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ABSTRACT

The Library Education Experimental Project (LEEP) involved the establishment of a computer-based laboratory for library science students, utilizing the Library of Congress MARC (Machine-Readable Cataloging) magnetic tapes. Assignments in several classes (reference and bibliography, cataloging, and technical services) involved the use of these tapes and special purpose programs at the Syracuse University Computing Center. With the aid of these computer programs, over two hundred students in eight different courses (repeated for three semesters) were able to search and retrieve catalog records for current literature, to process their own cataloging assignments or examine the characteristics of the Library of Congress cataloging. The laboratory's usefulness was evaluated by the students and the faculty at the end of each semester. The entire laboratory (computer program, data bases, class assignments, user manuals, etc.) has been fully described to other library schools at a special institute and via a newsletter and report series. Appended are the results of a survey of program languages and computing facilities available to library schools and a bibliography of LEEP publications. (Author/JB)

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Final Report
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DEVELOPMENT OF A COMPUTER-BASED LABORATORY FOR LIBRARY SCIENCE STUDENTS USING LC/MARC TAPES

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January 1970

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Preface

Library education today is undergoing dramatic changes. The impact of technology, the use of the computer, and changes in libraries and education all contribute to this. This project at Syracuse University benefited greatly from cooperative efforts with people engaged in these developments at the Library of Congress Information Systems Office, IBM (Syracuse office), the Five Associated University Libraries, the Syracuse University Computing Center and the Center of Instructional Communication. Without their help, this project could not have been undertaken or so successfully completed.

In turn, it is possible that we contributed something to the field of library education. Assignments for a third of the courses in the library science curriculum now involve student use of a computer-based catalog. The potential of automation for libraries is a real concept for the student and the faculty of the school. The computer is seen as a tool for library research.

Summary

Scope and Objectives

1. To use the Library of Congress MARC (Machine Readable Cataloging) data base and related programs in a library school environment for teaching and research purposes in order to uncover problems in system development, file maintenance and related matters.

2. To develop a computer-based laboratory at Syracuse University Computing Center which library science students could use with a minimum of instruction and programming knowledge on an every-day basis.

3. To evaluate such an effort (1 and 2 above) to determine its usefulness and applicability to other library science programs across the country.

4. To continue the effort over several semesters to accommodate necessary changes in data bases, programs, computer environment, faculty and student reactions.

5. To perform background studies on MARC as a file and as a set of individual records of cataloging practice.

6. To experiment with data bases related to MARC (e.g. LC List of Subject Headings, Z Classification Schedule).

Highlights

1. LC/MARC: We created several data bases from the original MARC Pilot Project data base of 48,190 records. By the conclusion of this grant period, we had a 9,000-volume computer-based catalog which was used by students for subject or reference retrieval assignments by means of an IBM software package called DPS (Document Processing System).

   The entire MARC data base was accessible via another program by LC card number. Other programs were written to provide additional access to MARC files. For example, printed catalogs of the entire MARC file in classified (LC and DC) order and main entry order were produced.

   More than half of the computer and programming staff's time (5,400 hours total) was spent in data file processing or data retrieval.

2. SLS/MARC Laboratory: Batched computer runs from various classes in the school were run on a semi-weekly or daily basis when necessary. Few difficulties were encountered by the students. Job preparation by the staff or the students consumed a minimal amount of time.

3. Evaluation: The Minnowbrook Institute on LEEP, held in October 1969, and the semester reviews by the SLS faculty and student body were our principal evaluation techniques. These reviews highlighted the values, costs, and modifications which are needed to keep such a laboratory viable and useful.

4. Experimentation and Research with MARC: The class assignments in reference, bibliography, cataloging, technical services and information systems changed each semester as the students and faculty became more oriented to the computer facility.

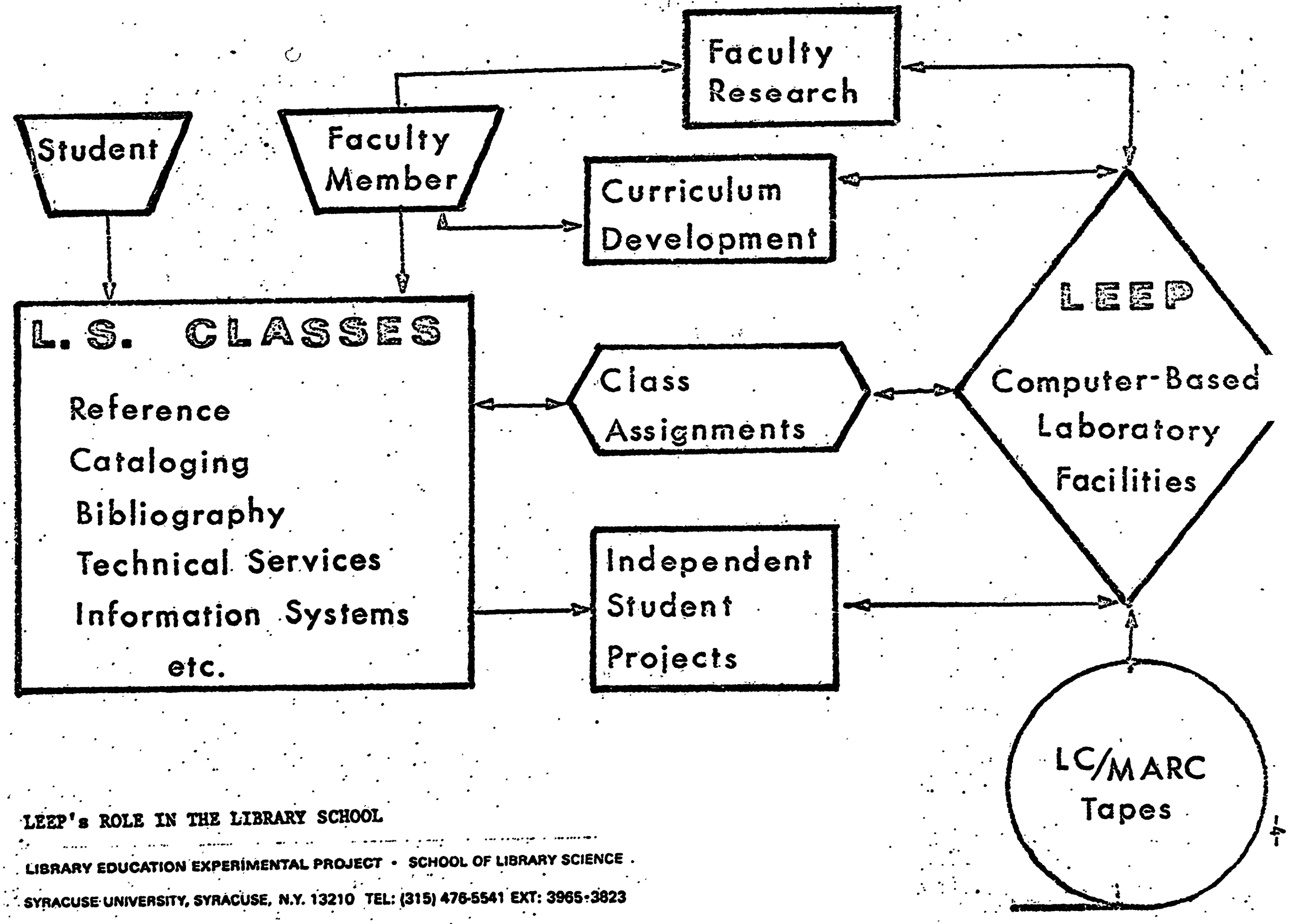
   The LEEP staff and some seminar students conducted research into the accessibility of the MARC record via several search strategies and several data fields.

   The effort associated with reformatting the MARC records became a research project in its own right since the demands of the programming system to be used exerted certain constraints which had to be studied and overcome or accommodated.

Introduction

This report will not itemize in detail the development of the LEEP/MARC Laboratory at Syracuse University. This has been done in the quarterly progress reports to the U.S. Office of Education and in the four LEEP newsletters issued during the grant period (see bibliography). Numerous special reports document special developments.

Instead this report will summarize the major developments associated with the project, namely, (1) Program and Data Base Developments; (2) Class Assignments using MARC Laboratory, and (3) Studies on LC/MARC and related Data Bases. Figure I ("LEEP's Role in the Library School") puts these three developments in context. How these three developments grew will be documented in the Methods section of this report and the Results and Findings section will summarize what happened.



LEEP's ROLE IN THE LIBRARY SCHOOL

LIBRARY EDUCATION EXPERIMENTAL PROJECT • SCHOOL OF LIBRARY SCIENCE
SYRACUSE UNIVERSITY, SYRACUSE, N.Y. 13210 TEL: (315) 476-5541 EXT: 3965-3823

Methods

LEEP used the facilities available at the Syracuse University Computing Center. These include two IBM 360 series computers (a model 50 and a model 20), card punching and verifying equipment and a mechanical card sorter.

Details about the IBM 360/50:
- Main memory - 512K bytes
- Disc Storage - 240M bytes (2314 disc unit)
- 3 Tape units - 9 Channel (800 bpi max)
- 1 Tape unit - 7 Channel (800 bpi max)
- Printer - 1000 lpm (two print chains - std and TN)
- Card read/punch - 1000 cpm in/300 cpm out

There are some thirty IBM 2741 typewriters tied to the 360/50 from remote locations around the campus, as well as various other terminal equipment, including IBM 2260 display consoles.

A. Program and Data Base Development

Several data files form the LEEP Tape Library:

File Description	No. of Records	IBM-format
MARC I catalog	48,000	VB
MARC I x-ref. tracing	?	V
MARC I auth/title	48,000	F
MARC II catalog	12,000	VB
LC Subject Headings	19,000	VB
Biosciences Abstracts	1,500	VB
ACM Journal Abstracts	70	U
(LC) Z-schedule text (60 pages)	60	U

These files, in turn, have been reformatted for use with special retrieval or processing programs. The programs written by LEEP staff are described below. 5,400 man-hours were spent in several programming tasks associated with this effort. Graduate students in the Systems and Information Science program were supervised by Frank Martel, associate director of the project. John Wyman, a member of the Computing Center staff, performed the MARC/DPS work.

Kinds of Programming Tasks	% of Time
1. learning via documentation	.07
2. programming	.40
3. job preparation (MOLDS,DPS)	.23
4. documentation	.14
5. instructing	.08
6. supervising	.02
7. technical administration	.03
8. general administration	.03
Total Hours	5400 hours=100%

Program Summaries

1. MARC/DPS File Converter (PL/I)

Use with entire MARC Pilot Project (MARC I) file.

DPS (Document Processing System)is an IBM natural text processing and retrieval system. The DPS data base loader expects "document" input where each document may consist of a set of bibliographic fields followed by text organized in sentences and paragraphs.

The MARC/DPS File Converter takes as input a MARC I catalog file and converts each record into a DPS input document according to a fixed specification. Certain MARC fields are extracted and reformatted to produce the bibliographic field content of the DPS document. Beyond this, the total MARC record is reorganized into "words," "sentences," and "paragraphs," corresponding respectively to true English words or individual data elements other than English words (e.g. numbers), true English sentences or the content of single MARC I fields (when the field content is not really an English sentence), and groups of related fields.

Diacritical marks and certain non-printable delimeter codes are eliminated during the transformation from MARC record to DPS document; sequential document numbers are generated and affixed to the documents.

At the conclusion of its task, MARC/DPS File Converter prints out a summary of record characteristics recorded during the conversion.

2. LEEP-BIBLOLST (Assembly Language)

Use with entire MARC I file.

BIBLOLST is essentially a record-printer program from the Library of Congress set of MARC I file processing programs. Given a "deck" of 80-column card images, each containing an LC Catalog Card Number in columns 1-11, BIBLOLST passes the sequentially organized file of MARC I catalog records, and prints, in an easy-to-read format, the content of each record whose LC Card Number matches one of those in the input deck. The program uses a 132 character print line, performs over-printing of diacritical marks (employing a special print chain), and lists no more than one MARC record per printer page. LC Card Numbers in the input deck must be in ascending sequence to match the ordering of records in the file.

For LEEP use, we modified the front end of this program to accept a multiple part input deck of LC Card Numbers, each separate part headed by a student (i.e., user) identifier card. Each student's deck of card numbers is listed on a separate printer page; then the entire set of card numbers is sorted (duplicates are retained) and one MARC I record is printed in BIBLOLST format for each found card number in the sorted list. Unfound card numbers are printed in a single list at the end of the record output. Of course, LEEP-BIBLOLST output must be separated and the pages reshuffled so that each student gets just that part of the run output which is of interest to him.

LEEP-BIBLOLST does error checking on the input LC Card Numbers; the maximum number of error-free card numbers accepted is 477 per run. Record output format requires a 132 character line, as in the original version of the program. Diacriticals are deleted prior to printing. Average run time has been three minutes.

3. MARC I Double Column Lister (Assembly Language)

Use with entire MARC I file or subset.

This program prints the entire content of a file of MARC I records in a two-column page format; the columns are sixty characters wide and individual records follow one another first down the left, then down the right column of each page in the order they occur on the input file. This lister presents the MARC I record in an abbreviated form, using single spacing, identifying information elements by inserting the associated tag number in the left margin of the column. On the average, six or seven MARC I records fit on each page of printout. The program processes about 3000 MARC records per minute; actual print time, of course, is limited by printer speed.

4. LICOSH LISTER (PL/I)

Use with LC Subject Headings (7th edition) file.

This program formats and prints the content of records in the Library of Congress Subject Headings file. The program obtains (from an input card) record numbers of the first record in the file to be printed, and the last,and lists all records on the interval so defined.

5. LICOSH FILE ANALYZER (PL/I)

Use with LC Subject Headings (7th edition) file.

This 'program' really consists of a special feature added to the LICOSH LISTER program to enable the computation of certain statistics on a specified interval of records from the Subject Headings file. The measurements taken are as follows:

(1) For the LC Class Numbers field (tag 050 on the Subject Headings record), a count of the records which contain this field, and, of those which do, separate counts to indicate the distribution over LC Classes as represented by the initial letter of the class code.

(2) For each of the remaining fields of interest--

see References
sa References,
also References,
x Tracings,
xx Tracings,
"example under"/"note under",
Previous Headings,

--a count of the records which do not contain the field, and, of those which do, a histogram showing the frequency of occurance of fields containing a single data element (word or phrase), two elements, three, etc.; and also, for each of the above fields, the average number of elements per field and the median number of elements per field.

6. FDR (Assembly Language)

Use with entire MARC I file.

FDR [Frequency Distribution of (MARC I) Records] is a special purpose program which calculates the distribution of the 48,190 MARC I records over (1) the seven possible Main Entry types,
(2) the twelve main Dewey classes, and the hundred principal subclasses (based on first two digits of the class code),
(3) the main LC classes (based on letter codes),
(4) the seven possible LC Card Number dates ('62-'68)
(5) consecutive intervals on the range of possible record lengths,
(6) consecutive intervals on the range of possible publication dates.

A special set of counts are produced with respect to the distribution of bibliographies, maps, conference proceedings and juvenile works with each of the main Dewey classes.

7. MARC SEARCH Program (Assembly Language)

Use with either MARC I or MARC II files.

The MARC SEARCH program is a primitive language processor which performs compile-and-go operations on input programs composed of two types of statements: the retrieval specification statement and the list statement.

Retrieval specification statements are the FIND statement and the COUNT statement; in each of these, the command is followed by a specification of retrieval criteria in the form of a single Boolean expression of arbitrary complexity. The COUNT statement demands only a count of the records satisfying the retrieval criteria. The FIND statement directs that the qualifying records be counted and saved as a subset of the total file.

The LIST statement uses the command LIST and serves to specify which fields of the qualifying records should be printed and which fields should be employed as sort keys to order the output prior to printing.

The MARC SERACH program is designed to work in conjunction with the IBM 360 Sort/Merge Program and a special lister program which prints the MARC SEARCH output file.

Typically, then, output of the MARC SEARCH program is a file of records which have qualified according to the retrieval criteria, where each record in the file has been reduced from a total MARC record to one which contains just the fields specified for printing, together with those designated as sort keys. This output file is used as input to the sort/merge program. The lister program is then employed to print the output file from Sort/Merge.

Work on the MARC SEARCH program is still in progress. The design intent is to provide a relatively low cost capability to search either MARC I or MARC II files in their sequential form, and to select subsets of these files according to a wise variety of criteria. The program will process an arbitrary number of different users' search/sort/print requests at once.

8. MOLDS DBG (PL/I)

Use with subset of MARC I file.

MOLDS (Management On-Line Data System) is one of two general purpose retrieval systems with which the LEEP staff has worked over the past year. This system accesses data bases generated by the user within

the following constraints: files within a data base must be sequentially organized; records must be fixed length/fixed field; all data values must occur in character form.

MOLDS DBG (Data Base Generator) is a fairly extensive program which generates any MOLDS data base from the MARC I catalog file. For a given (target) data base, the program accepts a MOLDS file description which designates:

(1) the maximum number of records to be placed in the file,
(2) identifiers (field name and/or field number), field lengths, and data types (numberic or alphabetic) for all fields in a record.

The program also is given the 'name' of the MARC I field from which the data for the corresponding MOLDS field is to be taken. Optionally, the user of the data base generator can also:

(1) specify whether lower-case characters in a MARC field should be translated to upper-case in the corresponding MOLDS field for each record produced,

(2) specify whether diacritical marks and delimiters should be deleted from the data as it is transferred to the MOLDS record,

(3) include special PL/I subroutines to further transform the data in a MARC field before it is placed in the corresponding MOLDS field for each record produced,

(4) include a special PL/I subroutine to select, according to any criteria, a subset of MARC I records to be transformed for a given MOLDS file.

Upon constructing the required MOLDS file, the data base generator provides summary information pertinent to the task performed.

9. Z-TEXT PROCESSOR

Use with Library of Congress Z-Class Schedule.

This is a test program package which selects certain lines of text (in the typographic sense) from a machine record representation of the Z-class schedule and transforms these lines into KWIC indexable data. Final output is a KWIC index of terms extracted from captions for each LC class number in the schedule.

The first input file is 15 pages of text from LC Z-class schedule encoded to identify a variety of typographical and information elements via an IBM MT/ST system (magnetic tape/selectric typewriter).

Z-TEXT PROCESSOR consists of two separate preprocessor programs and a KWIC INDEXER package consisting of a Sort/Merge preprocessor and post processor as well as the IBM SORT/MERGE program.

B. Class Assignments and Activities Using LEEP/MARC Laboratory

By January 1969, the laboratory was available for class use. The most important programs described above were written and debugged. Subsets of the MARC Pilot Project file were accessible via DPS, MOLDS or BIBLOLST.

Members of the LEEP Liaison staff (three research associates and the project director) worked with members of the faculty when they expressed an interest in developing an assignment using the MARC Laboratory. The limitations of the data base (only recent monographs and a sample at that!) and the potential access of such a file were explained.

During the Spring and Fall semesters of 1969, and the summer session, approximately two hundred different students had such class assignments. Some students had as many as five "LEEP assignments . The following summary described the purpose and procedures for each assignment.

Summary of Class Assignments

L.S. 407
Reference Service

Bibliographic Linking

Purpose: (a) Obtain a listing of titles containing bibliographies from MARC records;
(b) Prepare for extension and interconnection of some of these bibliographic entries and the original titles within the MARC data base;
(c) Practice bibliographic evaluation.

Procedure: (a) Area of interest was selected by Dewey or L.C. class number (root search, AND, OR options) from MARC file of 1000 records. Records with class number and bibliographic note were retrieved using DPS/MARC system;
(b) Bibliographic entries in these titles were examined and MARC I worksheets were made for three English monographs, with added data fields for source of reference;
(c) Evaluate the bibliographies in the books examined as reference tools for a scholar.

Subject Searching for Bibliography Preparation

Purpose: (a) To show how a computer can aid in the searching process of preparing a bibliography;
(b) To help formulate a strategy for searching;
(c) To discover available material on a subject;
(d) To evaluate the findings;
(e) To practice using a computerized reference retrieval system called MARC/DPS.

Procedure: (a) Do a subject search in a topic suitable for a bibliography;

(b) Examine records retrieved for relevance (is it really about a subject?) and bibliographic data (does it contain a bibliography about the subject or is it a bibliography on the subject?).

L.S. 602
Subject Reference

Retrieval of MARC records in response to a reference question; or aid in preparation of a bibliography in a subject area using the computer.

L.S. 427
Cat. & Class.

Title Searches

Purpose: Contrast searching for titles to be ordered in BPR and in MARC file, in order to obtain L.C. card number, established entry, and full cataloging record.

Procedure: (a) Search for 12 titles in BPR (1966 and 1967);

(b) Search in MARC file (1000 records) for 10 (AND searches of title words), DPS/MARC system, and prepare unit cards for any 5.

Classification Checks

Purpose: Check newly classified titles against computer-based shelflist to verify correctness and study relationship of classification and subject headings assigned.

Procedure: (a) Assign Dewey 17 Class numbers to 3 titles;

(b) Keypunch Dewey numbers in order to search shelflist;

(c) Scan titles and subjects to check how newly classified title fits.

L.S. 626
History and Theory of Class. and Cat.

Changing (Updating) Class Numbers and Subject Headings

Purpose: To show the process of updating the card catalog by computer.

Procedure: (a) Using a computer printout specially prepared for this assignment and a list of LC corrections, decide which books in the computer store will take the new corrections;

(b) Indicate whether an existing subject heading is to be changed to a new one or whether a new subject heading is to be added to the existing ones.

L.S. 622
Advanced
Cataloging

LEEP-prepared searches were used in class to compare and analyze the application of the AA code in the areas of series, corporate entries and analytical entries, to compare the Dewey and LC classifications, and to demonstrate how Dewey classification is, to a limited extent, a faceted classification.

L.S. 621
Technical Services

Searching for Acquisitions

Purpose: Extract cataloging records from MARC files (48,000 records) for titles selected from Choice or Library Journal (1967 issues).

Procedure: Cite L.C. card number for selected titles (at least 10); keypunch numbers; submit with job control deck to dispatcher in Computing Center and obtain printout of full L.C. cataloging via BIBLOLST program.

Evaluation of Series

Purpose: (a) For a given subject, examine catalog records for titles in a series;
(b) Determine quantity of material on a subject published in series;
(c) Evaluate series notes and series tracing with a view to setting policy for series control.

Procedure: (a) Search for subject via DPS/MARCS system (5000 social science monographs). (AND, OR, root searches of any descriptors are possible);
(b) Examine printout of 50 titles (or less) for series notes, publishers series, etc.;
(c) Write procedural statement for handling series.

L.S. 628
Information
Systems

Preparation of Bibliographic Information for Machine Input

Purpose: (a) Exercise keypunching;
(b) Simulate preparation of bibliographic information for machine input.

Procedure: For one MARC I input worksheet (done in L.S. 407) keypunch six data elements following a fixed format.

Use of Boolean Logic for Searching MARC File

Purpose: (a) Practice in use of Boolean operators;
(b) Practice in use of a reference retrieval system, e.g., DPS/MARCS.

Procedure: Construct 3 searches--(1) OR search for references found earlier in S.U. library with both L.C. card number and in BNB; (2) AND search for two descriptors possibly in the same document, e.g., D.C. class number and L.C. class number, or two English language words that describe a subject; (3) OR search looking for same subject as in (2). Compare results and comment on use of modifiers (root search, specification of field, sentence, or paragraph to be searched, etc.)

L.S. 605
Bibliography of the Social Sciences

Area Studies--Access to Recent Bibliographies

Purpose: (a) To show a means of bibliographic access using a computerized reference retrieval system as an example of area studies materials on MARC tape;

(b) Practice in the use of a computerized reference retrieval system called MARC/DPS.

Procedure: Working in groups formulate an area search through the use of key words (include LC or Dewey numbers when appropriate). Consider names of countries, geographic areas, religions, peoples, etc.

It may be useful to include a complete description of the steps involved in executing a class assignment to show how the project staff worked with the faculty and the students. During the evaluation period, this close liaison aid and assistance was highly commended.

Procedural Steps for LEEP Class Assignment

1. MARC Data Base and Retrieval Programs available at Computing Center. Description of each brought to the attention of the School of Library Science faculty.

2. Faculty member, interested in LEEP assignment, discusses possible approaches with LEEP staff member.

3. LEEP staff member writes draft of class assignment and makes trial computer run to determine difficulties (if any) and potential success of retrieval strategy.

4. Faculty and LEEP staff member rewrite assignment and plan date for class activity.

5. Optional: LEEP staff member available in class when assignment is made.

6. LEEP Clinic (outside of class) provides any additional instruction or assistance needed for student's completion of search strategy or keypunching.

7. MARC/DPS User's Manual, available on reserve and for sale, provides detailed explanations of data base and DPS language for self-instruction.

8. Student assignments are collected and run in batch by LEEP staff. Results are distributed via student mail folders.

9. Class discussion of results with evaluation of MARC/DPS retrieval scores compared with library catalog searches.

10. Faculty evaluates results of assignment; discussion with LEEP staff results in modification of procedures, data base, etc.

11. End of semester evaluation of all LEEP activities.

A specific example of one assignment and its evaluation might point out how the student sees the assignment. This follows on pages 16-18. Evaluations from one student group and the faculty member involved in this assignment follow on pages 19-20.

At the end of the semester, each student and each faculty member in the school has been sent the forms found on pages 21-23.

Bibliography of the Social Sciences — L.S. 605
Prof. North — Fall, 1969

AREA STUDIES -- ACCESS TO RECENT BIBLIOGRAPHIES

PURPOSE OF THE ASSIGNMENT

1. To show a means of bibliographic access using a computerized reference retrieval system as an example of area studies materials on MARC tape.

2. Practice in the use of a computerized reference retrieval system called MARC/DPS.

GENERAL PROCEDURE

Each student will work in a group, responsible for a certain area of the world. Each group will prepare at least one computer search to retrieve all the MARC records for its area of the world. Each MARC record retrieved should have a bibliography.

STEPS TO FOLLOW

1. Read Searching MARC/DPS, a user's manual on the computer-based reference retrieval system used for this assignment. It should answer many of your questions about how to phrase your request in a way the computer can understand.

2. As a group, make a list of all the words and phrases which might be included to retrieve all references to your area (see the attached sample on the Middle East). These would include the names of countries, geographic areas, religions, peoples, etc. If there are Dewey or Library of Congress Classification numbers that are appropriate, include these too.

3. Check your list to see that each word appears in the "MARCS/MARCH Index List" (in the LEEP study carrel outside Room 311). If the word does not appear in the index list, discard it. Remember to think of synonyms, words with the same root, etc.

4. From your revised list, write a MARC/DPS search according to the instructions in Searching MARC/DPS. Special help can be found on:
   (a) Information about MARC record and tags for data fields.
   (b) Combining keywords.
   (c) Search strategy.
   (d) Search deck.

5. Before keypunching check your search strategy with a LEEP staff member during LEEP Clinic hours (Monday, Tuesday 11-12; Wednesday, Thursday 12:30-1:30) or by calling ext. 3965.

6. Keypunch your search and submit your search deck to the LEEP mailbox. Use the name of one of the group members on the TITLE card. When the computer run is completed, the search results will be returned to the file folder of the person in whose name it was submitted.

AIDS TO STUDENTS USING LEEP COMPUTER-BASED LABORATORY

1. Searching MARC/DPS - newly published, a user's manual for MARC/DPS, explaining our computer retrieval program, DPS, its vocabulary and search strategy, and how to interpret and evaluate your search results. The manual is available for purchase for $.75 from the Library School Office, 119 Euclid, Room 101. There are 30 copies on seven-day reserve in the Reserve Section of the University Library.

2. LEEP Clinic - a member of the LEEP staff will be available to answer questions and help students on Monday and Tuesday from 11-12, and on Wednesday and Thursday from 12:30-1:30 in the third floor, east corridor of the Carnegie Library.

3. INDEX TO MARC/DPS SEARCH RESULTS (printouts) - An index to a file of over 150 MARC/DPS searches has been prepared. It is available in the LEEP library at A-21 Collendale. These search results are indexed by keywords used in search, MARC tags, search structure (weighted, compound searches, etc.), error messages received, and library science course numbers and instructors.

SAMPLE OF DPS SEARCH ON THE MIDDLE EAST

List of possible keywords selected (those marked with a * were discarded):

*ADEN	ISLAM	MIDDLE EAST	PERSIAN
ALGERIA	ISRAEL	MOROCCO	*SINAI
ARAB(S,IAN)	JERUSALEM	*MOSLEM	SUDAN
ARMENIA	*JEWS	*MUSLIM	SYRIA
BEDOUIN	JORDAN	*MUSSELMAN	TUNIS(IA,IAN)
CYPRUS	*KUWAIT	NEAR EAST	TURKEY
EGYPT(IAN)	LEBANON	*NEGEV	TURKS
IRAN	LIBYA	*OMAN	UNITED ARAB REPUBLIC
IRAQ	MESOPOTAMIA	PALESTINE	*YEMEN

SAMPLE DPS SEARCH

Search Deck:	Explanation:
L1 MIDDLE & EAST(+1);	Find MARC records with this phrase.
L2 NEAR & EAST(+1);	
L3 UNITED & ARAB(+1) & REPUBLIC(+1);	
L4 TURKEY,TURKS,CYPRUS,SYRIA,LEBANON;	Find MARC records with these keywords.
L5 IRAQ,IRAN,PERSIAN,MESOPOTAMIA,EGYPT($);	Find MARC records with these keywords or with words having EGYPT as a root.
L6 PALESTINE,ARAB($),MOROCCO,ALGERIA, TUNIS($);	
L7 ISRAEL, JORDAN;	
L8 ARMENIA,ISLAM($),BEDOUIN,JERUSALEM;	
*L9 L7 & T10(NOT SEN);	Do not save MARC records having ISRAEL or JORDAN in the author statement or the imprint.
*L10 L7 & T30(NOT SEN);	
L11 L1,L2,L3,L4,L5,L6,L8,L9,L10;	Summary statement.
**L12 BIBL($);	Find MARC records with words having BIBL as a root.
**L13 L12 & T60(PAR);	Save only those MARC records having BIBL words in the T60 or T70 statement notes or subject heading.
L14 L11 & L13;	Final summary of search strategy.
LIST OFFLINE,TEXT,SUBJECTS;	Print out the text portion of the MARC records and above each, the subject headings assigned by L.C.

* L9 and L10 narrow the search in order to avoid false drops. Since Jordan and Israel are relatively common surnames, we have specified that MARC records which contain these words in the T10 or T30 statements (author or imprint statements) be excluded.

** L12 and L13 will insure that each MARC record that is printed out will have a bibliography.

LEEP

LIBRARY EDUCATION EXPERIMENTAL PROJECT • SCHOOL OF LIBRARY SCIENCE

MARC/DPS SEARCH RESULTS EVALUATION SHEET

Please examine the results from your MARC/DPS search. After filling out the following form, "mail" it to LEEP or turn it in to your instructor. (LEEP's address is c/o PARRS, A-21 Collendale. Use campus mail or our mail box in Carnegie, 3rd floor.)

1. Name, course number and TITLE of search. Title L.S. 605 Florence Hayes, U.S.S.R. & Union

2. In your own words, what kinds of records were you searching for?
Records on the Soviet Union & states and regions within it containing a bibliography.

*3. Number of relevant MARC records retrieved. 55

*4. Number of 'questionable' MARC records retrieved. 2

*5. Number of non-relevant MARC records retrieved. 10

6. TOTAL number of MARC records retrieved. 67

7. What reasons can you give for the non-relevant MARC records being retrieved? e.g. Keywords too broad, keyword is also an author's name, etc.
One of key words, Georgia, also was an author's name. Occasionally appearing as the University of Georgia, or the name Georgia.

8. How would you change your search strategy to eliminate or reduce such false drops? In this case, such a change would appear difficult as Georgia, a Russian state is also a U.S. state & a proper name.

*9. Do you think all of the relevant references would have been retrieved if you made a subject search of a library catalog (assuming all books in MARCS are in the library)? no If your answer is no, please explain, in general terms, why you think they would not be retrieved.
In a library catalogue many of the relevant references would have been listed under subject headings other than the geographical area used and would not have been so easily located.

10. Have you any comments about using MARC/DPS?

*See other side

Faculty Evaluation

re: L.S. 605: AREA STUDIES AND MARC TAPES

The following information might be of interest to the LEEP project.

The class evaluated the assignment and the conclusions were:

1. That the assignment fulfilled its purpose as stated on the worksheet.

2. That those students who has worked with MARC tapes in the Reference course did not find this assignment repetitious. They stated that the more varied approaches to the tapes the better understanding they had of their potential use.

   Those few students who had not used the tapes before were enthusiastic, if a bit unsteady the first time around.

3. The class liked the group work (2 to 5 students per assigned areas). They admitted some students goofed-off. But as an ungraded assignment they felt this was to be expected.

4. That the worksheet did not take an undue amount of time as compared to other worksheets given throughout the course.

5. That as one means of access to social science literature the assignment did not over or under emphasize the approach but was well related to other means studied.

A by-product, but one with great potential, came from a Ph.D. history student taking the course as a tool. As a non-to-be-librarian and a person who has muddled through complex and diverse printed bibliographies his enthusiasm for the potential use of MARC II was clearly expressed. His response will be reported to the history department at the end of the semester when he evaluates the usefulness of Bibliography of the Social Sciences to his department.

--Prof. North

Form.2. STUDENT EVALUATION

BEFORE YOU LEAVE THIS SUMMER----

Would you please help LEEP?

The Library Education Experimental project is winding up its first academic year at Syracuse University. We have tried to involve as many students in as many projects using the computer-based laboratory facility as we could. We hope we reached you! Would you take a minute ot two to complete this evaluation sheet? Your comments and suggestions will help us plan for next year and help us measure the impact we have had this year.

NAME(optional)_____

Did you use LEEP facilities this summer? Yes_____No_____
If yes, was it a class assignment? Yes_____No_____
If yes, which class? Beg. Ref._____ Tech. Serv._____
Beg. Cat._____ Inf. System_____
Subj. Ref._____ Other(specify)_____
Have you any suggestions for new types of assignments LEEP might develop?

On your own did you use LEEP facilities (keypunch, LEEP library, MARC records, 360/50 computer, LEEP staff advice, etc.)? Yes_____No_____
If yes, please describe your use and your project.

Did you use the LEEP clinic? Yes_____No_____
Any suggestions about it?

Have you picked up any new ideas or information as a result of LEEP being at Syracuse University? Yes_____No_____
Please explain your answer.

If you were asked, would you take a job involving library atuomation?
Yes_____No_____ Why?

Is this the same answer you would have given a year ago? Yes_____No_____
If no, please explain your change of mind.

Do you have any suggestions, strong criticism, or comments to make about LEEP?
(Please use back for additional comments.)

Please drop this in 311 mail box! THANK YOU!

Form 3: EVALUATION OF LEEP
by SLS Faculty

January 1970

"Impressions, intuition, and judgment are unquestionably sources for discovering ideas, but should they be relied on for demonstrable verification of the advantage of one curriculum or teaching device over another?" James A. Robinson in Rossi and Biddle's The New Media and Education. (pp. 95-6).

Perhaps the following questions may help provide the evidence needed to verify claims we might want to make about LEEP and its future use at SU/SLS.

NAME: COURSE:

1. What was your purpose in designing a LEEP assignment?

2. In your opinion, did it serve this purpose? Yes ____ No _____
Comments:

3. Did the LEEP assignment occupy more than a marginal part of a student's time in your class?

4. If the LEEP assignment had much observable or unusual impact upon any of the students, please describe.

5. What were the consequences from the LEEP assignment (e.g., increase in interest and involvement in course work or learning of factual material)?

6. If there were any unanticipated consequences please describe.

7. Do you plan to continue to use the LEEP Laboratory?

8. Would you give use your active support for the continuation and further expansion of LEEP in 1970-71?

9. If we could begin again, what suggestions would you have fore re-designing the LEEP Laboratory and the class assignments related to it?

Class related activities included the following:

1. PL/I for Librarians

LEEP sponsored two PL/I seminar series for librarians and library students. John Wyman, a systems analyst and part-time LEEPer, structured the courses to teach only those character-manipulating functions available in the programming language. The courses have been non-credit and scheduled to fit the full-time student schedule: eight sessions once a week for the first seminar; eight sessions in four weeks the second.

2. Student Projects

LEEP facilities were limited to elementary automation techniques except for our DPS programming system for searching and sorting of the MARC I records. Even with these constraints, two student groups approached LEEP.

One student group indexed a file of student-produced abstracts for over 400 articles about technical services. The students used three facets or characteristics of the information in the documents: type of library (or general); function of technical services; and equipment or technique. The students planned coding, standard abbreviations, and format for the indexing records. The information was then keypunched. The students used a card sorter and the IBM 360/20 to produce three alphabetic sections of the index. This index and the file of abstracts are available to students in Technical Services classes this semester. The work was augmented and revised in the Spring semester.

The second project was the description of 200 titles in a local ghetto school library, selected for importance to Negro life and urban life. The students applied specialized subject headings, then constructed bibliographies by: author, title, grade level, and subject headings. These were run through the IBM 360/50 to reformat for easy reading and distributed to teachers at the elementary school.

C. Studies on LC/MARC and Related Data Bases

1. APL Activities

We began some preliminary experiments with APL/360, a time-share system available on the SU campus. APL (A Programming Language) is a rather intriguing, high level language in spite of its unpretentious name. "APL/360" designates the system which makes APL available as a time-share facility on IBM/360 series computers. At Syracuse, APL is useable exclusively through IBM 2741 typewriter terminals: about thirty-two of these are scattered around the campus--we have one at the LEEP offices; another is located at the School of Library Science

in the Carnegie Library.

From a data processor's point of view, the APL language represents a very powerful approach to the business of automatic string manipulation (i.e., the juggling of natural language words and phrases by machine), text processing, data input, and data retrieval. Furthermore, APL can be expanded quite readily to conform to the language requirements of those less intrigued with logic than with easy-to-use information services.

We generated a small bibliographic file which we have entered into computer storage via the typewriter and which we can search with word and word-stem descriptors. For example, we can retrieve all records citing 'Avram' in the Main Entry, or all records containing some form of the root, 'biblio-' in the Title Statement, etc.

We also generated a small file of the text and class numbers in the Z classification of L.C. From this we could extract, for example, all class numbers for which the word 'book' appears in the caption, or 'library' etc.

The index entries were input via typewriter terminal as two-field records: the first field contains the index term(s) as they appear in print (e.g., 'Book lists, Periodical'); the second field contains the corresponding class code(s), or 'see' or 'see also' references in the index published by the Library of Congress.

Our search program retrieved whole entries if an input descriptor occurs anywhere in the field named. For example, the statement 'IMAGINARY' IN TERMS asks for a typeout of all index entries containing the word 'imaginary' (in the field names 'TERMS'). The typed response may be as follows:

BOOKPLATES, IMAGINARY	Z 995.5
BOOKS, IMAGINARY	Z 1024

Another example:
'1000' IN CLASS would get:

BOOKBUYING, WANT LISTS	Z 1000.5
BOOK PRICES	Z 1000

In this way we could determine all class codes associated with a given term or all terms linked with a given class code.

This was a very small exploratory effort in which we wanted to investigate (1) the utility of APL as a language for programming input, editing, and retrieval facilities and (2) the value of this procedure for studying indexing practices for classification shcedules.

2. Converting LC Classification Schedule to Machine Readable Form

We completed a preliminary investigation into the feasibility of putting the published LC Class Schedule on magnetic tape and processing the resultant data by computer. In particular, we were interested in automatic indexing from the machine readable image of the printed page.

Vance Weaver Composition, Inc., New York, used IBM MT/ST equipment ('magnetic tape/selectric typewriter system') to convert a sample portion of the Z Schedule by copying the first hundred or so pages in their entirety (with additions and corrections inserted). The conversion techniques comprised an extension of methods used in the preparation of photo-composition copy: typeface is identified, as well as line indentions; class code ranges not shown on the printed page are added, as well as explicit identification of the various types of notes and references which occur in the published text.

The MT/ST tapes were converted, in turn, to computer-acceptable format (using a Digi-Data tape converter). Special computer programs were then used to rearrange the text into a format acceptable to a KWIC indexing program: each line passed to the indexing program was 'identified' by the presence of an appropriate LC class code. The final result, then, was an automatically generated index which associated every non-trivial word (i.e., articles and prepositions were not accepted as index terms) in the lines selected with the LC Class code(s) under which they occur in the published schedule.

This kind of output could represent a starting point from which the human indexer would proceed to develop cross references with added terms, etc.

3. LEEP Library

A small library of materials about the Library of Congress Machine Readable Cataloging Project (MARC) was established. One purpose of this library was to gather information to be used by students and faculty in their study of the MARC tapes. Cataloging rules, books on the use of Library of Congress classification, and other cataloging tools, as well as information on MARC I and II formats and on related computer programs were available.

The second purpose of this library was to document the MARC Project itself. We hope to maintain a comprehensive MARC collection--articles from books and periodicals, Library of Congress publications on MARC, news releases about MARC, and documentation of applications. A bibliography of materials was compiled for the use of interested persons in other centers.

4. DC-LC-Subject Headings Used in MARC Pilot Project File

LEEP programmers prepared several listings from the original MARC Pilot Project file (48,190 records) and the 8,900 volume MARCS file which we used for searching via DPS.

Every subject heading used in the MARC Pilot Project file is arranged in alphabetical order. Beside each is listed the DC and LC class numbers.

Example 1 - by subject heading:

338.01	HD82.C29	CAPITAL INVESTMENTS.
658.152	HD39.M57	CAPITAL INVESTMENTS.
658.153	HF5681.C25W6	CAPITAL INVESTMENTS.
658.15	HG4028.C4T45	CAPITAL INVESTMENTS.
658.1508	HG4026.W47	CAPITAL INVESTMENTS--ADDRESSES, ESSAYS, LECTURES.
332.67	HG4028.C4K38	CAPITAL INVESTMENTS--MATHEMATICAL MODELS.
339.4	HC110.C3H53	CAPITAL INVESTMENTS--U.S.

Two other arrangements show, in order, every DC and every LC class number used. Listed beside it is the subject heading used.

Example 2 - by DC number:

332.67	HG4028.C4K38	CAPITAL INVESTMENTS--MATHEMATICAL MODELS.
332.67	HG4028.C4K38	ELECTRONIC DATA PROCESSING--CAPITAL INVESTMENTS.

Example 3 - by LC number:

332.67	HG4028.C4K38	CAPITAL INVESTMENTS--MATHEMATICAL MODELS.
332.67	HG4028.C4K38	ELECTRONIC DATA PROCESSING--CAPITAL INVESTMENTS.
658.15	HG4028.C4T45	CAPITAL INVESTMENTS.

The book in example 2 is shown in the LC list (note unique LC call number), with another book.

Several SLS students completed studies of subject scatter using these listings as the basis for their term projects in cataloging and bibliography classes.

The procedure one used is as follows:

1. Begin with one major subject heading, e.g., WOMEN. Include all sub-divisions used with this heading.

2. Record different LC and DC class numbers used for books with these subject headings.

3. Check LC List of Subject Headings to verify use of headings and sub-divisions. Note any discrepancies. Also note any LC numbers which are given.

4. Check classification schedules (both DC and LC) to see if class numbers fall within a range of numbers representing one "group" or class. Record captions for each class number.

5. Check index to classification schedules to note access to subject and class numbers available.

6. Check "classified catalog" or "shelflist" of MARC Pilot Project File to study what other books have been classified in same place as books for this subject.

7. If possible, examine catalog and shelflist of a library to find books in MARC sample and check their placement with other books spanning a broader time period than MARC file.

8. If possible, run MARCS/DPS searches to check retrieval of books on this subject by keyword (not subject heading or class number).

9. Tabulate data to answer certain questions.

Questions to be answered:

1. Under how many different class numbers in LC and DC can books on a given subject be found?

2. Within a DC or LC class how many different subjects can be found?

3. Does a sample study in MARC produce results similar to a library catalog study?

4. Does practice follow the instructions and index directions in the LC and DC classification schedules and the LC List of Subject Headings?

5. What factors contribute to subject scatter in a library's arrangement of materials?

A different procedure was followed by another student:

1. Begin with a sample of references listed under the same DC class number.

2. Check the LC class number given for each of these references.

3. Analyze the make-up of the DC and LC class schedules in the neighborhood of these numbers. Determine the extent of similarity in subject grouping. Which classification is more specific? Could all the references be "automatically" reclassified from DC to LC?

5. File Management Exercise

As a basis for discussion at the 1969 ASIS Annual Meeting on the functions and capabilities of various file management systems, W. Douglas Climenson initiated a project in which interested groups might test their own data management and retrieval systems with a common data base and a common set of processing tasks. Since the LEEP project staff worked with two such systems--MOLDS (Management OnLine Data System) and DPS (Document Processing System)--we were interested in participating in this exercise. As it turned out, we found we would be unable to meet the required completion date and so (regretfully) excused ourselves after a preliminary analysis of the tasks involved.

Nevertheless, in view of the wide disparity of opinion as to the kinds of processing a file management system should be able to do, we found interesting and somewhat enlightening the results of our examination of the exercise requirements and our cursory evaluation of our systems in this context.

The project's common data base consists of three files. Two of these comprise the main file of 65 "old" records and an updata file of 6 "new" records to be added. Each record contains both fixed and variable length fields and represents an article in either the Journal or the Communications of the ACM, 1968. Included in a record are record number, journal name, volume and issue number, publication date, starting page, title, author(s) with affiliations, abstract, keywords and phrases, and category numbers from the Classification Systen for Computing Reviews.

The third file contains the text of the Classification System for Computing Reviews.

The participants were asked to use their own systems to build the main file, update it with the "new" records, apply corrections to individual records and to individual fields within records, include the Classification System file in the data base, produce listings from the file, and process specific inquiries against it, displaying the results in various forms.

The following three sections serve to summarize the specific requirements of the exercise and also to show the extent to which MOLDS and DPS might be expected to satisfy these requirements.

Data Base Maintenance:

Naturally, both MOLDS and DPS have features which enable the loading of initial files, and the adding of new documents to an existing file. However, neither system provides for modifying parts of records in the data base (e.g., to add a new author's name to the author field).

File Listings:

The exercise required that the following listings be produced from the data base:

1. A bibliography showing publication name, volume, issue number, starting page, author(s), and title; this listing to be ordered by the first four items (major to minor sort keys).

2. An author index, ordered by author name and including title, publication, volume, etc.; articles with multiple authors to appear in the index as many times as there are authors.

3. The classification System for Computing Reviews, citing under each category the articles classified under it.

4. A permuted title index of all articles such that the title contains at least one of the key words or phrases assigned to the article; to be ordered according to matched words.

Both MOLDS and DPS turned out to be exceedingly weak with regard to producing these kinds of listings. DPS, in particular, has no feature enabling sorted output.

File Searches:

The following indicates particular retrieval problems and, on the right, our estimate of the ability of MOLDS and DPS to solve them:

Problem	MOLDS	DPS
Find all records citing JACM as publication and the word "transform" or "transformation" in the title or abstract and which also cite "500" as a class code; display full record.	impossible	easy
Find all JACM records with "morph" within any word in the abstract; display full record.	impossible	difficult
Find all records citing any two of six given class codes: if such a record cites CACM as the publication, display certain data items, if JACM is the cited publication, display alternate data items.	easy	easy
Find all records citing no classification codes; display full record.	easy	easy
Find the record for the most recent CACM article containing "debugging" in the title; display full record.	somewhat difficult	quite easy

Problem cont.	MOLDS	DPS
Find all records with one or the other given word pairs in the abstract either in the same sentence or with no more than ten words intervening; display full record.	very difficult	easy
Find all records containing either in the abstract or keyword field at least one word from each of two given lists; display certain items from the qualified records.	very difficult	easy
Count the records which show publication date between two given dates and have certain words in the abstract and do not have certain other words in the abstract; display full record.	very difficult	easy
Find all records containing an author's name beginning with "Mu?ho", where any letter may appear in the "?" position; display selected items from each qualified record.	difficult	quite easy
Find all records with "IBM" or "International Business Machines Corporation" as author's affiliation and "New York" as affiliation state; display selected items.	easy	easy
Find all records which have no author's affiliation other than "Harvard University"; display selected items.	easy	easy
Find all records with at least one of a given set of keywords and phrases; display selected items and order by number of matching words per record.	diffidult	very difficult
Find any record containing the class code "3.70"; then find all other records containing at least one of the other class codes cited by the original record; display selected items and order by class code, records citing multiple class codes displayed once for each code.	very difficult	very difficult

6. Index of MARC/DPS Searches

An index to a file of over 150 MARC/DPS Searches was created for student use. Access to searches is provided from several points of view: keyword used, MARC tags specified, DPS search structure (truncation, weighted, compound, etc.), error message received, and library science course number and instructor. When possible evaluation forms are also included in the file.

Results and Findings

A. Statistics on Computer Usage of SLS/MARC Laboratory

The programmers' time on the computer reveal the amount and expense of background work before such a computer-based laboratory can be made available. The programs listed in the previous section on methods are shown here in terms of minutes of computer time consumed:

Program	Minutes
1. MOLDS IMPLEMENT	1000
2. MOLDS DBG	300
3. LEEP-BIBLOLST	200
4. L.C. SUBJECT HEADINGS	250
5. FDR	150
6. MARC-SEARCH	600
7. MARC/DPS FILE CNVTR.	500
8. MT/ST KWIC INDEX Z-CLASS	100
9. DPS IMPLEMENT	50
10. DPS D.B. LOADING	1000
11. DPS LOADING (UPDATE:3800 rec.	500
12 APL:I/P, EDITING, SRCH.	100

Those who wish to evaluate DPS as a software system may be interested in some of the statistics we have kept. We have installed DPS on an IBM 360/50 machine which has a 9-cabinet 2314 disc storage device (as well as tape units) among its peripheral equipments. Our data base at first consisted of 5,179 bibliographic records selected from the MARC I tape; in their source form these records have an average length of 500 characters.

DPS disc storage requirement for this data base is about 16.8 million characters, representing a gross storage overhead of nearly 6 to 1. The data base consists of four internal files: the 'master' file, dictionary, vocabulary (an inverted index), and the 'text' file. The dictionary consists of 8,465 entries, where class numbers, dates and even tag identifiers qualify as entries in the same sense as do conventional English words.

The DPS software requires another 10,000 characters of disc storage: 5,000 for programs and 5,000 for working data sets and intermediate files used by the programs during execution.

Data base programs are distributed more or less uniformly over three IBM 2316 disc packs, so that a little less than 20% of each pack is devoted to the total DPS system.

For a thoroughly experienced DPS system programmer, the process by which our MARCS file (5000+ records @ 500 characters) is transformed into a DPS data base requires about two hours of 360/50 machine time.

The updating of the file to 8,200 records consumed 500 minutes, only 218 minutes of which were successful loads. This job was done by someone less experienced in the DPS system.

The classroom use was heaviest for two programs: BIBLOLST and MARCS/DPS. DPS statistics for non-programmer use are as follows:

Size of Data Base: Spring and Summer 1969--Approx. 5,200 MARC I records in social sciences, generalia, bibliography and library science.
Fall 1969--Approx. 9,000 MARC I records combining above file with records from humanities.

Class Use: Spring 1969--6 classes--approx. 100 students
Summer 1969--6 classes--approx. 100 students
Fall 1969--9 classes--approx. 180 students

Search Statistics:

Definitions: Job=computer run of batched searches
Search=set of DPS search statements from individual

	1	2	3	4	5	6	7
Spring	11	242	22	35.5sec.	20	$.11	$2.20
Summer	10	201	20	32 sec.	14.8	$.13	$1.84

1. Number of Jobs in the sample used for statistical study.
2. Number of Searches in 1.
3. 2 divided by 1=average number of searches per job.
4. Computer time per search.
5. Average number of documents retrieved per search.
6. Approx. cost per document retrieved.
7. Cost per search.

Because of a shift in methods of computing time and costs we cannot offer comparable statistics for the fall semester. Instead, in a look at 343 searches we find an average of 7 searches per job; an average of 4 minutes running time per job and an average of 1.35 minutes of CPU time per job.

B. Evaluation by Students

A questionnaire (Form 2) was sent to all students registered in SLS courses at the end of the Spring and Summer sessions. The responses from the 100 students provided the following information:

75% had used LEEP facilities, 75% of them for class assignments and 25% for independent work. 33% had used the LEEP clinic. Those reporting class assigmments checked Beginning Reference (22), Beginning Cataloging (13), Technical Serivces (20), Information Systems (14), Subject Reference (2), and Advanced Cataloging (6). Some students used LEEP in more than one class.

66% had picked up new ideas and information as a result of LEEP. Some felt they had a better understanding of computers in libraries (6 respondents), and others felt their fear of computers had lessened or been overcome (6 respondents).

64% would take a job involving library automation. 32% indicated that this is not the answer they would have given a year ago. The reasons given for these positive answers include: automation is the key to library efficiency in the future (16 respondents); the challenge, interest and excitement of the field (12 respondents).

In comparing the summer evaluation sheets with those filled out by last spring's students, we find that the percentages are similar. The major variation is that fewer summer students did independent work than the students in the spring. This probably reflects the limitations of time during the short (six-week) summer session.

At an evaluation session in January 1970, students commented that the assignments in various classes were too alike and they hoped that more analytic problems or processing routines would be introduced in the future. They expressed some of their frustrations associated with the assignments but felt it was worthwhile and helped them overcome their fears of "the machine." They expressed an interest in a short course at the beginning of their first semester where some basic skills could be learned and then assignments in each class could relate to some special and unique project.

One professor included the following question on his final exam: Write a brief concise essay on your interaction with LEEP. Do not confine your response only to your experience within this course. Discuss how LEEP (relative to other automated systems) has affected your attitude toward library automation. The students who chose to answer this question echoed the criticism heard at the evaluation session and wondered if the experience was hampered by too small a data base. Again the students wished more could have been done with what we had. The responses show a fair understanding of the system, although its potential use within a library school environment was less clear to the students. They admitted LEEP helped them overcome fears and interested them in knowing more about library automation.

C. Evaluation by Faculty

The degree of sophistication which the students have gained in automated retrieval via this computer-based laboratory varied because each class' effort was subject to the ultimate purpose of the classroom assignment. These purposes included:

1. Retrieval for mechanized retrieval testing alone;
2. Retrieval for cataloging purposes:
3. Retrieval for analysis of bibliographic information;
4. Retrieval via traditionally inaccessibly information on the catalog card with the end view to document retrieval from the university library stacks.

The first approaches used in class assignments were shotgun approaches: broad searches, citing as many synonyms as possible, including few limiters such as field tag specification in the MARC record.

The teaching of the entire DPS system, although seemingly irrelevant to the student for some specific class assignments, was still a necessary first step to any assignment. The problem faced was to instruct the student in basics: first, he needs to know the DPS language, and then search strategy: how to broaden his subject or search criteria to the farthest extreme, and then how to limit his search down to the specificity which will exclude some documents which would be "false drops." With no one common course, it was difficult to bypass a "skills session" in each course.

Our experience with MARCS/DPS instruction pointed to another needed area of common instruction: instruction into the nature of the data base; first as MARC I records, and second, in terms of the "descriptors" available.

Using Form 3, the faculty responded favorably about LEEP assignments and their continued use of the laboratory. They highlighted the problems of working with a sample data base (only 9,000 records of recent imprints), and the spectrum of different student skills and experiences with computers.

An unusual consequence noted by one faculty member from a LEEP assignment was the revealed weakness in understanding sub-headings of subject headings. She felt that most of the students had not absorbed this from the beginning cataloging course.

At an open evaluation session in January 1970, the faculty expressed a need to learn more about the potential of such a MARC Laboratory through their own experience or via demonstrations. They expressed some willingness to prepare integrated assignments so that individual course assignments would not be so repetitive.

If expanded, they hoped that research interests could be served too.

Further random notes from this evaluation session include:

Impact of LEEP is greatest on the student's first encounter with it. Problems occur when some in the class have had greater contact with it than others.

Suggest: all students have a touch with it in an introductory course.

There's a need to know MARC's capabilities. For example, where can they find samples of what they could use in their particular course.

LEEP is like a library school having its own library for experimental work.

With a broader base of knowledge, the student could use LEEP for any assignment he thought it might help in.

Suggest: two levels of assignments:
1. Simple at the beginning of his career to overcome fears.
2. Specialized in the courses dependent on the subject matter of the courses and the data base.

Can we cooperate more with the University library?

There is a need for meetings of all university people involved in teaching about computer usage.

Dean Greer: What is required to maintain the current effort? to add to the data base? (job descriptions, money etc.)
Three levels: 1. hands on experience
2. specialization in courses
3. research for anyone interested

Faculty from twenty other library schools met at Minnowbrook in October 1969. They were presented with a review of how much time, money, people and commitment were needed to mount a project the size of LEEP. Some of them are considering implementing several LEEP programs at their institutions. A few expressed an interest in doing MARCS/DPS searches and a LEEP-by-Mail arrangement was drafted. (As of January 1970, three library schools have used this service.)

During the summary at Minnowbrook someone made the following statement:
"One giant LEEP for Syracuse,
one small step for library education."

Conclusions and Recommendations

"THE FUTURE will be different, if we make THE PRESENT different."
Peter Marvins

A computer-based laboratory using MARC tapes and other data was developed and used at Syracuse University. By the end of the eighteen-month grant period, over 250 students and twelve faculty members had used it for course work in cataloging, reference, bibliography, technical services, and information systems.

The MARC Pilot Project data and related files were used. Many retrieval searches were analyzed and the structure of cataloging records was scrutinized. Many students who would have said "no" to a job involving library automation changed their minds because of these assignments. Faculty members with no background in computers worked with systems programmers and research assistants to design computer-based assignments and provide students with this experience.

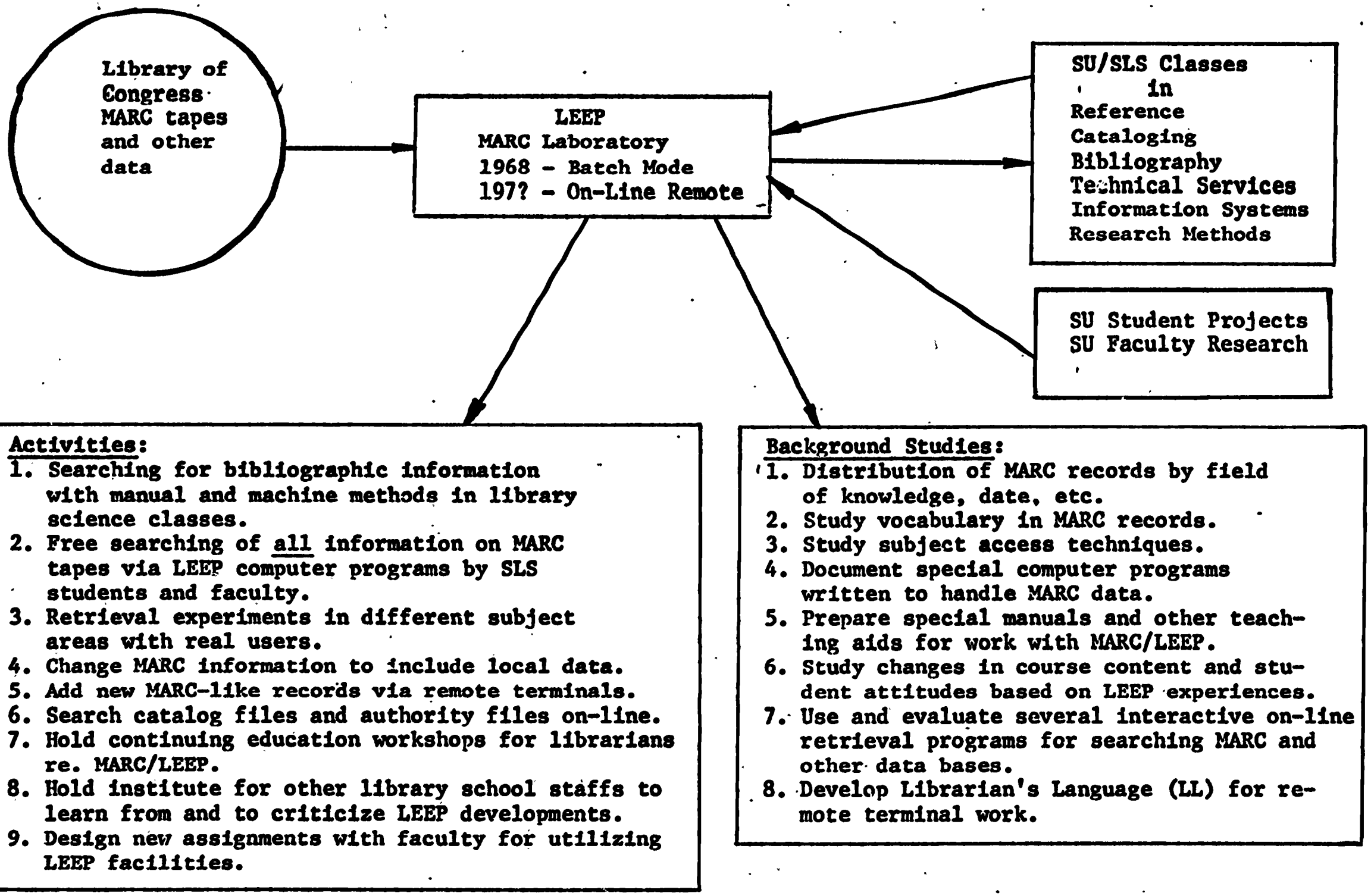
Figure 2 describes many of the accomplishments and possible future plans of such a laboratory facility, but many questions about future developments have been raised.

At Minnowbrook, a Library Education Network was mentioned. Although our original objective was to explore the possibility of exchanging programs, personnel, or even data bases with other schools, this now seems remote because of the divergent developments at various library schools. Computing facilities, program languages used, and research and curriculum orientation are very disparate. (see appendix A and B for special LEEP survey)

The main question is, along what lines should such a laboratory expand.

To date the program systems we provided the student have been operable in the batch mode of computer processing. The LEEP staff has prepared retrieval programs and placed them in auxiliary storage along with data bases. Students have come to the Computer Center, prepared job decks and input data, and have submitted their jobs as new members of the university-wide community of computer users. The students have been instructed (by LEEP staff) in the use of the various equipment available at the Center, including keypunches and the IBM 360/20 computer (which, unlike the larger model 50, is operable by the students, themselves). They have become familiar with the procedures of job submittal and pickup, and certainly have gained a sense of confidence and familiarity in these areas. More significantly, they have been introduced to some of the vigors and rewards associated with automated retrieval systems.

Figure 2: LEEP -- Present and Future Activities



SYRACUSE UNIVERSITY
SCHOOL OF LIBRARY SCIENCE
LIBRARY EDUCATION EXPERIMENTAL PROJECT

[Moreover, viewed in the context of prevailing developmental costs, it should be apparent that LEEP lab facilities have been provided at minimal expense. The following two factors have made this accomplishment possible:

(1) we have utilized pre-packaged software systems such as MOLDS, DOC-PROC, and the LC MARC I Pilot System, and have adapted our student assignments and related activities to the constraints inherent in programs which are not tailored to our specific needs,

(2) we have restricted ourselves to the utilization of systems which do not make abnormal demands on either the operating system or computer center operational procedures (i.e., we have implemented software to operate in batch processing mode and to interface with conventional input/output devices only).]

However, there is certainly a sense in which batch processed information retrieval leaves much to be desired both from a practical point of view as well as from an educational one.

For example, in an ideal retrieval situation, the user specifies a search criterion without knowing how many items will qualify for retrieval. Therefore, to specify further that all items retrieved should be printed may result in unwieldy and costly printouts of more records than could be examined in printed form. The user may direct that 'If more than 50 items are retrieved, do not print,' or 'Print only the first 50 items found,' etc. We may presume, however, that the user would wish to analyze the items retrieved according to some general characteristic and then make a decision as to which, if any, he would want displayed. In general, this kind of decision cannot be made in advance of the computer run. In batch mode, beside the obvious risk of sustaining charges for the processing and display of unwanted results, there is the problem of having to resubmit and wait several hours for output again and again before pertinent information is derived from the files.

In a word, off-line retrieval applications are less than adequate, both from the point of view of the user and that of the teacher.

Therefore, we would strongly recommend any future expansion of the idea of a MARC laboratory in a library school should feature the implementation of on-line, interactive retrieval facilities in addition to the refinement of systems already developed. Prolonged emphasis on off-line retrieval systems would be equivalent to training librarians in clerical skills at a time when clerical tasks are finally being taken over by non-professional librarians and machines.

A second major question is the development of a Librarians' Language (LL), as a beginning toward an information retrieval language in which the emerging 'librarian/information scientist' can best express the logic and procedures of data retrieval. This should

be a high level, powerful language specific to the needs of information retrieval ... to the extent that these needs are currently understood, couched in a vocabulary of operations presumed to be meaningful to librarians in particular. The development of language features, consistent syntax and English language constructions to represent logical operations should be the goal of any subsequent research along the lines described here.

Whether the results of this development effort should be transferred to other library schools may be a moot point, but somehow the measured impact on library science curricula should be felt. Bibliography classes in today's library schools should involve firsthand use of automated retrieval systems. Students in cataloging courses should become involved in analysis of form of entry, subject access, comparative classification, and input of MARC records. Technical services classes should include some activities which demonstrate the use of the computer as a tool in acquisition, cataloging, etc. Following analysis, comes evaluation and information systems classes should begin to teach librarians how to diagnose the attributes of a library system, how to assess its accuracy and deterioration of same.

The value of libraries and of library education needs to be assessed. In some small way, LEEP may have contributed something to that effort.

APPENDIX A:

LEEP Survey of Program Languages Available to Library Schools (as of 9/30/69)

	Fortran	PL/I	Cobol	Assembler	RPG	Basic	APL	Other	Used by Lib. Sch. pers.
Case Western	x		x	x		x			All
Drexel	x	x	x	x	x	x		LISP SNOBOL	PL/I
Eastern Ill. University	x	x	x	x	x				PL/I
Kent State University	x		x					ALGOL	COBOL
Mankato St. College	x		x	(autocoder) x					Autocoder, Fortran
Pratt Institute	x	x	x		x	x			Lectures only on COBOL and Fortran IV
Rutgers University	x	x	x	x	x		x	LISP SNOBOL	PL/I
Syracuse University	x	x	x	x	x		x		Assembly, APL PL/I, Fortran
Univ. of California	x			x					Assembler
Univ. of Michigan	x	x		x		(L-6)?		FOIL SNOBOL	FOIL
Univ. of Minnesota	x		x	x					Fortran
Univ. of N.C.	x	x	x	x	x				PL/I
Univ. of Pittsburgh	x	x	x	x				PIL	
Univ. of Texas	x							SNOBOL ALGOL,LISP	Fortran, ALGOL
Univ. of Toronto	x	x	x	x	x			ALGOL	Fortran, PI/I,COBOL, Assembler
Univ. of W.Ontario	x	x	x	x	x		x		COBOL
Univ. of Wis.-Mil.	x		x	x	x			LISP	None yet
Univ. of Maryland	x		x	x	x	x	x	MNITAB LB-90,MAD, UNIVAC LINER, Howard Data Test System	

APPENDIX B:

LEEP Survey of Computing Facilities Available to Library Schools (as of 9/30/69)

	Manu.	Series	Model	Oper.C.Sy. Release No.	Capacity Memory	Capacity Disc. St.	Tape Units No.	Tape Units Channel 7t	Tape Units Channel 9t.	Printer lpm	Printer std	Printer pr. ch.	Card Read	Card Punch	Remote Ter.
Case Western*	G.E.	200	225	written at CWRU	16K(wds) 48K(ch)	20M ch.	6	x		1000	x			x	
Drexel	IBM	360	75	HASP 1516	750K	2/2311	7	5	2			PN		x	x
Eastern Illinois Univ.*	IBM (IBM 1620)	S/360	5v	DCS 19	262K	2,917,60K 2314	4		x	1100	x			x	IBM 1031-4 2250-5
Kent	Burro IBM	500 1130	5500	Burroughs Mark IX Revision 31	4096 48 bit words	2-2mill. char. 2 units	4	x		1	x	sta		x	
Mankato (1/1970)	IBM	1401 3200		MSOS	16K 31K	2/1311 8.2mill. 3 each	3 3	3	3	600 950				x x	7 Honeywell
Pratt															IBM-1620 Philco-200(IBM360/50te
Rutgers	IBM	360	67	Operat.Sy.05 17	768K 256K	IBM2314	IBM 2401 Mod3	1	3	1100		PN QN		x	IBM 1130-1 2780-1
	IBM	360	40	O.S.											
Syracuse *	IBM	360	50	O.S. 17	256K	2314	4	1	3	1100	QN	TN-5		x	2741-(34 fo APL only 2260-7units
Univ. of Calif.	IBM	360	40	O.S.	256K	2314	4	4		1100	1	2		x	5
Univ.of* Maryland	UNIVAC	1108		EXEC 8 23.55.52:I	128,000 words		8	5	7	1200 (2-600lpm)				x	UNIVAC 1004 9200,9300

LEEP Survey of Computing Facilities Available to Library Schools (as of 9/30/69) cont.

	Manu.	Series	Model	Oper.C.Sy.	Release No.	Capacity Memory	Capacity Disc.St.	Tape Units No	Tape Units Channel 7t	Tape Units Channel 9t.	Printer lpm	Printer std	Printer per ch.	Card Read	Card Punch	Remote Ter.
Univ. of Michigan	IBM	360	67	Mich.terminal system	N.A.	500,000 ch.	500,000+	7	x	x	Changeable More than 1 of diff. speeds		x		x	110 in use teletype-IBM typewriter,CRT +
Univ. of Minn.	Control Data	3300		Master	2.0	64K,24 bit words	3,32mill. ch.per/d.	4	x		500			Read		CDC211(10)
Univ. of N.C.	IBM	360	40				2314									
Univ. of Pgh.	IBM	360 7090	50	CS360,PTSS		131K, 32K	2micro1311 233 micro 2314	20	15	5	900	1403	LN	x		2741(38)
Univ. of Texas	Control Data	6000	6600	Scope	3.m	131K 2Kexten-ded core	400K	6	x		1000	x		x		TTY/CRT-200
Univ. of Toronto	IBM	360 (2)	65	CS/MVT	15/16	10^6K	500x10^6K 2/2314LCS	4	1	3	1403 Ni	x	UC/ LC	x		10-2741,2-2260 1-360/44 8-360/20 +
Univ. of Western Ontario	IBM	360	40	DOS		128K	240mill.ch (29forSLIS) 1-2314	2	x		1100	1	UC& LC	x		2740(1 for SLIS)
	IBM	1130				16K	1mill. 1-2310				340	x		x		2741 APL
Univ. of Wisc.-Mil.	UNIVAC		1108	EXEC 8	VWCC23. 13.15	165K	4-FH432 (1,048,576 36bit wds) 1-FH1782(2,097,152 36 bit words) 1-FastrandII(22,020,096 36 bit wds)	6	x		1	x	1	x		UNIVAC9200 UNIVAC9300 6 in all

Case Western-also available:UNIVAC 1108 on-line; GE 415; IBM 1440 *Eastern Ill.-also available:IBM 1620
Syracuse-also available:S/360,model 20 for unit record purposes *Univ. of Md.-also available:IBM 7094;Two IBM 1401

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69-4	KEYPUNCH INSTRUCTIONS	SUCC	Feb. 1969
69-5	INDEX AND MANUAL FOR IBM SYSTEM/360 DOCUMENT PROCESSING SYSTEM	J. Tessier	Dec. 1968
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69-8**	TEACHING WITH MARC TAPES	P.Atherton Judy Tessier	Oct. 1969
69-9	LEEP PROGRAM SUMMARY	Frank Martel	Oct. 1969
69-10	INTRODUCTION TO LEEP	Staff	Fall 1969
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APPENDIX D.--ERIC REPORT RESUME

OE 6000 (REV. 9-66)

DEPARTMENT OF HEALTH EDUCATION AND WELFARE
OFFICE OF EDUCATION

ERIC REPORT RESUME

(TOP)

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CLEARINGHOUSE ACCESSION NUMBER

RESUME DATE: 1-25-70 | P.A. | T.A.

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TITLE

100 DEVELOPMENT OF A COMPUTER-BASED LABORATORY PROGRAM
101 FOR LIBRARY SCIENCE STUDENTS USING LC/MARC TAPES
102 Final Report
103

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RETRIEVAL TERMS

600 Library Education
601 LC/MARC Retrieval Programs
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IDENTIFIERS

607 IBM/Document Processing System LEEP(Library Education Experimental Project

ABSTRACT

800 The School of Library Science established a computer-based
801 laboratory for library science students utilizing the LC/MARC
802 (Machine-Readable Cataloging) magnetic tapes. Assignments in
803 several classes (reference and bibliography, cataloging, and
804 technical services) involved the use of these tapes and special
805 purpose programs at the Computing Center. With the aid of
806 these computer programs, over two hundred in eight different
807 courses (repeated for three semesters) were able to search and
808 retrieve catalog records for current literature, to process
809 their own cataloging assignments or examine the characteristics
810 of the Library of Congress cataloging. The laboratory's use-
811 fulness was evaluated by the students and the faculty at the
812 end of each semester. The entire laboratory (computer programs,
813 data bases, class assignments, user manuals, etc.) has been
814 fully described to other library schools at a special institute
815 and via a newsletter and report series.
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