word and phrase* (TW and TP). Other indexes such as ISSN, ISBN, and LCCN almost always yield very quick response. Record ID searches are,

naturally, almost instantaneous.

The personal name indexes use a name algorithm to allow more flexible searching. The *PE index* requires the precise cataloging form of a name, while the *PN index* allows less rigorous searching. Both indexes include name portions of name/title fields.

Corporate/conference indexes (CW and CP) and title indexes (TW and TP) also include appropriate portions of name/title fields. Word indexes have no exclusions except one- and two-letter "words" and a few conjunctions, prepositions, and articles. Even "BOOK" and "SERIES" are indexed. Filing indicators are used in phrase indexes.

A user may have more than one file selected (books, serials, scores, sound recordings, films, and maps), and a search will continue from file to file until a result is found. If a result is found, the system will automatically display it if the result has seven members or less.

Several hidden factors enter into the numbers and results below. Some of these are deliberate design elements of RLIN II.

- *Automatic resumption* of searches from one file to another, when several are selected, can slow down even a precise search when the item simply does not exist, since the resumption itself takes several seconds. It appears that all ISBN, ISSN, and LCCN searches in excess of three to four seconds involve automatic resumption.

- *Automatic displays* add slightly to some of the response times, particularly when multiple records are retrieved. In the latter case, as much as three seconds of the response may be due to display.

- *Aggregate numbers* given below include multi-index searches; many (perhaps most) personal name searches include title word segments.

Times given are *internal response times*. The user perceives response as two to four seconds slower, due to polling and communications delays.

GENERAL SYSTEM RESPONSE

Analysis was done on February 1, 3, 4, 7, 9, 10, 11, and 14; all days in which the system was heavily used but on which there were no known system difficulties. These days are typical of the last five months. February 1, 3, and 9 were somewhat slower

than average, while February 4, 7, and 11 were typically fast Fridays and Mondays. All eight days were normal working days.

The days chosen were suitable because no special hardware or software problems interfered with response. (Short-term system outages on February 2 and 8 make the figures for those days less reliable and meaningful.) The aim here was to look at factors in *searching* that lead to slow response, so normal days were chosen.

Table 1 gives response ranges for various command groups, to help place long search responses in perspective. Response *percentile limits* appear to be the most useful figures; these are rounded up to the nearest quarter second or, if more than fifteen seconds, full second. The median or 50th percentile is the point at which half of all commands have been completed; at the 75th percentile, three out of four are complete. At the 90th percentile, nine of ten commands are completed. The 90th percentile is the highest mark reflective of overall system performance.

Notes on Table 1

- FIN ID: Record number searches.

- FIN IS . . . : ISBN and ISSN searches, lumped together for command analysis.

- FIN PN: Most personal name searches include "and TW" or "and TP" title searches. The ANDED search is included in the time reported.

- FIN TW: Most title word searches are part of PN searches. Most index errors are FIN TW instead of FIN TP (see below).

- SEARCH: All searching commands except for "FIN ID." This group total includes FIN IS . . . through FIN TW, above.

- BUILD and DISPLAY: "BUILD" includes all commands issued during record building, including all time taken in verification. "DISPLAY" includes all explicit display requests (automatic displays, issued for most searches, are included in the search times). Both figures show underlying system performance.

- Worst Search Responses of the Days:

Feb. 1: 260 seconds (4.3 minutes)

Feb. 3: 790 seconds (13.2 minutes)

Feb. 4: 299 seconds (5 minutes)

Feb. 7: 195 seconds (3.3 minutes)

Feb. 9: 755 seconds (12.5 minutes)

Feb. 10: 539 seconds (9 minutes)

Feb. 11: 179 seconds (3 minutes)

Table 1. *General Response Limits**

Command or Group	Number Logged	Response Limit in Seconds		
		Median	75th Percentile	90th Percentile
All	14,842-19,321	0.5-0.75	1.0-2.25	2.0-6.25
mean	17,224	0.72	1.53	4.03
FIN ID	827-1,807	0.75-0.75	0.75-1.5	1.25-3.75
mean	1,263	0.75	1.19	2.5
FIN IS . . .	158-492	0.75-1.5	1.5-3.75	2.75-14
mean	273	1.06	2.66	7.28
FIN LCCN	400-737	0.75-1.0	1.25-2.75	2.0-6.75
mean	530	0.93	1.81	3.94
FIN PE	33-154	0.75-2.75	1.50-7.75	2.75-14.5
mean	64.4	1.47	3.56	8.66
FIN PN	560-964	1.25-2.75	2.75-7.75	4.75-19
mean	762	1.84	4.41	11.03
FIN TP	988-1,574	1.0-1.5	2.0-5.5	3.75-19
mean	1,226	1.28	3.44	10.4
FIN TW	154-302	2.25-4.25	6.25-18	16-53
mean	211	3.09	9.69	32
SEARCH	2,965-4,466	1.0-2.0	2.25-6.25	4.25-20
mean	3,568	1.34	3.56	10.5
BUILD	4,593-7,184	0.5-1	0.75-2.25	1.25-4.25
mean	6,128	0.75	1.41	2.88
DISPLAY	4,056-5,418	0.5-0.5	0.75-1.0	1.0-2.25
mean	4,675	0.5	0.91	1.69

*Ranges given represent low and high figures for the sample.

Feb. 14: 296 seconds (5 minutes)

- "100th Percentile" since October 4, 1982: The integrated Pascal RLIN II system went into use on October 4, 1982. Over the ninety-five logged weekdays since then, including days when there were known software or hardware problems, the *worst search response* fell into the following limits, where "3-4 minutes" means "at least 180 seconds but less than 240 seconds":

Less than 3 minutes: 13 days

3-4 minutes: 10 days

4-5 minutes: 13 days

5-6 minutes: 18 days

6-7 minutes: 6 days

7-8 minutes: 6 days

9-11 minutes: 3 days

12-15 minutes: 9 days

16-20 minutes: 7 days

20-25 minutes: 3 days

25-35 minutes: 3 days

35-40 minutes: 3 days

More than 40 minutes: 1 day (2,468 seconds or 41 minutes)

LONG SEARCH CAUSES

Five factors cause long searches with some frequency: index selection errors, excess words, extraneous title searches, automatic resumption, and deliberate long searches. A sixth, spelling and punctuation errors, appears less frequently. Many, perhaps most, long responses involve more than one factor. The choice of "major factor" is necessarily a subjective one.

This analysis was done from logs. Without knowing what information a searcher had, it is not always possible to know why searches were done as they were.

Index Selection Error

The most common factor in long search response is *mistaken index specification*. Most frequently, a full title is keyed, but as "FIN TW" rather than "FIN TP." Since the full title usually includes very general words, each of which must be retrieved to do the implied Boolean ANDing, the search takes a long time.

Since corporate indexes are not heavily used, "FIN CW" instead of "FIN CP" is not a frequent problem, but is almost always a *severe* problem when it occurs, as the phrase is likely to contain words such as

California, State, Institute, University, or other very frequently occurring words.

Too Many Words

There is a natural tendency to give *all* the known words when doing a word search. Since RLIN II word indexes are strictly single-word indexes, this can yield much slower results than giving *only distinctive* words.

Extraneous Title Search

Many searchers always qualify personal name searches with one or more title words, as a matter of habit or policy. While this is desirable for prolific authors (or names which are not distinctive), it is not always necessary.

More to the point, the word or the phrase subset chosen is not always as distinctive as the name. In some cases, the result is a search that takes longer to yield the same result. "FIN PN RABB, T AND TW NEW" is far slower than "FIN PN RABB, T," which yields a single screen of results.

Automatic Search Resumption

This is hidden in many of the other factors. When a search fails on one file, and the user has multiple files selected, each file is searched in turn; effectively, the search is multiplied by some factor. Added to that multiplication is the time required to change files, a small but significant factor.

This is probably *most* irritating when a searcher notes a poor or mistaken search just after sending it; nothing can be done until the system completes the search. (As a result of the study reported, automatic search resumption is currently being re-evaluated at RLG, and may be modified or eliminated.)

Deliberate Searches

Some searches simply take a long time, either because not enough is known about the desired item, or because no efficient search strategy is available.

The number of these deliberate slow searches is small, with five to ten being logged on typical days. No corrective action is indicated; one strength of RLIN II is its ability to handle searches that are difficult.

The remaining factor, keying error, is infrequent. It may actually occur more fre-

quently than assumed, buried in search resumption.

Keying Error

Three cases are involved:

- Failure to "quote": When a phrase contains "and," "or," or "&," the entire phrase must be surrounded with quotation marks; otherwise, the system assumes a Boolean search. FIN TP "WAR AND PEACE" will retrieve the Tolstoy book (and some others); FIN TP WAR AND PEACE won't retrieve anything: there are twenty titles with the phrase "WAR," and twelve with "PEACE," but none with both.

- Failure to truncate: Unless a '#' truncation symbol appears at the end of a phrase, the phrase must equal the entire title phrase. (Specification of a *very brief* truncated phrase can be very detrimental: "FIN TP CAL#" is an extremely long and cumbersome search.)

- Spelling errors: Spelling errors can cause slow (and usually useless) response in two ways: automatic resumption may take place because no result can be found, and a distinctive name or word may accidentally be keyed as an undistinctive word.

It is hard to tell how often such errors actually occur; they were not *apparent* in the analysis more than once or twice a day.

EXAMPLES AND ALTERNATIVES

The examples that follow are real examples, followed by the actual response time and, in some cases, by an alternative search that would have been very fast. The response time is given in square brackets: []. Possible alternatives appear on the next line in angle brackets: < >.

Examples are grouped under index selection errors, too many words, extraneous title, and apparent deliberate searches.

Note that all of these are *exceptions*: most are the slowest searches of the day, or within the slowest twenty or thirty. Note also that the alternatives are only possibilities; in most cases, any of several alternatives would serve.

Index Selection Errors

FIN TW NATIONAL STUDY OF THE

INCIDENCE AND SEVERITY # [145]
<FIN TP "NATIONAL STUDY OF THE
INCIDENCE AND SEVERITY #">

FIN CW OAK RIDGE NATIONAL
LABORATORY [50]

<FIN CP OAK RIDGE NATIONAL
LABORATORY>

<FIN CP OAK RIDGE#>

FIN CW AMERICAN ACADEMY OF
OPHTHALMOLOGY [93]

<FIN CP AMERICAN ACADEMY OF
OPHTHALMOLOGY#>

FIN CW UNITED STATES BOARD FOR
INTERNATIONAL BROADCASTING [122]

<FIN CP UNITED STATES BOARD FOR
INTERNATIONAL BROADCASTING#>

AND CW STANFORD RESEARCH
INSTITUTE [50]

<AND CP STANFORD RESEARCH
INSTITUTE#>

Too Many Words

FIN TW HERITAGE AMERICAN
DICTIONARY AND PN MORRIS, W [133]

<FIN TW HERITAGE AND PN MORRIS,
W>

FIN TW NATIONAL FIVE DIGIT ZIP CODE
DIRECTORY# [33]

<FIN TW FIVE ZIP>

FIN TW SCANDINAVIAN RESEARCH
PROJECT DESERTED FARMS [78]

<FIN TW SCANDINAVIAN DESERTED>

Extraneous Title Searches

In all cases below, searching on PN alone would be sufficient.

FIN PN RABB, T AND TW NEW [174]

FIN PN MACLAVERTY, B AND TP CAL#
[260]

<FIN PN MACLAVERTY, B AND TW
CAL>

<FIN PN MACLAVERTY, B AND TP CAL
#>

(The title of the book is "CAL," a single word.)

FIN PN QUINNETT, PAUL G AND TW
TROUBLED PEOPLE BOOK [49]

FIN TW PHYSIOGRAPHY NEW YORK AND
PN RAISZ, ERWIN [146]

FIN PN NICOLSON, WIL AND TW
ENGLISH SCOTCH IRISH HISTORICAL
[95]

FIN PN SOUKUP AND TW LIST [35]

FIN PN ZULKIFAR GHOSE AND TW NEW
[117]

Apparent Deliberate Slow Searches

Some of these may be mistakes of one sort or another, but there is nothing available to demonstrate that.

FIN TW SELECTED PAPERS SCIENTIFIC RESEARCH [656]

AND TW AMERICA [84]

FIN TP READING# [56]

FIN TW IMPRESSIONISM MODERN VISION [143]

FIN PN BACH, J S AND TP CONCERTO# [41]

A CLOSER LOOK AT FEBRUARY 7

February 7 was a moderately heavy day for use, and a very heavy day for logged use (more than 19,000 commands). The system was slow between 11 and 12 a.m. Pacific time, which is not unusual.

Here are *all* of the search commands requiring sixty seconds or more to complete, followed by three figures in brackets: response time in seconds, CPU time in seconds, and file I/Os.

FIN CW NATIONAL COMMISSION MARIHUANA DRUG ABUSE [70/8.9/958]

FIN TW JOURNAL NEUROSCIENCE [64/4.8/584]

FIN CW ORTHOPAEDIC RESEARCH SOCIETY [63/5.8/593]

AND TW PROCEEDINGS [117/2.9/214]

AND TW PLANNING REPORT

[126/16.6/2134]

FIN TW ANNUAL PLANNING INFORMATION [74/8.9/1192]

FIN TW 1000 AMERICAN IDIOMS AND THEIR# [102/9.3/1020]

AND TW REPORT# [119/19.1/2356]

FIN ISBN 0797000984 [78/0.2/17]

FIN TW NEW POLYMERIZATION REACTIONSFIN [88/6.4/789]

FIN CW CALIFORNIA STATE DEPARTMENT EDUCATION [62/8.6/983]

FIN CW MEXICAN AMERICAN EDUCATION RESEARCH PROJECT [69/16.4/1926]

FIN TW FORDHAM INTERNATIONAL LAW FORUM [78/10.4/1137]

FIN TW DEVELOPMENT ENVIRONMENT REFORMS [94/4.9/482]

FIN TW ECONOMICS OF NEW EDUCATIONAL MEDIA# [72/11.8/1378]

FIN PN DE BONO, EDWARD AND TW NEW THINK [143/8.8/941]

FIN CW SOUTHERN CALIFORNIA RESEARCH AND TW MEXICO SOUTHERN . . . [61/10.4/1144]

FIN TW AMA RESEARCH REPORT [114/18.0/2569]

FIN TW AMERICAN BOOK DEAD [146/16.2/2246]

FIN TW NEW HOMES SALES [85/8.8/1144]

FIN TW TAX LAW DEVELOPMENTS [60/4.6/535]

FIN PN GREENE AND TW NEW IOWA SPELLING [64/9.9/1128]

FIN PN KER AND TW ENGLISH MANUSCRIPTS [79/9.0/1143]

FIN TW INDEX CONFERENCE TITLES [69/3.7/370]

FIN TW MUSIC BUSINESS [80/2.0/241]

FIN PN DIETRICH, A AND TW RIDMAN [88/0.8/73]

FIN TP SURROGATE WIFE# [139/0.1/16]

FIN TP EFFECT OF PEAT MINING ON FISH# [61/0.2/13]

AND TW REPORT [115/13.0/1538]

FIN PN JONES AND TW FARMING [64/3.8/224]

Notes on Long Searches

The thirty over-one-minute responses do not suggest hundreds of other slow responses. Eleven searches took forty-five to fifty-nine seconds; 22 took thirty to forty-four seconds; 34 took twenty to twenty-nine seconds, and 52 took fifteen to nineteen seconds. In all, 256 of 5,815 logged searches took more than ten seconds; the bulk took less than five seconds.

Four of the slow responses were due to system slowness between 11 a.m. and 12 noon, or to automatic resumption of searches. Thirteen appear due to index selection error, with another four caused by poor word choice or inclusion of too many words. Nine may have been legitimate, though "AND TW REPORT#" is, at best, questionable.

System Impact

The twenty-six long searches not due to system problems have a disproportionate impact on the system. Those commands represented 0.13 percent of all logged commands, 0.6 percent of searches other than ID searches. At the same time, the twenty-six long searches used up 10.3 percent of all logged CPU time, or 22.4 percent of all searching CPU time. The twenty-six long searches also used 17.4 percent of all I/Os

for logged commands, or 27.1 percent of search I/Os.

In relative terms, the average long search used 86 times as much CPU time as the average command (47 times as much as the average search). The average long search also used 157 times as many I/Os as the average command, or 64 times as many as the average search.

RLIN II was designed to give the searcher as much flexibility and power as possible. The system does not prevent or actively discourage difficult searches. The impact of long searches clearly justifies training efforts and continued monitoring.

As a result of these findings, long search analysis has been added to the daily command analysis system. Long searches appear to have a disproportionate impact every day, but not always quite such a large impact.

CONCLUSIONS: HOW LONG IS LONG?

Most days, very few searches take more than thirty seconds or so. For instance, on February 3 (a slow day), 31 logged searches took more than 60 seconds; 150 took more than 40 seconds. On February 4, 35 logged searches took more than 38 seconds; 155 of 5,300 searches logged took 12.5 seconds or more. On February 7, 30 logged searches took more than 60 seconds; 220 of 5,800 searches took 12 seconds or more.

The RLIN II searching interface appears to be sound and workable *for what it is*: a technical processing and reference searching system used by professionals and trained paraprofessionals. Most searches are quick and clean. When there are problems with the information, the burden is placed on the computer, not on the searcher.

These results do suggest, however, that the RLIN II searching interface is not suitable, *as it stands*, for a large public access catalog. Naive use of the system could lead to significant difficulties for overall responsiveness. To maintain good overall response, such a catalog would need methods of detecting long searches, preventing inadvertent long searches, and reducing the impact of deliberate long searches. ■■

Touch-Screen versus Keyboard Terminals for Online Catalogs

Peter G. Watson

The Meriam Library of California State University-Chico is the pilot site for the introduction of online catalogs into the libraries of the nineteen-campus California State University system. In the 1982-83 academic year, CLSI's Public Access Catalog (PAC) was installed concurrently with the CLSI Libs 100 circulation system, and will be evaluated using, among other things, survey instruments that closely follow the recent CLR-sponsored nationwide evaluation of public acceptance of online catalogs.

The full shelflist of approximately 350,000 records had been previously converted via OCLC, and thus the PAC was offered as a complete file from day one. The PAC does not yet have authority control or cross-references, however; so although it can provide access features that no card catalog could, neither is it a complete substitute for the card file.

We are maintaining the card catalog as a backup, though the preponderance of catalog use shifted to the terminals within a few weeks of their introduction. The library has a PDP 11/44 with four 300 Mbyte disk drives; in addition to the circulation system, this equipment supports for the PAC functions twenty CLSI 700 touch terminals, nine CLSI 500 keyboard terminals, and two dial-in ports.

Since the touch and the keyboard terminals both access exactly the same database, how do they compare for public service purposes? The brief answer is that they complement each other reasonably well, bearing out our early planning assessment that the touch screen would be suited for the beginner, and the keyboard for the more experienced user.

The touch terminal can be used by many patrons without any instruction at all. It

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leads the user through a menu-driven series of steps to narrow down the search topic (author, title, subject, or call number) until one specific term is chosen; the screen then displays in short form the record(s) that match, with the full record available "behind" each short record if called for by a further touch of the screen.

The search method requires the user to touch the menu at the item desired or, if that item is not listed, at the term that immediately precedes it alphabetically or numerically. (Example: to choose LASERS from the range ABACUS to PEANUTS one touches ABACUS; the system will then offer successively finer subdivisions of the alphabet between ABACUS and PEANUTS until LASERS is reached. If one wanted the subject PEANUTS, one would touch it repeatedly until the lowest level of the display was reached.) After the user has grasped this basic search logic, the process is swift. Each stage can be accomplished in less than about five seconds. However, the presentation of this tree search on the screen is not always clear to the novice. The first and sometimes the second stages can consist simply of two or three choices (later levels will normally display a full screen of eleven choices). And while going through the search routine, the patron cannot back up because of course the program does not know by which of the thousands of possible pathways one arrived at a particular point. One must touch START OVER and go back to the beginning.

When the actual listing of authors, titles, subjects, or call numbers is reached, the BROWSE commands provide easy and rapid scanning forward or backward, at a rate of one screen or three screens as desired. This is excellent for looking at nearby entries (example: having found LASERS, one can see very quickly that the headings LASERS IN BIOCHEMISTRY, LASERS IN CHEMISTRY, and LASERS IN MEDICINE are also available). One would definitely not use the BROWSE feature to move to another letter of the alphabet, or even, in most cases, halfway through the letter within which one is searching, from LASERS to LOBSTERS, for instance. Again, one should start over, as one would do upon realizing one was in the wrong

drawer of the card catalog.

Standard computer sorting creates two phenomena that tend to need explaining to most patrons. First, numbers file before letters, so that the very first screen of the search sequence (recall that this usually divides the alphabet into only two choices) may present just two lines of information:

101 RANCH, OKLAHOMA
PEANUTS

which baffles most first-timers. Second, in the subject file, new multiword headings are interfiled with the subdivisions of a main heading:

LASERS—ADDRESSES
LASERS IN MEDICINE
LASERS—STUDY AND TEACHING

Even those of us who have known that these things would happen in the era of computerized catalogs can be taken aback at the differences in especially large, general subject term-lists (AGRICULTURE, BUSINESS, EDUCATION, PSYCHOLOGY, etc.). But there is a series of generally satisfactory HELP messages available through the touch screen, so the moderately patient first-time user can succeed unaided in finding appropriate catalog records quickly.

Such is not the case with the keyboard access method, which utilizes the keyboard that is familiar to many LIBS 100 users. From the public service viewpoint, that in itself is a small but significant irritant, in that only one of the long row of function keys (NEXT) is operative; for public access, the terminals are locked in SEARCH mode, but that impressive array of circulation-related function keys remains in place for the enterprising patron to try to cancel fines, extend due dates, expunge patron names, and the like.

Both types of terminals give the current circulation status of the item, in the form of a due date or the words ON SHELF. However, the touch terminal calls this "copy information" while the keyboard terminal asks if one wants "item detail." When this two-line field is displayed, lines one and two on the touch screen become lines two and one on the keyboard screen. I'm sure there is a good reason.

Keying in a search argument is basically very simple, once it is understood that this

is not a *keyword* system, searching for all occurrences of the term in a field. It searches the indexed field (A, T, S, call number) from left to right, and must find an exact match. For subject searches, this will mean exact LC headings for most academic libraries. If only one record is found, the system very speedily displays it in the full format. For more than one, it will list them first in the short format, and if it finds more than twenty-five "satisfiers," a check message asks if you wish to continue (it should also say ". . . or refine your search?" but this awaits a future release). Since the touch screen search will never take less than six steps in a file the size of ours, the keyboard terminal is much faster for known-item searching.

So far, so good, albeit rather inflexible. The keyboard system also offers, however, Boolean searching: AND and NOT are the choices; there is no OR logic yet. This feature was so slow on our first machine, a PDP 11/34, as to be practically nonexistent. Thirty minutes was not uncommon, even to search on terms that we knew had only twenty or thirty postings. On the larger machine, it works in reasonable time only for certain specialized, limited kinds of Boolean searches, mainly those using qualifiers such as date or language of publication. Genuine Boolean searching of subject headings is still likely to take in excess of fifteen minutes, for which few patrons are going to wait. When untrained patrons (many of whom, however, have had experience with other keyboard terminals, and who understand Boolean logic) enter as two terms a search which, had they but known it, the LC subject heading system has pre-coordinated for them into one term (for example, BUSINESS AND COMMUNICATION), the terminal is in most cases effectively "jammed" until a librarian can cut in and halt the search process. We have found that one such search will slow down response time on all the other terminals, whether circulation, public catalog, or processing. Regrettably, the keyboard search routine almost forces users into a Boolean search by its prompts (BOOLEAN SEARCH . . . Term 1? . . . And/Not? . . .).

Clearly, then two major considerations for the widespread acceptance of CLSI's

keyboard terminal will be a specially designed keyboard and much more sophisticated Boolean search software. Better prompts and HELP messages akin to those for the touch screen would also be welcome.

Any library adopting CLSI's Public Access Catalog should have both types of terminals, probably in a ratio of two or three touch to one keyboard. Touch terminals are especially well suited for novices, who can learn the database while using a simple search process. After the patron has learned what is in the database, success at the keyboard terminal is generally possible as long as one stays with single-term searching. Either terminal, used in this manner and on a system supporting about $\frac{2}{3}$ the number of terminals it theoretically could support, will provide for most patrons a quicker search of catalog information than would be possible using card files. ■■

The Personal Bibliographic System: A System for Creating and Maintaining Bibliographies

Victor Rosenberg

One of the most difficult chores facing a librarian, scholar, or researcher is the compilation of bibliographies. While the selection of works to be included constitutes scholarship, the actual compilation, formatting, arranging, and typing of the bibliography is a time-consuming clerical task. Over the past two years, a project has been under way at the School of Library Science, University of Michigan, to automate the compilation of accurate, attractive, and well-formatted printed bibliographies. The result is a set of microcomputer programs (called the Personal Bibliographic System) that accepts manual input or input

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from machine-readable catalog records to produce correctly formatted printed bibliographies suitable for publication. The program is intended for librarians, scholars, researchers, teachers, and students. The program is useful for all who produce bibliographies or reading lists. This includes students learning to write term papers as well as professionals.

The program converts database output into an attractive and usable form. Until now the major emphasis of online bibliographic information systems has been on the retrieval of information itself, with little attention paid to what the user might do with the information or how it looks. The end users are often left to struggle with a scroll of chemically treated paper from which the relevant useful information must be manually extracted. Even where the information is captured on disk, extensive editing is required to get the information into a proper bibliographic format.

The program formats citations according to the American National Standard for Bibliographic References (ANSI Z39.29-1977). One of the objectives of the project is to encourage the widespread acceptance of the ANSI format in place of the many bibliographic formats now being used.

The Personal Bibliographic System is a specialized word processor, database system, and text formatter for producing bibliographies. Although the system has many database features such as searching by first field (usually author or title) and searching by assigned index terms, the primary objective of the system is to produce printed bibliographies rather than a searchable personal database of references. The intent is to use the database capabilities of the bibliographic cooperatives or online catalogs and to create a tool for scholars to use as an interface to the larger systems. A sample bibliography produced by the system is shown in figure 1.

FEATURES OF THE SYSTEM

Full Feature Screen Editor

The system allows the user to edit a citation either before or after it is stored on the disk. The editor provides for inserting, deleting, and exchanging of characters, copying text from one field to another, as well as

word wrapping and "soft" hyphens in the text.

Variable-Length Fields and Records

The different fields of the citation are all of variable length, including the abstract. The only limitation on the size of a citation, or a field within a citation, is the remaining memory available in the microcomputer. The records on the disk are also of variable length so that the total number of records in the bibliography depends only on the disk capacity and the number of characters per citation. Typical disk capacities range from about 238 citations for the single-sided Apple II diskette to almost 2,000 citations for a double-sided, double-density 5¹/₄-inch diskette. The capacity of hard-disk systems ranges upward from these figures.

Text Formatter

The text formatter allows the user to select margins on all sides of the page; line spacing; citation numbering; page numbering; indented or block paragraph format; and continuous-form or single-sheet feeding. The formatter also allows the printing of first lines of citations for a quick reference listing and the printing of citations on the computer screen instead of the printer.

Database Searching

The system permits searching on a sort key derived from the first field of the citation, usually author. If no author is given, the title is substituted. Searching is also possible by user-assigned index terms. Each citation contains a field for index terms that can be easily suppressed during printing. This permits the bibliography to be arranged and printed by category.

Formatting by the ANSI Z39 Format

The system punctuates all citations according to the ANSI format. The user of the system need know nothing of the format to produce a correctly punctuated bibliography.

Ordering of Citations

The system will arrange the bibliography alphabetically (using a sort key, de-

- Allison, John, composer. Johnny has gone for a soldier [Score]. In: Lomax, Alan, ed. Folk song U.S.A.: the 111 best American ballads. First ed. Lomax, John; Lomax, Alan, adapters, arrangers. New York: Duell, Sloan and Pierce; 1947; (no. 35): 117; 3 stanzas.
Note: Piano arrangement by Charles and Ruth Seeger. Revolutionary War version of the Irish "Shule Aroon".
- Andrews, E. Benjamin. Civil War and Reconstruction: period IV. New York: Charles Scribner's; 1925; c1922. (Andrews, E. Benjamin. History of the United States from the earliest discovery of America to the present time; IV).
Note: "With 650 illustrations and maps."
- Bailey, Thomas. Diplomatic history of the American people. New York: Appleton-Century-Crofts; 1964; c1958.
Note: 7th ed.
- Bauer, Raymond A. [and others]. American business and public policy: the politics of foreign trade. New York: Atherton; 1967.
Note: LC 63-8171.
- Carte des Etats-Unis de l'Amerique: suivant le Traite de Paix de 1783. Dediee et presentee a s. excellence Mr. Benjamin Franklin [Historical map]. Lattre, engraver. Paris: Lattre, Graveur du Roi; 1784; 1 tinted sheet; 24 x 30 in.; 1:210,000. In: Newberry Library Chicago, IL.
Note: Insets of "La Floride" and table of 13 states.
- Civil War videorecording: a conversation with two soldiers [Videorecording]. Mississippi College Learning Resource Ctr., producer; Winshel, Terrence [and others], actors. Clinton, MS: Mississippi College; 1981; 1 cassette; 3/4 in.
Note: Sd. Color. Videotaped July 17, 1981.
Impersonations of two Civil War soldiers who give their recollections of life on the battlefield. Narrated by Ron Howard.

Fig. 1. Sample Bibliography.

rived from the author, title, and date fields); in order of first in, first out; or by user-defined ordering. In addition the program will arrange the bibliography by assigned index terms using any of the above orderings within the category.

Annotation

A "notes" field and an "abstract" field are provided for annotation.

Document Types

The system formats citations for monographs, journal articles, reports, dissertations, letters, manuscripts, conference proceedings, newspaper articles, trade catalogs, maps, music scores, sound recordings, audiovisual materials, motion pictures, videotapes, artworks, computer programs, and data files.

Complex Citations

The program allows for simple as well as complex citations. The program handles analytics within monographs and series statements. For example, the program allows the manual addition of analytics to catalog records derived from online catalog records.

HARDWARE REQUIREMENTS

The Personal Bibliographic System can operate as a complete stand-alone system with easy manual data entry. With the addition of the terminal emulator program and the interface program the system is capable of downloading catalog records from bibliographic cooperatives (OCLC, RLIN, WLN, etc.).

The Personal Bibliographic System is

available for the Apple II, Apple IIe, IBM-PC, and the TERA microcomputers. The system requires 64K of memory, an 80-column display, and two disk drives. A printer is also useful. The system will soon be available for additional microcomputers including the TRS-80 model II, the IBM Displaywriter and others. The programs are available from Personal Bibliographic Software, Inc., P.O. Box 4250, Ann Arbor, MI 48106 (or call (313) 996-1580).

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Shelf Space Management: A Microcomputer Application

Richard A. Desroches
and Marie Rudd

In recent years microcomputers have become important tools in the science of information management. Since the introduction of these amazing machines in 1975, prices have plummeted while speed and storage capacity have grown. Librarians were quick to realize that microcomputers might have applications useful to them. Several microcomputer software dealers now offer complete circulation, acquisitions, and serials management systems, many of which are available for only \$200 to \$300.

This article describes a shelf space management application recently developed for the University Library at the University of Rhode Island at Kingston. The University Library was constructed in 1964 and ex-

panded in 1976. A third expansion planned for the early 1980s has not been funded due to current economic conditions. Now, the only alternative open to the library is to better manage the space it has.

In June of 1982, an Apple II Plus microcomputer was purchased to serve as a backup to the library's CLSI circulation system. However, the Apple has not yet been used in this capacity, so other applications have been under consideration. The first use made of the Apple has been to maintain statistics on shelf space availability. Prior to the implementation of this system, all stacks in the library were physically measured late each summer to determine the total amount of space in use versus the total space remaining. Obviously, the collection of this information was tedious and time-consuming. Also, a great number of calculations had to be done manually in order to determine shelf space statistics for each floor and the entire library.

In September of 1982, an investigation was begun to see how this process could be improved. The authors identified five basic fields of information that describe each range in the library: range number, floor, total number of inches per range, total number of inches presently occupied, and call numbers in each range. A computer file was created on the Apple that stores each of the fields of data for each range in the library. Upon completion of the file, several programs were written to access the data.

The system, known as Rangefinder*, operates on an Apple II Plus with 48K of core storage and one disk drive. The program, written in Applesoft, contains four modules that are discussed below. The program and the data file reside on the same floppy disk, and occupy about 20K of the disk's available 148K.

The database is a single direct access file. Each record in the file contains three fields: call number, total inches, and inches in use, for a total length of 24 bytes per record. The relative address of each record corresponds to the range number allowing for rapid retrieval.

The main menu of Rangefinder is shown

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*Copyright 1982 by Richard A. Desroches.

in figure 1. Four basic functions are available. The ADD mode (option 1 from the menu) allows the user to add new range information to the file. The DELETE mode (option 2) allows for the deletion of data.

RANGEFINDER
MAIN MENU
(1) ADD RANGES
(2) DELETE RANGES
(3) SEARCH
(4) PRINT
TYPE THE NUMBER PRECEDING YOUR CHOICE

Fig. 1. Main Menu.

The SEARCH mode (option 3) enables the user to retrieve the information stored in the file. Retrieval can be by individual ranges or groups of ranges. If the user wishes to retrieve the data for a particular range, the range number is entered in the SEARCH mode. The computer finds the information in an instant, performs calculations to find the number of inches remaining, percent of space in use and percent remaining, and displays the information on the screen. A sample SEARCH display is seen in figure 2. If the user wishes to obtain statistics for a group of ranges, an entire floor, or even the whole library, a group search can also be conducted as shown in figure 3. In each table, the fields marked RANGE NUMBER, CALL NUMBERS, INCHES IN USE, and TOTAL INCHES were previously entered and stored in the ADD mode. For multiple range searches, the system totals figures input for the individual ranges included. The fields marked REMAINING, PERCENT USED, and % REMAINING are calculated by the computer.

SEARCH MODE	
ENTER RANGE NUMBER	256
RANGE NUMBER 256	
CALL NUMBERS : QH1-QH2340	
INCHES IN USE : 3198.5	
TOTAL INCHES : 3430	
REMAINING : 231.5	
PERCENT USED : 93.2%	
% REMAINING : 6.74%	

Fig. 2. Sample SEARCH Display.

SEARCH MODE	
ENTER RANGE NUMBER	125/275
RANGE NUMBER 125 TO 275	
INCHES IN USE : 420156	
TOTAL INCHES : 481342	
REMAINING : 61186	
PERCENT USED : 87.29	
% REMAINING : 12.71	

Fig. 3. Sample SEARCH Display.

The PRINT mode (option 4 from the main menu) produces several hard-copy printouts of the information stored in the file. A sample printout is shown in figure 4. As in the SEARCH mode, the first four columns of the printout indicate data previously stored for each range; the last three columns are calculated by the computer. Subtotals for each floor are derived as is the overall total for the entire library.

The system described above would not be very useful if it were still necessary to measure the stacks each year. To avoid this, the Cataloging Department periodically supplies the stack supervisor with the number of new books added in each call number category. Using an estimate of 1.25 inches per book, the computerized file is updated with the new information. Now, at the push of a button, the library has instant access to the estimated amount of space available in each range, on each floor, and in the entire library. Areas that are becoming crowded and need weeding or shifting can be quickly identified; areas of slow growth can be consolidated.

This one application of microcomputers in the University of Rhode Island Library has spurred interest among other departments. The Friends of the Library has shown interest in putting its membership list on the Apple; a public access program that would answer often-asked questions (Where are the rest rooms? What are the hours this weekend?) is being considered for the Reference Department; interlibrary loan wants its statistical record keeping automated; and the use of the microcomputer for maintaining the serials list has been considered. A detailed investigation of the present serials list batch-mode program revealed that, with the addition of a hard-disk drive, the Apple would be capable of managing the Library's 23,000 current and

RANGE #	CALL NUMBER	TOTAL INCHES	TOTAL USED	PERCENT USED	INCHES REMAINING	PERCENT REMAINING
401	KF-KT	3094	1417	45.7%	1677	54.2%
402	KF	3430	3198.5	93.2%	231.5	6.74%
403	JX-KF	3430	3113.5	90.7%	316.5	9.22%
404	JN-JX	3430	3059	89.1%	371	10.8%
405	JF-JN	3430	3077.5	89.7%	352.5	10.2%
406	HX-JF	3430	3024	88.1%	406	11.8%
407	HV-HX	3507	2685	76.5%	822	23.4%
408	HD-HV	4900	3769	76.9%	1131	23.0%
409	HM-HD	4900	4055.25	82.7%	844.75	17.2%
410	HG-HM	4900	3782	77.1%	1118	22.8%
411	HF-HG	4900	3748.75	76.5%	1151.25	23.4%
412	HF	4900	3634	74.1%	1266	25.8%
413	HD-HF	4242	2958.25	69.7%	1283.75	30.2%
414	HD	2450	1882	76.8%	568	23.1%
415	HD	2205	1532.5	69.5%	672.5	30.4%
416	HD	2450	1802.5	73.5%	647.5	26.4%
417	HD	2450	1584.5	64.6%	865.5	35.3%
418	HD	2450	1684.25	68.7%	765.75	31.2%
419	HC-HD	2450	1491.25	60.8%	958.75	39.1%
420	HC	2450	1593.5	65.0%	856.5	34.9%
421	HC	2450	1479.25	60.3%	970.75	39.6%
422	HC	2450	1724	70.3%	726	29.6%
423	HB-HC	2450	1993.75	81.3%	456.25	18.6%
424	HB	2450	1970.5	80.4%	479.5	19.5%
425	H-HB	2310	1835	79.4%	475	20.5%
426	GV-H	2450	1799.5	73.4%	650.5	26.5%
427	GF-GV	2450	2239.75	91.4%	210.25	8.58%
428	G-GF	2380	2171.25	91.2%	208.75	8.77%
429	F	2450	2063.75	84.2%	386.25	15.7%
430	F	2450	1925	78.5%	525	21.4%
435	E-F	2450	2014	82.2%	436	17.7%
436	E	2450	2025.5	82.6%	424.5	17.3%
437	E	1225	1024.5	83.6%	200.5	16.3%
438	E	1715	1426.25	83.1%	288.75	16.8%
439	E	2450	2013.5	82.1%	436.5	17.8%
440	E	2450	2035	83.0%	415	16.9%
441	E	2450	2021.75	82.5%	428.25	17.4%
442	DT-E	2380	2080.25	87.4%	299.75	12.5%
443	DS-DT	2450	2081.75	84.9%	368.25	15.0%
444	DS	2450	2217.5	90.5%	232.5	9.48%
445	DS	2450	2274.75	92.8%	175.25	7.15%
446	DG-DS	4830	4305.75	89.1%	524.25	10.8%
447	DC-DG	4900	3739.5	76.3%	1160.5	23.6%
448	DA-DC	4900	3763.25	76.8%	1136.75	23.1%
449	D-DA	4900	3869.75	78.9%	1030.25	21.0%
450	CT-D	4900	3641	74.3%	1259	25.6%
451	BX-CT	4207	2983	70.9%	1224	29.0%
452	BS-BX	3430	2662	77.6%	768	22.3%
453	BL-BS	3430	2952.25	86.0%	477.75	13.9%
454	BF-BL	3430	3183.5	92.8%	246.5	7.18%
455	B-BF	3430	2913.5	84.9%	516.5	15.0%
456	B	3185	2736.5	85.9%	448.5	14.0%
457	A-B	2652	2384.5	89.9%	267.5	10.0%
458	CARRE	2366	0	0%	2366	100%
459	TMPSH	4410	0	0%	4410	100%
460	TMPSH	4410	0	0%	4410	100%
461	DVSI7	3500	292	8.34%	3208	91.6%

4TH FLOOR TOTALS

TOTAL INCHES = 181488
 TOTAL IN USE = 132935.25
 REMAINING = 48552.75
 % IN USE = 73.2%
 % REMAINING = 26.7%

TOTAL INCHES AVAILABLE = 1203425
 TOTAL INCHES IN USE = 827369.5
 TOTAL INCHES REMAINING = 376055.5
 TOTAL PERCENT IN USE = 68.75%
 TOTAL PERCENT REMAINING = 31.24%

Fig. 4. Sample Printout.

past periodical subscriptions.

Microcomputers have proven to be very useful tools for librarians. Speed and capacity have increased dramatically in recent years making micros as capable as most

mini or mainframe computers. Microcomputers can and should be used more in all areas of librarianship including administration, management, and public access. ■■

put your 16mm COM catalog reader to the test!

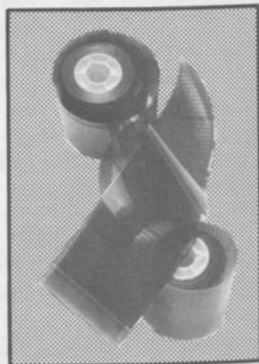
Do you experience:	Yes	No
... reliability/downtime problems?	<input type="checkbox"/>	<input type="checkbox"/>
... insufficient capacity?	<input type="checkbox"/>	<input type="checkbox"/>
... lack of accurate indexing?	<input type="checkbox"/>	<input type="checkbox"/>
... ambient light problems?	<input type="checkbox"/>	<input type="checkbox"/>
... neck strain from vertical screens?	<input type="checkbox"/>	<input type="checkbox"/>
... film scratching or breaking?	<input type="checkbox"/>	<input type="checkbox"/>
... focus problems?	<input type="checkbox"/>	<input type="checkbox"/>
... extra processing costs when using both 16mm film and 105mm fiche readers?	<input type="checkbox"/>	<input type="checkbox"/>

*If you have answered "yes" to any of these questions,
you owe it to your library to see how the*

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Reports and Working Papers

BISAC Variable Format

Book Industry Systems Advisory Committee

This document is a revision of the Book Industry Systems Advisory Committee (BISAC) format for electronic transmission of purchase orders that was approved by the Committee in May 1982. The approved format was distributed at the ALA annual meeting in Philadelphia in July 1982. In this revision to the approved format, the binary fields are changed to decimal characters, and the directories have been modified. Binary fields proved to be unworkable for certain mini and microcomputers as well as asynchronous transmissions. Additionally, a subfield was added to give the format the capability to support multiple ship-to addresses at the item level. The changes presented here give the format an additional option for servicing large public libraries and make it more independent of the communications hardware and system protocols. The format is designed to be in compliance with level one of the seven-layer ISO protocol standard.

The variable purchase order format, as represented here, was reviewed and approved by BISAC in January 1983 as Version V02. ANSI Z-39 Subcommittee U is also preparing this format for presentation to ANSI Z-39 in 1983. The ANSI procedure requires both industry and public review of a format proposal. Your comments on the format will be appreciated. Any comments or questions should be directed to: James K. Long, Chairman BISAC P.O. Subcommittee, c/o OCLC, 6565 Frantz Road, Dublin, Ohio 43017, or Ernest Muro, Chairman, ANSI Z-39 Subcommittee U, c/o Baker & Taylor Company, 6 Kirby Avenue, Somerville, New Jersey 08876.

This format is designed specifically for electronic transmission of orders via direct computer-to-computer communication. The format is designed to support the ordering of any monograph or series title. It is most efficient in ordering material to which an ISBN may be assigned. It has a combination of fixed and variable length data fields. This format evolved from the BISAC fixed field purchase order format. The fixed format is used by over 25 companies within the book industry for mass ordering via magnetic tape.

1.1 GENERAL INTRODUCTION

It has been the function of the Purchase Order Subcommittee of the BISAC to advance the avenues through which automation can be expanded and the productivity of the Book Industry improved. One such innovation was the adoption of a Book Industry Standard for automated purchase orders via tape. An increasing number of our Vendors and retailers are using this format with significant benefits to the order process.

The tape format is a fixed length format; however, with some shortcomings in both the amount of information it can convey and the efficient use of space. Therefore, the enclosed standard was developed as a format for data transmission.

The process of data communications established among multiple customers, Vendors, and publishers will reduce the lead time on an order. This can improve the in-stock position, lower inventories, and increase stock turnover, with a corresponding increase in cash flow while reducing operating costs. The use of data communications can also reduce the rate of rise of operating costs related to increased volume. Thus, once again, increasing the cash balance.

Another advantage is quicker response to the customer. Thus the customer can reduce

his on-order commitment and reassign those monies. The customer can then reorder more quickly, once again increasing the "real" cash flow into the system.

The Electronic Purchase Order can aid the Vendor in a number of significant ways. It can lower entry costs by eliminating or limiting data entry to simple verification. The system can also allow for standardization of order entry, thereby making data immediately available for processing. The potential is here to interface the standard order entry with the "picking list" component, inventory control, management information, and billing systems.

Even for the less mechanized Vendor, the potential is there to increase his cash flow by getting the order in the system faster. If the order is then only printed out on a standardized batch picking and packing form, invoice form, verification form, etc., there are manual savings in working with a familiar standard form.

In summary, the electronic data transmission in a variable format allows us to increase the speed, dependability, efficiency, and cash flow of the order related processes.

1.2 TECHNICAL INTRODUCTION

The general flow of the records within a transmission file is described under "General File Description." The technical guidelines and assumptions will be addressed in this Technical Introduction section.

It is a preponderate assumption of the committee that companies engaged in the electronic transmission ordering process are interested in ordering with a minimum amount of data per transmission. The degree to which this objective can be met depends on:

- a. accuracy and reliability of the ISBN,
- b. close synchronization of the SAN file between transmitter and recipient, and
- c. establishment of an "account file" for each customer to hold default values for:
 - 1) bill-to and ship-to addresses,
 - 2) back-order code, substitute code, etc. for the Purchase Order description, and
 - 3) discount, binding, shipping mode, etc. for the line item descriptors.

As you become more familiar with the format, you will appreciate more the importance of these items to the efficiency of the electronic ordering process. We urge you to work with the BISAC Committee to ensure standards compliance within the industry.

The variable length record format was developed under several constraints. Some of these constraints were self-imposed by the developing Subcommittee, and some were imposed to comply with existing standards (ANSI, BISAC, MARC). These constraints are:

1. There is correspondence between all fields contained in the most recent Fixed Format and the Variable Format. Therefore, for those who wish to use a fixed length data base modeled after the BISAC fixed field record, there is a data element for each data element in the variable format. A "bridge" document will be available from BISAC to facilitate conversion.
2. All characters transmitted are standard ASCII including the data terminators (see Appendix A). In "coded" subfields, the small letter following the Ts subfield delimiter is the subfield identifier. It is NOT part of the data in the subfield (See Figure 5).
NOTE: Some terminals and microcomputers have had trouble with the ASCII delimiters, i.e., they have been misinterpreted as "end of screen" or "carriage return," etc. This format, however, will retain these bit configurations in support of existing standards (ANSII and Z39.2). If this causes problems with your hardware, there is most always a "SYSGEN" option or control character table within the hardware. It is a simple matter for the troublesome bit configuration to be changed. BISAC recommends that you request a change from your vendor and insist your vendor support existing ANSI standards.

Both upper and lower case data can be transmitted using the ASCII character set. All upper case is assumed as this corresponds to the BISAC fixed format. However, an indicator can be set in the file header to indicate mixed upper and lower case data (Section 3.1).

3. Transmission will be in Hexadecimal ASCII characters in support of the BISAC hardware standards. Maximum physical block size is 1024 bytes, logical block size of 1020. The recommended protocol is a bisynchronous protocol endorsed by BISAC (currently 3780). Please note that the 3780 protocol transmits approximately a 400 character maximum physical block size. However, the protocol will rebuild the physical record to whatever you specify upon receipt of the transmission. Therefore, 1024 is the maximum buffer size in your application program.

NOTE: In this version, all binary fields have been eliminated since they are potential problems for some data controllers and microcomputers. This is an applications level format and as such is devised to be independent of lower ISO protocol levels. To achieve this objective, no binary fields could be included.

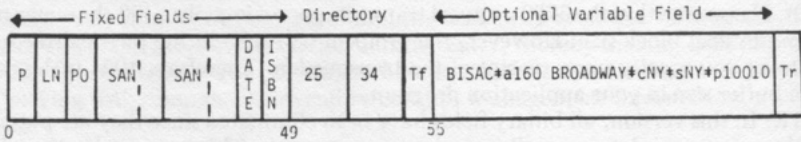
4. The block length and record length characters appended to the logical and physical blocks by the Operating System to variable length data records are not described in the data format. Only user created fields are addressed.
5. The fixed field data is determined to be the necessary information to order an item. Therefore, for ease of handling by high level software languages, it is fixed length and placed first in the record. The variable fields and subfields are both optional and variable in length. They are meant to augment and further describe or verify the fixed length data.
6. The composition of the directories with tag and length but not the address of a variable field evolved from a compromise of two objectives:
 - a. minimum characters to be transmitted over a transmission line, and
 - b. facilitate front-end editing (i.e., a way of recognizing what fields were present without scanning the whole record).

It is assumed that in order to determine what variable fields are present, the software must scan the directories. As this scan progresses, a simple addition of length will compute the address, or displacement, of the specific variable field.

7. In variable fields (Section 3.4, 3.5, and Figure 2):
 - a. The TAG in the directory identifies the field.
 - b. The length of the field is contained in the directory.
 - c. All variable fields and the subfields within them are optional.
 - d. If a variable field is indicated via its directory, its subfields may be "coded" or "positional" (see Glossary). Some coded subfields are also repeatable.
 - e. The first subfield is terminated by a subfield delimiter unless it is the only subfield present in the field. In "positional" variable fields, if the first subfield is absent, its position is noted by a subfield delimiter (Ts).
 - f. In coded subfields, if the first subfield present is a subfield "a," then the subfield code is implied (i.e., the first character is valid data). If the first subfield present is not subfield "a," then both a subfield delimiter and the subfield code must be included. The subfield delimiter is necessary to identify the subsequent character as a subfield code and not data.
 - g. All subfields are terminated by a subfield delimiter (Ts), EXCEPT the last subfield.
 - h. A "record" is terminated by a record terminator (Tr).
 - i. The first variable field starts in the first character position after the field terminator (Tf) at the end of the directories. There is NOT a field terminator at the end of the variable field. The variable field length is contained in the directory (see Figure 2). If there is more than one variable field, the starting position or address of each subsequent field can be computed by adding the length of the preceding variable field (contained in the directory) to the address of the first character of the preceding variable field.
8. All dates are six numeric characters to correspond to the BISAC Fixed Format.
9. All directories (Figure 2) are five characters in length. Their TAG defines the field; therefore, there will not be a TAG in a field referenced by a directory. Length field in the directory defines the length of the optional variable field; therefore, there will be no

LENGTH in a field referenced by a directory.

For example:



2.1 GENERAL FILE DESCRIPTION

For a schematic representation of the file, refer to the Schematic Diagram in Section 2.2.

Once the System protocols have established that communication is to commence, each variable length file is initiated by the transmission of a fixed length Header Record (3.1). This Header Record is identified by the constant 'H' in the first byte.

Each subsequent Purchase Order is composed of a Purchase Order Record (3.2) and line item record(s). The Purchase Order Record is identified by a 'P' in byte one. This record is terminated by a record terminator Tr (see Appendix A). In addition to several fixed length data fields, the Purchase Order Record may contain 0 to 4 directories of five characters each. These directories refer to variable length fields for bill-to, ship-to, and special instructions that are pertinent to all line items under this purchase order number. In the organization of the 'P' record, these optional fields should be the last fields in the record.

Each line item is a separate record (L). The first part of this record is the line item fixed fields (3.3). The line item records have a fixed field portion and a variable field portion (3.4, 3.5). If there are multiple line items within a purchase order, there will be multiple (L) records.

The fixed fields are required fields for transmission of a purchase order or line item respectively. The optional variable fields are introduced by directories. These directories are five characters in length (Figure 2) and are all concatenated to the fixed fields. The first variable data follows the delimiter (Tf) that signifies the end of the directories. If there are no variable fields, and consequently no directories, the fixed fields are followed by a record terminator (Tr).

The line item fixed fields are followed immediately in each record by the directories to the variable fields for the line item.

- There may be 0 to multiple directories (Figure 2) associated with a line item. The last directory is terminated by a field terminator (Tf).
- The next position after the field terminator for the fixed fields and the concatenated variable field directories is the first position for the variable data. If the variable data is not present, there will not be directories and the record terminator (Tr) will follow the fixed field portion of the record.
- The last variable field (or subfield) is terminated by a record terminator (Tr).

Within the optional variable fields there may be optional subfields. Some of these subfields are recognized by their relative position or "order" within the variable field (3.5). These are called "positional" subfields. They are also variable in length. Each subfield except the first subfield is initiated by a subfield delimiter (Ts). The delimiter for the first subfield is implicit. Each missing positional subfield is designated by a delimiter if there are subsequent subfields. If there are no subsequent subfields, the trailing delimiters are not transmitted.

Other optional subfields are designated as "coded." Except for the first subfield, these subfields are designated by a subfield delimiter (Ts) followed by a small alphabetic character (see Figures 3, 9, and 10). These subfields are also:

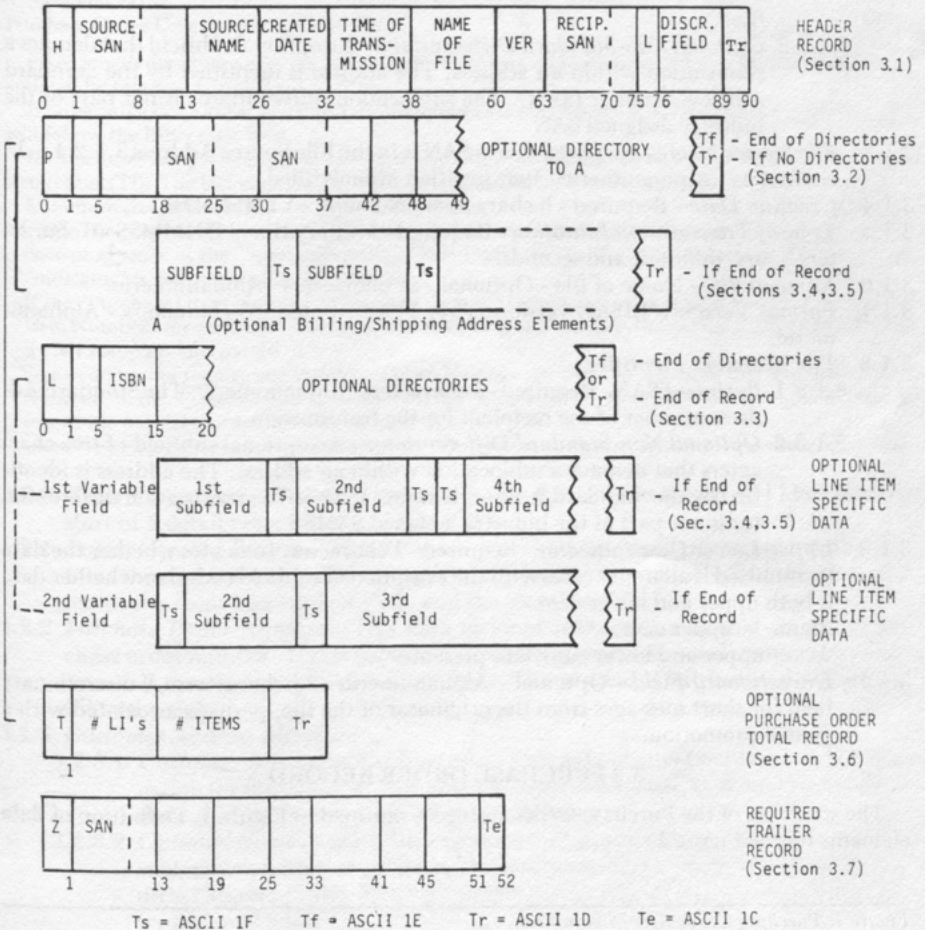
- variable in length,
- optional, and

- not designated by a delimiter or character if omitted.

Each series of one or more line item (L) records is followed by an optional line item trailer record (T). This "T" record (3.6) terminates a purchase order set (P, L, T) of records. The "T" record contains verification totals for the preceding line items.

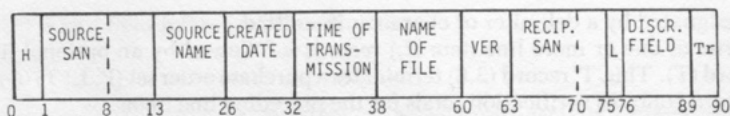
This pattern of Record identifier, fixed field elements, and optional directories to optional variable fields in the record is repeated through the file. The last user record in the file is a trailer or balancing record (3.7). The trailer record is identified by a "Z" in the first byte of the record. It is terminated by a file terminator Te (Appendix A).

2.2 GENERALIZED SCHEMATIC OF A SIMPLE FILE ORGANIZATION USING THE PROPOSED BISAC VARIABLE RECORD FORMAT



3.1 FILE HEADER

The file header is the first record that is transmitted. The file header should appear *once per transmission session*.



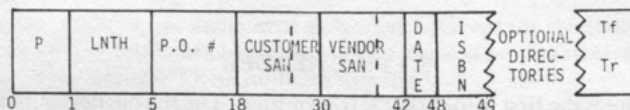
The purpose of a file header is to provide information about the origin or the data to be transmitted. (This may be different from the ordering customer or the fulfillment Vendor.) It includes:

- 3.1.1 *Header Identifier* - 1 byte - Alphanumeric - Constant = H.
- 3.1.2 *Source Address Identifier*
 - 3.1.2.1 *File Source Address* - Optional - Alphanumeric - Right justified Zerofill length 7; Pos. The Standard Address Number - Address of the source of the file.
 - 3.1.2.2 *Optional Non-Standard Differentiator* - An optional subfield that denotes a sublocation within an address. The address is identified by the Standard Address Number (SAN). The sublocation differentiator is not part of the industry assigned SAN.
- 3.1.3 *File Source Name* - Required unless SAN is in the File Source Address 3.1.2.1, - 13 characters - Alphanumeric - Left justified - Blank filled.
- 3.1.4 *Creation Date* - Required - 6 characters - Numeric - YYMMDD.
- 3.1.5 *Time of Transmission Initiation* - Required - Military time - HHMMSS - 6 characters hours, minutes, and seconds.
- 3.1.6 *Name of File* - Name of file - Optional - 22 characters - Alphanumeric.
- 3.1.7 *Format Version* - BISAC version (V01, V04 . . . etc.) - 3 characters - Alphanumeric.
- 3.1.8 *File Recipient Identifier*
 - 3.1.8.1 *Recipient SAN* - Required - 7 characters - Alphanumeric. The Standard Address number of the recipient for the transmission.
 - 3.1.8.2 *Optional Non-Standard Differentiator* - An optional subfield of five characters that denotes a sublocation within an address. The address is identified by the Standard Address Number (SAN). The sublocation differentiator is not part of the industry assigned SAN.
- 3.1.9 *Upper-Lower Case Indicator* - Required - 1 character. Indicates whether the data transmitted is all upper case (with the exception of subfield codes) or whether data is both upper and lower case.
Blank = upper case
'L' = upper and lower case data present
- 3.1.10 *Discretionary Field* - Optional - Alphanumeric - 13 characters. A discretionary field for short messages from the originator of the file, perhaps associated with a special promotion.

3.2 PURCHASE ORDER RECORD

The structure of the Purchase Order Record is outlined in Figure 1. Definition of data elements follow Figure 1.

Figure 1. Purchase Order Record Summary.



Data Element Fixed Fields	Length	Byte Position	Data Description	Required
Record Identifier	1	1	Constant 'P'	Y
Logical Record Length	4	2- 5	N decimal	Y
Purchase Order Number	13	6-18	AN	Y
Customer Identification Number (SAN)	7	19-25	AN	Y
Customer Identification Differentiator	5	26-30	AN	N
Vendor Address Number (SAN)	7	31-37	AN	Y
Vendor Address Differentiator	5	38-42	AN	N
Date of Order	6	43-48	N	Y
ISBN Code	1	49	N	N
Default Billing Directory (optional 25)	5	-	N	N
Default Shipping Directory (optional 30)	5	-	N	N
Special Handling Code Directory (optional 21)	5	-	N	N
Purchase Order Descriptors (optional 20)	5	-	N	N

Fixed length directories may not be present or they may all be present. All directories will be differentiated by tags (see Figure 2).

If no variable fields are applicable, then directories are not present. If no directories are present, a Tr will follow the ISBN code field.

If directories are present to point to variable fields, the last directory will be followed by a field terminator (Tf). The last variable field will be terminated by a record terminator (Tr).

Minimum size of fixed fields + Tr = 50 bytes.

NOTE: The purpose of the "Special Handling Indicator" from the fixed format is served by the presence or absence of the "Special Handling Code Directory" in the variable format. Therefore, the "indicator" is not included in this format.

If the "Purchase Order Number" is blank or zeros, it is *strongly* recommended that there be a "Line Item Number" for each title. This facilitates invoicing and tracking the partial fulfillment of orders if your company fills partial orders.

Some companies require one Purchase Order Number per title. In this case, the "Purchase Order Number" in the 'P' record may be zeros, and the "Line Item Number" in field 41 would be used to record the purchase order number for each title.

3.2.0 *Record Identifier*—This data element is one character in length and identifies the start of a detail record by the constant 'P'.

3.2.1 *Logical Record Length*—This data element which is four characters in length, contains the decimal value of the length of the logical record including this data element, the record terminator (Tr), and the identifier 'P'.

3.2.2 *Purchase Order Number*—This data element contains a customer-assigned purchase order number. This number may contain alphabetic as well as numeric characters. It may be up to 13 characters long. The number is left-justified with blank fill to the right.

3.2.3 *Customer Address Identifier*

3.2.3.1 *Customer Identification Number*—This data element contains an identification for the customer to whom the order is directed. It should be the Standard Address Number (SAN) of the customer.

3.2.3.2 *Optional Non-Standard Differentiator*—An optional subfield that denotes a sublocation within an address. The address is identified by the Standard Address Number (SAN). The sublocation differentiator is not part of the industry assigned SAN.

3.2.4 *Vendor Address Identifier*

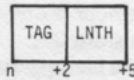
3.2.4.1 *Vendor Address Number*—This data element identifies the Vendor. The data element is 7 characters long and should be the Vendor's SAN.

3.2.4.2 *Optional Non-Standard Differentiator*—An optional subfield that denotes a sublocation within an address. The address is identified by the Standard Ad-

dress Number (SAN). The sublocation differentiator is not part of the industry assigned SAN.

- 3.2.5 *Date of Order*—The date on which the purchase order was created is contained in this data element. The date is constructed according to ISO in the form YYMMDD where YY is the two-digit year, MM is the two-digit month (with leading zero as necessary), and DD is the two-digit day (with leading zero as necessary).
Example: 791118
- 3.2.6 *ISBN Code*—A numeric value indicating the use of ISBN's on the order.
0 = No ISBN's on the order
1 = Some ISBN's on the order
2 = All ISBN's on the order
- 3.2.7 *Default Billing Directory*—This data element defines a variable field for a default billing address. The format for a directory entry is shown in Figure 2. This is an optional field to be used when the billing address for this P.O. # is not on record in the Vendor's file. Its TAG is 25.
 - 3.2.7.1 *Tag*—This data element identifies the nature of the variable field to which it applies. It consists of only two numeric characters in length. Alphanumeric, required.
 - 3.2.7.2 *Field Length*—This data element of a directory entry defines the number of characters in the field identified by the tag immediately preceding this data element. This data element is three characters in length and its content is a decimal value, required.
- 3.2.8 *Default Shipping Directory*—The format for this item is the same as Default Billing Directory but this directory points to shipping information. Its TAG is 30. Optional if not on Vendor's file.
- 3.2.9 *Special Handling Code Directory*—The directory format is described in Figure 2. The field TAG is 21. The data layout for the Special Handling Instruction field is in Figure 7.

Figure 2. Directory Data Schematic.



"n" for the first Purchase Order directory would = position 50; the first line item directory would = position 20.

Data Element	Length	Description
Directory tag	2	decimal characters
Field length	3	decimal length

Directories are always optional. They indicate via their TAG what variable information they refer to. If the information that the directory would direct the recipient to is not necessary (i.e., Billing Address), then the specific directory does not exist in this record.

The Purchase Order Record directories are identified by the following TAGs:

- 20 - Purchase Order Descriptors
- 21 - Special-Handling-Instructions Directory
- 25 - Customer-Bill-To Name and Address Directory
- 30 - Customer-Ship-To Name and Address Directory

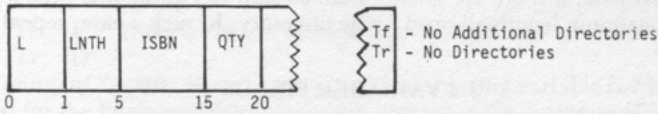
The Line Item directories are identified by the following TAGs:

- 40 - Line Item Descriptors
- 41 - Title and Associated Elements
- 42 - Author/Publisher Field
- 43 - Additional Description

3.3 LINE ITEM RECORD

This is a series of data elements which defines a distinct line item. It may consist of fixed length fields, directories, and optional variable fields.

Figure 3. Fixed Length Line Item Data.



Data Element	Length	Byte Position	Description	Required
Line Item Identifier	1	1	Constant 'L'	Y
Logical Record Length	4	2- 5	N binary	Y
ISBN	10	6-15	AN	O
Quantity	5	16-20	N	Y
Variable Directories	5	-	See Figure 2	O

Minimum Size = 21 bytes

3.3.0 *Line Item Record Identifier*—This data element is a one character constant 'L'. It identifies the start of each individual line item record. There may be multiple line items associated with a purchase order number in the 'PO' record. The number of line item records will be balanced to a line item total record (T) for each purchase order.

3.3.1 *Logical Record Length*—This data element, which is four characters in length, contains the decimal value of the length of the logical line item record including this data element, the identifier (L) and the record terminator (Tr).

3.3.2 *International Standard Book Number (ISBN)*—This data element contains the International Number of the title being defined. It is the key element necessary for a minimal data transmission. It should be included if it is known. If it is absent, variable field 41 must be included with its directory.

3.3.3 *Quantity*—The desired number of books to be ordered.

NOTE: If there is no ISBN in the 'L' record, there must be a variable record '41' for the title and its concomitant directory.

3.3.4 *Variable Field Directors*—There is a directory for each variable field present. Each directory is five characters in length and has a format described in Figure 2. The directories are terminated by a field terminator (Tf). There are a maximum of four valid directories per line item record. Valid directories are:

- 40 - Line Item Descriptors
- 41 - Title Information Directory
- 42 - Author, Publisher Directory
- 43 - Additional Title Description (repeatable)*

*NOTE: It is the intent of the standard to recognize standard practice within the industry. Relative to "Bill-to" and "Ship-to" considerations, this standard allows:

1. No "Bill-to" designation if the two correspondents have an account file that designates "bill-to".
2. No "Ship-to" designation if the two correspondents have an account file that designates "ship-to".
3. Designation of a "Ship-to" and/or "Bill-to" per purchase order number.
4. A separate "ship-to" for each Purchase Order.
5. Third Party Billing.

6. Multiple "ship-to" per line item (an option for large retail chains, public libraries, and processing centers).

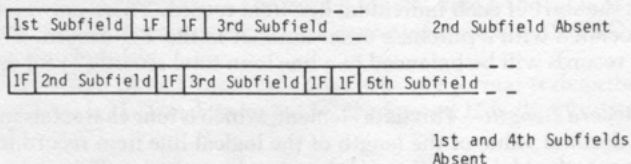
The user should look at the trade-offs between using multiple purchase orders with all line items specified per ship-to and purchase order, versus a single purchase order with all line items specified and a listing of multiple ship-to's per line item.

In the latter case, if there are greater than 99 ship-to's at the line item level, it will exceed the maximum length allowed in the directory. In such a case, repeat the directory.

3.4 VARIABLE FIELDS

The presence of a variable field is designated by its TAG in a directory. The length of each variable field is also contained in its directory (Figure 2). Variable fields are designed to contain specific optional information about an order or about items ordered, that need not be readily expressed in coded or fixed-length format. Data elements in variable fields are identified either by the use of subfield codes, or by their position in the field. The position in the variable field is designated by delimiters (Ts). The general structure of coded variable fields is shown below (Figure 5). The length of the variable length field is contained in the directory, therefore there is not a field terminator (Tf) embedded in the variable fields. The last subfield in the record is terminated by a record terminator (Tr).

Figure 4. Positional Variable Field Schematic.

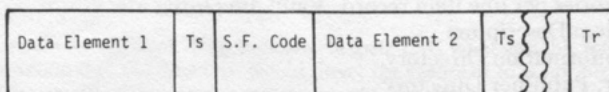


Variable fields 20, 40, 41, and 42 have "positional" subfields. The optional subfields are most all present if the variable field is used at all. Therefore, the identity of a subfield is determined by its position in the variable field itself (Figure 6).

If a subfield is absent and there are no succeeding subfields, the field itself is simply ended. If this is the end of the record, the end of the subfield is followed by a record terminator.

If a subfield is absent and there are succeeding subfields, the position of the absent subfield is noted by a subfield delimiter (Ts = 1F).

Figure 5. Coded Variable Field Schematic.



For variable fields 21, 25, 30, and 43, because of the variety or repeatability of potential subfields, there are specific subfield codes to identify the data content. These are described in Appendix C or D. If the first subfield is subfield 'a' (extent of item), then there is no subfield code; however, all other subfields have explicit subfield code identifiers. All subfields except the last subfield are terminated by a subfield terminator. The last subfield in the field simply ends at the extent of the field "LENGTH" as contained in the directory. The record itself is terminated by a record terminator (Tr = 1D).

3.4.1 *Subfield Codes*—For variable field 43, a subfield code precedes, and is used to identify each distinct data element in a complex variable field. Subfield codes consist of lower-case alphabetic characters. Each subfield is terminated by a delimiter (Ts)

except the last subfield in a field. If it is the last subfield in a record, it is terminated by a record terminator (Tr).

- 3.4.2 *Data Element*—All data elements in a variable field have variable lengths.
- 3.4.3 *Delimiter and Terminator Codes*—Each subfield except the last subfield is terminated by the delimiter Ts. The record is terminated by the code Tr. Their hexadecimal ASCII values are:

Ts IF These codes are described in Appendix A.
Tr ID

- 3.4.4 *Summary of Specific Variable Fields*—The following variable fields have been defined for the Purchase Order (P) record portion of the customer file.

20 - Purchase Order Descriptors	positional
21 - Special Handling Instructions Directory	coded
25 - Customer Bill-to Name and Address Directory	coded
30 - Customer Ship-to Name and Address Directory	coded

The following variable fields have been defined for the line item (LI) order records:

40 - Line Item Descriptor	positional
41 - Title and associated elements (required if no ISBN)	positional
42 - Author/Publisher field	positional
43 - Additional description e.g., performer, illustrator, Series info, etc.	coded

3.5 DESCRIPTION OF SPECIFIC VARIABLE FIELDS

- 3.5.1 *Special Handling Instructions (Free Form)*—This field is used to record special handling instructions. The layout for Special Handling Instructions is described in Figure 7. The tag identifier is 21.

- 3.5.1.1 Subfields -
 - a - Special handling instruction codes, repeatable.
 - b - Free form instructions
 - c - Do not ship before date
 - d - Do not exceed amount
 - e - Delayed billing code
 - f - Special discount percent

See Figure 7 for a complete description of subfields.

- 3.5.2 *Customer Bill-to Name and Address Field*—This coded field is used to record the name and address to which the invoice should be sent if different from that normally used by the Vendor. This field is not repeatable. The tag identifier is 25.

- 3.5.2.1 Codes of Subfields:

- a - The address for the customer bill-to name and street or post office address. Repeatable a maximum of five times. Maximum of 25 characters per repetition.
- c - The city of the customer.
- s - The state or province of the customer.
- p - The postal code of the customer.
- i - SAN (for indexing your own data base).
- n - The nation of the customer if non U.S.
- t - State tax identifier.
- b - City subdivision if applicable.

- 3.5.3 *Customer Ship-to Name and Address Field*—Normally, Vendors understand that items are to be shipped to the same address as that to which the invoice is sent. The previously defined variable field 25 allowed for a bill-to name and address different from the invoice address. This variable field (Tag 30) allows for a ship-to address different from the invoice address. The format is the same as the 25 field.

- 3.5.3.1 Indication of the subfields:

No state tax ID.
All other subfields same as tag 25.

- 3.5.4 *Line Item Descriptors*—The line item descriptors are optional subfields associated with a given line item. A few of them were “required” under the BISAC fixed formats, but were blank if meaningless. For efficiency they are optional in this format. They are positional. They occur in the following order:
- 1 Binding
 - 2 Price
 - 3 Back Order Code
 - 4 Volume/Set
 - 5 Discount
 - 6 Catalog Service
 - 7 Substitute Code
 - 8 Catalog Quantity
 - 9 Special Action Code
- 3.5.4.1 Tag—The tag number is 40.
- 3.5.4.2 Subfields—The information here corresponds to the information in the “40” record of the BISAC fixed format. See Figure 10 for respective subfields.
- 3.5.5 *Title and Associated Elements*—This variable field is used to indicate the title and title associated elements of the book being ordered. It is required if the ISBN (3.3.2) is not present.
- The “line item number” is an optional subfield to be used to cover requirements such as:
- a. the recipient of the order requires a line item number per title,
 - b. The originator of the order requires a line item number within Purchase Order Number (3.2.2), and
 - c. there is a single Purchase Order Number per title, this would be placed in the “line item number” subfield since this subfield is title specific. The “Purchase Order Number” fixed field (3.2.2) would then be zeros or blanks.
- 3.5.5.1 Tag— The tag number is 41 for this variable field with positional variable subfields.
- 3.5.5.2 Subfields:
- 1 - Free text title of the material being ordered (required if no ISBN).
 - 2 - The line item number associated with this title.
 - 3 - Edition - a numeric designation of the edition.
 - 4 - LCCN prefix, left justified, alphanumeric.
 - 5 - LCCN, numeric Library of Congress Catalog Card Number.
- 3.5.6 *Author/Publisher*—This positional variable field may indicate the author or publisher of the item being ordered.
- 3.5.6.1 Tag - the tag number is 42.
- 3.5.6.2 Subfields:
- 1 - Free text description of the publisher of the item being ordered.
 - 2 - Free text name of the author of the item.
 - 3 - Obsolete or alternate ISBN by which a title may be known.
- 3.5.7 *Additional Information*—This variable field is used to define variant forms of an author’s name or an item’s title. The field may also contain performer or performing group for Sound Recordings, production people for various media items, Sponsoring corporations, translator, or illustrator. Information found here supplements information found in the 41 and 42 variable fields.
- 3.5.7.1 Tag - the tag number is 43.
- 3.5.7.2 Subfields—The information here may be used to clarify or verify a title. The data approximate what might be found in the “description” portion of the “Title/Description” fields in records 41, 42, and 43 of the BISAC fixed format. The information is subfielded here for clearer identification. See Figure 9 for respective subfields.

Figure 6. Subfield Codes for Optional Purchase Order Descriptors (Tag 20).

*Y##2*1	Tf	No Order Cancel Date, Back Order if out of stock or NYP,
	Tr	No CAT Services, 2 invoice copies, Supply any binding if 005.

- Order Cancel Date**—This data element contains the date on which the order is to be considered cancelled if it has not already been filled. If a cancel date is not applicable, this data element should contain a subfield delimiter.
Example: 800215 or Ts
- Back-Order Code**—The purpose of this code is to indicate whether or not to back-order out-of-stock items. Permissible values of this data element are:
Ts – Back Order as indicated in line item record.
N – Do not back-order any item.
Y – Back-order if out-of-stock or not yet published.
B – Back-order only if title not yet published.
- Cataloging Services Code**—This data element is used to specify the nature of cataloging services desired from the Vendor. The following values are defined for this data element:

Value	Significance
Ts	No Cataloging Services
1	Full Processing
2	Partial Processing
3	Kits with Item
4	Cards with Item
5	Other Specifications Established between Customer and Vendor

Some publishers and vendors supply cataloging services and some do not. The inclusion of this code will in no way alter the policy of the company relative to Cataloging Services.
- Invoice Copies**—The number of copies of the Vendor's invoice that are desired is indicated in this data element. Permissible values are '1' to '99' and Ts.
- Substitute Code**—Indicates whether another type of binding may be substituted for a book not available in the binding requested.

Ts	= No action
0	= No substitution
1	= Supply any binding if edition ordered is not available
2	= Supply PAPER binding if edition ordered is not available
3	= Supply CLOTH binding if edition ordered is not available
4	= Supply LIBRARY binding if edition ordered is not available

NOTE: Wherever zero or blank was an optional code in the fixed format, a subfield delimiter (Ts) was substituted in the variable format to denote the position of subfield and that the default value should be used.

Figure 7. Special Handling Instructions Field Schematic (Tag 21).

Each unique item in the Special Handling Instruction Field is identified via a subfield code. If subfield a is first, it is implicit and therefore not transmitted.

Example of Special Handling Variable Field:



The special handling codes associated with all earlier BISAC formats are contained in subfield a. They are three digits in length - numeric. Valid codes are:

1XX = Number of copies of invoice where XX will contain that information, e.g., 105 = 5 copies.

2XX = Disposition of invoice

201 = Attach invoice to outside of carton marked *invoice*.

202 = Attach invoice to outside of package.

- 203 = Enclose invoice and mark carton *invoice enclosed*.
- 3XX = Sequencing on invoice
- 301 = Provide invoice in same sequence as order or line item number.
- 302 = Provide invoice in ISBN sequence as order.
- 303 = Provide invoice in Author sequence.
- 304 = Provide invoice in Title sequence.
- 4XX = Shipping instructions
- 401 = Ship best method
- 402 = UPS (United Parcel Service)
- 403 = Book Post
- 404 = Freight
- 405 = Hold for pickup
- 406 = Air
- Subfield b = Indicates that a customer special handling instruction applies to this order in the free-form (BISAC fixed format record code 21).
- Subfield c = *Do Not Ship Before Date*—a six character date YYMMDD indicating the earliest date an order can be shipped. This provides for delayed shipping (i.e., a store or library is not open to receive materials yet).
- Subfield d = *Do Not Exceed Action Code*—If the purchase order establishes a dollar amount for the order as a maximum to be expended (see Do-Not-Exceed Amount variable field 21, subfield d), this data element is used to indicate what action the Vendor should take. Values for this data element are:
- 0 - Cancel balance of order in excess of do-not-exceed amount.
- 1 - Cancel entire order if amount of order exceeds DNE amount.
- Do-Not-Exceed Amount*—This data element is a second part of Subfield d. It contains the maximum amount to be expended on this order. The value is expressed in U.S. dollars and should not contain either the dollar sign (\$) or the decimal point (.), both of which are to be assumed. If the do-not-exceed amount is entered in whole dollars, two zeros must be appended on the right.
- Examples:

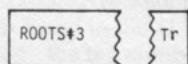
Value	Interrelationships
100000	\$ 1,000.00
98050	\$ 980.50
1235000	\$12,350.00
- Subfield e = *Delayed Billing Code*—An alphanumeric code to indicate a delayed (buy now - pay later) billing arrangement negotiated between the Vendor and the customer. Format of the subfield is code/month (X/MM). MM is the numeric month (01-12) that designates when the delayed billing is to begin.
- Subfield f = *Special Discount Percent*—A numeric subfield of five positions (2 whole numbers and 3 decimals) with an implied decimal point between the 2nd and 3rd position. This percent is intended to be a time dependent special discount to be *added to* (additional) the regular discount. The regular discount continues to be carried in the line item record.

Figure 8. Title and Associated Line Item Elements (Tag 41).

Each line item may have a title and title associated optional elements. These are transmitted in field 41 which is described here. There may be additional line item descriptors which are transmitted via tag 43 and described in Figure 9.

Tag = 41

Examples:



Title = "ROOTS", this is the third line item for this purchase order. No edition or LCCN were transmitted.



Title = "ROOTS" no line item number, edition, LC prefix, or LCCN.

1st = Title - Title of the line item.

2nd = Line Item Number - Title-specific line item number.

BISAC VARIABLE ORDER FORMAT*1*1

Title = BISAC Variable Order Format"
 line item = 1
 edition = 1
 No LCCN prefix or number
 No record terminator; therefore, expect
 additional variable fields.

STRUCTURED ANALYSIS AND SYSTEM SPECIFICATION*2**78*51285Tr

Title = "Structured Analysis and System
 Specification"
 line item = 2
 No edition specified
 LC prefix = 78
 LCCN = 51285

Figure 9. BISAC Proposed Variable Length Purchase Order Format (Tag 43).

Additional Information Coded Subfields:

Tag	Subfield Code	Content
43	a	Extent of item (pages, number of reels, number of transparencies, number of disks, etc.).
	b	Other characteristics (color, processing, etc.).
	c	Dimensions (16 mm, 1/2 in., 1500 rpm, etc.).
	d	Date of a conference or meeting (YYMMDD).
	e	Accompanying material (instructional pamphlets, guide manuals, etc.).
	f	Fund Identification—This subfield is applicable if the Vendor applies purchases for specific line items against a customers fund. It is repeatable and for quantities > 1 a slash (/) may separate the fund from the quantity that should be charged to that fund. The total quantity designated in the fixed fields may be charged to the same or different funds, e.g., If quantity = 3, then #MED80/1#MED-81/1#HUMAN/1; three books and three funds.
	h	Media type.
	i	Illustrators.
	l	Language.
	m	Alternate Name (personal, corporate, or meeting/conference name).
	n	Number of part or section.
	p	Name of part or section.
	q	Location and/or name of an institution (for conference or meeting).
	s	Series title, Series ISBN/ISSN.
	t	Translator.
	v	Volume or number.
	x	Free text.
	y	Performer, performing group.
	z	SAN and quantity of ship-to location at the line item level in the format #z123456/3 is three items to SAN1234567.

Figure 10. Subfield Codes for Optional Line Item Descriptors (Tag 40).

For description of "positional" subfields, see Figure 4.

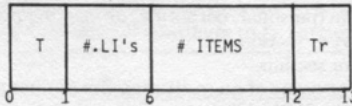
1. **Binding**—Represents the type of binding requested for the title ordered. Available types of binding are:

- Ts = Blank - not specified
- P = Paper
- C = Cloth

- L = Library
- O = Other (any further description, e.g., "text" will be included in the variable field 43).
- 2. *Price*—Estimated list price of a single copy of the book. The value is expressed in U.S. dollars and should not contain either the dollar sign (\$) or the decimal point (.) and as such takes on the identical format as defined under variable field 21, subfield 'd', second portion.
- 3. *Back Order Code*—The purpose of this code is to indicate whether or not to back-order out-of-stock items. Permissible values of this data element are:
 - N - Do not back-order any item
 - Y - Back-order if out-of-stock
 - B - Back-order, not yet published
 This code is only valid if BACK-ORDER CODE (Tag 20 Subfield 2) is blank (Figure 3).
- 4. *Volume/Set*—This data element indicates the number of volumes or sets associated with the title being ordered.
- 5. *Discount*—This data element defines the discount the customer expects to receive on the list purchase price of this title. A three-place decimal point (.) and percent sign (%) are implied and should not be entered. The amount is left-justified.
 - Examples: 35% would be entered as 35000
 - 17.5% would be entered as 17500
- 6. *Cataloging Services Code*—This data element is used to specify the nature of cataloging services desired from the Vendor. This code takes preference over the customer header record cataloging services code defined in Tag 20 Subfield 4 (Figure 6) although the codes are the same.
- 7. *Substitute Code*—This data element is used to indicate whether another type of binding may be substituted for a book that is unavailable in the binding requested. The following values are permissible:

Value	Significance
Ts	No substitution.
1	Supply any binding if edition ordered not available.
2	Supply <i>paper</i> binding if edition ordered not available.
3	Supply <i>cloth</i> binding if edition ordered not available.
4	Supply <i>library</i> binding if edition ordered not available.
- 8. *Catalog Quantity*—This data element defines the number of catalog components (e.g., kits) desired if different from the quantity of books ordered (3.3.3). Permissible values are '001' through '999' or '0' if not applicable.
- 9. *Special Action Code*—This field indicates some type of special action is required relative to this title, e.g., a special promotional discount for this title. It is to be used for exception reporting.

3.6 PURCHASE ORDER TRAILER RECORD (OPTIONAL)



The optional "T" record terminates a purchase order. It contains balancing information as each purchase order is transmitted.

3.6.1 *P.O. Trailer Indicator*

Required
One position constant "T".

3.6.2 *Total Line Items*

Required
Five positions - numeric - zero fill
The total number of line items records (L) transmitted for this Purchase Order.

3.6.3 *Total Items Ordered*

Required
Six positions - numeric - zero fill
The total number of items (line items × Quantity) ordered in this Purchase Order.

3.7 USER TRAILER RECORD (ONE PER FILE)

Z	SAN of ORIG	DATE TERM	TIME TERM	RECORD TOTAL	BOOK TOTAL	TOTAL PO#s	TOTAL LINE ITEM	Te		
0	1	8	13	19	25	33	41	45	51	52

There is one user trailer record per file. It contains balancing or control totals to balance the entire file.

3.7.1 *Trailer Indicators*

Required

1 character constant 'Z'

3.7.2.1 *SAN of Originator*

Required

7 characters - alphanumeric, left-justified

3.7.2.2 *Optional Non-Standard Differentiator* - An optional subfield that denotes a sublocation within an address. The address is identified by the Standard Address Number (SAN). The sublocation differentiator is not part of the industry assigned SAN.3.7.3 *Date of Termination*

Required

6 characters - numeric, ISO format YYMMDD

3.7.4 *Time of Termination*

Required

6 characters - numeric, ISO format HHMMSS

The military time when the transmission was terminated.

3.7.5 *Record Total*

Required

8 characters - numeric

The total number of records transmitted, including the user header and trailer records.

3.7.6 *Book Total*

Required

8 characters - numeric

The total number of individual titles (line items \times quantity) ordered in this transmission session.

3.7.7 *Purchase Order Total*

Required

4 characters - numeric

The total number of individual purchase orders transmitted this session.

3.7.8 *Line Item Total*

Required

6 characters - numeric

The total number of individual line items transmitted this session.

3.7.9 *End of File Indicator*

Required

character - constant (Te)

APPENDIX A. ASCII HEXADECIMAL VALUES OF SPECIAL CHARACTERS

In interpreting the special characters that are used throughout this format, the hexadecimal ANSI standard values should be used.

Record Description Character	7-Bit Octal Code	Decimal Code	Hex ASCII Value	ASCII Bits	EBCDIC Value	EBCDIC Bits
Ts Subfields (=)	037	31	1F	001 1111	FC	1111 1100
Tf Field	036	30	1E	001 1110	FD	1111 1101
Tr Record	035	29	1D	001 1101	FE	1111 1110
Te File	034	28	1C	001 1100	FF	1111 1111

Each terminator takes one byte.

All subfield codes are small alphabetic letters.

Ts is depicted in the schematics throughout this document as a "≠" to save space and confusion.

APPENDIX B. SAMPLE ADDRESS DESCRIPTIONS

The address fields are referenced via the address directories in the Purchase Order.

Their valid tags are 25 and 30. There are seven or eight coded subfields:

a = A line of address maximum of 25 characters per repetition, maximum of 5 repetitions.

c = City

s = State or Province

p = Postal code, e.g., Zip Code

n = Nation, if non U.S.

b = City subdivision, if applicable, e.g., borough

i = SAN

t = State tax identification - is necessary when:

- a legal entity stipulates that it must accompany all Purchase Orders, or
- it is not on file with the Vendor, or
- this state tax identifier is specific to the items in this Purchase Order.

line of addr≠a2nd line of addr≠cCity≠sState abbrev≠pPost

1st line of addr≠cCity≠sState≠pPost≠nNation

Please note that certain non U.S. postal codes are to be placed on the line address subsequent to the street, others are on the same line as city, but precede the alphabetic name. It is our experience that non U.S. postal codes - particularly those countries that have multiple postal codes within the address - should have their postal codes embedded in the proper line of address by the *originator*.

e.g., 4400 Muenster-Hiltrup

West Germany

As an alternative, the ISO standard country code abbreviations should be in the "nation" subfield. The address program can then place the postal code correctly for that country, using a stored table that notes countries with a different requirement than the U.S. Postal Service. This is particularly useful if you want all your mail sorted by postal code within country.

APPENDIX C. SUMMARY OF FIXED RECORDS

This is a summary schematic of the fixed field portions of the variable format records. The schematic depicts the minimum number of characters necessary to order three titles with two purchase orders. It assumes that SAN and ISBN are relied upon in this electronic ordering process. Therefore, no directories or variable fields are necessary.

H	SOURCE SAN	SOURCE NAME	CREATED DATE	TIME OF TRANS- MISSION	NAME OF FILE	VER	RECIP. SAN	DISCR. FIELD	Tr
0	1 8	13	26	32	38	60	63 70	75 76	89 90

P	P.O.#	SAN	SAN		Tr
1	5 18	30	42	48 49	50

Purchase Order with

L	LNTH	ISBN	00002 QTY	Tr
1	5	15	20 21	

singular line item
quantity = 2

T	00001	000002	Tr
1			

optional hash total

P	SAN	SAN		Tr
1	5 18	30	42	48 49 50

Purchase Order with

L	LNTH	ISBN	00001 QTY	Tr
1			21	

two line items each
with quantity = 1

L	LNTH	ISBN	00001 QTY	Tr
1			21	

T	00002	000002	Tr
1			

optional trailer

Z	SAN				Te
1	13	19	25	33	41 45 51 52

APPENDIX D. SCHEMATIC OF ORDER WITH VARIABLE FIELDS

This schematic depicts a single purchase order with multiple line items. Both the purchase order and the line items have variable fields.

P		SAN	SAN		30	x	Tf	Shipping address subfields	Tr
0	1	5 18	25 30	37 42	48 49	51 54	55	← x →	

L	ISBN		40	n	41	m	Tf	L+1250	ROOTS*1+3	Tr
0	1	5 15	20 22	25 26	30 31	← n →		← m →		

(Library Binding, \$12.50, Roots, line item 1, 3rd edition)

L	ISBN		41	y	42	x	Tf	ROOTS**3	Doubleday*Haley	Tr
0	1	5 15	20 22	25 26	30 31	← y →		← x →		

(Roots, no line item, 3rd edition, Publisher=Doubleday, Author=Haley)

T	# LI's	# ITEMS	Tr
0	1		

Optional Hash Total

GLOSSARY

- Address**—the physical location of the first character of a variable field. It is a relative address or displacement from the origin of the record.
- Coded**—Refers to an optional subfield that is identified by a specific lower case alphabetic character (See Tag 25 and 43, Appendix C and D). If the subfield is present, it is terminated by a subfield delimiter (Ts) unless it is the last subfield in the field (Tf) or record (Tr).
- Delimiter**—A single character code that marks the limit of a subfield (Ts), field (Tf), record (Tr), or file (Te).
- Displacement**—The number of characters that the first character of a field is offset from the origin of the record. May be thought of as the "address" of the field within the record.
- Field**—Refers to data. If the data is in a fixed record (HR, LT, TR) or the fixed portion of a variable record, it has a fixed place and a fixed length (e.g., Name of File, ISBN). Its space is then reserved in that record. If the data is variable in length and optional (e.g., bill-to-address, title), it is identified by a 'TAG' and pointed to by a directory (see 3.4 and 3.5). This is referred to as a "variable" field. All variable fields contain subfields.
- Non-Standard Differentiator**—Five characters that were appended to the seven character SAN in the BISAC fixed format. They are not part of the SAN standard. They may depict a sublocation within the SAN location if it is somehow coordinated between the recipient and the transmitter.
- Optional**—Refers to data that is not required. Variable fields are not required, nor are their subfields. Therefore, they are all optional. Some fixed fields are also optional (3.2.8 Do Not Exceed Action Code), but their places are held in the record.
- Positional**—Refers to an optional subfield that is identified by its relative order, or place, in a string of subfields (see Tags 40, 41 in Section 3.5). The subfield is terminated by a subfield delimiter (Ts) unless it is the last subfield in the field (Tf) or record (Tr). If the subfield is not present, its relative position is designated by a subfield delimiter unless there are no more subfields in this variable field, i.e., only inclusive subfields need be designated (see Section 3.4).
- Subfield**—Refers to data that comprises a field - usually an optional variable field. Subfields are:
- always optional,
 - coded or positional, and
 - terminated by subfield delimiters (Ts) unless they are the last subfield, then use record terminators (Tr).
- Tag**—A two-digit numeric designator that occurs in a directory (Figure 2) to identify the directory and its associated optional variable field (the variable field is comprised of optional subfields). See Figure 2 and Sections 3.4 and 3.5.
- Variable**—Refers to the length of the data (Section 3.4). All "variable" data is optional and may be of varying length. The length of a field is designated by the length parameter in the directory (Figure 2). Fields of unpredictable length are called "variable" and are comprised of optional subfields whose length may also be unpredictable.

RULES

1. All fixed fields in the variable format correspond in size and characteristics to their respective BISAC fixed format field.
2. All prices are variable in length with no leading zeros, no dollar sign, and no decimal point. There are two decimal places. If translated to the fixed format, leading zeros must be inserted.
3. All variable fields that were blank or zero in the fixed format have been made optional and that default value changed to a delimiter (Ts) if no action is expected.
4. There are no maximum lengths to the variable fields. All lengths are controlled by the various "length" fields. If a translation of a lengthy variable subfield is made to the BISAC fixed format and the variable subfield exceeds the maximum size for the fixed format, the excess characters will be truncated. A report should be generated to call attention to this condition for exception handling.
5. All dates are in ISO format YYMMDD or YYYYMMDD.
6. All characters correspond to ANSI X3.4-1977 ASCII as an extension of ISO and CCITT recommendations. ■■

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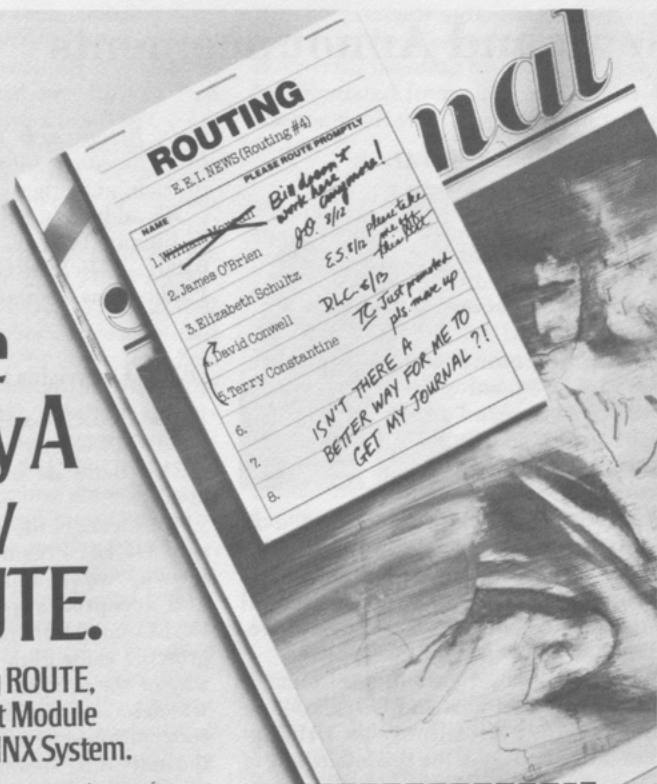
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News and Announcements

William Gray Potter Is Named New Editor of *ITAL*

LITA is pleased to announce that William Gray Potter has been named the editor of *Information Technology and Libraries* beginning with the 1984 volume. *Information Technology and Libraries* is the journal of the Library and Information Technology Association, a division of the American Library Association. For the remainder of the 1983 volume, Mr. Potter will serve as editor designate and will work with the current editor, Brian Aveney.



Mr. Potter is currently the assistant director for Acquisitions and Circulation at the University of Illinois at Urbana-Champaign and holds the academic rank of associate professor of library administration. Prior to his current position, he had been the acquisitions librarian at Illinois and before that was the systems librarian at the University of Wisconsin-Whitewater.

Mr. Potter chaired the LITA Institute on Serials Automation in September 1980 and is currently the deputy chair for the LITA national conference to be held in Baltimore in September 1983.

Mr. Potter received an M.S. in library science from the University of Illinois in 1975. He is currently writing a doctoral dissertation at Illinois on the evaluation of library collections using machine-readable databases, specifically the libraries in the LCS network in Illinois.

In addition to coediting the proceedings of the LITA Institute on Serials Automation, Mr. Potter also edited a recent issue of *Library Trends* on bibliometrics and has written numerous articles published in *Li-*

brary Resources & Technical Services, *Library Research*, *Library Trends*, *Serials Librarian*, and other journals.

His address is: 246A Library, University of Illinois, 1408 W. Gregory, Urbana, IL 61801.—*Michael Gorman*, chair, LITA Publications Committee. ■■

OCLC Copyrights Database

The OCLC Board of Trustees has authorized OCLC management to register the OCLC database under federal copyright law.

"By means of the federal copyright law," said OCLC President Rowland C. W. Brown, "we are applying a commonly used and accepted approach to protect the OCLC database. This action recognizes the growing value to the information community of the unique, international resource which has been created by OCLC with the cooperation of its many members. OCLC, the individual member libraries, clusters or associations of libraries and the various networks, are continually finding new and creative ways to make this database more useful. OCLC is encouraging and assisting in such use. Copyright will be one tool in a broad, educational program being undertaken by OCLC and the members to ensure the integrity of the database as well as its appropriate and responsible use in keeping with the mutual rights and obligations of its members."

Beginning with the week of December 27, 1982, copyright notices appeared on the online system log-on message and on various OCLC products derived from the database including OCLC-MARC subscription service tapes, accession lists, and union lists of serials.

According to OCLC Trustee Nancy H. Marshall, chair of the ALA Copyright Committee, the OCLC copyright program is in keeping with the constitutional pur-

pose of copyright legislation, which is to foster the creation and dissemination of intellectual works for the public welfare and to reward creators for their contributions.

Under federal copyright law, databases are equally entitled to copyright protection whether printed in hard-copy form or fixed in an electromagnetic medium. The OCLC database is a uniquely arranged and augmented compilation of entries, which make it a proper subject for copyright protection.

According to David P. Lighthill, OCLC vice-president and corporate counsel, the OCLC Users Council Task Force on Responsible Use of the OCLC System, as well as various library members, have identified a number of practices by some members and third parties that are detrimental to the continuing value of the database and attainment of OCLC's charter purpose. The task force recommended that remedial actions be taken, including among others, development of tightened contractual provisions and new pricing mechanisms.

"In considering how to implement Task Force recommendations," said Mr. Lighthill, "OCLC took account of the fact that many of the cited practices involved the reproduction or distribution of databases beyond that authorized by current contracts. The copyright program is one of the fairest and best understood means to protect the rights of members and provide for the equitable use of the OCLC system."

"Copyrighting such bibliographic information is not a new phenomenon in the library world," said Mr. Lighthill. "The American Library Association, for example, holds the copyright on the National Union Catalog."

According to Mr. Lighthill, the copyright program will help avoid the depreciation of the database that results from its use without the addition of original cataloging and current library data. "It will also reduce the amount of burden on the system due to unauthorized copying and use, and the amount of use without payment which unfairly shifts the financial burden of the system to authorized users," Mr. Lighthill noted.

According to Mr. Lighthill, all contracts now in effect between OCLC and the networks, members, and users will be deemed

to include licenses under the copyright as necessary to permit the exercise of all rights granted under such contracts. Other practices not presently authorized either by contract or by the fair-use doctrine will be considered for licensing by OCLC on terms to be negotiated from case to case including the grant of royalty-free rights when appropriate. ■■

Ninety-four Percent of Users Prefer Online Catalogs over Card Catalogs

Using Online Catalogs: A Nationwide Survey, to be published by Neal-Schuman Publishers in June 1983, is a report of the findings of a set of cooperative research projects funded by the Council on Library Resources that studied the use of online catalogs in a variety of libraries and locations. Edited by Joseph R. Matthews, Gary S. Lawrence, and Douglas Ferguson, *Using Online Catalogs* reports great user satisfaction with online public access catalogs: 94 percent of all users in the survey preferred the online catalog to the card catalog.

In addition to analyzing the findings, *Using Online Catalogs* discusses the implications of this nationwide survey.

Using Online Catalogs: A Nationwide Survey (6 by 9 inches, c250p., ISBN 0-918212-76-6, \$24.95, plus postage and handling) is available from Neal-Schuman Publishers, 23 Cornelia St., New York, NY 10014. ■■

OCLC Accelerates Development of Local System with Agreement with Online Computer Systems

OCLC and Online Computer Systems, Inc. (Online) of Germantown, Maryland, have entered into negotiations leading toward joint development of a local library system to be marketed and supported exclusively by OCLC.

The new system will include an online public access catalog, authority control, circulation control, acquisitions and serials control, as well as a clustering capability. The system will be designed for a wide range of sizes and types of libraries; will be integrated with the OCLC central system,

a unique feature for local systems; and will lend itself to be readily expanded by the library or cluster to meet future growth.

It is expected that OCLC will fund and guide Online in developing a new system that will build upon the considerable development effort by the principals of Online for the system at the Lister Hill National Center for Biomedical Communications at the National Library of Medicine, and, additionally, that the jointly developed system will benefit from the experience OCLC has gained in developing its own local library system.

"By combining the talents and the development already under way by both OCLC and Online," said OCLC President Rowland C. W. Brown, "we can expect significantly to accelerate OCLC's offering of a superior, full-service, state-of-the-art, minicomputer-based stand-alone system. Furthermore, OCLC's considerable resources and incomparable library automation expertise can provide for the best comprehensive support structure for any local system."

William H. Ford, Jr., Online Computer Systems chairman, said: "Since founding Online, one of our major business objectives has been to introduce new products and services into libraries. This joint development will be the first significant step in realizing that goal. We at Online are dedicated to providing support to OCLC in the application of new technology to libraries." ■■

Schultz Collection of Information Science Literature

The University of Pennsylvania has acquired the Claire K. Schultz Collection of documents relating to the early development of the computer and the field of information science in the three decades from the 1940s through the 1960s. The collection, which occupies twelve filing cabinets, was given to the University by the Medical College of Philadelphia (MCP) in the interest of making it more widely available to scholars in this field. Ms. Schultz, who recently retired as librarian of the MCP Library, began her career in 1949 as a participant in the early mechanization and then

automation of information retrieval. Since then, she has been a retrieval systems designer, research investigator, teacher, librarian, and consultant.

The acquisition of the Schultz collection is another effort by the University of Pennsylvania Library to preserve historical material concerning this century's outstanding invention—the electronic digital computer. In 1979, John W. Mauchly, the co-inventor with John Eckert of the first stored-program digital computer, donated his papers and collection to the library. The Mauchly collection documents the Eckert-Mauchly invention of ENIAC and UNIVAC and contains many other materials within Mauchly's wide sphere of interest in computer development and weather prediction. Ms. Schultz was associated with Mauchly in the late 1950s, at the UNIVAC Applications Research Center, where she pioneered application of computers to indexing and retrieval—an application that departed from concentration on mathematical treatment of data within the computer, to develop logical processing of the kind used in present-day word processing and online databases.

The Schultz collection consists of approximately 4,000 documents, arranged by serial acquisition number; it is thoroughly indexed by author and subject. The majority of its documents were published prior to the mid-1960s; the focus of the subject matter is the developing technology of indexing and retrieval processes, including early research reports. Part of the value of the collection lies in its having preceded allocation of responsibility to U.S. government agencies for preserving research materials in the subject area. The collection also predates any concerted effort on the part of libraries to collect in the area. Because of events in Ms. Schultz' career, there is a sizable subset of documents pertaining to automation of the Armed Forces Technical Information Agency (1960) and an almost complete set of the working papers created during development of the MEDLARS System of the National Library of Medicine (1964).

Unique to the collection is its subject index. The terms used for indexing are controlled by the Schultz *Thesaurus of Information Science Terminology* (latest ed.,

1978, Scarecrow Press). The index is constructed on McBee edge-notched punched cards, using the random, superimposed coding technique developed by Calvin Mooers in 1948. Throughout Ms. Schultz' teaching experience, the index served as a working model of the manual "coordinate" indexing and searching methods that led from standard library card catalogs to automated procedures. The index will be perpetuated as a useful artifact for understanding this evolutionary linkage, as well as for gaining access to the content of the collection.

Both the Mauchly and Schultz collections are housed in the Special Collections Department of the Van Pelt Library at the University of Pennsylvania. Scholarly use of the collections is invited and encouraged. ■■

Minnesota Becomes First Tapeloading Member of OCLC

The University of Minnesota, which is a member of the Research Libraries Group (RLG) and does its cataloging online via the RLIN system, will send tapes of its cataloging to OCLC, where holdings information will be entered into the OCLC online union catalog and will become available to the 6,000 libraries that participate in OCLC's international network.

Tapeloading is one of the expanded opportunities for participation that OCLC announced in February 1982. OCLC historically required that participants be libraries that do all their roman-alphabet cataloging online. Now, however, input of cataloging via tapeload qualifies a library as a participant and as an OCLC member and enables it to participate in other OCLC subsystems such as interlibrary loan.

Libraries electing to become tapeload participants in OCLC send machine-readable tapes of their cataloging to OCLC. After an evaluation charge, which is based on processing time and ranges from a minimum of \$325 to a maximum of \$525, a tapeloading library is charged on a per-record basis to add its holdings information to bibliographic records in OCLC's online catalog.

The capability of accommodating tape-

load participants required a special development effort by OCLC to come up with a matching algorithm whereby the bibliographic record on tape is matched against records in the database; when a match occurs, the institution's holding symbol is added to the online bibliographic record.

For further information about tapeload participation in OCLC, write to the nearest regional OCLC network affiliate. ■■

Library Hi Tech

Pierian Press has announced *Library Hi Tech* scheduled for publication in July 1983. Oriented to applications of technologies in libraries, *LHT* will be 8 1/2 by 11 inches, run to 100 pages per issue, and appear quarterly.

Issues will include essays, reviews, literature surveys, and directories prepared by library practitioners and vendors. *LHT* will evaluate, describe, and report on processes and decisions involved in selecting, installing, maintaining, and integrating all avail-

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Other regular *LHT* columns will report on: software developed in libraries and available for purchase; copyright; networking; in-house library systems; development and products of vendors and other library supply agencies; and preservation activities and techniques. A calendar of forthcoming events such as conferences and workshops, reviews and guides to books and articles, and indexes to reviews of software will appear in each issue.

Please send manuscripts, inquiries, and

review copies to Nancy Jean Melin, Editor, *Library Hi Tech*, 103 High St., Armonk, NY 10504; or call (914) 666-4099. ■■

BRS/SEARCH Information Retrieval Software Available

BRS announces the availability for purchase or lease of BRS/SEARCH. Developed specifically for the storage, online retrieval, and maintenance of textual and numeric information, BRS/SEARCH is currently used to run the BRS online database service. In addition to mainframe computers, this software also operates on micro- and minicomputer hardware.

In the mainframe environment, BRS/SEARCH operates on IBM and IBM-compatible equipment and provides sophisticated capabilities for rapid but exact searching of very large databases. BRS/SEARCH is directly competitive with the IBM/STAIRS software product and offers

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BRS/SEARCH, micro/mini version, retains the functional capabilities of the mainframe version and additionally offers a general load process enabling the direct load of databases without the expertise of a programmer, a data entry system, immediate online updating, and other performance enhancements. The micro/mini software is written in the C programming language and currently runs under the UNIX operating system (a trademark of Bell Laboratories), resulting in transportability across many different hardware configurations such as Digital Equipment Corporation's PDP/11 and VAX families and the Onyx and WICAT microcomputers.

For more information on BRS/SEARCH including complete product descriptions, contact BRS Software Group, 1200 Route 7, Latham, NY 12110. ■■

New BRS/DISC Database of Microcomputing Literature

BRS has created DISC, a new online table-of-contents and bibliographic database that provides controlled vocabulary indexing and subject access to leading microcomputer journals. Peripheral coverage of mini systems, information science, and EDP is included.

BRS/DISC was designed to provide relevant information to home computer owners and information science and EDP professionals by offering:

- quick subject access to the tables of contents of popular and professional EDP-related journals.
- the ability to display and print tables of contents in their entirety without referring to the printed journal.
- immediate retrieval of all features, articles, and regular columns included in DISC journals.
- location of product reviews and pricing information for mainframe, micro-, and minicomputer hardware, software packages, etc.

DISC currently includes 4,000 citations

from selected prominent journals including *Datamation*, *Byte*, *Personal Computing*, *Popular Computing*, and *Creative Computing*. The articles date from January 1982 to the present and will be updated monthly. BRS plans to continue expanding the coverage of DISC to keep up with the quickly developing body of microcomputer literature.

Each DISC record contains title, author, complete bibliographic information including ISSN, full publisher's name and address, subscription information, and specially developed controlled vocabulary indexing searchable by two-character codes to reduce searching time. ■■

Carnegie Awards \$250,000 to RLG for Distributed Processing

The Carnegie Corporation of New York has awarded a grant of \$250,000 to the Research Libraries Group, Inc., to plan the implementation of a distributed processing environment for RLG's automated information system, the Research Libraries Information Network (RLIN).

"Distributed processing," or "distributed systems," describes an arrangement of separate computing facilities working together in a cooperative manner, rather than the conventional single computer at a single location. In such an arrangement, a powerful computer may hold central files and perform large tasks, while geographically dispersed smaller computers perform many processing and some data storage tasks, connecting with the central machine as needed.

Over the next nine months, a team headed by John Schroeder, RLG director of Research and Development, will formulate the functional, operational, and technical requirements for distributed systems. Alternative technical solutions will be documented and evaluated, in terms of both their ability to meet RLG members' needs and their financial impact. At the end of this study, RLG senior staff will recommend a specific distributed systems architecture in a report to the board of governors of the consortium.

Schroeder, commenting on the project, noted, "RLG has concentrated over the

past five years on providing an integrated technical processing system that addresses the cataloging and acquisitions requirements of large research libraries. RLG must now begin to assess its members' needs to support activities that are primarily local—circulation, direct patron access, serials control—and to maintain the technical links that underpin our programs and facilitate resource sharing among the members."

In the coming months, Schroeder plans to visit member institutions and meet with RLG's program committees to discuss their particular needs. Emphasizing the importance of the project to the partnership, he added, "The Carnegie grant will allow us to examine thoroughly requirements for a distributed architecture for the entire membership; to assess technical alternatives; and to analyze the financial consequences of such a system. I believe the recommendations coming out of this study will chart the technical course of RLG for at least a decade." ■■

RLG's RLIN Authorities Subsystem Ready for Searching

The Research Libraries Group has announced a major addition to its automated information system, the Research Libraries Information Network (RLIN)—searching access to two large files of authority records. The RLIN authorities subsystem allows any RLIN searching user to retrieve records from both the Library of Congress name authority file, a machine-readable version of the *Library of Congress Subject Headings*, and the New York Public Library's authority file of names and subjects. This database comprises approximately 2.3 million authority and cross-reference records. The LC name authority file will be updated regularly with records provided by the Library of Congress.

Authority records are used to register headings authorized for use as access points in catalog records, such as the correct form of an author's name. They also connect related headings through cross-references, indicating when a heading is not the authorized one or when it is different but related

(for example, "City planning; see also Urban policy"). The RLIN authorities database contains headings records for personal names; corporate/conference names; uniform titles; topical subjects; geographic names; and name-title combinations.

Users can search the authorities database using standard RLIN indexes: personal names, corporate/conference name words or phrases, title words or phrases, subject headings or heading subdivisions, Library of Congress card numbers, classification numbers, and unique record IDs. Search strategies for locating authority records include combining values for several indexes into one search request using Boolean operators (for example, "find pn [personal name] haydn, joseph and tw [title word] drum") and truncating phrases or words (for example, "fin sp [subject phrase] electroplating#" to retrieve subject headings beginning with the term "Electroplating"). In addition, authorities searchers may "browse" the contents of either file to aid in formulating specific search requests (ask the system to retrieve a sampling of fifty headings from the file). ■■

CLSI Microprocessor Systems

CLSI reports that 38 percent of its new customers in the last six months have installed microprocessor-based systems, ranging in cost from \$99,000 to \$137,000 per system.

CLSI's microprocessor system, the System 23, uses a Digital Equipment Corporation LSI 11/23 microprocessor which is powerful enough to support all of CLSI's software, including modules for circulation control, public access catalog, book acquisition, and materials booking. Prices vary according to the software modules installed, the amount of storage needed (160 megabytes to 600 megabytes), and the number of terminals required (up to sixteen).

Littleton, Colorado's Edwin A. Bemis Library is the most recent library to acquire CLSI's System 23. Serving a population of approximately 30,000 in suburban Denver, the library circulates about 275,000 items annually. It will install eleven terminals and convert its collection using an online

interface between its CLSI system and a MINI/MARC cataloging system.

Other libraries that have installed CLSI's System 23 include: the Waterloo Public Library, Iowa; the Appleton Public Library, Wisconsin; the National Institute of Environmental Health Sciences Library, Research Triangle Park, North Carolina; the University of North Florida Library, Jacksonville; Memorial University of Newfoundland, St. John's; and the NASA Langley Research Center Technical Library, Hampton, Virginia. ■■

Study of Library Network Agreements

The National Library of Canada has undertaken a study of agreements among Canadian libraries and other parties providing computerized bibliographic and information services. The National Library Advisory Board has recognized the need for clear definitions and guidelines in contracts drawn up by database suppliers, vendors, common carriers and their users, and libraries. The board recommended that the National Library take the initiative in developing these guidelines.

The current study is designed to perform a variety of functions: (a) to identify and briefly describe the most important types of computerized bibliographic network interactions that are or may be covered by agreements or contracts; (b) to recommend and define the names to be applied to the participants in the interactions; (c) to identify and provide copies of existing guidelines judged relevant to the interactions; (d) to recommend guidelines relating to the interactions; (e) to identify and define the terms most in need of increased uniformity of use; (f) to identify the publications and documents most useful for libraries to refer to in drawing up and/or interpreting network agreements and contracts; and (g) to make recommendations and/or draw conclusions and observations. ■■

Scott, Foresman & Company—SPIN Distributors

BRS has announced that Scott, Foresman & Company are now the distributors of the School Practices Information Net-

work (SPIN). Scott, Foresman's Electronic Publishing Division will become the exclusive distributor of the BRS/SPIN subscriptions to elementary, middle, and high schools. Authorized Scott, Foresman products dealers will also market SPIN to colleges and universities.

Services available to SPIN subscribers include access to computerized educational resource files containing more than 1 million documents in fifteen educationally related databases, an electronic newsletter, an online directory of SPIN subscribers, and electronic mail service. Included in the educational databases are the Educational Resources Information Center database (ERIC), the School Practices Information File, Bilingual Education Bibliographic Abstracts, Exceptional Child Education Resources, the National Center of Educational Media and Materials for the Handicapped database, Resources in Vocational Education, and Resources in Computer Education. ■■

CLSI Demonstrates New Products at ALA Midwinter Meeting

At its booth in San Antonio's Convention Center, CLSI demonstrated several of its latest offerings, including two new microprocessor-controlled subsystems that offer technologically advanced solutions to two of library automation's biggest problems: label scanning and downtime.

CLSI's solution to the dilemma of circulation librarians having to rescan OCR or barcode labels is the Two-Way Laser Scanner. With this compact, streamlined device, CLSI has combined two of its most popular innovations, the stand-alone light-pen terminal, which it introduced in 1974, and the laser scanner, which it introduced in 1979. The combination has resulted in the scanning reliability of large supermarket laser scanners at a fraction of the price. Consisting of a clear LED read-out screen, a twenty-button keypad, and a pistol-shaped laser-beam scanner, under which borrowers' cards and books are placed, the Two-Way Laser Scanner constantly seeks a good scan at the rate of 150 scans per second. The LED read-out screen quickly displays system responses when patrons are

delinquent, when the book is on hold, or when similar messages are required. CLSI reports that, with the new scanner, circulation desk throughput is up to 50 percent higher than it is at libraries using traditional hand-held wands. The Two-Way Laser Scanner may be used by libraries as a stand-alone terminal or in conjunction with a CRT terminal. There's also an optional printer for producing due-date slips, payment receipts, check-in receipts, and routing slips. CLSI will begin delivering the new scanner in the spring of 1983 and reports a current backlog of more than eighty orders for the device.

The other new product was CLSI's Microprocessor Support System. This unit uses an Apple II microprocessor and special software developed by CLSI to capture and store circulation transactions while the main system is down. The check-out, check-in, and renewal transactions are stored on the Apple's floppy diskettes and

then transmitted to the system when it is up again. While not being used as a backup system, the Apple may be used as a regular online terminal or with any of the other Apple software packages.

In addition, CLSI demonstrated its new superminicomputer-based system, the System 44, which employs a large Digital Equipment Corporation PDP 11/44 computer and supports up to sixty-four online terminals. CLSI's integrated software package—with modules for circulation control, book acquisitions, public access catalog, and materials booking—was also demonstrated. Now at level 26.5, the new software includes several new features suggested by CLSI customers, including a sophisticated Boolean search function, multi-level passwording, fine calculation matrices based on patron, item, and branch, and an online due-date calendar that automatically anticipates days and times when the library is closed. ■■

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Recent Publications

Bibliographic citations were produced by Maria Clark, Yale University Library, New Haven, Connecticut, in accordance with the American National Standard for Bibliographic References. New York: American National Standards Institute, 1977. 92p. (American National Standards on Library Work and Documentation; ANSI Z39.29-1977).

Reviews

Boss, Richard W. *Automating library acquisitions: issues and outlook.* White Plains, N.Y.: Knowledge Industry Publications; 1982. 135p. (Professional librarian series). Bibliography: p.129-31. ISBN: 0-86729-006-4, softcover. \$27.50

Lumped with the turnkey systems descriptions is a new (to this reviewer) term as applied to that class of suppliers which the author describes as "integrator systems." This term, *integrator*, rather loosely describes a vendor that offers a variety of hardware and software services (p.54). In applying the definition to the only integrator system discussed, that of M/ACOM Sigma Data, Inc., of Rockville, Maryland, I found only one feature really distinguishing it from other turnkey options: the system is offered at a guaranteed annual price under a total facilities management concept, including shared computer resources, while a stand-alone minicomputer option is also available. At the time of writing, six libraries were using the service-bureau approach, three had acquired the minicomputer version.

This reviewer has been involved with the development of automated acquisitions systems in libraries and book wholesaling organizations for nearly twenty years. A commercially available turnkey system, from Ringgold Management Systems, Beaverton, Oregon, called NONESUCH, was developed in part as a variation to the reviewer's order processing system installed at the Academic Book Center in Portland, Oregon; the same system is installed at two other commercial booksellers. It was a per-

sonal disappointment, therefore, for this reviewer not to see a description of the Ringgold system.

Quite simply this book does what it purports to do: identifying and describing the issues in automating library acquisitions. The book is "tight"—really only 114 pages of text, not including a less-than-two-page appendix on the criteria for conducting a cost study. A second appendix of nine pages consists of an incomplete glossary of computer and acquisitions terms (noting, for example, the terms *random access* and *direct access* are not defined, nor is the acronym *BISAC* for Book Industry Systems Advisory Committee, the latter a gross oversight in terms of this group's impact on automating acquisitions). The bibliography is sparse—of a total of thirty-eight references, only three are citations to 1981 publications, and there are no citations for 1982. In fact, the most current citation is to a *JOLA* article from the June 1981 issue.

These are minor criticisms, as the author appears willing to sacrifice absolute detail in exchange for establishing a broad definition of the problem and presenting an outline for more detailed analysis. The reader is left with homework to do, and if you understand this, the book is extremely useful as an outline.

The options for automating acquisitions are presented here. Against a description of an "ideal system" the author offers comparisons of the offerings of turnkey systems, bibliographic utilities, the systems of book wholesalers, and of course, the in-house, build-your-own system option is also covered. According to the author's criteria, a description of a vendor's acquisitions system is included in the book only if the system is already installed or is planned for delivery in 1982, and only if the vendor has an existing customer base of at least six libraries (none of which need be installations of the acquisitions system itself). The Ringgold system does fail to satisfy the author's criteria, thus exemplifying the book's regrettable omission of the work of smaller organizations, which are placing addi-

tional options into the marketplace.

Mini- and microcomputer system offerings (hardware and software) are expanding so rapidly that a new perspective needs to be placed on options available to libraries today. Those who want the proven performance of a system that has been installed and tested at a large number of installations will have to wait for a long time to make a buy decision. No organization has yet demonstrated a track record in acquisitions that meets this criterion. Even the large bibliographic utilities have long-term development requirements to achieve the "ideal system," and their cost/benefit performance needs watching.

Because acquisitions activity is back-room stuff, compared to the high public visibility of cataloging and circulation control, it is this reviewer's contention that it is much more a "low risk" investment for the library to engage in automation efforts in this area of activity. It is nearly certain that, within the next five years, technology will have again changed the acquisitions work environment. Mistakes made in this activity can more easily be corrected, when compared to those of circulation control and public access cataloging. This is not to say we shouldn't attempt to do the job correctly from the beginning, and this book can help to establish the initial design criteria, but the automation environment is now such that one can't automate with absolute certitude about the decision. In this light, therefore, one should look at automating acquisitions from the point of view of protecting the library's future options, spending as little as possible for the maximum returned services.

Available through the new programming languages in today's technical environment are self-generating codes. Through this technique, file maintenance and transaction input/edit programs can be generated without writing a single line of "machine level" code, the construction of reporting and inquiry programs is simplified, and system documentation is produced as an automatic by-product of the programming task. The new tools for system builders, together with the turnkey offerings, comprise a richer set of options than has existed heretofore. For those librarians who wish to maintain control over

their destiny this book will be an encouragement. Acquisitions librarians can shape their own systems rather than wait for the marketplace to deliver solutions.

Judging by the amount of activity in libraries already, and by the variety of options, it's a good time to be a buyer. There is no substitute, however, for planning, and this book is a good departure point—recommended for those who are considering their automation options.—*Donald P. Chvatal, Academic Book Center, Portland, Oregon.* ■■

Censorship or selection: choosing books for public schools [videorecording]. New York: Media and Society Seminars; 1982. 1 tape cassette; 60 min.; sd. Available in $\frac{3}{4}$ -inch U-matic (also in VHS, Beta) format from Media and Society Seminars, Graduate School of Journalism, Columbia University, New York, NY 10027. \$150 purchase (all formats) plus \$3.50 postage and handling. No rentals. Free discussion guide. \$3.50 for transcript.

Censorship or Selection raises touchy issues, works them over through the questioning of a large and diverse group of panelists by a keen-minded moderator, and leaves them unresolved but exposed for the viewer's thought and further discussion.

Fred Friendly, the former president of CBS News, introduces each of three controversial questions about censorship of classroom and school library materials, and then lets moderator Benno Schmidt, professor of law at Columbia University, draw reactions from twenty-two participants including authors Kurt Vonnegut and Judy Blume, members of the Moral Majority, teachers, school board members, judges, and a variety of others (a student, parent, publisher, librarian, lawyer, etc.). The occasion for this intense, though polite, confrontation was a gathering of the National School Boards Association in Atlanta, Georgia, in April 1982. The questions are simple: Who should determine what can be taught in the classroom—teacher or parent? Who puts books in the school library and who can remove them? Who determines what belongs in texts, e.g., the creationism/evolution controversy?

Established by the Ford Foundation in

1974 to promote dialogue between the media and the law, Media and Society Seminars became a program of Columbia University's Graduate School of Journalism in 1981. A selection of seminars produced since then are available to the public on tape, including this one; *Eyeball to Eyeball*—a two-part examination of the ethics of investigative journalism; and *The Constitution*—a five-part series on interpretations of the Bill of Rights.

No amateur exercise, this is a slick, carefully produced and recorded live performance made for national (and international) broadcast. It is an edited version of a three-hour discussion before a live audience who are all but invisible to the viewer. The technique immediately draws the viewer into the seminar room as the audience, and the illusion holds for all but Mr. Friendly's brief segments and two spontaneous outbursts on the part of those actually present. The camera lets the viewer see emotions play over the faces of the panelists and watch their body language while they respond to Dr. Schmidt or their antagonists. The moderator is skillful at stirring up the controversy and keeping it boiling at a furious pace, using a method Mr. Friendly calls "one part Socrates, one part Phil Donahue, and one part *The Paper Chase*."

Despite all of the interesting and appealing technical attributes of *Censorship or Selection*, one wishes that close-ups of Dr. Schmidt's back and Mr. Friendly reading his lines from a clipboard had been left on the editing-room floor.

The American Library Association and Association of American Publishers are named as associates in the production. The two organizations published the accompanying discussion guide, available free of charge with purchase of the videotape. The guide offers checklists for discussion moderators planning to use the tape covering preparation of the facility in which it will be viewed, background information for the moderator, and methods of preparing audiences and of leading different kinds of discussions. Extracts from documents dealing with issues raised in the seminar and an annotated bibliography are included in the twenty-six-page document. The discussion guide may be useful for amateur discussion leaders, posing possible questions to be

asked, presenting a role-playing situation, etc., but professionals in education and library/information science may find it somewhat lacking in depth. For a freebie, it is not bad, but it does not add much to the material in the tape itself. Also, users are confronted with a copyright statement prohibiting them from reproducing any part of the guide without permission from ALA and the AAP, even though it contains pages likely to be of great use as handouts in a class, church, or community discussion, such as the two-page bibliography, the reproduction of the *Library Bill of Rights*, and the names and affiliations of the participants.

Of equal or even greater value is the transcript of spoken material on the tape, useful in analyzing the exact words of a speaker, following the sequence of discussion, and providing relevant quotes for moderating a discussion based on the tape. It, too, carries a copyright warning against illegal duplication, but at least users need contact only one source for permission, the trustees of Columbia University. Purchasers might save time and correspondence by requesting permission at the time of purchase. The transcript is \$3.50 extra.

Reactions from student viewers in this reviewer's own library school classes were overwhelmingly positive to the presentation—its style and ability to provoke them, expose complex issues and complex points of view. Criticisms included the feeling that the moderator did not remain neutral but permitted his personal bias to slip through, and that participation by the various panelists was uneven, though opposing views were well, and evenly, represented. Many expressed a desire to see the balance of the actual taping, i.e., the excised two hours. This is *Censorship or Selection's* greatest compliment.—Sheila S. Intner, *School of Library Service, Columbia University, New York, N.Y.* ■■

The COINT report. *Communication and information technology: a multidisciplinary approach.* 1(1); February 1980-3(5); February 1982. Morton Grove, Illinois: AD Digest. Available from AD Digest, P.O. Box 165, Morton Grove, IL 60053. Six issues per year.

ISSN: 0198-8840. Annual subscription \$12; single issues \$2.50.

All of *The COINT* Reports* are a little difficult to review because their approach and perspective have evolved since the first report was published in February 1980. The original concept was to document the volume and type of advertising, by type of equipment and service, i.e., EDP, office/micro/repro, AV/TV/video, and library, plus provide a review and synthesis of articles pertaining to a number of technologies appearing in a variety of publications. In subsequent issues, *The COINT* Reports* have taken on a more focused perspective with a state-of-the-art review and synthesis of a single topic.

The editor/publisher of *The COINT* Reports* is Chung I. Park, a librarian at Malcolm X College in Chicago. Park is to be commended for his ability to summarize and synthesize technology-related articles that appear in publications that range from the popular press to highly technical journals. To give some idea of the scope of the journals regularly, or irregularly, covered in *The COINT* Reports*, the following journals have been mentioned at least once: *Infosystems*, *Information & Records Management*, *Datamation*, *Journal of Communication*, *Byte*, *Creative Computing*, *ASIS Journal*, *Administrative Management*, *Educational and Industrial Television*, *Computerworld*, *Wilson Library Bulletin*, and *Business Week*.

The strength of *The COINT* Reports* is the high quality of the synthesis of articles and reports that appear in a wide range of journals. The ability to find, in one place, a summary about technology is almost enough to recommend *The COINT* Reports* due to the reasonable price. The fact that it is a good summary commends *The COINT* Reports* even more. All of the above ignores the fact that the summary reports contained in *The COINT* Reports* are even more attractive to busy managers and librarians who find reading a wide range of journals on a regular basis a difficult, if not impossible, task.

A brief review of the contents of *The COINT* Reports* will illustrate the range of topics covered (the following summaries are the reviewer's, not the *COINT** editor's).

Current Synthesis, V.1, no.1, Feb. 1980, 28 p.

Current Synthesis, V.1, no.1, June 1980, 32 p.

Microelectronics: New Revolution Makers +, V.1, no.3, Oct. 1980, 32 p.

The individual, national, and international implications of microelectronics—chip technology—are explored.

DPers: From Data Technologists to Information Managers, V.2, no.1, Feb. 1981, 12 p.

The current evolution of data processing departments from machine handlers to information handlers, from technologists to generalists, from dealing with machines to dealing with users is documented.

Information Delivery via Video, V.2, no.2, Feb. 1981, 7 p.

The use of video is documented in business, the academic world, publishing, and the library. The implications of interactive video are explored.

The Automated Office as Information Center, V.2, no.1, Feb. 1981, 9 p.

In most offices, managers and professional workers account for 75 percent of all salaries, yet the majority of equipment installed in offices to improve productivity is directed at the clerical and secretarial staff. Focusing on managers with the introduction of automated support systems will result in a 15 percent savings in "wasted time" for the average manager. For office automation to be truly effective, the machine must be programmed to maximize the productivity of the person.

Microcomputer as a Handy Tool, V.2, no.4, Feb. 1981, 12 p.

Uses of microcomputers are explored, and trends in microcomputer equipment and software are identified.

VIDEOTEX: Home Delivery of Information, V.2, no.5 & 6, Feb. 1981, 23 p.

A glossary index of Videotex terminology and projects is presented. For example, terms such as *NITE OWL*, *ORACLE*, *PRESTEL*, *TELIDON*, *VUTEL*, *INFOVISION*, and *GREEN THUMB* are explained.

Home Delivery of Information, V.3, no.1, Feb. 1982, 10 p.

Videotex is explored from the perspective

of the technology, information providers, intermediaries, and individual users. Information hackers (those who overdose on video technology), it is suggested, may become afflicted with a new disease called "information sickness."

The Electronic Journal: A New Solution, V.3, no.2, Feb. 1982, 10 p.

This issue explores the implications of an electronic journal and the limitations of print journals. Space limitations of print journals often prevent the publication of two out of ten satisfactory submissions. Even after acceptance, it typically takes more than a year for the article to appear in print. The electronic journal offers a quick-access, speedy delivery, and a potential reduction in costs.

The Resurrection of Libraries: Bookless Libraries or Libraryless Books, V.3, no.3, Feb. 1982, 10 p.

The electronic form of communication will emerge to satisfy social needs as opposed to the needs of individuals. But the book will have an important place. Just as photography did not displace painting and audiovisuals and microforms did not weaken the print medium, so, too, is electronic communication likely to complement the book.

Commentaries for Microcomputer Users: Part A, V.3, no.4, Feb. 1982, 10 p.

The microcomputers reviewed in this issue include the Apple machines, CBM 8032, and TRS-80. Word processing packages for the Apple and TRS equipment are also discussed.

Commentaries for Microcomputer Users: Part B, V.3, no.5, Feb. 1982, 10 p.

The first generation of microcomputers were board-level computers for hobbyists. The second generation of microcomputers were designed to run as soon as they were plugged in but still had a lot of limitations. The third generation of micros will be user-oriented, have multiple high-capacity disks, and lots of compute power. Micros covered include the IBM PC, Osborne 1, Xerox 820, and Heathkit H-89; a discussion of 8-bit versus 16-bit machines is included.

Park might wish to consider designating a specific technology for a particular issue. In that way, each technology would be reviewed on a regular annual cycle.

There are only two negative aspects to *The COINT* Reports* that should be mentioned. First, the Korean-born Park needs a copy editor to improve the grammar, syntax, and choice of words. While the language as currently used does have a certain charm to it, and requires a bit in the way of extra concentration in order to not miss anything, it is time that this defect be addressed. Second, Park needs a spelling-checker program, in conjunction with his word processing system, to eliminate annoying "typos."

This reviewer heartily recommends that anyone the least bit interested in technology subscribe immediately to *The COINT* Reports*. If enough new subscriptions are received, the remaining two minor defects can be shortly corrected.—Joseph R. Matthews, J. Matthews and Associates, Inc., Grass Valley, California. ■■

Dodd, Sue A. *Cataloging machine-readable data files: an interpretive manual*. Chicago: American Library Assn.; 1982. 247p. ISBN: 0-8389-0365-7, softcover. \$35.

Frost, Carolyn O. *Cataloging nonbook materials: problems in theory and practice*. Edited by Arlene Taylor Dowell. Littleton, Colo.: Libraries Unlimited; 1983. 390p. ISBN: 0-87287-329-3. \$28.50 in the U.S.; \$34.00 elsewhere.

Rogers, JoAnn V. *Nonprint cataloging for multimedia collections: a guide based on AACR2*. Littleton, Colo.: Libraries Unlimited; 1982. 198p. ISBN: 0-87287-284-X. \$21 in the U.S.; \$25 elsewhere.

Provision of a uniform code dependent on a single bibliographic structure to describe library materials in all physical formats was one of the objectives of the second edition of the *Anglo-American Cataloguing Rules* (1978), abbreviated here AACR2. Media catalogers finally had a national standard capable of producing entries for nonbook/nonprint/audiovisual materials (the terms are used interchangeably here) identical with those for books and integrable with them into omnimedia catalogs. Early manuals designed for use with the new code covered both book and nonbook applications, e.g., Hoffman's *Getting Ready for AACR2* (1980) and Maxwell's

Handbook for AACR2 (1980), while others such as Fleischer and Goodman's *Cataloguing Audiovisual Materials* (1980) and Olson's *Cataloging of Audiovisual Materials* (1981) treated only nonbook formats. None of them, however, treated all the physical forms dealt with in AACR2's chapters 3 through 11. In the case of the trio of new manuals reviewed here, two, Frost's and Rogers', cover most, but not all, of these chapters/media, while the third is limited exclusively to machine-readable data files, a medium that *none* of the multimedia manuals included. It seems appropriate to include Dodd's book as a complement to the others, then, despite its monomedia approach.

An adequate definition of what constitutes nonbook media is yet to be written. Frost and Rogers agree on including sound recordings, graphics, micrographics and cartographics, films and video, and three-dimensional objects. They both exclude, in addition to machine-readable materials, music and manuscripts. Frost discusses kits in a separate chapter; Rogers does not. The omissions may reflect the authors' perceptions of general need in the field and/or personal expertise. Certainly, manuscripts are a highly specialized type of material much akin to books. Frost says, "Serials, manuscripts, and music scores reproduced in audiovisual formats are also included." This would indicate exclusions were made on the basis of their "nonaudiovisualness." Terminology is obviously still a problem, for she goes on to say, "there are of course obvious difficulties with a term such as *nonbook* . . . because of its implicit lack of specificity, encompassing as it does anything not a book . . . the focus of the discussion will be on defining the scope and nature of the category" (p.12). Rogers does not explain her choice, but follows a tradition of other earlier manuals and reproduces lists of terms from Johnson's *AV Cataloging and Processing Simplified* (1971) and the National Center for Educational Statistics' *Handbook of Standard Terminology* (1975) that also omit manuscripts, music, and machine-readable.

While a better case might have been made for excluding machine-readable materials on grounds that few libraries collected them only a short time ago, now

school and public libraries are acquiring microcomputer software packages in larger and larger numbers, and academic libraries may not be far behind them. Surely no one doubts that computer software qualifies as nonbook, whatever the definition. Dodd's manual fills a great, glaring gap in the array of available tools for creating AACR2 cataloging for the media.

Now that it is clear what is not covered, let us turn to what is present in these volumes. The bulk of both Frost's and Rogers' manuals is devoted to explanations of rules for description and access, with plenty of illustrative examples. Their style of presentation differs dramatically however, and each offers some features the other does not. Rogers works through the entire chapter of AACR2 rules for each medium, element by element. For each rule selected for discussion, she offers several examples, e.g., for title proper, she gives a number of titles proper, and so forth. However, one never sees the actual data sources either in pictures or text showing possible problems the cataloger might encounter in transcribing these titles proper. Both the Fleischer and Goodman and the Olson manual reproduced data sources—Olson with photographs and Fleischer and Goodman with drawings—to demonstrate typical placement and style for each different medium. Dodd does this extensively, too, and Frost reproduces the textual material from which entry elements are drawn. This is extremely helpful. When Rogers finishes the discussion of rules for the chapter, she gives several full-entry examples of typical items in the medium. In contrast, Frost works her way through an entire example, beginning with a full description of the item and its data sources, followed by a complete entry according to the second level of bibliographic description of AACR2. Sometimes a second entry according to the second edition of Jean Weihs' *Nonbook Materials: The Organization of Integrated Collections* (1979), abbreviated here *NBM2*, is included, too, where cataloging according to that Canadian Library Association-sponsored code would differ from AACR2. Only then does Frost begin her discussion of individual rules. She gives variations from Library of Congress interpretations first and reproduces relevant text in full from the

codes. She comments after each element, making comparisons with LC practice and treatment of the same area using the fourth edition of the Association for Education Communications and Technology-sponsored code, *Standards for Cataloging Nonprint Materials* (1976), abbreviated here *AECT4*.

One result of Frost's and Rogers' different approaches is that Frost presents fewer examples, but each is integrated with her rule explanations; while Rogers has many more illustrations with less emphasis on full-entry integration. This stylistic difference is likely to figure significantly in determining one's preference for one manual over the other.

Each has unique features as well. Frost devotes one lengthy chapter to historic background and another to bibliographic concepts and their nonbook applications, and still a third to those multipart, multimedia items called kits. She really explains two codes, not one, even though Weihs' *NBM2* is designed to coordinate with *AACR2*, and she also gives many references to *AECT4*, a code popular with school libraries. Rogers, while describing historical background, too, does so in a few pages and, in contrast to Frost, gives a whole chapter to a (selected) rule-by-rule discussion of *AACR2*'s first chapter of general rules. In this chapter we also find the rules about kits, which Rogers explains. Rogers' primary concern is to explain the physical formats, which she does at length and with many pictorial illustrations. This information is indispensable for a neophyte, or even an experienced practitioner unfamiliar with a particular medium or intramedium variation. Rogers provides lengthy bibliographies; Frost has a short list of "Selected Readings" following the text, but recommends medium-specific aids throughout her book. Frost quotes at length from *AACR2* and *NBM2*; Rogers does not, but either manual could probably be used without an accompanying copy of the code(s). Neither author deals with coding and tagging for entry into automated systems, an unfortunate omission in this age of bibliographic utilities and online systems development. Only in Olson's *Cataloging of Audiovisual Materials* are all card-

formatted entries translated into OCLC work sheets.

Dodd's treatment of the one medium everyone else shunned is comprehensive, detailed, and well illustrated with reproductions of data sources from the materials she covers. She begins with an uncomplicated explanation of computer hardware and goes on to describe the materials *AACR2* calls machine-readable data files (MRDFs). Dodd points out that the term covers both data and program files, but for software enthusiasts, this cataloging convention is a glaring error—and perhaps not the only one made by the code.

Dodd's ten chapters are organized into three sections: (1) an introduction to the medium; (2) the rules, with examples for different software formats, software serials, and dynamic databases; and (3) a discussion of bibliographic concepts as applied to software and recommendations for multilevel record keeping. In the chapters on rules, sections quoted from the code are applied and interpreted. Library of Congress policies are discussed, too, though LC has chosen not to collect or catalog machine-readables yet. The final chapter reproduces the outline of the 1981 MARC format for MRDFs and augments it with a tagged card entry, a sample of a completed work sheet, and a corresponding computer-generated entry. Dodd includes an extensive glossary, drawn from several sources, both library and data processing, and appendices on *ISBD(G)* as it might apply to an MRDF, a cataloging checklist, and sample catalog card entries for various cataloging problems. The drawback to this manual may well be a function of its age. One year is not much in the history of books, graphics, or a host of other media; but in the computer milieu it is long enough for the innovation of the moment to become old hat. The limited discussion of microcomputer software—a new kind of program package when this book was in progress—barely scratches the surface of the muddle that catalogers want plumbed. Clearly, this is an area demanding much more attention. Also, the Committee on Cataloging: Description and Access of ALA's Resources and Technical Services Division has a task force studying the rules

for MRDFs for changes accommodating newer software that may require some re-evaluation of Dodd's interpretations.

Three problems this reviewer found in the Cataloging in Publication (CIP) for these manuals struck a rather embarrassing note: first, in the entry for Frost's book, Jean Riddle Weihs is listed as a subject heading, despite the fact that she, personally, is not a subject of the Frost book, even though her book *NBM2* is; second, for the same book, a subject heading found only on this entry, "Anglo-American cataloging—Problems, exercises, etc.," is given that is either very new or an error intended to be "Anglo-American cataloging rules—Problems, exercises, etc."; and finally, the addition or omission of subheading, "Handbooks, manuals, etc." to the subject headings "Descriptive cataloging—Rules" and "Cataloging of non-book materials," appears to follow no recognizable pattern.

Since cataloging and cataloging codes are dynamic processes and media are evolving with a speed that make one's head spin, a look into the future seems appropriate. As was already mentioned, the rules for MRDFs are under review, with a report from the task force likely soon. The AECT is bringing out a fifth edition of *Standards for Cataloging Nonprint Materials* under the direction of Doris Clack, and Jean Weihs has a third edition of *NBM* in progress. Nancy B. Olson is preparing a second edition of her book, much expanded and including MRDFs for the first time. A small packet of additions and corrections to *AACR2* has been out for some time, but so far, the Joint Steering Committee for the Revision of *AACR* appears to be successfully resisting any drive toward *AACR3*. — Sheila S. Intner, School of Library Service, Columbia University, New York, N.Y. ■■

Lancaster, F. W. *Libraries and librarians in an age of electronics*. Arlington, Va.: Information Resources Press; 1982. 229p. ISBN: 0-87815-040-4. \$22.50.

F. Wilfred Lancaster has been, in recent years, one of the most articulate and outspoken of library and information futurists. This latest book systematically presents his

thoughts on the "evolving paperless society and the implications . . . for libraries and librarians."

The style is easy and free of jargon. Like much of Lancaster's work, significant portions have the flavor of bibliographic essay. Given the controversial nature of the content, the extensive citations are useful in lending a sort of "Delphi Study" credence to the ideas presented. The bibliography itself is an excellent and useful gathering of perhaps 300 items from both library and general literature, up-to-date through 1980.

In the introductory chapter, Lancaster articulates the basic concepts of an information, as opposed to agricultural and industrial, society. He discusses trends toward distributed access, and touches on the ongoing shift from physical to electronic transfer of information.

In succeeding chapters, computer and communications state of the art and trends are discussed, with descriptions of optical disks, micros, optical fiber technology, etc. The application of these technologies in computer conferencing, telefacsimile, the paperless office, electronic publishing, and various video systems is reviewed. Chapter 4, "Computers and Publishing," is an excellent survey of the current and anticipated effects of this technology on both primary and secondary publication. Reported cost information is included as appropriate.

The first of two major scenarios in the book is given in chapter 5, "A Paperless Communication System." This weaves together Lancaster's work with intelligence information systems for the CIA, developments in office automation, personal information systems, and electronic publishing, in order to set forth his ideas on where it's all going.

In chapters 6–8, Lancaster focuses on the impact of these developments on the library. After a logical analysis of library functions and their sensitivity to technological change, and a review of the trend from print to electronic storage as it impacts libraries, past predictions of the future of the library (e.g., Licklider's) are discussed.

In "The Disembodiment of the Library," chapter 9, the second major scenario is presented. Here, Lancaster pre-

dicts a gradual shift in library activities from ownership of resources to access to resources. The final two chapters build on the earlier discussions and include reviews of pioneering library efforts, library education, and relevant information that would not have fit smoothly into earlier chapters.

Perhaps ironically given its subject, the book is handsomely designed, well bound, and notably free of typographic errors. It is priced most reasonably given its quality, content, and size.

Lancaster's book is strongly recommended for library administrators and others who must plan to meet the challenges and opportunities of the new technologies. It would also be useful reading for library school students who think to work in the field ten years hence.—*Brian Aveney, Blackwell North America, Inc., Lake Oswego, Oregon.* ■■

Maggie's Place [videorecording]. [Arlington, Mass.] Nancy Bicknell Associates; c1982. 1 tape cassette; 13 min.; sd.; 3/4 in. format. Available from: Eastern Massachusetts Regional Library System, Boston Public Library, Copley Square, Boston, Massachusetts 02117. \$50 (purchase only; no rental or preview).

What's on the menu at *Maggie's Place*? Not your usual hashbrowns and greasy eggs, but online car-pool information, electronic mail, and community events for you to digest.

Maggie's Place is both the title of this videotape and the name of the computer system at the Pikes Peak Regional Library District in Colorado Springs, Colorado. Developed by director Ken Dowlin, the purpose of *Maggie's Place* is to replace the image of the public library as a static warehouse with an image of the public library as the central provider of community information. *Maggie's Place* contains the usual circulation and catalog functions that introduced libraries to automation, however it is the innovative uses that make this system so special.

From the same terminal that brings you book status and catalog information, patrons are able to access files containing

community events, car-pool listings, and a local organization directory. Patrons interviewed on the videotape seemed to adapt easily to using the computer terminals. One librarian reported that people believe a computer more readily than a librarian, when being informed that a book is not on the shelf.

Maggie's Place provides some impressive services for the staff at Pikes Peak. There is electronic mail, word processing, and even budget programs, all designed to make work easier and the librarian more efficient. One staff member has become so dependent on the computer system, that she had both typewriters removed from her office.

By far the most unique feature of *Maggie's Place* is that you don't have to be present in the library in order to access it. Even though there are more than 100 terminals at Pikes Peak and its branches, more than 400 home users are able to dial into *Maggie's Place*. The tape visits one such electronic cottage where a frequent user demonstrates how easy *Maggie's Place* is to use. The user points out that he is not interested in bits or bytes or computer programming, but only in access to the information stored in *Maggie's Place*. Although it saves time and effort, the viewer never learns what the costs are for home use, a question that is sure to arise.

This videotape gives us a glimpse of the future of librarianship, and forces one to consider one's own future. *Maggie's Place* clearly demonstrates that our roles are changing in the information age society. Hopefully, people will learn to depend on the library to provide instant community information.

At least two ideal uses of this tape are apparent. For those library staff or students that need an introduction to the "information age" library, this short tape is an excellent discussion tool. In addition, this tape will create a great deal of work for the small microcomputers that are becoming popular in libraries.

This videotape does contain some problems that must be noted. Amateur, rather than professional, production techniques hinder viewing at times. Some audio transitions are so poor that to avoid confusion it is

necessary to view portions twice. More detail should have been paid to describing the limits and the potentials of Maggie's Place. Certain questions about costs and staff time go sadly unanswered.

Despite these problems, library schools and library systems may find this tape motivating. For the price, *Maggie's Place* is a very worthwhile trip into the library's near future.—Bob Katz, *Albany Public Library, Albany, New York.* ■■

Other Recent Receipts

Listed here are books and other publications of potential interest to members of LITA, received for review. Some of these materials may be reviewed in later issues of ITAL.

Advances in library administration and organization; 1. Gerard B. McCabe [and others], eds. Greenwich, Conn.: London, Eng.: JAI Press; 1982. xiv, 148p. Includes bibliographies. ISBN: 0-89232-213-6. \$34.50.

A Cable television report and program for the city of Cambridge, Massachusetts. City Manager's Cable TV Advisory Committee. 1980. vi, 64p.

Changing information concepts and technology: a reader for the professional librarian. White Plains, N.Y.: Knowledge Industry Publications; 1982. iii, 179p. (Professional librarian series). Bibliography: p.173-78. ISBN: 0-86729-028-5, hardcover, \$34.50. ISBN: 0-86729-027-7, softcover, \$27.50.

Clement, Hope E. A. *The Research network: major issues facing Canadian libraries.* Ottawa: National Library of Canada; 1982 September. 24, 27p. (Canadian network papers; 3). Text in English and French. "Elaboration of presentation to the joint meeting of the Resource Network and the Bibliographic and Communications Network Committees of the National Library Advisory Board, May 12, 1981." ISBN: 0-662-51993-0. ISSN: 0226-8760.

Durance, Cynthia J. *Initiatives toward a bibliographic communications network for Canada.* [Ottawa]: National Library of Canada; 1982 May. vi, 8p. (Canadian network papers; 2). Text in English and French. ISBN: 0-662-51891-8. ISSN: 0226-8760.

Infotecture Europe; 3: 1981 Nov. 16. Available in English or French from: Infotecture Europe: 11 rue du Marché Saint Honoré, 75001

Paris, France. Subscription: 1 yr. 18 issues plus special issue, Fr 1500.

The On-line public library. A. J. Oulton [and others]. [London]: British Library; 1982. xii, 113p. (Library and information research report; 1). ISBN: 0-7123-3002-X; ISSN: 0263-1709. Available from: Publications Section, British Library Lending Division, Boston Spa, Wetherby, West Yorkshire LS23 7BQ. £8.00.

Special issue on software packages for information retrieval. Program: automated library and information systems. 16(3): 93-190; 1982 July. ISSN: 0033-0337. Available from Aslib Publications Dept., 3 Belgrave Square, London SW1X 8PL.

Yeates, Robin. *Prestel in the public library: re-evaluation of the general public to Prestel and its potential for conveying local information.* [London]: British Library; 1982. x, 134p. (Library and information research report; 2). ISBN: 0-7123-3003-8; ISSN: 0263-1709. Available from: Publications Section, British Library Lending Division, Boston Spa, Wetherby, West Yorkshire LS23 7BQ. £8.50. ■■

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INTEGRATED ONLINE LIBRARY SYSTEMS

September 26 and 27, 1983

Hyatt Regency Hotel, Ohio Center, Columbus, Ohio

SPEAKERS

(Partial list in alphabetical order)

- Pat Barkalow Pasadena Public Library
 - Richard Boss Information Systems Consultants
 - Vinod Chachra Virginia Polytechnic University
 - Fred Glazer W. Virginia Library Commission
 - Carol Knoblauch Public Library of Columbus & Franklin County
 - Joseph Matthews J. Matthews & Associates
 - Rob McGee RMG Consultants
 - John McGowan Northwestern University
 - Ellen Miller University of Cincinnati
 - Gail Persky New York University
- Additional speakers being chosen as this ad goes to press.

MAIN TOPICS

- Survey of integrated online library systems (those systems that use a common machine readable database and have two or more subsystems operational and accessible online, such as circulation, public catalog, acquisitions, etc.)
- Selection and evaluation criteria
- Development of RFLs, RFPs and contracts
- Installation of systems (including environment control)
- Administrative issues
- Impact of advancing technology (mass storage devices, increasing power of microcomputers, effect of improved data communications, etc.) on future developments.
- Special section on microcomputer library systems.
- Initiating systems in multi-campus, multi-branch, and

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- Vendor/client expectations

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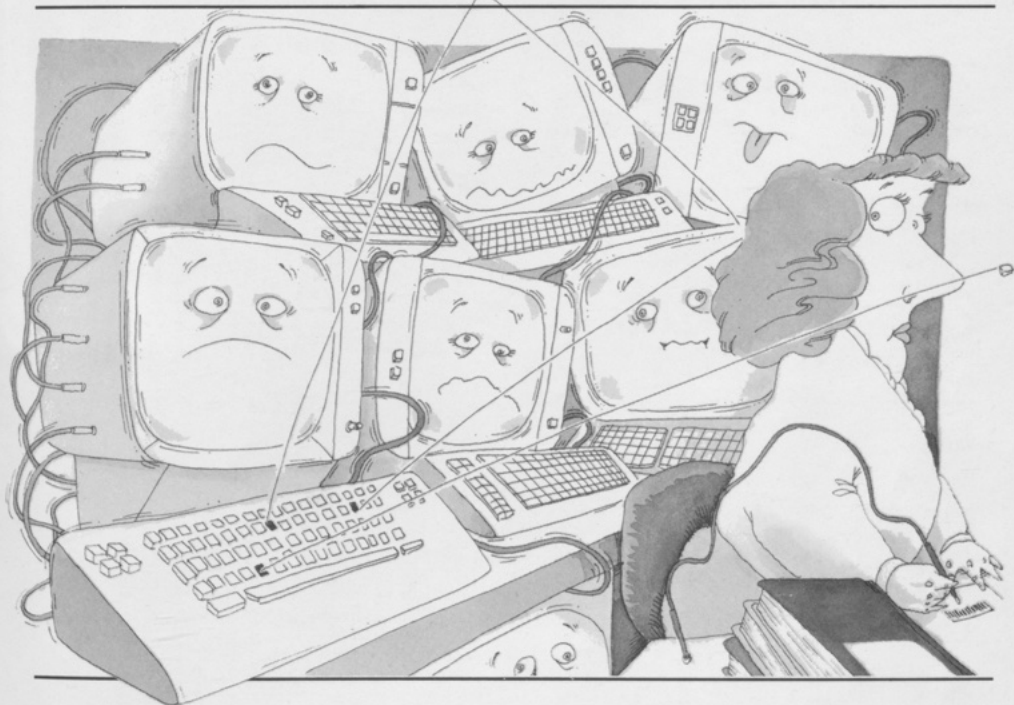
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