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## ABSTRACT

This booklet was written to assist organizations in determining whether a computerized resource system would be useful, to understand the steps necessary to develop such a system, and to judge the computer programs for adaptation or adoption. The experience of the Hampshire Educational Collaborative Inservice Program (Northampton, Massachusetts) is used as an example. The gradual accumulation of data on resource people and organizations for inservice teacher education is recounted, leading to the decision to put the information in a computerized retrieval system. Factors involved in designing the resource system, such as staff and user goals, information categories, and legal implications, are reviewed. An account of the frustrations of an equipment change and of the resulting reexamination of goals and categories emphasizes the importance of flexibility and detailed planning. Data collection, coding, and entry are addressed along with publicity for the ongoing system. Appendices contain the first and revised sets of user instructions, sample printouts from the computer program, and a list of the subject categories stored in the database. (FG)

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# Developing A Computerized Resource Retrieval System

inservice series no. 5

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This booklet was written to help other organizations to determine whether or not a resource retrieval system would be useful to them, to understand the steps needed in developing such a system, and to consider the computer programs for adaptation or adoption.

If you need further information, or if you have ideas for ways we can improve our system, please let me know.

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# Developing A Computerized Resource Retrieval System

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## B.C. [Before Computer]

The Hampshire Educational Collaborative (HEC) Inservice Program is designed to train inservice facilitator teams in each of the eleven school systems in the collaborative to organize inservice activities for their school systems. The Inservice Program provides a variety of support services to help teams in their planning. One service is a computerized resource file which teams use to locate individuals, organizations and materials to help school staff meet their professional development needs.

When the Inservice Program began in 1975, no one associated with it envisioned a computerized retrieval system as a vital component of the program. We were intent on helping inservice planning teams prepare needs assessments, design good workshops, develop effective communication systems within the team and with the school community, and evaluate their activities. Once needs assessments had been completed, however, it became obvious that the teams did not know where to find the appropriate individuals or organizations needed to conduct inservice workshops. The teams met to create the first resource file. It was a brainstormed list of people and places -- two pages long.

In 1976, teams asked the teachers coordinating the Inservice Program to maintain and update a file of potential resource people. We developed a form which asked for the resource person's name, address and areas of expertise, and we distributed it to team members.

who were supposed to actively solicit names for the file. By 1977, we had enough forms completed to fill one manilla file folder!

» In 1978, the Inservice Program hired its first half-time coordinator and half-time secretary. Representatives of inservice teams, serving as an Advisory Council to the coordinator, listed the development of a complete resource system as a priority.

The coordinator established categories and sought names to put in each category. Now each category had its own file folder (with this system, an individual skilled in both language arts and teaching the gifted and talented appeared in two folders). The resource files, filling a red plastic milk carton, were carried to inservice team meetings throughout the 360 square mile area served by the collaborative. We also devoted space in our monthly newsletter, Inside Inservice, to list resources (people, organizations, and books).

## Computerization

At the end of 1978, the Advisory Council listed the resource file, once again, as a high priority for the coordinator, suggesting politely but firmly that it be moved out of the milk carton into some type of computerized system. Dr. G. Ernest Anderson from the School of Education at the University of Massachusetts volunteered his time to help the coordinator design a retrieval system, and to do the programming of the system. He, very wisely, suggested a simple programming approach which could be used as the first step toward a resource retrieval system.



Because of time and money limitations, this system is not very elegant; however, it does work. If it works well enough for a large enough number of users, it may be worthwhile expanding and developing a more sophisticated system from this humble beginning. On the other hand, it is often the case that a very simple, "quick and dirty", system, such as this is all that is needed to get the job done. Time will tell if any computerized system is really superior to a good manual system, and is worth the money it costs to maintain it.

This project may serve another purpose: once a computer terminal is available, people's imaginations begin to come up with additional uses for it. Whether or not this data retrieval system thrives, or even survives, it may be the "spark plug" for additional and possibly important uses of the computer.

Dr. G. Ernest Anderson  
October 31, 1979

The system developed included the programs Dr. Anderson wrote in BASIC for the University of Massachusetts' CDC - Cyber 79 computer, and an acoustically coupled terminal at the HEC office. (See Appendix I for programs.)

We developed 51 categories for the program. Users would take a print-out list of names to alphabetically arranged files. Each paper file included information on an individual or organization: a resource form, resume, and any additional information which we had received.

Since one of our purposes in developing the retrieval system was to encourage our school systems and our own staff to explore the many uses of the computer, it was important for us to have programs that were very easy to use. Dr. Anderson's program provided many user prompts, and we developed an additional user sheet to help the nervous user to get the program started, correct

typing mistakes, and exit from the program. We also developed forms to log the use of the terminal so that we would have data on the purpose of uses and problems that occurred during use. Like most logs, it was used sporadically, but it still provided a sampling of information which we used to correct errors and in our next revision of the system.

## From Terminal To Micro-computer

As Dr. Anderson suggested, the presence of the terminal in the Inservice Program stimulated ideas for additional uses of the computer. At about the time that our staff was beginning to use the terminal for a variety of purposes (statistical analysis, as a link to other computer data bases, as a method to learn programming) the technological revolution in micro-computers was making the small machines accessible to our school systems. We realized that a micro-computer in the office could be used as a terminal for the retrieval system and as a demonstration machine in inservice courses for both student and adult use of micro-computers.

Although we had originally thought we would keep our retrieval system on the UMass computer, once the micro-computer came to the office we decided to rewrite the programs for use directly on the micro-computer. The resource retrieval system was, therefore, rewritten in BASIC for use on the APPLE II. (See Appendix II for programs.)

Richard Horlick, who developed the computer programs for the APPLE computer, began by asking the same hard questions that Dr.

Anderson had asked a year, and a half earlier. Since the program had to be rewritten anyway to accommodate the differences between machines, he encouraged us to reexamine our goals and categorization system. It is important to stress the problems associated with such an examination. To begin with, reviewing goals and categories requires time and discussion. While we were involved in that process, our old system became outdated and was, therefore, not very useful to school systems. There is no question that the new system is better designed to meet our changing needs, but there have been moments when we would have thrown, cheerfully, the baby out with the bath water.

## Goal Setting

It is not always easy to decide exactly what you want a resource system to do. It is time consuming, but absolutely essential, to discuss goals with staff members, policy boards, users, and funding agents. The goals we established for our retrieval system were:

1. To provide planners with a variety of easily accessible resources (workshop presenters and background information) for planning inservice activities.
2. To actively recruit local resources which have not commonly been used in the schools.
3. To encourage teachers and school staff to serve as resources to each other.
4. To introduce the capabilities of micro-computers to users.
5. To have the system work as simply and accurately as possible.

In selecting these goals, we left out other possible goals, such as fancy print-out, more rigid "security," quality control, and a more complicated filing system. It is important to set goals so you know when you reach them, or, one might add, when you miss them. You may revise them later, but start with a well thought out set.

## Alternative Designs

Once you establish goals, you can look at alternative designs for meeting those goals. Gluing the goals you establish to your clipboard when you visit resource centers will keep you from adopting some terribly clever designs that will not meet your needs. Contact resource centers (educational, environmental, consumer, political), educational intermediate agencies (regional centers, collaboratives, counties), industrial firms, business organizations, cooperatives, distribution centers, and human service organizations. If there is a chance that you will computerize your resource system, bring your computer programmer along when viewing systems. There are packaged resource retrieval systems available which may meet your needs. If you go that route, test the program and talk with experienced users to make sure it will meet your needs.

## Categorization

One of the most difficult problems in developing any resource file, computerized or not, is the selection of categories. The larger the system, the more important careful categorization becomes, since it is an incredible nuisance to change categories. In the

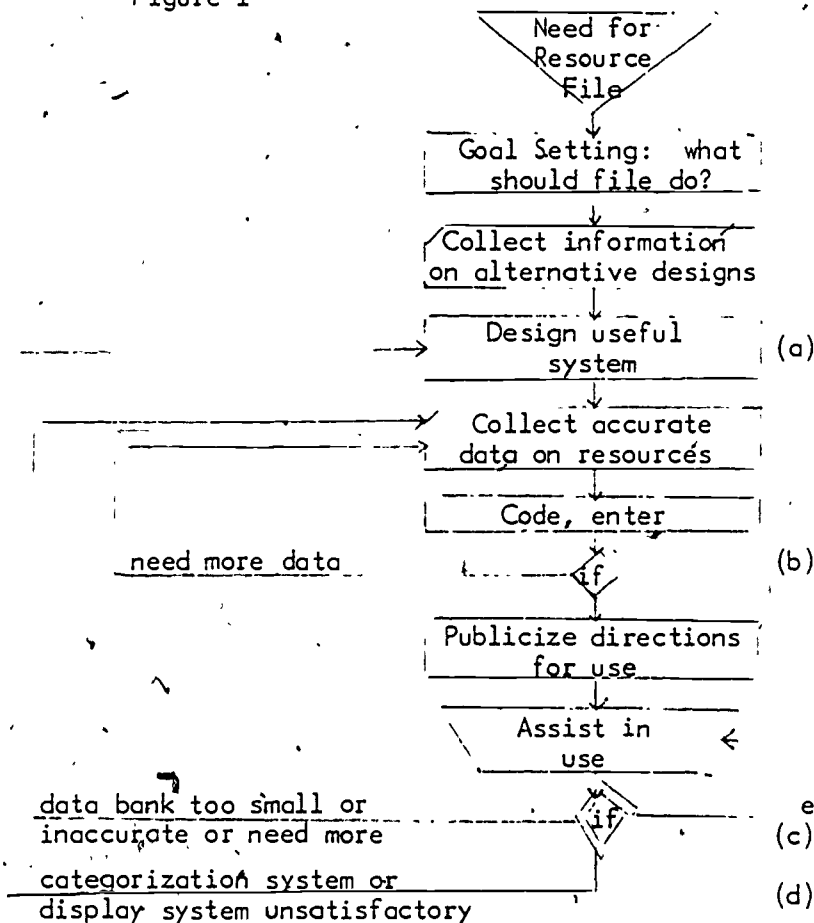
process of developing the first computerized system, the coordinator examined every system she could locate. Many of them had hundreds of categories. Most of the people who had developed large numbers of categories admitted, however, that they had never got their systems working. A good rule of thumb is to use common sense, to develop a reasonable set of categories, to try using them to both enter and retrieve resources, and to allow for the introduction of new categories at future dates. The introduction of new categories can create crises. Our first program had categories integrated into it. Our new computer system is category-free: the names of the categories are on the users' paper guide, not in the program. Having the program category-free makes the introduction of new categories easier. Someone still has to review all present files to see if there are entries which should be coded into new categories. (Copies of our changing category lists are included in Appendix III.)

## Legal Implications

As long as we carried the resource file around in a milk carton, the legal implications of including or excluding individuals or organizations were not major concerns. In one of the many revisions of resource forms, however, the inservice teams suggested that we include comments from the teams about the effectiveness of the presenter. This opened up all kinds of legal and ethical issues. Anyone who has done workshops knows that personal health, the political climate of the school, the temperature of the room, and Murphy's law can all contribute to the workshop's success or failure.

Finally, we compromised by asking the presenter for references and providing these to the potential user. It was easier, legally safer, and probably more ethical to help the planning teams become more sophisticated consumers when contracting with presenters. We made it their responsibility to determine the appropriateness of a presenter to their situation.

Figure 1



- a) Useful 1) to potential clients 2) to you. Make sure it will not consume more time and money than you have.
- b) 1st evaluation point ☒ if There is never enough data. Unless you are publishing the file as a book, you will have to take both paths simultaneously.
- c) 2nd evaluation point ☒ if data always needs updating. Design changes are major crises -- do infrequently.
- d) Note: there is not way out of the system except by cutting off the electricity, paper supply, or funding!

## Collecting Accurate Data

It is possible to spend months, even years, collecting data before entering any of it into a resource file. No one, however, wants to fill out a form for a nonexistent data bank. If they do fill out the form the day will finally come when someone has to start entering data, boxes and boxes of it.

We recommend that as soon as you have the first bit of data, enter it into your system. This has two advantages: (1) it will enable you to find the mistakes you have made in the form you use for data collection. You will surely want to revise your form (spacing, color, information, -- something.) You may wish that you had asked everyone for his or her home phone number, social security number, or, perhaps, height. (2) The best advertisement for your resource file is the person who gets a consulting job through its use. That person's friends will flock to fill out forms. Although we make sure that every consultant we use in our wide variety of programs gets entered, nearly half our entries come from requests for forms from someone-who-talked-to-someone who was in the file.

We have gone to meetings and organizations to seek entries for our file, especially in new or weak categories. We find this an important activity, and will continue to solicit entries in order to avoid the "old boy network." Even the simplest retrieval system is better than a "top of your head" referral system if you are interested in trying to avoid closed networking.

## Keeping Your System Up-To-Date

What happens when people move, acquire new skills, or become less interested in an area? Many people remember to tell us about address changes, others ask us to upgrade their files. Once a year we review the names on file and send out letters to those we have not used or heard about to see if they still exist. Users are of assistance in this process by telling the system coordinator of problems they have had in locating consultants.

## Coding

Coding of resources for the retrieval system is most effective when done by someone familiar with the topic to be coded and resources. Thus, the staff member who ordered a book should code it; the coordinator who has a project in nutrition should code all nutrition resources. In this way, the process will be most efficient and the coding most accurate.

Uniform coding procedures are important. Be sure to have at least one workshop on the coding process for your entire staff, and review the process regularly. At one time, we asked consultants to code themselves. We found they tended to put themselves into too many categories, so we now code them ourselves. Overcoding has also been a tendency among our staff. It is tempting to code someone who is skilled in energy education into several categories: social studies, science, environmental education, etc. A user, however, wants to consider that name only when looking for energy education resources. Don't overcode.



## Entering

Entering data requires careful typing, attention to detail, quiet working conditions, and a strong back. Every entry should be checked for accuracy by a person serving as a verifier. Some type of security system, such as a different user number for a terminal, no directions for entry program, back up disks and tapes, should be developed so that well-meaning users cannot help out in correcting data. There should be a place in the log book for the user to record recommendations, but users should not be allowed to enter data. If your files are going to electronic heaven, you want to be responsible for sending them there.

## Publicity

Since resource files are designed for a specific group of users, it would seem that publicizing the presence of the file would not be too important. We have found, however, that any new way of handling information requires careful explanation. In the beginning, when the file is fairly small, publicity can be frustrating. "This name is spelled wrong," "I know someone who should be here but isn't," "Wouldn't a simple list be easier?" These are not encouraging words. Just keep at it.

To understand what is happening when they call to ask for information, users should be encouraged to sit down at the machine at least once to run their own searches. This may require special invitations, wine and cheese, or door prizes; but it will increase the confident, continuous, and, perhaps, creative use of the system.

Micro-computers and terminals can be carried to work sites for demonstrations.

We devote a section of the newsletter to the resource file. Although it is difficult to assess the impact of this publicity, it is certainly not as powerful as watching the machine whirr. However, it does help to remind people of the file's existence.

Since one of the goals of our resource center is to familiarize users with the capabilities of the micro-computer, we like to spend as much time as possible with the user when a search is underway. The extra time and extra questions make extra sure that users have all the information they need. Some people get so excited by the printout that they don't realize they have selected wrong categories for their needs and, so, have a useless list.

A users manual that is clearly written in real English is invaluable. It should include information on plugging in the machine, correcting errors, and remembering to press "RETURN," etc. (See Appendices I and II.)

## The Future

We do not expect to make major changes in our present system. (That is not a statement, but a prayer.) Since the categories are essentially unlimited, we will be able to add new categories as they are needed with only changes in the instruction to users rather than in the program. We will review files for entries which should be categorized in new areas. Editing programs allow us to make these

types of corrections easily.

With the uncertainty of state and federal funding, the cost of maintaining our system is especially appealing. We anticipate that a staff member knowledgeable about the system can keep the files updated with new entries or changes in present entries working two hours per week. Each request for assistance in using the files takes approximately a half an hour of staff time. (The user is encouraged to try a variety of category combinations and is helped in using the backup paper file.) Assistance is often given by phone, with the staff person reading from the files and xeroxing and mailing information which the user can evaluate. There are no monthly hook-up or terminal rental or computer storage costs with the micro-computer. All disks have backup copies (\$5.00 each) which will be recopied periodically.

## APPENDIX I

HAMPSHIRE EDUCATIONAL COLLABORATIVE

## USER INSTRUCTIONS

To use the data retrieval system, you must first know what it is you want to know. Consult the current list of Resource File Categories, and select those that appear to be most useful to the problem at hand. You will also need the current index numbers of these Categories. It is anticipated that the Categories in use may change through replacement or through additions. You can always obtain a current list on your computer terminal by GETting the file NAMES and LISTing it as shown on a following page.

We also assume you have a computer terminal available, either where you are or at the Hampshire Educational Collaborative, that can connect to the University of Massachusetts Time-Sharing System, and that you or someone who is using the system for you knows enough about the Time-Sharing System and terminal operation to use it. Instruction at this level is not included here, but is available through a number of University sources.

Suppose you want a list of the available resources that meet the criteria of: SEVERE/PROFOUND NEEDS for LEARNING DISABLED that can be a RESOURCE to you at the SECONDARY level and also with EVALUATION competencies. By consulting the NAMES file listing, you find that these categories have index numbers of 51, 47, 22, 7, and 17 respectively.

As shown on the Sample Retrieval Run on a following page, you log onto the computer, giving your own user number and password. (For the time being, the School of Education has made a user number available; this may eventually change.). You need to select the BASIC system, since this retrieval system was programmed in BASIC to ease possible future transition to a mini-computer. As shown in the Sample Retrieval Run example, you then get from disk storage the.

necessary files: RETR (which is the computer program that does the work), DATA (which is the file of actual resource categories associated with each possible resource), and NAMES (which contains the plain English equivalent of each resource category). These files are stored under a different account number than the one you are using, but have been made "semi-private" so you can use them from your terminal under your account number. Please follow exactly the procedure outlined in the Sample Retrieval Run.

When all 3 files are available, and you give the computer command RNH (or RUN), the program will ask you first the number of descriptors you want to use. Since you have 5, that is what you type in. The computer then asks you for one descriptor index number at a time, and tells you what that is as a check that you have selected (and typed!) correctly. The list of files that match all of your criteria is then typed out for you, unless you were unlucky enough to ask for a set of criteria not met by any resource.

You may re-run the program again, if you wish, without logging in to the computer again, and without getting the necessary files again. Simply give the command RNH (or RUN) again, and specify another set of criteria (descriptors) you want to try.

It is anticipated that there will be changes and improvements to this system from time to time. Insofar as possible, these changes will be "transparent" to you, the user; you will be unaware that there is more data on the system, may be minorly aware that some aspect of the retrieval program operates differently, but should be carefully aware of changes in the categories available so you can select what is most appropriate for you at the current time.

It remains your responsibility to examine each indicated resource further and to determine its real potential use to you. ERIC, for example, has information on most subjects, but sometimes very little in the specific combination you are looking for.

I b

# Resource File Categories

## Services offered

workshop/course  
visitation/model program  
resources to share

## Student level

Pre-school  
elementary  
middle school/junior  
secondary

## Organizational Issue

alternative program  
counseling/guidance  
developmental approach  
goal setting/philosophy/organizational  
management/leadership/supervision  
parents/community  
substitute/aide/intern

## Skill area for teachers

classroom organization  
curriculum development  
evaluation/testing/competency testing  
inservice process  
funding/legislative guidelines  
interpersonal/group process/discipline  
media/computer  
resource services  
teacher goals

## Curriculum areas

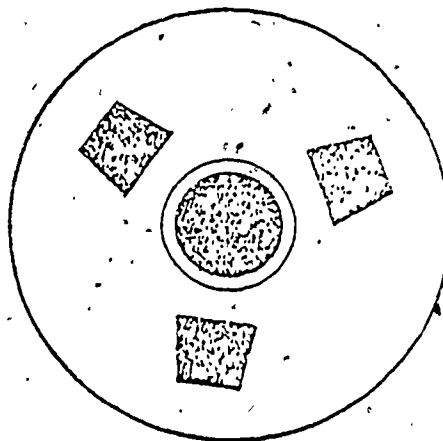
business/commercial  
creative arts  
home economics/industrial arts  
language arts except writing  
writing/composition  
languages/foreign/bi-lingual  
math and measurement  
movement/sports/games  
occupational/vocational education  
social studies  
science

## Curriculum approaches

career/pre-vocational  
energy/environmental education  
gifted and talented  
health/safety  
nutrition  
law  
multi-cultural education  
sex role issues  
thinking skills/learning styles/thinking  
styles

## Special needs

special education process  
visually impaired  
communication/speech/hearing impaired  
learning disabled/perceptual problems  
therapeutic services  
psychological/emotional services  
mild/moderate needs  
severe/profound needs  
physical/medical needs



PROCEDURE FOR OBTAINING  
CURRENT LIST OF  
RESOURCE FILE CATEGORIES

READY.  
LIST=F=NAMES

79/10/31. 14.16.57.  
FILE NAMES

- 01 "WORKSHOP/COURSE"
- 02 "VISITATION/MODEL PROGRAM"
- 03 "RESOURCES TO SHARE"
- 04 "PRE-SCHOOL"
- 05 "ELEMENTARY"
- 06 "MIDDLE SCHOOL/JUNIOR HIGH"
- 07 "SECONDARY"
- 08 "ALTERNATIVE PROGRAM"
- 09 "COUNSELING/GUIDANCE"
- 10 "DEVELOPMENTAL APPROACH"
- 11 "GOAL SETTING/PHILOSOPHY/ORGANIZATION"
- 12 "MANAGEMENT/LEADERSHIP/SUPERVISION"
- 13 "PARENTS/COMMUNITY"
- 14 "SUBSTITUTE AIDE/INTERN"
- 15 "CLASSROOM ORGANIZATION"
- 16 "CURRICULUM DEVELOPMENT"
- 17 "EVALUATION/TESTING/COMPETENCY TESTING"
- 18 "INSERVICE PROCESS"
- 19 "FUNDING/LEGISLATIVE GUIDELINES"
- 20 "INTERPERSONAL/GROUP PROCESS/DISCIPLINE"
- 21 "MEDIA/COMPUTER"
- 22 "RESOURCE SERVICES"
- 23 "TEACHER GOALS"
- 24 "BUSINESS/COMMERCIAL"
- 25 "CREATIVE ARTS"
- 26 "HOME ECONOMICS/INDUSTRIAL ARTS"
- 27 "LANGUAGE ARTS EXCEPT WRITING"
- 28 "WRITING/COMPOSITION"
- 29 "LANGUAGES/FOREIGN/BI-LINGUAL"
- 30 "MATH AND MEASUREMENT"
- 31 "MOVEMENT/SPORTS/GAMES"
- 32 "OCCUPATIONAL/VOCATIONAL EDUCATION"
- 33 "SOCIAL STUDIES"
- 34 "SCIENCE"
- 35 "CAREER/PRE-VOCATIONAL"
- 36 "ENERGY/ENVIRONMENTAL EDUCATION"
- 37 "GIFTED AND TALENTED"
- 38 "HEALTH/SAFETY"
- 39 "NUTRITION"
- 40 "LAW"
- 41 "MULTI-CULTURAL EDUCATION"
- 42 "SEX ROLE ISSUES"
- 43 "THINKING SKILLS/LEARNING STYLES/THINKING STYLES"
- 44 "SPECIAL EDUCATION PROCESS"
- 45 "VISUALLY IMPAIRED"
- 46 "COMMUNICATION/SPEECH/HEARING IMPAIRED"
- 47 "LEARNING DISABLED/PERCEPTUAL PROBLEMS"
- 48 "THERAPEUTIC SERVICES"
- 49 "PSYCHOLOGICAL/EMOTIONAL SERVICES"
- 50 "MILD/MODERATE NEEDS"
- 51 "SEVERE/PROFOUND NEEDS"
- 52 "PHYSICAL/MEDICAL NEEDS"

READY.

I d

COMPUTERIZED RETRIEVAL SYSTEM



SAMPLE RETRIEVAL RUN

79/10/31. 14.12.25. TIP2015 . (

UMASS NOS 1.3-485/485

-NOS 1.3-485/485

USER NUMBER:

TERMINAL: 145, USERS 99

(give your user number  
and password)

RECOVER /SYSTEM: BASIC

OLD, NEW, OR LIB FILE: OLD, RETR/UN=A431130

READY.

GET DATA/UN=A431130

READY.

GET NAMES/UN=A431130

READY.

RNH

WELCOME TO DATA RETRIEVAL DEMONSTRATION

TYPE IN THE NUMBER OF DESCRIPTORS YOU WANT TO USE

? 5

(10 is maximum)

TYPE IN DESCRIPTOR 1 ? 51

SEVERE/PROFOUND NEEDS

TYPE IN DESCRIPTOR 2 ? 47

LEARNING DISABLED/PERCEPTUAL PROBLEMS

TYPE IN DESCRIPTOR 3 ? 22

RESOURCE SERVICES

TYPE IN DESCRIPTOR 4 ? 7

SECONDARY

TYPE IN DESCRIPTOR 5 ? 17

EVALUATION/TESTING/COMPETENCY TESTING

THE FOLLOWING FILES SEEM TO MATCH YOUR REQUESTS

SEVERE/PROFOUND NEEDS

LEARNING DISABLED/PERCEPTUAL PROBLEMS

RESOURCE SERVICES

SECONDARY

EVALUATION/TESTING/COMPETENCY TESTING

FEIKER SCH. 1205

D.M.H. 1701

L.CARROLL 0200

P.SMITH 0500

MA DISSEM P1700

ERIC CLEAR 2200

SRU 1.819 UNTS.

RUN COMPLETE.

I e

HAMPSHIRE EDUCATIONAL COLLABORATIVE

## MAINTENANCE INSTRUCTIONS

The following pages outline how to enter data into the system, how to obtain listings of the data, and provides listings of the actual programs. It is assumed that only a designated person at the Hampshire Educational Collaborative will maintain the data, and that computer programs will be maintained by the author.

All files are stored under an account number different than that provided users so that no user can accidentally (or otherwise) change or eradicate the contents of any file.

It may be desirable to undertake reordering of the data, reformatting of the data to add or change categories or expand what the user is told about each resource. Such "massive" changes also require changes in the computer programs that operate on the data; obviously, both should be brought about at the same time.

Because of the simplicity of the present programs (as a result of the quick and dirty, and cheap, approach), they are extremely sensitive to any errors in the DATA file. Every change or addition to that file should be carefully and thoroughly checked before changes are REPLACED on the disk for use. A minor format error can cause a program not to run past that point in the data.

### The NAMES file:

This is a very simple file, as shown in a previous listing. It contains a 2 digit line number that is also the index number to the resource category so named, followed by a space, followed by the actual name in quotation marks. A name may not exceed one line.

### The DATA file:

This file consists of a unique 3-digit line number for each resource, a space, a string of 52 (at present) 0 or 1 indicators that say whether or not each of the 52 categories apply to this resource, another space, and then descriptive material for the user to have in finding where to look further.

I. f

# CHARACTERISTICS OF THE FILE DATA (as of 10/31/79)

79/10/31. 14.47.24.  
FILE DATA

```

980 100111100010000000100100000000000000000000100000001 M.W-ASSOCT 0500
981 1011111000001000000100000000000000000000000100000000 J-LEVINE 1204
990 101111101011011000101000100000001000110010000001001 LIFEWAYS 1800
991 100111100000000000000000000000000000000000010000000 J-WALL 0701
    
```

## FORMAT OF DATA FILE

```

POS. 1-3 = LINE (CASE) NUMBER
      4   = BLANK (END OF LINE NUMBER)
      5-56 = 0 OR 1 INDICATORS S2 AVAILABLE CRITERIA
      57   = BLANK
      58-68 = ABBREVIATED FILE NAME (PERSON OR ORGANIZATION)
      69-72 = FILE LOCATOR NUMBERS
    
```

READY.

As a help in typing in a new data line, remember that the 0 - 1 descriptors (categories) should be 4 positions to the right of the index number for the categories. Thus if category 14 applies, the 1 should be typed in position 18. By listing an existing line known to be in correct format, errors of spacing can be caught and corrected. Standard sequenced file editor operations are useable on this file for changes in format or content.

As a further help in assuring that data are correctly entered, the program SELDIS may be run from the terminal to display back in plain English what has been coded for each resource.

Another program, SUBDIS, may be submitted to cause a similar listing for all entries in the DATA file. Because of the length of such a listing, the results should be printed on the high speed printer at the computer center and obtained there. It is recommended that this be done once in a while, and used as a reference as well as for checking purposes.

I h

COMPUTERIZED RETRIEVAL SYSTEM

OBTAINING A LISTING OF SELECTED FILE CHARACTERISTICS  
(Resource File Categories that apply)

OLD,SELDIS

READY.  
GET,NAMES

READY.  
GET,DATA

READY.  
RNH

TYPE IN NUMBER OF FILE DATA TO BE DISPLAYED  
? 781 (line number for  
file wanted)

LINDBURGH S1301 781

3 RESOURCES TO SHARE

4 PRE-SCHOOL

5 ELEMENTARY

10 DEVELOPMENTAL APPROACH

TYPE IN NUMBER OF FILE DATA TO BE DISPLAYED  
? 691

C.SELLERS 1202 691

1 WORKSHOP/COURSE

4 PRE-SCHOOL

5 ELEMENTARY

6 MIDDLE SCHOOL/JUNIOR HIGH

7 SECONDARY

13 PARENTS/COMMUNITY

16 CURRICULUM DEVELOPMENT

25 CREATIVE ARTS

31 MOVEMENT/SPORTS/GAMES

45 VISUALLY IMPAIRED

46 COMMUNICATION/SPEECH/HEARING IMPAIRED

47 LEARNING DISABLED/PERCEPTUAL PROBLEMS

48 THERAPEUTIC SERVICES

49 PSYCHOLOGICAL/EMOTIONAL SERVICES

50 MILD/MODERATE NEEDS

52 PHYSICAL/MEDICAL NEEDS

TYPE IN NUMBER OF FILE DATA TO BE DISPLAYED  
? 0

("0" is stop indicator)

SRU 2.238 UNTS.

RUN COMPLETE.

I i

HAMPSHIRE EDUCATIONAL COLLABORATIVE

## PROGRAM LISTINGS

For the sake of completeness, programs are listed on the following pages. Because of their simplicity, they are not at this time flowcharted or further documented.

They are all written in the BASIC language, with the possibility in mind that a data retrieval system such as this may someday operate on a resident mini-computer. The dominant "native language" of minicomputers at this time is BASIC.

The program SUBDIS is entirely control language statements, and is equivalent to the cards that would be punched at the computer center. It requires the current password for the account number under which all files are stored; hence, this program may have to be modified if the account number and/or password is changed.

Listing of the main retrieval program, RETR

79/10/31. 14.23.18.

FILE RETR

```
125 DIM NS (60)
130 FILE #2 = "NAMES"
132 RESTORE #2
134 IF END #2 GO TO 140
135 INPUT #2, N, SS
136 NS(N)=SS
137 GO TO 134
140 FILE #3 = "DATA"
141 RESTORE #3
145 DIM D(25)
150 PRINT "WELCOME TO DATA RETRIEVAL DEMONSTRATION"
155 PRINT
160 PRINT "TYPE IN THE NUMBER OF DESCRIPTORS YOU WANT TO USE"
165 INPUT N
170 IF N <= 0 GO TO 999
200 FOR I = 1 TO N
210 PRINT "TYPE IN DESCRIPTOR"; I;
215 INPUT D(I)
216 K=D(I)
217 PRINT TAB(23); NS(K)
220 NEXT I
225 G=0
300 IF END #3 GO TO 800
305 INPUT #3, J, TS
310 FOR I = 1 TO N
315 K=D(I)
320 L=VAL(SUBSTR(TS,K,1))
330 IF L<=0 GO TO 460
335 NEXT I
400 IF G=1 GO TO 450
403 PRINT
405 PRINT "THE FOLLOWING FILES SEEM TO MATCH YOUR REQUESTS"
410 PRINT
415 FOR I = 1 TO N
420 K=D(I)
425 PRINT TAB(7); NS(K)
430 NEXT I
435 PRINT
450 G=1
455 PRINT SUBSTR(TS, 54, 16)
460 IF MORE #3 GO TO 300
800 IF G > 0 GO TO 900
805 PRINT "SORRY WE DIDN'T FIND ANY FILES MEETING ALL YOUR CRITERIA."
810 PRINT
815 PRINT "TYPE IN 1 TO TRY AGAIN, 0 TO END THE COMPUTER SEARCH."
820 INPUT A
825 IF A > 0 GO TO 160
900 GO TO 999
999 END
```

READY.

I k

HAMPSHIRE EDUCATIONAL COLLABORATIVE

# PROGRAM LISTING FOR SELECTIVE FILE DISPLAY

OLD,SELDIS

READY.  
LIST.

79/10/31. 14.23.13.  
FILE SELDIS

```

190 DIM M1 (50)
200 FILE #2 = "NAMES"
205 FILE #3 = "DATA"
210 RESTORE #3
215 RESTORE #2
220 IF END #2 GO TO 300
225 INPUT #2, N,SS
230 M1(N)=SS
235 GO TO 220
300 PRINT "TYPE IN NUMBER OF FILE DATA TO BE DISPLAYED"
305 INPUT B
310 IF B = 0 GO TO 999
320 RESTORE #2
330 IF END #3 GO TO 990
340 INPUT #3, J, TS
350 IF J<>B GO TO 500
357 PRINT
360 SS=SUBSTR(TS,54,16)
370 PRINT SS, J
380 FOR I = 1 TO 52
390 K1=SUBSTR(TS,I,1)
400 L=VAL(K1)
410 IF L <=0 GO TO 535
420 PRINT USING 531, I, M1(I)
531 :      ??      <????????????????????????????????????????????????????????????
430 NEXT I
440 GO TO 300
450 PRINT
460 PRINT "END OF DATA FILE REACHED".
470 GO TO 300
480 PRINT
490 END

```

READY.



## APPENDIX II

HAMPSHIRE EDUCATIONAL COLLABORATIVE



# HAMPSHIRE EDUCATIONAL COLLABORATIVE

PETER F. DEMERS, EXECUTIVE DIRECTOR

USERS MANUAL  
APPLE II

## RESOURCE FILES

1. Select the type of resources you are looking for from the following:
  - A. Workshops/Courses (individuals and organizations who can give inservice assistance)
  - B. Resources (organizations who have specialized libraries, resource centers, publish certain types of materials)
  - C. Visitations (schools or institutions where demonstration/model classrooms are available for visits)
  - D. Library (materials in our HEC Resource Center)
2. Take out the two disks labeled with the type of resource you want. One will say, for example, "Workshops/Courses", the other will say "Annotations: Workshops/Courses". Put the annotations disk where you can easily find it (on top of the disk drive, i.e.: the little black box labeled "Disk II"). Put the other disk in the left hand disk drive. Place it label side up, "slot" goes to back -- label to front. Gently insert the disk into the slot: DO NOT FORCE. Close the door above the slot.
3. Turn on TV monitor. Turn on the computer (the switch is on the back left hand side). Disk drive will "whir" -- that's o.k.

If you want to ENTER DATA: hold down the "CTRL" key (this is called the "control" key) while you hit the letter "c", and then hit the key labeled "return" on the right side of the keyboard. The machine will respond with "Error 255 at line 150 close". That's o.k. Turn to directions on page 3 to continue.

If you want to GET INFORMATION: proceed to page 2.

N.B.: If you ever accidentally hit the RESET key, you can usually "recover" what you were doing in the following way:

- 1) Hold down the "CTRL" key while you hit the letter "c"
- 2) Type the letters "c", "o", "n" and "t".

## IF YOU WANT TO GET INFORMATION

N.B.: If you make a mistake, go back with the arrow "←". This deletes each letter it goes over, so retype from the error on to the end of the line.

✓ Follow general directions on page 1, then:

If you see "CHARACTERISTIC ? ■", go to step 5. Otherwise:

4. Type "Run Workshop/Course" , press "RETURN"

N.B.: Workshops/Courses is used as an example throughout these pages. You can, of course, substitute Resources, Visitations, or Library as appropriate.

5. You are now in the program and just need to follow the directions Rick Harlick has written into it.

6. When the program asks "Do you wish to see the annotations for this record?" type Y if you do, and press "RETURN" (or type N if you do not, and "RETURN"). If you type Y, then you will have to place the appropriate annotations disk in the disk drive (as described in #2, page 1) and press "RETURN".

7. A copy of the category numbers is in Appendix III.

8. If, after one listing, you want to try another combination of categories, type "Run", press "RETURN" and you can start again. We would like to encourage you to try various combinations to get the best total listing.

## IF YOU WANT TO ENTER DATA

See page 1 for instructions (#2) on turning on the machine. Type :

- "Run Services-Works" if you want to enter data on Workshops/Courses
- "Run Services-Resau" if you want to enter data on Resources
- "Run Services-Visit" if you want to enter data on Visitations
- "Run Services-Libra" if you want to enter data on the library

The program will give you instructions.

If you don't know what record number to begin with, turn to "Reading Numbers File" on page 4 before you go any further.

- a. When typing numbers, leave only one space between entries. Thus, record 93 with interests in pre-school and media would have

93 1 210

Be very careful about this. All hell breaks loose when you add extra spaces, commas or anything else. Most important, do not start or end with a space.

- b. Write reference # on coding sheet top right hand corner.
- c. When typing name, address put last name first. Use NO commas. You only have 20 spaces per line.
- d. When typing annotations, you have 39 spaces per line. Use NO commas. When you are done, hit "RETURN" until you get "NEXT READ"
- e. Remember to type "STOP" and follow directions for putting in annotation disk when you are through or all your work will go to electronic heaven. When you put annotations disk in, press the "RETURN" key and listen to the lovely whirl of information being recorded.

II c

HAMPSHIRE EDUCATIONAL COLLABORATIVE

TO READ NUMBER FILE  
(reference number and categories)

First you need to know last reference number used. With disk in and machine on

- a. Hold down the "CTRL" key while you hit the letter "c", and press "RETURN"
- b. Machine will say "error 255 at line 35  
clase"  
That's o.k.
- c. Type "Run Filereader", press "return".
- d. Machine will ask "File Name?"
- e. Type "Dafiworks" (DATA FILE for WORKShops) or  
"Dafiresou" (DATA FILE for RESOUrces) or  
"Dafivisit" (DATA FILE for VISITations) or  
"Dafilibra" (DATA FILE for LIBRARY).

Press "RETURN"

- f. Machine will begin typing lots of numbers. Let it run until it stops. If you want to stop it, hold down the "CTRL" key while you hit the letter "s". This will stop the "scrolling". To start again, press "RETURN".

The last file has

RN=number ?	number	number	number
	number	number	etc.
error code:5 at line:28			

The number before the question mark is the reference number. (The other numbers are the categories that were assigned to that person/book/organization.) You will want to start entering at the next highest number.

N.B.: Filereader now allows one to give a record # (as defined on page 3) to find a record to fix. It also lets one save the old version if one is not sure that he entered corrections well.

II d

COMPUTERIZED RETRIEVAL SYSTEM

CORRECTION IN NUMBERS  
(categories)

When you make a mistake in the numbers (DAFIWORKS):

1. Type "Run FILEFIXER", press "RETURN"
2. It will ask "file name?" Type "DAFIWORKS", or the appropriate data file.
3. It will ask "Do you want to start with the first record?" If you do, type Y. If you want to start further along, type N.

If you have typed N, you are going to have trouble guessing where to start. If you entered files in order, and know the entry number (not the record number) of the file you are looking for, by multiplying the entry number by 5.25 you can estimate its place in the files. The count is by entries. Each person/organization/book has the following entries:

x=number of categories	Approximately	100 starts you in the middle
y=reference number		of record 17,
z		150 is record 30,
a		200 is 38,
b } category listings		250 is 44,
c		300 is 51
etc.)		

4. The machine will ask "L or N?" Type L.

N.B.: The machine opens and closes each file; it is, therefore, very slow. Don't panic. Just wait.

5. If you want to insert, go to the previous number. Type "c" (for change), reenter that number and then, when prompted, add the number you want.

DO NOT EXIT THIS PROGRAM UNTIL YOU HAVE FINISHED IT. YOU COULD LOSE AN INCREDIBLE NUMBER OF FILES.

II e

HAMPSHIRE EDUCATIONAL COLLABORATIVE

## TO READ MAIN NAME FILE

If you want to look at the address information which has been entered:

- a. Hold down the "CTRL" key while you hit the letter "c", press "RETURN".  
It will type "Error 255 at line 35  
close"  
That's o.k.
- b. Type "Run RANDREADER"  
It will type "File Name?"
- c. Type "MLIWORKS" (for Main Literal WORKShops file) -  
"MLIRESOU" ( " " " RESOUrces file)  
"MLIVISIT" ( " " " VISITations file)  
"MLILIBRA" ( " " " LIBRAry file)  
It will type "length of file?"
- d. Type 80 (that is the number of characters allowed).  
It will type "number of fields per record?"
- e. Type 4 (that is the number of lines)  
It will type "continue?"
- f. Hit "RETURN"  
It will type "RECORD #?"
- g. Either begin with 1 or with some record you have a reason to want.  
Since it asks each time what number you want, you can skip along as  
you need to.

II f

COMPUTERIZED RETRIEVAL SYSTEM

## CORRECTING MAIN NAME FILE

When you make a mistake in the address list (MLIWORKS, etc.)

- a. Type "RUN RANDFIXER", press "RETURN"  
It will ask "file name?"
- b. Type "MLIWORKS" or appropriate main literal file.  
It will ask "Length of file?"
- c. Type 80  
It will ask "Number of fields per record?"
- d. Type 4  
It will ask "How long is each record?"
- e. Type 19 (that is the length of line)  
It will ask "Continue?"
- f. If you wish to continue, type Y, if not, type N (to stop).



## READING ANNOTATIONS

If you want to check out the annotations:

- a. Type "Run RANDREADER"  
It will ask "File name?"
- b. Type "AFIWORKS" (Annotation File for WORKShops)  
"AFIRESOU" ( " " " RESOUrces)  
"AFIVISIT" ( " " " VISITations)  
"AFILIBRA" ( " " " LIBRAry)  
It will ask "Length of file?"
- c. Type 400 (number of spaces)  
It will ask "Number of fields per record?"
- d. Type 10 (number of lines)  
It will ask "Continue?"
- e. TAKE OUT REGULAR DISK, PUT IN ANNOTATIONS DISK, press "RETURN"

II h

COMPUTERIZED RETRIEVAL SYSTEM

## CORRECTING ANNOTATIONS

If you want to correct annotations:

- a. With main disk in, type "Run RANDFIXER"  
It will ask "File name?"
- b. Type "AFIWORKS" (Annotation File for WORKShops)  
"AFIRESOU" ( " " " RESOURCES)  
"AFIVISIT" ( " " " VISITations)  
"AFILIBRA" ( " " " LIBRARY)  
It will ask "Length of file?"
- c. Type 400 (number of spaces)  
It will ask "Number of fields per record?"
- d. Type 10 (number of lines)  
It will ask "How long is each record?"
- e. Type 39 (length of line)  
It will ask "Continue?"  
TAKE OUT REGULAR DISK, PUT IN ANNOTATIONS DISK, press "RETURN"
- f. Type Y (if you want to continue), type N (if you want to stop).

II i

HAMPSHIRE EDUCATIONAL COLLABORATIVE \*

# CATALOG

## DISK VOLUME 254

```

A 002 HELLO
A 015 SERVICES-WORKS
T 035 MLIWORKS
A 003 FILEREADER
A 004 RANDREADER
A 011 FILEFIXER
A 006 RANDFIXER
A 010 WORKSHOP/COURSE
T 009 DAFIWORKS
A 003 FILESTARTER

```

## JLOAD SERVICES-WORKS JLIST.

```

1  ONERR GOTO 20000
5  GOSUB 30001
10 DIM L$(100),M1$(100),M2$(100),M3$(100),M4$(100),A1$(100),A2$(100),A3$(100),A4$(100),A5$(100),A6$(100),A7$(100),A8$(100),A9$(100),A0$(100)

20 REM  START OF MY FNS SECTION
30 PRINT "THIS IS THE INPUT SECTION OF          THE RESOURCE PROGRAMS;
   ": PRINT : PRINT
35 FOR Z = 1 TO 2000
36 NEXT Z
40 F$ = "WORKSHOP/COURSE"
50 A1$ = "AFI" + LEFT$(F$,5)
60 LI$ = "MLI" + LEFT$(F$,5)
70 FI$ = "DAFI" + LEFT$(F$,5)
80 PRINT : PRINT : PRINT : PRINT
90 CALL (- 936)
100 PRINT "*****"
110 PRINT "          THE SERVICE YOU HAVE"
120 PRINT
130 PRINT "          REQUESTED IS..."
140 PRINT : PRINT : PRINT "          ";F$: PRINT : PRINT-"IS THIS
   CORRECT?"
150 INPUT YN$
160 IF LEFT$(YN$,1) = "N" GOTO 32500
170 PRINT : PRINT : PRINT "*****PLEASE NOTE*****": PRINT : PRINT "DO NOT
   TRY TO INPUT INFO ON ANY OTHER SERVICES."
180 PRINT : PRINT "INSTEAD,IF YOU WANT TO": PRINT "ENTER A NEW SERVICE,T
   YPE$": PRINT "RUN SERVICES": PRINT "AND THEN YOU CAN ENTER THE NEW"
   : PRINT "SERVICE NAME"
190 FOR K = 1 TO 10000: NEXT K
200 D$ = CHR$(4)
210 PRINT : PRINT : PRINT : PRINT
220 PRINT : PRINT : PRINT "PLEASE TAKE NOTE!": PRINT : PRINT : PRINT "T
   O STOP ADDING FILES, TYPE..."
230 PRINT "STOP": PRINT : PRINT : PRINT "PLEASE WRITE THIS DOWN."
240 FOR K = 1 TO 8000: NEXT K
250 CALL - 936

```

II j

COMPUTERIZED RETRIEVAL SYSTEM

```

260 PRINT "PLEASE BEGIN INPUTTING, USING": PRINT "THE FOLLOWING FORMAT":
    PRINT "RECORD NUMBER < RESOURCE STRENGTHS"
270 PRINT : PRINT : PRINT "TO FIND STARTING RECORD, USE FILEREADER"
280 I = 1
290 INPUT L$(I): IF L$(I) = "STOP" THEN ST = 1: I = I - 1: GOTO 490
300 S = 1
310 S = S + 1
320 RN$ = LEFT$(L$(I),S)
330 IF NOT (MID$(L$(I),S,1) = " ") GOTO 310
340 RN(I) = VAL (RN$)
350 PRINT "INPUT 4 LINES PLEASE:": INPUT M1$(I),M2$(I),M3$(I),M4$(I)
360 INPUT "ANNOTATIONS?";YN$: IF NOT ("Y" = LEFT$(YN$,1)) GOTO 380
370 PRINT "YOU HAVE TEN LINES"
375 INPUT A1$(I),A2$(I),A3$(I),A4$(I),A5$(I),A6$(I),A7$(I),A8$(I),A9$(I),
    A0$(I)-
380 PRINT "NEXT RECORD": PRINT "RECORD NUMBER      RESOURCE CODES"
390 REM NEXT SECT. CHANGES SPACES INTO CR;STORES A COUNT OF SPACES AS
    SECOND RECORD, A FILE # AS FIRST
400 SPCT(I) = 0
410 FOR DX = 1 TO LEN (L$(I))
420 SH$ = MID$(L$(I),DX,1)
430 IF SH$ ( ) " " THEN GOTO 460
432 IF MID$(L$(I),DX + 1,1) = " " THEN L$(I) = LEFT$(L$(I),(DX - 1))
    + RIGHT$(L$(I),(LEN (L$(I)) - DX)): GOTO 432
440 SPCT(I) = SPCT(I) + 1
450 L$(I) = LEFT$(L$(I),(DX - 1)) + CHR$(13) + RIGHT$(L$(I),(LEN (
    L$(I)) - DX))
460 NEXT DX
470 IF I = 100 THEN GOSUB 490: GOTO 280
480 I = I + 1: GOTO 290
490 PRINT D$;"APPEND ";FI$
500 REM ?D$;"APPEND WORKSHOP/COURSE".
510 PRINT D$;"WRITE ";FI$
520 OI = I
530 FOR I = 1 TO OI
540 PRINT SPCT(I)
550 PRINT L$(I)
560 NEXT I
570 PRINT D$;"CLOSE ";FI$
580 PRINT D$;" OPEN ";LI$;"L80"
585 FOR I = 1 TO OI
590 PRINT D$;"WRITE ";LI$;"R";RN(I)
592 SP$ = "
595 IF LEN (M1$(I)) = 0 THEN PRINT : GOTO 597
596 PRINT LEFT$ ((M1$(I) + SP$),19)
597 IF LEN (M2$(I)) = 0 THEN PRINT : GOTO 599
598 PRINT LEFT$ ((M2$(I) + SP$),19)
599 IF LEN (M3$(I)) = 0 THEN PRINT : GOTO 601
600 PRINT LEFT$ ((M3$(I) + SP$),19)
601 IF LEN (M4$(I)) = 0 THEN PRINT : GOTO 605
602 PRINT LEFT$ ((M4$(I) + SP$),19)
605 NEXT I
610 PRINT D$;"CLOSE ";LI$
615 PRINT "PLACE THE ANNOTATION DISK IN THE DRIVE"

```

II <

HAMPSHIRE EDUCATIONAL COLLABORATIVE

```

616 GET DU$
617 PRINT DU$
620 PRINT D$;"OPEN ";AI$;"L400"
625 FOR I = 1 TO 01
630 PRINT D$;"WRITE ";AI$;"R";RN(I)
632 IF LEN (A1$(I)) = 0 THEN PRINT : GOTO 636
634 PRINT LEFT$ ((A1$(I) + SP$),39)
636 IF LEN (A2$(I)) = 0 THEN PRINT : GOTO 640
638 PRINT LEFT$ ((A2$(I) + SP$),39)
640 IF LEN (A3$(I)) = 0 THEN PRINT : GOTO 644
642 PRINT LEFT$ ((A3$(I) + SP$),39)
644 IF LEN (A4$(I)) = 0 THEN PRINT : GOTO 648
646 PRINT LEFT$ ((A4$(I) + SP$),39)
648 IF LEN (A5$(I)) = 0 THEN PRINT : GOTO 652
650 PRINT LEFT$ ((A5$(I) + SP$),39)
652 IF LEN (A6$(I)) = 0 THEN PRINT : GOTO 656
654 PRINT LEFT$ ((A6$(I) + SP$),39)
656 IF LEN (A7$(I)) = 0 THEN PRINT : GOTO 660
658 PRINT LEFT$ ((A7$(I) + SP$),39)
660 IF LEN (A8$(I)) = 0 THEN PRINT : GOTO 664
662 PRINT LEFT$ ((A8$(I) + SP$),39)
664 IF LEN (A9$(I)) = 0 THEN PRINT : GOTO 668
666 PRINT LEFT$ ((A9$(I) + SP$),39)
668 IF LEN (A0$(I)) = 0 THEN PRINT : GOTO 680
670 PRINT LEFT$ ((A0$(I) + SP$),39)
672 PRINT LEFT$ ((A0$(I) + SP$),39)
680 NEXT I
690 PRINT D$;"CLOSE ";AI$
700 IF ST THEN GOTO 32767
710 RETURN
20000 REM *****ERROR TRAPPING****
20005 CALL 768
20010 ERR = PEEK (222)
20020 ELINE = PEEK (218) + PEEK (219) * 256
20030 IF ERR = 53 AND ELINE = 320 THEN PRINT "PLEASE REENTER, ": GOTO 2
90
20900 PRINT "ERROR ";ERR,"AT LINE ";ELINE
29999 PRINT " ": PRINT D$;"CLOSE "
30000 GOTO 32767
30001 POKE 768,104: POKE 769,168: POKE 770,104: POKE 771,166: POKE 772,2
23: POKE 773,154: POKE 774,72: POKE 775,152: POKE 776,72: POKE 777,9
6
30010 RETURN
32500 PRINT : PRINT : PRINT : PRINT : PRINT
32505 PRINT "THIS IS THE ";F$;" DISK"
32510 PRINT : PRINT : PRINT "PLEASE INSERT THE CORRECT DISK IF YOU": PRINT
"NEED ANOTHER SERVICE."
32767 END

```

JLOAD FILEREADER

JLIST

```
1 DIM L$(100)
5 ONERR GOTO 25000
10 D$ = CHR$(4)
15 INPUT "FILE NAME?";FI$
20 PRINT D$;"OPEN ";FI$
25 PRINT D$;"READ ";FI$
28 INPUT SPCT
29 INPUT RN: PRINT "RN=";RN;
30 FOR SC = 1 TO SPCT: INPUT L$(SC): NEXT SC
32 FOR I = 1 TO SPCT: PRINT L$(I),: NEXT I
33 PRINT
35 GOTO 28
40 PRINT D$;"CLOSE ";FI$
50 GOTO 32000
25000 ERR = PEEK (222)
25005 EL = PEEK (218) + PEEK (219) * 256
25100 PRINT "ERROR CODE=";ERR;"AT LINE=";EL
25110 IF ERR = 5 AND ELINE = 28 THEN GOTO 40
32000 PRINT D$;"CLOSE "
32767 END
```

JLOAD FILEFIXER

JLIST

```
10 REM FILEFIXER,...
30 REM *READS SEQ FILES AND ALLOWS CORRECTIONS
50 D$ = CHR$(4)
70 ONERR GOTO 1030
90 INPUT "FILENAME?";FI$
95 GOSUB 250
110 PRINT "THIS PROGRAM ALLOWS YOU TO STEP THROUGH A TEXTFILE AND MAKE C
    ORRECTIONS"
130 PRINT
140 INPUT "DO YOU WANT TO PICK BY RECORD *?";YN$
145 IF LEFT$(YN$,1) = "Y" THEN GOSUB 1400
148 IF ST ( ) 0 GOTO 410
150 PRINT "DO YOU WANT TO START "
170 PRINT "WITH THE FIRST RECORD?"
190 INPUT ST$
210 IF MID$(ST$,1,1) = "Y" THEN ST = 1: GOTO 410
230 PRINT "WHAT RECORD DO YOU WANT TO START WITH": INPUT ST: GOTO 410
250 PRINT "TO START READING CONSECUTIVE RECORDS, HIT A RETURN"
270 PRINT D$;"OPEN TEMPFILE"
290 PRINT D$;"CLOSE TEMPFILE"
310 PRINT D$;"DELETE TEMPFILE"
330 PRINT D$;"OPEN TEMPFILE"
350 PRINT D$;"CLOSE TEMPFILE"
370 PRINT D$;"APPEND TEMPFILE"
390 PRINT : PRINT "IF YOU WANT TO CHANGE A RECORD HIT ANY KEY AND THEN
    RETURN."
```

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HAMPSHIRE EDUCATIONAL COLLABORATIVE

```

400 RETURN
410 REM INPUT "L OR N?";DT$
430 DT$ = "L"
450 PRINT D$;"OPEN ";FI$
470 PRINT D$;"APPEND TEMPFIL"
490 PRINT D$;"READ ";FI$
492 IF ST < 11 GOTO 520
494 FOR SP = 1 TO (INT (ST / 10))
496 FOR I = 1 TO 10
498 INPUT H$(I)
500 NEXT I
502 PRINT D$;"APPEND TEMPFIL"
504 PRINT D$;"WRITE TEMPFIL"
506 FOR I = 1 TO 10
508 PRINT H$(I);:NEXT I
510 PRINT D$;"CLOSE TEMPFIL"
512 PRINT D$;"READ ";FI$
514 ST = ST - 10
516 NEXT SP
520 IF ST = 1 GOTO 690
530 FOR SP = 1 TO ST - 1: INPUT DU$
550 PRINT D$;"APPEND TEMPFIL"
570 PRINT D$;"WRITE TEMPFIL": PRINT DU$
590 PRINT D$;"CLOSE TEMPFIL"
610 PRINT D$;"READ ";FI$
630 NEXT SP
650 REM *****READ NEXT REC HERE!!!!
670 PRINT D$;"READ ";FI$
690 IF DT$ = "L" THEN INPUT LR$: PRINT "RECORD IS...": PRINT
    LR$
710 IF DT$ = "N" THEN INPUT NR: PRINT "NUMERIC RECORD IS...": PRINT NR
730 PRINT D$
750 INPUT CH$
770 IF LEN (CH$) = 0 THEN GOSUB 1110: GOTO 670
790 PRINT D$
810 PRINT "QUIT, DELETE, CHANGE OR CONTINUE?"
830 INPUT "(Q, D, C OR EMPTY RETURN)";:DC$
850 IF LEN (DC$) = 0 THEN GOSUB 1110: GOTO 670
870 IF LEFT$ (DC$,1) = "Q" GOTO 1210
890 IF LEFT$ (DC$,1) = "D" GOTO 650
910 PRINT "BEGIN INPUTTING RECORD(S)"
930 PRINT "STOP WITH AN EMPTY RETURN"
950 INPUT LR$
970 IF LEN (LR$) = 0 THEN GOTO 650
990 GOSUB 1110: GOTO 950
1010 REM *****ERROR HANDLING!!!
1030 PRINT D$;"CLOSE "
1050 PRINT "ERROR ="; PEEK (222)
1070 PRINT "AT LINE "; PEEK (218) + PEEK (219) * 256
1080 IF PEEK (222) = 5 GOTO 1350
1090 GOTO 1390
1110 PRINT D$;"APPEND TEMPFIL"
1130 PRINT D$;"WRITE TEMPFIL"

```

II n

COMPUTERIZED RETRIEVAL SYSTEM

```

1150 PRINT LR$
1170 PRINT D$;"CLOSE TEMPPFILE"
1190 RETURN
1210 PRINT D$;"CLOSE TEMPPFILE"
1230 PRINT D$;"APPEND TEMPPFILE"
1250 PRINT D$;"WRITE TEMPPFILE"
1270 PRINT LR$
1290 PRINT D$;"READ ";FI$
1310 INPUT LR$
1330 GOTO 1250
1350 INPUT "DO YOU WANT TO ERASE THE OLD FILE?";YH$: IF LEFT$(YH$,1) <
    > "Y" GOTO 1390
1355 PRINT D$;"DELETE ";FI$
1370 PRINT D$;"RENAME TEMPPFILE,";FI$
1390 GOTO 32000
1400 REM *****SUB TO FIND A REC ***
1420 INPUT "WHAT RECORD ARE YOU LOOKING FOR?";LF
1430 LF$ = STR$(LF)
1490 PRINT D$;"READ ";FI$
1500 INPUT CT$: INPUT RH$
1510 IF RH$ = LF$ THEN ST = ST + 1: GOTO 1600
1520 ST = ST + VAL (CT$) + 2
1525 FOR I = 1 TO VAL (CT$): INPUT DU$: NEXT I
1530 GOTO 1500
1600 PRINT D$
1610 RETURN
32000 END

```

LOAD RANDREADER  
LIST

```

10 ONEER GOTO 170
20 GOSUB 210
30 INPUT "FILE NAME?";FI$
40 D$ = CHR$(4)
50 PRINT "LENGTH OF FILE?": INPUT LE
52 INPUT "NUMBER OF FIELDS PER RECORD?";FS
55 PRINT D$;"CLOSE ";FI$
60 INPUT "CONTINUE?";YH$
70 IF LEFT$(YH$,1) = "N" GOTO 240
80 FL = 0
100 INPUT "RECORD #?";RN
110 PRINT D$;"OPEN ";FI$;",";L";LE
120 PRINT D$;"READ ";FI$;",";R";RN
125 FOR CT = 1 TO FS
130 INPUT REC$
140 PRINT REC$
150 NEXT CT
160 GOTO 55
170 ERR = PEEK (222):ELINE = PEEK (218) + PEEK (219) * 256
180 CALL 768
200 PRINT "ERROR ";ERR;"AT LINE ";ELINE: GOTO 240
210 REM *****MACHINE LANGUAGE*****:ERROR HANDLING
220 POKE 768,104: POKE 769,168: POKE 770,104: POKE 771,166: POKE 772,223
    : POKE 773,154: POKE 774,72: POKE 775,152: POKE 776,72: POKE 777,96
230 RETURN
240 PRINT D$;"CLOSE ";FI$

```

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HAMPSHIRE EDUCATIONAL COLLABORATIVE



ILOAD RANDFIXER  
 ILIST

```

10 ONERR GOTO 490
40 GOSUB 610
70 INPUT "FILE NAME?";FI$
100 D$ = CHR$(4)
130 PRINT "LENGTH OF FILE?"; INPUT LE
140 INPUT "NUMBER OF FIELDS PER RECORD?";FS
150 INPUT "HOW LONG IS EACH RECORD?";LN
160 INPUT "CONTINUE?";YN$
190 IF LEFT$(YN$,1) = "N" GOTO 700
250 PRINT D$;"CLOSE ";FI$
280 INPUT "RECORD #?";RN
310 PRINT D$;"OPEN ";FI$;"L";LE
340 PRINT D$;"READ ";FI$;"R";RN
350 FOR I = 1 TO FS
370 INPUT REC$
432 LA$(I) = REC$
460 NEXT I
470 PRINT D$;"CLOSE ";FI$
475 GOSUB 1000: GOTO 160
490 ERR = PEEK(222):ELINE = PEEK(218) + -PEEK(219) * 256
520 CALL 768
550 IF ERR = 5 AND ELINE = 370 THEN FI = 1: RESUME
580 PRINT "ERROR ";ERR,"AT LINE ";ELINE: GOTO 700
610 REM *****MACHINE LANGUAGE*****:ERROR HANDLING
640 POKE 768,104: POKE 769,168: POKE 770,104: POKE 771,166: POKE 772,223
: POKE 773,154: POKE 774,72: POKE 775,152: POKE 776,72: POKE 777,96
670 RETURN
700 PRINT D$;"CLOSE ";FI$
799 GOTO 32767
1000 PRINT D$;"CLOSE "
1010 FOR J = 1 TO I - 1
1020 PRINT LA$(J),
1030 INPUT "CHANGE?";YN$
1040 IF LEFT$(YN$,1) = "Y" GOTO 1200
1050 FA$(J) = LEFT$(LA$(J),LN)
1060 GOTO 1300
1200 REM CHANGE
1205 PRINT "ENTER NEW RECORD"
1210 INPUT NR$
1219 PP$ = " "
1220 NR$ = LEFT$((NR$ + PP$),LN)
1230 FA$(J) = NR$
1300 NEXT J
1310 PRINT D$;"OPEN ";FI$;"L";LE
1320 PRINT D$;"WRITE ";FI$;"R";RN
1330 FOR K = 1 TO I: PRINT FA$(K): NEXT K
1340 PRINT D$;"CLOSE ";FI$
1350 RETURN
32767 END

```

II p

COMPUTERIZED RETRIEVAL SYSTEM

JLOAD WORKSHOP/COURSE  
 JLIST

```

5  DIM L$(100),L(100)
10  ONERR GOTO 30000
40  D$ = CHR$(4)
70  REM READ RN, CHECK FOR THE ANDED LIST OF CHARACTERISTICS, AND SAVE O
    R DONT THE RN IN AN ARRAY
100  REM ESTABLISH AN ARRAY OF CHARACTERISTICS(CH) AND O FRE C O
    R DNUM          S(RECS), AND TAKEUP TO A99RE          C OR DS OR
    UNTILEOF
120  A = 1
130  DIM CH(100),RECS(100)
160  PRINT "PLEASE LIST THOSE CHARACTERISTICS," : PRINT "(BY NUMBER,SEE TH
    E MANUAL),YOU'RE LOOKING FOR."
170  INVERSE : PRINT : PRINT : PRINT "PUT IN CHARACTERISTICS ONE AT A TIM
    E" : PRINT : FLASH : PRINT "TYPE A 0.(ZERO) WHEN YOU ARE DONE." : NORMAL

190  PRINT : PRINT : PRINT : PRINT "NOTE*****" : PRINT : PRINT "THIS PROGR
    AM WILL ONLY PULL RECORDS WITH *ALL* OF THE CHARACTERISTICS YOU GIVE
    ."
220  PRINT : PRINT : PRINT "IF YOU WANT RECORDS WITH *ANY* OF A SET" : PRINT
    " OF CHARACTERISTICS, YOU WILL HAVE TO " : PRINT "DO SEVERAL DIFFEREN
    T RUNS."
250  PRINT : PRINT
280  I = 0
310  I = I + 1 : INPUT "CHARACTERISTIC?";CH(I)
340  IF CH(I) = 0 THEN I = I - 1 : GOTO 400
370  GOTO 310
400  SE$ = "WORKSHOP/COURSE" : PRINT : PRINT : INVERSE : PRINT "THIS IS THE
    ";SE$;" DISK" : PRINT : NORMAL : PRINT "IF YOU WANT ANOTHER SERVICE
    THEN PUT " : PRINT "IN ANOTHER DISK NOW!"
402  PRINT "(HIT RETURN TO,BEGIN.)" : INPUT R$
405  SE$ = LEFT$(SE$,5)
410  FI$ = "DAFI" + SE$
430  PRINT D$;"OPEN " ;FI$
460  PRINT D$;"READ " ;FI$
490  INPUT SPCT
520  INPUT RN
550  FOR SC = 1 TO SPCT : INPUT L$(SC):L(SC) = VAL (L$(SC)): NEXT SC
580  EL = 0
610  FOR B = 1 TO I
640  FOR Z = 1 TO SPCT
670  IF CH(B) = L(Z) THEN E = 1
700  NEXT Z
730  IF E = 0 THEN EL = 1
740  E = 0 : NEXT B
760  IF NOT EL THEN RECS(A) = RN:A = A + 1
820  GOTO 490
850  PRINT D$;"CLOSE " ;FI$
900  REM *****MLI LOOKUP
920  PRINT : PRINT : PRINT : PRINT : PRINT
940  IF A = 1 THEN PRINT "NO RESOURCES AVAILABLE THAT MEET ALL" : PRINT "
    OF THOSE SPECIFICATIONS!!" : GOTO 30120
950  PRINT D$;"OPEN MLI";SE$;"L80"
  
```

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HAMPSHIRE EDUCATIONAL COLLABORATIVE

```

960 PRINT D$;"OPEN AFI";SE$;"",L400"
980 FOR I = 1 TO (A - 1)
1000 PRINT D$;"READ MLI";SE$;"",R";RECS(I)
1010 PRINT "RECORD ";RECS(I)
1020 FOR J = 1 TO 4: INPUT R$: PRINT R$: NEXT J
1040 PRINT : PRINT : PRINT : PRINT
1050 PRINT D$
1060 INPUT "DO YOU WISH TO SEE THE ANNOTATIONS FOR THIS RECORD?";YN$
1080 IF LEFT$(YN$,1) = "N" GOTO 1150
1090 PRINT D$
1095 PRINT "PLACE ANNOTATIONS DISK IN THE DISK DRIVE"
1097 INPUT O$
1099 PRINT D$;"OPEN AFI";SE$;"",L400"
1100 PRINT D$;"READ AFI";SE$;"",R";RECS(I)
1110 FOR K = 1 TO 10: INPUT R$: PRINT R$: NEXT K
1112 PRINT D$;"CLOSE AFI";SE$
1113 INPUT "REPLACE ORIGINAL DISK, (HIT RETURN WHEN THROUGH).";Z$
1150 NEXT I
1190 PRINT "THOSE ARE ALL OF THE RECORDS FOUND": PRINT "WHICH MATCH ALL
      OF THE CHARACTERISTICS": PRINT "WHICH YOU SPECIFIED."
12000 GOTO 30120
30000 ERR = PEEK (222)
30030 EL = PEEK (218) + PEEK (219) * 256
30040 IF ERR = 5 AND EL = 490 GOTO 850
30060 PRINT "ERROR CODE:";ERR,"AT LINE:";EL
30120 PRINT D$;"CLOSE "
30150 END

```

```

JLOAD FILESTARTER
JLIST

```

```

1 ONERR GOTO 32000
10 D$ = CHR$(4)
20 INPUT "FILE TO INITIALIZE?";FI$
25 PRINT : PRINT : PRINT : PRINT : PRINT
26 INPUT "RANDOM FILE?";YN$
27 IF LEFT$(YN$,1) < > "Y" GOTO 30
28 INPUT "LENGTH?";L$
29 O$ = ",L" + L$
30 PRINT D$;"DELETE ";FI$
35 PRINT D$;"OPEN ";FI$;O$
50 PRINT D$;"CLOSE ";FI$
60 GOTO 32767
32000 REM *****ERROR TRAPPING****
32010 ELINE = PEEK (218) + PEEK (219) * 256
32020 ERR = PEEK (222)
32030 IF ELINE = 30 AND ERR = 6 GOTO 35
32699 PRINT D$;"CLOSE "
32700 PRINT "ERROR ";ERR;" AT LINE ";ELINE
32767 END

```

```

JLOAD HELLO
JLIST

```

```

10 PRINT "SLAVE DISKETTE","48 K"
20 PRINT "DOS 3.3","(16 SECTORED)"
30 PRINT CHR$(4);"RUN WORKSHOP/COURSE"

```

II r

COMPUTERIZED RETRIEVAL SYSTEM

## APPENDIX III

HAMPSHIRE EDUCATIONAL COLLABORATIVE

Service Offered: ☒ Workshop/courses ☐ Visitation/model program ☒ Library  
☐ Resources to share

Author \_\_\_\_\_  
Last First

Title \_\_\_\_\_

Publisher \_\_\_\_\_ Copyright \_\_\_\_\_

Student Level

- 1 \_\_\_\_\_ Pre-school
- 2 \_\_\_\_\_ Elementary
- 3 \_\_\_\_\_ Middle School/Jr. High School
- 4 \_\_\_\_\_ High School
- 5 \_\_\_\_\_ Adult/Community
- 6 \_\_\_\_\_
- 7 \_\_\_\_\_
- 8 \_\_\_\_\_
- 9 \_\_\_\_\_

- 200 \_\_\_\_\_ Teaching and Learning Styles
- 201 \_\_\_\_\_ Thinking/Problem Solving/  
Study Skills
- 202 \_\_\_\_\_ Gifted and Talented
- 210 \_\_\_\_\_ Educational Media Management
- 220 \_\_\_\_\_ Computer
- 221 \_\_\_\_\_ Reference/Background
- 222 \_\_\_\_\_ Classroom Activities
- 223 \_\_\_\_\_ Software
- 230 \_\_\_\_\_ Substitute/Aide/Intern
- 240 \_\_\_\_\_ Volunteer
- 250 \_\_\_\_\_ Individualization
- 260 \_\_\_\_\_ Inquiry-Based Approach

Program Management Skills

- 10 \_\_\_\_\_ Educational Management
- 11 \_\_\_\_\_ Project Management
- 12 \_\_\_\_\_ Change in Education
- 13 \_\_\_\_\_ Innovation
- 14 \_\_\_\_\_ Leadership/Supervision
- 20 \_\_\_\_\_ Management by Objectives
- 21 \_\_\_\_\_ Behavioral Objectives
- 22 \_\_\_\_\_ Objectives/Examples
- 23 \_\_\_\_\_ Curriculum Design
- 30 \_\_\_\_\_ Evaluation
- 31 \_\_\_\_\_ Evaluation of Management
- 32 \_\_\_\_\_ Testing for outcomes
- 40 \_\_\_\_\_ Research and Model Programs
- 41 \_\_\_\_\_ Educational Resources
- 50 \_\_\_\_\_ Minimal competency/Basic Skills
- 60 \_\_\_\_\_ Funding/Legislative Guidelines
- 70 \_\_\_\_\_ Fiscal Management
- 80 \_\_\_\_\_ School Facility
- 90 \_\_\_\_\_ Parent Involvement
- 100 \_\_\_\_\_ Community Involvement
- 110 \_\_\_\_\_ Alternative Programs
- 120 \_\_\_\_\_ Counseling/Guidance
- 130 \_\_\_\_\_ Library/Resource Center Management
- 140 \_\_\_\_\_ Collaboratives
- 150 \_\_\_\_\_ Grant Writing
- 160 \_\_\_\_\_

Curriculum Areas

- 270 \_\_\_\_\_ Reading
- 280 \_\_\_\_\_ Writing/Composition/Spelling
- 290 \_\_\_\_\_ Listening
- 300 \_\_\_\_\_ Speech and Drama
- 310 \_\_\_\_\_ Handwriting
- 320 \_\_\_\_\_ Foreign Languages
- 330 \_\_\_\_\_ Bilingual
- 340 \_\_\_\_\_ Creative Arts
- 350 \_\_\_\_\_ Movement/Sports/Games
- 360 \_\_\_\_\_ Science
- 370 \_\_\_\_\_ Environmental Education
- 371 \_\_\_\_\_ Reference/Background
- 372 \_\_\_\_\_ Classroom Application
- 380 \_\_\_\_\_ Energy Education
- 381 \_\_\_\_\_ Reference/Background
- 382 \_\_\_\_\_ Classroom Application
- 383 \_\_\_\_\_ Alternative Energy Sources/  
Conservation
- 384 \_\_\_\_\_ Policy/Legal Issues
- 390 \_\_\_\_\_ Nutrition
- 391 \_\_\_\_\_ Reference/Background
- 392 \_\_\_\_\_ Classroom Application
- 400 \_\_\_\_\_ Health Education
- 401 \_\_\_\_\_ Drug/Alcohol/Smoking
- 402 \_\_\_\_\_ Family Life
- 403 \_\_\_\_\_ Sex Education
- 404 \_\_\_\_\_ Safety/First Aid
- 410 \_\_\_\_\_ Home Economics

Instructional Management Skills

- 170 \_\_\_\_\_ Classroom Management/Discipline
- 180 \_\_\_\_\_ Classroom Organization
- 190 \_\_\_\_\_ Developmental Approach
- 191 \_\_\_\_\_ Values/Humanistic Approach

III a

COMPUTERIZED RETRIEVAL SYSTEM

420 \_\_\_\_\_ Consumer Economics  
 430 \_\_\_\_\_ Social Studies  
 440 \_\_\_\_\_ Local History  
 441 \_\_\_\_\_ Reference/Background  
 442 \_\_\_\_\_ Classroom Application  
 450 \_\_\_\_\_ Law Education  
 460 \_\_\_\_\_ Multi-cultural Education  
 470 \_\_\_\_\_ Sex Equity Education  
 480 \_\_\_\_\_  
 490 \_\_\_\_\_  
 500 \_\_\_\_\_ Math  
 510 \_\_\_\_\_ Metrics  
 511 \_\_\_\_\_ Reference/Background  
 512 \_\_\_\_\_ Classroom Application  
 520 \_\_\_\_\_ Thinking/Problem Solving  
 530 \_\_\_\_\_  
 540 \_\_\_\_\_ Business/Commercial  
 550 \_\_\_\_\_ Industrial Arts  
 560 \_\_\_\_\_ Occupational/Vocational  
 570 \_\_\_\_\_ Career/Vocational Awareness  
 580 \_\_\_\_\_  
 590 \_\_\_\_\_

#### Special Education

600 \_\_\_\_\_ Program Development  
 610 \_\_\_\_\_ Visually Impaired  
 620 \_\_\_\_\_ Communication/Speech/Hearing Impaired  
 630 \_\_\_\_\_ Learning Disabled/Perceptual Needs  
 640 \_\_\_\_\_ Psychological/Emotional Needs  
 650 \_\_\_\_\_ Mild/Moderate Needs  
 660 \_\_\_\_\_ Severe/Profound Needs  
 670 \_\_\_\_\_ Physical/Medical Needs  
 680 \_\_\_\_\_ Assessment Techniques  
 690 \_\_\_\_\_ General Background  
 700 \_\_\_\_\_ Classroom Applications  
 710 \_\_\_\_\_ Daily Living Skills  
 720 \_\_\_\_\_ Vocational Education  
 730 \_\_\_\_\_ Therapeutic Services  
 740 \_\_\_\_\_ Special Education Legal Issues  
 750 \_\_\_\_\_ Mainstreaming Strategies  
 760 \_\_\_\_\_  
 770 \_\_\_\_\_  
 780 \_\_\_\_\_  
 790 \_\_\_\_\_

#### Inservice

800 \_\_\_\_\_ Group Facilitation  
 810 \_\_\_\_\_ Logistics/Planning  
 820 \_\_\_\_\_ General  
 830 \_\_\_\_\_ Model Programs  
 840 \_\_\_\_\_ Clearinghouses/Data Bases  
 850 \_\_\_\_\_ Philosophy  
 860 \_\_\_\_\_ Newsletters

#### Professional Support

870 \_\_\_\_\_ Career Exploration  
 880 \_\_\_\_\_ Personal Growth  
 890 \_\_\_\_\_ Professional Growth  
 900 \_\_\_\_\_ Stress/Time Management  
 910 \_\_\_\_\_ Certification  
 920 \_\_\_\_\_ Adult Education

#### Annotations:

Note: Coding sheets for Workshop/courses, Visitation/  
 model program, and Resources to share are like  
 this Library coding sheet, but request name,  
 address and phone number where this does author,  
 title and publisher.

III b

HAMPSHIRE EDUCATIONAL COLLABORATIVE