# A L E P H:
## An Online Real-Time Integrated Library System

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## The Environment of A L E P H

A L E P H (*A*utomated *L*ibrary *E*xpandable *P*rogram, *H*ebrew University), an online,* real-time,* integrated library management system, was developed at the Hebrew University of Jerusalem. The first version of ALEPH was developed in order to provide a vehicle for integrating the collections and catalogs of twenty-three departmental libraries which were to be moved from the Givat Ram campus to the new Library for the Social Sciences and the Humanities on Mount Scopus. During the conversion of the catalogs (in an off-line,* batch* mode), the concept of an integrated online library system was conceived, and the system was planned and programmed in anticipation of the Library's opening in October 1981.

After implementation in the Mount Scopus library, ALEPH was expanded and other libraries began using the system. These include several libraries at the Hebrew University of Jerusalem, among them the Jewish National and University Library, Tel Aviv Municipal Library, Ben Gurion University of the Negev, Technion — Israel Institute of Technology, and the *Union List of Serials in Israel Libraries.*

## System Overview

The system was developed and is operating on a Control Data mainframe* computer (C.D.C. 825) with some eighty terminals* connected, using dedicated and dial-up lines.

ALEPH provides solutions for library management problems utilizing sophisticated but friendly search capabilities, integration of various library functions, efficient text editing, Hebrew character capabilities, and online, real-time update of files. It has proved to be of interest to various types of libraries, as well as to other institutions dealing with information-handling. This interest led to the conclusion that the system should be able to run on a minicomputer* as well as a mainframe computer. After investigating available computers, we decided that the Digital VAX 700 super-mini series would be most suitable. The VAX was chosen because of its widespread use, its machine and operating system reliability, its range of size and capabilities, and its performance for the ALEPH application.

In 1983 the system was completely rewritten for VAX computers, taking into account both previous experience with libraries and with Control Data hardware,* and the added capabilities that the VAX could provide. ALEPH operates on the full VAX 700 super-mini series, under the standard VMS operating system and standard file organization. The programs are written in COBOL.* In Israel, ALEPH on VAX is marketed through ALEPH-YISSUM (a Hebrew University company). Marketing and maintenance in the United States is handled by AUREC, a Tel Aviv-based software* house with offices and applications in the U.S.

ALEPH provides a full range of library management capabilities, from monograph and serial acquisitions to cataloging, authority file maintenance, online searching and circulation. Of special interest to Judaica libraries is the ability of ALEPH to handle Hebrew characters as well as Latin characters in a Hebrew field.* A catalog record* may have a full mix of Hebrew and Latin characters; for example, the author might be in Latin transcription, the title in Hebrew, place of publication in Hebrew, publisher in Latin characters, with all notes in Latin characters. Any Hebrew field can include upper-case Latin characters. ALEPH is also able to convert MARC* format records to ALEPH structure and vice-versa.

In an integrated system, all activities are carried out on the same files, so that bibliographic information is input only once for all purposes (acquisition, cataloging, circulation, etc.).

## System Options

ALEPH can be used not only for classic library materials, but for managing other information repositories such as archives, museum collections, etc. The system is parametric, with the user determining the fields, their codes, how they are edited and displayed, and how they are used in the system. A library-type option is provided as the default, to help the institution set up the system. Determining the parameters is a user-task and requires no programming knowledge. One computer and software installation is capable of simultaneously running any number of applications ("catalogs"), each with a different set of parameters. If desired, for example, an institution could use MARC tags as field codes for bibliographic* records of the library, and an entirely different set of codes and access files* for a collection of personal archives.

The elements* of descriptive information for an item (in a library, the catalog record) are defined by the user (or users in a multi-application environment). Each element is considered a field, and the user determines which fields are required, the tag* and name for each field, and the order of the fields when displaying the record. Most important, the user determines how the field is handled by the system: e.g., does the field open an authority record, and if so, in which file (one dictionary file, or separate files for authors, subjects, etc.; are series in the titles file, or in a separate series file, etc.)? Is the field an information field for display only, or an index field (and if so, which index)? Is the field to undergo automatic full text inversion? In all cases, the field content may be in Hebrew and upper case Latin characters, or upper and lower case Latin characters.

In ALEPH the user 'converses' with the system through the terminal, choosing the language of instruction best suited to him. The standard ALEPH package provides instructions in English and Hebrew, and additional languages of instruction may be added. Extensive "help" screens explain each display and its valid action codes. These help screens can be added to or rewritten by the librarian to provide installation-specific instructions to the end-user.

Authority files can be created for any type of field. An authority file provides for global change of a heading in all linked catalog records. Cross references in an authority file provide bibliographic control by automatically switching to the

preferred term. Relationships between entries can be expressed as use-for (*see* references), related terms (*see also* references), or broader or narrower terms, thus providing thesaurus-building capabilities. Entries can be linked regardless of the character set of each entry. For example, a library could refer from the real name and Yiddish form of *Shalom Aleichem* (the Romanized form of his pseudonym established at the Jewish National and University Library).

The ALEPH system is broken down to five functions, each with several sub-functions. These functions are: Catalog search, Cataloging, Authority file maintenance, Circulation, and Acquisition. The search function is open to all users. The other functions, which involve updating of files, are protected by passwords. For control and protection of information on files, password levels can be assigned to prevent unauthorized changing of information.

### Catalog Search

The online search has been designed both for the occasional user looking up a specific item, and for the sophisticated user who might want to build sets of search arguments and expand or narrow them using Boolean* commands. At each step "help" screens can be called up to explain

the displayed screen and action codes to the library user. The standard search is always in a browse mode, assuming right truncation, and always presents the user with a list from a file. When searching the catalog, the user is never presented with a "no hits" screen. Cross references in an authority file provide automatic access to the preferred term in the catalog search.

The main search screen is illustrated in figure 1. In a typical search for a known item, the user would approach the online catalog in the same manner as a manual catalog. Depending on the information in hand, he would decide which file ('catalog') to choose, key its code, and the text of the entry (author or title or other access field). The user is then presented with a list of entries, together with a notation of the number of publications (postings) under the entry, and an indication as to whether the entry has cross references. The asterisk next to *Maimonides* in figure 2 serves the latter purpose. Short bibliographic citations (author, title, location, year of publication) can then be displayed in alphabetical order (figure 3). The user can zero in on the item in the alphabetic sequence that he requires. When searching for an entry, the user can combine the first characters of the heading with an additional character string to refine

a search on long entries, or to retrieve entries for which the exact heading is not known (e.g., 'United States/environ' to search for federal agencies with 'environ...' in the name). When a desired publication has been found, the user can then request details on the copies (their location and availability), full bibliographic information (figure 4), or an abstract.

One of the strengths of an online catalog search, as compared to the card catalog, is the ability to create sets of documents and manipulate these sets to narrow or broaden a search. For example, a user could create a set of all documents with the word 'econom' in the title or subject heading, and then limit the set to works in Spanish, published since 1979.

The user can tag postings to be saved in a set of individual bibliographic records, for later reference or for printing.

### Cataloging

Cataloging is the function through which catalog and holdings information are entered on ALEPH files. The cataloging process is free-form, with no prompting (although help screens are available) and no minimum required information. The system makes minimal checks (to provide for maximal flexibility), and the librarian is
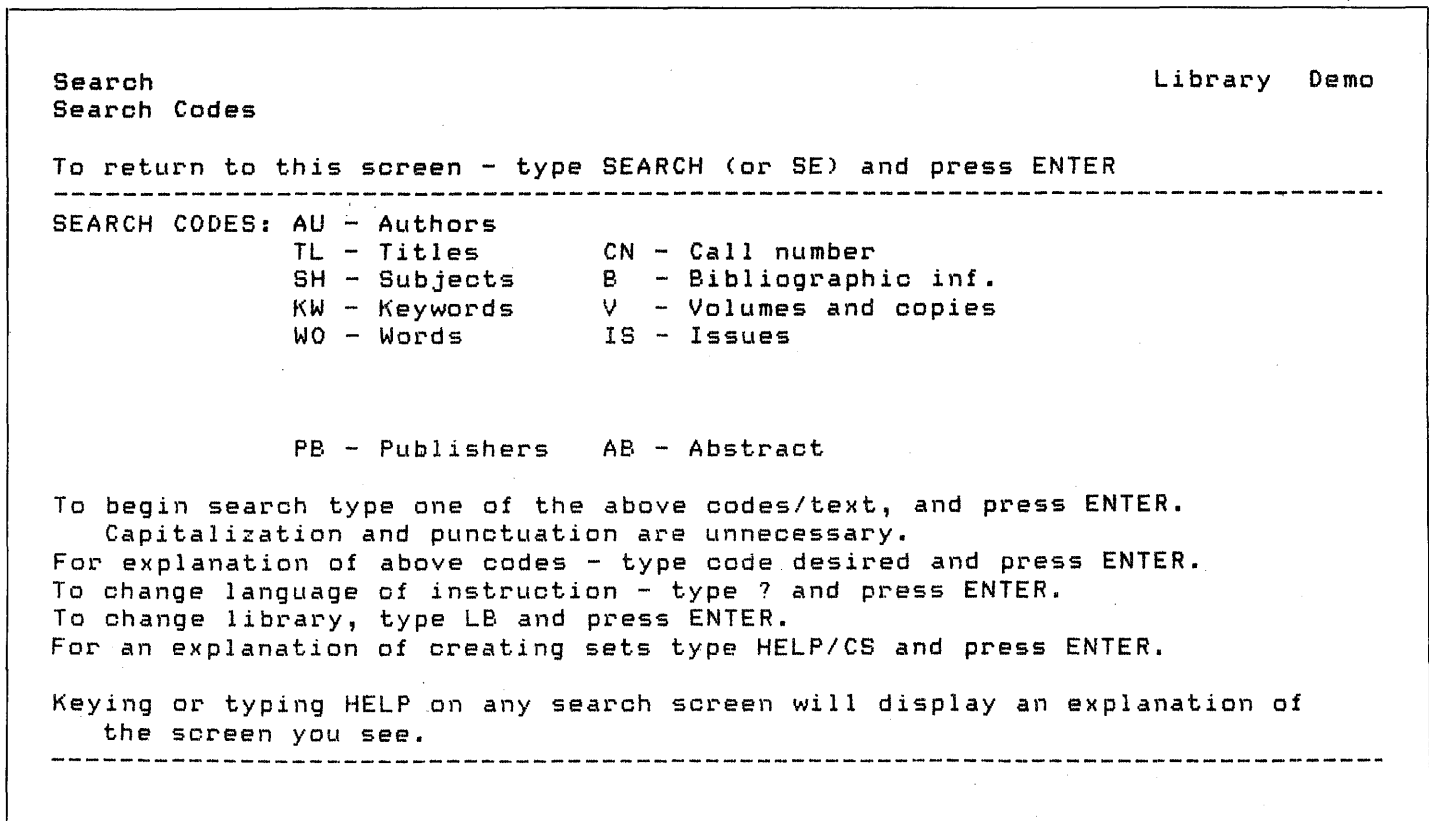
```
Search                                              Library   Demo
Search Codes


To return to this screen - type SEARCH (or SE) and press ENTER
----------------------------------------------------------------------------
SEARCH CODES:  AU - Authors
               TL - Titles         CN - Call number
               SH - Subjects       B  - Bibliographic inf.
               KW - Keywords        V  - Volumes and copies
               WO - Words          IS - Issues




               PB - Publishers    AB - Abstract

To begin search type one of the above codes/text, and press ENTER.
    Capitalization and punctuation are unnecessary.
For explanation of above codes - type code desired and press ENTER.
To change language of instruction - type ? and press ENTER.
To change library, type LB and press ENTER.
For an explanation of creating sets type HELP/CS and press ENTER.

Keying or typing HELP on any search screen will display an explanation of
    the screen you see.
----------------------------------------------------------------------------
```

**Figure 1. Main Search Screen of ALEPH.**

```
Search                                              Library    Demo
Access List Authors


1.  Maimonides (1).*
2.  Malone, Thomas F. (1)
3.  Matsushita Sadami (1)
4.  McElhinny, M. W. (1)
5.  Miller, David Hewitt (1)
6.  Moorbath, S. (1)
7.  Nagata, Takesi (1)
8.  NATO (2)
9.  NATO Advanced Study Institute on Palaeomagnetic Methods (1964 : University
    of Newcastle-upon-Tyne) (1)




Continue=C, Publications=P/line no., References=RF/line no.,
Save set=CS/line no., Create set=CS/catalog code/text, Sets=LS, Libraries=LB.
---------------------------------------------------------------------------
```

**Figure 2. Display of Author Headings with Number of Postings.**

```
Search                                              Library    Demo
List of publications

1. Maimonides
-----------------------------------------------------------------------------
BS 256.M254 194                    Maimonides                             .1
     187  1946 ...........................................מורה נבוכים




Display list from=C/text, Access=AC, Vols/copies=V/line no., Issues=IS/line no.,
Bibl.inf.=B/line no.,Abstract=AB/line no.,Save=S/line no.,Sets=LS, Libraries=LB.
-----------------------------------------------------------------------------
```

**Figure 3. Short Bibliographic Record.**

responsible for correctly entering and tagging information. Catalog records can be copied from the same file or from other files in the computer. During the cataloging process, the cataloger can search the authority files and copy information from them to the cataloging record. Cross references in the authority file provide authority control in the cataloging process.

The sub-functions of the cataloging function are:
1. Creating a new bibliographic record
2. Duplicating a record to serve as the basis for creating a new record

3. Updating of a bibliographic record
4. Deletion of a bibliographic record
5. Volumes/copies registration, additions and corrections
6. Issues check in

The online catalog obviates the necessity of filing catalog cards, and pulling cards when a correction or an addition is needed. The real-time update of the files means that the moment the librarian has cataloged an item, it becomes part of the public access catalog. The ease with which corrections can be made means that the catalog can always be up-to-date.

### Authority File Maintenance

The Authority file maintenance function serves for correction or deletion of authority entries (which are then automatically corrected or deleted in all linked documents), and for creating cross references (linking entries). An authority record is opened either through the cataloging process, or by entering it in the authority maintenance function (figure 5). Details on the status of the record (date opened, date of last update, cataloger code and level) provide the tools for authority file security and control (figure 6).

```
Search                                              Library   Demo
Bibliographic information 0000187


  Author   Maimonides
                                          מורה נבוכים       כותר
                                   מדריך ליהודי המבולבל    תת-כותר
                                   מאת הרב משה בן מימון     כותר-המ
   Place   London
                                          SONCINO דפוס      מו"ל
    Year   c1946
  Year-f   1946
   Pages   567 p.
 Subject   Judaism
    Lang   HEB
Local-no   BS 256.M254 1946
      -    BS 256.M254 1942


Display bibl.inf. from start=B, Next publ.=N, Vols/copies=V, Issues=IS,
Abstract=AB, Publications=P, Access=AC, Save=S, Sets=LS, Libraries=LB.
------------------------------------------------------------------------
```

Figure 4.  Full Bibliographic Record.

```
Maintenance                                         Library   Demo
Access list Authors


1. Maimonides (1)*
2. Malone, Thomas F. (1)
3. Matsushita Sadami (1)
4. McElhinny, M. W. (1)
5. Miller, David Hewitt (1)
6. Moorbath, S. (1)
7. Nagata, Takesi (1)
8. NATO (2)
9. NATO Advanced Study Institute on Palaeomagnetic Methods (1964 : University
   of Newcastle-upon-Tyne) (1)




Continue=C, References=RF/line no., Correct=CL/line no., Delete=DL/line no.,
Combine=CM/incorrect line no./correct line no., Create reference=CR/line no.,
Add new entry=AE, Change and add as new entry=AE/line no.
------------------------------------------------------------------------
```

Figure 5.  List of Headings in Authority File.

```
Maintenance                                              Library   Demo
Show entry

          Maimonides

Cataloger YOHANAN       Level 10    O-date 84/10/31     U-date 84/10/31
Documents       1 Refs.    3 Last ref.      3

                                            רמב"ם : מ- נראה    1
                                     משה בן מימון : מ- נראה    2

    3 Seen from : Rambam


Exit=EX, Confirm=CF, Change type=CT/code, Entry-type list=ET, Add reference=CR,
Add note=A, Correct note=CL/line no., Delete reference or note=DL/line no.
-----------------------------------------------------------------------------
```

**Figure 6. Authority Record with Hebrew and English References.**

```
Circulation                                              Library   Demo
Circulation Functions

Loan       - LN
Return     - RN
Due Dates- DD

Borrowers -
   Registration (new and update) - U/id no.
   List (by id no. or name)      - L/id no. or name
   Details (loans, fines, etc.)  - D/id no.
   Change id no.                 - ID/id no. (not released)
   Delete borrower               - DL/id no. (not released)

Volumes/copies information       - V/system no.
   Change copy loan-status       - (not released)
   Delete holds                  - DH (not released)


For an explanation of each function, type HELP/code.
To initiate function, type code or code/no. and press ENTER
-----------------------------------------------------------------------------
```

**Figure 7. Circulation Functions and Their Codes.**

## Circulation

The ALEPH circulation function was originally developed for a university library, with all the complications of a reserve book collection, holds, differing borrower privileges for different types of readers, etc. (figure 7). Bar-coded markings can be used to identify readers and items, in order to facilitate circulation activities. Because

ALEPH is an integrated system, the library user searching the online catalog is informed of the current status of the item searched (e.g., out on loan, when due back).

When an item is loaned, the due date registered is assigned according to a predetermined table. This table can be changed for one or all terminals in the system, so that exceptions can be handled.

The loan function registers the item to the borrower and vice-versa, performing checks on the validity of the transaction (i.e., that the item status is permitted to the reader status, and that the reader is not delinquent or has not already checked out the maximum number of items allowed). The return function alerts the operator if a hold has been placed on the item. The borrower list is accessible online by borrower ID number or borrower name,

and a display of all items (current and past) registered to a borrower can be requested (figure 8).

All circulation transactions are kept on file until a deletion is requested, so that batch statistical programs can be run. The system provides for notices to be sent to readers on overdue items, items about to become due, and items that have been placed on reserve for the reader.

### Acquisition

The bibliographic information needed for acquisition purposes is entered in the cataloging function, and becomes part of the public access catalog. Acquisition records are then linked to the bibliographic record. A vendor file is available online. The acquisition information includes budget number, price, estimated time of arrival (for issuing claims), subscription renewal date (for periodicals), and invoice information. These data elements are accessible only to staff members who have the acquisition function assigned to their password.

### ALEPH and Bibliographic Utilities

ALEPH should not be confused with bibliographic utilities (such as OCLC, RLIN, or UTLAS) which provide machine-readable cataloging information to a library. ALEPH's objective is to provide an in-house total library system, capable of using information copied from a bibliographic utility. Each library is then able to set its own cataloging rules, standards, and policies, as well as circulation policies.

Conversion of bibliographic and circulation records is one of the prime difficulties faced by a library instituting an automated

system. Libraries can load existing machine-readable bibliographic records into ALEPH. ALEPH provides a standard conversion program to load MARC format records. If a library has other machine-readable records (e.g., circulation records), the library can contract for a conversion program. A library with a circulating collection that was previously bar-coded can retain those bar-codes in ALEPH.

> ## *ALEPH's objective is to provide an in-house total library system, capable of using information copied from a bibliographic utility.*

In most libraries, even if a machine-readable file exists, it will probably not cover the entire catalog or the full range of information desired in a bibliographic system. A library might decide to close its card catalog and open up a new, current, automated catalog. A library might create its machine-readable catalog through the circulation process, catching books "on the fly," and filling in full bibliographic information at a later time. The ease of update, and the ability to combine or correct headings via authority file maintenance, obviate the need for fully verifying information prior to input. For example, a library might have headings "intuitively" interfiled in a card catalog (such as Lawrence, D.H. and Lawrence, David Herbert), which would then be

created as separate headings in the online catalog. These headings can be corrected in one operation through the authority file maintenance function.

The extensive help screens in ALEPH make the system self-instructing to the user. Our experience has shown that a cataloger can learn the search, cataloging and authority file maintenance modules in one week.

As stated earlier, ALEPH runs on Digital VAX 700 series super-minicomputers, which require only an air-conditioned office environment. Standard VT 100 or VT 100 compatible terminals can be used. If Hebrew is required, the terminal would have to have a Hebrew ROM*. VAX equipment with ALEPH can handle from eight to fifty terminals on one computer, and there is a clustering capability for linking several machines together for greater terminal capability.

Anyone interested in any further information, including what is being done with the system at libraries in Israel, may contact the author. A *General Information Manual* on ALEPH was published in 1984 by Aurec (17 Abba Hillel St., Ramat Gan, Israel), and is available upon request.

*Terms followed by an asterisk are defined in the glossary by Linda Lerman, found on p. 69.

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```
Circulation                                            Library   Demo
Borrower - Loans

000000020 Levi Judith Jewish National and University
Status       01 Expiry date 84/12/31 Delinquency 00

Seq Sys.no. Vol c.      Title                Due-at    Returned St.
  3. 0000140 004 001    Rehovot's faculty of 84/09/18 84/11/14 10 0
  4. 0000140 004 002    Rehovot's faculty of 84/09/18          10 0
  5. 0000187 000 001          ‫מורה נבוכים‬ 84/11/21          10 0



Exit=EX,Check borrower=BRD,Delete fines=DL/line no.,Return+DL fine=RN/line no.,
Hold list=HL,Renew=CD/line no.,Change date=CD/no./date,History=HS,No history=NS.
```

**Figure 8. Borrower Record Display: Current and Past Circulation Data.**