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Child's Play

Microcomputers have come a long way since 1971, when the Intel Corporation produced the first microprocessor CPU for use in a calculator. During those ten years, that 4004 chip has more than come of age—it has spawned a series of successors that outstrip it in computing power and destiny.

Following an initial period when microprocessors were used almost solely for numerical computation, the various support devices needed to complete the evolution into microcomputers were rapidly borrowed from other fields: CRTs from conventional-scale computing, Teletypes from the communications arena, and cassette storage from audio technology.

Improvements followed as industry retooled for the growing mass market. More memory—until last year, 64,000 characters was the practical limit. Better mass storage, in the form of floppy disk, then hard disk. Faster printers, letter-quality printers, color printers, graphics printers, plotters, color plotters, digitizers, and bar-code wands. And following on the heels of the hardware boom came the resounding echo of software development.

Technology is still evolving at a great rate. In some areas it is responding to present needs, such as in the new models of floppy disk drives that are but half the thickness of their predecessors. In other areas progress is reflected in products that have little immediate application. The 32-bit chip that is destined to replace all but the very largest computers in the world is already on the market. It is roughly at the same developmental stage as the 4004 chip was a decade ago, and barring some gross political or economic crisis, it is soon going to begin turning the main-frame computers that we are now using into dinosaurs.

At first only pioneers put microcomputers to work. Although history has apparently not recorded the first use of microcomputing in a library or information center, we know that progress was slow, and that the tool made several turns through the popularity-improvement spiral before it attained a maturity appropriate to library use. Such developments as Radio Shack's well-packaged TRS-80 Model I, disk storage devices holding millions of characters, and the nimble software to manage databases have contributed substantially to that maturity.

Despite these gains, however, most of the developmental work in library microcomputerization has been done by the librarians—and their children. I am continually startled by just the concept, not to mention the success, of teenage programmers. Fourteen-year-olds are teaching microcomputing to university professors. If this is less surprising once one learns that the age of the average microcomputing industry leader is around twenty-three, it is still a sobering contrast to the number of adults trying to catch the next workshop, article, or course, in their pursuit of a mastery of what is becoming literally child's play.

As we collectively inch toward the new literacy of microcomputing we can at least be encouraged: despite the usual cloud of buzzwords and concepts surrounding it, the subject is not as dense as the older technology, especially for an end user. Allan Pratt, the editor of *Small Computers in Libraries*, is right when he says that using a micro can be likened to building a doghouse when compared to building a full-scale house. One needs far fewer skills to build a passable shelter for a pooch, or implement a basic microcomputer applica-

tion, than are absolutely required with family homes or main-frame computers.

The old shibboleths of continuing education still ring true. You must read. Read every professional journal and newsletter you can. Scan every trade magazine and index you see. But don't get bogged down if learning and facts come slowly. It is a writer's market in the glossy trade magazines, and many articles are accepted for publication because of topical demand and not for clarity of style. Fortunately, popular topics are covered almost monthly in more than one publication, so if an author's explanation doesn't make sense, just skip it and try the next one you run across.

After you have begun reading, start talking. Talk to exhibitors and colleagues whenever you can. I petitioned LITA for a microprocessor discussion group because I wanted to learn. Many of those attending the sessions in Philadelphia knew more than I did, but as a facilitator I got to pick some of the best brains in the business.

And when you talk, listen as well. In fairness to fate, some of the talkers will be either ignorant or wrong. But you should be hearing answers to the same questions more than once, and the false ones will tend to ring falsely.

Until now the profession has had consultants who were able to advise the library on a computerized approach to a function. The person might aid in the selection of a system, but separate and apart was the developer of that system.

However, this is changing. Soon, if not already, you will be able to find a single person who can help you determine the automated answer to your needs and then develop the system as well, including equipment, programs, and training.

That gap will be bridged because of several factors: (1) the simplicity already described—after all, *children* are writing microcomputer programs for their parents to use at the library; (2) the comparatively low capital investment required to turn an individual expert into a developer; (3) a combination of the increasing pool of talent, the advantages of self-employment, and a sound (if not yet overwhelming) market for one's services.

However, as you attain your new literacy and begin to feel comfortable with programs, operating systems, files, and especially with microcomputer applications that have been developed elsewhere, I have a caveat for you: Precious few standards have been established to guide us.

While many standards actually do exist for hardware, a recital of the incompatible bits and pieces on the market would soon convince a listener that the only element in common is the RS-232 interface. And even this recommended standard is typically implemented in a nonstandard fashion.

Some standards are being developed, alas, after the fact. The most promising area for hardware standards relates to the 32-bit architecture. We can expect to see more advance planning and standardization for that technology than for any other so far.

Enhancements in most microcomputers, such as lowercase letters, 80-column display screens, memory expansion, connections to external devices and so forth are typically accomplished by purchasing printed circuit boards and plugging them in. These boards, however, do not fit all brands and models of microcomputers. Many of them fit only a very few, and some fit only one. You must be sure that the microcomputer you are going to buy can do, or can be enhanced to do, what you need done; and especially that the boards and software will work on your particular configuration.

Standards are even scarcer in microcomputing software. BASIC, the most common programming language for micros, operates differently for different brands of microcomputers, and can even vary among the models of one brand. CP/M, esteemed by many as a type of Esperanto of operating systems, also varies between brands and models.

Incompatibilities in both hardware and software among the various systems result in files being written onto a disk on one system that cannot be read by another system except by transferring the data through the ubiquitous RS-232 interface. Even on the same computer a data file created by one program might not be readable by a second program.

Of course, there are exceptions to this grim picture of standards, and the exceptions are gradually becoming more and more numerous. But before you commit to a system, convey to your vendor a clear understanding of the job you expect it to do, and find out exactly what recourse you have if it doesn't do it, particularly with respect to functional enhancements, work load and database expansion, and interconnection with other systems. You need to know these facts, and to be able to express them to the new breed of consultant cum salesman cum programmer.

Not only do we lack standards which aid in the evaluation of microcomputer systems, but we lack even the semblance of a comprehensive and regular review service to guide us. Some clearinghouses are just beginning to emerge, and partial reviewing is here, too. But a *Library Technology Reports* for microcomputing is not yet in sight.

It is safe to predict that we, the end users, will continue to be the greatest source of library applications. Do not expect corporations such as Radio Shack or Xerox to become suppliers of library software or of systems.

However, we can expect some type of library-supply vendor to emerge. That vendor could be an existing traditional one such as Brodart or Gaylord, but it might as easily be a new company that specializes in microcomputerized library systems.

Such a vendor might or might not evolve as a federation of existing developers. But it will probably have the following characteristics:

- It will market the widest possible variety of turnkey systems for all purposes, from electronic mail to online catalogs.
- It will be nationwide, to the extent of exhibiting at state association meetings and of contracting with hundreds of hardware dealers for authorized maintenance.
- It will project the image of a supermarket, or a warehouse, staffed by knowledgeable library types, so that *somewhere* in its inventory is the product we need.
- It will issue a catalog.
- It will continually acquire marketing rights to new applications that we and our children develop.
- It will contract with us to maintain or modify our applications for some customers or to develop new ones for others.

It is exciting to watch the revolution in our work that microcomputers are responsible for, and it is gratifying to see us happily accepting and exploiting what we have wanted for decades, and what we always knew would help so much—cheap computing. Our partner in this breakthrough is a chaotic young industry that hardly understands just how powerful a library tool it has created.

The personal cost to us is the acquisition of yet another technology. But few we have mastered so far hold anywhere the promise of microcomputers for the improvement of library control and service.

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VUBIS: A User-Friendly Online System

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This paper sketches the history, design, and future plans of VUBIS, an online, mini-based library system for a medium-sized, European academic library. Unique to VUBIS is its user-friendly public access facility, which is the core of the system. This public-access module is self-explanatory; catalog searches can be performed in three different languages (Dutch, French, and English); no patron knowledge either of cataloging rules or of data processing theory and practice is assumed; bibliographical descriptions are retrievable in a variety of forms (uppercase and/or lowercase, with or without diacritics, inverted or noninverted name forms, titles with or without beginning article, etc.) and on the basis of truncated information. The available character set (107 characters) permits input and output of all standard Western European characters.

INTRODUCTORY REMARKS

The authors of this paper have been involved for the past five to six years in the development, implementation, and evaluation of VUBIS, an online library system for a medium-sized, European university library.[1] Central in this effort has been the creation of a user-friendly public access facility. In the following article, the history and design of, and future plans for, this system are described. VUBIS is the joint development of the VUB (Vrije Universiteit Brussel/Free University of Brussels)[2] and IS (Interactive Systems, Inc.).[3] In 1975, preliminary discussions between the partners were concluded, which led to the signing of a contract and the actual start. In accordance with this contract, IS accepted the general responsibility for the overall design of the core bibliographical system (cataloging and public access), while the VUB library made staff available to perform the analysis and programming tasks. The contract, in effect, represented a merging of two essential kinds of expertise: database management (IS) and library operations and automation (VUB).

By the end of 1977, the core bibliographical system was running on a time-sharing basis on IS's minicomputer (the entire VUB catalog having been loaded into the new system),[4] new acquisitions were cataloged online, and the public had, on an experimental basis, online access to the catalog in one of the three libraries.

In mid-1978, after some months of experience with the cataloging and public-access subsystems, the university formally accepted the core system software.[5] Ac-

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cordingly, the appropriate hardware configuration was ordered and eventually installed in the library.[6]

The original decision to go ahead with the joint development was based on the conviction that no existing system met the university's requirements, and that the appearance of newly available minicomputer hardware, high-level programming languages, and operating systems had made such a development feasible within the limited financial and personnel resources which the university could muster.

What were the general requirements of VUBIS?

1. The system had to be integrated, online, interactive, and mini-based (although standard batch products were required as well).
2. It had to be developed in such a way that, by and large, the existing batch catalog and cataloging rules could be preserved.
3. Generally speaking, it had to reflect all the complexities of academic library practice, while at the same time be sufficiently simple to remain efficient.
4. The anticipated needs of the reading public were made its central concern, i.e., all functions were planned and designed from the viewpoint of *the public access subsystem:*
   a. The online retrieval capability had to satisfy the needs of a reading public having experience with traditional card and COM catalogs but no special knowledge either of cataloging rules or of data-processing theory and practice.
   b. In order to permit its independent use, i.e., without the assistance of trained staff, the subsystem had to be self-explanatory.
   c. It had to be sufficiently similar to existing catalogs not to require extensive training or excessive personal adaptation.
   d. Bibliographical descriptions had to be retrievable in a variety of forms (e.g., uppercase and/or lowercase, titles with or without diacritics, inverted or noninverted name forms, titles with or without beginning articles, etc.).
   e. Adequate response time had to receive high priority.
   f. Although the retrieval technique had to be simple, searches via traditionally complex data elements (e.g., corporate authors, series entries, cross references, etc.) had to be provided.
   g. The available typography had to be rich enough to permit the input and output of the standard Western European character set (uppercase and lowercase, diacritical and other marks), both online and batch; letters carrying a diacritic mark (e.g., ä) had to be keyed with a single stroke.
   h. The reader should be able to find needed information even with incomplete knowledge of searched-for items.
   i. The system should, above all, be *user friendly*. To us that meant the translation of different processes into cogent, easily understandable dialogue sequences omitting, as much as possible, the use of coded information.
   j. In general, only a passive knowledge of bibliographical detail should be assumed. The system had to provide as much information as possible in the form of options, asking the reader to make numerical choices, in order to minimize typographical or spelling errors.
   k. Public searches had to be feasible in the three languages most frequently used by VUB readers, namely Dutch, French, and English.
5. *The cataloging subsystem* had to meet many of the same requirements (4*d*–4*i*). The subsystem had to have the capability of handling original cataloging, using somewhat simplified rules, and producing slightly abbreviated, but basically MARC-compatible, bibliographical records of an average length of about 200 characters.[7]
   a. Each new bibliographical description added to the database had to be integrated into the existing catalog through a search-and-edit process, requiring the capability of basic authority control.

b. Besides standard cataloging and editing facilities, programs had to provide global, a posteriori updating of the existing catalog, such as the systematic review of corporate names, series, and subject headings, etc.

6. Finally, the system should represent an acceptable compromise between the varying, and often conflicting, requirements of different users and user groups. It is not surprising, therefore, that the final design decisions reflect a constant and often painful process of weighing trade-offs.

It is our conviction that the existing core system meets these various requirements to a large extent. VUB readers seem to appreciate the online-search facility, and catalogers use the cataloging capability with pleasure and ease. On the other hand, the experience of the last few years has taught us a great deal, which we hope to incorporate in a revised version of VUBIS. Before turning our attention to future plans, however, we would like to describe the modules that are now available.

PUBLIC ACCESS[8]

Let us assume that a patron, wishing to perform a public catalog search, sits down in front of one of the library's terminals. He will find a text on the screen telling him in Dutch, French, and English that he can start his search by pressing the RETURN key.

When this key is depressed, a message appears on the screen instructing him to choose one of the three languages for the remainder of his search. Depending on the rapidity of his answer, the system assesses whether it is dealing with an experienced or inexperienced user. In the case of a slow response, the system, before presenting the next question, displays in the chosen language some basic information (see figure 1).

The terminals used by the public have a classical QWERTY keyboard with a shift key for the selection of uppercase or lowercase. Although for reasons of simplicity this keyboard shows the standard alphanumerical and punctuation sets only, many more characters can be and are displayed on these screens (and can in principle be keyed as well). The terminals (DEC VT52) and printing devices (DEC LA35 and LA180) have been modified by the engineering department of the university to handle an extended character set of 107 characters, including all standard Western European characters and those with diacritical marks. The terminal keyboards used by technical services show all 107 characters and allow those having diacritical marks to be keyed by a single stroke.

Let us assume that the search language has been chosen and the RETURN key depressed after the basic instructions were presented. At this point, the user is asked which type of catalog search he intends to perform. In the public access subsystem there are three basic search modules: *author*, *title*, and *subject*. It would appear that by providing this classical (and to most users well-known) approach to the catalog, we have fulfilled some of the requirements expressed in points 4*a* and 4*c* above. If we provided approaches such as those used in documentation systems (for instance, Boolean search techniques), the dialogue necessary to locate particular library holdings would have become far more complex; most library users would have required training or assistance to achieve their objectives. It is our feeling that a university library catalog, covering a large spectrum of subjects, should not be confused with a specialized documentation system. If a reader wants to know what has been published by a given author or on a given subject, he should transfer his query to an appropriate large-scale documentation file to obtain a sensible answer; after having identified relevant citations, he should translate his query into a standard catalog search, i.e., "Are some well-defined works available in this library?"

Author Searches

Assume that our patron would like to find out whether the library owns Alfred Einstein's biography of Mozart. He begins by selecting the author option. The system responds by asking that either the surname of a personal author or the principal part of a corporate author be entered.[9] The user is informed that all name forms defined in the database that have the keyed data as initial

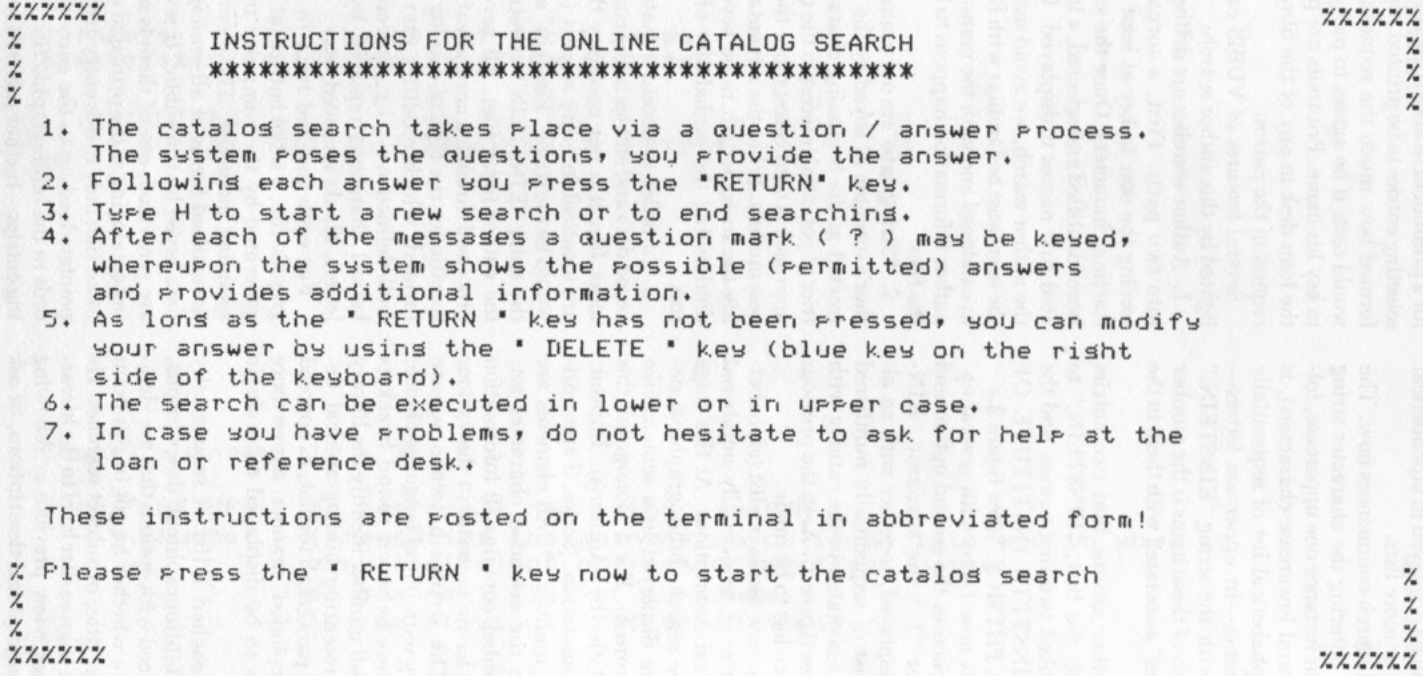

Fig. 1. Basic Instructions at the Beginning of the Catalog Search, Displayed to the Inexperienced Patron.

characters will be displayed in alphabetical order, in one or more lists.

The actual search commences now. The reader, after entering the character string "Einstein" (for instance one uppercase, followed by several lowercase characters), is shown an alphabetical list of sequentially numbered names—in uppercase letters—all starting with the string "EINSTEIN." Linked to each of these items is the number of "first names" associated with them in the catalog.

Let us further assume that two entries are displayed: the first, "EINSTEIN," to which are linked two first names, and the second, "EINSTEIN INSTITUTE OF CHEMICAL PHYSICS." (See figure 2.)

The user is now faced with several options. If he chooses the second option and keys number "1," the surname "EINSTEIN" is displayed, together with an alphabetical list of sequentially numbered first names, associated in the catalog with that name (see figure 3). As in the previous stage, a choice has to be made.

The system now displays a list (alphabetically, by title) of sequentially numbered bibliographical descriptions. At this stage of the public search, bibliographical descriptions are displayed in a sentencelike form (see figure 4). For a monograph this would be: Title [by] Author(s). Imprint. Collation. Annotation. (Series, if appropriate). **Call number **. All elements are displayed in the extended character set. The call number contains all information necessary to locate material in the various libraries. The strings between square brackets vary with initial language choice; the characters between round brackets within the call number identify the library building. Presenting bibliographical descriptions in paragraph format, as opposed to a "field-exploded" manner, allows more descriptions to be displayed on a single screen.

Having reached a list of sequentially numbered bibliographical descriptions, the user is faced with options that are virtually the same whether he got to this point using author, title, or subject searches. He may go back to an earlier level in the hierarchical process, view previous or following lists of bibliographical descriptions, or ask for a printout of selected descriptions. After selecting entries to be printed, the user is informed how much the requested printout would cost; if he agrees to pay, he is asked to key his name. Printouts are produced at the loan desk in any of the libraries at the request of the patron.

Several features of VUBIS can be highlighted by this author search:

1. Author searches are deliberately split into two parts. First, a surname search forcing the user to key at least some of its starting characters. Once the surname has been identified and selected, a list of associated first names is displayed. By splitting the author search, we avoid assuming that the user must be familiar with first name(s) as cataloged and with the manner in which author information happens to be stored in the files.

2. "String data" (in our example, the author's surname as keyed by the patron) are treated as the beginning characters of entries of potential interest to the reader. This approach is used throughout the public access module. It has the advantage of limiting the string length to be keyed, thereby diminishing the probability of typing errors.

3. In order to obtain a match between keyed data and entries in the corresponding index file, it is not necessary that the two are identical in every respect (an example would be the string "Einstein" as keyed and the entry "EINSTEIN" as retrieved from the author index file). All keyed data are processed through a normalization routine, specific for the type of catalog search performed, which modifies user input in a well-defined way, i.e., lowercase alphabetical characters replaced by uppercase letters, blanks removed, etc. . . .

For each indexed item in the bibliographic file, a set of entries (at least one) is generated by the computer in the corresponding index file. These entries are the normalized forms of all *anticipated* string data keyed by the public. If several entries are generated, one of them is selected during cataloging as the principal entry in that index file; only to this entry are assigned the pointers leading to the corresponding records in the bibliographic file. The remaining entries—further referred to as "spelling

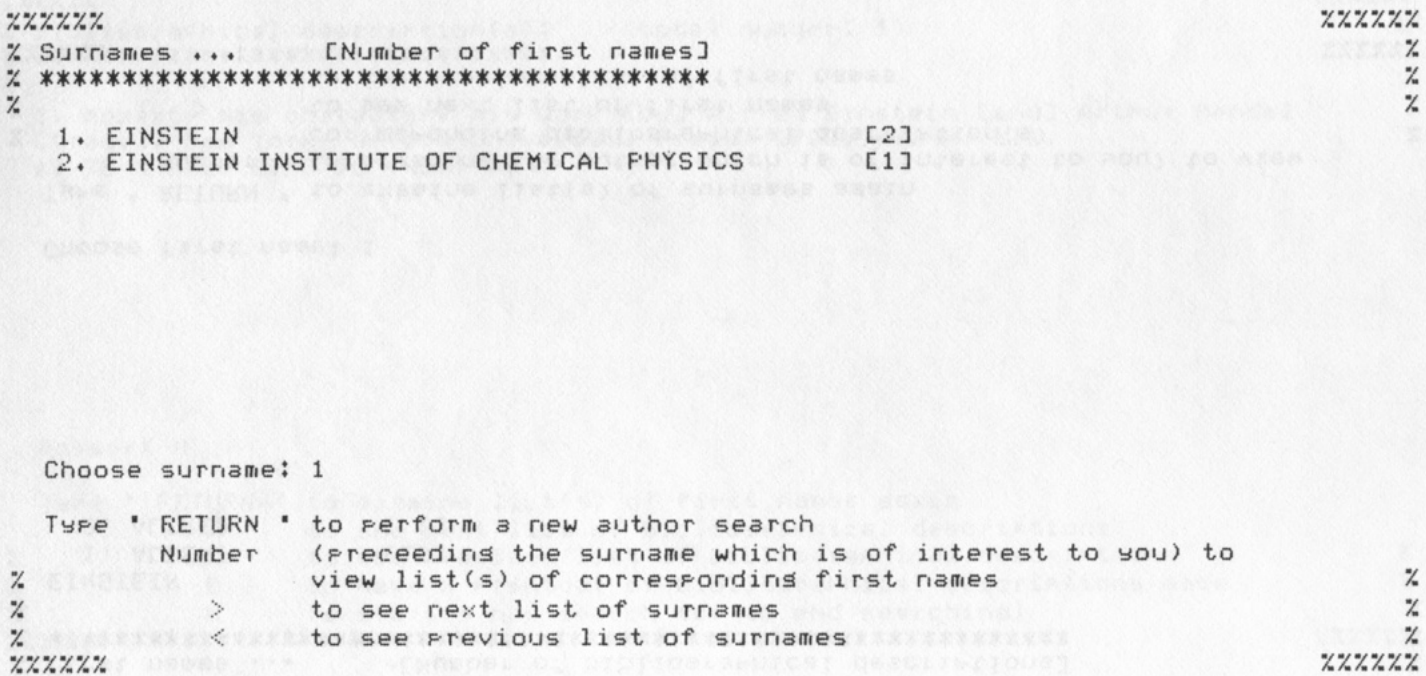

Fig. 2. Author Search. List of Surnames, Displayed in Response to the Patron's Keying of a Character String.

```
%%%%%%                                                                  %%%%%%
% First names ...      [Number of bibliographical descriptions]                 %
% ***************************************************************          % %
%                                                                           %
  EINSTEIN
    1. ALBERT          [15]
    2. ALFRED          [ 1]




  Choose first name: 1

  Type " RETURN " to examine list(s) of surnames again
       Number   (preceeding the author which is of interest to you) to view
%                corresponding bibliographical description(s)               %
%          >     to see next list of first names                            %
%          <     to see previous list of first names                        %
%%%%%%                                                                  %%%%%%
```

Fig. 3. Author Search. List of First Names, Displayed in Response to the Patron's Selection of the Surname "EINSTEIN."

```
%%%%%%                                                                    %%%%%%
% Bibliographical description(s):    (total number: 1)                        %
% ******************************                                           %
%                                                                           %

  1. Mozart, his character, his work [by] Alfred Einstein [and] Arthur Mendel
  [trad.]. New York, Oxford University Press, 1972. 492 p. ill.
  ** 78 N MOZA EINS 72 (HSW) **
```

```
  Answer: H

  Type ' RETURN ' to examine list(s) of first names again
            >     to see next list of bibliographical descriptions
%           <     to see previous list of bibliographical descriptions        %
%           P     to have a printout of bibliographical descriptions made     %
%           H     to start a new search (or to end searching)                 %
%%%%%%                                                                    %%%%%%
```

Fig. 4. List of Bibliographical Descriptions, Displayed in Response to the Patron's Complete Identification of One of the Corresponding Authors (or the Title).

references"—point to this principal entry and, when retrieved during a catalog search, this link is displayed. In the example discussed, the item "Einstein" when cataloged generates a unique entry "EINSTEIN" in the corresponding index file. It is indeed anticipated that the normalized form of any string, keyed for the retrieval of this surname, would conform to that single entry. In addition, it is clear that the string data "Einst" will produce lists of which "EINSTEIN" must necessarily be part.

However, let us now look at a somewhat more sophisticated example.

How does VUBIS manage a surname like "von Köchel?"

We anticipate that it can be searched in a variety of ways, such as "KOCHEL, VON"; "KOECHEL, VON"; "KOCHEL"; "KOECHEL"; "VONKOCHEL"; "VONKOECHEL"; even the same variants using "Köchel";[10] or as other strings obtained by mixing upper- and lowercase characters and/or by introducing blanks before, between, or after the two elements of the compound surname; or, of course, as a portion of any of these. The number of index-file entries automatically generated during cataloging depends on the algorithm used for the transformation of user entries. For a compound surname containing a diacritical character such as "ö," four index-file entries are needed: two because of the diacritical character, and two because of the compound nature of the surname. One of these entries is selected by the system as the principal entry according to prevailing cataloging rules; the other forms become spelling references. The following index-file entries would be generated during cataloging: "KOECHEL, VON," considered as the principal entry, and the spelling references "KOCHEL, VON," "VONKOCHEL," and "VONKOECHEL."[11] Any spelling reference can in its turn be the principal entry of another surname. For instance, "VONKOECHEL" could also be the principal entry of a surname "Vonköchel." Pointers to the corresponding bibliographical record(s), as well as the pointer to the principal entry "KOECHEL, VON" in the index file, would be linked in that case to the index-file entry "VONKOECHEL." Both links would be displayed when retrieving the entry "VONKOECHEL."

4. Spelling references are not the only internal links built into the author index file. Bibliographical links between complete author names (i.e., surname plus first name) are managed by so-called bibliographical references (i.e., having a *see* or a *see also* character). "Alphabetical references" (of two kinds, one acting on the last name, the other on the first-name level) are necessary to solve particular sorting problems. All of these different types of references carry a specific code in the index file, and consequently permit a type- and case-dependent kind of processing when retrieved. *Spelling references* are used during online retrieval and ignored in batch applications (being concerned primarily with the generation of alphabetical directories). *Bibliographical references* are displayed both online and in batch applications, having an authority function during cataloging. *Last-name alphabetical references* are considered as spelling references online and are executed in batch applications as well. *First-name alphabetical references* affect both online and batch applications. (All reference types are filed in two directions: from the pointing item to the pointed-to item—the active side of the reference—and vice versa—the passive side of the reference. By "execution" of an alphabetical reference we mean skipping, during the generation of alphabetical lists, of entries to which passive alphabetical references are linked, and the displaying of these same entries while retrieving items related to corresponding active references.)

Title Searches

The strategy developed for title searches is very similar to the previous; the user types a full title or its starting characters; the system responds by displaying matching file entries. When a selection is made, the corresponding bibliographical descriptions are displayed, and if desired, printed out.

As mentioned before, spelling references are also provided for the title-index file, primarily to handle the problems arising from the use of two character sets—extended in the bibliographic, uppercase

only in the index files. Of course, the rules governing the generation of title spelling references differ from those required for surnames. For instance, the composed nature of a surname has no title equivalent. Consequently, the normalization module is specific for title searches. Among other features, this module encompasses a stop list of articles (a three-language list). When cataloging, beginning articles are automatically indicated, resulting in titles being alphabetized in the index file by their first significant term. In case the indicated word happens not to be an article (e.g., *De profundis*), catalogers provide a spelling reference. When retrieving, the normalization routine removes the initial article from the normalized form, before the actual start of the search in the index file. It therefore does not make any difference whether the patron keys the initial article or not, the final result being the same. When displaying, beginning articles are shown, leading to a seemingly nonsequential presentation.

As in the author index file, bibliographical links are managed by bibliographical references, while alphabetical references provide specific alphabetical ties. The same remarks concerning the type-dependent processing of these references are valid here; alphabetical title references are handled in the same way as alphabetical author references on the surname level.

Subject Searches

The strategy developed for subject searches is dependent upon the particular subject approach used by the VUB library, namely a KWUC subject catalog ("*K*ey*w*ord in *U*DC *c*ontext"). Approximately a thousand UDC numbers and associated topics (name equivalents of UDC numbers), selected from the standard UDC-number list and sometimes tailored to the particular needs of the VUB collection, make up a controlled list of broad subject areas. New UDC numbers cannot be introduced during the cataloging process; a separate procedure exists to modify this controlled list.

At the VUB, subject indexing includes assigning to each work one or more UDC numbers, and to each of these one or more keywords. The broad subject descriptions, (UDC) are refined by the keywords, serving further to group bibliographical records in the subject catalog under a given UDC number. Subject indexing refers therefore to the assigning of subject relations, pairing UDC numbers and keywords. One of these UDC numbers is part of the call number and serves as a shelving element.

Keywords, which may be single or composite terms, are uncontrolled, and are assigned without database consultation, often being selected from the title. This policy is due to a lack of adequate personnel resources in the VUB library, having serious implications for the intrinsic quality of the subject catalog of course. However, a substantial quality improvement has been achieved by the introduction of features in the cataloging module which permit global, a posteriori modifications to the assigned keywords. The indexing of individual works can be updated through modifications directly performed in the subject field of corresponding bibliographical descriptions; this can also be done via an editing process directly performed in the keyword index file (an alphabetical file of all keywords defined in the database), or via the editing of UDC-bound keyword index files (alphabetical files of all keywords defined in the database under a given UDC number).

Given the controlled nature of UDC numbers and their corresponding topics and the uncontrolled nature of keywords, the subject search was designed to allow the user to input either a UDC number or its corresponding topic (or its beginning characters). No direct input of keywords is supported at this time. After the selection of a particular UDC number, keywords are displayed; any or all may be chosen so that the corresponding bibliographical descriptions can be inspected.

If the user starts his subject search by typing a UDC number (assuming that it is defined in the database—otherwise a corresponding error message would inform him that he has to try again), the system will display the following information:

- a sequentially numbered list, representing the selected UDC number within

the hierarchical tree of defined UDC numbers;

- the number of keywords related to the selected UDC number;
- the number of periodicals carrying the selected UDC number;
- the menu of options. As usual, the reader may type RETURN or "H"; he may type a list number from the list of UDC numbers displayed to perform a new but related subject search; he may view the descriptions via the alphabetical list of keywords; or he may directly proceed to inspection of the periodicals, without having to review the keywords list (giving access to all other descriptions).

Once bibliographical descriptions are displayed, the procedure is identical to author or title searches. If the user starts his subject search by typing a string of characters not fulfilling a UDC number format test, this string will be considered to constitute the beginning characters of the searched-for topic. The system then displays the sequentially numbered list of topics starting with these characters (if they exist) taken from the topic index file. After selecting one item from this list, the user is brought to the same point in the dialogue as if he had keyed the corresponding UDC number directly.

There are other features that differentiate subject from author and title searches. On the average, one can anticipate that the reader has to view many more descriptions as a consequence of a subject search than with the two other approaches to the catalog. To decrease the number of lists to be viewed, the system introduces an intermediary step; in case the number of descriptions requires viewing more than a given number of screens (presently about three), these descriptions are shown in an abridged version first (titles truncated to 60 characters together with call numbers). The user may then select those descriptions he wishes to look at in standard format. Moreover, if the number of descriptions exceeds a second value (about 100), the system refuses to show these online; the user is notified that if he is interested in viewing the entire list, he should update his print file (which can be done in a single command), for offline consultation. This approach avoids the library's CRTs' being monopolized by individual patrons.

CATALOGING

The cataloging subsystem was designed with the same "user-friendly" approach as the public access module: a step-by-step dialogue guiding the cataloger through the entire original cataloging process. Since cataloging is intrinsically more complex than online access, a greater number of interactive steps is necessary. To keep that number to a minimum, the system allows the experienced cataloger to stack commands, when appropriate, in order to shortcut some of the subsequent dialogues. Following is a summary of its features:

1. The cataloging subsystem allows for original cataloging only; no input from MARC tapes is included at this point.

2. The functions and characteristics that make up the public access module are its central concern. References of different kinds are generated. Public access files are updated. Accession numbers, linking index entries to bibliographic records, are stored presorted in the index files permitting retrieval in alphabetical order. In the author and subject index files, records are listed alphabetically by title, in the title index file by author.

3. The subsystem is intended to be used as a "book-in-hand" cataloging device, i.e., catalogers are supposed to enter cataloging data directly from the title page, without the aid of intermediary work sheets.

4. Somewhat simplified cataloging rules are used which produce slightly abbreviated but basically MARC-compatible bibliographical descriptions having an average length of about 200 characters, in a character set of 107, including all Western European characters.

5. The integration of new items into the database is done using a search and editing process, ensuring basic database consistency and excluding unnecessary duplication of bibliographical information in the database.

6. Although the subsystem does not make use of separate authority files, a kind of authority control is provided through indexes and references, leading to extended typography forms selected by the library

and displayed in the bibliographical descriptions.

7. Catalogers maintain control of author and title index entries. Though these entries are generated automatically, catalogers may modify, delete, or create new ones.

8. The dialogue is structured to minimize the amount of data that must be keyed. The transfer of elements from existing to new bibliographical descriptions is always achieved by numerical choice. The input of keywords selected from the title is done numerically as well, and can be edited after transfer if necessary. Spelling references and principal forms are generated automatically.

9. Bibliographical descriptions are presented in an "exploded" form, with each subfield identified and handled individually.

10. The subsystem allows editing of all elements in a bibliographical description. The editing effort may result in modifications to other descriptions, which are processed automatically, e.g., when updating series information, in conjunction with the editing of a monograph which is part of a series. Moreover, all modifications performed in the bibliographic file result in corresponding modifications in the related index files.

11. Book labels corresponding to separate physical volumes are automatically generated.

12. A variety of "global" editing functions have been developed. For example, different bibliographical descriptions can be merged, resulting in the deletion of all but one of them; selected author names being part of different descriptions can be merged to a previously defined "authority," etc.

13. Mainly because of the particular way subject indexing is performed at the VUB, "macroscopic" subject editing functions are provided as well, allowing for the editing, merging, or deletion of keywords associated with one or more UDC numbers. The result of this editing activity is decoded and integrated into the corresponding individual bibliographical descriptions and index files.

14. The subsystem does not provide real-time update. All data resulting from the input of new bibliographical records or from the editing of existing ones are coded and stored in a temporary work file, and integrated into the database during the night. However, the display of a bibliographical description, viewed during the cataloging process, takes into account individual modifications stored in work files.

SYSTEM SOFTWARE

The software supporting VUBIS is MUMPS-11 (version 4B), a DEC dialect version of MUMPS ("Massachusetts General Hospital Utility Multi-Programming System"). Many aspects of this software are particularly attractive for library applications. First, the MUMPS language is an interpretive language. We feel that the interpretive character of MUMPS is essential to the ease with which we introduce modifications and new modules. Although a real price in execution time is paid for interpretive processing (this price would be much too high if we were primarily concerned with batch applications), response times for interactive transactions are kept within very acceptable limits, varying for VUBIS between .5 and 5 seconds, depending on the type of question and the loading of the system.

Secondly, the MUMPS language has extensive string-handling capabilities. Logical operators are available for checking the occurrence of strings within larger contexts, or for locating string patterns or alphabetical relationships between strings. Functions exist for the determining of string lengths, or for the extraction of substrings out of string expressions.

Thirdly, with the MUMPS-11 implementations, all data on disk reside in tree-structured files, the physical details of which are largely made invisible to the programmer by the MUMPS-11 syntax. Indeed, these tree-structured files are referred to symbolically (by means of a file name and a set of numerical subscripts). The database-management module maps this symbolic (logical) information at a specific level of the file into directories of fixed-size blocks. These blocks are chained together in a linear fashion to contain all the data values at that specific level; all infor-

mation (pointer and/or data) at the same level of subscripting having a common ascendant, reside in the same block or block chain. The symbolic (logical) file structure thus determines their physical structure (and consequently the retrieval and processing times). It is sufficient for the programmer to carefully design the symbolic structure of his file before coding his applications in order to resolve, once and for all, the physical addressing on the disk. He must design the logical structure in such a manner that an acceptable compromise is achieved between the optimum use of disk space and a minimum allocation of continuation blocks by the system. These blocks are scanned sequentially within a level, and the subscripts within these blocks are not sorted but simply stored as entered.[12]

FUTURE PLANS

A number of factors have retarded the timely implementation of the entire integrated system, including acquisitions, circulation, and serials subsystems:

1. In 1974, a series of programs were initiated by the Belgian government in the areas of scientific and technical documentation and information, including studies with regard to a possible national shared-cataloging system.[13] As a result of this effort, committees were appointed to investigate matters such as common cataloging rules, subject treatment, and record format. In 1978, a formal proposal was made that a pilot project should be set up using VUBIS as the starting point of a demonstration model. At this time (spring 1982), the proposal has been abandoned, but the feasibility of a joint development with other partners is still being studied. The possibility of a shared system cannot but have serious design implications, which necessarily affect the development process.

2. The recent availability of standardized versions of MUMPS, such as DSM-11, has posed another dilemma. Going ahead with the existing software and implementing activities, which certainly are in need of being automated, would meet the immediate requirements of the VUB library. On the other hand, further development on the basis of MUMPS-11 (version-4B) might result in the VUB software becoming incompatible with later developments outside VUB, thus foreclosing future cooperation with other institutions.

A decision has now been reached to rewrite existing programs in DSM-11 and create VUBIS II. At this time the authors are in the process of performing a comprehensive problem analysis, both for an updated version of the core system and for the additional subsystems, completing the integrated system. Within the context of the previous discussions of the existing core system (VUBIS I), we would like to indicate the direction we intend to take in amending the earlier system. As far as *public access* is concerned:

1. In addition to the classical author, title, and subject searches, we plan to introduce the option of searching by significant term(s) taken from the corporate author, surname, title (including series), topic (UDC), and keyword files. Carefully structured Boolean searches would be allowed between terms, and within, or between categories.

2. We would split personal- and corporate-author presentation (as part of the traditional author search), although the initial string provided by the patron would lead to either or both. We intend to do this in order to allow for a separate corporate author treatment, taking into account the difficulty of forcing a surname logic upon forms of authorship which may require a more complex logical structure, e.g., in three or four levels.

3. In VUBIS I, no solution is provided for the quick perusal of excessively long lists of data elements. Currently the patron either has to view as many screens as it takes to come to the end of a list in case he wishes to see *all* data, or redefine the initial string. In VUBIS II, we intend to handle this problem through a combination of techniques, namely the presentation of indexes and/or compressed lists, and allowing the patron to introduce an initial character, pinpointing the desired section within a large list. All this does not exclude the possibility of viewing the totality of screens.

4. In case the reply to a keyed string constitutes only a few items, we are considering moving through the search process by skipping intermediary steps, thereby

speeding up the retrieval activity. For example, if a given string produces very few surnames, to which in turn are connected very few first names, we would lead the patron directly from a keyed string to a list showing all surnames *and* all first names associated to the initial string. It is clear that the advantage of arriving in fewer steps to the desired end may be offset by the loss of a logical, step-by-step sequence.

5. As is the case with keywords now, we plan to introduce the facility of selecting more than one item from a given numbered list; in addition, we would like to make it possible to save selected data from one screen to the other, grouping all selections before display.

6. There are a number of desirable embellishments of the public access module, such as the presentation of certain references and the rewording of particular dialogues.

Although we propose making these changes to the existing public access module in the conviction that they will lead to a more flexible and richer search instrument, we are concerned at the same time that the introduction of more sophisticated devices may endanger the essential quality of VUBIS I, namely its simplicity of use.

As to *cataloging*, if VUBIS II were selected as the basis of a larger system serving a number of institutions, the cataloging module undoubtedly would have to include provisions for any or all of the following:

1. Entering MARC data, batch or online, in full or in abbreviated form.
2. Richer cataloging than performed by the VUB.
3. Union catalog treatment, i.e., differing solutions to the storing and displaying of call numbers and institutional notes.
4. Bilingual versions of corporate heading, series, etc.
5. Separate authority control files in rich typography.

Whatever happens in this respect, we plan to continue the development of the VUBIS system.

REFERENCES

1. A short description of VUBIS can be found in: G. Alewaeters, S. M. Namenwirth, C. Segebarth, and M. Verpoorten, "VUBIS: A MUMPS Based Library System," *Intermarc Software-Subgroup Seminar 3, Library Systems Seminar, Lausanne June 4–6 1980* (Lausanne, Switzerland: Bibliothèque Cantonale et Universitaire de Lausanne, 1980), p.49–55.
2. The VUB was founded in 1970, when, out of an existing bilingual institution, independent French-language (ULB) and Dutch-language (VUB) universities were established. Current enrollment at the VUB totals approximately 5,000 students, distributed among seven faculties (schools) and two campuses. The university opted for a centralized library organization, consisting of a central administrative and technical services unit, and of three libraries, two of which are located on the main campus in Brussels, the third in the medical complex on the northern outskirts of the city. Present library holdings of roughly 180,000 volumes are accessible in open-stack arrangement, in addition to some 3,000 periodical subscriptions. The *entire* catalog (currently about 140,000 bibliographical descriptions) is accessible online to the public. Annual growth is approximately 12,000 titles. For more information about the VUB library system see S. M. Namenwirth, "De Centrale Bibliotheek van de Vrije Universiteit Brussel" (the Central Library of the Free University of Brussels), *Bibliotheekgids*, 51, no.3-4:134–40 (1975).
3. Interactive Systems Inc. (IS), a Brussels-based company, has affiliates in France, the UK, and the U.S. The firm specializes in the development and marketing of software systems, using online, real time, interactive database management techniques. It concentrates on medical and library applications. The firm uses the MUMPS operating systems exclusively.
4. Virtually from the start, the VUB library made use of computer technology in producing its catalogs. Through the services of a British software house, local cataloging data were transformed into COM catalogs (annually by author, title, and subject in addition to monthly cumulating appendixes). For a variety of reasons, this batch application was abandoned, however, and the decision made to initiate a joint development with IS. For details of this batch system, see H. D. L. Vervliet, "The Machine-Readable Cata-

logue of the UIA Library Antwerp: An Experiment with an Interim MARC-Compatible Cataloguing System," *Program* 8:117–33 (July 1974). For more information about this decision consult S. M. Namenwirth, "Online, mini, geïntegreerd en interactief: waarom?" (Online, Minibased, Integrated and Interactive: Why?), *Archief—en Bibliotheekwezen in België* 48:281–89 (1977).

5. Since the installation of the library's own hardware, the university has: (1) Implemented certain, mostly minor modifications to the existing subsystems, although a few, more extensive adjustments in file structuring proved necessary as well. (2) Developed various "housekeeping" modules related to, for example, the production of different kinds of printouts (including SDI's), the output of data on magtape and the gathering of statistical data. (3) Written the editing programs necessary to improve and maintain the quality of the catalogs—this being a high-priority task considering that spelling imperfections and other inconsistencies appear to trouble the library user more in the case of online catalog searches than when using traditional catalogs, such as card or COM devices. The relative imperfection of the inherited files was due to the input method used at the time, i.e., "blind" keying of bibliographical data on telex punch machines (no monitoring of the input) and the introduction of data without matching new and existing data elements. The high cost of editing in the batch mode explains both the error rate and the desire to develop online capacities in this respect. (4) Produced parts of other subsystems, such as a module for serials, including binding but, at this time, without provision for entering single issues.
6. Present hardware (all DEC equipment) includes one PDP 11/60 minicomputer (loaded with a MUMPS operating system), to which are linked one RP06 disk drive (with a 170 MByte disk), one TE 16 magtape unit (used for the daily backup and for the exchange of bibliographical information with other institutions) and a 300-baud printer console. The library's technical services make use of seven CRTs and one 300-baud printer. Each of the three libraries offers two or three CRTs for public catalog searches and one 300-baud printer for the output of bibliographical data selected during these searches. In addition, two CRTs and one 1200-baud printer are reserved for further software implementation and for housekeeping activities. All CRTs on the main campus function at 9600 baud; those of the medical library at 1200 baud, because of the limitations of transmission speed through the telephone lines linking the main campus to the medical complex. The hardware cost, at the time of purchase, was about $200,000.
7. To the English-language reader it may appear surprising that so much effort was put into the creation of an original cataloging module at the time that MARC records were available for local use, in printed form, batch or online. However, to a medium-sized, continental university library—given its particular mix of acquisitions, its use of UDC classification, and its exclusion of English-language subject headings and main entries—the employment of MARC data is of limited value. This does not exclude the future use of such data, for example, in a cooperative cataloging effort on the national or regional level.
8. A detailed discussion of this module (with extensive screen examples) has been published in: S. M. Namenwirth, M. Verpoorten, G. Alewaeters, "Hij die zoekt zal vinden: het probleem van de opzoekingsstrategie bij de interaktieve, publieke consultatie van een online catalogus" (He who seeks shall find: problems related to the search strategy for the interactive public access of an online catalog), in *Uit bibliotheektuin en informatieveld: opstellen aangeboden aan Dr. D. Grosheide bij zijn afscheid als bibliothecaris van de Rijksuniversiteit te Utrecht* (Utrecht: Universiteitsbibliotheek, 1978) (Reeks bibliotheek en documentatie, 3), p.430–45.
9. No distinction is made from the user's point of view between personal and corporate authors. During cataloging input, corporate author information is split into two parts ("principal" and "secondary"), so as to allow corporate names to be treated during retrieval like personal names. There is no doubt that a more effective recall of corporate authors could be done using a strategy of searching on distinctive words from the corporate author heading. However, as with many of the decisions made during the problem analysis stage, we were faced with a trade-off between simplicity of use and optimization of retrieval effectiveness. We found little literature dealing specifically with these kinds of problems at the time. We, therefore, had to anticipate user behavior as best as possible, feeling that ease in using the system should carry the greatest weight.
10. Although the umlaut is not available to the public because of the standard QWERTY keyboard, the technical services must be able to search this name form as well.
11. Automatic generation of index file entries,

i.e., without intellectual intervention during cataloging, does not prevent catalogers from modifying these during the cataloging process: each of the entries can be deleted as long as one remains; others may be added if judged helpful to the readers; references may be exchanged with principle entries, etc. By providing these references and by processing user entries through normalization routines, we satisfy the objective of not requiring users to have a prior knowledge of cataloging rules and of the way special characters are processed, in order to perform effective catalog searches.

12. In more recent implementations of MUMPS (such as DSM-11, DEC's STANDARD MUMPS version) file structure is based on the use of balanced trees. The number of logical levels no longer fixes the number of physical levels: all data are stored at the lowest physical level (subscripts—which might even be strings—are organized in ascending order) and upper pointer levels are defined by the system when necessary, to avoid the introduction of continuation blocks. This structure guarantees an optimum number of disk accesses for all data stored in the file, and a filling rate of the data-storage blocks of at least 50 percent. It implies more overhead during update or deletion (because of the ordered subscripts), but less during retrieval (because the data chains to be scanned fill one block at most); this is essential in the context of online interactive systems which are characterized by very frequent retrieval, and less frequent updating or deletion activities.
13. P. Scherer-Goossens, "Het Nationaal Project C.I.S." (The National Project of Shared Cataloging), *Bibliotheekgids* 52:20–27 (1976). ■■

The Australian Bibliographic Network—An Introduction

Chris Hannan

The Australian Bibliographic Network, in a broad sense, encompasses a variety of resource sharing and cooperative activities at the national, regional, common-interest-grouping, and institutional level. This article concentrates on a narrower usage, the centralized, online, shared-cataloging facility operated by the National Library of Australia. After a brief review of existing automated library systems in Australia, the selection and implementation of the WLN software is discussed, followed by a discussion of differences between Australian and U.S. automation environments, and some projections of future developments.

In October 1980, the National Library had the pleasure of a brief visit from Fred Kilgour of OCLC. In a conversation between Kilgour and the director-general of the National Library, Harrison Bryan, the subject of a proposal for a national network for Australia was raised. At the end of the conversation Bryan said, "Well, Fred, what do you think?"Kilgour replied, "I wish you well. You realise of course that you are attempting to do something that hasn't been successfully accomplished anywhere else in the world."

The viability of a national network may well be questioned in the light of past experience and the as-yet-unsuccessful attempts to create such an entity in the United States. There are however, a number of important factors, unique perhaps to Australia, that lead to a growing confidence that a national network for Australia can and will succeed. There is considerable support for such an undertaking within the Australian library community, and this has encouraged the Australian government to approve the commencement of a national service with the agreement and support of the seven state governments.

The proposal for a national network has come to be known as ABN (Australian Bibliographic Network). In a broader context it is seen as encompassing a number of resource-sharing and cooperative ventures conducted at the national, regional, common-interest-grouping, and institutional level. These activities will not necessarily be computer based. At the moment, however, ABN has a more specific connotation, namely the centralised online shared-cataloguing facility operated by the National Library of Australia. This service is based on the software system provided under license by the Washington Library Network.

WHAT IS ABN?

A detailed statement on ABN is provided in the publication *Draft Proposal for the Development of an Australian Bibliographic Network*.[1] In this document ABN is envisaged as supporting an integrated bibliographic network through both centra-

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lised and decentralised facilities. A number of aims for the centralised services of ABN were identified. They are:

1. To develop a comprehensive national database of machine-readable records for all types of library materials, providing: (a) a pool of bibliographic records, and (b) related location information reflecting the holdings in Australian libraries of particular items described in the pool of records.
2. To implement an enquiry system that permitted the widest possible access to the national database in the most effective and efficient manner.
3. To provide a range of products and services based on the national database.
4. To accommodate a range of decentralised services with a view to promoting the fullest possible use of the national database.
5. To develop an Australian authorities system.

Specific functions to be supported include:

- Shared cataloguing
- Selection of library materials
- The components of the National Union Catalogue, and regional and specialised union catalogues
- Reference and information services
- Provision of interfaces to appropriate decentralised facilities including other similar networks.

The services and products to be provided through ABN are discussed in some depth in the above-mentioned publication. They include online shared-cataloguing facilities for copy and original cataloguing supported by an online authority file. Participants can also interrogate the various files on the system, in particular the bibliographic, vocabulary, and holdings files, to satisfy particular reference requests and to assist in locating material. A variety of cataloguing products are available such as cards, spine labels, microfiche catalogues, and printed lists. Machine-readable records can also be supplied. The salient features of the WLN system are well covered in other articles[2,3] and will not be considered here.

The development of a comprehensive national database is fundamental to the ABN concept. It is expected that over time it will develop a particular Australian flavour with the addition of records derived from the Australian National Bibliography and the retrospective cataloguing of the collections of the major Australian libraries. The greater portion of library material, however, is still currently obtained from overseas sources. Consequently the database has been largely assembled from national agency MARC records issued by the Library of Congress, the British Library, the National Library of Canada, and the National Library of Australia. Activity on the database to date has been mainly confined to cataloguing by the National Library of Australia; however, this will change with the commencement of national networking.

Particular emphasis is being placed on the quality of records added to the database. The sophisticated facilities of the WLN software permit the development and application of a national authority file, and provide suitable mechanisms for vetting data before it is added to the database. These facilities, however, would be of little value without the full cooperation of the network participants. On the particular issue of standards, the ABN network is fortunate. There is a real commitment amongst Australian libraries to implementation of standards, and this is one of the measures of support that inspires confidence in the future of ABN.

The ABN proposal has taken some time to emerge and has many antecedents. It is therefore worthwhile, considering briefly the background to its development and why it has met with such acceptance.

ABN—THE BACKGROUND

The National Library, as might be expected, has been consistently involved in library automation activities in Australia, particularly efforts to develop a national system. This involvement has not always been self-initiated, and has in almost all circumstances been supported by the Australian library community. Discussions in the early seventies quickly identified the benefit of a national database, and the National Library was selected as the institution best placed to develop and maintain it.

The National Library began work on a specification for an online shared-

cataloguing system in 1975, and results were published in 1976.[4] A meeting was held between the National Library and a representative cross section of Australian libraries to discuss the proposal known as BIBDATA. Although there were some reservations about the BIBDATA proposal (particularly costs and the implied degree of centralisation), general support for the concept was expressed. This same high level of support continues to be demonstrated for the ABN proposal.

There were, of course, other developments in the area of library automation apart from moves for a national system.

The early seventies saw the implementation of a number of computer-based services by the National Library. In 1972 the production of the Australian National Bibliography was automated. This opened the way for the introduction of the Australian MARC Distribution Service (AMDS) allowing the issue of machine-readable records of Australian books in MARC format. The Australian MARC Record Service (AMRS) was introduced in 1974. This service allowed Australian libraries to request machine-readable records in MARC format from the National Library by quoting an appropriate record control number, e.g., ISBN or LC card number. The database on which this service operated consisted of national agency records issued by the Library of Congress, the British Library, and the National Library of Australia. The service was for books only and the database was not supplemented by contributions from other sources such as the customers themselves. The AMRS service was originally operated by a commercial computer service bureau on behalf of the National Library but was moved to the library's own computer facility in 1977. The bureau (known now as Libramatic) played an important role in the development of library automation in Australia, providing end-processing facilities for the customers of the AMRS service, as well as other services such as automated circulation control.

In 1976, the National Library automated the Australian Card Service. This had previously operated by using reproductions of Library of Congress cards, which were then issued to requesting libraries. The automated card service was based on AMRS and allowed Australian libraries to request catalogue cards from a number of sources by quoting a suitable control number. Automation was by no means confined to the National Library in this period. In fact libraries of all types were examining the benefits to be obtained from use of computers in their operation. It is not possible here to discuss in detail even the most important of these activities; however, there are some that are germane to the development of a national network.

An important forward step was the emergence of consortia formed for the specific purpose of exploiting automation, particularly shared cataloguing, to the benefit of their members. A number of these groups were incorporated along similar lines to SOLINET. The primary motivation for the formation of these networks has been a desire to achieve economies in the operation of the library, especially in technical areas such as acquisitions and cataloguing.

The first major consortium was formed by a group of public libraries in the state of Victoria. Members of this consortium (known as TECHNILIB) are served by a single common technical service unit responsible for the acquisition and cataloguing of library material for its members. TECHNILIB uses the services of AMRS and the Libramatic bureau to produce microfiche catalogues and other products for its members. Two other consortia are worthy of mention: CLANN and CAVAL. Both of these have been constituted as limited liability companies.

The CLANN organisation operates in the state of New South Wales primarily for the purpose of operating an automated shared-cataloguing network for its members. It is essentially a consortium of small colleges (tertiary institutions), although it is now seeking to broaden its base of operation and includes a public and a government departmental library in its membership.

CAVAL, a Victoria-based consortium, also has automated shared cataloguing as a primary aim, although it has embarked upon a number of other resource-sharing activities, for example, reciprocal borrow-

ing for library users and cooperative storage facilities. It is the largest consortium in Australia at the moment, with 29 members, all of them academic institutions (with the exception of the State Library of Victoria). CLANN and CAVAL both use AMRS and Libramatic services for the selection of records and the production of microfiche catalogues.

These groups have contributed significantly to the development of library automation in Australia, particularly in smaller libraries that might otherwise be forced to contend with expensive manual systems. They have also provided a sound base for the implementation of a national network and are likely to play key roles in promoting the rapid expansion of ABN.

The larger academic libraries were also in the forefront in applying computer processing to library activities especially in the areas of circulation control and cataloguing. All of these developments, however, at the National Library, commercial bureaus, and elsewhere, were largely batch offline systems with little or no application of the more sophisticated online techniques.

Restrictions on growth in the public sector and restrained economic conditions meant that moves toward a national system, especially on the part of the National Library, were slow. Some problems had been identified with the BIBDATA proposal including:

- The cost of computer hardware;
- The cost of data communications; and
- The lack of a suitable software system.

The first two problems could be expected to be resolved by time with substantial reductions in costs predicted in both of these areas. A solution to the third problem still had to be found.

The National Library investigated a number of software systems during the period 1975–77, but none were considered suitable. In late 1977 the National Library decided to acquire the system operated by the British Library in support of its BLAISE services for a trial period. However, problems were encountered by the British Library in its software development programme, and the National Library again considered alternatives and identified the WLN system as a possible candidate. It was intended that the WLN system would be considered on its ability to support the National Library's own in-house operations. However, its suitability as the basis of a national system was recognised in the selection criteria.

SELECTION AND IMPLEMENTATION OF WLN

In assessing the suitability of particular software packages, the National Library was particularly concerned with the functional capabilities of the system, its transportability, the level of support provided by the software supplier, and, of course, the cost of the software package.

The National Library used a survey document that had been developed by the National Library of Canada as a means of assessing the functional capabilities of various software systems. This document was modified to reflect the requirements of an Australian network. The survey form had been used previously by the National Library to rate other software systems including OCLC, BALLOTS (RLIN), and DOBIS. The WLN system rated most favourably against these systems, especially in the areas of cataloguing, catalogue products, and quality control.

Transportability of a software system, i.e., the ease with which it can be implemented at a new site, was of particular importance. The National Library had operated on IBM computer equipment for some time. Most of the systems that had been developed or acquired had been written in the PL/1 or IBM Assembler programming languages. Understandably, the library did not want to engage in costly software conversion or computer reequipment programmes if they could be avoided. The area of transportability was the one where most systems investigated were found to be deficient. OCLC, for example, ran on a line of equipment that was no longer in production. The WLN system was a notable exception. It ran on IBM equipment, was written in PL/1 and Assembler, and used standard manufacturer-supplied software products. The software was in fact implemented at the National Library with relative ease.

The level of support provided by the sup-

plier also required careful consideration when evaluating the various software systems. Factors to be considered include problem resolution mechanisms, software development, documentation, and training. In relation to WLN, support in the area of problem resolution was thought to be adequate. The policy of WLN relating to replication of its system suggested that prospects for software development were very good, and this certainly seems to be the case. Development projects unrelated to system replication, such as the WLN/RLIN/LC Linked Systems Project (LSP) sponsored by the Council for Library Research, will provide further opportunities for system enhancement. Documentation provided with the system is variable, and its comprehensiveness can be described as fair to good. Training has been limited but satisfactory. There are obviously problems associated with providing support for an installation that is many thousands of miles away, and under the circumstances, the level of support provided by WLN has been most satisfactory.

The cost of a packaged software system must always be related to the added cost of modifying it to meet a library's specific requirements and the cost of developing a similar system in-house. The cost of modifying WLN was negligible. The cost of acquiring WLN and related products probably represents one-tenth of the cost of developing a similar system as a new product.

Once the National Library was satisfied that the WLN system was suitable for both its own purposes and potentially as a system for a national network, it decided to implement it in Australia for a trial period. This occurred in April 1979. During the trial period, only necessary changes were made to the system and these were minimal. The system was useable within two weeks of commencement of installation and fully installed in six.

After a six-month trial, the National Library formally decided to acquire the system for its own use. A licence agreement for the software was concluded with WLN in January 1980, and the National Library began production cataloguing on the system in March 1980.

In retrospect, the problems encountered during this year of testing and implementation were acceptably few. Many of them stemmed from lack of familiarity with the system and limited knowledge of the software programs. The National Library did eventually have to make some modifications to the system to tailor it to Australian requirements and to rectify problems that had been identified.

The first major problem that had to be addressed was that of visual display terminal (VDT) support. Initially, the National Library leased three terminals from WLN. These terminal devices were not completely suitable, however, and the library undertook to develop support for alternative terminal types.

A further problem concerned MARC formats. The WLN system is based on LC MARC. Australia has its own MARC specification known as AUSMARC. The WLN system also had to accommodate MARC records available in the UK MARC format (Canadian MARC records did not present a problem in that they were available in LC MARC format from the Library of Congress). The solution adopted was to develop computer programs that converted MARC records from non-LC to LC format on input and in order to maintain compatibility with the Australian standard to convert from LC MARC to AUSMARC for output of machine-readable records. The WLN software then had to be modified to allow the different origins of the records to be reflected on the database without changing the internal format of the system or its orientation toward LC MARC.

The systems operated by WLN and ABN are very similar. There are, however, a number of differences between the two networks that are likely to become more pronounced as they develop. ABN is a national system, WLN a regional one, and despite differences in population and relative size of participants, it would seem that ABN is likely to become a larger network. As stated previously, Australian libraries obtain a substantial proportion of their material from a number of different overseas sources. Therefore the coverage of the databases in the respective networks will differ substantially over time. Further modifica-

tion of ABN to provide for more effective handling of bibliographic information from these different sources can be expected.

Standards for the two networks are almost certain to differ. Standards for WLN are tuned to Library of Congress standards and U.S. interpretation. While ABN will adopt a number of standards established by the Library of Congress, there is also a commitment to international standards and the development of Australian ones where appropriate. For example, Library of Congress subject headings have been adopted as a general standard; however, these will be modified over time to reflect Australian usage.

A COMPARISON BETWEEN THE AUSTRALIAN AND U.S. SCENES

Having looked briefly at the difference between WLN and ABN, a comparison of the USA and Australian library scenes may be of value. Table 1 lists some demographic facts about the two countries. It can be seen that the areas of the two countries are comparable. The populations however are markedly different, the U.S. having more than fifteen times the population. This is reflected in the population-density figures, where the U.S. has twelve times that of Australia. The manner in which the population is distributed over the Australian continent is particularly interesting. Some 52 percent of the population is concentrated in the four capital cities of the eastern and southern mainland states. Over 77 percent of the population resides in the three eastern mainland states mainly along the seaboard. Figure 1 illustrates the likely distribution of the ABN network.

Two important facts emerge from these figures. The first is that the cost of data communications is going to be high for a network such as ABN, especially when a number of low population centres in the more geographically remote areas have to be served. The second is that prospects for economies of scale, always of importance to the development of networks, are not as good in Australia as they are in the U.S.

Table 1.

	Area (Sq. Km.) (Millions)	Population (Millions)	Population Density (Per Sq. Km.)
USA	9.52	220.1	23.0
Australia	7.69	14.5	1.9

The National Library is the largest library in Australia with more than 3 million volumes in its collections. There are, however, more than twenty institutions in the U.S. that have a larger collection than the National Library. Any comparison between what might be considered comparable institutions in the two countries will almost certainly show that the U.S. institution has a significantly larger base collection, a bigger annual intake of library material, and a more substantial budget. If, for example, we consider the National Library and the Library of Congress, the latter has a significantly larger collection with more than 75 million items. The annual intake of monographs for the National Library is approximately 60,000 titles. The Library of Congress receives some 350,000–400,000 titles annually. The annual budgets for fiscal year 1981/82 are $189 million for the Library of Congress and $18.4 million for the National Library. Obviously, then, the economics of networking in Australia have to be very carefully considered. It might be argued that there is insufficient scope for competing bibliographic utilities.

There are significant political differences between the two countries. While they both embrace the free-enterprise ethic, it is not quite so pronounced in Australia. Many Australian industries are highly protected, and the government is often involved in what might be described as private-sector activities, for example, banking and the airlines. The involvement of the National Library, a government-funded organisation, in information services should not be surprising. Until recently the involvement of the private sector in library automation has been rather limited. The activities of not-for-profit companies have also been minor by comparison with the United States. Australian libraries are almost totally government funded, with very little involvement of private trusts, certainly not to the extent such funding is evident in the U.S.

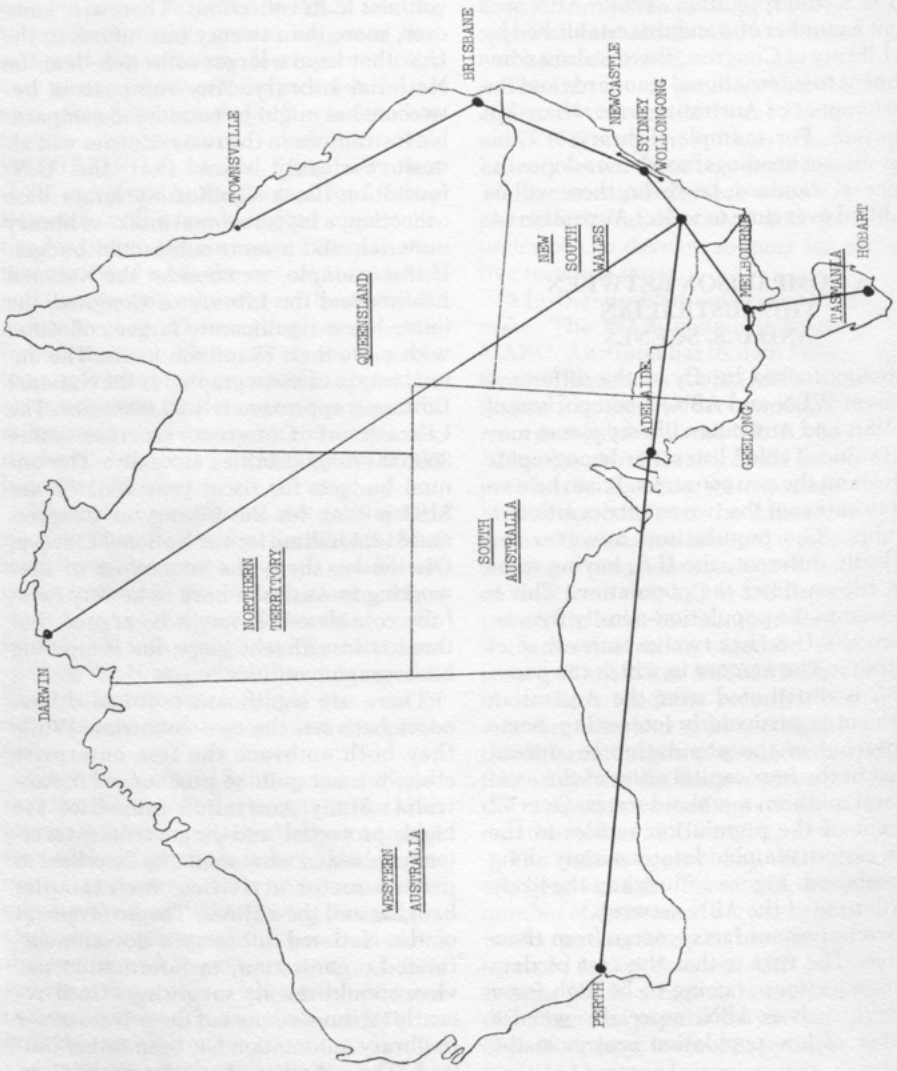

Fig. 1. Future ABN Network.

The National Library enjoys a prominent position amongst Australian libraries, with a particular responsibility to provide national bibliographic services. Most importantly, it has the support of the library community in its endeavours to develop a national system.

CURRENT STATUS AND FUTURE DEVELOPMENTS

ABN formally commenced operation on November 2, 1981, with five participants. It is expected that by the end of 1982 there will be at least twenty participants, and these will include some of the largest and most influential libraries in the country. Two important committees have been formed to manage the network. A standards committee with responsibility for the establishment of standards and a network committee responsible for advising the National Library on policy and operational matters relating to the network. A separate group known as the ABN Office has been established within the National Library to provide support for network participants. These will complement staff working in the ADP Systems branch of the library who will provide computer support.

Understandably, the first objective of ABN will be to consolidate its customer base through a period of horizontal expansion. The hope is that the network will have expanded to one hundred participants by 1986. These participants will represent more than four hundred libraries. Present indications are that ABN will be utilised by all types of libraries including research, academic, special, public, and school libraries.

A number of enhancements to the system have already been proposed. One of the earliest requirements, in line with the state aims of the centralised service, is the development of an authorities system. It is expected that the LSP project being undertaken jointly by WLN, RLIN, and LC will contribute significantly to such a project.

At the moment, the ABN system only provides for the cataloguing of films, books, and serials. An investigation has commenced into ways in which cataloguing for other materials can be satisfactorily achieved.

It was decided when formulating the ABN proposal that the centralised system would not attempt to provide services and facilities that are better developed at the regional or institutional level. These would include circulation systems, serials check-in, and most importantly, online public catalogues. It will be necessary therefore to develop interfaces that will promote the speedy and efficient transfer of information from the centralised system to regional or institutional systems and vice versa. It is expected that the development of such interfaces will receive early priority.

Looking a little further into the future, it seems inevitable that an automated interlibrary lending system be developed to complement the facilities that are already there. Having identified required material and (it is hoped) where it is held, the next logical step is to obtain it if it is not held in the user's institution.

There is evidence of a growing interest in the interlinking of networks. The interconnection of the major bibliographic utilities in the U.S. has been a subject of discussion for some time now. Transfer of information between WLN and RLIN is implicit in the LSP project. There is also scope for internetwork connection in Australia. There exists at present three information networks excluding ABN. The ability to move easily from one network to another using the same terminal equipment would be of both economic and practical benefit to users. Perhaps in the not-too-distant future the interconnection of networks in different countries will also become a reality.

The scene has now been set for the development of a national network in Australia. The success of the endeavour rests with the Australian library community as it is only through its support, especially the practical one of participation, that the network will prosper. ABN must meet the challenge to succeed not only in the short term but also in the future. It must prove itself adaptable to changes in both the requirements of the users and the environment in which it operates. Changes in technology and society could see radical changes in libraries and librarianship over the next twenty years, and a system such as ABN must have the necessary flexibility to take advantage of these changes, and indeed turn them to the benefit of library users.

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The Library Superstation: A Library Guide to Satellite Earth Stations

Mary Diebler

Satellite communications technology is evolving at a dramatic rate, making advanced telecommunications more affordable and accessible to public services. Recently, libraries have begun to become more involved in using the satellite technology through their participation in the cable library (CATVLIB) network as video-teleconferencing receive sites. Some libraries are becoming more interested in going one step further—acquisition of their own satellite hardware. This article is designed to present a step-by-step guide for those libraries considering an earth-station purchase. Determining the need for a library satellite dish is discussed with potential library applications given. Programming availability is defined and several programmers listed. In addition to this regular satellite programming (most of which is for cable television use), occasional programming, such as video-teleconferences, is explained. Earth station and vendor selection are discussed, including hardware, technical parameter alternatives, vendor services, and costs. Recommendations for library satellite network aggregation are raised, and examples of libraries acquiring satellite access are given.

As technology becomes more affordable and more indispensable, some libraries will find themselves in the enviable position of selecting an appropriate earth station for library satellite communications. The advent of domestic commercial communications satellites in the mid-to-late 1970s inspired a surge in the number of ground hardware manufacturers. Consequently, a variety of earth stations, available at a wide range of prices and with various capabilities, have flooded the marketplace, often leaving a trail of confusion to the novice charged with making a prudent purchase.

WHERE DO I BEGIN?

Define All Potential Uses

As with the addition of any new piece of equipment, a library must comprehensively assess its reasons for purchase. Make a list of all potential uses of the earth station. Research additional uses by contacting other libraries with satellite hardware or groups, such as the PSSC, with satellite communications expertise, particularly in the public sector. Don't forget your patrons. Undoubtedly, the hardware will be used to offer them special services, such as an educational or business video-teleconference, and they might have definite suggestions as to hardware use. Let yourself brainstorm about the future. Remember, you're going to make a significant investment, and you don't want to be caught with obsolete or limited hardware several years later. Satellites offer all the opportunities current terrestrial telecommunications media do, and much more.

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Popular satellite communications applications include:

- Distribution of preproduced entertainment video programming
- Distribution of preproduced instructional video programming, including courses of study
- Distribution of nonvideo signals, e.g., voice, digital, facsimile
- Teleconferencing for continuing education
- Conference extension through teleconferencing
- Teleconferencing for diagnosis and consultation
- Teleconferencing for planning, advisory, and administrative functions
- Shared resources and specialists via satellite services

If your library can afford it, you may want to contract consulting services to assist you in determining your ultimate goals and then to achieve them through the actual purchase.

Locate Available Programming

If you've marked an interest in receiving preproduced programming on your list of potential uses, you must be aware of what exists and how you can legally receive it. Currently available *regular* programming is virtually limited to video, rather than audio or data. Most video programming, such as Home Box Office and other cable television fare distributed via satellite is covered by a strict copyright. Although at the present most of this type of programming is not scrambled, and anyone with normal video receiving equipment can technically pick up the video signals, it is illegal to do so without paying for it. However, a major problem has been that these programming agents lack provisions for handling individual subscriptions, making it difficult to be an honest program recipient. Instead, programmers sell their programs to cable systems, hotels, and major networks.

Thus, you should acquaint yourself with what kinds of programming are being carried via satellite, and directly contact the programming agents themselves to determine if, and under what conditions, your library will be able to subscribe to their service, usually for a fee. Below are several of the top programming services/agents:

American Educational TV Network (AETN)
2172 Dupont Drive
Irvine, CA 92715
(714) 955-3800

Appalachian Community Service Network (ACSN)
1200 New Hampshire, Suite 240
Washington, DC 20036
(202) 331-8100

Black Entertainment Television (BET)
Prospect Place, Suite 300
3222 N Street, NW
Washington, DC 20007
(202) 337-5260

Cable News Network/WTBS-TV ("The Superstation")
1050 Techwood Drive, NW
Atlanta, GA 30318
(404) 898-8500

Cable Satellite Public Affairs Network (C-Span)
3800 North Fairfax Drive
Arlington, VA 22203
(703) 525-3030

Christian Broadcasting Network (CBN)
Virginia Beach, VA 23463
(804) 424-7777

Entertainment and Sports Programming Network (ESPN)
ESPN Plaza
Bristol, CT 06010
(203) 584-8477

Home Box Office (HBO)
Time and Life Building
Rockefeller Center
New York, NY 10020
(202) 841-2433

Modern Satellite Network (MSN)
45 Rockefeller Plaza, Suite 1460
New York, NY 10111
(212) 765-3100

Nickelodeon
1211 Avenue of the Americas
New York, NY 10036
(212) 944-4250

People That Love (PTL)
Charlotte, NC 28279
(704) 554-6080

Satellite Program Network (SPN)
8252 South Harvard
Tulsa, OK 74136
(918) 481-3275

Spanish International Network (SIN)
250 Park Avenue
New York, NY 10177
(212) 953-7500
Trinity Broadcasting Network (TBN)
P.O. Box A
Santa Ana, CA 92711
(714) 832-2950
USA Network
208 Harristown Road
Glen Rock, NJ 07452
(201) 445-8550
WGN-TV (Channel 9)
2501 West Bradley Place
Chicago, IL 60618
(312) 528-2311

In addition to regularly distributed video programming, live, interactive occasional programming is often available via satellite. These special, often educational programs are called satellite video-teleconferences and are generally sponsored by an organization for its staff, membership, clients, or the public. PSSC, through its National Satellite Network, has coordinated and assisted in more than 200 of these satellite events. As travel costs continue to rise and budgets continue to shrink, video-teleconferencing will increase as an alternative to travel and as a means of program extension. Since this kind of programming is customized, and receiving locations are preselected, it is difficult to locate video-teleconference program opportunities in advance.

However, once your earth station is operational, if you desire to become a video-teleconference receive site, a service that is revenue-generating, you should contact video-teleconferencing coordinators, such as PSSC, and make them aware of your library's satellite access capabilities. Then, your library can be called upon to serve as a video-teleconference "receive site."

Buying an earth station for the *sole* purpose of receiving current available regular programming is *not* a valid justification for purchase. Do thoroughly investigate other uses.

Locate Similar Satellite Communications Users

As a single entity, your library will be limited in its satellite communications opportunities. Preproduced video programming legally requires expensive subscriptions, if available to individuals at all. Video-teleconferencing opportunities should increase, but your library may not always be requested as a receive site. So, where else do you turn? Try finding others in your position and aggregating into a network.

Satellite communications becomes more cost-effective when large distances or mountainous terrain are involved, since a communications satellite is both distance and terrain insensitive. To a communications satellite positioned in geostationary orbit, 22,300 miles above the equator, it is just as far from Los Angeles to San Francisco as it is from Los Angeles to New York. Long-distance charges are irrelevant.

It was this logic that encouraged the Corporation for Public Broadcasting (CPB) to institute the Public Television Satellite System (PTSS) in 1978 and the Public Radio Satellite System (PRSS) a year later. At that time, Public Broadcasting Service (PBS) and National Public Radio (NPR), who once distributed their programming terrestrially, switched their nationwide affiliates to satellite distribution.

Satellite communications-users groups exist. Look for other libraries or educational institutions with satellite hardware. As your group or network grows in quantity and becomes more geographically dispersed, you may wish to pool your financial and human software resources and become active users (programmers) of your own network. Academic libraries may be able to share college telecourses. Public libraries may enjoy sharing locally produced cable-access programming. School libraries may aggregate to secure the live, interactive services of a children's author. Special libraries may wish to share expensive, special reference materials. Aggregated as libraries, all categories can benefit from special library educational programs, such as the recent ALA-sponsored conference program on library marketing.

Finding the Right "Dish"

Capabilities

Once you've defined your library's present and projected satellite communica-

tions needs, you will have outlined the technical parameters your earth station will require. Will you need data capabilities only? Video only? Data, audio, and video? Do you anticipate a need to routinely transmit? Or receive only? Due to the high expense of a satellite transmitting station (uplink), most earth stations currently operational are "downlinks" or "television receive-onlys" (TVRO).

Location

In addition to planned uses of your earth station, you must consider its location. Will the antenna be directly on the library's premises, on the roof, or some distance away from the electronics and viewing facility? You should have a site survey done to determine positively that there are no problems, such as obstructions (trees, buildings), microwave frequency interference, zoning restrictions, or aesthetics regulations. Unfortunately, an earth station cannot be located just anywhere. This aspect requires careful planning. You might ask the satellite hardware vendors marketing their earth stations to visit your library if they have staff able to perform a site survey. Many vendors aren't staffed for this.

Satellite Interface

You will need to specify which U.S. commercial satellites your library wishes to access. As of February 1982, fourteen communications satellites serve the U.S. At least twenty-five more have been authorized for launch and construction by the FCC. A list of present and planned satellites follows this discussion.

Three decisions must be made regarding satellites to be accessed. First, the number of satellites you wish to access will determine whether your earth station will need a fixed or steerable antenna. The antenna, which is usually shaped like a dish, is pointed toward the satellite to be accessed. If you need only access one satellite, a "fixed" facility pointed at that satellite only will be sufficient. However, more than likely, your library will want access to two or more satellites. That capability will require a "steerable" antenna, which can be steered from satellite to satellite, providing total access flexibility.

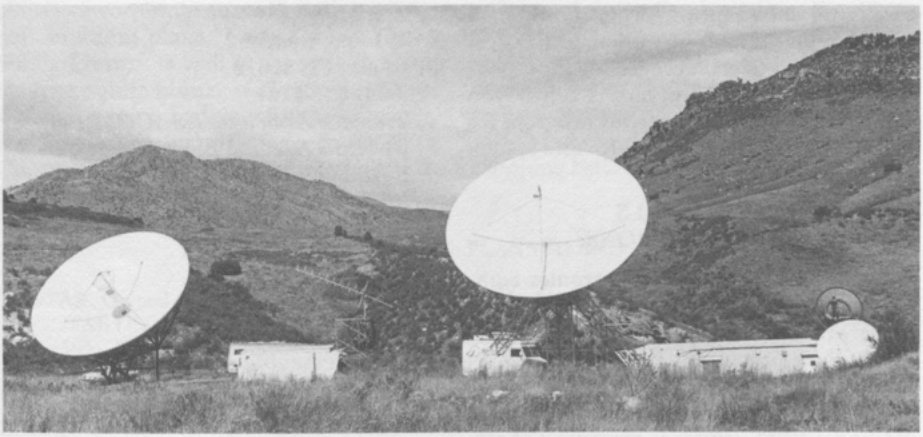
The second decision revolves around the need to access more than one satellite *simultaneously*. Until recent technical innovations, satellite antennas were designed to access only one satellite at a time. They are generally 15 to 16 feet (or 4.6 to 5m.) in diameter. Some cable systems, for example, have more than one earth station, so they can receive cable programming from two different satellites simultaneously. Multibeam satellite antennas, like the "Torus," have recently been designed and are now being marketed. Their special antenna design enables them to "look at" and access more than one satellite simultaneously. Unless your library anticipates heavy satellite access, one steerable earth station will probably suffice.

The last decision examines satellite frequencies. All but two U.S. commercial communications satellites operate in the C-Band; that is, 6/4 GHz. Satellite Business Systems' two satellites and some of Canada's ANIK satellites operate at the higher 14/12 GHz, or Ku-Band. The frequencies of the satellites you plan to access will dictate the earth station needed. Most earth stations available today interface with C-Band satellites. Satellite hardware manufacturers are just beginning to produce Ku-Band earth stations. The market for Ku-Band terminals is not large enough presently to encourage more availability. However, a future generation of Ku-Band satellites have advanced from the drawing board to construction. Hybrid satellites, operating at both C-Band and Ku-Band are awaiting launch. Hybrid earth stations are being announced as well.

The best safeguard against earth station obsolescence or outgrowth is its ability to be upgraded *inexpensively*. Learn a lesson from computers. Ask your vendors to outline expansion options, and don't forget to have them translate those options into dollars and cents.

Vendor Services and Competency

Ask each vendor to provide you with a *written* cost estimate, itemizing exactly what you will be buying for that price. An earth station is composed of three main components: an antenna, a receiver, and a low-noise amplifier (LNA). However, you



PSSC's Denver Satellite Access Facility (DSAF) is located in Morrison, Colo. These 36-foot uplinks can transmit to any U.S. communications satellite and are linked via microwave to PSSC's Denver teleconferencing studio.

should be receiving more than the physical earth station for your investment. Make sure your quote includes vendor services such as site survey, installation, antenna pointing, maintenance, and even training. In addition, you may inquire as to licensing and frequency clearance services. The FCC does not require receive-only equipment to be licensed. Unless the dish is located in a concentrated urban area, or you anticipate the possibility of current or future interference, the cost of the license tends to dissuade its purchase. These services are as important as the equipment, and, sold separately, can be as costly. "Homebrew" earth station kits are available for only several thousand dollars, but are often more trouble than they're worth. One high school in Illinois, however, does sport a student-built TVRO.

If you plan to offer external satellite services, you should consider investing in an earth station capable of receiving a broadcast quality signal. Monitors wired to display satellite programming received by your earth station should be of equal quality for optimum results.

A vendor may also offer you a better deal if you elect to purchase a turnkey earth station, rather than buying individual components, much like a stereo system. While less expensive, there's always the chance of sacrificing quality, as some manufacturers specialize in a particular component.

Multiple earth station orders can result in reduced rates. This opportunity should encourage network aggregation, such as an area satellite library consortium. Current broadcast quality TVROs with a service and installation package are generally selling for $10,000–$20,000. However, local vendors may offer more inexpensive deals. Also, advances in the technology are lowering costs as well.

Equipment Interface

Don't forget to consider the equipment with which your earth station will interface: monitors, projectors, computers, relay systems, and others. While current plans may not include data services, for example, don't overlook providing for that future capability.

Program Capacity

A video program currently takes up a full satellite transponder (channel).* Most U.S. satellites have either 12 or 24 transponders each. If you wish to receive programming from more than one transponder of the same satellite *simultaneously*, you will need a satellite receiver for each transponder accessed. Thus, your library could be

*Video compression has made it possible to use only one-tenth of a transponder for a video signal, although costs are still prohibitive for common usage.

receiving subscription programming on Transponder 9 and, at the same time, receive a video-teleconference on Transponder 16 using two receivers. Even if you don't anticipate simultaneous program reception, a second receiver provides system redundancy.

WHO SELLS EARTH STATIONS?

More and more local electronics companies are marketing earth stations, but these are often the "homebrew" variety. Study their brochures. Protect yourself by doing your homework, which includes learning the vocabulary. An advantage of finding a local vendor is proximity of service. If the vendor will allow your library to rent his equipment to participate in a specific satellite program, you have an opportunity to sample the quality of hardware, service, and competency before you actually buy.

Below is a selected alphabetical list of manufacturers you may wish to contact for further information:

Gardiner Communications
1980 Post Oak Road
Houston, TX 77056
(713) 961-7348

Harris-Satellite Communications Division
P.O. Box 1700
Melbourne, FL 32901
(305) 724-3000

Microdyne
491 Oak Road
Ocala, FL 32672
(904) 687-4121

Microwave Associates (MACOM)
63 Third Avenue, Bldg. 10
Burlington, MA 01803
(617) 272-3000

Satcom
1756 Junction Blvd.
San Jose, CA 95112
(408) 286-6000

Scientific Atlanta
3845 Pleasantdale Road
Atlanta, GA 30340
(404) 441-4000

A FUTURE TREND?

In 1975, Home Box Office gambled that their satellite-distributed pay-TV programming would be successful even though most cable systems did not have a TVRO. That risk has since established HBO as the foremost pay-TV programmer and has set a trend in satellite-delivered cable programming.

As the number of earth stations available for shared use continues to rise, offering expanded flexibility and alternatives, video-teleconferencing use trends will follow an upward pattern similar to HBO, and the "library superstation" could evolve to provide such services. Farmington (Conn.) Public Library has already announced its

PSSC's Transportable Earth Sation (TES) can make any facility an instant uplink. The TES is based in Denver.

plans to incorporate an earth station into its new building plans. Lake County (Ind.) Public Library is well on its way to being the first public library with satellite access if they stay on schedule with their upcoming hardware installation. Burlington County (N.J.) College recently installed its own satellite earth station with much involvement from the Learning Resources Department. Several other libraries have access to satellite dishes from their local vendors when the need arises. Satellite technology is here, and libraries must not be left behind. It's not too early to make a shopping list! ■■

APPENDIX 1. SATELLITES: PLANNED AND PRESENT

WESTAR: Owned and operated by Western Union. 12 transponders each at C-Band.
- WESTAR I (launched 1974)—Used for primary PBS and NPR programming, offers some occasional traffic. Being phased into retirement.
- WESTAR II (launched 1974)—Primarily message traffic.
- WESTAR III (launched 1979)—Message, occasional, independent, and cable networks.
- WESTAR IV (launched 1982)—24 transponders. Replacement for WESTAR I, carries some cable programming.
- WESTAR V (launched 1982)—24 transponders. Carries data and some cable programming.
- WESTAR VI (to be launched 1984)—24 transponders.
- Advanced WESTAR (to be launched 1983)—16 transponders, shared with NASA (12 at C-Band, 4 at Ku-Band and 20 multiple-access channels at S-Band). (Tracking and Data-Relay Satellite).

SATCOM: Owned and operated by RCA Americom. 24 transponders each at C-Band.
- SATCOM I (launched 1975)—Was all cable programming traffic (Cablenet I). Currently being phased into retirement.
- SATCOM II (launched 1976)—Primarily Alaskan programming traffic.
- SATCOM III (launched 1980)—Lost during launch.
- SATCOM III-R (launched 1981)—Replacement for SATCOM III; new Cablenet I.
- SATCOM IV (launched 1982)—Cablenet II; BizNet.
- SATCOM V (to be launched 1982)—Will be dedicated to Alaskan programming, (ALASCOM I), replacing SATCOM II.

COMSTAR: Owned and operated by COMSAT General, leased to AT&T and GTE. 24 transponders each at C-Band.
- COMSTAR D1 (launched 1976)—Primarily telephone and data service. Eleven transponders were leased to cable programmers due to loss of SATCOM III. Co-located with D2 to operate as a single satellite thus conserving power.
- COMSTAR D2 (launched 1976)—Same as D1.
- COMSTAR D3 (launched 1978)—Primarily telephone and data service.
- COMSTAR D4 (launched 1981)—Primarily telephone and data service.

TELSTAR 3: Owned and operated by American Telephone & Telegraph. 24 transponders each at C-Band.
- TELSTAR 3A (to be launched 1984)—Will carry telephone, data, and Satellite Television Service.

G-STAR: Owned and operated by GTE Satellite Corporation (G-SAT). 16 transponders each at Ku-Band.
- G-STAR 1 (to be launched 1984)—Will carry telephone, data, some video.
- G-STAR 2 (be launched 1984)—Same as 1.

SPACENET: Owned and operated by SP Communications Corporation. 24 transponders each (12 at C-Band; 12 at Ku-Band).
- SPACENET I (to be launched 1984)—Will carry video cable programming distributed to CATV operators and other users whose ground network is dubbed EARTHNET I.
- SPACENET II (to be launched 1984)—Will be more business/customer-oriented.

GALAXY: Owned and operated by Hughes Communications, Inc. 24 transponders each at C-Band.
- GALAXY I (to be launched 1983)—Will carry video and cable programming.
- GALAXY II (to be launched 1983)—Will carry primarily business and data services.
- GALAXY III (to be launched 1984, pending FCC authorization.)

SBS: Owned and operated by Satellite Business Systems. 10 transponders each at Ku-Band.
- SBS 1 (launched 1981)—Primarily digital data and audio service.
- SBS 2 (launched 1981)—Primarily digital data and audio service.
- SBS 3 (to be launched 1982 +).

Hebrew Cataloging and the Computer—The View from Israel

Elhanan Adler

Both the American and Israeli library communities have been working on the creation of machine-readable Hebrew bibliographic records using different approaches and with virtually no coordination. Differences in American and Israeli cataloging standards are discussed as they relate to automated cataloging. The existing Israeli computerized cataloging systems are presented and evaluated in terms of compatibility with American standards.

INTRODUCTION

With the successful implementation of roman-character MARC cataloging now taken for granted, attention has been given in recent years to the problems of handling bibliographic data in nonroman scripts. An underlying principle has been that these scripts should be retained and displayed, not merely romanized. Particular attention has been given to Hebrew since many American research libraries have significant Hebrew holdings in support of programs in Bible, Judaica, and Near Eastern studies. Terminals have been developed and standards have been prepared.[1] All of these developments have taken place independent of and with virtually no contact with the library and computer communities in Israel, who should be the main source of Hebrew bibliographic data and who have developed systems and standards of their own.

This lack of coordination, while difficult to understand, might have been justifiable post-factum had it led to a successful implementation. Unfortunately this is not the case. The recent decision by OCLC to defer plans for Hebrew cataloging is the most recent but not the only setback in this area.[2] The pioneering work in Hebrew cataloging done by the New York Public Library (NYPL) has come to an end due to the NYPL Research Libraries' decision to abandon its own system in favor of RLIN.[3] RLIN itself, while committed to displaying nonroman scripts, is at this time more concerned with implementing a Far Eastern capability.

In this situation it is doubly important to evaluate the work done by Israeli institutions and to what degree it can be made compatible with the needs of American libraries. This paper will attempt to present the major computer and cataloging problems involved and the approaches taken to them in Israel today.

CHARACTER SET

The Hebrew alphabet consists of twenty-two single-case consonants, five of which have additional final forms (a total of twenty-seven characters). Vowels (aside from several consonants that sometimes have vowel value and that will be discussed later) and accent marks appear as signs above, below, and within the consonants. With the major exception of elementary readers, poetry, and dictionaries, Hebrew

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is normally written unvocalized (i.e., without the vowel and accent signs), and the reader is expected to fill them in according to grammar and context. Standard cataloging practice in both Israel and the United States is to record all Hebrew works in the nonvocalized form so the vowels and accents need not concern us here. (Israeli manual-cataloging practice has allowed the insertion of a single vowel sign by hand in cases of ambiguous context.)

Since we are dealing with a total of twenty-seven different characters, the Israeli data-processing community has adopted the simple solution of incorporating them *within* the existing character sets, usually instead of the lowercase roman characters. In 8-bit ASCII code, for example, the Israeli standard assigns the decimal values 96 to 122 to the Hebrew character set (since the roman alphabet has only 26 characters, it was necessary to displace character 96, the accent grave, as well). This pragmatic arrangement allows the display of both roman (uppercase) and Hebrew characters with no need for escape sequences and with minimal hardware adjustments. The loss of the roman lowercase appeared (to the Israeli data-processing community) a small enough price to pay for this solution.

The American approach to the Hebrew character set is quite different because Hebrew is not the only alphabet of concern. The American solution must encompass several nonroman scripts in parallel with an extended roman character set. This approach requires a series of escape sequences to shift to alternate character sets. Hardware problems are also much more complex, as will be discussed later.

I/O DEVICES

The Israeli approach to the Hebrew character set (substitution for lowercase roman) provides a simple solution to the hardware display of Hebrew letters. CRT terminals and matrix printers need only be supplied with an alternate ROM to display Hebrew in place of lowercase roman. Most Israeli distributors of I/O equipment offer this option. Many firms now offer the capability for switching from one ROM to the other by hardware (an external switch) or software (a control sequence). Impact devices are a bit more complicated as they require special print chains, bands, daisy wheels, etc., on which the lowercase roman has been replaced by Hebrew. Most impact printers sold in Israel are available with such equipment. Photocomposition equipment, laser printers, etc., use a vastly enlarged character set and, while requiring much greater software control, do not present hardware problems.

Israeli-adapted terminals usually include the capability for cursor or printhead advance from right to left in order to allow normal display of data as it is input (the data is, of course, stored in the order keyed). In most terminals the change of direction is software-controllable. In output this is less of a problem; a line of Hebrew can be software-reversed, right-justified, and then printed from left to right.

An additional problem with Hebrew terminals is the placement of the keys themselves. The first Hebrew terminals changed display alone, i.e., if the Hebrew letter *shin* uses the ASCII code for lowercase *y*, then keying the letter *y* would cause a *shin* to be displayed. This approach bore no relation to the layout of the standard Hebrew keyboard, required retraining typists, and made life very difficult for those who had to continue using typewriters as well as terminals. The new generation of Israeli Hebrew terminals change the codes sent by the keys as well as the characters displayed. Thus, a capital Y remains unchanged but a lowercase *y* (in Hebrew mode) will now be sent to the computer as a lowercase *h* corresponding to the Hebrew *tet*, the letter normally located at the *y* key.

The devices available in the United States are far more limited and follow different standards. A few terminals such as the Beehive B601, the Telex model 476L, and the OCLC model 110 have Hebrew capability, but at this stage it is more for experimentation than actual use. These terminals use an expanded character set with special escape codes. Hebrew output in the United States is usually done via laser printers or photocomposition (as in the NYPL catalog). The NYPL input was done using a transcribed form subsequently interpreted by the computer as Hebrew.[4]

This is a tedious and difficult way to input data.

CATALOGING STANDARDS: ISRAEL AND AMERICA

Israeli cataloging has always been based on American cataloging practice, with certain adjustments in Hebraica and Judaica. The current Israeli cataloging code is based on the 1967 AACR1.[5] A new edition based on AACR2 is now in preparation. Most university libraries have already made the changeover to AACR2 with the same problems and compromises as their American counterparts. Other library sectors will make the change as soon as the new Israeli code appears.

Roman-character descriptive cataloging in Israel is virtually pure American practice, and most university libraries have used or are using NUC, LC cards, or LC MARC data as their cataloging source. Some variant headings have, however, developed for "anonymous classic" Judaica. For example, Israeli libraries never used the now defunct *Jews. Liturgy and ritual*, but rather the romanized heading *Tefillot* (prayers) with additional subheadings. The Passover Haggadah was always entered directly under the heading *Haggadah*. Interestingly, AACR2 has brought American practice closer to Israeli practice with regard to many Judaica headings.

Hebrew cataloging presents a very different situation. In American cataloging practice, Hebrew characters appear primarily in the body of the entry and in some notes. All access points with the exception of titles and series appear in romanized form. In the major American Judaica libraries, there is usually a separate title and series catalog to allow these headings to be retained and filed in Hebrew. Other libraries file them in romanized form. (A study on the problematics of Hebrew cataloging, particularly from the American standpoint, has been published by Hass Weinberg.)[6]

The Israeli practice is quite different. Separate catalogs are maintained for roman, Hebrew, Arabic, and occasionally Cyrillic scripts (some Israeli libraries follow American practice on Cyrillic). In each catalog *all* access points are in the script of that catalog. Furthermore, all standard notes, abbreviations, etc., are given in the same alphabet. An Israeli Hebrew cataloging record might not contain a single roman character unless it appeared on the title page itself.

The advantages and disadvantages of separate script catalogs have been discussed recently by Spalding[7] and are not relevant to this discussion. What is important is that Israeli libraries could not consider using romanized access points with a Hebrew-speaking public, and that American libraries are highly unlikely to change from their current practice.

Use of an Israeli cataloging record by an American library (or vice versa) would require extensive changes:

1. Assigning alternate forms of all access points except title and series (including the authority work involved).
2. Changing abbreviations and standard terms (*p.*, *ill.*, *s.l.*, etc.) from one script to the other.
3. Translation of notes.
4. Miscellaneous minor inconsistencies: e.g., date of publication transcription might also have to be changed as the Israeli practice is not to supply a Christian-era year if the piece does not contain one and if a Jewish calendar date appears.

Additional changes would be required also in classification and subject headings. Even those Israeli libraries that use LC classification and subject headings have made changes on subjects related to Israel and Judaica (e.g., moving the material on the Holocaust from World War II to Jewish history). In addition, personal, corporate, and some uniform title *subject* headings are given in the alphabet of the work cataloged and filed in its author/title catalog (a Hebrew work on Shakespeare would have a subject entry *Shakespeare, William* in Hebrew). These headings would also require a change of script.

Thus, while Israeli cataloging has been and continues to be based on American practice, a significant number of differences exist. These would make difficult the transfer and reuse of bibliographic data even on a manual basis.

MARC FORMAT AND HEBREW CATALOGING

The MARC format was designed as a universal system for the tagging and distribution of bibliographic data. Experience has shown, however, that not all foreign-language (even roman character) cataloging has been comfortably accommodated as proven by the variety of national MARC formats currently in existence and the differences between them.[8] Hebrew cataloging, as well, raises a number of MARC format problems that have not yet been seriously addressed.

Definite Articles

The Hebrew definite article (there is no indefinite article) is the letter *heh* (vocalized as *ha* or *he*) appended at the beginning of the word. Once appended it is distinguishable only by grammatical or contextual analysis, since an initial *heh* may also be an intrinsic part of the word. When using romanized headings, this analysis is done by the cataloger, who records the article in the form *ha-* or *he-*, as in *ha-Histadrut*. The original Hebrew, having only one case and no hyphen, shows no such distinction, and no accurate system exists for machine identification of articles.

MARC format allows for disregarding initial characters only in some of the title (2xx) fields, using the second indicator for this purpose. There is no similar provision for series, two-line added entries ($t subfields), corporate headings, etc. (the article *is* significant in personal names). This problem exists to a certain degree in regular MARC as well and is imperfectly solved by omitting the article. In Hebrew it is a crucial problem, since the article can be neither computer-identified nor omitted, and since a great many Hebrew corporate entries begin with the definite article.

One possible solution might be the use of a special code or escape sequence to delimit the nonfiling article. This approach has, however, no legitimacy in existing MARC format. Another solution might be the use of an additional indicator to show the position of the initial filing character. This approach, while theoretically legal in MARC, would require a third indicator in all fields, would wreak havoc with much existing software, and would still not solve the problems of author-title added entries or compound corporate headings (e.g., *Israel. ha-Agaf le-tarbut*). An additional solution to this problem will be suggested later.

Orthographic Variation

The Hebrew language uses some characters both as consonants and as so-called mothers of reading or *matres lectionis* (i.e., representing vowel signs). Nonvocalized Hebrew is written today in either of two officially recognized forms: the *ketiv haser* (defective or minimal form) and the *ketiv male* (plene form). In the first, two of the *matres lectionis*, the letters *vav* and *yod*, are omitted. In the second form both are retained. Rules for writing in the plene form have been published by the Academy of the Hebrew Language.[9]

Current Israeli usage is inconsistent in the use of these forms. In Israeli newspapers, the written medium that reaches and influences the majority of the population, one finds that some words are usually written in the full form, others in the short form, and yet others appear interchangeably in both forms. The current trend is towards the full form.

This slightly anarchistic state creates special problems for the Israeli cataloger. While bibliographic data is normally transcribed as it appears in the item cataloged, the reader cannot be expected to know whether a given title, person, corporate entry, or series appeared in the full or short form. Indeed, there may not be consistency in all the words in the same heading. The Israeli solution to this dilemma has been to force all access points into a standardized form, regardless of how they appear in the item cataloged. The result is equivalent to deciding that all authors named Shwarz, Shwartz, Schwarz, Schwartz, etc., should be entered under one standard form. The alternative would require alternate-form *see also* references for the majority of the headings in the catalog.

To make matters even more complex, two such "standardized" forms are used by Israeli libraries. The Jewish National and

University Library and some of the older libraries use the official "defective" form. The Center for Public Libraries (the producer of catalog cards to the public and school libraries) and some of the universities have opted for a compromise format: omitting the *yod* but leaving the *vav*. This form has dubious linguistic justification but is somewhat closer to popular spelling.

A different approach has been taken in the annual *Index to Hebrew Periodicals* (1977–)prepared at the University of Haifa Library. Authors are recorded as written, with cross-references from alternate forms. Subject headings are given in the most popular form with cross-references as justified and with no attempt at consistency for consistency's sake.[10] This approach has been successful in the *Index*, which is computer-produced and has authority control. It has not yet been tried in a major library catalog. Indeed, the effort involved in changing thousands of headings manually from one form to another would be prohibitive.

Since the title and series data are recorded as written on the item but filed and searched according to the standardized form used by the library, both should be retained in the bibliographic record. Current MARC format makes no provision for such alternate-form "filing fields." Such a provision would also provide a solution to the definite article problems mentioned above. Hebrew MARC should also be able to accommodate the alternate forms of spelling used by different libraries. The MARC provision for parallel sets of subject headings (LC, MESH, etc.) might serve as a model for solution of this problem. This would also allow appearance of romanized headings as well. A heading might then appear in several forms: as written, Israeli standard format #1, Israeli standard format #2, and romanized. A parallel heading capability would be desirable for American libraries as well, as it would allow network users with non-Hebrew terminals to search and display meaningful Hebrew records (e.g., for interlibrary loan purposes). This approach would, however, require expanding the indicator count so that each field could have an indicator showing its form.

Other Languages in Hebrew Script

The two above problems are limited to the Hebrew language, but other languages are also written in the Hebrew script. Yiddish is somewhat easier to handle as its articles are separate words. It is also usually written today in a fairly standardized very full form. The full Yiddish forms, however, clash so with the shorter Hebrew language forms that most Israeli (and American) libraries with major Yiddish collections prefer to keep them segregated in separate catalogs even though they are written in the same script.

Ladino (Judeo-Spanish), Judeo-Arabic, and several other dialects written in the Hebrew script are usually merged into the Hebrew catalog. Very little is currently published in these languages, but a significant body of literature exists that will ultimately have to be converted to machine-readable form. No serious analysis has been made yet of the problems these languages will present in automated cataloging.

Direction

Hebrew is written from right to left, roman characters from left to right. Data is of course stored in the order keyed. Displaying an all-Hebrew MARC field in readable fashion would require some additional programming, but this is not a MARC format problem. Multilingual fields present format problems as well, as there are segments of text coming towards each other from opposite directions. For example, if a data field *E*1, *E*2, *E*3, *H*1, *H*2, *H*3 begins with three words in English followed by three words of Hebrew, this field should normally be displayed as: *E*1, *E*2, *E*3, *H*3, *H*2, *H*1. If, however, the data could not be displayed in one line, the Hebrew words to be dropped to the next line would come from the middle (*H*3, then *H*2) rather than from the right end. NYPL avoided this problem by starting a new line with each change of script unless a special alternate escape sequence appeared in the field.[11] This local solution has no validity in official MARC.

AUTOMATED CATALOGING SYSTEMS IN ISRAEL

In Israel today there are three operational automated cataloging systems, each

of which is quite different from the other and serves different purposes. These systems are:

MARCIS (MARC ISrael)

In 1975 a proposal to use LC MARC tapes for cataloging was proposed to the Israeli university libraries by an information center connected with the Ministry of Defense (at that time the only place at which the necessary expertise was found). Three university libraries (Ben-Gurion, Haifa, and Bar-Ilan) joined in this project, which produced work sheets and card sets in batch mode.[12] The larger university libraries did not use the system and preferred to catalog manually for a variety of reasons.

After several years and due to both staff and priority changes, the Defense Information Center lost interest in MARCIS and decided to discontinue the service at the end of 1980. The University of Haifa Library, which had been one of the primary users of MARCIS, offered to take it over. The database was transferred to the university, all programs were rewritten for the university's PDP-11, and the new system became operational in March 1981.

The MARCIS database consists of LC MARC Books-English only. The database is searchable by LC card number or ISBN. While the index is kept online all day, requested records are retrieved and work sheets are printed once a day. Corrections are made online and cards are printed daily.

The University of Haifa Library provides MARCIS service also to Ben-Gurion and Bar-Ilan universities and to the Technion Medical School Library. Both the University of Haifa and the Technion subsequently process their archival records for other services (see below).

MARCIS does not, at this stage, include an original cataloging capability, and therefore no attempt has been made to use it for Hebrew. It is, however, the only Israeli cataloging system using the MARC format, and its use has trained the catalogers of four institutions in the use of MARC.

ALEPH (*A*utomated *L*ibrary *E*xpandable *P*rogram— *H*ebrew University

The decision of the Hebrew University in Jerusalem to move its faculties of humanities and social sciences to its old-new campus atop Mount Scopus (in 1981) led to the merging of twenty-five departmental libraries into one central library. As part of this reorganization and as a method of uniting collections with variant cataloging and classification (DC) standards, a decision was made to change to LC cataloging and classification and to create an online catalog. ALEPH runs on a dedicated CDC main frame and uses a database management system written at the Hebrew University. ALEPH, which bears many similarities to the European IBM DOBIS system, is primarily designed as an original cataloging system: all items must be keyed in and all access points must be checked against authority files. There is at this point no card production capability and no interface with LC MARC records, although one is planned. ALEPH includes circulation control; additional services are planned.

Both Hebrew and roman cataloging (uppercase only) can be accommodated in ALEPH in accordance with the abovementioned Israeli hardware and software standards. Users of the online catalog have the option of using Hebrew or English prompting. ALEPH has been in full-scale operation since fall 1981.

HOBITS (*H*aifa *O*n-line *BI*bliographic *T*ext *S*ystem

The University of Haifa has been active for many years in automation of bibliographic records, beginning with pure bibliography (the *Index to Hebrew Periodicals* database) and more recently adding standard library operations. The library has a dedicated PDP 11/34 minicomputer for this purpose.

HOBITS was developed as a multipurpose software package for online input, correction, and limited searching of bibliographic data, as well as batch preparation of bibliographies, catalogs, and indexes. HOBITS contains standard programs with a great many options; each application can use only those options that have been preselected and appear in a data dictionary. One of these options, for example, is the substitution of Hebrew for lowercase roman.

HOBITS has been used to date in more

than twenty different applications, e.g., preparation of bibliographies for publication; holdings lists of serials, audiovisual materials, and other special collections; and since 1980 for current cataloging. HOBITS is currently being used in three cataloging applications:

1. *SDI New Book List.* Since January 1980 the University of Haifa Library has produced a monthly personalized new book list for all departments and interested individual faculty members. Profiles are defined using LC classification numbers, keywords, or a combination of both. Monthly data is retained and serves as the nucleus of the library's bibliographic database. A COM catalog will soon be produced from this data. At first all data was keyed *after* manual cataloging had been done. With the gradual implementation of MARC and non-MARC online cataloging and card production, this redundancy has been greatly reduced and should soon disappear.

2. *ORICAT (Original Cataloging System).* The University of Haifa Library uses the above-described MARCIS service for all LC MARC cataloging. Since MARCIS does not include non-English MARC and does not have an original cataloging mode, a separate HOBITS application was set up to enable input, correction, display, and card production of original cataloging (the data being subsequently merged into the SDI system). Roman data is handled in both upper- and lowercase. Input and revision are done using a Superbrain microcomputer; card production and further data storage and manipulation are done in the library's PDP 11/34. The use of the microcomputer allows input at other sites (two other libraries have purchased the system).

3. *ULTRA—Union List of Technion Recent Acquisitions.* The Technion-Israel Institute of Technology has a decentralized library system and wished to create both a bibliographic database and a distributable union catalog on microfiche. The Technion contracted with the University of Haifa Library to use HOBITS for this purpose. The first edition of the three-part catalog (roman, Hebrew, and UDC classified) appeared in January 1982.

While ALEPH and HOBITS, the two systems that accommodate Hebrew data, have quite different goals, their approach to representation and coding of Hebrew data is quite similar. Neither system uses tags as detailed as MARC (e.g., both generic and geographic subject headings have the same tag). Neither system uses indicators or subfield codes, although some ISBD punctuation is entered. Neither is therefore "MARC compatible," even given a fairly liberal definition of that term. Both systems do contain the capability to insert alternate "filing fields" or special delimiters as a solution to the definite article and spelling problems herein discussed. Interestingly, both systems developed with very little coordination between them and arrived at very similar solutions.

CONCLUSION

Israeli libraries have, de facto, opted for a non-MARC solution to Hebrew cataloging problems rather than create a local MARC format to accommodate them. This approach may be partly due to the fact that American libraries and bibliographic centers working on Hebrew cataloging did so as a totally American project, with little attempt to involve Israeli libraries in the process, either as a development partner or as a cataloging source. Israeli librarians were at fault as well for not initiating contacts and exchange of information. However, at least some of the Israeli systems might have developed closer to the MARC format had there been encouragement from the international library community to make the additional effort required. Even at this point, greater cooperation could lead to a record that would be at least partly usable on both sides of the ocean.

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Automated Acquisitions and Collection Development in the Knox College Library

John C. Calhoun and James K. Bracken

The paper describes the automated acquisitions system that the Knox College Library presently employs and gives a brief chronology of the events that led to its development. It also compares and contrasts the system to the OCLC Acquisitions Subsystem, for which the library acted as a user evaluator in the spring of 1981. Finally, it provides details on how the system's chief management tool—a dealer report, together with several permutations (a sort by publisher and a sort by fund)—may be of use, not only in acquisitions, but also in collection development.

THE KNOX SYSTEM BRIEFLY EXPLAINED

The Knox College Library, with a collection of 200,000 volumes, has been adding an average of 4,500 new titles each year for the last three years. Since the summer of 1980, the acquisitions system has been automated. Using a terminal in the library, the acquisitions assistant is able to access the main computer in the Science/Math Center. The library's account is stored on a disc pack, and it is possible to print files from it on either of two line printers. The system's hardware is all made by the Digital Equipment Corporation (VT52 terminal, PDP-11/40 main computer, RP03 disc drive, LA120 and LP05 line printers), and it runs under an RSTS/E system monitor.

The library's account contains an "address file," a "book file," and a "cash file"—together with programs that manipulate these files. One of the programs links the first two files and prints purchase orders, and another links the last two and prints fund reports. A third program encumbers money, and a fourth expends money. A fifth checks linking elements in records when an order is initiated, and a sixth extracts and reduces records when an order is received. And finally, a seventh program, added after the first six months of service, links these reduced records back to the address file and prints a dealer report summarizing response time and discount.

Purchase orders (see figure 1) are usually issued weekly, and fund reports (see figure 2) are normally printed monthly. The vendor report, on the other hand, is compiled quarterly. The account also contains a description of the size and layout for each file type and programs to print out the contents of each file. The book file has two records in each 512-character block, the address file has three records per block, and the cash file has four records per block. A single RP03 disc pack on the DEC 11/40 computer is capable of storing 80,000 blocks, so the library could keep a fund file with 50 records, a vendor file with 500 records, an or-

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*** PURCHASE ORDER ****                                    PAGE    1
                                                          DATE 02/11/82

                SHIP-TO:      KNOX COLLEGE LIBRARY
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          TEL. 309-343-0112   P. O. BOX 500X
                EXT. 245
                              GALESBURG, IL 61401



          ARDIS PUBS.
          2901 HEATHERWAY
          ANN ARBOR MI 48104
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QUAN	**AUTHOR PUBLISHER,YEAR**	**TITLE EDITION/NUMBER** (CANCEL AFTER)**	PRICE**
1	AKSENOV,VASILY ARDIS,1981	OSTROV KRYM /81-7931 (08 WEEKS)	$ 10.00
1	ISKANDER,FAZIL ARDIS,1981	NOVIE GLAVY /81-13028 (08 WEEKS)	$ 10.00
1	POPOV,EVGENII ARDIS,1981	TVESELIE RUSI /81-48334b (08 WEEKS)	$ 5.00

Fig. 1. Purchase Order (Actual Size 8½ by 11 Inches, Designed to Fit into a Window Envelope).

DEPARTMENT	MONTH END DATE
PHYSICAL EDUCATION	12/31/81

THE FOLLOWING BOOKS ORDERED BY YOUR DEPARTMENT HAVE BEEN CATALOGED DURING THE PAST MONTH AND ARE NOW AVAILABLE FOR USE ON THE NEW BOOKS SHELF

AUTHOR	TITLE	PRICE
CRATTY	SOCIAL PSYCHOLOGY IN ATHLETICS	15.16
FIGLER	SPORT AND PLAY IN AMERICAN LIFE	17.95
LEONARD	SOCIOLOGICAL PERSPECTIVE OF SPORT	13.46
RYAN	SPORTS AND PSYCHOLOGY	5.97
SUINN	PSYCHOLOGY IN SPORTS: METHODS AND APPLICATIONS	10.76

ALLOCATION	ENCUMBERED	EXPENDED	CURRENT BALANCE
500.00	263.25	63.30	173.45

NUMBER OF BOOKS CATALOGED	AVERAGE DISCOUNT	AVERAGE TIME TO ACQUIRE A BOOK	AVERAGE COST OF BOOKS CATALOGED
5	1.29	0 MONTHS 29 DAYS	12.66

Fig. 2. Fund Report.

der file with 2,500 records, and a stats file with 5,000 records, duplicate the two larger files and rearrange them, and still be only one of fifteen similarly sized users on the disc pack. The elements of each of the three files, together with those of the simplified statistics file, are indicated in tables 1–3.

The programs were all written in BASIC by the director of data processing specifically for the library. The library's account also uses several programs originally writ-

Table 1. Layout for Address File
(File Type: DLR, Records/Block: 3, Total Number of Attributes: 9)

		In Record		On Screen	
ID	Description	Start	Length	Row	Col.
ID	Dealer Abbreviation	1	10	1	1
NM	Name	11	25	1	30
AD	Address (Lines Separated by ^)	36	75	3	1
ST	State	111	2	4	1
ZP	Zip	113	5	4	20
VN	Vendor Number	119	5	1	60
Q%	Firm-Order Books Rec'd (YTD)	124	2	5	1
R#	Response Time Days (YTD)	126	8	4	40
D#	Total Discount (YTD)	134	8	5	40

Table 2. Layout for Book File
(File Type: LIB, Records/Block: 2, Total Number of Attributes: 18)

		In Record		On Screen	
ID	Description	Start	Length	Row	Col.
ID	Author's Last Name	1	14	1	1
N1	First Name	15	10	1	30
TT	Title	25	50	2	1
NB	Number	75	10	3	1
PB	Publisher	85	20	5	1
YR	Year	105	4	5	30
PL	Cancel Date (YYMMDD) Period (WW)	109	8	5	40
ED	Edition	117	4	2	65
DL	Dealer	121	10	6	1
P#	List Price	131	8	7	60
AC	Account	139	7	7	1
DO	Date Ordered (YYMMDD)	146	6	7	40
DR	Date Received (YYMMDD)	152	6	8	40
CM	Comment	158	3	8	1
Q%	Quantity	161	2	7	20
I#	Invoice Price	163	8	8	60
CC	Counting Code (Tally)	171	1	8	20
RP	Resting Place	172	8	5	60

Table 3. Layout for Cash File
(File Type: FND, Records/Block: 4, Total Number of Attributes: 12)

		In Record		On Screen	
ID	Description	Start	Length	Row	Col.
ID	Fund Abbreviation	1	7	1	1
DS	Description of Department	8	35	2	1
F#	Current Fund Balance	43	8	4	60
E#	Encumbered	51	8	4	20
X#	Expended	59	8	4	40
B#	Beginning Balance	67	8	4	1
Q%	Firm-Order Books Rec'd (YTD)	75	2	5	1

ten in BASIC by the director of the Wabash College Computer Center and extensively modified by the director of the Knox College Computer Center. These programs, which are stored in the Data Processing Program Library, allow us to search and edit a file, to copy recent additions or parts of a file into a second, smaller file, or to rearrange an existing file.

BACKGROUND OF AUTOMATED ACQUISITIONS AT THE COLLEGE

In the fall of 1975, in a project done un-

der the supervision of the director of the computer center, a student at the college submitted a paper entitled "Knox College Library Automated Acquisition System: A Feasibility Study." The paper envisioned using a terminal (which the library would purchase if it joined the OCLC system) to access the main computer in the Science/Math Center rather than a teletypewriter (the only other suitable hardware the library possessed, and which it then employed in its regional interlibrary loan activities). That configuration would permit a group of programs familiar to the staff of the computer center to be used with an acquisitions file that would be stored on a disc drive.

The acquisitions file would contain information familiar to the staff of the library in its paper-slip form, but by combining that file with a similarly stored dealer or fund file, a variety of print products could be generated. As the records were deleted from the disc, they would be collected on tape; and this would permit a management report to be written on a yearly basis. The idea for an automated acquisitions system was thus present, in nascent form, the year before the library joined its major bibliographic utility.

In the spring of 1976, the library took part in an acquisitions survey project conducted by OCLC and funded by a grant from the Council on Library Resources. In the summer of 1978, it sent a staff member to the ALA Resources and Technical Services Division (RTSD) program in Chicago entitled "Automated Acquisitions: What's New? What's Bad? What's Good?" And in the winter of 1979, using a list of participants from the RTSD program, it obtained additional information from two of the commercial suppliers and two of the bibliographic utilities offering automated systems—Baker & Taylor (LIBRIS) and Brodart (IROS); and OCLC and the Washington Library Network.

It invited representatives to the campus for a demonstration of the first of the systems available through a commercial supplier, and it sent a staff member to the University of Illinois in Urbana to see a demonstration of the second of the systems available through a bibliographic utility (which was to be incorporated into the LCS system there). Questions of cost, in the first case, and governance, in the second case, made it difficult to pursue either of these (admittedly attractive) possibilities, however.

In the summer of 1979, the library applied to become a user evaluator for the OCLC Acquisitions Subsystem. In the fall of 1979, two staff members from the library attended a preliminary briefing workshop on the subsystem in Chicago. And finally, in the winter of 1980, after Knox was selected as one of the twenty test sites, the director of the library signed an agreement to act as a user evaluator.

The original assumptions of the project were that OCLC would remain responsive to our revised cost estimate of $.45 per order. When delay ensued and OCLC began to project a cost of three times that figure, the director of the library asked the director of data processing to proceed with the design of a more cost-effective in-house system. In late fall, the Knox system had been in operation for five months when the library received the terminal to be used during the OCLC Acquisitions Subsystem evaluation. And in the winter of 1981, the Knox system had been in place for eight months when a staff member finally received training in the use of the subsystem.

THE OCLC TEST, PART I: SIMILARITIES OF THE SYSTEMS

The test was conducted for three months in the spring of 1981. For the first month of the test, the staff of the library ran both systems in parallel. This was possible because of the similarity in file structure: both systems contained an address file, a book file, and a cash file. In the OCLC system, records in the address file (the "name-address directory") were accessible by control numbers. The library's two major suppliers could be retrieved there by indicating the file type (with a colon) and using the search keys *17451* and *17928*. In the Knox system, records in the address file were accessible by mnemonics. The library's two major suppliers could be retrieved there by indicating the file type (with DLR) and then using the search keys *B&T* and *MIDW*.

By inserting a control number in an order

record in the OCLC system, the address file could be linked to the book file and a purchase order (an "action form") could be printed. By inserting a mnemonic in an order record in the Knox system, the address file could be linked to the book file and a purchase order could be printed as well.

OCLC used the first of two possible layouts and designs specified by the Bookdealer-Library Relations Committee of the American Library Association in *Guidelines for Handling Library Orders for In-Print Monographic Publications:* an individual form per title. Knox used the second of the two possible layouts and designs: a list form.[1]

In the OCLC system, records in the cash file (the "fund-accounting component") were accessible by mnemonics with qualifiers indicating the fiscal year. Two of the library's accounts there could thus be retrieved by indicating the file type (with a dollar sign) and using the search keys *HIST'80* and *PHIL'80.* In the Knox system, records in the cash file were also accessible by mnemonics. The same two accounts there could be retrieved by indicating the file type (with FND) and then using the search keys *HIST* and *PHIL.*

Each system encumbered and expended money through the same links: the OCLC system by restoring the list price to the free balance of a particular fund, and then taking the invoice price from the free balance of the fund in question; and the Knox system by taking the list price from the encumbered balance of a particular fund, and then getting any difference between the list price and the invoice price from the free balance of the fund in question.

By inserting a mnemonic with its fiscal-year qualifier in an order record in the OCLC system, the book file could be linked to the cash file and a monthly list of all the titles purchased under each fund (the "fund-commitment register") could be produced. By inserting a mnemonic in an order record in the Knox system, the book file could be linked to the cash file, and a monthly list of all the titles purchased under each fund (the "departmental reports") could be printed as well.

Each system also attempted to provide some information on response time and discount: OCLC by permitting the library to block-sort titles by vendor under each fund in the fund commitment register; and Knox by averaging these figures under each fund in the departmental reports.

THE OCLC TEST, PART II: DIFFERENCES BETWEEN THE SYSTEMS

About the time the terminal that was to be used in the OCLC test was being installed, a refinement was made in the Knox system based on an article in the *Journal of Library Automation* by Janet Uden entitled, "Financial Reporting and Vendor Performance."[2] We had been removing records for received items from the book file, and rather than storing them on tape, we were reducing them to about half their size (by stripping out unwanted fields) and storing them on disc. Our intention was to produce a management report like the feasibility study had suggested six years earlier, and the Uden article now caused us to see that the report we wanted to print could best be produced by linking the "history file" of these reduced records and the address file: what we had been groping towards was a series of lists, like we had with the departmental reports, but compiled over a longer interval and having a dealer's name at the top of each page. Once this became clear, it was relatively easy to see that the mnemonic for the dealer had to be among the fields we retained when we reduced the original record to the simplified history record, and we were in business.

At the same time that we introduced this refinement, we also added a "cancel-after" statement to the purchase order. This was indicated in each book record by a date, expressed in year-month-day form (*YYMMDD*), and by a period, expressed in weeks (*WW*). The cancel-after period was printed on the purchase order, and the cancel-after date was used to clean the file. We believed that adding a cancel-after statement to the purchase order would lead to a more effective procedure than following up with a claim form. We actually had a claim form, along the lines of our purchase order, but we found that we almost never used it.

By the time we received our training and began the OCLC test, we were able to produce our first quarterly management report from the Knox system. By cleaning the book file for unfilled orders at the same interval, and by sorting those records by dealer, we were able to complement the picture of dealer performance for filled orders that the dealer reports gave us.

Following the first month of the test, the director of the library asked that the remaining requests be ordered as quickly as possible, so that the books might be received and paid for with the budget for that fiscal year. Pursuant to these instructions, our acquisitions assistant ordered presearched requests (and did nothing else) for eighty-seven hours during the period May 11–May 20. Since the subsystem automatically assigned a sequential control number to each order, it was possible to subtract the first control number of this group (*81-754) from the last control number of this group (*81-1229) and compute the average time required to complete an order. This computation suggested a peak processing limit of about two hundred items per work week—a serious problem.

The OCLC system was more efficient than the Knox system in that bibliographic information (author, title, edition, imprint, and standard number) appeared automatically on a work form. But the OCLC system required five separate "sends" for each order: one for the fixed field, one for the source field, one for the destination field, one for the encumbered field, and one to produce the record. That meant that the gain in efficient design could be lost in poor response time.

Although the Knox system required typing all of the bibliographic information, our acquisitions assistant was able to equal rather easily, and even exceed, the performance figures established as a maximum for the OCLC system during the test—not only because she was an excellent typist and could take full advantage of her skills by batching the input and using a preset screen the Knox system afforded, but also because she did not have to wait for system response five times on every record.

At the conclusion of the test, we reported the slow response time as our chief objection to the OCLC system. We also indicated the cost was more than we could afford. The chief virtue of the OCLC system, we believed, was that it eliminated the need to type bibliographic information. It also had a very effective safeguard in the form of the fund adjustment records for any editorial change in the cash file. However, the subsystem lacked access by dealer or fund to an individual title, and it did not provide for sequential scanning of the order file—both of which, we suggested, would be helpful features to add.

MORE ON THE DEALER REPORTS AND THE ADDRESS FILE

Be retaining the history file on disc throughout the year, we were able to make each of the succeeding dealer reports cumulative. And by subarranging the portion of the file that came from our two major suppliers by publisher, we were able to compare their performance to direct orders from the publishers. It took, on the average, we found, two months to get an order from one of our major suppliers; but we received a 7 to 10 percent discount (and fewer invoices to contend with) for our patience. By going directly to the publisher, we could usually get the book in half the time, but we ordinarily lost the discount in the process.

A few publishers were nice enough to mail the book promptly and to provide us with a discount as well. When this was more than either of our major suppliers was willing to offer, we resolved to continue ordering directly from the publisher, of course. But when the vendors could match this discount, however, we believed the simplicity that a single invoice offered was worth the wait.

Faculty members were advised of our findings, and in those cases where they wanted an item as soon as possible, they were invited to sacrifice discount for response time by writing "rush" on the order card. (Some like to do this for all their orders, as a consequence of which the address file now numbers almost three hundred entries.)

At the end of the year we also sorted the entire history file by publisher. This enabled us to obtain a ranking of the pub-

lishers that were ordered most frequently. We give that list of "preferred publishers" in table 4.

The dealer reports (see figures 3 and 4) ignored any records that had the same date ordered as date received and the same list price as invoice price. We condensed the entries for those records into three generics in the address file: "standing order," "faculty purchase," and "gift."

When we cleaned the book file, which we tried to do at the same time we printed a dealer report, we found that our major suppliers usually filled 80 to 85 percent of our orders (most of which were generated by *Choice* cards). Some of the orders, however (particularly for retrospective titles), could not be filled even by reordering from the publisher. Our experience soon suggested that the best strategy with these items would be to disencumber the money involved and list them with subject specialists gathered by collating the *Directory of American Book Specialists*[3] and the "Directory of Specialist and Antiquarian Booksellers" in *AB Bookman's Yearbook*.[4] We entered these specialty dealers in the address file with a system of mnemonics similar to the one we used for departments, followed by a number.

Since we were an academic library, the funds were usually equivalent to subject ar-

Table 4. Publishers

Preferred Publishers	No. of Books	Established Publishers	No. of Books
1. Oxford	95	1. Oxford	115
2. Cambridge	64	2. Princeton	71
3. Greenwood	58	3. Harvard	66
4. Wiley	53	4. California	65
5. Academic	49	5. Cambridge	64
6. Princeton	44	6. Academic	53
7. Harvard	43	7. Wiley	49
8. Harper & Row	42	8. Yale	46
9. St. Martin's	40	9. Chicago	45
10. California	39	10. Knopf	37
11. Prentice-Hall	38	11. Cornell	34
12. Random House	38	12. Columbia	32
13. AEI	35	13. Harper & Row	32
14. Chicago	34	14. Prentice-Hall	29
15. Columbia	33	15. Norton	27
16. McGraw-Hill	33	16. Indiana	26
17. Pergamon	33	17. St. Martin's	25
18. Springer-Verlag	31	18. Basic	24
19. Doubleday	30	19. Johns Hopkins	24
20. Little, Brown	30	20. Free	23
21. Norton	30	21. Halsted	23
22. Johns Hopkins	29	22. Greenwood	22
23. Knopf	29	23. Doubleday	21
24. Freeman	28	24. Little, Brown	21
25. Simon & Schuster	28	25. McGraw-Hill	20
26. Indiana	26	26. Random House	19
27. Routledge & Kegan Paul	24	27. Viking	18
28. Farrar, Straus	22	28. Scarecrow	17
29. LSU	22	29. Gale	16
30. MIT	22	30. Rowman & Littlefield	16
31. G. K. Hall	20	31. Routledge & Kegan Paul	15
32. Viking	20	32. Springer-Verlag	15
33. Cornell	19	33. Freeman	14
34. Plenum	19	34. G. K. Hall	14
35. Basic	18	35. North Carolina	14
36. Holt, Rinehart	18	36. Pantheon	14
37. Lexington	17	37. Texas	14

Table 4. Publishers (Continued)

Preferred Publishers	No. of Books	Established Publishers	No. of Books
38. Macmillan	17	38. Thames & Hudson	14
39. Yale	17	39. Van Nostrand Reinhold	14
40. Elsevier	16	40. Holmes & Meier	13
41. Longman	16	41. MIT	13
42. Humanities	15	42. Plenum	13
43. Scarecrow	15	43. Westview	13
44. Arno	13	44. Illinois	12
45. North Carolina	13	45. Lexington	12
46. Scribner's	13	46. Pergamon	12
47. Allen & Unwin	12	47. Praeger	12
48. Dutton	12	48. Wisconsin	12
49. Pantheon	12	49. Barnes & Noble	11
50. Barnes & Noble	11	50. Humanities	11
51. Rowman & Littlefield	11	51. Jossey-Bass	11
52. Westview	11	52. Minnesota	11
53. Addison-Wesley	10	53. New York	11
54. Atheneum	10	54. Putnam	11
55. Free	10	55. Scribner's	11
56. Harcourt, Brace	10	56. Southern Illinois	11
57. Illinois	10	57. Temple	11
58. Praeger	10	58. Twayne	11
		59. Ballinger	10
		60. Fortress	10

DEALER ------ ALFRED A KNOPF INC

MONTH END DATE ----- -- ---- 12/31/81

AUTHOR	TITLE	PUBLISHER	ORDERED	RECEIVED	LIST	INVOICE
ALTHER	ORIGINAL SINS (ISBN 0394516850)	KNOPF	04/14/81	04/30/81	13.95	13.95
CARVER	WHAT WE TALK ABOUT WHEN WE TALK ABOUT LOVE	ALFRED A KNOPF	06/17/81	07/08/81	9.95	9.95
FRANKLIN	A RIVER NO MORE: THE COLORADO RIVER AND THE WEST	KNOPF	05/20/81	06/01/81	15.95	15.95
GUGGENHEIMER	APPLICABLE GEOMETRY	KNOPF	05/20/81	06/15/81	13.50	13.50
HITE	THE HITE REPORT ON MALE SEXUALITY	ALFRED KNOPF	06/02/81	06/22/81	19.95	19.95
LEWIS	WHEN HARLEM WAS IN VOGUE	A A KNOPF	06/17/81	07/08/81	17.95	17.95
MILNE	THE AUDUBON SOCIETY FIELD GUIDE TO NORTH AMERICAN	KNOPF	05/20/81	06/24/81	9.95	11.95
SENNETT	AUTHORITY	KNOPF	04/20/81	05/05/81	10.00	10.95
TIMERMAN	PRISONER WITHOUT A NAME, CELL WITHOUT A NUMBER	ALFRED A KNOPF	04/28/81	05/13/81	10.95	10.95

NUMBER OF BOOKS CATALOGED: 9 AVERAGE TIME TO ACQUIRE A BOOK: 0 MONTHS 19 DAYS AVERAGE DISCOUNT: 0.00 0%

Fig. 3. Dealer Report.

ROWLAND	B&T	MEDIEVAL WOMAN'S GUIDE TO HEALTH: THE FIRST ENGLISH	HIST	810121810624A	1500	1540	1KENT STATE UNIV PR
BERMAN	B&T	SOLZHENITSYN AT HARVARD: THE ADDRESS, 12 EARLY RESL	LIB	811030811117A	950	855	1KNOPF
DAYAN	B&T	BREAKTHROUGH: A PERSONAL ACCOUNT OF THE EGYPT-ISRAL	LIB	811106811125A	1500	1035	1KNOPF
DONNER	B&T	AGE OF SURVEILLANCE	HIST	810918811019A	1795	1239	1KNOPF
HALBERSTAM	B&T	BREAKS OF THE GAME	ONE	811106811125A	1500	1035	1KNOPF
HAZAN	B&T	CLASSIC ITALIAN COOK BOOK	LIB	801125810108*	1295	1101	1KNOPF
JAMEWAY	B&T	POWERS OF THE WEAK	SOC	810211810317A	1395	963	1KNOPF
LESSING	B&T	THE SIRIAN EXPERIMENTS: THE REPORT BY AMBIEN II	LIB	810121810205A	1195	825	1KNOPF
MALCOLM	B&T	PSYCHOANALYSIS	ONE	811106811125A	995	687	1KNOPF
RUSHDIE	B&T	MIDNIGHT'S CHILDREN	TS	810918811019A	1395	963	1KNOPF
THOMAS	B&T	THE HARMLESS PEOPLE	REPL	810211810319A	895	618	1KNOPF
WILLIS	B&T	BEGINNING TO SEE THE LIGHT	SOC	810918811019A	1295	894	1KNOPF
CORT	B&T	SHIGARAKI, POTTERS VALLEY	ART	811106811201A	6000	4306	1KODANSHA INTERN

Fig. 4. Data for Dealer Report Subarranged by Publisher.

eas. By sorting the "cancel/reorder file" by fund and entering this system of mnemonics as the new dealers (*HIST 1* for anything wanted by *HIST*, *PHIL 1* for anything wanted by *PHIL*, and so on), we greatly simplified the listing process. It has proved easy enough to substitute another subject specialist under the same mnemonic for one who doesn't supply at least an occasional out-of-print or difficult-to-supply title. And it should be just as easy to add a second or third subject specialist for any particular area (*HIST 2* or *PHIL 3*, say) and bump out-of-print or difficult-to-obtain titles through several listings.

THE PBL SORT: COLLECTION DEVELOPMENT FOR THE LIBRARY IN GENERAL

With the PBL (publisher) sort (see figure 5), we are able to perform what could be called "acquisitions analysis"—the identification of the library's tendencies (both preferences and biases) to buy books from certain publishers while ignoring the books published by others. The fifty-eight publishers that were ordered most frequently (the "preferred publishers" of table 4) account for half of the library's firm orders for 1980/81. This is, of course, only a measurement of quantity. To provide a comparable list of publishers that measures the quality of our acquisitions—one identifying the publishers that an academic library should be buying—we analyzed the imprints of the books presented in *Choice* magazine's "Outstanding Academic Books" issues for the years 1977–80. The sixty publishers that appeared most frequently (the "established publishers" of table 4) account for two-thirds of the books that were considered to be "essential" purchases for an academic library.

The list of established publishers and the list of preferred publishers are quite similar. Ordering is initiated by the faculty, and three-fourths of the publishers who produced a significant number of outstanding titles managed to catch the faculty's eye. Books by those publishers alone (established and preferred publishers) account for almost half of the library's firm orders. An even closer inspection of our buying patterns, which the PBL sort also affords, shows that the few titles from established but not preferred publishers that were ordered, were ordered with the general fund rather than by any of the academic departments. This indicates, we believe, that the faculty should be made aware of a small group of quality publishers that they have overlooked.

Further analysis of the outstanding titles produced by established publishers in relation to the number purchased by the library reinforces this belief. The library has half of the outstanding books produced by established publishers (791 of 1,450)—just as it has half of the outstanding books by any publisher (1,130 of 2,257) for this four-year period. It is clear that by the simple expedient of monitoring the reviewing slips of the established publishers and purchasing those identified by *Choice* as "outstanding," "essential," or "highly recom-

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GREY            B&T   HISTORICAL BIOGEOGRAPHY, PLATE TECTONICS, AND THE LIB  0106028107JA  6475  5258  1UREGON STATE UNIVERS
EDUCATIONAL     OHIO  THESAURUS OF ERIC DESCRIPTIONS                  REF     0104158106Q4A  1350  1195  1ORYX PRESS
CEN CUNG CH     PAC   CENTRAL CONGREGATIONAL CHURCH (GALESBURG, IL)  PIN     0109048109Q4F  000   000   1USGRHD
PINCUS-WITTEN   B&T   POSTMINIMALISM                                  ART     0103238108Q24A 1195  1195  1UOT UP LONDON
LOEWY           COUTTS INDUSTRIAL DESIGN                             ART     0010108101Q7A  4500  4455  1UVERLOOK
SILVER          MIDW  FILM NOIR: AN ENCYCLOPEDIA REFERENCE TO THE AMERICENG    0102208105I5A  2500  1750  1UVERLOOK
GOFFMAN         UVERLOOK PRESENTATION OF SELF IN EVERY DAY LIFE       REPL    0105208109Q21A 1000  1695  1UVERLOOK PRESS
WILLIAMSON      MIDW  TEACHING SCIENCE FICTION: EDUCATION FOR TOMORROW ENG     0102208104Q7A  1500  1500  1UWILSWICK PRESS
ARASARATNAM     IDW   INDIANS IN MALAYSIA & SINGAPORE                 SOC     0109108111Q9A  995   995   1UXFORD
BELL            OXFORD FREGE'S THEORY OF JUDGMENT                    PHIL    0104078105Q4A  1995  2895  1UXFORD
BERKE           OXFORD BOUNDS OUT OF BOUNDS: A COMPASS FOR RECENT ENGL & LIB  0104078105Q4A  1495  1595  1UXFORD
BHATNAGAR       MIDW  NONLINEAR WAVES IN ONE-DIMENSIONAL DISPERSIVE SYSTMART   0010258101Z6S  1695  2093  1UXFORD
BOLLEN          ANOX  PRESIDENTIAL ANECDOTES                         ONE     0107278109I1A  1495  1475  1UXFORD
BRANDT          B&T   THEORY OF THE GOOD AND THE RIGHT               PHIL    0010318101Q9A  1995  1930  1UXFORD
BRODY           OXFORD WORKERS IN INDUSTRIAL AMERICA: ESSAYS ON THE 20TH-CEC  0105138106Q1A  1495  1495  1UXFORD
BUTLER          OXFORD SOIL CLASSIFICATION FOR SOIL SURVEY            GEO     0104078105Q4S  2250  2250  1UXFORD
CARR            OXFORD MODERN HISTORY                                HIST    0104038105Q4A  1150  1250  1UXFORD
CAVELL          OXFORD THE CLAIM OF REASON: WITTGENSTEIN, SKEPTICISM, MORPHIL  0104078105Q2A  1950  1995  1UXFORD
COBB            OXFORD DEATH IN PARIS: THE RECORDS OF THE BASSE-GEALE DE LIB  0106248107I5A  1500  1975  1UXFORD
DOVER           BLACKWELL CLUDUS                                     CL      0911258101I3A  595   702   1UXFORD
EURIPIDES       OXFORD ELECTRA (J.D. DENNISTON, ED.)                 CL      0101288103Q4A  1195  1495  1UXFORD
FELDBERG        B&T   TURBULENT ERA                                  HIST    0911258103Q4A  895   788   1UXFORD
FONER           MIDW  POLITICS & IDEOLOGY IN THE AGE OF THE CIVIL WAR HIST    0109188111Q3A  1595  1463  1UXFORD
GUIDICE         B&T   PIRANDELLO, A BIBLIOGRAPHY                     THEA    0912058101J0A  1975  298   1UXFORD
HAIGHT          B&T   ANNA AKHMATOVA                                 RUSS    0910258101Z0A  1095  1428  1UXFORD
HALL            ANOX  OXFORD BOOK OF AMER LIT ANECDOTES              ONE     0107278109I1A  1595  1360  1UXFORD
KENNEDY         MIDW  OVER HERE                                      HIST    0109188111Q3A  2000  1855  1UXFORD
MACCORMICK      B&T   LEGAL REASONING AND LEGAL THEORY               PHIL    0010318103Q4A  1495  1316  1UXFORD
PIMAN           B&T   LIFE OF ALEKSANDR KUIN V.2 ONLY                RUSS    9U1125W103Q4A  4800  4224  1UXFORD
SMOLDON         OXFORD MUSIC OF THE MEDIEVAL CHURCH CHANA            MUS     8005088105J3A  5200  4888  1UXFORD
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Fig. 5. Publisher Sort.

mended," the library could have acquired more than half of the "Outstanding Academic Books" that the faculty overlooked—just as it could have sped the acquisitions process by preselecting the reviewing slips of the preferred publishers (that is, anticipating that the faculty would buy certain publishers).

THE FND SORT: COLLECTION DEVELOPMENT IN A PARTICULAR DEPARTMENT

In addition to the possible analyses of the buying patterns of the library as a whole using the PBL sort, it is also possible to analyze the buying patterns of a specific department using the FND (fund) sort (see figure 6). In the case of a department whose holdings are known to be strong, a comparison of the preferred publishers to the established publishers may turn up a few missing titles to help complete the collection. And in the case of a department whose holdings are known to be weak, a comparison of the preferred publishers to the established publishers will usually reveal entire groups of titles to help establish the collection.

The library considers its collection in history to be strong, a belief borne out by a number of recent evaluations. For instance, a search of a random sampling of recent history books cited by technical services in the *Three Year Study* showed that 80 percent were in the library.[5] A stack sampling by call numbers, part of the ACM Library Collection Use Study (a three-library pilot project sponsored by the Council on Library Resources), indicated that the classifications for history comprised 11.8 percent (the median was 7.1 percent) of the library's circulating collection.[6]

The FND sort shows that the history department purchased 225 books in 1980/81. One hundred forty of these (about two-thirds) were produced by 35 of the 60 established publishers. Of the *Choice* "Outstanding Academic Books" for history produced by 116 publishers, 215 (about two-thirds) were from 40 of the established publishers. The library owns 179 (about half) of these 323 books. Not among the imprints purchased in the last year by the history department are a number of publishers known to produce a significant number of outstanding titles (Rowman and Littlefield, Temple, and Wisconsin). And a further examination of the FND sort shows that the history department also did not order from a publisher of outstanding books in the field who was not on the list of established publishers—that is, a publisher who could only be discovered by examining the "Outstanding Academic Books" list by department (Rutgers, who published four outstanding history books). If the library had monitored the reviewing slips of these established publishers, together with the additional "subject-area publisher" that it could have discovered with a little digging, we could have improved our "OAB" holdings for history by 10 percent, and thus enhanced the quality of an already strong area.

The use of the FND sort to strengthen

JANSEN	=1D=	JAPAN AND ITS WORLD	HIST	0110099811103A	950	684	1PRINCETON UNIV PR
KAISER	=1D=	ECONOMIC DIPLOMACY AND THE ORIGINS OF THE 2ND WORLWIST		0110099811124A	2500	2325	1PRINCETON UNIV PR
KEOHANE	=1D=	PHILOSOPHY AND THE STATE IN FRANCE	HIST	0110099811124A	3000	2790	1PRINCETON UNIV PR
LANGLOIS	=1D=	CHINA UNDER MONGOL RULE	HIST	0109149811103A	1250	1163	1PRINCETON UNIV PR
MABB	=1D=	MARRIAGE AND FERTILITY	HIST	0110JUN811214A	595	553	1PRINCETON UNIV PR
SO 986	PUP	PAPERS OF WOODROW WILSON	HIST	0106199106019A	3000	2700	1PRINCETON UNIV PR
STRAIER	=1D=	REIGN OF PHILLIP THE FAIR	HIST	0110099811124A	3500	3255	1PRINCETON UNIV PR
BERGER	PUP	PARTIES OUT OF POWER IN JAPAN, 1931-1941	HIST	0101238810413A	2500	2500	1PRINCETON UNIV PRESS
HERKL	PUP	THE MAKING OF A STUMPTHUMPER (ISBN 0691076200)	HIST	0102198103164A	1650	1650	1PRINCETON UNIV PRESS
=ILSON	PUP	PAPERS OF WOODROW WILSON #35 (SU 1986)	HIST	0102248102246A	3000	2733	1PRINCETON UNIV PRESS
GOULD	HPUR	PRESIDENCY OF WILLIAM MCKINLEY	HIST	0110099811028A	1500	1500	1REGENTS PR OF KANSAS
GRATHWOL	=1D=	STRESEMANN & THE UNVP	HIST	0109198811028A	2000	2000	1REGENTS PR OF KANSAS
ROSE	HPOR	INTERSTATE	HIST	0110099811028A	1400	1400	1REGENTS PR OF KANSAS
WOOD	HPUR	KANSAS BEEF INDUSTRY	HIST	0110099811028A	2250	2250	1REGENTS PR OF KANSAS
HANLEY	B&T	CUNTEMPORARY FRANCE	HIST	0010078110104A	2500	2500	1ROUTLEDGE
URAY	ROUTLEDGE	PERSPECTIVES ON HISTORY	HIST	0110308811117A	1000	900	1ROUTLEDGE & KEGAN PA
FERRO	=1D=	OCTOBER 1917; A SOCIAL HISTORY OF THE RUSSIAN REVOLHIST		0110128104028A	3500	3255	1ROUTLEDGE & KEGAN PA
STONE	ROUTLEDGE	PAST AND THE PRESENT	HIST	0110028811026A	1595	1436	1ROUTLEDGE & KEGAN PA
UNTERMAN	ROUTLEDGE	JEWS	HIST	0110028811026A	2250	2025	1ROUTLEDGE & KEGAN PA
RODGERS-HUBE	B&T	BLACK WOMAN	HIST	0109198811019A	995	995	1SAGE
MIDDLEBROUR	B&T	BATTLE OF HANNUNG	HIST	0110099811123A	1795	1239	1SCRIBNER
SAND	B&T	LAVINIA; TRANSLATED FROM THE FRENCH	HIST	0101218106017A	195	195	1SHAMELESS HUSSEY PR
MADISON	B&T	PAPERS OF JAMES MADISON (SU 83389)	HIST	0103308810330A	2000	1900	1SIMON & SCHUSTER
LJUNGMARK	=1D=	SWEDISH EXODUS (ISBN 0809309054)	HIST	0103098103194	1195	1140	1SOUTHERN ILL UNIV
LURIE	B&T	WISCONSIN INDIANS	HIST	0101278103194	200	180	1ST HIST SOC OF WI
MANLEY	B&T	GREAT WAR AND THE SEARCH FOR A MODERN ORDER	HIST	0010078101094A	1295	1595	1ST MARTIN'S
NEW	ST MARTIN	STATE IN NORTHERN IRELAND, 1921-72	HIST	0110099811104A	1995	1596	1ST MARTIN'S PR
CARR	ST MARTIN	FROM NAPOLEON TO STALIN AND OTHER ESSAYS	HIST	0110099811106A	2000	1600	1ST MARTIN'S PR
CHAMBERS	=1D=	THE TYRANNY OF CHANGE; AMER IN THE PROGRESSIVE ERAHIST		0101278103244	495	554	1ST MARTIN'S PR
INFIELD	ST MARTIN	SKURZENY	HIST	0110099811104A	1595	1436	1ST MARTIN'S PR

Fig. 6. Fund Sort Subarranged by Publisher.

part of the collection known to be weak would proceed in much the same way. A search of a random sampling of recent items in biology from *Books for College Libraries* showed that only 40 percent were in the library. The stack sampling by call numbers, part of the "ACM Collection Development Use Study" mentioned above, showed that the classification for biology comprised 2.7 percent, and for medicine 1.0 percent (the median, again, was 7.1 percent of the circulating collection). The FND sort shows that the biology department purchased 73 books in 1980/81. Eighteen of the established publishers produced 47 (almost two-thirds) of these books. Of the 119 "Outstanding Academic Books" for biology and health science (produced by 53 publishers), 65 (about half) were produced by 23 of these publishers. The library owns only 28 (about one-fourth) of these 119 books. An examination of the FND sort for biology shows that it did not purchase a single title from several of the established publishers of biology and health science books (Oxford, California, and Cambridge). A closer monitoring of these imprints, as well as any identified by examining the "OAB" list by department (Toronto, say), would be an obvious way to develop the holdings in this area.

The use of the publisher's imprint in a profile intended to identify suitable acquisitions is an established feature of almost any approval plan—like that of the Baker & Taylor Company, for instance. It is used to help a library with a limited budget, like our own, to acquire the best books from the major university and trade publishers before it exhausts its funds. The FND and PBL sorts, when used in conjunction with an evaluative check (like that which exists in *Choice* magazine's "Outstanding Academic Books"), allow us to do much the same thing without the commitments and expenses that ensue with an approval plan. By identifying the book-buying patterns of the library as a whole, or of a department in particular, we can initiate intelligent actions that will both enhance the strengths and correct any weaknesses in the library's collection.

ACKNOWLEDGMENT

We would like to acknowledge the personnel of the Knox College Computer Center and the school's library, as well as the student (now a graduate) whose work made the system go: Charles J. Gibbs, Terri Niles, and William C. Ripperger; Renee Naven, Ann Schamp, and Ruth Robison; and Eugene Procknow.

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Communications

Animated TV Spot Features Library

Corky Kirkpatrick: Portland Community College, Oregon

If you were an alien, where would you go to learn about a different planet? The library, of course.

And when two science fiction buffs join forces in Portland, Oregon, to learn some animation techniques, the resulting sixty-second public-service announcement takes place in a library setting.

The road to producing a successful spot was long and rocky for Tom Platt and Steve Isakson. It took three years of creative time for the two Portland Community College students, who wanted to learn a new technique. It started with a desire to meld their two artistic talents—art and television production—using a new technique.

Platt returned to the community college after trying his hand as an automobile mechanic. He had dropped out of high school during the "hippie era" and decided he didn't want to be a mechanic the rest of his life. He actually stumbled onto TV production by looking through college brochures and discovered his interest in special effects during his first term.

Isakson started sketching super heroes as a child and had taken classes at the Portland Art Museum before enrolling for art study at Portland Community College. He learned that the college encouraged students to work on camera-ready television spots and actually pursued the idea with another student before he discovered Platt.

When the two students, both in their twenties, did eventually meet, they not only discovered their mutual interest in science fiction, but also learned that the movie *2001* was the best thing either of them had ever seen.

Little wonder that their dreams started revolving around production of a science fiction spot. They set out to get approval from college officials with the hope of getting financial backing as well. They knew the process would be trial and error because the college had no classes in animation, but that was the technique Platt wanted to pursue. He had decided filmmaking provided the ultimate in special effects and had started experimenting with a college-owned Super 8 camera. In addition, he enrolled in a college photography class to learn basic techniques about shooting and printmaking.

The two approached the college officials with sketchy storyboards and much enthusiasm. The television-production instructor agreed to help get the project online, and initial funds were budgeted by the college's public relations department.

Next came the brainstorming for actual content. The spot would carry itself with little verbiage. Platt explained the combination of the library and the *2001* monolith seemed natural since both represented knowledge. One of the big decisions revolved around titles for the book spines. The objective was to pick subject matter that represented future careers at PCC.

Isakson started on the sketches for the spot and the two tried to put together a team to help them with the inking and painting that is the meticulous work of animation. For the sixty seconds of air time, it was necessary to produce more than 2,000 pieces of artwork. The two used a number of students, but soon found that by the time they had others trained, the interest had waned. In the final analysis, they did most of the work themselves, estimating they put in close to thirty hours per week during the entire three years the spot making was in progress. Admittedly, much of it was trial and error.

The backgrounds for the film were cre-

ated by Cheryl Johnson and technical assistance was provided by: Mark Brown, music; Tim Saben, voice; and Charlotte Noble, audio engineering.

Before they finished getting the product on film, the two ran out of funds. The college continued to give them production space, but indicated it would be necessary to see a piece of film before more dollars would be spent. In the meantime, the college had formed a consortium with the other three community colleges in the metropolitan area to work on enhancing the image of community colleges in general and to capitalize on limited promotion dollars. The students were told they could appeal to the consortium for continuing funds once they had something to show. They were determined to finish the work, even if they had to work odd jobs to finance the work, and they eventually sold the product to the consortium.

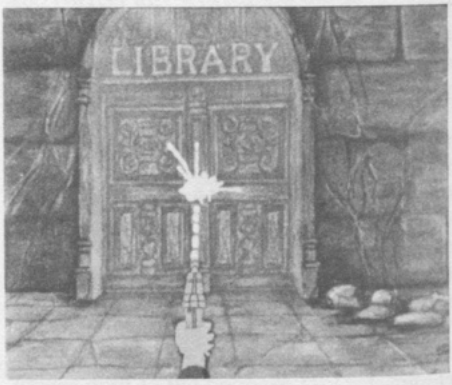
When the spot was delivered to the first television station for airing, the public-service director could hardly believe it was produced by students. And the story was fascinating enough that they followed through with an interview on their evening magazine show. They scheduled the spot for six months and made dubs for the other three television stations in the metropolitan area. All four stations are using the piece as a public service in a variety of times, but especially adjacent to cartoons and science fiction presentations.

Following the airing of the spot, the college received a number of congratulatory calls, including one from the editor of this journal, who was interested in the background and asked that an article be written for *Information Technology and Libraries*. He made further arrangements for showing the spot, as well as the TV program explaining the process, on the Video Sampler at the American Library Association Annual Conference.

Another article has been requested for use in the *Community and Junior College Journal*, but even more important is a job opportunity for Platt. He started interning with Graphoons, Inc., animation designers, and will be added to that firm in a full-time capacity before the summer is over.

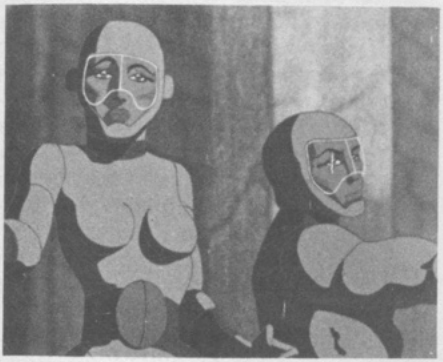
Platt and Isakson have indicated they

1. Scene opens with alien spacecraft in front of ruins of old Earth library.



2. Long zoom into door, laser gun comes in and fires.

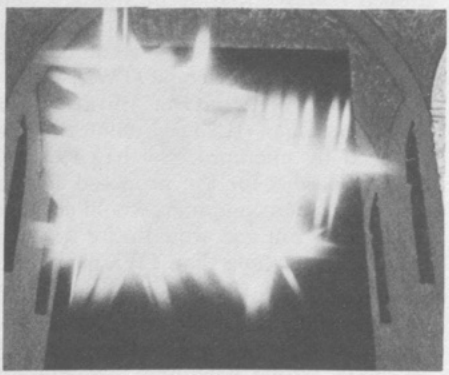
3. Characters enter library.



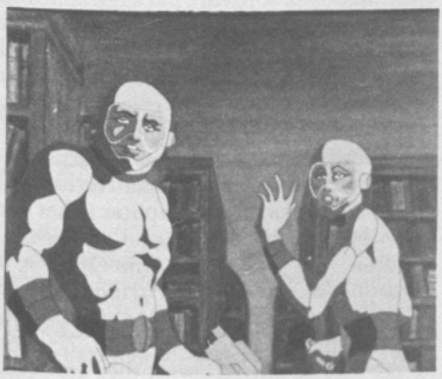
4. Two aliens looking, "Are you searching for your future—searching for new directions in education?"

7. Monolith appears.

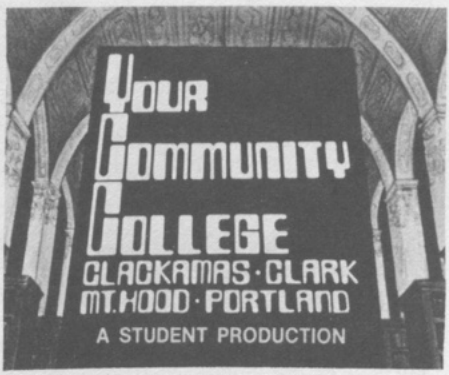
5. Close-up of book, commercial art.



8. Big light flash.



6. Room flashes and aliens turn.



9. "Come to us for the greatest adventure of your life."

would tailor the spot for use by other community colleges or public libraries. Anyone interested should write Tom Platt, 4225 S.W. Agate Lane, Portland, OR 97201. ■■

Montana's Use of Microcomputers for Interlibrary Loan Communications*

Beth Givens:
Montana State Library

BACKGROUND

Two years ago, consultant Joe Matthews studied resource sharing in Montana and made recommendations for future developments.[1] One of Matthews' recommendations was that the teletype (TWX) equipment used in Montana libraries for interlibrary loan (ILL) communication be replaced by microprocessor-based equipment. Reasons for the proposed switch were that microcomputers would cost less in the long run and would offer speedier telecommunications than TWX machines.

The Montana State Library formed a committee to review the alternatives and recommend an appropriate system for the six public library federation headquarters and the State Library.† One of our first tasks was to sketch a flowchart of what we saw as the ideal software package for interlibrary loan communication. Our software sketch included automatic input of repeated data elements (such as addresses), statistics tallying, alphabetical sorting, different formats for different types of requests, and "forced" compliance of copyright guidelines for periodical photocopy requests.

At the same time, we began to collect information on the many equipment alternatives from which we could choose. We talked with vendors and with librarians in other states who were contemplating similar projects. The gamut of our deliberations ran from a dedicated usage microprocessor unit attached to a computer terminal to "personal-size" microcomputers to combinations of mini- and microcomputers.

Budget size and a tight implementation schedule caused us to tone down both our hardware and software expectations. We decided to acquire multipurpose personal-size microcomputers for the ILL communication network. We also decided to abandon, at least temporarily, our scheme for the development of the perfect interlibrary loan software. Instead, we selected an off-the-shelf electronic-mail software package to allow us to send ILL requests from library to library.

After looking at several systems, we chose the Apple II-plus microcomputer for several reasons: the large number of libraries nationwide already using Apples; the availability of many software packages for a variety of applications; in-state vendors and maintenance; and cost. For peripheral equipment, we selected two $5^{1}/_{4}$-inch disk drives, dot matrix printer, green phosphor monitor, and a 300-baud modem for each Apple.

The software package selected to format, edit, and transmit ILL requests was MicroCourier, developed by MicroCom (Norwood, Massachusetts). Two features of this electronic-mail software package appealed to us for our ILL application—automatic transmission at preset times and "terminal mode." MicroCourier allows the operator to prepare and edit ILL requests during working hours and send them automatically during evening hours, when telephone rates are less expensive. Its terminal mode allows the microcomputer to act like a computer terminal—to send messages to libraries who subscribe to the Ontyme II electronic-mail service and to interact with other host computers like Montana university system computers.

We also acquired two other software packages for general library applications—Applewriter for text processing (Apple

*Reports on this project and portions of this article have appeared in *PNBC Report* 5:1–3 (Jan.-Feb. 1982) and in *Access: Microcomputers in Libraries* (July 1982) (in press).

†Microcomputer selection committee members: Bill Berg, Parmly Billings Library; Randall Collver, College of Great Falls Library; Beth Givens and Bruce Newell, Montana State Library.

Computer, Inc.) and DB Master for database management (Stoneware, Inc.).

INSTALLATION AND TRAINING

In November 1981, the microcomputer systems were installed at the Montana State Library and the six public library federation headquarters.* We at the State Library received a tutorial from the vendor and then prepared a detailed user guide for the ILL librarians and equipment operators. We traveled to the federation headquarters, spending one day at each to train the ILL staffs.

This was a very crucial part of the project. Looking back, we should have stretched out the calendar a bit in order to take more time to train the operators. We needed to take more time at each library, perhaps several days, not only to train the ILL personnel, but also to acquaint the rest of the staffs with the other applications for which the microcomputers can be used. Although acceptance of the microcomputers as a multipurpose tool is spreading throughout the staffs, this process could have been enhanced by more attention to the training process. We will be wiser next time.

ELECTRONIC MAIL

The microcomputers are used for two kinds of electronic-mail communication—microcomputer-to-microcomputer communication within the Montana network and microcomputer-to-Ontyme II electronic-mail service (Tymnet, Inc.) for communicating with other subscribing libraries in the western states.

The Round Robin

Montana's use of microcomputers for ILL has an unusual twist. They are used to send batches of requests from library to library in "round robin" fashion. The round robin is another Matthews recommendation, the purpose of which is to fill as many requests as possible in-state before sending them to out-of-state libraries.

Each day, requests from public libraries are sent via microcomputer to the first stop on the round robin. There the equipment operator merges all of the incoming request files into one file. She checks the requests against local catalogs and then sends the file on its way around the state. By the time it reaches the last stop, it will have been checked against the collections of four public libraries, two university libraries, and the State Library. "Remarks" statements are added as necessary, for example "MtGr will reserve." Filled requests are deleted from the file. As the last stop, the state library checks the remaining requests against the Washington Library Network (WLN) database.

The round robin will continue in Montana until we have enough holdings in the Washington Library Network database to warrant the production of a union catalog of monographs. Although for the time being we are saddled with a cumbersome indirect approach to finding ILL locations in-state, the microcomputer network is easing the round robin burden. At the same time, it is allowing us to use Montana's library resources before going to out-of-state locations.

Ontyme II

The microcomputer has also simplified our use of the Ontyme II electronic-mail service. Previous to acquisition of the microcomputer, the State Library used a Texas Instruments 745 computer terminal for ILL communications with other western libraries and the Pacific Northwest Bibliographic Center.[2] Messages were entered online—a relatively slow and expensive process. We frequently encountered the annoyance of line noise or the more serious problem of losing the connection altogether and having to enter the entire message again.

With the microcomputer, we prepare messages offline and store them on diskette. On a given day, we will create several ILL

*Montana's six public library federation headquarters are: Bozeman Public Library, Broad Valleys Federation; Glasgow City–County Library, Golden Plains Federation; Great Falls Public Library, Pathfinder Federation; Miles City Public Library, Sagebrush Federation; Missoula City–County Library, Tamarack Federation; Parmly Billings Library, South Central Federation.

request files, each for a different library. When the operator is ready to send them to the Ontyme II computer, she uses the MicroCourier software, dials the Tymnet telephone number, establishes a good connection, and then sends each file. The request files are stored in the "mailboxes" of each recipient library and are retrieved at the convenience of those libraries. If the telephone connection is poor, the operator has the option of trying again later without the time-consuming inconvenience of having to rekey the requests. Our Ontyme II cost per request has decreased by more than half since we began using the microcomputer for offline file preparation.

Another advantage that the microcomputer offers is being able to store messages, both incoming and outgoing, on diskette. If for some reason we need to send the message to another library, we can retrieve the original file, edit the request if necessary, and retransmit it without having to rekey the entire request. Of course, the maintenance of a transaction log of sufficient detail has become a necessary part of the ILL electronic-mail routine.

As mentioned above, we use two different electronic mail processes—one for the intrastate microcomputer network and one for communicating with libraries both in and out of state who subscribe to Ontyme II. It should be noted that Ontyme II electronic mail has the advantage over microcomputer-to-microcomputer electronic mail of flexibility in scheduling. Ontyme II allows the operator to send a message at *any* time. The intrastate microcomputer network requires scheduling to ensure that the hardware is turned on and the electronic-mail software is in the send/receive mode. Because a majority of our requests are sent overnight, this presents little problem. When we do want to send a message on short notice during the day, we must contact the recipient library and ask the operator to enable the system to receive messages.

Another advantage of Ontyme II over direct microcomputer-to-microcomputer communication is its ability to transmit and receive messages using a wide variety of equipment. These advantages do mean somewhat higher per-request transmission costs for Ontyme II than for microcomputer-to-microcomputer electronic mail.

THE PROS AND CONS FOR ILL COMMUNICATION

The microcomputers function with more ease and speed than did the TWX machines for sending ILL requests from library to library. Telecommunication costs are considerably less—about $.20 per request for microcomputer-to-microcomputer transmission compared to over $1.25 per request for TWX machine operation. The editing features save time for the operators compared to the TWX machines' limited capabilities. The working environment is certainly improved. (A member of our staff used to say that you needed the wrists of a wrestler and the insensitive ears of a factory worker to run the TWX machine.) And the microcomputers are capable of being used for a variety of other library applications.

There are some drawbacks to our system, however. The electronic-mail software, MicroCourier, is basically a business application package. Some of its features are not well suited for interlibrary loan: (1) file size is limited to 4,000 characters, which allows only 8 to 10 ILL requests per file; (2) there is no form feed function to automatically advance the paper from one request to the next as the requests are printed; (3) the software does not allow the operator to append one file to another; (4) records cannot be sorted alphabetically or numerically within a file; (5) there is no "search" function that would be useful to quickly retrieve requests from files.

We have bypassed most of these shortcomings by preparing the request files on the Applewriter software and simply using the electronic-mail software to transmit Applewriter files.* MicroCom's revised version of MicroCourier, due on the market soon, is expected to overcome some of the above-mentioned limitations.

We still have to contend with a lot of paperwork. We also must delete files stored on diskettes on a regular basis in order to keep from overflowing the storage capacity. A hard disk instead of the two $5^1/_4$-inch disk drives would solve these problems. Again, our equipment choice was a function of budget; for most of our needs it is adequate.

POSITIVE SPIN-OFFS

The microcomputer systems have successfully replaced TWX machines and are less expensive to operate for ILL communications. These results alone make the conversion worthwhile.

There are several positive developments over and above our original objective that deserve mention. The first is in the realm of computer literacy. There are now many Montana librarians who are gaining familiarity with an information technology that is becoming a vital part of people's everyday lives. Interest in microcomputers among librarians is spreading. At the May 1982 Montana Library Association conference, more than 120 librarians attended microcomputer workshops that spanned one and one-half days of activities. Most of the instructors were Montana librarians who freely shared their knowledge and experience.

The microcomputers are slowly but surely becoming used in other library applications to improve work productivity and enhance library services. Examples of applications in use or planned are: library statistics (Visicalc software), newsletters, an audiovisual materials catalog, gifts lists, periodicals collection management, and word processing. Also, we have successfully tested the ability of the microcomputers to create data files for the Washington Library Network's retrospective conversion process.

The acquisition of like hardware and software for the public library network gives us the opportunity to share expertise among libraries. The first to master Visicalc, for example, can help others with their library applications for budgeting and statistics.

The sharing of data files is another advantage of having acquired the systems on a network-wide basis. The MicroCourier software can transmit any Apple file produced on DOS 3.3 software, i.e., Applewriter, DB Master, Visicalc. This opens up the possibility of creating and merging like files in order to develop many useful library tools. As an example, we prepared an "instant" directory of ILL personnel by first, agreeing on a format using Applewriter text-editing software, second, filling in the blanks on each of our microcomputers, and third, sending all of the files via MicroCourier to the State Library to be merged into one directory. The same idea could be used for small union catalogs of special collections, combined gifts lists, and a com-

*Readers considering similar applications should be aware that Ontyme II only accepts "text" files from teletype (TTY) equipment or TTY emulators. "Binary" files cannot be successfully transmitted to the Ontyme II computer without first being converted to text. MicroCourier is a TTY emulator and creates text files. But if MicroCourier is used to send to Ontyme II a file that is created on another software package, that file must also be text. Files that we prepare and transmit to another Apple microcomputer on Applewriter software cannot in turn be retransmitted to Ontyme II because Applewriter creates binary files.

pendium of ILL policies, to give a few examples.

Another positive development is the use of microcomputers for public relations. The Parmly Billings Library is sharing its microcomputer with city employees from other departments. The Bozeman Public Library is planning a program of offering hands-on experience to youngsters. Glasgow City–County Library is planning a series of computer-awareness workshops for the community. The Miles City Public Library used the arrival of its microcomputer as a promotion for National Library Week.

Last, and most significant, is the effect of electronic mail on communication among librarians. We are finding that we use the microcomputers for a great deal more than just sending ILL messages. They have been used to transmit meeting agendas, memorandums, discussion papers, library statistics, and Valentine's Day greetings. Almost instantaneous communication is achieved in one sitting by entering, editing, and sending messages via microcomputer. This is a tremendous improvement over typing the letter, photocopying it, addressing the envelope, posting it, and having it reach its destination two days later. Electronic mail is even taking the place of some long-distance telephone calls, with the added advantage of having a written record of the message at each end. In short, intralibrary communications are becoming more frequent and more informal.

Our project began with the single objective of improving the interlibrary loan communication process. We have done this with a savings in cost large enough to purchase the systems in less than two years. Additionally, and perhaps more significantly, we are educating ourselves about microcomputer systems, their strengths and weaknesses, electronic mail, telecommunications, and the integration of automation into the library setting. Finally, the microcomputers have made the wide-open spaces of Montana a little less of an impediment to the uniform delivery of good library service.

For more information, contact: Beth Givens, Coordinator of Library Services, Montana State Library, 930 E. Lyndale, Helena MT 59620 or call (406) 449-3004.

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DOBIS/LIBIS Users Group: Report on Founding Meeting

James Heilik: University Library, University of Alberta, Edmonton

As of May 1982, IBM has sold 38 DOBIS/LIBIS licenses. Representatives of twenty-six of these installations came to the founding conference of the DOBIS/LIBIS Users Group held in Leuven, Belgium, May 6–7, 1982. They came from Europe, Canada, South Africa, and Saudi Arabia. They spoke many languages, but managed to communicate in English and French. They came from a wide variety of libraries, but found they had much in common.

The site of the conference was the Beguinage, a former convent restored and used by the University of Leuven. It is a medieval village in the heart of Leuven, and was no doubt as bemused by computer terminals as the participants were by the cobblestones.

The first day was devoted to getting acquainted. Each installation had completed in advance a questionnaire giving some details of how DOBIS/LIBIS is used. Copies of these were distributed at the meeting. Delegates had an opportunity to give brief

background information and answer some questions.

The system is used by a wide variety of libraries, but common themes appeared in the presentations. As DOBIS/LIBIS is designed for all, it is perfect for none. Most installations have three or four people on staff for adjusting and running the system. Support from IBM varies from excellent to almost nonexistent. There was much frustration expressed about individual aspects of the system but general satisfaction with the overall concept.

Day two was devoted to more detailed business. Two parallel sessions were organized: one on software, and one on library applications and organization. These sessions attempted to pinpoint those problem areas in which the cooperative mechanism of a users group could best be used. Here were aired the horror stories and the triumphs.

It became clear that, in fact, there are several user groups. The special technical libraries tend to have smaller collections, but want to index them intensively. Great interest in information retrieval was expressed in this quarter. University central libraries in Europe tend to be smaller than their North American counterparts, do not have a tradition of shared cataloging, and generally do not have a preexisting machine-readable database from previous automated activities. Hence, they are not as interested as the North Americans in bibliographic exchange standards and bulk-loading facilities for databases. Saudi Arabian and South African libraries appear to follow the European pattern.

Following the parallel sessions, Dr. Caryl MacAllister of IBM described and demonstrated some coming system developments. Sometime toward the end of 1982, the next version of DOBIS/LIBIS is expected to be released. Included in this planned version are Boolean search, statistics, serials check-in, abstracts, and numerous refinements to existing facilities. The audience received these announcements with much enthusiasm.

Can a real users group be pulled together from this diversity of libraries? Sufficient interest was expressed at least for an attempt. An executive was appointed, a number of jobs were distributed, and a secretariat will be established in Leuven. The group agreed to meet again in Paris in December 1982.

A word on the organization of the conference: the University of Leuven was a magnificent host, providing a very enjoyable setting for a most profitable couple of days. The smooth organization and hospitality helped tremendously.

LIST OF ACTUAL AND SUSPECTED DOBIS/LIBIS INSTALLATIONS

(The following institutions were invited to the Users Group meeting. Not every institution has an operational system.)

University of Leuven, BELGIUM
Centrum voor Overheidsinformatiek, BELGIUM
Departemento de Bibliotecas Publicas, BRAZIL
Centennial College Bibliocentre, CANADA
Hamilton Public Library, CANADA
National Library of Canada, CANADA
University of Alberta, CANADA
University of Calgary, CANADA
Inst. national de la statistique et des etudes economiques, FRANCE
P.T.T., FRANCE
University of Dortmund, GERMANY
University of Heidelberg, GERMANY
Ernst Klatt Verlag, GERMANY
University College, Cork, IRELAND
Camera Deputati, ITALY
Consiglio Nazionale Ricerche, ITALY
CSATA, ITALY
ENEA, ITALY
IBM Italia, ITALY
Istituto Superiore di Sanita, ITALY
Prov. Autonoma Trento, ITALY
University of Parma, ITALY
University of Perugia, ITALY
Institute of Science and Technology, JAPAN
Delft University of Technology, NETHERLANDS
University of Petroleum and Minerals, SAUDI ARABIA
University of Riyadh, SAUDI ARABIA
Ferdinand Postma Biblioteek, SOUTH AFRICA
Human Science Research Council, SOUTH AFRICA
South African State Library, SOUTH AFRICA
University of Pretoria, SOUTH AFRICA
University of Witwatersrand, SOUTH AFRICA
Universidad de Navarra, SPAIN
Universidad Politecnica de Madrid, SPAIN
CIBA-GEIGY AG, SWITZERLAND
P.T.T., SWITZERLAND

University of Zurich, SWITZERLAND
Austin Public Library, U.S.A.
COMSAT Technical Library, U.S.A.
IBM Research Library, San Jose, U.S.A.
Sandia National Laboratories, U.S.A.
Thomas Jefferson University, U.S.A.
University of California at San Diego, U.S.A. ■■

Computers in the Library: The Human Element

Lynn L. Magrath:
Pikes Peak Library District, Colorado Springs, Colorado

As I talk with librarians from other libraries who have recently begun automation or are considering moving into the realm of computerization, there are two questions that come up repeatedly: How did your library's staff react to the introduction of the computer? and How does the public react to using the computer instead of the traditional card catalog? The Pikes Peak Library District's (PPLD) experience has been that both the staff and the public have responded favorably to the computerization of operations at the library. This response was not, however, always immediate or automatic.

STAFF REACTION

Though we have done no formal evaluation of staff acceptance of the computer, staff who have worked here since the beginning of PPLD's move to automation generally agree that though the staff's reception of the computer has had its ups and downs, it has never been as negative as some of the horror stories we have all heard about computers vs. the staff in some organizations.

The Pikes Peak Library District implemented its first computerized system, a circulation transaction system, on the El Paso County computer (a DEC PDP/10) in August of 1975. Because the library's use of the county system soon became excessive, the library acquired Maggie (a PDP 11-70) in 1978 and has been adding programs and applications ever since. (See figure 1.)

Because the computer was a "foreign object" to the majority of the library staff in 1975, the library was closed two half-days for training the staff on just what a computer is and how the introduction of a computer would change the structure of some functions, but not put anyone out of work. The training sessions were very basic and were conducted by the people hired to write the software. Initially, the library's employees seemed interested but still quite apprehensive. Once the circulation system began running, their apprehension changed to distrust and frustration. Because we began using the circulation system as it was still in the process of being developed, it was necessary for people to know both the manual and the computerized systems. That fact, coupled with the usual bugs in the development of my new system and the library's low priority status on the county's computer, caused employees to lose some of their initial enthusiasm about the automation process.

PHASE II

New hope was generated in 1978 when the library began operations on its own computer and began doing its own programming in-house rather than contracting it out. In the next two years, attitudes about the computer improved dramatically at the main library as the circulation system became a dependable, time-saving program and as the number of programs doubled. The number and variety of available programs were very important in staff acceptance because our experience has been that the more people have occasion to use the computer to accomplish their own work, the less resistance they feel and the more applications they find for future use of the computer. Even those employees who don't use such programs as the Community Information Files, Circulation, Acquisitions, or the Furniture and Equipment Inventory regularly in their jobs have become dependent on one of the text editors or word processors to help accomplish their daily tasks.

Until mid-1979, the branch personnel were mainly observers as they did not have

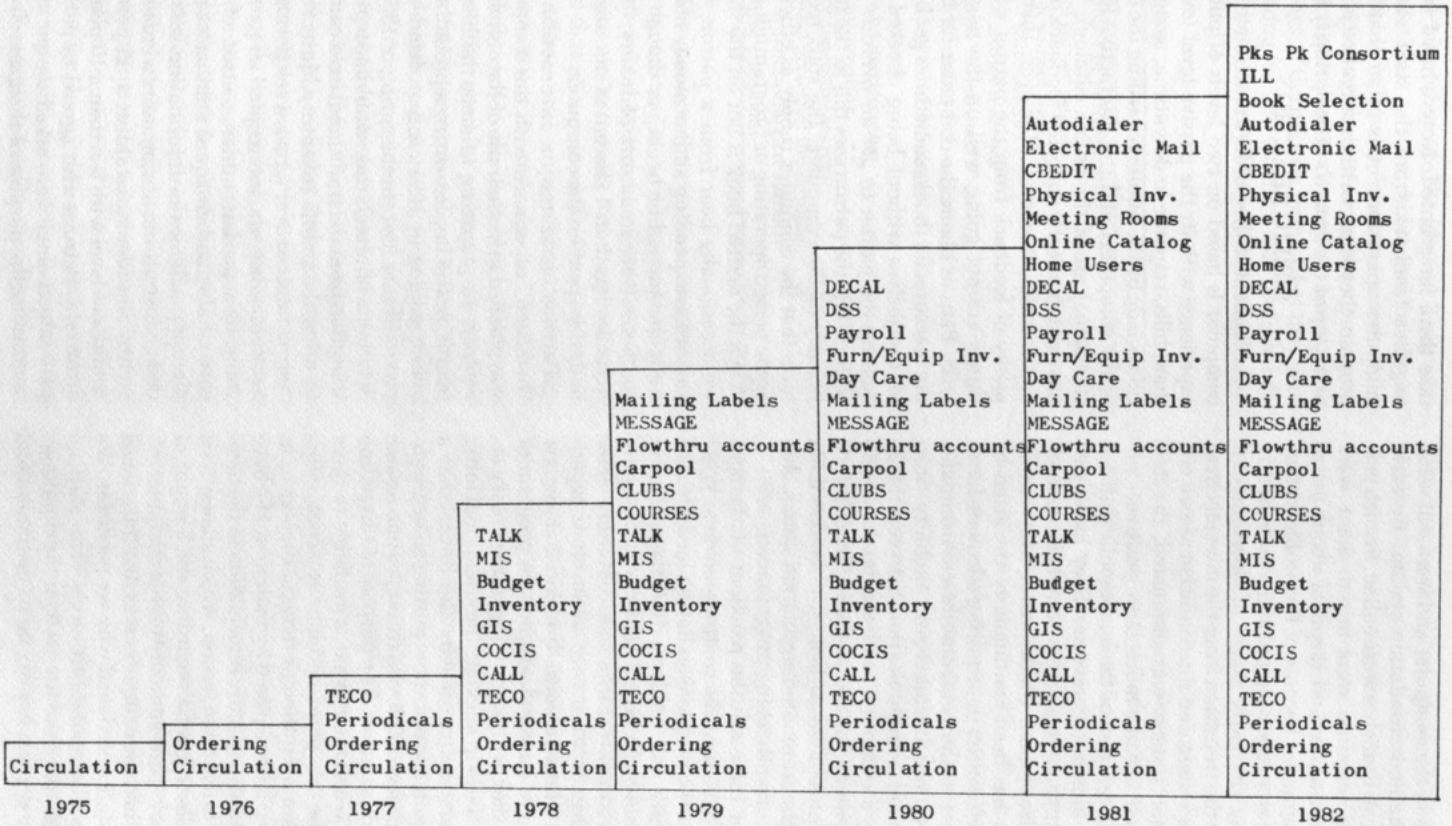

Fig. 1. Computer Applications Growth Chart.

access to the computer and were still using the manual circulation system. By early 1980, all branches were online. Branch personnel reactions were mixed. Some were unenthusiastic and skeptical about use of the computer because of the problems they knew were encountered at the main library during the early stages of development. Once the transition from the manual circulation system and the confusion of two circulation systems was eliminated, the staff attitude became much more positive.

The reaction of the bookmobile staff has been almost the reverse. They have been very anxious to convert from their old manual circ system. Unfortunately, this enthusiasm has been continuously thwarted by the difficulties in acquiring adequate hardware for the bookmobile environment. Limitations included size, mobility, storage, and communication between the library's computer and the bookmobile's computers. In 1981, a Radio Shack TRS80 was purchased to bring the bookmobiles into the automated circulation system, and it is currently being programmed.

But these are the reactions of the staff that have seen the computer evolve. What about the people who have joined the staff recently and suddenly find themselves in the midst of a broadly developed computer environment? Employees naturally enter the organization with all levels of experience. Many are initially afraid that they are going to have to learn how to program or that they will destroy files if they make errors. To help alleviate these fears and foster understanding of why the library has a computer, we are now putting all new public services employees through a one-on-one training session. The purpose of this session is to teach them what is available to them on the computer and how to access information even though these particular tasks may not be required by their jobs. We have also added specific information to the new-staff orientation session, which all new staff members attend regarding the amount of money spent annually on the computer.

When the computer was first introduced the staff questioned why we needed it. We have now come full circle. The staff no longer questions the need for the computer. They depend heavily on its operations and take them for granted. Now when I hear negative feedback from the staff about computer operations, it is often that the program they want written or revised is not at the top of the system's office priority list.

PUBLIC REACTION

Assessment of the public's reaction to the computer is based on two levels of public experience with it: the passive level (overdues, bills, response to downtime, assumptions made by the public regarding the cost of the computer) and the interactive level (the actual use of the online catalog). We have systematically collected feedback only on the interactive level. However, there is plenty of feedback from the patron when things are not going well on the passive level. Patrons blame the computer for billing inaccuracies (books sometimes get back on the shelves without being checked in, causing the patron to get an overdue notice). While the patron sees this as the inefficiency of the computer, the staff recognizes that the computer is only as efficient as the person operating or programming it. When the desired book is not on the shelf, we occasionally hear from a patron who feels we are spending all our money on the computer instead of books, as though the computer were some sort of luxury item. Actually, less than 3 percent of our annual budget is spent on the computer.

Patrons' first major interaction or "hands-on" experience with the computer was planned to be their use of the online inventory. In preparing to meet the library boards' goal of implementing a preliminary online catalog in 1981, it was decided to survey library users in the spring of 1980 to determine how well they would accept the transition from the traditional card catalog to using the online inventory. Interviews were conducted over a two-week period by a staff member who intercepted all patrons going to a predetermined section of the card catalog and an equal number of people approaching the information services desk. Ninety-seven library users were interviewed in order to establish a 95 percent confidence level with less than a 10 percent error rate. Patrons who agreed to participate (ninety-one) were asked six questions concerning the purpose of their search and

how often they use the library. They were then taken to a terminal and briefly instructed in how to conduct a search. After completing their search, the interviewer asked questions to determine, among other things, if the patrons found what they were looking for and whether they preferred the online inventory or the card catalog. (See table 1.)

Table 1.

	Pretest	Survey
Number of participants	7	97
% of survey refusals	14	66
% of subject searches	67	67
% of title searches	17	23
% of author searches	17	9
% who visited once a week	33	25
% who visited 2–3 weeks	33	23
% who visited 1–5 times per year	14	18
% who needed other information	33	46
% of successful searches	50	60
% who preferred the terminal	50	85
% for whom the first search was adequate	66	86

The question that we were the most anxious to answer was, Which method of access would the patron prefer—the card catalog or the terminal? We were amazed to find that 85.4 percent preferred the terminal. There was no significant correlation between the person's age and his or her preference for the terminal. The reason most often cited for preferring the terminal was that it is easy to use and faster than the card catalog. Seventeen percent preferred the terminal because it told which facility currently had the book and the number of copies available. Comments from several older people included their preference for the terminal because it was easier to read the screen than to read catalog cards. One person mentioned it was easier to use because she didn't have to bend down to get at the bottom catalog drawers. It is important to note that the majority of the people surveyed (82 percent) use the library once a month or more.

The results of this survey were much more favorable toward the online catalog than we expected and encouraged us to go ahead and make terminals available to the public while the online catalog was still in the process of being developed. In June 1981, ten terminals were set up for public use in the main library and two in the largest branch.

Because we were interested in validating our preliminary study, we were particularly pleased to be asked to participate in the Council on Library Resources National Online Catalog Survey. Data collection for the first phase of this study began November 2, 1981, and was completed December 12, 1981, to determine attitudes of users and nonusers toward online catalogs. To date, we have received no hard-data feedback, however the majority of the comments to the data collector from the patrons who used the online catalog in our portion of the study were positive. Many people said the terminal was easy to use. There were also a number of suggestions on how to improve the catalog such as, "less keys on the terminal," "should have printers available," and "need the ability to list a group of titles without separate commands." The second phase of data collection for this study was completed in May 1982. We are expecting to have the data feedback from our portion of the study by fall 1982. At that time, we will compare the data with that collected in our 1980 survey to see if patrons feel the same way about using the terminals now that they have had a chance to use them on a regular basis.

CONCLUSION

If we were beginning the process of computerization over again, there are a few things we would do differently to help the staff make the transition.

1. Plan an ongoing series of meetings (perhaps one per quarter) for the people designing the software to meet with the whole staff to keep them informed of progress and changes and allow more time for staff feedback.

2. Plan for more-detailed explanation of the process and for the time involved to get from where we are now to the ideal finished program.

3. Spend time better preparing the staff "on the firing line" to understand and explain the early "bugs" to patrons.

4. Set up a system for feeding back results of suggestions made to systems so the staff knows their suggestions have been heard. Systems is doing a good job of this now, but we did not plan for it in the early stages.

I believe that these steps would help make the transition into automation more comfortable for the staff and perhaps avoid some of the bad feelings that did surface from time to time.

We are just beginning the transition for the public and our efforts to evaluate their attitudes toward the computer. One thing I would *not* want to change is the timing of the introduction of the computer to the public. In the last two years, the phenomenal increase in the number of computer games, home computers, and bank and grocery store computerized tellers has raised the public's consciousness and made the appearance of the computer terminal in the library something that was almost *expected* by the public. ■■

Syncopation Automation: An Online Thematic Index

Karen Miller: Health Sciences Library, State University of New York at Buffalo; and A. Patricia Miller: Marathon Oil Company, Denver Research Center, Littleton, Colorado

Computer applications in science and technology are widespread and well known. In the humanities, however, computer-aided research is a recent development. Of all the humanities, music lends itself most to computer applications; music is precise and based upon mathematics. A line of music may be paralleled to a mathematical equation or chemical formula; all three are written in universal languages that mean specific things to their readers. Music, of course, has the added dimension of subjective interpretation, but its logical basis suggests numerous computer applications in music analysis and information storage and retrieval.

This paper will focus on some of the ways music research in libraries can be linked with computer technology. A proposal for improved retrieval of citations to musical works through the incorporation of fields for musical themes within the MARC format for music will be presented.

MUSIC CATALOGING

Traditional library card catalogs are gradually being replaced by other forms of the catalog, including books, microfilm, and online computer databases. The Library of Congress' machine-readable cataloging (MARC) format has become the communications standard for computer storage and generation of cataloging information about books. But cataloging features of musical works differ from those of books. Additional unique characteristics of musical scores include form of composition, existence of parts, format of score, publisher's plate number, type and number of instruments, different arrangements of the same piece, other classification schemes (Dickinson, Ohman, Balliet), and uniform titles with medium, key, and opus number. Phonorecords cataloging data often include physical description (size, speed, number of bands, etc.), program notes, persons associated with the work, data on recording sessions, and analytics for each band of the record. These and other cataloging needs were met with the publication, in 1976, of a special MARC format for music,[1] results of a project developed by the Music Library Association's MARC Format Committee, initiated by Harvard librarian Mary Lou Little. The use of this MARC format will allow for the transition of more complete bibliographic information about musical works.

Despite the depth of descriptive information or the form of the catalog, retrieval of citations to musical compositions has proven to be a tedious task. The traditional title, author, or subject access for books cannot efficiently apply to musical works. Composers are more prolific than authors, and searching by composer name sends the user thumbing through many entires. Also, titles of musical works tend to be repetitive,

with the form of composition and key being the only distinguishing feature. Subject headings are much too general for effective retrieval. These problems are multiplied in retrieval of musical works from large, online databases. Retrieval of many irrelevant citations in response to a query is unacceptable, not only because of the volume of information that the end user must read, but also, from the viewpoint of the searcher, because of higher costs of computer and/or connect time.

To illustrate these retrieval problems, consider the online cooperative cataloging database of the Online Computer Library Center (OCLC), which presently contains music records in MARC format. The five current search keys (LC card number, OCLC number, author, title, and author-title) are not adequate for retrieval of these records. The LC card number is generally not listed on musical works as it is on books. The OCLC number for a cataloged work is rarely known. The author search key has a tendency to retrieve too many works not only because composers are generally more prolific than authors, but also because the composer acts as author for all recordings of his work. For example, a recent search for the works of Beethoven (search key: Beet, Lu) retrieved over 256 citations. (Note: OCLC has an arbitrary limit of 256 citations retrievable per search statement.) The title search key does not perform well because many title words (such as symphony, concerto) do not sufficiently describe a work. Many composers have written many symphonies, and the title search key does not provide a way to distinguish among them. For example: "sym, g, m" retrieves all symphonies written in G minor or major regardless of composer. The author-title key truncates too much of the title and makes it very difficult to retrieve anything at all. For example: "Moza, Symp" retrieves every citation to Mozart's symphonies in the database, more than 256 entries.

As solutions to the problem, the present search keys could be expanded in length or other search keys could be developed. A stop-word list for title words (e.g., omit "symphony," "concerto," etc., from search keys) could be used. But, often, these words may be the only ones in the title aside from the more general mention of musical key. Since users of OCLC generally have the work to be searched in hand, sound recordings could be retrieved using a key derived from the manufacturer's label number. But this presupposition of a hands-on knowledge of the given work would not lend itself well to general retrieval. The theme of a musical work is a definitive factor in distinguishing it from other works. A thematic search key, used alone or concentrated with other search keys, would certainly serve to "name that tune" and retrieve citations to a musical work.

NAME THAT TUNE

One aspect of music cataloging excluded from the MARC format is a provision for musical themes. Whether it is necessary to include musical themes on catalog cards depends on the nature of the collection and the cataloging time available.[2] A field for musical themes should be included. Naturally it could be an optional field, but its use would contribute to efficient information retrieval. Extensive work has been done in the use of computers in thematic indexing. In the conclusion of his report about computers and the thematic index, Harry B. Lincoln comments, "The new type characters make possible the printing of 3×5 cards (library catalog size) containing music notation as well as textual information. It is recommended that music librarians interest themselves in the possibilities of this new technology. There are many possible applications, including folk song repertoires, popular music, lieder, etc. to name but a few."[3] But the applications of a field for themes can go well beyond the traditional catalog card.

Proposed is a synthesis of the true thematic index and the musical incipit. An incipit is simply a quotation of the opening theme of a work giving accurate identification of melody.[4] Because of its depth of notation, it is valuable in musical analysis as well as in "name that tune" type applications. A true thematic index, on the other hand, includes the main identifying theme of a musical work, regardless of where in the piece it occurs. It is not common to find both incipits and the main themes on cata-

log cards, but the benefits of inclusion of each seem more than worth the minimal extra effort required to compile them. Naturally, in many cases, the incipit is the main theme and no extra work is required to find an identifying theme. Two additional fields, one for incipit and one for identifying theme, could be added to the MARC format for music. The inclusion of themes would make possible the retrieval and accurate identification of musical work in an online database using only musical excerpts.

Incipit Field

Incorporation of incipits in the MARC format requires an appropriate input code for musical notation. There are several codes from which to choose. Some of the better known codes are the IML (Intermediary Music Language), the Plaine and Easie Code, ALMA (Alphanumeric Language for Music Analysis), and DARMS (Digital Alternate Representation of Music Symbols).[5] An ideal machine-readable code should be: (1) speedy, simple, and accurate in representation of pitch and rhythm, (2) mnemonic to music notation with no arbitrarily assigned symbols, (3) usable by nonmusicians with minimal instruction, (4) easily recognizable and retranslatable, and (5) applicable to all music, from Gregorian to modern.[6]

A modified version of Barry Brook's Plaine and Easie Code seems to be the best suited to the MARC format.[7] This simple code uses characters found on typewriter or terminal keyboards. Notes are represented by letters of the alphabet (A,B,C,D,E,F,G) and rhythms, preceding the notes, are represented by the digits (1 equals a whole note; 2, a half note; 4, a quarter note; 8, an eighth note; 6, a sixteenth note; etc.). Sharps, flats, and naturals are represented by #, b, and n, respectively. Rests are represented by =, holds by ., and bar lines by /. To indicate a different octave above or below the original, the octave can be represented by a + or − preceding the note, a modification of Brook's code.

The musical excerpts could be given a MARC field tag within the description fields (300's) or notes (500's). The subfield codes, with $ separator, chosen for the incipit field include: (1) $a = clef, (2) $b = key, (3) $c = meter, (4) $d = tempo, (5) $e = melodic excerpt. There are no fixed lengths for incipits; an arbitrary maximum number is twenty notes. The following examples illustrate the representation of the proposed MARC incipit field:

aGbG$c44$dmb$e2E4F4G/4.F8E2E/
2E4D8B8D/2E
(Dvorak, Symphony no. 9 in F Minor, "From the New World")
aGbD$c34$dmb$e4A4D4F/2G8.G16F/
2.F/
(Tchaikovsky, Nutcracker Suite, "Waltz of the Flowers")
aGbF$c44$dmb$e8F8F8A8C/
4C8A8C4C8A8C/4C
(Paul Simon, "Kodachrome")

Retrieval Theme Field

Since a person trying to identify a melody is not likely to know the key, time signature, rests, and the like, elimination of everything from the coding except the letter of the notes simplifies the incipit into a retrieval theme. The musical excerpt in the retrieval field is always transposed into the key of C. Music is based on relationships between notes, and the musician thinks in terms of these relationships. It is possible, therefore, to know a "tune" without knowing its key. A computer program could be written to interface with the retrieval software to transpose the music into the key of C, or the music cataloger could input the theme after mentally transposing it. Only one subfield code is used: $a = melodic excerpt. Examples of representations of the proposed MARC retrieval themes include:

$aABCBAAAGEGA
(Dvorak, "From the New World")
$aGCEFEEGCEFEEGC
(Tchaikovsky, "Dance of the Flowers")
$aFGEEEEEFED
(Paul Simon, "Kodachrome")

The retrieval field described above would be useful in academic music libraries where the majority of the patrons have had musical training and are able to transpose to the key of C. A major drawback to the thematic system as outlined here appears to be that a nonmusician would have a difficult time "naming that tune." Fortunately, there exists a system of representing relationships between notes that require no

knowledge of music and takes very little time to learn. In *The Directory of Tunes*, Denys Parsons has created a type of thematic index for the individual who knows nothing about music but nevertheless wants to know the name of a specific tune.[8] His notational system does not include specific notes, only the "steps" of the notes, i.e., if the melody goes up, down, or remains the same. Consequently, this system is not accurate to pitch and rhythm and could be used by someone who knows a tune but cannot recall its name. This notational system would be especially appropriate in general-user situations, like public libraries. Parson's system could be easily incorporated into another retrieval field for MARC for music. Parson's code consists simply of an asterisk (*) representing the first note of the tune, with the remaining notes represented by an R (for repeat), U (for up), or D (for down). To continue the illustrations in Parson's notation the retrieval fields would be:

$a*UUDDRRDDUU
(Dvorak, "From the New World")
$a*UUUDRDUUUUDDUD
(Tchaikovsky, "Dance of the Flowers")
$a*UDRRRRUDD
(Paul Simon, "Kodachrome")

The Parson's system is so simple that it seems as if it would not work as a search key; that is, too many tunes would map to the same retrieval key. But in actual use, it has been found that the duplicate mappings are very few. To quote Bernard Levin in the introduction to Parson's thematic index, "[it] works without flaw or failure, works for those who know absolutely nothing whatever about music, works for those who hate music and want only to know exactly what music it is that they are hating at any given moment as much as for those who love music and want to know the particular name that their beloved goes by."[9]

To summarize, the incipit would not be used for retrieval, but would serve as information for the individual who knows the title or composer of musical work, and would like to see how the piece begins (what key it is in, the speed, melody, etc.). Other uses of incipits are for the purposes of accurate identification, determination of musical trends, and for comparisons of different composers in musical analysis. The retrieval theme (either in Parson's form or another simplified code) would be used by the person who does not know the composer or title of the work, but knows a melody and wishes to identify it. Musical recordings could be treated in the same manner as musical scores; consequently, it would be possible to request a theme for any band of a musical recording and check the incipit for a retrieved piece.

CONCLUSION

The authors of this paper are not music catalog librarians and have proposed the field for incipits and/or musical themes from the perspective of the musician and computer specialist. To gain further insight into the feasibility of implementation of incipits in OCLC music cataloging, a visit was made to the Sibley Music Library at the Eastman School of Music in Rochester, New York. According to cataloging librarian Joan Swanekamp, a field for incipits would be useful in information retrieval and, in the format outlined in this paper, would not be difficult to implement. Music score cataloging is a very involved process (cataloging a music score requires, on the average, twice the time necessary to catalog a book) and adding a field for musical themes would not take very much extra time. Swanekamp expressed the opinion that the use of musical themes in cataloging would be especially useful in the case of music scores for which composer and dates are not known.[10] The use of musical themes in a computerized system could also aid in music analysis; it would be possible to retrieve certain patterns of notes and draw conclusions about similarities between composers as well as trace the evolution of musical trends.

As well as aiding in online retrieval, the suggested fields could be used to compile paper copies of thematic indexes, such as that of Barlow and Morgenstern[11] or Parsons. Subset indexes for library holdings of a particular composer, musical form, or time period could easily be generated. Computer-produced book catalogs could be expanded with incipit information to aid the user in identifying a desired work.

Computer technology has advanced to the point that the musical symbols entered

at a terminal can be converted to the sounds they represent. For example, the SCORTOS music implementation language,[12] designed for computer composition of music, uses a standard ASCII keyboard to input music by the use of key substitutions. Using a terminal with a sound synthesizer, the retrieval theme could be "played" on the keyboard, with the patron actually hearing his tune. Better yet, automatic voice scanners may some day be developed so that a patron could sing his retrieval theme to the computer!

ACKNOWLEDGMENT

The ideas for this paper were developed by the authors while they were both students in the School of Library and Information Studies, State University of New York at Buffalo.

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Subminute Telefacsimile for ILL Document Delivery

Virginia Algermissen, Pennie Billings, Sandra Grace, Barbara Guidry, and John Blair: TAMU Consortium of Medical Libraries

A recent demonstration of resource sharing via telefacsimile within geographically separated units of the TAMU (Texas A&M University) Consortium of Medical Libraries proved to be fast, efficient, dependable, and rewarding for librarians and users.

The TAMU Consortium of Medical Libraries, composed of three library units and two media center units, serves the College of Medicine at both its campuses: College Station and Temple, which are separated by seventy-seven miles.

The goal of sharing resources held by three relatively small libraries has remained foremost in shaping management activities during the 5½ years of consortium development. Although interlibrary loan activities within the three library components has steadily increased throughout the years, delays in mail and courier service have inhibited full resource sharing. The combined collections of the three libraries total approximately 100,000 volumes and serve a broad range of health-sciences users. Premium collection growth has been limited by inadequate space in each library.

The Medical Sciences Library, which serves as the administrative unit of the consortium, initiated a three-month pilot study of the use of subminute telefacsimile* in late January 1982. A telefacsimile machine was placed at the Medical Sciences Library, College Station, for a three-month period with a second machine shared by the two hospital libraries in Temple. The Olin E. Teague Veterans Administration Center Library first housed the tele-

*Subminute telefacsimile refers to the capability of transmitting a full page of text in less than one minute.

fax for nearly two months, and the Scott and White Memorial Hospital Library housed it for the remainder of the study. Objectives of the study included, among others, determination of speed, cost, and reliability of transmission; quality of copy; ease of use; and overall efficiency for document delivery. The cost of the three-month study, including lease of machines, totaled approximately $3,000.

Statistics from the demonstration study revealed positive findings. During the study, interlibrary loans between two library components, Veterans Administration Center Hospital Library and Medical Sciences Library, increased by 350 percent, proving a commonly held hypothesis that the demand for information would increase if reliability and speed of delivery were enhanced.

Statistics for 267 interlibrary loan transmissions and 2,682 pages over the eleven-week period revealed an average transmission time of one minute and twenty-three seconds at a line cost of $.11 per page. Quality of transmitted copy was high, although dependent on original page or photocopy.

The stand-alone units used in the study were chosen for speed and quality. Demonstration indicated that the somewhat complicated paper path presented occasional maintenance problems with disappointingly slow response to maintenance calls. Paper and toner required by this model proved more expensive than anticipated. Installation of machines was complicated by quality of telephone companies within the region. Speed of transmission was also affected by line quality.

During the study, Medical Sciences Library reviewed the capabilities of two other manufacturers. Similar and highly desirable capabilities or features of the three makes were: top subminute transmission speed ranging from fifteen seconds to twenty-four seconds with each having step-down modem capabilities, batched document transmission, variable document size, in-house copy mode, and other similar options, such as time and date record for each transmission, polling, and report-generation capability. Each was easy to use, and each met international CCITT (Comité Consultatif International Telegraphique et Telephonique) standards.

Several differences observed among the three were: archival or thermal copy, desktop versus stand-alone model, and the total price for models we reviewed ranged from approximately $8,850 to $14,625. The most important differences were in warranty and maintenance, ranging from a thirty-six–month period for free parts and service to a fee of $104 monthly. Maintenance response time ranged from the four to eight hours advertised by the manufacturer up to one working week as evidenced during the pilot study. Installation charges ranged from $100 to $195. Delivery time varied from immediate delivery to sixty days.

At least one company, Panafax, advertises its most advanced machine, a transverter, as having been designed with capabilities for the near future of transmitting or receiving from computers, Telex or TWX, word processors, other facsimile, and models.

Response from librarians, staff, and users, after initial vexing problems, was and remains highly enthusiastic.

Three machines are now in the state bid process and we all look forward to purchase, installation, and use. We highly encourage other libraries to consider this advance in document delivery with its implications for local and international use. We believe adapting this technology, widely utilized by the business world for over a decade, to libraries would greatly affect the present status of interlibrary loans in general and, in particular, resource sharing among smaller libraries. Our findings and comparisons are specific to our needs and may not reflect the similarities and differences perceived by the companies we observed. Each has a highly desirable product. Telefacsimile machines reviewed during the study were products of Panafax, Rapicom, and Xerox.

We invite you to call (713) 845-7427 for additional information or to write: Virginia Algermissen, Director, Medical Sciences Library and Consortium of Medical Libraries, Veterinary Administration Building, Suite 101, College Station, TX 77843. ■■

Videotex—The Library of the Future

Lare Mischo and Kevin Hegarty: Tacoma Public Library

On March 17, 1981, the board of trustees of the Tacoma (Washington) Public Library were given a preview of the library of the future, utilizing videotex technology. This presentation, prepared by Boeing Computer Services (Seattle, Washington) in cooperation with Tacoma Public Library staff, demonstrated the potential of interactive cable systems based on the Canadian Telidon system. The demonstration entailed building a small database as an example of what the library could do in the way of delivery of home information services.

Telidon is an alpha-geometric videotex system utilizing four layers of bit-plane RAM, thereby allowing complex and detailed graphics, and permitting the use of an alpha-photographic mode. It is the most versatile of all the teletex/videotex systems. This is due to the technique used for storing and sending information—picture description instructions (PDI's). PDI's are a compact set of commands that describe pictures to the terminal; they are interpreted by the terminal, which then constructs the picture on the television screen. The trade-off for the flexibility is that the terminal decoder requires a microprocessor and relatively large memory. In addition, Telidon has been designed to provide both forward and backward compatibility, and it is capable of emulating Antiope and Prestel.

The Telidon system uses a hand-held key pad attached to the home television set to allow the viewer to select from menu screens. The library-of-the-future presentation began with the library as one part of a broad range of home information services, including banking, shopping, news, and others. A key-pad choice of library information brought up a menu including browsing the library catalog, public events, library program listings, best-seller lists and reviews, and a humorous story. None of these services are necessarily unusual or original, but board members were able to use the key pad to select the information they wanted, to move back and forth interactively with the library, while imagining themselves sitting in their own home.

Photo by Neil B. Hare

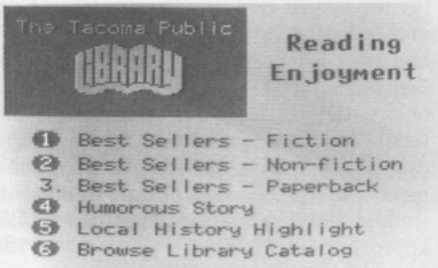

Photo by Neil B. Hare

Best-seller reviews included the ability to reserve copies for pickup at the library location of one's choice or to arrange for the material to be mailed to one's home by keying appropriate codes. A small subset of the business and management collection of the library allowed the viewer to browse through the library's holdings.

Experiments, such as Channel 2000 and others, demonstrate the interest in using interactive cable and videotex systems. A library such as Tacoma Public, with its holdings in machine-readable form in a circulation system, can provide more remote and home access than was ever before possible. What form this access may take and what problems will be involved need to be faced in the very near future.

The trustees of the Tacoma Public Library were given a hands-on opportunity to use interactive cable television and to see one possible role the library could play in supplying home information. This experi-

Photo by Neil B. Hare

ence was just a prelude to the decisions that will need to be made in determining the future direction of the public library.

The presentation was prepared by Boeing Computer Services, using part of its BITS (Boeing Intelligent Terminal System) software package. The equipment used included a Terak 8510-A, a microcomputer to mimic an interactive cable system, a Telidon decoder, and RGB television for display. The BITS software Telidon component (BITSVIEW), which runs on a number of different microcomputers, was the result of BCS' investigation of various Viewdata systems. It demonstrates successfully that microcomputers may be used to create the videotex picture description instructions, to transmit this data between remote sites, and to display the resulting screens as needed.

The Boeing-developed software interface allows the creation of geometric shapes and lettering in eight colors and eight gray tones. Using a grid system and menu selections, a palette and shapes coordinates are used to create the desired images, which can be composed of detail down to the single pixel level. The color detail and overall quality of the Telidon screens used in the demonstration were particularly impressive. In addition, the BCS software interface provides future users with a choice between using an existing Telidon database constructed with PDI's, or the utilization of a non-PDI existing database.

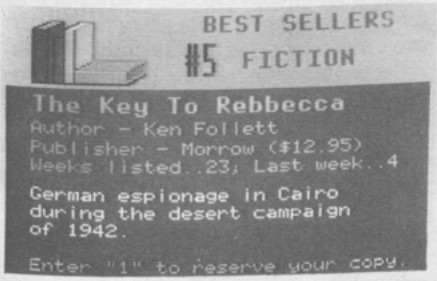

Photo by Neil B. Hare

The demonstration by BCS and Tacoma Public Library staff was designed to offer the board of trustees an opportunity to experience firsthand the kind of home access that is being talked about for the library of the future. If one picture is worth a thousand words, then the ability to interact with the admittedly limited set of Telidon screens still told the board more about the future than a thousand written reports. The most telling effect of the demonstration was a subsequent action by the board in the appropriation of $25,000 to purchase microcomputers and software to explore the utilization of microcomputers in the library of the present. ■■

Automated and Manual ILL: Time Effectiveness and Success Rate

Izabella Taler: Paul Klapper Library, Queens College, Flushing, New York

Queens College of the City University of New York, established in 1937, offers extensive undergraduate- and graduate-level educational programs.

The college library—Paul Klapper Library (PKL)—is responsible for servicing its 18,200-member student body as well as its staff and faculty. In order to support the existing curriculum and research needs, the library maintains an extensive collection of monographs, serials, and microforms. The demand for material not owned by PKL is channeled through the Interlibrary Loan (ILL) Department.

For the past few years the Interlibrary Loan Department has been witnessing a significant shift in the material requested

by its patrons, as well as experiencing a rise in the demand. The need for old and out-of-print material is being replaced by the need for vast amounts of extremely current information. This shift can be attributed to two primary factors: the growing popularity of computerized bibliographic retrieval systems, which have promoted the dissemination of information, and the library's inability to acquire this material due to the diminished monetary resources allocated to the library's collection development.

The purpose of this paper is to study and report on the time effectiveness and success rate of the various methods used by the ILL Department in obtaining monographs requested by its patrons.

ILL METHODS

The City University of New York (CUNY) is comprised of junior and senior colleges located within New York City's five boroughs. The Paul Klapper Library of Queens College relies heavily on the library resources available at other CUNY units, and its patrons' needs are often met by the collections of CUNY's senior colleges. To facilitate the sharing of information within CUNY, a teletype (TWX) service has been utilized by most of the four-year colleges.

In addition to resources available in CUNY, PKL's access to the vast library resources within New York State has been made possible through the New York State Interlibrary Loan (NYSILL) system. The process for obtaining material through NYSILL requires that a request be teletyped in a coded format to the state library in Albany, where it is either filled or referred to an appropriate cooperating library.

To obtain material not available in CUNY or thorough NYSILL, the PKL utilizes an ALA-approved interlibrary loan form which must be mailed to a specific library.

Since mid-1979, the ILL Department has been using the latest online communication system available through OCLC. Unlike the traditional methods described herein, OCLC offers an online union catalog of library materials available at participating libraries. The OCLC ILL subsystem provides an automatic transfer of bibliographic data from the union catalog onto an interlibrary loan form displayed by the system, thus minimizing the amount of typing otherwise required. Additionally, the system's referral capability, whereby a request is automatically forwarded to each of the five libraries preselected by the borrower, eliminates the need for retyping of the request in the event a negative reply is received from a potential lender.

ILL STUDY

Although some advantages and disadvantages are associated with each interlibrary loan method, the primary concern of our research was to study the time effectiveness and the success rate of each method outlined herein. This was accomplished by examining: (1) the time required to obtain a reply—whether negative or positive—to an ILL request initiated by PKL; (2) the time lapse between sending a request and receiving needed material; and (3) the ratio of filled versus unfilled requests.

The data analyzed consisted of requests processed by the ILL Department during fall 1979 and spring 1981. The 1979 data represents the department's initial use of the OCLC ILL subsystem; the 1981 figures represent the latest available data.

Throughout this report, the interlibrary loan methods described here will be referred to by the following acronyms: TWX, NYSILL, ALA, and OCLC.

ANALYSIS OF TIME EFFECTIVENESS

During the three month period in 1979, the Interlibrary Loan Department processed 200 requests for monographs as compared with 333 requests completed within the three month period in 1981.

The data summarized in table 1 shows the average number of days required to obtain a positive reply from a lender and to receive material at PKL. The number of days reflects calendar- rather than work-days because of variations otherwise introduced by mail procedures and work schedules.

These results show that TWX transactions, i.e., requests submitted to CUNY libraries, produce fewer delays than other ILL methods. Although this is a significant finding, the ILL Department is unable to rely substantially on the library resources

Table 1. Time Delay in Obtaining Interlibrary Loan Material

Type of Transaction	1979 Notification of Shipped Date	1979 Receipt of Material	1981 Notification of Shipped Date	1981 Receipt of Material
ALA	14.29	27.39	9.69	22.13
NYSILL	10.16	19.50	9.83	19.60
OCLC	5.05	17.01	5.33	16.33
TWX	2.18	10.09	5.11	13.70

within the CUNY system due to the lack of information regarding library holdings. Even though current holdings information is available through OCLC, to date no CUNY library has completed its input of retrospective holdings into the OCLC online union catalog.

Of the remaining three interlibrary loan methods examined here, the OCLC ILL subsystem was the most expedient in 1979 and its performance has improved slightly in 1981. Considering that the OCLC ILL subsystem reaches in-state as well as out-of-state locations, the average 16.33 days required in 1981 to obtain needed material is certainly significant. This is especially so when compared to the 19.6 days needed by the NYSILL system, which reaches only in-state locations, and the 22.13 days required by the ALA ILL form.

ANALYSIS OF SUCCESS RATE

The second part of this study concentrates on examining the success rate of each of the interlibrary loan methods with regard to obtaining needed material.

Although 133 more requests were processed in 1981—a 66.5 percent increase—the percentage of unfilled requests was only slightly higher: 11 percent in 1979 and 13 percent in 1981.

The data summarized in table 2 shows that the OCLC ILL subsystem achieved the highest success rate during both years. The highest number of unfilled requests resulted when standardized ALA ILL forms were used.

As previously stated, the OCLC and NYSILL are the only interlibrary loan methods with referral capability that are presently used by the PKL Interlibrary Loan Department. The system's capacity for an automatic transfer of a request from one location to another is extremely important to an ILL Department. Clearly, the elimination of otherwise necessary clerical routines associated with resubmitting of each unfilled interlibrary loan request results in significant time savings to the department and the patron it serves.

The success of the OCLC and NYSILL referral capabilities was examined and the results are presented in table 3.

The 1981 data shows that of all the requests submitted via OCLC, 56.91 percent were filled by the first lender. This is almost double the rate experienced with NYSILL requests.

Of the two systems, OCLC ranks first, both in the number of libraries a single interlibrary loan request is capable of reaching, as well as the success of filling the request at the first site. An important factor that contributes to this high success rate is that OCLC allows the borrowing library the ability to select up to five prospective lenders. Thus, such factors as the location of lending library, its past record of cooperation, etc., may be considered.

Unlike OCLC, the NYSILL system lacks this feature. The borrowing library must

Table 2. Distribution and Success Rate of Interlibrary Loan Methods

Type of Transaction	1979 Total No. of Requests Processed	1979 % Filled	1979 % Unfilled	1981 Total No. of Requests Processed	1981 % Filled	1981 % Unfilled
ALA	75	74	26	110	76	24
NYSILL	35	86	14	57	84	16
OCLC	79	100	—	130	95	5
TWX	11	100	—	36	94	6

Table 3. Referral Success Rate Using OCLC and NYSILL

Transactions	1979	1981
OCLC		
Supplied by 1st lender	63.30%	56.91%
Supplied by 2d lender	31.64	23.57
Supplied by 3d lender	2.53	9.75
Supplied by 4th lender	2.53	7.32
Supplied by 5th lender	—	2.44
NYSILL		
Supplied by the New York State Library	50	29
Supplied by referral library	50	71

therefore rely on the New York State Library to forward its requests to other locations.

CONCLUSIONS

The data examined clearly indicates that the OCLC ILL subsystem is extremely time efficient and that it offers the highest success rate of filling interlibrary loan requests for monograph material.

While the TWX method resulted in the speediest response time, such factors as insufficient information regarding library holdings and lack of referral capability contribute to the system's underutilization.

The high-speed technology utilized by OCLC offers a variety of improvements not available through other currently used methods. The immediate advantages of the OCLC ILL subsystem, such as the online union catalog, automatic transfer of bibliographic data, and the referral capability, result in a more efficient interlibrary loan service. Clearly, the utilization of computerized technology has proved to be both extremely successful and highly desirable. ■■

Reports and Working Papers

MARC Record-Linking Technique

Sally H. McCallum

The following document presents the technique to be used in the MARC Communications Format when encoding cataloging records for component parts of items (analytics). It was prepared for discussion at the MARBI Committee meetings, and approved by that group and the Library of Congress in February of 1982. The new fields and subfields defined in this document will appear in Update Number 7 of the MARC Formats for Bibliographic Data. *Any questions concerning use of this extension of the MARC Communications Format should be addressed to: MARC Standards Office, Processing Services, Library of Congress, Washington, DC 20540, ATTN: Margaret Patterson.*

GENERAL TECHNIQUE

A. Introduction

This paper describes a technique for linking related bibliographic units. The technique is basically that now used in the MARC format for serials to link related serials, i.e., the linking entry fields that are defined for the 76x–78x area of that format.

The following terms are used in this paper.

Chronological Relationship—the relationship in time between bibliographic items such as the relation of a serial to its predecessors and successors.

Horizontal Relationship—the relationship between versions of a work in different languages, format, media, etc.

Linking Entry Field—a field that carries descriptive data for a related item or the record number for the item or both.

Related Item—a bibliographic item that has either a vertical, chronological, or horizontal relationship with a target item in a record.

Target Item—the bibliographic item that is the principal or primary unit for the description of which the record was constructed. The target item is the item to which the data in the legend apply.

Vertical Relationship—the hierarchical relationship of the whole to its parts and the parts to their whole, such as an individual item to its series or a journal article to the journal.

The data fields of a MARC record generally contain data describing the target item. Exceptions in which related bibliographic items, either physically separate or contained in the target item, are referenced in a record occur in the series fields, serial linking fields, and many of the author/title added entries and contents notes. The technique for referencing other items that is described below focuses on providing a mechanism for linking the target item to a separate record where the complete data concerning the related item will be found. Limited descriptive data may be embedded in the record for the target item, but record number links to complete records for the related bibliographic units can also be carried in the record.

In order to ensure a technique that is flexible and yet will facilitate implementation by being consistent with the current format, the record-linking technique must meet the following requirements:

1. Capable of handling a variety of relationships including vertical, horizontal, or chronological.
2. Consistent with the record structure standard as defined by ANSI Z39.2-1979.
3. Description of the related bibliographic units not required to reside in the same bibliographic record.
4. Consistent, as far as possible, with

techniques identifying related bibliographic units that are already used in MARC records.

The record-linking technique described below, which is a generalization of the serial linking entry fields, meets those requirements. The variety of relationships accommodated is noted in section III. It is consistent with Z39.2-1979. The description of related items need not reside in the record for the target item; a linking record number is sufficient. The present serial linking entry fields are valid under the expansion of the technique. The existing implementations are discussed in section II.

B. Linking Entry Fields

A linking entry field will be used when references to bibliographic items that bear specified relationships to the target item are required. These fall into two classes: (1) those related items that may assist the user in continuing to search but are not necessarily required in order to obtain the target item, such as former entries for serials and translations of the target item; (2) those related items that are required to obtain the target item, such as the host items for component parts.

The serial linking entry fields were designed to support manipulation by the receiver in the following way. The data, i.e., author, title, etc., information was to be used to display an eye-legible note on the record in which the field appeared. Thus minimal content designation (only enough to arrange the order of the data in a display) was provided. For data operations that might require fuller content designation, such as some types of indexing and sorting, a subfield for the record number of the full record for the related item was provided. Systems were expected to follow that link to the related record to obtain fully content designated data. This number link is also the key to the update of the eye-legible data subfields. The following generalization and use of the linking fields adheres to the original design of the linking fields except that the data provided in a control subfield will allow some systems to be able to carry out some types of indexing without reference to the actual related records.

The linking entry fields are to be used in the formats and for the linking situations that have been specified. The extension and use of these fields for additional formats should be carefully considered to avoid conflict with linking mechanisms already employed, such as the author/title added entries. Conversion of linking techniques already in use in the MARC format to the technique described below would be possible but such is not anticipated.

C. Description of the Record-Linking Technique

The record-linking technique is made up of three parts: (1) *linked-record code*, a leader byte that indicates whether or not the record for a related item will be required in order to fully process the record for the target item; (2) *linking entry field*, a field that carries descriptive data concerning the related item, record number for the record of the related item, or both; (3) *linking entry complexity note field*, a field that carries a note that expresses a complex relationship between a related item and the target item that cannot be adequately expressed using the data of the linking entry fields.

Specifications for the Linked-Record Code

Byte 19 in the record leader will contain an alphabetic code indicating whether a record for a related item is required in order to fully process the record. Related records will be considered "required" when a record number *without* supporting $a + $t or $a + $s or $a or $t or $s or $u or $r subfields containing author and/or title or technical report number appear in a linking entry field. These subfields are designated the "basic item identification subfields" and constitute those data elements that are commonly considered sufficient for eye-legible citation of an item. Other subfields may be present in the linking entry field with the record number but only the above determine the value of byte 19.

leader, byte 19—

r—Related record required to fully process the record.

(At least one linking field does not contain one or more of the basic item

identification subfields $a + $t, $a + $s, $a, $t, $s, $u, or $r, but contains the record control number of the related item with or without other supporting subfields, such as $g.)

b—Related record not required to fully process record.
(No linking fields present, or the linking fields that are present contain either basic item identification subfields, $a + $t or $a + $s or $a or $t or $s or $u or $r, or a 580 note field with basic item identification information.)

Note: This byte is provided to identify those records that have linking fields from which an eye-legible note cannot be generated without accessing the actual related record, i.e., neither the linking field nor a 580 field contains the basic item identification information. Without this indicator, it would be necessary to examine the subfields of the linking entry fields to ascertain whether a related record is required for a complete display. It is not intended that this byte will specify whether or not linking fields appear in the record; this may be ascertained by a scan of the directory. Attempting to code for the *existence* of linking fields in this byte would require change of many existing records.

Specifications for the Linking Entry Field

The range of tags 760–789 will be reserved for Linking Entry Fields. (Tags 769, 779, and 789 are reserved for local use.) The structure of the fields will be as follows:

Tag—indicates the general nature of the relationship of the related item to the target item.

Indicator 1—indicates whether a display note is to be generated from the data in the field or from the data in the record for the related item (value 0) or whether a 580 note is present in the record that explains the relationship for display purposes (value 1).

Indicator 2—indicates the specific nature of the relationship of the related item to the target item (may not be defined for all tags). Values would be tag dependent since they represent a specific relationship breakdown of the general relationship indicated by the tag.

Subfields—The subfield data is described in terms of the location and form in which the data would occur in the related record, even though in some instances there may not be an actual related record. When there is no related record, the specifications for the form of the data element will be as if it appeared in a related record. If a Linking Entry Field appears in a record, it should contain at least one of the following subfields: $w, $a + $t, $a + $s, $a, $t, $s, $u, or $r.

$7—control subfield
Contains up to four fixed positions, one character codes that indicate the type and form of author name in the $a subfield, type of record for the related item, and bibliographic level for the related item. If this data is not needed for a given linking field, the control subfield need not be used in that field. If the control subfield is used, the coding of any position mandates that each preceding position be coded although succeeding ones need not appear. The code value n (not applicable) should be used for bytes 0 and 1 when bytes 2 or 3 are needed but a $a subfield does not appear in the field (either because the main entry for the time did not include $a data elements or a related record is referenced rather than including the data in the linking field). A fill character *may* be used, however, in any position that is required because a subsequent one is coded. (not repeatable)
Code values for byte 0, type of author name:
p—personal name
c—corporate name
m—conference name
u—uniform title heading
n—not applicable
Code values for byte 1, form of author name:
If byte 0 = p,
0—forename only
1—single surname
2—multiple surname
3—name of family

If byte 0 = c or m,
0—surname (inverted)
1—geographic name with corporate or form subheading and/or title
2—name (direct order)
If byte 0 = u or n,
n—not applicable

Code values for byte 2, type of record, and byte 3, bibliographic level, are the same as for bytes 6 and 7 of the leader of the related item.

$w— record number
Contains the record control number from the 001 field for a related item and the NUC symbol for the system to which the number applies. The record control number is formatted as in the 001 field. The NUC symbol will appear in parentheses immediately preceding the record number. (repeatable)

$a— main entry (corporate, personal, conference name, or uniform title heading)
Contains the 100, 110, 111, or 130 data from the related record. (not repeatable)

$s— uniform title
Contains the title from the 240 or 243 field of the related record. (not repeatable)

$t— title
Contains the title from the 222 or 245 $a, $n, $p of the related record. (not repeatable)

$q— parallel title
Contains the parallel title from the 245 $b subfield of the related record. (not repeatable)

$b— edition
Contains the name of the edition from the 250 field of the related item. (not repeatable)

$c— qualifying information
Contains the parenthetical expression that follows a key title or other data needed to distinguish between two titles. (not repeatable)

$d— place, publisher, and date of publication
Contains data from the 260 field of the related record. (not repeatable)

$g— relationship information
Contains data that indicates the specific piece or pieces of the related item that are involved in the relationship with the target such as dates and volumes. (repeatable)

$k— series data for related item
Contains data from the 4xx or 8xx field of the related record. (repeatable)

$e— language code
Contains language code from the 008 field of the related item. (not repeatable)

$f— country code where issued
Contains country of publication code from the 008 field of related item. (not repeatable)

$r— report number
Contains report number from the 088 of a related technical report record. (repeatable)

$u— STRN
Contains Standard Technical Report Number from the 027 of a related technical report record. (not repeatable)

$x— ISSN
Contains ISSN from a 022 of a related record. (not repeatable)

$y— CODEN
Contains CODEN from a 030 of a related record. (not repeatable)

$z— ISBN
Contains ISBN from the 020 of a related record. (repeatable)

Specifications for the Linking Entry Complexity Note Field

The tag 580 will be used for the linking entry complexity note. This field is used for notes that express the relationship between the target item and a related item when the *relationship* is too complex to be expressed using a print constant and the data in the linking entry field (or the linked record). When used, this field appears in addition to any relevant linking entry field. As noted above, the first indicator in each linking entry field shows whether the linking entry field data (with or without the corresponding linked record) will be adequate to display a note or whether a 580 field carries the display information.

Indicators—undefined
Contain blanks.
Subfields
$a—linking entry complexity note
Contains the full display note that explains the relationship to a user of the record. (not repeatable)
$z—source

II. EXISTING USES OF THE RECORD-LINKING TECHNIQUE: SERIALS AND TECHNICAL REPORTS

A. Changes

As noted earlier, the "record-linking technique" is a generalization and refinement of an existing MARC convention that was introduced in the serials format. Three additional subfields ($r, $u, and $z) were added to those available in the serial linking entry fields when the serial linking fields were added to the books format to accommodate technical reports. The additional changes introduced by the generalization and expansion of the technique as specified above are (1) the introduction of the linked-record code in the leader which supports more convenient processing of records that carry only control number record links instead of data, (2) the addition of $7 control subfield, $d subfield for imprint information, $k subfield for series data pertaining to the related item, and $s subfield for uniform titles to the possible subfields contained in a linking entry field, and (3) the redefinition of the $a subfield to include uniform title headings.

B. Linked-Record Code

There are several options for the implementation of the linking record code in existing implementations. While some of the existing records may contain $w record number subfields, it is probable that none contain only that data, thus all existing records that contain linking entry fields should require value "b" in leader byte 19. Thus since byte 19 is presently b in all formats, existing records would contain valid values and require no change.

C. $7 Control Subfield

The subfield code value 7 was selected over the $w, which is used in the authority format, because $w is now used in these fields for the record number of the related record. Using $w for the control subfield would have meant changing many existing records. The numeric subfield code value 7 was selected in line with the general (and reasonably well observed) principle that non-heading data not be carried in the alphabetic subfields. Since the $7 subfield is optional for a record, existing records remain valid.

D. $d Subfield

While in some cases the $c subfields in existing records may contain the place of publication for the item, many records contain other types of qualifiers. Thus a separate subfield $d has been defined for publisher information.

E. $s Subfield and Extended $a Subfield

The new $s subfield contains 240 and 243 titles only. The $a has been extended to include uniform title headings (130 field in record for the related item). The $t contains all other titles (222 and 245). Subfield $s was created to accommodate situations where both a 240 and a 245 might be required in a linking field, resulting in multiple $t subfields. The 130 title headings are more logically placed in the $a that identifies them as lxx titles which in some systems are accorded special processing for sorting and display. Existing serial records with linking entry fields contain primarily 222 key title and 245 common title in the $t subfield. Since the implementation of AACR2, however, 130 uniform title headings have become more common in serial records and are being recorded in $t. Thus when the expanded $a is implemented, serial records will contain some records with incorrect $t subfields. There appears to be no simple way to discover these but the impact of their being "wrong" may not be great.

F. Additional Subfields

It should be noted that there are only a limited number of additional data items that can be added to the linking fields because many of the subfield codes have been used. Since the intended focus of the fields was to provide minimal display informa-

tion with links to the record for the related item, data pointing to related records should be given preference when defining additional subfields. It would be both inefficient and against the intent to pack the linking fields with extensive descriptive information.

III. LIST OF EXISTING & PROPOSED GENERAL/SPECIFIC RELATIONSHIPS

Tag	*Relationship*	*(Type)*	*Formats*	
760	Main series entry	(vertical)		SE
762	Subseries entry	(vertical)		SE
765	Original language entry	(horizontal)	BK	SE
767	Translation entry	(horizontal)	BK	SE
770	Suppl./special issue entry	(vertical)	BK	SE
772	Parent record entry	(vertical)	BK	SE
773	Host item entry (proposed)	(vertical)	BK	FI
			MS	MP
			MU	SE
775	Other edition available entry	(horizontal)	BK	SE
776	Additional physical form available entry	(horizontal)	BK	SE
777	Issued with entry	(vertical)		SE
780	Preceding entry	(chronological)	BK	SE
	0 Continues			SE
	1 Continues in part			SE
	2 Supersedes		BK	SE
	3 Supersedes in part		BK	SE
	4 Formed by the union of			SE
	5 Absorbed			SE
	6 Absorbed in part			SE
	7 Separated from			SE
785	Succeeding entry	(chronological)	BK	SE
	0 Continued by			SE
	1 Continued in part by			SE
	2 Superseded by		BK	SE
	3 Superseded in part by		BK	SE
	4 Absorbed by			SE
	5 Absorbed in part by			SE
	6 Split into			SE
	7 Merged with			SE
	8 Changed back to			SE
787	Nonspecific relationship entry		BK	SE

IV. NEW USE OF THE RECORD LINKING TECHNIQUE: COMPONENT PARTS

A. Definition and Purpose

The definition of a *component part*, for the purposes of this discussion, is a bibliographic unit that is physically contained in another bibliographic unit such that the location of the component part is dependent on the physical identification and location of the *host item* or container. Examples of component parts with corresponding host items include a journal article in a serial, one paper or chapter in a book, one band on a phonodisc, and one map on a single sheet that contains several maps. The bibliographic record for a component part contains fields that describe the component part and data that identify the host item. The record is constructed for the description of the component part which is the target item for the record. The data in the leader of the record apply to the component part.

The purpose of the description of the component part is to provide the means to identify the part or the contents of the part to the user of an information system. Therefore the description should include coded data that describe various aspects of the part, transcription of identifying data as they appear on the part, physical description of the part, additional access points to assist in finding the part, and subject description of the part.

The identification of the host item is provided in order to locate the physical piece that contains the component part. Thus only those data elements required to assist in the identification of the host item need to be included in the linking entry field, such as links to the bibliographic record describing the item and/or descriptive data that identify the host item. In the case of host items that are serial or multi-volume in nature, information that points to the exact location of the component part within the host bibliographic item is necessary.

Component parts as well as host items may take a variety of forms: printed text, manuscripts, music scores, projected media, maps, or sound recordings. Thus the data and fields pertaining to component parts and host items will usually need to be defined for all formats. A record may describe, for example, a printed map that is contained in a volume of printed text in which case the record will be a map record (indicated in the type of record byte in the leader) but the linking entry field will point

to a record for a book. The bibliographic level byte in the leader of a record for a component part will indicate that a record is for a component part and the periodicity of that component part (monographic or serial).

B. Requirements for a Record for a Component Part

The following fields and data elements would need to be added to the *MARC Formats for Bibliographic Data* as specified.

Leader

Bibliographic level (byte 7)
- a—component part, monographic BK FI MS MP MU
- b—component part, serial FI MS MP MU SE

Linked record code (byte 19)
- ♭—related record not required to fully process the record. BK FI MS MP MU SE
- r—related record required to fully process the record. BK FI MS MP MU SE

Fixed fields

Nature of contents
Add the value n—literature review BK SE

Variable fields

018 Copyright Article Code NR BK SE
This field contains the unique identification code for component parts appearing in monographs and serials. It is recorded in the record for the component part, not in the record for the host serial or host monograph. The code was developed by American National Standards Committee (ANSC) Z39 and adopted by the Copyright Clearance Center as its Article-Fee Code. It is composed of five parts:

serial ISSN (International Standard Serial Number) or monograph ISBN (International Standard Book Number)—eight- or ten-digit number constructed according to ISO 3297 or 2146 and assigned to serials and monographs.

last digits of year—two-digit number giving the last two digits of the year of publication of the component part.

item number—eight-digit number designed to guarantee the uniqueness of the code for a specific work.

per-copy fee—four digits giving the fee for photocopying the work, stated in U.S. dollars.

author-royalty indicator—one digit, either 0 or 1. One indicates that there is a royalty agreement with the author(s); 0 or nonexistence of the indicator means that there is no royalty agreement.

The code carries slash marks (/) between each part except between the item number and per-copy fee, where a dollar sign ($) is used. The per-copy fee will contain a decimal point after the second digit.

Indicator 1—Undefined
♭ BK SE

Indicator 2—Undefined
♭ BK SE

Subfields
$a Copyright Article-Fee Code NR BK SE

Examples:
♭♭$a0844021842/78/010032-08$01.25/1
♭♭$a03043923/78/050243-03$00.95/0

773 Host Item Entry R BK FI MS MP MU SE
This field contains data that identifies the item that serves as host for the component part for which the record was made.

Indicator 1—Specifies display of a note from this field
- 0 Display a note BK FI MS MP MU SE
- 1 Do not display a note BK FI MS MP MU SE

Indicator 2—Undefined
♭ BK FI MS MP MU SE

Subfields
$7 Control subfield NR BK FI MS MP MU SE
byte 0—type or author name NR BK FI MS MP MU SE
byte 1—form of author name NR BK FI MS MP MU SE
byte 2—type of record NR BK FI MS MP MU SE
byte 3—bibliographic level NR

BK FI MS MP MU SE
$w Record control number R BK FI MS MP MU SE
$a Main entry NR BK FI MS MP MU SE
$s Uniform title NR BK FI MS MP MU SE
$t Title NR BK FI MS MP MU SE
$b Edition NR BK FI MS MP MU SE
$d Place, publisher, and date of publication NR BK FI MS MP MU SE
$g Relationship information R BK FI MS MP MU SE
$k Series R BK FI MS MP MU SE
$r Report number R BK FI MS MP MU SE
$u STRN NR BK FI MS MP MU SE
$x ISSN NR BK FI MS MP MU SE
$y CODEN NR BK FI MS MP MU SE
$z ISBN R BK FI MS MP MU SE

Notes:

All data pertains to the host item.

Indicator 1: If a 580 field appears in the record then this value is set to 1 and the text of the note used for display is taken from the 580.

Subfield $g: contains the general and specific location of the component part in the host item, such as "no. 170 (Feb. 1960), p. 4–19."

Subfield $w: contains the record control number of the record for the host item preceded by the NUC symbol in parentheses for the name of the agency assigning the record control number.

Display constant: In

580 Linking Entry Complexity Note R BK FI MS MP MU SE

This field is used for a note that expresses a complex relationship between related records that cannot be adequately expressed using the data and the print constants associated with the linking entry fields 760–787. When used, this field appears in addition to any relevant linking entry field.

Indicator 1—Undefined

b BK FI MS MP MU SE

Indicator 2—Undefined

b BK FI MS MP MU SE

Subfields

$a Linking entry complexity note NR BK FI MS MP MU SE
$z Source NR BK FI MS MP MU SE

C. Examples

[See boxes on pages 289–91.]

V. OTHER WHOLE/PART RELATIONSHIPS

This proposal treats the case in which the item being cataloged is the component part, with the linking entry containing the identification of the host item. "Component parts" limits it to parts that are physically contained in the larger ones. There are three related data arrangements that also need to be clarified with respect to the technique.

a. Item being cataloged is the host item, need identification of the component part(s).

b. Item being cataloged is one piece of a multi-piece item, need identification of the multi-piece item.

c. Item being cataloged is a multi-piece item, need identification of the pieces.

Item Cataloged Is Host Item

A "contains" field could be defined to make it possible to reverse the component part record structure and make a record for the host that contains citations to the component parts which may or may not be represented by separate records. This is certainly easily done with the technique but has not been proposed for several reasons.

(1) If the host is a serial, the potential number of component parts is infinite, thus the resulting records would not be very useful or usable and eventually would exceed the bounds of the format in size.

(2) If the host is a monograph, there is already a well established method for recording component parts—via content notes and added entries—and decisions would need to be made concerning revision of old records or coexistence of two techniques for the same type of data.

(3) Any component part for which it is difficult to record sufficient data via content note and/or added entry may be de-

scribed in a separate record for a component part with the host identified in the 773 field.

Item Cataloged Is Piece of Multi-Piece Item

When the target item is one piece of a multi-piece item, the relationship is similar to the component part except that the part is physically separate from the "larger" work. Whether this "larger" work is a multi-volume monograph or a series, a method of identifying the "larger" work is well established in the MARC formats using the 4xx and 8xx fields. A linking field for multi-piece citations is therefore not proposed.

Item Cataloged Is Multi-Piece Item

If the target item is the series or multipart item, and identification of the individual parts is desired, then again, existing techniques such as contents notes and added entries would continue to be used. ■■

Example 1

Cataloging record for a journal article

Bryant, Keith L.
Cathedrals, castles, and Roman baths; railway station architecture in the urban south.
ill.

Grant St, Station (Aeck Assoc., archts.) and Decatur (Ga.) Station (Stevens & Wilkinson, archts.).
In Journal of urban history, February 1976, v.2, n.2, p.195–230.

1. Atlanta (Ga.)—Railroads—Stations. 2. Aeck Associates. 3. Stevens & Wilkinson

75-3249
MARC

MARC record for component part—Host item identified by title

Leader: record status—n
type of record—a
bibliographic level—a
linked record code—b
encoding level—b
descriptive cataloging form—b

Tag	*Indicators*	*Data*
001		bbb75003249b
008		7 . . .
040	bb	$aDLC
100	10	$aBryant, Keith L.
245	00	$aCathedrals, castles, and Roman baths; $brailway station architecture in the urban south.
300	bb	$bill.
500	bb	$aGrant St. Station (Aeck Assoc., archts.) and Decatur (Ga.) Station (Stevens & Wilkinson, archts.)
651	00	$aAtlanta (Ga.) $xRailroads$xStations
610	20	$aAeck Associates
610	20	$aStevens & Wilkinson
773	0b	$tJournal of urban history$gFebruary 1976, v.2, n.2, p.195–230

Alternative forms for linking entry field

(1) Host item identified by record number:
leader, byte 19—r
773 0b $w(DLC)bbb75001234b$gFebruary 1976, v.2, n.2, p.195–230

(2) Host item identified by record number and by title:
leader, byte 19—b
773 0b $w(DLC)bbb75001234b$tJournal of urban history$gFebruary 1976, v.2, n.2, p.195–230

Example 2

Cataloging record for a map in a book

Palliser, John, 1807–1887.

A general map of the routes in British North America: explored by the expedition under Captain Palliser, during the years 1857, 1858, 1859, 1860 / compiled from the observations and reports of Captain Palliser and his officers, including the map constructed by Dr. Hector, and other authentic documents.—Glasgow : Robert MacLehose & Co., 1968?

1 map : col. ; 33 × 129 cm.

Scale ca. 1:2,250,000

Facsim. of 1865 ed. published by Stanford's Geographical Estabt., London.

Relief shown by hachures.

In Spry, Irene Mary (Bliss). The papers of the Palliser expedition, 1857–1860.—Toronto, Champlain Society, 1968.

1. Canada—Exploring expeditions—Maps. I. Hector, James, Sir, 1834–1907. II. Robert MacLehose & Co. III. Stanford's Geographical Estabt.

Map 78-690142
MARC

MARC record for component part—Host item identified by record number

Leader: record status—n
type of record—e
bibliographic level—a
linked record code—r
encoding level—b
descriptive cataloging form—r

Tag	*Indicators*	*Data*
001		map78690142b
008		7 . . .
100	10	$aPalliser, John,$d1807–1887.
245	02	$aA general map of the routes in British North America :$bexplored by the expedition under Captain Palliser, during the years 1857, 1858, 1859, 1860 /$ccompiled from the observations and reports of Captain Palliser and his officers, including the map constructed by Dr. Hector, and other authentic documents.
260	0b	$aGlasgow :$bRobert MacLehose & Co., $c(1968?)
300	bb	$al map :$bcol. ;$c33 × 129 cm.
507	bb	$aScale ca. 1:2,250,000
500	bb	$aFacsim. of 1865 ed. published by Stanford's Geographical Estabt., London.
500	bb	$aRelief shown by hachures
651	b0	$aCanada$xExploring expeditions$xMaps
700	11	$aHector, James,$cSir,$d1834–1907
710	21	$aRobert MacLehose & Co
710	21	$aStanford's Geographical Estabt
773	0b	$7nnam$w(DLC)bbb77574016b

Alternative forms for linking entry fields

(1) Host item identified by author and title:
leader, byte 19—b
773 0b $7plam$aSpray, Irene Mary (Bliss).$t Papers of the Palliser expedition, 1857–1860.$dToronto, Champlain Society, 1968

(2) Host Item identified by record number and by author and title:
leader, byte 19—b
773 0b $w(DLC)bbb77574016b$aSpray, Irene Mary (Bliss).$tPapers of the Palliser expedition, 1857–1860.$dToronto, Champlain Society, 1968

MARC record for host item

Leader: record status—n
type or record—a
bibliographic level—m
encoding level—b
descriptive cataloging form—b

Example 2 (Continued)

Tag	*Indicators*	*Data*
001		␣␣␣77574016␣
008		7 . . .
015	␣␣	$aC70-818
043	␣␣	$an-cn—
050	0␣	$aF1060.8$b.P22
082	␣␣	$a917.1
100	10	$aSpry, Irene Mary (Bliss)
245	04	$aThe papers of the Palliser expedition, 1857–1860,$cedited with an introd. and notes by Irene M. Spry.
260	0␣	$aToronto,$bChamplain Society,$c1968.
300	␣␣	$axxxviii, 694 p.$billus. (col. map in pocket)$c25cm.
490	1␣	$aPublications of the Champlain Society,$v44.
504	␣␣	$aBibliography: p. 613–634
600	10	$aPalliser, John,$d1807–1887
651	␣0	$aNorthwest, Canadian$xDescription and travel$y1821–1867
651	␣0	$aCanada$xExploring expeditions
700	11	$aPalliser, John,$d1807–1887
740	01	$aPalliser papers, 1857–60
810	2␣	$aChamplain Society.$tPublications,$v44.

ALA Statement on Cable Telecommunications Act of 1982

Eileen D. Cooke: ALA

May 20, 1982

The Honorable Barry Goldwater,
Chairman
Subcommittee on Communications
Committee on Commerce, Science, and
Transportation
U.S. Senate
Washington, DC 20510

Dear Senator Goldwater:

This letter is submitted on behalf of the American Library Association for the hearing record on S. 2172, the Cable Telecommunications Act of 1982, which you introduced March 4 and on which hearings were held April 26–28. This letter also makes reference to S. 2445, the Cable Telecommunications Competition and Deregulation Act of 1982, introduced April 27 by Senators Hollings and Cannon.

The American Library Association is a nonprofit educational association of almost 40,000 libraries, librarians and information specialists, library trustees, educators and communicators, and is the only nongovernmental organization at the national level representing all types of library and information services. In a 1980 publication, *Video & Cable Guidelines*, ALA's Library and Information Technology Association identified 264 libraries involved in video or cable television. The current president of LITA, Brigitte L. Kenney, provided considerable input to this statement.

The rationale for library involvement in cable television lies in the expanding role of libraries as informational, educational and cultural institutions. Given the complexity of society, the delivery of information is recognized as a major activity, using a variety of technologies and formats. The library's educational role lies not only in providing resources to support school and college curricula, but in literacy training, individualized learning projects, and adult and continuing education. For many communities, the public library represents the only tax supported cultural institution. Concerts, exhibitions, talks, and the whole gamut of cultural programming have been legitimate library activities for over a century.

Given libraries' expanding role but lim-

ited resources, it is not surprising that for over ten years, libraries have been using cable TV as a delivery mechanism. There is probably no more economical a method of reaching into the homes, offices, schools and other agencies of society. It requires no broadcast tower facilities. Some libraries have been able to enter CATV without any expenditure, depending upon the nature of the local franchise. Even a fully equipped studio with every option, and capable of reaching an entire city can supplement a library system's delivery mechanisms at less cost than the construction, equipping and operation of one small branch library.

Library origination of local cable programming has ranged from traditional activities such as story hours and book talks to presentations of videotaped community events, speakers, discussions of critical community issues, and to video reference service in which material which could not be adequately described by phone such as maps, statistical tables and other graphic material was placed under a stationary camera.

The Santa Fe, New Mexico, public library transmits public affairs programming such as coverage of mayoral candidates and Ground Zero week activities over a public access cable channel, a particularly important function since Santa Fe does not have a local broadcast TV station. The New Mexico state library recently used cable TV facilities to participate in an ALA-sponsored teleconference on marketing strategies for libraries transmitted from Denver by satellite with the assistance of the Public Service Satellite Consortium. The public library in Columbus, Ohio, participated in a joint experiment with the Online Computer Library Center (OCLC) using Warner Cable's interactive QUBE system. The experiment allowed viewers to scan an online encyclopedia, influence the discussion on a book review program, choose the next book to be reviewed, and order books to be mailed from the library to the home without ever leaving their living rooms.

Another valuable application lies in the data communications capability of cable. In Kansas City, all types of libraries have formed a consortium to use cable for information sharing over distance, for data, facsimile, visual and printed information. In Los Alamos, New Mexico, an existing coaxial cable was by far the most economical way to connect the main public library with the county's central computer in order to automate the circulation control system. In Atlanta, branch libraries are being connected to the main library by cable for a communications capability greater, but less costly, than phone lines. Interinstitutional looping and connections among cable systems in contiguous urban areas increase the potential for data transmittal and resource sharing. In Minneapolis–St. Paul, librarians have been vocal in demanding a single regional channel for the metropolitan area so as to exchange information with each other and with other public institutions.

In Aurora, Colorado, the library administers four channels for government, educational, public access and leased use, and has a well-equipped professional TV studio furnished by the cable company. Part of the franchise fee goes for the maintenance of the studio and personnel costs. Public libraries in Atlanta, Georgia; Bloomington, Indiana; and Altoona, Pennsylvania, are examples of libraries which administer or provide all programming for a public access, governmental, educational or library cable TV channel.

While these few examples do not adequately describe the extensive involvement of libraries in the delivery of programming and information via cable television, they do give some idea of the extent of the involvement. This involvement stems from the belief that, as the delegates to the 1979 White House Conference on Library and Information Services declared, "a free, democratic society depends on a fully informed citizenry." The promotion of equal access to a diversity of information sources is a legitimate and necessary matter for national public policy.

Some provisions of both S. 2172 and S. 2445 cause us concern to the extent that they do not further this national policy. This point was made very well in the testimony before your Subcommittee on April 27 by Susan Buske, Executive Director of the National Federation of Local Cable

Programmers. We wish to endorse the specific suggestions of the NFLCP on S. 2172. Many of our members who are involved in cable TV are members of or have worked with the NFLCP, whose purpose is to aid community groups in fostering citizen participation in community television and in developing creative public access programming. I will summarize their suggested amendments to S. 2172 only briefly below:

1. The bill should make an explicit finding recognizing the interest of the states as well as the federal government in regulating cable.

2. The bill should make clear that one of its purposes is to encourage development of outlets for community self-expression and promote diversity in the public's choice of programs and types of service.

3. The exclusive jurisdiction granted the FCC should be modified to provide that states and subdivisions may regulate if not inconsistent with federal law or regulation.

4. Existing franchises should be protected.

5. The definition of "basic services" in S. 2172 gives the cable operator absolute power to define basic services. "Basic services" are now defined by agreement between cable operators and franchising authorities; there seems little reason to change this arrangement. A definition of "leased channel" should be added to protect against a cable operator controlling the content of telecommunications services through a parent company or subsidiary.

6. Reasonable regulation of ownership of cable systems should be permissible by states and localities to protect the rights of citizens and consumers to obtain an information utility suited to their needs and to participate through local governmental mechanisms in its operation.

7. There is no justification for guaranteeing a cable operator who violates the terms of its franchise agreement a right to the "fair market value" of its system. The bill should permit states or localities to provide for reacquisition of the franchise under whatever terms have been fairly negotiated with the franchisee.

8. The bill should state clearly that the statutory reservation of 10 percent of channel capacity for public access and 10 percent for leased access is a minimum and not a maximum. Individual systems should remain free to negotiate for provision of additional channel capacity to meet the needs of the local service area.

9. The procedure by which the FCC can eliminate leased access requirements should be modified to take future use into consideration, to put the burden of proof in any proceeding on the party seeking to eliminate access, and to provide a corresponding procedure for reinstating access requirements.

10. The provision that access channels may be utilized by the cable operator until there is demand for them should be eliminated. Public access providers would be at a great disadvantage in attempting to implement such a provision.

11. States and localities should not be prevented from making useful and legitimate distinctions between the rates charged for use of public access channels; nor should they be prevented from requiring free access and production facilities for certain public access programmers such as schools, libraries, and nonprofit community groups.

12. States and localities should have the option to regulate leased channel rates since this may be the only way of ensuring that a wide range of potential programmers such as small businesses and community groups will have the opportunity to enter the market and provide innovative services.

13. The criminal and civil liability section could unintentionally protect an operator who knowingly or maliciously abets a libel but who may not have an economic interest in the program carried on the cable. The section should be amended slightly to prevent this.

14. The bill should include a section which provides for interconnection of cable systems. Especially in contiguous urban areas, this would allow communities to hook up with one another to share public access cablecasting facilities or to receive and exchange information.

In addition, we believe that national public policy would be served by encouraging the provision of two-way capability in all future cable systems to accommodate data communications. As S. 2445 recog-

nizes in several of its provisions, cable systems will be used increasingly for transmission of data and information. Such services will be much more useful to consumers if they can adjust and interact with the information to meet their needs. We commend the "New and Additional Services" section of S. 2445 which encourages innovative services and presumes them to be in the public interest if technically feasible.

S. 2445 appears to retain the fairness doctrine and equal time requirements, and some cross ownership restrictions. In an ideal world, if access to the various technologies of information delivery were guaranteed, there would be no need for content regulation, and questions of multiple ownership could be handled by antitrust policies. Even with legislation which provides for a minimum of public access, we feel these requirements should not be dropped until actual experience has demonstrated that the public access principle is well established throughout the telecommunications industry.

With regard to cable legislation, we feel the most important point is ensuring public access. We strongly support the provision of S. 2172 which requires cable systems with 20 or more channels to set aside 10 percent for public, educational, and governmental use, if amended to make clear that states and localities may negotiate for additional public access capacity. The lack of a public access provision in S. 2445 is a serious defect; the provision for petitioning the FCC to obtain access to a cable operator's facilities is a most unsatisfactory substitute.

We hope these comments are helpful to the Subcommittee. They are made in the interest of protecting the diversity of information sources so essential under the First Amendment. Diversity cannot be guaranteed, we feel, if all decisions are left to marketplace forces. Diversity can be nurtured by a minimal amount of structural regulation at the federal level, and by allowing states and localities to use appropriate mechanisms to ensure that public access to the various forms of telecommunications is available to all.

We appreciate the opportunity to present the views of the American Library Association.

Sincerely,
Eileen D. Cooke
Director
ALA Washington Office ■■

Frederick Gridley Kilgour: ALA Life Membership Award

S. Michael Malinconico: New York Public Library

The following statement was prepared for the occasion of the presentation of an honorary life membership in the American Library Association to Frederick G. Kilgour. Kilgour was a founding member and president of the Information Sciences and Automation Division—a predecessor of LITA—and editor of its journal, the Journal of Library Automation, *for its first six volumes. He is, of course, most known to the world as the founder of OCLC and developer of the world's first large-scale online library network.*

Photo courtesy of OCLC, Inc.

There are those who on seeing an indistinct shape on the distant horizon create for us soaring visions never before thought or imagined. Sculptures fashioned of light. Elegant, refulgent, seductive, yet insubstantial. There are others who, inspired by the same shimmering distant apparitions, fashion lenses so that their precise measure may be taken and their distance reckoned. The object and the way clearly perceived, it is these latter who confidently point the way to rich new discoveries. It is only when the phenomena are close at hand and readily experienced that we come to comprehend the full import of what these intrepid guides had foretold prior to setting out on the arduous journey of exploration.

Two decades ago, Frederick Kilgour and many of his contemporaries discerned in vague outline the potential that electronic computing and telecommunications technologies held for the practice of librarianship. Some of Fred's contemporaries boldly sketched the outlines of monumental murals that were executed only on the insubstantial canvas of the imagination. Others made pen-and-ink sketches of the shadows of what they beheld to a scale diminished by timidity. Fred carefully avoided the snares that lay at both extremes; maintaining at all times a remarkable sense of proportion between innovation and practicality, he came to know the medium he sought to work with such intimacy that he neither over- nor underestimated it.

Fred's ability to gaze forward in the direction in which technology was developing was rendered particularly acute by many years of gazing backward over the history of science. He thus noted far in advance of his colleagues the rate at which the indistinct phenomenon was growing, and the rapidity with which it was moving to-

ward us. While others fixed their attention on the dazzling corona of the bright object that appeared on the horizon, Fred instead looked deeply into its core and there discovered a potent source of energy that libraries would need to learn to exploit if they were to remain economically viable.

Frederick Kilgour has devoted only slightly less than a half-century to library and information service. The most recent third of that career has been dedicated to the establishment and development of OCLC, the single best-known and most successful library automation project—indeed, the most successful library venture with the exception of those initiated by Melvil Dewey. OCLC was not simply an idea which sprang full grown at the end of the 1960s, nor a fortuitous confluence of events. Rather, it represents the continuous refinement of ideas Fred Kilgour had begun developing as early as 1961 when he helped found the Columbia, Harvard, Yale Medical Libraries Computerization Project, and later in 1965 when he was appointed Yale's associate librarian for Research and Development.

In 1967, Fred Kilgour was named executive director of the newly formed Ohio College Library Center. OCLC afforded Fred the opportunity to execute, on a scale limited by scarcely more than his ability, ideas he had been promoting for nearly a decade. The means were at hand to verify empirically the acuity of his vision. The realization matched the conception with a precision few had been prepared to grant. An entire profession was transformed in the bargain.

OCLC is, of course, Fred's most dazzling achievement; all the more so as it demonstrated his ability to master and direct three enormously powerful forces: computer technology, communications technology, and the potent intellectual energies of youthful engineers anxious to test the limits of their abilities. He dominated and shaped these forces without diminishing them. OCLC thus became the vehicle that revealed the scope and depth of Fred Kilgour's abilities; in addition to exhibiting his technical perspicacity, the success of OCLC served to demonstrate an entrepreneurial flair and executive ability which is found only rarely in librarianship.

There is no doubt that the profession that Frederick Gridley Kilgour has served and graced so long has been profoundly altered by his efforts. It is with a deep sense of gratitude and in recognition of those efforts that the American Library Association confers upon him honorary life membership, its highest award. ■■

News and Announcements

First LITA National Conference

Save the dates of September 17–21, 1983, for the first Library and Information Technology Association (LITA) National Conference in Baltimore, Maryland. The conference, titled "Information and Technology at the Crossroads," will focus on library technology and its ramifications. A wide range of topics and activities will familiarize librarians, information specialists, and media people with present and future technology. Human concerns with technology will not, however, be forgotten. Considerable time will be allotted to such topics as human interface with technology, fear-of-machines psychology, the ethics of information availability, computer-based instruction, and computers and the handicapped.

The conference will encompass a broad spectrum of technology subject areas. Topics to be presented include: online catalogs; personal computing; teleconferencing; library automation; satellite communications; video and cable communications; word processing; microcomputers; online publishing; turnkey systems; information dissemination and databases; audiovisual developments; and electronic mail.

Exhibits and demonstrations will be an important part of the conference, with vendors and manufacturers showing their latest hardware, software, and systems. Contributed and invited papers, workshops, panel sessions, and tours in the Baltimore and Washington areas will form the heart of the subject content along with state-of-the-art papers and preconference tutorials on various levels of expertise.

Conference chair is Berna Heyman, College of William and Mary, Williamsburg, Virginia. To submit a paper or appear on a program, contact Charlene Renner, Iowa State University Library, Ames, IA 50011; (515) 294-8186. To arrange for an exhibit, contact George Abbott, Syracuse University, Bird Library, B101, Syracuse, NY 13210; (315) 423-2438. For information and registration forms, contact Donald Hammer, executive director, LITA, 50 E. Huron St., Chicago, IL 60611; (312) 944-6780. ■■

LITA Issues Call for Papers for National Conference

The Library and Information Technology Association (LITA) National Conference Committee invites persons to submit papers on current aspects of information and technology for its first national conference, September 17–21, 1983, in Baltimore. Papers may deal with any aspect of current and future information technology—hardware and software, the impact of those technologies on the information process, or specific recent and evolving processes in information technology.

Submitted papers should be typed double-spaced on 8 1/2-by-11-inch paper, and two copies should be sent. For maximum consideration, they should be received by January 1, 1983. The papers will be refereed (the author's identity being concealed), and changes may be asked for in accepted papers. The papers will likely be published.

Send papers to: Michael Gorman, Chair, Contributed Papers Committee, 246A Library, University of Illinois, 1408 W. Gregory Dr., Urbana, IL 61801. ■■

Floppies to Pass the Billion-Dollar Level in '84

Very rapid increases in the use of 5 1/4- and 8-inch floppy disks, together with an upsurge in the new 3 1/2-inch size, will push shipments of floppy-disk media past the $1 billion mark by 1984, according to a new report. The 210-page report, from Interna-

tional Resource Development, Inc., predicts that flexible disk media (which recently overtook traditional hard disks in terms of media shipments) will lead the storage media market throughout the 1980s. Although optical disks will become commercially available in 1984, they will find their principal applications in very large memory systems, leaving most of the memory market to magnetic media. By 1990, only about 9 percent of the media market will be for optical media, compared to almost 50 percent for floppies and 30 percent for Winchester media. (See figure 1.)

Possible Venture Capital Opportunities Seen

According to the report there will be a new round of opportunities for innovative start-up firms, paralleling the success in the 1970s of such firms as Verbatim, Maxell, and Dysan. "Drexler Technology looks like the leader today in the optical disc media market," said IRD's Ken Bosomworth, who cautions industry watchers to note, however, that Drexler's main sales to date have been of evaluation kits to optical drive manufacturers. "It is the big boys who are running scared at the moment," according to Bosomworth, who sees BASF, 3M, and DuPont as all being threatened in the magnetic media field by ultra-thin metal coatings, deposited on new types of substrate materials by sputtering techniques. "It may turn out to be a horserace between the Japanese manufacturers—particularly Sony—and a new set of Silicon Valley startups," suggests Bosomworth.

IBM, which pioneered the flexible-disc concept and was the leading supplier of floppy drives and media for many years, has been pushed out of first place in the floppy-media market by Verbatim, according to the IRD report, which points out that Verbatim and other vendors frequently manufacture floppies on a "private label" basis to be sold by mail-order companies, office-supply stores, etc.

Optical Versus Magnetic Media
(Percentage By Shipment Value)

	1982	1985	1990
Floppy	51.3	52.8	46.9
Winchester	8.4	16.7	28.7
Hard pack	40.3	27.3	14.9
Optical	-	3.3	9.4
TOTAL	100.0	100.0	100.0

(SOURCE: INTERNATIONAL RESOURCE DEVELOPMENT INC.)

Fig. 1.

Computer Stores Lead in Floppy Distribution

In an analysis of distribution channels for floppy media, IRD concluded that computer stores had now pulled ahead of other types of distribution channels (including mail-order computer-products vendors, office-supply stores, and hardware manufacturers). The trend is expected to continue, both because of attractive pricing (some computer stores use floppy discs as "loss leaders" to attract traffic) and because of the convenience factor—when a user runs out of floppies, he tends to not want to wait one or two weeks for a new supply.

3½-inch Discs Coming Soon

With the expected introduction this year of 3½-inch floppy-disc drives from several manufacturers, a new market will open up for 3½-inch floppy-disc media. According to the IRD report, Sony, Hitachi, and Maxell are already gearing up to supply this market with media. IRD analysts expect Verbatim and 3M to follow quickly and participate in this market.

Continued Dropout Problems for Optical Disc Media

Analyzing the state of the art in optical-disc technology, the IRD report indicates that researchers are looking at several different materials for the substrate and the recording layers. Recording material might be metal and polymer compositions, vesicular films, bilayers, or infrared-absorbing organic materials. Metals considered for the recording layer include tellurium, silver, gold, platinum, selenium, and bis-

muth. Other possibilities are absorbing organic materials such as cross-linked gelatin, by Drexler; homogeneous grain-free films, by Kodak; and metal composite films in polymerized plasma, by Nippon Telephone and Telegraph. This activity is expected to accelerate since the need for archival storage is increasing.

Substrate materials are also very important. According to IRD, possible materials include aluminum, glass, polycarbonates, and microtextured–Teflon based polymer materials. The latter enhances the heating effect and reduces the power required to modify the recording film. "Many of the aspiring optical disc drive manufacturers are faced with an awkward choice right now," reports Bosomworth. "Almost everyone is having pesky dropout problems with experimental optical media, and a number of manufacturers are leaning towards the use of Drexler's Drexon material. But industry rumors are that Control Data and at least two other vendors have rejected Drexon because of problems with error rates." According to Bosomworth, "With planned shipment dates coming closer, the drive vendors have to jump one way or another, or risk being left at the post."

International Resource Development Inc. is an eleven-year-old research and consulting firm, which explores the commercial implications of new technologies for major commercial and government organizations all over the world. The new report (no.502) entitled *Optical and Magnetic Disc Media* costs $1,285.00, and a free table of contents and description are available from IRD at 30 High St., Norwalk, CT 06851; Phone toll free (800) 243-5008 (in Connecticut or outside the U.S. phone (203) 866-6914); Telex 64 3452. ■■

Computer Conferencing for General Public

If two heads are better than one at problem solving, what about 20, 200 or even 2,000?

That is the theory behind PARTICIPATE, the first computer conferencing service made commercially available to the general public, via THE SOURCE.

PARTICIPATE facilitates a rapid exchange of ideas and information among the nearly 20,000 subscribers to THE SOURCE. Questions can be posed for response by small, select groups—or by an audience as large as the subscriber base itself.

PARTICIPATE offers many advanced features that set it apart from the early types of computer conferencing developed by government and education in the 1970s. Those features include:

- Flexibility. Unlike the traditional rigid focus on single topics, PARTICIPATE allows a branching off of subtopics from any preceding conference. This approach, which more closely simulates human thought and conversation processes, takes advantage of the extensive storage and information-branching capabilities of the large main-frame computers of THE SOURCE.
- Open/Closed Conferences. Rather than an "invitation-only" approach, PARTICIPATE allows conference sponsors to decide whether to open their conferences to all subscribers to THE SOURCE or only to a selected group. Concurrently, any of THE SOURCE subscribers may read, or join in the discussion of, any "open conference" topic. (All open conferences are listed automatically on PARTICIPATE.)
- Optional Features. Among the unique optional features of PARTICIPATE are automatic transcription, whereby conference dialogues can be stored for the sponsor; assignment of conference leaders; the capability of reviewing, then editing comments before participating in a conference; and a listing of the background and interests of subscribers taking part in various conferences.

The initial uses being made of PARTICIPATE are primarily business related, according to Chandler Harrison Stevens, creator of the service and president of Participation Systems, Inc.

Specifically, Stevens notes early trends to use the service for *project management* (to monitor progress and share information despite geographic separation); *group authorship* (to review new material and direct manuscript changes and consistency); *specific inquiries* (to pose a question, as one subscriber did about office automation,

and have several "substantive" replies within hours); *executive decision making* (to gather information to support timely decisions and actions); and *market research* (to survey and poll other subscribers to THE SOURCE).

A toll-free number (800/336-3366) is available for further information. ■■

PSSC, SatServ Set Conference Dates

The Public Service Satellite Consortium will hold its seventh annual conference October 19–20, and PSSC's subsidiary, Services by Satellite, Inc. (SatServ), will hold its annual conference October 20–22. Both conferences will be held at the Washington Hilton Hotel in Washington, D.C.

The PSSC conference, "Satellite Communications for Public Service Users," will feature discussions of the Campus Conference Network™, PSSC's dedicated satellite network located on university and community college campuses, and the use of satellite networks in education, health, religion, and libraries.

The SatServ conference, "Space Communications in the '80s," will include panel discussions on dedicated networks; full-motion video teleconferencing; slow-scan, freeze-frame, and computer conferencing; telephone bridging systems; insurance; home earth stations; and international teleconferencing, among dozens of other subjects.

Both conferences will feature exhibits of satellite industry products and services.

The preliminary lineup of speakers for the PSSC conference includes John Wherry, executive director, National School Public Relations Association; J. O. Grantham, director, University Extension, Oklahoma State University; and Wasyl Lew, president, Catholic Telecommunications Network of America.

The SatServ conference will begin the evening of October 20 with a cocktail party in the exhibit hall and a keynote speech the next morning by SatServ president Dr. Elizabeth Young. Speakers tentatively will include Robert N. Wold, chairman and president of Robert Wold Co., Inc.; Stanley Hubbard, president, Hubbard Broadcasting; Robert Schmidt, president, Communications Technology Management; John Tagliaferro, president, Hughes Television Network; Harry Newton, president, Telecom Library; Mack Schwing III, manager, management consulting division, Touche Ross & Co.; Walter Morgan, president, Communications Center of Clarksburg (Maryland); and Robert Luckenbach, executive director, Video Systems Network, Inc.

For more information on the PSSC and SatServ conferences, contact Polly Rash, director of marketing, at PSSC and SatServ headquarters, 1660 L St., NW, Washington, DC 20036, (202) 331-1154 or 331-1960. Contact Publisher Services, Inc., 80 S. Early St., Alexandria, VA 22304, (703) 823-6966, for information on exhibiting at the conferences. ■■

Roufa and Smith Leave DataPhase

H. Paul Rosenberg, chairman of the Board of Directors of DataPhase Systems, Inc., has announced that Sheldon P. Roufa and Elvin E. Smith have left their employment with the company as of June 27, 1982.

Rosenberg, chairman since the company's inception in 1975, further announced that Paul Rosenberg had been elected president of the company. Paul Rosenberg had been executive vice-president of Midland Lithographic Company and a member of the Board of Directors of DataPhase. William Adiletta, vice-president of Engineering, and Steven Lassiter, vice-president for Library Services, will continue to direct the company's activities and growth. ■■

OCLC Monograph Series

In June, OCLC launched a monograph series, The OCLC Library, Information and Computer Science series, that will share research findings with the library community. The first publication is *Online Public Access Catalogs: The User Interface* by Charles Hildreth.

"The monograph series will further our efforts to disseminate our research findings to the library community," said Dr. Neal Kaske, OCLC director of research. According to Dr. Kaske the OCLC Library, Information and Computer Science series will

have two additional titles published in the coming year, including Donald J. Sager's writing on public library administration and a study by Dr. Kaske on terminal requirements for online catalogs.

Author Charles Hildreth maps out heretofore uncharted territory in his *Online Public Access Catalogs: The User Interface.* "It's the first systematic effort to compare and analyze online public access catalogs from the user's point of view," he said. "Just browsing through the glossary of the monograph provides many insights into the problems and promises of this exciting new bibliographic retrieval instrument."

As part of a study funded by the Council on Library Resources, Mr. Hildreth assessed the state of the art for online catalogs, developed a framework for analyzing and comparing online catalogs, and used that framework to analyze the online catalogs in operation at the following institutions: University of California, Claremont Colleges, Dartmouth College, Mankato State University, Mission College, Northwestern University, OCLC, Ohio State University, Pikes Peak Library District, and RLG/RLIN.

Price for the 263-page monograph is $18. Send order prepaid to OCLC, Dept. 630, Box ONB, Columbus, OH 43265. ■■

CLSI Expands to Europe; Three More Systems Added in Australia

C L Systems, Inc., Newtonville, Massachusetts, has installed its first library automation system in the Netherlands. The system was installed in April at the library of the European Space Research and Technology Center (ESTEC) in Noordwijk, Holland. ESTEC is the largest establishment of the European Space Agency. The library, whose holdings consist of special aeronautical documents and other technical materials, is used primarily by scientists of corporations that are working under contracts with the European Space Agency.

The ESTEC system employs standard Digital Equipment Corporation central site equipment acquired in Holland, CLSI laser and touch screen library terminals, and CLSI's Circulation Control and Public Access Catalog software modules, with a planned future installation of CLSI's Book Acquisition module. Local service and support to CLSI libraries in the Netherlands, Belgium, and Luxembourg in provided by Arsycom BV in Amsterdam.

CLSI also reports that three more libraries have acquired its LIBS 100 System in Australia: the Box Hill-Doncaster Regional Library Services, Box Hill, Victoria; the Moonee Valley Regional Library Services, Moonee Ponds, Victoria; and the Eastern Regional Library Services, Knoxfield, Victoria. This brings the number of CLSI installations in Australia to six, with the Royal Melbourne Institute of Technology Library, the University of Melbourne Library, and the Melbourne State College Library currently online. Local service and support to CLSI libraries in Australia is provided by Libramatics Systems Pty., Ltd. ■■

DLQ Looks at the Electronic Library

The latest issue of the *Drexel Library Quarterly* (Vol. 17, no.4) examines *The Electronic Library* from computer basics, written for the layperson, through financial options. Edited by Kenneth Dowlin, director of the Pikes Peak Library District, the issue contains seven articles authored by specialists in the field. Present and future technologies are discussed, and their impact on the profession is considered in the light of library education and staff development. Articles in this special issue are:

- "You're in the Chips; or The Computer: What It Is and What It Can Do" by Joseph Matthews (Matthews and Associates)
- "Remote Electronic Delivery of Information through Libraries" by Richard Sweeney (Public Library of Columbus and Franklin County, Ohio)
- "Library Information Delivery Systems: Past, Present, and Future" by Brigitte Kenney (Golden, Colorado)
- "Networking and the Electronic Library" by Neal Kaske and Nancy Sanders (OCLC)
- "Education for the Electronic Library" by C. Edwin Dowlin (Sam Houston State University)
- "The Human Element: Staff Develop-

ment in the Electronic Library" by Barbara Conroy (Tabernash, Colorado)

• "Financing the Electronic Library: Models and Options" by Richard Waters and Victor Kralisz (Dallas Public Library)

This issue is available from the *Drexel Library Quarterly*, School of Library and Information Science, Drexel University, Philadelphia, PA 19104. The cost is $6 a copy (postage included). ■■

Indian Network

The Native American Public Broadcasting Consortium (NAPBC) has contracted with the Public Service Satellite Consortium (PSSC) to assist with the planning and design of an American Indian/Alaska Native Satellite Communications Network.

PSSC will study the communications needs of American Indian tribes and native Alaskans, review and analyze existing telecommunications capabilities in reservations and other Indian and Alaskan native communities, then determine requirements for expanded and improved communications. PSSC also will advise on budgeting and administration of the proposed network.

To assist in the work, PSSC has subcontracted with Dean Chavers and Associates (DCA), a coalition of native American researchers and management experts. DCA will have the responsibility for coordinating on-site visits and conducting surveys. Questions of governance and administration of the proposed network also will be addressed by DCA.

NAPBC has formed an advisory committee made up of tribal and executive representatives of Indian organizations to provide guidance and counseling to the project. The committee also will select the sites to be studied.

The satellite network study developed as a result of a concept paper written by NAPBC in 1980 focusing on the programming and service needs and potential uses of such a network. The paper was distributed to tribal and Indian organizations and public telecommunications groups, who provided input and support for recommendations made in the concept paper.

Frank Blythe, executive director of NAPBC, says it is hoped that as a result of the study, a group will be established to proceed with the construction and operating plan for a satellite communications network that will provide inter- and intratribal communications, intergovernmental, native American news and public affairs, and social- and educational-services programming. Blythe says one possible use of a satellite network would be video teleconferencing between tribal groups and government agencies, since there is frequent communications between Indian organizations and the federal government.

"As the study proceeds and more Indian organizations become more aware of what the project is about," Blythe says, "they will be able to see the project as a potential economic and social base to overcome the communications problems among themselves and non-Indian organizations."

The NAPBC, a nonprofit organization of public broadcasting stations, tribal organizations, and educational institutions, distributes broadcast programs by, for, and about native Americans. NAPBC received funding for the satellite network study from the Public Telecommunications Facilities Program of the National Telecommunications and Information Administration. ■■

TRS-80 as OCLC Terminal

A new software product that enables the Radio Shack TRS-80 computer to be used as a terminal for access to OCLC has been announced by Maxwell Library Systems.

The software utilizes "translation" tables to permit the standard TRS-80 keyboard to perform all of the special commands required for access to OCLC—even though they don't appear on the keyboard. The information found in the OCLC database can be transferred to the microcomputer's memory and then saved on floppy or hard disks for later use. The library using this system will not have to wait for OCLC to send them an archival tape of their holdings for use with other automated systems.

According to Maxwell, "The TRS-80 computer is a little more expensive than a good 'dumb' terminal and provides the library with the flexibility to use the micro

for other library applications when it is not being used as a terminal."

For further information contact Maxwell Library Systems, Suite 206, 186 Alewife Brook Parkway, Cambridge, MA 02138 or phone (617) 661-5961. ■■

System Links Promote Nationwide Bibliographic Database

Linking computer systems to allow users to locate bibliographic information in systems other than their own is the objective of recent Council on Library Resources (CLR) grants. The Research Libraries Group, Inc. (RLG), the Washington Library Network (WLN), and the Library of Congress are working together to develop a Standard Network Interconnection (SNI)—a means of connecting their three computer systems so that each can communicate with the others. This work has been funded under the council's Bibliographic Service Development Program (BSDP), and builds on previous BSDP work on linking authority systems. WLN will receive up to $330,00, and RLG will receive up to $395,000 to support participation in the project, which is scheduled to be completed in 1983.

According to Lee Jones, CLR program officer, "It is difficult to exaggerate the importance of linking existing network systems in support of the objective of establishing a nationwide bibliographic record service. This is a major step toward solving the technical problems of communication between computers."

The development of the SNI is part of the BSDP's Linked Systems Project (LSP; formerly the Linked Authority Systems Project, LASP), which supports activities promoting both technical and intellectual links between computer systems. The technical links are the telecommunication capabilities that allow computer systems to exchange information. The intellectual links include sharing authority records between systems and the development of telecommunication protocols for sharing information between computers. These protocols are the procedures and rules that govern computer-to-computer communications.

The protocols are based on the seven-layer open-systems model promulgated by the International Standards Organization. Using the already established lower layers, this project will develop layers four and five, called the transport and session layers, respectively. Work on the higher layers (six and seven known as the presentation and application layers) is under way at Northwestern University.

On completion of development work, participants in the SNI project will implement the protocols in order to exchange bibliographic and other information between their systems. As they develop the Standard Network Interconnection, LSP participants will work closely with the appropriate American National Standards Institute (ANSI) committee. Cooperation between the two groups is expected to lead to the adoption of the protocols as national standards for computer-to-computer interchange of information.

Using the new telecommunication protocols, libraries will be able to establish links from one computer system to other systems. They will be able to send and receive interlibrary loan requests, catalog and authority records, location and holdings data, and other information and services. In the future, BSDP participants anticipate that the protocols will be used by all sizes and types of computer systems—small as well as large, and school and public library computer systems as well as those of research libraries and networks. ■■

Recent Publications

With this issue we have begun to include reviews of videotapes. In the "Recent Publications" section of ITAL *we will attempt to cover a broad spectrum of materials that fall within the subject scope of the journal, regardless of the medium in which publication may take place. From time to time, audiovisual materials produced by libraries for the professional library audience may also be included, even if the subject is out of scope.*

Bibliographic citations were produced by María Clark, Yale University Library, New Haven, Connecticut, in accordance with ANSI Z39.29-1977, American National Standard for Bibliographic References, *New York: American National Standards Institute, 1977.—David L. Weisbrod, Book Review Editor.*

Reviews

If it weren't for the patrons [Videorecording]. Baltimore: Library Video Network, 1981. 1 tape cassette; 18 min.; sd. Available in 3/4-inch U-matic and in 1/2-inch VHS formats (also in Beta format, only with advance notice) from Library Video Network, 1811 Woodlawn Dr., Baltimore, MD 21207. $115 purchase, $60 rental.

LVN has produced a lively videotape on public relations for library workers. Although the opening is rather slow, the body of the program is worth waiting for. It consists of a series of vignettes of common situations with library patrons and staff. The first vignette is always a poor and often humorous solution to a problem, which is followed by a more desirable solution. There is a space to stop the cassette after each vignette to discuss the situation and possible solutions. The situations are real and your staff will certainly recognize themselves and others. In most cases, the staff has caused a patron's anger, and the second solution shows how to avoid the anger in the first place. One vignette shows the patron angry over library policy and the librarian skillfully dissipates the anger.

Unfortunately, professional actors weren't used so the drama is a bit awkward. The situations are so real, however, that the points are still made clearly.

Your library may not recommend each positive solution, but the tape is a good discussion starter anyway. You might find there is enough information to use the tape over two or three sessions instead of trying to use the entire program in one session.

The program should be viewed and a discussion planned before it is used with staff. How people are treated in the library is probably the most important aspect of public relations. All the fancy printing and well-written articles in the world won't do a bit of good if the library staff is rude or unpleasant to people in the library. Staff development in one-to-one public relations is the most important training we do, and all too often we don't train staff at all in public relations. How a person feels about the library visit is more important than whether the requested information is located.—*Sarajean (Marks) Allen, Tucson Public Library, Tucson, Arizona.*

The online hotline. Machovec, George S., ed. Information Intelligence, Inc., P.O. Box 31098, Phoenix, AZ 85046. 24 issues per year in hard copy, mailed first class (foreign by air); ISSN 0277-9250. Online daily edition freely accessible to subscribers. Annual subscription $325 in U.S., Canada, and Mexico; $400 elsewhere.

The online chronicle. Emard, Jean-Paul, ed. Online, Inc., 11 Tannery Lane, Weston, CT 06883. Online database updated twice monthly and accessible solely through Dialog Information Services (as

file 170). Fees through the Dialog tariff schedule.

The field of online database systems is a dynamic and fast-changing one. It seems appropriate that this field has online electronic news journals to help the information professional keep up with developments in the online industry and profession, the information utilities field, and related areas. Two such online newsletters are the *Online Hotline* and the *Online Chronicle.*

The *Online Chronicle* is published by Online, Inc., who also publish *Online* and *Database.* The *Online Hotline* is published by Information Intelligence, Inc., publishers of the *Online Newsletter.*

The *Online Hotline* is accessible via direct telephone connection to Information Intelligence's computer in Phoenix, Arizona, at either 300 or 1200 baud. The system operates on an Apple Computer running Apple Access III software. This system provides twenty-four functions of which twenty are implemented in the *Hotline.* These functions and general operating procedures are described in an eight-page *User Guide.* Online help is also available. Two modes of interaction are provided—expert and beginner. Beginners get more detailed prompts.

It is possible to switch modes any time during a session. The interaction with the *Online Hotline* is relatively simple. A quick reading of the *User Guide* followed by a few minutes of experimentation online is sufficient to acquire proficiency. After logging on, the user receives a "title page" with a suggestion to new users to type an asterisk. This generates a condensed version of the *User Guide* explaining how to scan and retrieve the news, to do subject searching, to retrieve specific news items, to send letters to the editor, and to abort any process and return to the function prompt. These, in addition to logging off, are the activities that the user can perform with the system.

The *Online Hotline* database consists of the latest thirty days or so of news. A print version is sent to subscribers via first-class mail every two weeks. News items in both the online and print version are numbered with a chronological message number. An annual index to the print version is provided to subscribers.

At the time this review was written, the *Hotline* database consisted of seventy-three news items grouped into nine categories, with from three to sixteen items in each category. The categories are: newsfront, people, telecommunications, library and information networks, new equipment and developments, new and forthcoming databases, forthcoming meetings, publications and user aids, and bits, bytes, and nibbles.

Each news item is assigned to one of these categories and is also assigned a subject description (a phrase of thirty or fewer characters). Two citation formats are available: the full citation gives message number, category, subject, source, organization, and date; and abbreviated format gives message number, category, and subject. The source on all records was listed as the *Online Hotline* and the organization as III (Information Intelligence, Inc.). Since the content of these two fields never varies, their information value is zero. A list of items can be generated in chronological or reverse chronological order in either format, either for the entire file or for a specified category. (The abbreviated format would be the more practical format for this, since it provides two lines of useful information on each record, as opposed to five lines, three of which are informative in the full format.) Full records for items of interest can be displayed by requesting them by message number. Records range from short paragraphs up to about seventy-four lines (sixty-four characters per line). Items that require more space are split into two messages.

Subject searching of the *Online Hotline* is possible via the FIND function. This does a string search of the entered subject term or fragment against the subject description phrases of the records. For records that match, full citations are listed in chronological order.

The limited subject searching capability and the limitation to a single thirty-character subject description for each record is primitive in comparison with the capabilities of the DIALOG system, through which one accesses the *Online Chronicle,* but given the small number of records and their grouping by categories, it is probably adequate for most users. With a 1200-baud

modem it does not take long to print the entire file description in abbreviated format. Items of possible interest can then be requested for full display.

In contrast to the daily updating and deletions of the *Hotline*, the *Online Chronicle* is updated on the first and third Monday of each month, and the database cumulates. Each update contains a table-of-contents record as the last record of the update. Thus the current news can be scanned via this table, and specific items then printed by their accession numbers. Alternatively, the entire file can be searched by means of the usual DIALOG search methods. The basic index includes descriptors, section headings, titles, and text. Additional indexes provide access by accession number, article type, author, publication date, and update.

Records in the *Online Chronicle* range from short paragraphs to about sixty lines of seventy-five characters each.

The coverage of the *Online Chronicle* is somewhat broader than that of the *Online Hotline*. Items are classified in fifteen categories: major and general news, database updates, information utilities, education and training, search aids and publications, book reviews, meetings and conferences, classified ads (positions sought and positions available), feature stories, hardware, software, tips and techniques, "Have you read . . . ?" section, letters to the editor, and speakers bureau.

A recent table of contents included thirty-six records. In many instances, one record contained several related items, so the total number of items in each update is greater than the content of the *Online Hotline* database.

The major advantage offered by the *Online Hotline* is that the database is updated daily, as compared to the *Chronicle's* twice-monthly schedule. By making a note of the latest message number accessed in the previous session, it is very easy to list only items added since then.

On the other hand, the cumulative nature of the *Online Chronicle* and the much more sophisticated searching capability available through DIALOG makes for a powerful system when compared to the *Hotline*.

The topical nature of much of the content of these two services would make it less important to have online access to older material. In the case of the *Hotline*, the subscriber will have back files in printed form, with an annual index. Printed back files of the *Online Chronicle* could be obtained by doing a search for the latest update twice a month and ordering an offline print. The cost of ordering twenty-four offline prints, each containing about forty records, would be about $300. An annual subscription to the *Online Hotline* costs $325 in the U.S., Canada, and Mexico, and $400 in other countries. Online access to the *Hotline* database is free to subscribers (other than long-distance telephone charges).

It is not likely that many users would want to collect all back files of the *Chronicle* in the form of offline prints (much of the information appears in *Online* and *Database*), but it is interesting to note that the cost is comparable to the *Hotline* subscription.

Cost for online searching of the *Chronicle* is $35 per connect hour, $.15 per full record typed or displayed online, and $.30 per full record printed offline, plus telecommunication costs (for most users, $6 per hour on Telenet or Tymnet).

Each database appears to have some unique items. It would be an interesting exercise to compare the content over an extended period of time to determine the degree of duplication and the relative currency of each. Such a study is, however, beyond the scope of this review.

In frequency of update (which may be the most important criterion for a newsletter), the *Online Hotline* has a definite advantage over the *Online Chronicle*; in all other respects (scope, search capabilities, access to older material), the *Chronicle* has more to offer.—*Gerald Lundeen, University of Hawaii, Honolulu.*

Rorvig, Mark E. ***Microcomputers and libraries: a guide to technology, products and applications.*** White Plains, N.Y.: Knowledge Industry Publications, 1981. 135p. ISBN 0-914236-67-9. Published in cooperation with the American Society for Information Science. $27.50.

It is not an accident that libraries have discovered microcomputers. Indeed, these machines have the capability of enhancing library operations in every area from reference service to the business office. With the explosion of interest occasioned by this discovery, there is now a gap in information about microcomputers that is directed specifically at libraries. This book is an attempt to address the need for relevant information. Unfortunately, it fails. This reviewer has documented more than sixty factual and conceptual errors scattered throughout the text, raising the specter that many more may be lurking in areas of which this reviewer has no direct knowledge. If these errors were the result of the time lag involved in publication, as inevitable in this fast-moving field, they could be forgiven. However, this is not the case. The author is apparently not fully familiar with many of the microcomputers currently on the market, yet he makes many misleading or outright erroneous statements about them.

For example, in discussing the Apple II computer, the author states, "The system may employ a maximum of 48K bytes of RAM. The Apple II is also available with an IEEE-488 compatible bus, which plugs directly into the Apple mother board as an extender 'card' or board. With this extension, the Apple II can have eight ports, including keyboard, cassettes, printers, CRTs and speakers" (p.89).

This is perhaps the worst description of the Apple ever set to print. The Apple has eight peripheral slots into which extender boards may be plugged. *One* of these is an IEEE-488 card, which is most commonly used to connect to scientific test equipment. The Apple still has eight slots, whether or not this particular board is plugged in. In addition, neither the keyboard, cassettes, CRTs, or speakers are commonly connected to the computer through this bus structure. They all have separate outlets. The only truth to the entire statement is that the printer is connected through the bus structure, commonly in slot number one. In addition, the Apple can handle 64K of RAM quite easily; and much more is possible.

This is only one of many such statements. It is reproduced here because it may hold the distinction of more errors per sentence than any of the others. There are numerous errors concerning the Apple, but also the TRS-80 line from Radio Shack and the Commodore series as well. The errors range from typos, which riddle the text, to conceptual misunderstandings. The author continually lumps operating systems and languages together, for example, suggesting that the PASCAL language can be used with the Applesoft operating system (p.55). Applesoft is a dialect of the BASIC language, quite separate from PASCAL. It is not an operating system at all. The author may very well be familiar with some of the more esoteric and expensive microcomputers available today, but it is obvious that he is not at all familiar with either the characteristics or operation of the more popular microcomputers mentioned above, the very computers that are most likely to appear in libraries.

Perhaps more frustrating than the many errors themselves are the value judgements

sprinkled through the text. There should be nothing wrong with judgements on particular systems per se, if they are backed up with hard data. However, this is not the case. In a quite detailed appendix, Rorvig rates many popular brands for "comprehensiveness," which is nowhere defined in the text. Computers such as the Radio Shack Model II and the Apple II are listed as "fair," yet the TI 99/4, one of the greatest disappointments of the microcomputer industry, is listed as "good." In another example, Rorvig states, "The documentation for the Apple II is only fair overall and is highly technical" (p.91). Here is what others have to say about the same material:

(Discussing the Apple III) "The manuals are typically Apple: complete, well structured, indexed, well illustrated and written in a non-technical tone. The one thing missing from the Apple III manuals is the humor apparent in the manuals for the II."—Thom Hogan, *InfoWorld* 3, no.24:34 (2 Nov. 1982).

"One of the excellent features of the Apple II is the documentation that comes with it. I know of no other personal computer that comes with documentation of the quality of Apple's."—Stephen Bach, *Byte* 7, no.1:22 (Dec.81).

These many errors of fact and unsupported value judgements are also combined with rather questionable advice. In the quite skimpy section on software, Rorvig states, "In fact, the best way for librarians to get the software they need is to learn BASIC or other languages and then to program functions for themselves" (p.41). This statement has the potential for scaring many librarians away from microcomputers altogether. The expertise needed to program a sophisticated application is quite substantial; the time necessary is considerable. There are many packages available for circulation control, acquisitions, serials control, etc., for microcomputers; and many more that, although not specifically for libraries, can be adapted for local use relatively easily. This, of course, is not an "error" as such, but the effect is to discourage rather than enhance microcomputer use.

The examples provided above reveal only a few of the book's many problems. In a general sense, the book is dangerous, both because of misleading and erroneous information and because of highly questionable advice. Many librarians who know very little about microcomputers may pick up this book to arm themselves with basic information. Certainly many will eventually discover for themselves what is best for their situation. But information such as this, written with a tone of authority, may set the reader on the wrong path from which it may be time consuming (and therefore costly) to recover. Rather than presenting a worthwhile guide to an exciting subject, the book is a severe disappointment to anyone interested in microcomputers, and to the entire profession. Sadly, it has little redeeming value and cannot be recommended.—*Michael R. Schuyler, Kitsap Regional Library, Bremerton, Washington.*

Because of the nature of the preceding review, the author of the book was offered the opportunity to respond in the same issue of ITAL. *His response appears below.—DLW.*

Microcomputers and Libraries was written for librarians who have little knowledge of computers and considerable knowledge of library needs. It introduces a variety of new concepts, many of which focus on hardware and its development history, but also many that address the societal context of microcomputers. My objective was to write a book that would equip librarians with the conceptual tools necessary to walk into a computer store or pick up manufacturers' literature, and evaluate the information contained there. I strongly believe the book to be a valuable tool for any librarian contemplating the investment of $2,000 to $5,000 in a micro. I believe the cost of the book to be a modest investment for the service it provides.

The conclusions of the above review of the book are not supported by the reviewer's observations. All of the direct references ignore the context of the book. For example, I doubt many readers would conclude from the absence of two clarifying words (unfortunately edited out by error) in the discussion of the IEEE extender card

that the extender card was necessary for the Apple II to have eight ports. A full-page photo of the Apple II mother board shows the eight ports to be standard, and an appendix note on the Apple II also states this. The reviewer has drawn a major inference about the book from a minor editorial error.

Another problem is the reviewer's attribution of documentation ratings as representative of my general opinion of a device. It is possible for a device that is not well recommended to have excellent documentation and vice versa. Moreover, the book's evaluations were based on examination of original system manuals rather than secondary sources. Finally, I think a general English-language dictionary sufficiently defines *comprehensiveness* for the purposes of the book's discussion.

The reviewer also makes assertions that are simply wrong. For example, it is stated that the Apple II can handle 64K "and much more is possible," when the 6502 CPU of the Apple II cannot address more than 64K of main memory and 48K is the Apple II standard.

This review thus cites material out of context, makes errors of inference, errors of attribution, and just plain errors. In short, I do not take this review seriously.

However, the reviewer does make one point with which I take major exception. I wish to address this point in detail. In criticizing my suggestion that librarians should learn to program micros, the reviewer offers the profession another tiresome admonition that librarians are technically incompetent. Indeed, the reviewer contends that we are so incompetent that the mere prospect of programming will have the effect of "scaring many librarians away from microcomputers altogether."

I do not accept the reviewer's point. It is true that many librarians lack educational experiences that deal with the abstract symbol manipulation necessary in programming. However, I suggest that this may be readily overcome. For example, at Berkeley's School of Library and Information Studies, among the most popular courses are those dealing with programming. Last winter, I had the privilege of assisting with a course on programming Apple computers. The students in this course had little prior experience with programming (one other one-quarter course) and varied widely in age and professional background. In ten weeks, working about 5–7 hours per week, all of the students had written an original program that addressed some aspect of library organization or management. Two of the students produced work that probably would have been salable in the general professional community.

I was taught programming by a former children's librarian. We librarians are information workers, and programming is as much a tool of that work as the ability to critically evaluate reference guides. For those readers interested in programming, I recommend the self-teaching guide used in the Berkeley course: *Apple Basic: Data File Programming* by LeRoy Finkel and Jerald R. Brown and published by John Wiley & Sons, Inc., New York, 1982.—*Mark E. Rorvig, doctoral student, School of Library and Information Studies, University of California at Berkeley.*

Smalley, Donald A. and others. ***Technical report on linking the bibliographic utilities: benefits and costs;*** submitted to the Council on Library Resources. Columbus, Ohio: Battelle Columbus Laboratories; 15 Sept. 1980. 169p. [121p.]

Jones, C. Lee. ***Linking bibliographic data bases: a discussion of the Battelle technical report.*** Washington, D.C.: Council on Library Resources, Inc.; 15 Oct. 1980. 28p.

While the desirability of a single national bibliographic network has gained widespread acceptance among librarians, it is generally assumed that the nationwide network will actually take the form of a series of links between already established, and quite disparate, systems. In 1979, the Council on Library Resources (CLR) commissioned Battelle Columbus Laboratories to study the costs and benefits of linking the major bibliographic databases (OCLC, RLIN, WLN, and the Library of Congress). The methods and results of the study, which was completed in the summer of 1980, are described in Battelle's *Technical Report.*

The first half of the report attempts to quantify the benefits of linking in the areas of shared cataloging, interlibrary loan, and reference searching. For the cataloging function, a sample of current titles was searched in each database and incremental hit rates calculated for all combinations of links. A "paper and pencil" model is offered for calculating original cataloging costs saved, given the premise that copy cataloging can be done for some titles not available in a library's "host" database but found via links to another utility. A similar study was conducted of incremental hit rates for a sample of ILL requests, and an algorithm is given for calculating savings to the borrowing library. For reference searching, estimates center not on savings but, rather, on the volume of successful linked searches that could be conducted given various assumptions about when an online search would be attempted by patrons and staff.

The report concludes that linking the utilities would provide significant dollar savings to libraries in current title cataloging, less substantial savings in ILL, and that "the aid to reference searching alone may be enough to justify linking."

Three of many possible links are then examined in detail in terms of development effort, ongoing cost to the utilities, and benefits to the user. These methods are: tape delivery, online access using the various search command languages and record formats of the four utilities, and online access in "translation mode," where much of the translation is handled automatically. All of the links are based on the idea that only requested records are exchanged. BIBLINK, an interactive modeling system developed by Battelle for the study, was used to help estimate the impact on the utilities.

The report concludes with three recommendations: continued use of BIBLINK "to expand the analyses presented in this report and to explore issues that were not addressed here," the immediate development of an online link in translation mode, and the appointment of two standards committees to determine technical requirements for implementing such a link.

The Battelle study was immediately controversial. OCLC President Rowland Brown issued a statement that the report "raises at least as many questions as it answers, and it ignores completely some crucial economic issues." RLIN, which was just beginning a spurt of rapid growth at the time the hit-rate studies were performed, and WLN, which was not regularly loading LC MARC tapes during the test period, appeared to suffer in the comparison with OCLC. Criticism was voiced by the library community that the central problem, how to make resource sharing attractive to OCLC, was not even addressed.

The discussion paper by C. Lee Jones, program officer for CLR, was perhaps an attempt to anticipate and diffuse some of this criticism. After summarizing the *Technical Report*, Jones elaborates reasons for, and implications of, limitations of the study in several areas, including the data collected by and available to the researchers, the range of link alternatives considered, and the scope of costs and benefits included in the analysis. Jones emphasizes that the strength of the Battelle effort is in the development of tools like BIBLINK for display and analysis, given different sets of data and varying assumptions. He points out the need to investigate not only other linking alternatives but also alternatives to linking.

Mr. Jones' paper preempts many quibbles about the *Technical Report* that would otherwise be raised, but an additional warning about Battelle's conclusions is in order. The report makes no attempt to relate costs and benefits in any formal way, much less to provide guidelines for evaluating such comparisons. Estimates of benefits to the library community are made without regard to type of link, making it difficult to relate these to the estimates of ongoing expenses calculated for each linking alternative. Possibly because there is no rigorous cost-benefit analysis, the report has a tendency to present premises as conclusions. To give only one example, online access with automatic translation is recommended "because it allows the user to access the resources of other utilities immediately, using the host utility's request statements, and then displays the responses in the host utility's record format." This is the definition of "translation mode" linking, not a reason for adopting it.

Overall, Battelle's *Technical Report* is unlikely to be of lasting interest. The data obtained in the hit-rate studies is already outdated, while the analysis has an almost classroom flavor, lacking depth and sophistication. The discussion of the economic impact of linking is especially academic, excluding such immediate aspects as the effects on rate structures, current services, and other planned development efforts. At a time when linking is of immense topical importance, the *Technical Report* is liable to disappoint advocates and opponents of linking alike.—*Priscilla Caplan, Harvard University Library, Cambridge, Massachusetts.*

Telidon [Videorecording]. Ottawa: Dept. of Communications Information Services; 1981. 1 tape cassette; 13 min.; sd.; color; 3/4-in. format. Available from: Dept. of Communications Information Services, Rm. 1950, 300 Slater St., Ottawa, Ontario, Canada K1A OC8.

Telidon is distributing a thirteen-minute videotape describing its videotext capabilities and graphics. This videotape program, whose general tone is that of a sales pitch for Telidon, does demonstrate Telidon's basic videotext/teletext services, even though a program such as this can never adequately show the interactive capabilities that a "real" demonstration should.

The production is a straightforward presentation featuring Dr. David Suzuki as the host/narrator. A series of montages of Telidon graphics illustrates many of the applications of videotext services for advertising, education, business, information storage, etc. The graphics used support Suzuki's claim that Telidon graphics are indeed "stunning."

The program is apparently intended for a general audience with little technical background. With the audience in mind, this reviewer wishes that there had been a clearer demonstration of what a user would see when calling up pages in an interactive mode. Librarians or other "professional" audiences would probably want to know more about the information providers and the way Telidon graphics/services are developed than is briefly described in this tape.

This video production employs good editing, color, and basic video techniques, while letting the "superb" Telidon graphics carry the program. The program is certainly not as slick as a WGBH–Boston, "Nova" production.

On the whole, this is a good tape for what it attempts to do—to demonstrate and explain Telidon services and graphics to a general audience. The *Telidon* tape might very well be used in conjunction with WGBH's recent production, "The Television Explosion," which places videotext services in the context of all of the telecommunications technologies. Seeing all of those "superb" graphics in the *Telidon* tape just makes one want to know more.—*Lynne Bradley, Library Video Network, Baltimore, Maryland.*

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.

AVMP 1982 = Audiovisual market place 1982: a multimedia guide. New York: Bowker, ca.1982. 471p. Includes index. ISSN 0067-0553. ISBN 0-8352-1361-7. $39.95.

Baum, Claude. *The system builders: the story of SDC.* Santa Monica, Calif.: System Development Corporation, ca.1981. 302p. ISBN 0-916368-02-5.

Bommer, Michael R. W. and Chorba, Ronald W. *Decision making for library management.* White Plains, N.Y.: Knowledge Industry Publications, 1981. 178p. (Professional librarian series) Bibliography: p.151–72. Includes indexes. ISBN 0-86729-000-5. $27.50.

Fang, Josephine R. and Songe, Alice H. *International guide to library, archival and information science associations.* 2d ed. New York: Bowker, 1980. Bibliography: p.382–87. Includes indexes. ISBN 0-8352-1285-8. $32.50.

Grosch, Audrey N. *Minicomputers in libraries, 1981–82: the era of distributed systems.* White Plains, N.Y.: Knowledge Industry Publications, 1982. 263p. (Professional librarian series) ISBN 0-914236-96-2, hardcover, $34.50. ISBN 0-914236-92-X, softcover, $27.50.

Information processing & management: libraries and information retrieval—systems and communication networks. 17(6); 1981. Oxford, New York: Pergamon. p.305–79. ISSN 0306-4573. Available in North America from Pergamon Press, Inc., Maxwell House, Fairview Park, Elmsford, NY 10523; all others from Pergamon Press, Ltd., Headington Hill Hall, Oxford, OX3 OBW, England. Continues *Information Storage and Retrieval.* Annual subscription $170 institutions; $35 additional copy for personal use.

Library research. 1(4); 1979 Winter. Voigt, Melvin J., ed. Norwood, N.J.: Ablex Publishing Corporation. p.293–396. Quarterly. ISSN 0164-0763. Annual subscription $40.00 institutions; $19.50 individuals.

Masuda, Yoneji. *The information society; as post-industrial society.* First U.S. printing. Bethesda, Md.: World Future Society, 1981. 171p. ISBN 0-930242-15-7. Translated from the Japanese by Bernard Halliwell. Reprint of the Tokyo Institute for the Information Society; 1980 edition. Available from: World Future Society, 4916 St. Elmo Ave., Bethesda, MD 20814. $12.50.

Microcomputer index. 2(2); 1981 April-June. Santa Clara, Calif.: Microcomputer Information Services. 113p. Available from Microcomputer Information Services, 2646 El Camino Real, #247, Santa Clara, CA 95051. Quarterly. Annual subscription $30.

New information systems and services: a periodic supplement to the fourth edition of "Encyclopedia of information systems and services." 1; 1981 May. Detroit, Mich.: Gale. Kruzas, Anthony T. and Schmittroth, John Jr., eds. ISSN 0190-8197. Inter-edition subscription $140.

Proceedings of the conference universities in world network of information and communication, III; 1980 May 20–23; Dubrovnik, Yugoslavia. IRCIHE Bulletin 6(1-2); 1980. Zagreb: IRCEBS, 1980. Published by International Referral Centre for Information Handling Equipment (IRCIHE), Zagreb. ISSN 0351-0123. ■■

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