

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
SCHOOL OF INFORMATION STUDIES FOR AFRICA



ENHANCEMENT OF USER-FRIENDLINESS OF MICRO CDS/ISIS FOR
SEARCH AND RETRIEVAL PHASE

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT
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DECLARATION



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CHAPTER ONE

INTRODUCTION

1.1. OBJECTIVES OF THE STUDY

The search-interface of an information system is the part of the system that the end-user comes into contact. The software for retrieval of records from a database must not only provide for the variety of users approach to retrieval but should also be user-friendly and the operations and options transparent especially to those who may not have had experience with information storage and retrieval systems.

The general goal of this study is to improve the search interface of the Micro CDS/ISIS software so that end-users participate comfortably and efficiently in the information retrieval process, that is, to enhance the user-friendliness of Micro CDS/ISIS software. The specific objectives are:

* to develop using CDS/ISIS Pascal language a search and retrieval interface to help end-users at two levels:

(1) A general Online Library Catalogue Search Facility; and

(2) An Advanced System Interface and Search Facility, that will enable end-users:

- select particular database(s) on the basis of

- a knowledge about them
- perform all retrieval options provided for by Micro CDS/ISIS, including searching via a thesaurus
 - receive help/guidance in the formulation of search expression as well as a "tutorial" on the search capability and search language of Micro CDS/ISIS
 - review the history of the searches made by each user in each of the databases.

* to incorporate some library service utilities for Micro CDS/ISIS.

1.2. BACKGROUND AND JUSTIFICATION

1.2.1. Use of Computers in Africa

The use of computers to solve the needs of information seekers dates back to the 1960's. Computers were first used for the production of printed indexes and related files by the US National Library of Medicine (Henry et al. 1982). Since then the amount and range of information available in computer readable form has increased significantly. At present the range of coverage of computer readable databases include most of the

disciplines. Along with this, software packages to develop and access computer-readable databases are becoming more widely available.

Information is increasingly accepted, even in developing countries, as an important resource input to socioeconomic development. Aware of this fact, African countries are using computers in an increasing measure to facilitate their information storage and retrieval activities (PADIS 1988, 1990). Microcomputers have become more widely available since the early 1980's, and their power and capabilities have increased to a considerable extent while the cost of data storage and retrieval has decreased dramatically during the past decade.

Comparing the surveys of PADIS on computer use in Africa (PADIS 1988, 1990), an increase in microcomputer use in Africa can be observed. In the 1988 survey 58 percent of the responding centres had computer equipment but in 1990 this percentage had increased to 75 (an increase of 17 percent). Of the centres with computer facilities, 93.5 percent were using microcomputers. In addition, an increase in the number of microcomputers per centre was also noticed. The 1988 survey showed that in the responding centres 43 percent had only one micro, but in 1990, some 65 percent had more than one micro. And in 1988 only 9 centres had three or more micros; this had doubled in the 1990 survey.

Regarding the purpose, 58 percent of the respondents were using their computer facility for bibliographic and/or library database management. And also, there was an overwhelming dominance of the use of CDS/ISIS. This shows that there is a clear trend towards the adoption of CDS/ISIS as the preferred software for bibliographic database management.

PADIS is establishing a network to improve the flow of development information in Africa, to contribute toward the efficient and effective utilization of data communications and information technologies and to develop online linkages between existing information systems and networks in the region.

Several international and national organizations in Africa are establishing information systems and networks. For instance, PADIS, International Livestock Centre for Africa (ILCA), and the National Scientific and Technological Information and Documentation Centre (NSTIDC) all in Ethiopia have established close contacts with a number of regional and international organizations.

Exchange of databases and records among institutions will be facilitated through the use of a common search language and database management software.

With the earlier version of Micro CDS/ISIS with single user capacity, only few users could use

simultaneously an information system developed with the software as most institutions could not provide a number of stand-alone micros with databases loaded into each of them. With version 3.0, in a network environment, the databases will be searched directly by users from linked terminals. This means the number of end-users directly interfacing with the system, will increase.

Unesco is distributing Micro CDS/ISIS free of charge. As indicated earlier, CDS/ISIS is widely used for information storage and retrieval in Africa. As version 3.0 of the software has a networking feature which can be used to exchange information in a network environment, the software is likely to be used even more extensively in Africa in the future.

International information programs, such as the Pan African Development Information System (PADIS) are developing in-house databases using CDS/ISIS software package and they organize training in the use of CDS/ISIS in library, documentation and information centres in Africa. ILCA also offers training in the use of CDS/ISIS. At the regional School of Information Studies for Africa (SISA) of the Addis Ababa University in Addis Ababa, CDS/ISIS is one of the softwares introduced to students. International and regional databases such as AGRIS of the UN Food and Agricultural Organization (FAO), LILACS of Pan-American Health Organization (PAHO) are available on

CD-ROMs as CDS/ISIS databases. In general, in Africa over 200 centres have the Micro CDS/ISIS software package.

1.2.2. Problems of End-users with Online Database Searches

Information storage and retrieval systems in general have until now remained almost entirely in the hands of trained intermediaries, as the command languages and database structures are complex and require training to master them. With the increase in the number of databases and online search systems, users no longer accept that the intermediary can only be involved in the search process. They want participation and facility in the information search and retrieval activities. In fact with users' informed participation in the retrieval process, the retrieved records are found to be more relevant to users' interests.

Nevertheless, with many software packages the problem of user interface exists. With online information retrieval systems and services, Lancaster 1979, Gerrie 1983, Houghton 1984, Husain & O'Brien 1992 and many others, have reported on several search/interface problems.

Some of these findings are relevant to searching in local databases especially in a network environment.

For example:

(a) The search language, the use of Boolean and other operators, the search strategy, the use of vocabulary control tools, such as, thesaurus, etc associated with different databases that are networked or down loaded on to a database are not easily understood by end-users to ensure efficient and effective searching, without the help/guidance from the information system or an intermediary.

(b) Even in local area networks and in information systems of an institution, several databases of similar type (e.g. bibliographical) and of different types (e.g. numerical, factual, referral etc) may be accessible to users. Without a knowledge of the content, coverage, updates, etc. of the databases end-users may not be able to select the databases more relevant to their different information needs and thus fail to derive optimal benefit from the system. Therefore, users need to be provided with a facility to select databases(s) with reference to their respective needs, at the moment. This is an aspect of user-friendliness.

The problems of online searching identified in Fenichel's study may be summarized as follows (Fenichel 1980-1981):

1. Approaches to searching vary considerably, from one searcher to another even on the same system and

database.

2. Major problems of most searchers are with the search strategy and not with the mechanics of the retrieval system.

3. Many searchers perform simple searches and do not browse the retrieved references to check the adequacy of a search formulation or to improve a search; that is, they do not make full use of online interactive facilities.

4. The online search process tends to be sensitive to many factors in addition to the skill of the searcher and the nature of the question.

In general, it is difficult to use online search services optimally and competently because of:

- the large number of databases available, there are a large number (about 580 in 1990) of commercially supported online search services offering close to 5000 publicly available databases, produced by some 1800 database producers, containing several millions of records. Therefore, there is difficulty in selecting the

databases likely to be most productive with reference to a specific information need.

- the overlap and duplication among the databases offered by different search systems: Overlap and duplication in respect of coverage of subject areas

offered by different search systems exists. For example, it is known that nearly 50 percent of the material covered by Exceptional Child Education Resources also appear in ERIC database. The Toxicity Bibliography of MEDLINE is included in TOXLINE. There may be differences in the subject index terms selected if overlapping databases or segments are produced by different online services.

- the variability among query languages,
- the variability within query languages when different versions of the same language are available at the same time, and

- the variability between databases and index languages including different versions of the same language.

- inadequacy of Boolean based searches
- difficulties in using weighted, ranking, etc. of output with some of the databases,

- non-availability of built-in control vocabulary with some of the database and services, and

- restrictions in formulating users own output format(s).

In respect of subject access in OPAC's (Online Public Access Catalogue), Larson cited in Husain and O'Brien (1992) points out that there are two problems

that users suffer from during an online access process. Not all subject searches are one hundred percent successful. They result sometimes in no retrievals or 'too many' records, so much so that users are discouraged to proceed further. And this is called 'search failure' and 'information over load' respectively.

Thus, success of an online information search and retrieval from databases can be affected by a number of factors.

1.3. USER-FRIENDLINESS

User-friendliness is associated with systems which are easy to learn and easy to use, particularly for the novice computer user. The Dictionary of Computers and New Information Technology defines user-friendliness "as a system with which relatively untrained users can interact easily," (cited in Perera, 1992). Hancock-Beaulin (1992) pointed out that user-friendliness is a notion which emerged with the advent of microcomputer and spread of information technology in many different types of uses. Kemp cited in Perera (1992) indicates that " user-friendliness is not an absolute concept but a relative one, it relates to individual user" and that " user-friendliness for interface as a whole and for their various components, is achieved when inexperienced users

find that they make the systems to which they are attached simple and easy to use, when experienced users are able to use them quickly, without having to enter redundant information and when they can give complex instructions to do complicated things". Therefore, user-friendliness is not an inherent characteristic of the software but a way in which each individual user experiences it.

Users fall into three categories depending on their experience of using the software: the novice, the intermediate and the experienced. A system can be called user-friendly if it satisfies all these categories of users by providing different interaction levels for them. Micro CDS/ISIS does not have this feature. It assumes that the user has a prior knowledge of the suitable replies for certain system prompts. Perera(1992) concluded her evaluation of Micro CDS/ISIS by saying that "Micro CDS/ISIS does not provide user instructions properly and the limited amount of instructions provided are not sufficient even for the intermediate and experienced users" .

However, many institutions in Africa are and will be developing inhouse databases and information retrieval facilities using micro CDS/ISIS (PADIS 1988,1990). There is thus a need to examine the problem and find solutions.

The present study, attempts to improve the user-

friendliness of Micro CDS/ISIS software such that end-users can easily learn to use it with minimum guidance /training.

1.4. SCOPE AND LIMITATION OF THE STUDY

The scope of the study is restricted to search and retrieval option of the Micro CDS/ISIS software package. Among the various levels of users (novice, intermediate and experienced) of the software, the interface programs cater to the needs of all the three levels.

Since operating system commands may be different from one computer system to another, the interfaces need some functions before running the interfaces. But the interfaces can run successfully in VAX versions and PC version 3.0.

The type of users in mind in the preparation of the interface facilities are : end-users and library and information professionals using Micro CDS/ISIS. For this purpose, the study will be developing interfaces using CDS/ISIS Pascal for search and retrieval facilities. The interfaces will be largely menu-driven.

This study uses Micro CDS/ISIS version 3.0 and its Pascal interface facilities. However, with some modifications the programs could be successfully run in version 2.3.

1.5. SIGNIFICANCE OF THE STUDY

Computer use for information retrieval purpose is inevitable and can not be ignored. But Africa is lagging behind in the use of computers in information storage and retrieval. It is only recently that African institutions especially libraries and documentation centres have begun to use computers (micros) in database development and information storage and retrieval. Because of this, there are not enough qualified personnel who can take up responsibilities to use and develop software packages. However, Micro CDS/ISIS, a proven DBMS package for handling structured textual database developed and distributed free of cost by Unesco to not-for-profit organizations in developing countries, is now being used in a number of centres in Africa. Improving the user friendliness of the Micro CDS/ISIS will therefore mitigate the problem of shortage of information professionals. The interface will thus encourage the development and facilitate the use of information storage and retrieval systems in Africa.

The study will, in general, benefit CDS/ISIS users by introducing new facilities which are not available with the standard Micro CDS/ISIS software package.

The study will also contribute to the improvement of future versions of the Micro CDS/ISIS package.

CHAPTER TWO

A REVIEW OF MICRO CDS/ISIS SOFTWARE

2.1 DEVELOPMENT OF MICRO CDS/ISIS

CDS/ISIS, 'Computerized Documentation System (CDS) Integrated Set of Information Systems (ISIS)' is a software package developed and distributed by Unesco (the United Nations Educational, Scientific and Cultural Organization) to non-profit organizations free of charge. The software is based on the program of the same name, developed initially in 1965 by ILO (International Labour Organization) and intended for IBM mainframes.

ILO offered the mainframe version to the International Development Research Centre (IDRC), Canada. IDRC developed a minicomputer version of CDS/ISIS, the MINISIS, for use on HP 3000 series of minicomputers. CDS/ISIS mainframe version was given to Unesco who developed it exclusively. Besides, Unesco, over 200 international organizations and large libraries and documentation centres use the software. When the use of microcomputers in library and documentation centres spread in the 1980's, Unesco developed a microcomputer version of CDS/ISIS, especially for use by developing countries' institutions. Version 1 was released for

general use in Dec., 1985; version 2.3 in march 1989; modified version 2.32 Sept., 1989 and version 3.0 late 1992.

2.2. GENERAL FEATURES

Micro CDS/ISIS is a generalized system designed for the computerized management of structured textual databases.

CDS/ISIS enables the user to: Build, Manipulate, Maintain, Manage and Retrieve records from structured textual databases.

In particular CDS/ISIS enables the:

- Defining of databases containing user selected data elements
- Entering new records into a given database
- Modification, correction, and deletion of records in a database
- Automatic creation of fast access files, e.g. the inverted file (index file) for any or all of the fields (data elements) in a record in each database using eight different indexing techniques
- Retrieval of records from a database using simple or complex (including Boolean and other operators) search expressions
- Displaying the list of terms in the index file

facilitating selection of terms to formulate search expressions

- Displaying the number of hits for each component of the search expression
- Re-execution of earlier search expression in the same or another database (resident in the same directory)
- Displaying of records according to user defined formats
- Sorting of retrieved records in desired sequence(s)
- Printing out entire database or retrieved records
 - . partial or all the retrieved records and/or
 - . indexes of a data base
- Exchanging or merging of records of two or more data bases that are in compatible formats (eg. ISO 2709 format).

Version 1 of the software, released in Dec. 1985, consisted of a set of six programs which functioned separately. Subsequently, further modifications and changes have been incorporated on the basis of feed back from users. A major innovation was introduced in version 2.3 released in March 1989, in which all programs used to manipulate different tasks were integrated and a main menu (See Fig. 1) was provided to access these different functions. (eg. data entry, searching, printing, etc.)

Micro CDS/ISIS - Version 2.3

- C - Change data base
- L - Change Dialogue language

- E - ISISENT - Data entry services
- S - ISISRET - Information retrieval services
- P - ISISPRT - Sorting and printing services
- I - ISISINV - Inverted file services
- D - ISISDEF - Database definition
- M - ISISXCH - Master file services
- U - ISISUTL - System utility services
- A - ISISPAS - System utility services
- X - Exit(to MSDOS)

?

Micro CDS/ISIS -(C) Copyright Unesco 1988

Fig. 1. CDS/ISIS main menu

The number of records in a database has increased to 16 million within a limit of 500 MB. New and powerful features have been added to the formatting language, for example record linking facility.

The system restrictions currently in effect are:

Maximum number of data bases	Unlimited
Maximum number of records in a data base	16 millions
Maximum record size	8000b
Maximum number of fields(defined in FDT)(excluding repetitions of repeatable fields)	200
Maximum number of FST lines	200
Maximum field size	8000b
Maximum number of fields in a worksheet page	19
Maximum number of pages in a worksheet	20
Maximum size of a display format	8000b*
Maximum number of stopwords in stopword file	799
Maximum number of identifiers in an ISIS Pascal program	200
Maximum number of instructions in an ISIS Pascal program (including all programs called in by a USES statement)	10000
Maximum number of loaded programs	10
Maximum number or real constants	200
Maximum Pascal Run-time stack	2000
ISIS Pascal dynamic string area	16932
Worksheet work area size	3kb
Maximum Hit record size	4000*
Maximum number of characters per field	8kb
Maximum number of indexes	1
Maximum number of indexed characters per term	30
Maximum Number of laterals	132b
Maximum number of sort keys	256
Maximum number of characters in search expression	250
Maximum number for a field tag	32,767
Maximum number of printed characters in a single page	300
Maximum length of a pattern type field	20b
Maximum field length in a worksheet	8000b
Maximum length of the name of a database, display format and worksheet	6b
Maximum length of a field name in FDT	30b

* Changes in Version 3.0

Table 1 System restrictions in effect on version 3.0.

Version 2.32 was released in Sept 1989 and version 3.0 (the present version) was released for public use late 1992 which eliminated some bugs noticed in the earlier version and the sorting and indexing have been made faster.

2.3. MICRO CDS/ISIS VERSION 3.0

Version 3.0 provides a facility for local area network support i.e. simultaneous access to a given database by several users for searching and data entry. As indicated in version 3.0 manual for Micro CDS/ISIS, the network facility works on most types of networks. It has been tested on Novel, 3COM and Banyan VINES networks. In version 3.0, a facility has been introduced to change network facility of particular database. Record locking is available only for PC version.

In order to enhance the capacity of the Micro CDS/ISIS expanded memory support has been provided. This facility allows the user to increase: the number of instruction in CDS Pascal, format work areas, CDS Pascal string work area, CDS Pascal Run-time stack. New formatting techniques in formatting language and Pascal interface has been also introduced.

Generally, Micro CDS/ISIS version 3.0 allows to build and manage an unlimited number of structured databases. The database can be manipulated in various ways as indicated in section 2.2. above.

The operation to be performed are chosen from the main menu by typing a single character. A selected menu option may ask the user for additional data to complete the request or display another menu or perform some

function. CDS/ISIS is a multilingual software. Menus and prompts may be displayed in any of the given languages (English, French or Spanish). Versions in East European languages, Chinese, Amharic, and 15 languages of India are available. A Vax version and Wang version can also be obtained.

Information in CDS/ISIS is stored in a database in the form of records. Records can be structured into a set of fields, which in turn can consist of sub-fields. The data of fields can be composed of characters, numbers or a combination of both. Not every field in every record must receive a content. A particular field can be present more than once in the same record, which is then called a repeatable field. This also applies to sub-fields within a field. Each record entered in a database is automatically assigned a number by CDS/ISIS, called the master file number (MFN). Fields are identified through tags. A tag is a numeric code. A field is also assigned a name or label.

The CDS/ISIS system consists of a number of files each of which has a distinct purpose. The CDS/ISIS files are broadly classified into: System files and Database files. The system files are common to all CDS/ISIS users while the database files are not. For details refer the Mini-Micro CDS/ISIS Reference Manual.

The Main component of CDS/ISIS is its menu system, which allows to call the various services. However, in order to manage and operate a database a number of techniques, such as, the search language and the formatting language must be known to a user. In addition to these system features, CDS/ISIS provides for programming facility through its pascal interface. CDS/ISIS pascal is used to develop applications which are not readily available in the standard package, or, customize the existing features. CDS/ISIS Pascal facility consists of a compiler, an interpreter and a library. The compiler produces a pseudo-code which is then executed by the interpreter. The executable code is machine-independent, and application programs written in CDS/ISIS Pascal are portable across computers on which CDS/ISIS can be operated.

2.3.1. Version 3.0 New Features

Micro CDS/ISIS version 3.0 provides new features and facilities. Some of these are mentioned below. For other details, the user should refer to the READ.ME file provided with the software package.

1) Local Area Network (LAN) support

Version 3.0 provides simultaneous access to a given database by two or more users for both searching and data entry in a LAN environment on Novel Netware and other network software. However, certain functions, such as master file backup/restore, inverted file update or import operations may only be performed if no other user is writing to the database. Micro CDS/ISIS provides appropriate locks to prevent this from happening. Likewise, the system will not allow modification of a record which is already being modified by another user at the same time. To operate in LAN mode, parameter 14 in SYSPAR.PAR or parameter 10 of DBN.PAR, should be set to appropriate value (see section 2).

2) New Parameter in SYSPAR.PAR File

Version 3.0 provides a facility to redefine the graphic characters for boxes of type 1 (single lined box) and 2 (double lined box) by modifying parameter 11 and 12 respectively.

Parameter 13 has been introduced to control Expanded Memory Support (see section 5 below.). As mentioned above parameter 14 has been also added to control network support.

3) DBN.PAR

Like SYSPAR.PAR file, a new parameter, parameter 0 has been introduced for DBN.PAR file. It may be used to change the value of parameter 14 of the SYSPAR.PAR file for a particular data base.

4) Record Locking (PC version)

To allow simultaneous updating of a database by more than one user, CDS/ISIS uses three types of locks. These are: Data entry lock, Exclusive write lock and Record lock.

For instance, in the database definition (ISISDEF) option:

L - Change dialogue language
C - Define a new data base
U - Modify data base definition
I - Re-initialize data base
R - Unlock data base
X - Exit

Fig. 2. CDS/ISIS Database Definition sub-menu

On selecting option R, the system displays at the bottom of the screen,

D - Data base locks R - Record lock X - Exit

5) Expanded Memory Manager and System Restrictions

Expanded Memory Manager (EMM) if installed is supported in version 3.0. It is used to expand the amount of memory available to the software.

The system restrictions affected when there is EMM are shown in the table below:

	Without EMM	With EMM
Maximum number of instructions in ISIS Pascal program (including all programs called in by A USE statement)	10000	16383
ISIS Pascal Run time Stack	2000	16000
ISIS Pascal Dynamic String area	16932	49500
Format Work Area	8000	32767

Table 2.: System Restrictions affected by EMM

The worksheet work area which was 2000 in version 2.3 has been increased to 3000 in version 3.0 and the maximum hit size which was 510 in version 2.3 has been increased to 4000 in version 3.0.

6) Exit to DOS

A facility to execute DOS commands in any menu is supported by pressing F6 in version 3.0.

7) Formatting Language

New formatting language commands have been introduced which should only be used in formats for printing. For example, NC(n) to move to New column and NP(n) to move to new page.

8) New Indexing Technique in FST

In version 3.0 new indexing techniques which allow specifying a prefix for search terms extracted with indexing techniques 1,2,3, and 4 are provided. These techniques are numbered 5,6,7 and 8 respectively.

9) Display Dictionary (Option T in Search Menu)

Previously paging backwards was not possible. In version 3.0, <PgUp> key may be used to page backwards up to 50 screen pages from the last key selected with the T command.

10) New Option to Convert Hit File to Master File

A new option (H) has been added to the print menu, which allows to load a hit file to a master file. This option is useful for producing certain types of indexes

which were impossible to obtain with version 2.3, such as the use of different subfields of the same repeatable field in different sort keys.

11) New Messages

New messages have been introduced to allow a language dependant response and some messages have been modified in this version.

12) CDS Pascal

Procedures and Functions in CDS Pascal language have been added and some are modified in Version 3.0. The Procedures and functions are:

ASSIGN*	NPOSTS
READ*	SYSVARS
READLN*	SYSTEM
INKEY*	GETMFN
SCROLL	KEYPRESS
MAXSET	SUBMENU
RECALL	COPYFMT
EDITMOD	COPYSCR
OCCSEP	SCREEN
KEYDEF	COPYSTR
FLUSH	WSNAME
FLDTAG	

* Modified in version 3.0.

In addition to the procedures and functions, there are also some modifications in declaration statement,

i.e. ARRAY of String has been introduced. In the previous versions, bugs existed (e.g. Menu jump keys, entering longer records, range of MFN, calling a program). Some of them have been fixed in version 3.0

2.4. CDS PASCAL

Micro CDS/ISIS offers an integrated programming facility allowing the development of specialized applications and/or the functional extension of the original software. The programming language is known as CDS/ISIS Pascal also called CDS Pascal or ISIS Pascal.

The CDS/ISIS Pascal is based on the standard Pascal programming language. The specificity of CDS/ISIS Pascal is its library of predefined procedures to provide access in a convenient manner to most CDS/ISIS functions. As mentioned earlier, CDS/ISIS consists of a compiler, an interpreter and a library. The compiler produces a pseudo-code which is then executed by the interpreter. The executable codes are machine-independent, application programs written in CDS/ISIS pascal are fully portable across the whole spectrum of computers supporting CDS/ISIS. However, there are some library procedures only available on certain computers. If portability is essential, those statements should be avoided.

The programs written in CDS Pascal must be stored in a file with extension PAS in program directory as mentioned in SYSPAR.PAR file, otherwise compiling will not be possible. To compile a program, select option A (Advanced Programming Service) from the main menu of CDS/ISIS and type C and name of the program file, at the prompt then press <ENTER> key.

The executable code created by CDS/ISIS compiler is stored in a file with extension PCD using the name of source file in the program directory.

CDS Pascal deviates from standard Pascal in some ways. Unlike the standard pascal, the CDS/ISIS Pascal does not support CONST and TYPE declarations and Exponent notation is not supported. ARRAY bounds must be integer constants and lower bound must be 1. Array constant is not supported in CDS Pascal. All variables must be declared in a 'VAR' clause before they are used.

CDS Pascal statements follow the standard Pascal syntax except some specific restrictions. Procedures and functions for Real and String are supported in CDS Pascal but Array functions are not.

The CDS Pascal library contains a collection of pre-defined procedures and functions which can be classified in two broad categories: General and CDS/ISIS procedures. As used in developing the interfaces the following pre-defined procedures and functions are currently available

in CDS Pascal Version 3.0. Those marked with an asterisk are new features introduced in version 3.0.

1. General Procedures and functions

a. Screen management

ATTR	Set screen attribute
BOX	Draw box
CHATTR	Change screen attribute
CLEARBOX	Clear box
CLEARDATA	Clear data area (lines 1- 21)
CLEARLN	Clear line
CLEARMSG	Clear message area (lines 22-24)
CLEAR	Clear screen
CURSOR	Set cursor position
GETCC	Get Cursor position(column)
GETCL	Get Cursor position(line)
PAGE	Select active page
SAVESCR	Save active page
SCROLL*	Scroll window(box)
COPYSCR*	Copy content of a screen
SCREEN*	Store content of COPYSCR in buffer

b. Keyboard management

AUTOTYPE	Simulated keyboard input
INKEY	Single character input(with echo)
KBDKEY	Single character input (without echo)
DEFKEY	Define function key
KEYDEF*	Get key definition value
KEYPRESS*	Get Keyboard status

c. Type conversion

CHR	Convert real to character
ENCINT	Convert real to string (integer)
ENCREAL	Convert real to string
ORD	Convert character to real
VAL	Convert string to real

d. String utilities

POSITION	Find position of string
SIZE	Size of string
SUBSTR	Substring
UC	Convert to upper case
COPYSTR*	Copy string to another

e. Miscellaneous

ASSIGN	Assign file name
DATESTAMP	Get date and time
FILEEXIST	Check existence of file
EXEC	Execute another program
SYSTEM*	Execute VAX/VMS or DOS command

2. CDS/ISIS procedures and functions

a. System

LANG	Current language
MENU	Display system menu
MSGTEXT	Get system message
MSG	Display system message
PATH	Get path definition in SYSPAR.PAR or DBN.PAR
SETLANG	Set dialogue language
SYSVARS*	Modify or display system settings
SUBMENU*	Get submenu internal option identifier

b. Database

CLOSE	Close data base
DBN	Current data base name
LOCK	Lock data base (VAX only)
MAXMFN	Next MFN to be assigned
OPEN	Open data base
UNLOCK	Unlock data base (Vax only)

c. Master file

CREATE	Create new record(interactive)
DELETE	Delete record
FIELDN	Find field number
FIELD	Get field contents
FLDADD	Add field
FLDCHA	Change field
FLDDEL	Delete field
FLDMOD	Modified field
FLDREP	Replace field
MODIFY	Modify record structure
FIELDS	Number of fields in record
FLDTAG*	Get field tag
GETMFN*	Get master file number(MFN)
RLOCK*	Lock master file record
RUNLOCK*	Unlock master file record
NOCC	Number of occurrences of field
RECORD	Get master file record
UPDATE	Update record
OCCSEP*	Get repeatable field separator

d. Inverted file

DELTERM	Delete dictionary term
FIND	Get dictionary term
NXTPOST	Get next posting
NXTTERM	Get next dictionary term
POSTING	Get posting component
UPDIF	Update inverted file
NPOSTS*	Get number of postings for a dictionary term
SHOWDICT*	Display search term dictionary

e. Searching

NXTPOS	Get MFN of next record retrieved
SEARCH	Execute a CDS/ISIS search expression
SETPOS	Get MFN of retrieved record
MAXSET*	Get number of search expressions submitted
RECALL*	Get previous search expression component
FLUSH*	Delete search expressions submitted

f. Formatting

FMTNAME	Current format name
FORMAT	Execute display format
GETFMT	Define display format
LINES	Number of lines produced by FORMAT
NXTLINE	Get next line produced by FORMAT
COPYFMT*	Copy current format

g. Editing and data entry

DATAENTRY	Edit a worksheet page
DUMMYREC	Establish a dummy record
EDIT	Edit a string through the CDS/ISIS field editor
WORKSHEET	Select worksheet
EDITMOD*	Get edit mode
WSNAME*	Get current worksheet name

For detailed explanation see Mini-Micro CDS/ISIS Reference manual.

CHAPTER THREE
INFORMATION STORAGE & RETRIEVAL SERVICES:
LITERATURE REVIEW

3.1. USE OF COMPUTERS IN ONLINE SERVICES

The accumulation of information over the years has reached a proportion that its storage and retrieval in response to users' queries cannot be efficiently and effectively handled by manual methods. The amount of information in some major subject fields is increasing exponentially. For example 3.5 million chemical abstracts were published from 1907 to 1966 (60-year period); on the other hand, from 1967 to 1982 (15-year period), 5.5 million abstracts were published (Rao 1990). The timely handling of information in the face of such rapid rate of growth in the number of records necessitated the extensive use of electronic computers.

Computers were first used for the purpose of information storage and retrieval in the early 1960's. The first public demonstration of online bibliographic or text searching were conducted in 1960 with the System Development Corporation's (SDC) interactive system known as Protosynthex, using a full-text approach to the contents of the Golden Book Encyclopedia. And then

Lockheed demonstrated in 1964 using its own online system known as CONVERS, with an inhouse library database. In 1965, the TIP online search system was demonstrated at the Massachusetts Institute of Technology (MIT) using project MAC time-sharing system and a file of 35,000 citations to physics literature. Following these demonstrations, SDC and Lockheed went on to establish the well known ORBIT and DIALOG online database services. DIALOG and ORBIT services offer almost instant access to citations to published literature in a number of subject fields, from remote locations, via telecommunication networks, eliminating much of the manual searching. Several software programs were also developed, one of these being IBM's STAIRS (Storage and Information Retrieval).

The European Space Research Organization's (ESRO), Space Documentation Service (SDS), established in 1965, was one of the first facilities in Europe to provide online search services especially to institutions in Europe. The software used was called RECON.

In the UK the Department of Industry's DIALTECH service began to make available dial-up access to RECON databases in october 1970. After the foundation of the European Space Agency (ESA) in 1975, the RECON software was replaced by QUEST programs in the Information Retrieval Service (IRS). There are now a large number of

online database services and information retrieval softwares available world wide. Nieuwenhuysen (1991) listed some of the major software packages for information storage and retrieval purposes: Assassin, Bib-Search, BRS/SEARCH, Cardbox-plus, CDS/ISIS, Cormorant, Finder, Freebase, Headfast, Inmagic, Marcon, Notebook II, Persona, Librarian, Polydoc, Prodoc, Pro-Cite, Questel, Status, Strix, Superfile, Texto, TINman/-TINlib, and VUBIS.

The software programs for information storage and retrieval purposes were first developed for mainframe computers. In the 1970's and 1980's mini and microcomputers entered the scene. Local databases were developed in a number of institutions. However, searching was done mostly in batch mode, i.e. a number of queries were run at a time offline to the users who requested for information. This was generally replaced by online access from remote terminals providing for direct interactions of users with the computer database system. Such interactions, were carried out by information intermediaries on behalf of end users (the ultimate users of the information). As indicated by ECHO (1990), currently there are about 3000 databases worldwide that are accessible from Europe, and it is estimated that about 90 percent of the usage is made by intermediaries and not by the end-user himself/herself.

3.2. NEED FOR END-USER INTERFACE FACILITY

Traditionally, online searching has often been carried out by librarians/information professional intermediary on behalf of end-users.

Considerable effort and money have been invested in the development of the search/system interfaces in order to build versatile systems that are efficient and flexible, through a stepwise simplified communication with the retrieval program, by a variety of searchers with different backgrounds, experience, and needs. (Gerrie 1983)

To an increasing extent, both the database producers and service suppliers in the economic, financial and legal fields, are marketing their services directly to end-users. (Chorofas 1986).

By developing a 'user-friendly' software they are endeavouring to encourage the end-user himself/herself to interact with the database directly rather than to use the service of an intermediary in a library, information centre or information brokers. (Chorofas 1986).

Several online information retrieval systems have been also been developed that are accessible directly by the end users (Patricia 1984, Marchionini 1992, Tenopir 1984, and many others).

Due to the widespread use of microcomputers for different purposes by specialists in various fields who are not professionals in data processing, the need to make the use of computer systems convenient and comfortable for such users has become an important research topic. The research and development efforts toward developing user-friendly interfaces have born some fruits.

Some of the research and development activities focused on end-user searching are: the Individualized Instruction for Data Access System (IIDA) development at Drexel University by Charles Meadow, aimed at designing a computer intermediary to train and assist end-user to search bibliographic databases. Tests of this system indicate that using the interface, end-users can do bibliographic searches that are as satisfactory as those performed by intermediaries (Patricia 1984). Another development is the TRAINER system developed at the University of Pittsburgh, designed to teach infrequent users to search bibliographic databases without the aid of an intermediary. There are also others, such as, BRS's AFTER DARK, DIALOG's KNOWLEDGE INDEX, etc, which assist end-users search directly (Patricia 1984).

Software packages have also been developed by online services to assist and train end-users. Some of these are: "Discovery" by DIALOG, and those provided by the

European Communities Host Organisation (ECHO): Sherlock, GENIOS, QUASIMODO, etc. Users of online services have also developed simulation software, computer-aided instructions and computer-aided learning (CAI and CAL) packages. TESS for DIALOG from the University of Sheffield, QUESTSIM for ESA-IRS from Chalmers University of Technology (Gothenberg) are examples. On the other hand, software package developers provide built-in assistance (eg. ASSIST in DBASE III & IV, and similar facilities in INMAGIC).

3.2.1. Micro CDS/ISIS

Until the release for public use of version 3.0 of Micro CDS/ISIS in late 1992, the software, though widely distributed to several thousands of institutions in developing countries and in Europe, has been used in the stand alone single user mode. Searches were made mainly by information intermediaries.

Unesco distributed a demo package (ISISDEMO) intended to create better awareness of the features and capabilities of Micro CDS/ISIS. A tutorial package developed by F.J. Devadason (University of Papua New Guinea), using a story-board like software is intended for use as a CAI/CAL facility for Micro CDS/ISIS. The International Centre for Living Aquatic Resources

Management (ICLARM) in Manila, developed a program to assist in formulating display specifications (ICLARM Personal communication). Several utilities, mostly using CDS/ISIS pascal, are available, again to assist in the design and development of databases, data entry, global editing of records, generation of output reports, services, etc. (Example: NEWDB, GDE, GMODE, GLB, QUICK and its modified version, SHOW, REPORT, NEWSDI, ILOAN, etc).

There have, however, been very few attempts at providing end-user interface at the search and retrieval stage. Sreelatha and Aparna (1992) modified the TEXT.PAS program to develop INFRET.PAS that lists database names and fields of the selected database facilitating database and search field selection in free text searching. Neelameghan (1991) used a modified THES.PAS program to enable end-users to navigate from a broad area to the specific concepts of interest to them in a specialized field to formulate search expression(s). This has been applied to an information system to support urban planning (Unpublished). As mentioned earlier, Micro CDS/ISIS version 3.0 enables direct interaction of several end-users from different terminals with databases simultaneously in a network mode, it is essential to provide interfaces to make the search and retrieval in Micro CDS/ISIS databases convenient and comfortable.

CHAPTER FOUR

METHODOLOGY

4.1. APPROACHES TO IMPROVING END-USER INTERFACE

Studies have been undertaken to remedy the problems of user interface with online systems. For example:

- Providing assistance in the form of a thesaurus or thesauruses like facility to improve information retrieval services.
- Improving searcher/system interface to improve user-friendliness of the system.
- Developing a common command language.

The European Communities Host Organization (ECHO) solutions to user interface include:

- providing training and awareness services and supporting materials in order to teach the basics.
- Menu searching (menu searching avoids the need for the end user to learn commands, as it displays on any screen a number of meaningful options to guide the user to a successful search result).
- solution offered by AI (Artificial Intelligence) incorporated/associated with the information retrieval system.

4.2. METHODS

A menu-driven system provides options to make a selection. Such a system is easy to use even though it is not flexible in the sense that it is restricted to a limited number of options. On the other hand, command mode is much more flexible providing a larger number of options. Some systems (like BRS's After DARK, Compuserv) use both command mode and menu-driven options. Since the study attempts to focus on end-users, menu-driven options will be used for developing interfaces.

In order to develop the interfaces, a number of Pascal programs will be written. The CDS/ISIS pascal programming language of Micro CDS/ISIS version 3.0 will be used to develop the programs.

Help and similar guidelines will also be incorporated in the interfaces so as to make the interface more user-friendly.

The program will be tested by Micro CDS/ISIS users in some sectors and the feedback will be used in the formulation of the final package, and the interface program will be incorporated into Micro CD/ISIS version 3.0.

A manual for the data/database manager and another for the end-user will be provided. These manuals can also be used in the training of information intermediaries and end-users.

CHAPTER FIVE
ADVANCED SEARCH FACILITY (SISA)

5.1. GENERAL INTRODUCTION

Micro CDS/ISIS is a menu driven package. However, most parts of the system are not convenient for end users. Perera (1992) confirms this by saying that "micro CDS/ISIS is friendly to experts but hostile to novice [end users]".

Micro CDS/ISIS does not contain help messages for information search and retrieval which makes the use of the system by end users difficult. The help could be a facility to display available databases, how to formulate search expression (e.g. combining terms using boolean, and proximity operators), for interpreting search results, and so on. These facilities may be needed by all levels of users. Perera (1992) asserts that:

"The naive users especially cannot make good use of the system unless the context-sensitive help messages are provided, but this does not mean that they are required only by the naive users, even the intermediate and experienced users sometimes require them."

Therefore, there is a need to enhance the user-friendliness of Micro CDS/ISIS. This has been attempted by developing programs written in CDS/ISIS pascal for the following facilities:

- selection of database(s),
- formulating search expression,
- searching database(s)
- displaying retrieved records,
- saving records, and
- review of search performance.

5.2. SELECTION OF DATABASE(S)

On invoking CDS/ISIS, (implementing and invoking SISA is described in Chapter 8 Manual for System Manager) the system presents the Main Menu (Fig. 1 on p.17). To initiate a search, the user presses the S option (in Information retrieval services menu). The system will ask for the name of the database to be searched. The user cannot proceed beyond this prompt for the database name, without knowing the names of accessible databases in the system and some idea about their coverage, contents, etc. Perera confirms that "the first problem which the naive user encounters when interacting with the [Micro CDS/ISIS] system is giving the database name which he/she wants to search." It is possible to pre-select automatically an oft-used database by modifying parameter 6 or 9 in the SYSPAR.PAR file.

However, if a number of databases are accessible, then the user will find it helpful to have an online

facility for listing on the screen the names of the databases and providing some information about the contents, coverage, etc of each database to select one relevant to his/her interest.

On selecting a database as provided in option C of the micro CDS/ISIS main menu, a user is likely to make error(s) in entering the name. Reentering the database name two or more times may be required if an error is encountered. Providing a simpler way of selecting a database name will prevent this from happening. In the interface, thus, simple and convenient methods of selecting a database have been incorporated (See section 5.8.1).

A database name in CDS/ISIS may consist of a maximum of six characters. The six-character name may not tell the user about the contents, coverage, etc of the database and the user may not know which database will serve his/her purpose. Along with listing of names of databases, information on each database consisting of a brief description of the coverage and content of the database needs to be incorporated. Thus, in the interface, a facility to display information on databases is provided by pressing a single key. (see section 5.8.2)

5.3. CROSS DATA BASE SEARCH

A database may contain a small number of records or none at all relevant to a user's information need. However, in order to ensure comprehensiveness of retrieval, users may need to search not only an entire database but also several databases at a time. On the other hand, the user may not know anything about the content of any of the databases relevant to his/her information need and therefore needs to search several databases in order to select a database relevant to his/her query. Thus, searching all or in one or more databases with respect to a specific information need, to identify those databases suitable for formulating search expressions; and for automatic display of the hits records for a given search in a database have been provided in the interface (see section 5.8.3 and 5.8.4).

5.4. FORMULATING SEARCH EXPRESSION

After keying in the name of a database and on selecting option S of the Information Retrieval Service menu, the user will be prompted to enter a search expression. Here, a user needs guidance in formulating search expression in CDS/ISIS search language. The user may also need to have some knowledge of CDS/ISIS search

language and its capability in order to derive optimum benefit from searching.

Guidance in selecting a particular term from the terms dictionary, combining the terms using operators, use of appropriate symbols for each purpose and, in general, the formulation of search expression needs to be provided. Free text searching is useful; however, most end-users are not aware of its availability (Perera 1992) hence a message to indicate the availability of the facility and how to use it needs to be provided.

Such guidance for end-users can be conveniently provided as an 'online tutorial'-like help facility. The text for providing such help has been incorporated so as to enhance the user-friendliness of search facility of Micro CDS/ISIS. The help text provided in the interface is presented in Annex 3. Brief on-screen guidance on search expression formulation can be obtained by hitting a single key at the time of formulating the search expression. The help cues will be displayed in a window.

In formulating search expressions end-users are likely to forget the boolean operator '*', '+' and '^' symbols since they are not normally used as the 'AND', 'OR' and 'NOT' respectively. The interface accepts both 'AND', 'OR' and 'NOT' or alternatively '*', '+' and '^'.

5.5 HITS AND DISPLAY

While search is in progress CDS/ISIS indicates the number of occurrences (posting) in the records in the database of each term of the search expression, the number of records for each term, and the total number of records retrieved. For free text searching, CDS/ISIS, displays the current state of searching, the recall value, etc. Users may find it useful to be able to interpret these hits/retrieval data properly. Appropriate notes have been incorporated in the Help option of the interface.

Micro CDS/ISIS allows the use of more than one display format for a particular database so that users may select a convenient format. When only one display format is available it is possible to select it automatically, but when a number of display formats are available it is necessary to display the available display formats for the user to select. The interface lists on the screen the names of formats for a database in use to facilitate selection.

Micro CDS/ISIS software displays several records at a time unless the content of a record is a full screen or more. It is not possible to move back to previously displayed record(s). In order to refer back to previously displayed record the user has to exit and restart the

display. This may be time consuming. The interface provides for referring back to previously displayed records, and also displaying one record at a time.

5.6 SAVING RELEVANT RECORDS

Micro CDS/ISIS provides for the saving of retrieved records for a particular query. But all retrieved records of a query may not be relevant to the user; and user may wish to select some and save in a file. Such a facility has been incorporated in the interface.

5.7. SEARCH HISTORY

Information retrieval performance evaluation is an important issue that has been discussed extensively (Vickery and Vickery 1987, Rijsbergen 1980, Davis and Rush 1979, Lancaster 1977, and many others).

Evaluation is helpful to improve the search capability of a system, and to help users in performing effective and efficient searching. In order to do this, data on the performance of the system with respect to each search needs to be collected. It may also be useful to know which option is frequently used by users in searching. A mechanism to store such performance data for

each query for each user has been provided in the interface program.

5.8. SISA OPERATION

The main objective of the study was to develop an end-user interface for search and retrieval option of Micro CDS/ISIS. SISA is an interface, written in CDS/ISIS Pascal language, providing for advanced search facility in Micro CDS/ISIS databases. It is designed to assist users in performing search and retrieval operations in CDS/ISIS databases in a convenient manner. The program consists of 23 procedures, each of which performs distinct function(s), and a main program which controls the procedures. The source code of the interface is presented in Annex 1.

The SISA interface is based on Micro CDS/ISIS version 3.0, released by Unesco in late 1992, and can be implemented on IBM PC or compatible microcomputers using MS-DOS 3.0 and above. Micro CDS/ISIS version 3.0 is a multi-user version and can be operated in a network configuration using Novel Netware, Banyan Vines, etc.

The major functions provided by SISA allow users to:

- select database(s) for searching
- formulate search expressions using CDS/ISIS search language

- retrieve records
- display records using different display formats
- save records retrieved selectively
- review search performance of each user.

SISA is a largely menu-driven interface. It executes its functions through various options in the main menu. The use of each option in the main menu is explained below.

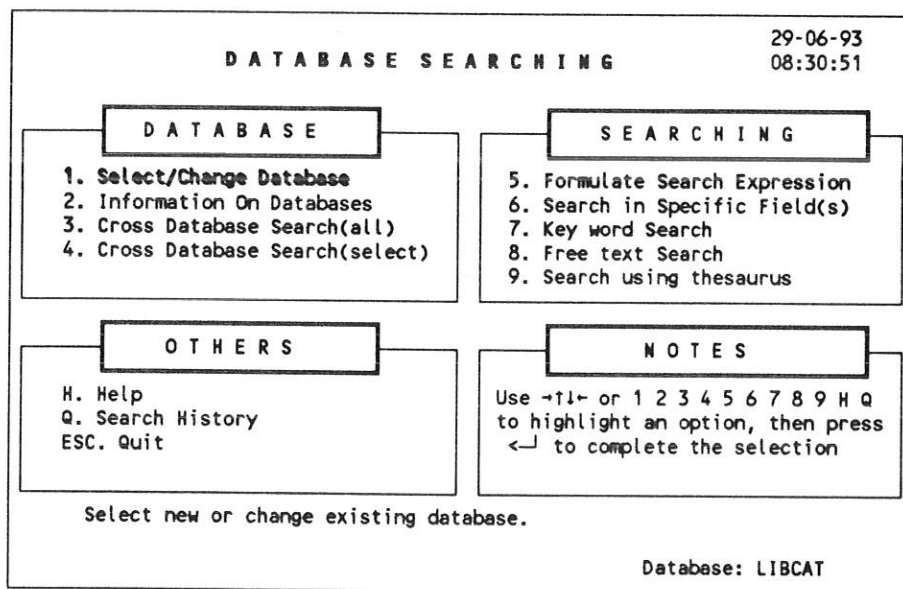


Figure 3: SISA Main menu.

As shown in Fig. 3, the main menu is divided into four major sections DATABASE, SEARCHING, NOTES and OTHERS. At the top of the screen is the heading of the main menu. The right side of the heading displays a clock with system date and time. The bottom part of the screen contains a brief explanation for the highlighted option.

For instance, the highlighted option as shown in Fig. 3 is 1, and the brief explanation of it appears at the bottom of the screen. If a database has already been selected, its name will be displayed at the right bottom of the main menu screen.

To select an option, move the cursor to highlight the option using appropriate arrow keys or pressing the option digit as mentioned in the NOTES, and then press the <ENTER> key.

5.8.1 Database Selection

Selection of a database means to open a database, that is make ready for successive operations to be performed on it. Option 1 of SISA is used to select a database or to change from a database in use to another.

Names of available databases will be listed on the screen as shown in Fig. 4. Using appropriate arrow keys the database that one is interested in is highlighted and on pressing <ENTER> key the database will be selected.

D A T A B A S E S E A R C H I N G 29-06-93
08:30:51

D A T A B A S E S		S E A R C H I N G																									
<table style="width: 100%; border-collapse: collapse;"> <tr><td>CDS</td><td>IIS</td></tr> <tr><td>OODB</td><td>PITU</td></tr> <tr><td>THESB</td><td>TMRI</td></tr> <tr><td>LIBCAT</td><td>MEDIS</td></tr> <tr><td>SERIAL</td><td>SYNDRO</td></tr> <tr><td>ABNCD</td><td>SRLS</td></tr> <tr><td>MIBIS</td><td>FORD</td></tr> <tr><td>IES</td><td>MAL</td></tr> <tr><td>PADDEV</td><td>PLAN</td></tr> <tr><td>PADEXP</td><td>CHEM</td></tr> <tr><td>RESPRO</td><td>TOXIS</td></tr> <tr><td>THES</td><td>PREMA</td></tr> <tr><td>LIBRI</td><td>PROMAR</td></tr> </table>	CDS	IIS	OODB	PITU	THESB	TMRI	LIBCAT	MEDIS	SERIAL	SYNDRO	ABNCD	SRLS	MIBIS	FORD	IES	MAL	PADDEV	PLAN	PADEXP	CHEM	RESPRO	TOXIS	THES	PREMA	LIBRI	PROMAR	<ol style="list-style-type: none"> 5. Formulate Search Expression 6. Search in Specific Field(s) 7. Key word Search 8. Free Text search 9. Searching using Thesaurus
CDS	IIS																										
OODB	PITU																										
THESB	TMRI																										
LIBCAT	MEDIS																										
SERIAL	SYNDRO																										
ABNCD	SRLS																										
MIBIS	FORD																										
IES	MAL																										
PADDEV	PLAN																										
PADEXP	CHEM																										
RESPRO	TOXIS																										
THES	PREMA																										
LIBRI	PROMAR																										
<p>Use →↑↓← to highlight an option, then press <ENTER> to complete the selection</p>	<th style="text-align: center;">N O T E S</th>	N O T E S																									
	<p>Use →↑↓← or 1 2 3 4 5 6 7 8 9 H Q to highlight an option, then press ← to complete the selection</p>																										
		Database: LIBCAT																									

Fig. 4: List of Available Database Names.

Information about the contents, coverage, etc of databases can be displayed by pressing <F1> key (see Fig. 5). This is equivalent to selecting option 2 (see below)

After selecting the database, the system will then return to the main menu to enable the selection of a search option. The selected database name will be displayed (see Fig. 3) at the right bottom corner of the main menu replacing the previously selected database name, if any. The <ESC> key may be used to quit to the main menu without selecting a database or replacing a pre-selected database.

INFORMATION ON DATABASES		
	ABNCD	Integrated database of bibliographic records, profile of institutions, of experts, of information systems and activities mainly in the fields of socioeconomic development.
	FORD	Factual information on forest divisions (Kerala, India)
CDS	IES	Description of IES museum objects
OODB	IIS	Bibliographical records on medical topics
THES	LIBCAT	Library catalogue mainly on information systems, info technology, info economy, info politics and policies, etc.
LIBC		
SERI	MAL	Similar to ABNCD
ABNC	MEDIS	Case records of hospital patients
MIBI	MIBIS	Bibliographic records on African development(PADIS)
IES	PITU	Case records of hospital patients with tumours
PADD	SRLS	Union catalogue of serials of international agri centres
PADE		
RESP	SYNDRO	Medical syndromes
THES	TMR1	Similar to PITU
LIBR	URBPLN	Factual data relating to selected Ethiopian towns
		press <ESC> to quit
		Database: LIBCAT

Fig. 5 Information on Databases (selected by pressing <F1> key while using option 1)

5.8.2. Information on Databases

Option 2 of SISA is used to get brief descriptions about the content, coverage, etc. of the databases. A screen-full of information will be displayed at a time (See Fig. 6). <PgDn> and <PgUp> keys may be used to move from one page to another back and forth. Pressing <ESC> key will return to the main menu.

INFORMATION ON DATABASES

ABNCD	Integrated database of bibliographic records, profiles of institutions, of experts, of projects, of information systems and activities mainly in the fields of socioeconomic development in Africa
FORD	Factual information on forest divisions (Kerala, India)
IES	Descriptions of IES museum objects
IIS	Bibliographical records on medical topics
LIBCAT	Library catalogue mainly on information systems, info technology, info economy, info politics and policies, etc.
MAL	Similar to ABNCD
MEDIS	Case records of hospital patients
MIBIS	Bibliographic records on socioeconomic development
PADDEV	Bibliographic records on African development (PADIS)
PITU	Case records of hospital patients with tumours
SRLS	Union catalogue of serials of international agri centres
SYNDRO	Medical syndromes
TMR1	Similar to PITU
URBPLM	Factual data relating to selected Ethiopian towns

Press <ESC> to quit

Fig. 6 Information on Databases

5.8.3 Automatic Search of Available Databases

Option 3 is used for searching all the databases in the system. This option helps in finding out how many records relevant to a specific query may be retrieved from each of the databases. To obtain such information, a keyword or combination of them in upper case or lower case representing, say, a subject interest. For example:

AGRICULTURE AND INFORMATION SYSTEMS AND AFRICA,
is typed in and <ENTER> key is pressed (see Fig. 7.)

Enter Search Expression:

EDIT: Insert F1 - Help Press <—| to continue

Fig. 7 : Search Formulation

Brief help in formulating search expression can be obtained by pressing the <F1> key (see Fig. 8).

Enter Search Expression:



Key in appropriate terms representing your information needs press <—| eg. Africa for retrieving information on Africa. Terms may be combined as follows:

- Information base or database
- information and retrieval
- Automation not library automation
- Robert or John

Terms may be truncated by suffixing \$ to the root term eg. Networks\$ which will search Network or Networking or Networks.

To execute earlier query: key in set number eg. #2

Press ESC to quit For More help use option H in the main menu

Fig. 8 Brief help in Search Formulation screen.

The system will search all the databases and display the number of hits, the search expression used, name of the corresponding database, the set number (see Fig. 9) to enable the selection of one or more databases relevant to user's interest.

SEARCH EXPRESSION(S) SUBMITTED			
<u>Set</u>	<u>Data base</u>	<u>Hits</u>	<u>Search Expression</u>
1	LIBCAT	45	INFORMATION
2	ABNCD	3	INFORMATION
3	CDS	30	INFORMATION
4	SERIAL	0	INFORMATION

[Set No.]select [M]ax [Q]uit █

Fig. 9: Cross Database Search result

Three options are shown at the bottom left of the screen: [Set No] [M]ax [Q]uit. To search in one of the databases listed, the set number is to be typed in and <ENTER> key pressed to initiate search. Selecting option M and pressing <ENTER> will initiate search in the database giving the highest number of hits for the query. Selecting option Q and pressing <ENTER> will return to the main menu.

In response to the search expression entered, the system will present a report as shown in Fig. 10. For example, for the search expression:

(CULTIVATION OR AGRONOMY) AND RICE

the report may be as shown below, for a particular database:

```

Set          1: (CULTIVATION + AGRONOMY) * RICE

P=          3 CULTIVATION
P=          3 AGRONOMY
T=          5 -#2: CULTIVATION + AGRONOMY
P=          1 RICE
T=          1 -#3:  #2 * RICE
T=          1 -#1:  #3
---> █

```

Fig. 10: CDS/ISIS Report for a Search Expression

This indicates that the term CULTIVATION occurs three times (three postings) in the database, though all occurrences may be in the same record. The term AGRONOMY has also three occurrences. There are five occurrences of the sub-expression CULTIVATION + AGRONOMY (referred to as sub-expression #2), meaning that there are five records in which one or the other of the terms occur. There is one posting for the term RICE; one occurrence of the sub-expression #2 * RICE (that is, sub-expression #2 and RICE) (referred to as #3) and one for the whole query (referred to as #1), which is identical with the sub-expression #3.

Pressing the <ENTER> key will display the retrieved record(s). If the number of hits is greater than 0 the available display formats for the database will be displayed as shown in Fig. 11 below.

Database: LIBCAT
Search expression: Information

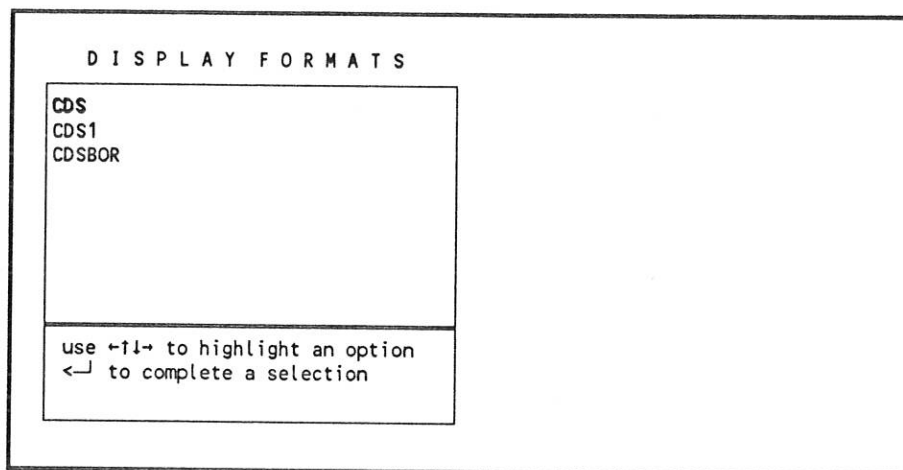


Fig. 11: List of Display Formats

To select a display format, the appropriate arrow keys are to be used to highlight a display format and the <ENTER> key pressed. Then, the records will be displayed (See Fig. 12). After displaying a record the system will request selection from one of the options shown at the bottom right of the screen. Pressing the <ESC> key will return to the main menu; pressing S key will save the displayed record in a file name of which will be required to be keyed in a box on the screen. Using <PgDn> and <PgUp> keys will enable moving back and forth through the retrieved records.

Database: LIBCAT Format: CDS
Search expression: Information

1 of 45

TITLE	: Powershift: Knowledge, wealth and violence at the edge of the 21st century
AUTHOR(S)	: Toffler, Alvin
PUBLISHER	: New York: Bantam books
YEAR	: 1990
Collation	: 611 p.; 459 ref.
SERIES	: Bantam books
ISBN	: 0-553-18052-5
KEYWORDS	: Politics; Power; Future; Information; Information technology; Mass media; Civilization
LOCAT./COPY	: GRADUATE LIB c. 1 SISA C. 1
CALL NUMBER	: 328.34 1990 Pow
ACC. NO.	: 12001
DOC. STATUS	: Book

PgDn
[ESC] to quit [S]ave

Fig. 12: Search Result Display.

5.8.4. Multiple Database Search

Multiple databases can be searched using option 4 of SISA. Option 4 may be used to search one or more specific databases preliminary to selecting database(s) for further search. A list of names of databases will be displayed as shown in Fig. 13

DATABASES AVAILABLE

- CDS	- TMR1	- CHEM
- SERIA	- MEDIS	- TOXIS
- ABNCD	- SYNDRO	- PREMA
- LIBCAT	- SRLS	- PROMAR
- MIBIS	- FORD	
- PADDEV	- MAL	
- PADEXP	- PLAN	
- RESPRO	- CHEM	

Use →← to highlight an option, press S to select,
then press <↵> to complete the selection(s)
F1 - database information

Figure 13: Multiple Database Selection screen.

Using the appropriate arrow keys the database to be searched is highlighted and pressing the S key will select. Proceeding in this manner several databases can be selected. Pressing the <ENTER> key will initiate the search process. Then the same procedure as for option 3 is to be followed. As for option 1, pressing <F1> key will display information on databases (see Fig. 5.).

5.8.5 Formulating Search Expression

Option 5 is used to formulate and submit search expression and to retrieve and display search results in one or more databases (see under options 3 and 4). On selecting option 5, the system will display the list of search expressions, number of hits, etc. for previous searches (during the current session), if any. On pressing the <ENTER> key, the system will display a blank

screen with the prompt:

Enter search Expression:

at the top left of the screen.

The search term/expression is to be entered at the position of the cursor at the top left.

Micro CDS/ISIS provides for searching using the index of terms extracted by the system from the records of databases according to prescribed techniques, and also for free text searching, that is, not using the index of terms. Formulation of search expressions according to search language of Micro CDS/ISIS can be displayed by pressing option H in the main menu (See Annex 3).

5.8.6 Search in Specific Field(s)

Option 6 is used for searching in specific field(s). Field numbers (tags) and field names for the database will be listed on the screen (see Fig. 14).

D A T A B A S E S E A R C H I N G 29-06-93
08:30:51

Tag	Field Name
12	Conference main entry
24	Title
25	Edition
26	Imprint
30	Collation
44	Series
50	Notes
60	Class Number
69	Keywords
70	Personal Authors
71	Corporate Bodies
72	Meetings
74	Added Title
76	Other language titles
80	ISBN

S E A R C H I N G

5. Formulate Search Expression
6. Search in Specific Field(s)
7. Keyword Search
8. Free Text Search
9. Searching using Thesaurus

N O T E

Use →← to highlight an option,
to highlight an option, then press
← to complete the selection

Use →← to highlight an option,
Press S to select, then press ←
to complete the selection(s)

Database: LIBCAT

Fig. 14: List of tags and field names of a database.

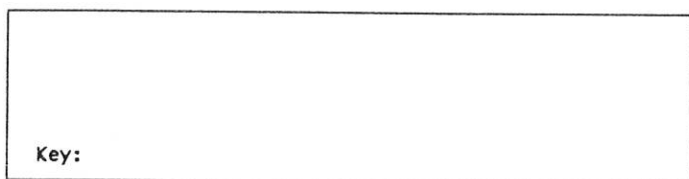
Using appropriate arrow keys the field of interest is highlighted and pressing S key will select. Proceeding the same way more fields, up to a maximum of 10, can be selected. After selecting the tag(s), <ENTER> key is pressed. The system will prompt to formulate the search expression. The procedure is the same as for option 5.

In this option free text search is not permitted. Specifying separate tags for different search terms in the same search expression is not permitted. Option 5 permits the performance of this kind of search specifying tags at the end of each term as qualifier (see option 5).

After formulating the search expression, the procedure is the same as for option 3.

5.8.7 Keyword Search

Option 7 is used to search using the list or dictionary of index terms. This is equivalent to selecting option T in the Information Retrieval Services menu of CDS/ISIS. On selecting the option the screen will be as in Fig. 15



Key:

Fig. 15 Keyword search prompt

A key term or the first few characters of the term is to be entered at the cursor position at the bottom left of the screen . A list of index terms beginning with the string keyed in will be displayed in alphabetical sequence in two columns as shown in Fig. 16.

Dictionary ListData Base Name: LIBCAT	
- ABCARIAN, GILBERT	- ANTHONY, R.M
- ACCOUNTING	- ANTHROPOLOGY
- ACTION	- ANTILL, LYN
- ADAMS, WALTER	- APPLE
- ADAPTIVE	- APPLICATION
- ADDIS ABABA UNIVERSITY	- APPLICATIONS

Fig. 16 An example of the LIBCAT database dictionary.

If there is no index term matching the string keyed in, the display will start from the next nearest term in the alphabetical sequence.

The arrow keys are to be used to move the cursor to the desired terms(s) and pressing S will select. The <PgDn> and <PgUp> keys are used to move from one page to the next on the screen. Finally, to submit the search expression, X is pressed. The terms selected will be combined by the OR operator. The expression can be edited as desired. Pressing <ENTER> key will initiate the search. The same procedure is to be followed as for option 3. Pressing Q will quit to main menu.

5.8.8. Free Text Search

To facilitate using free text search, option 8 may be used to search a string of character(s) in a database. If there is no pre-selected database, the system will automatically execute option 1. Then, if a database is

selected, list of its tags and corresponding field name(s) will be displayed as for option 6. But in this case the selection of only one field is permitted (see Fig. 17). Appropriate arrow keys are used to highlight the relevant field and pressing <ENTER> key will select.

D A T A B A S E S E A R C H I N G		29-06-93 08:30:51
Tag	Field Name	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;">S E A R C H I N G</p> <p>5. Formulate Search Expression 6. Search in Specific Field(s) 7. Key word Search 8. Free Text Search 9. Searching using Thesaurus</p> </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;">N O T E</p> <p>Use →← or 1 2 3 4 5 6 7 8 9 H Q to highlight an option, then press ← to complete the selection</p> </div>
12	Conference main entry	
24	Title	
25	Edition	
26	Imprint	
30	Collation	
44	Series	
50	Notes	
60	Class Number	
69	Keywords	
70	Personal Authors	
71	Corporate Bodies	
72	Meetings	
74	Added Title	
76	Other language titles	
80	ISBN	
Use →← to highlight an option, then press ← to complete a selection		Database: LIBCAT

Fig. 17 List of Tags and Field Names for option 8

When a field is selected, the system will prompt to type in the string to be searched,

Enter String to be searched: Information

Pressing <ENTER> key will initiate the search. The record(s) in which the keyed-in string is present in the specified field will be displayed (See Fig. 20).

```
1
TITLE      : Powershift: Knowledge, wealth and violence at the edge of the
            : 21st century
AUTHOR(S)  : Toffler, Alvin
PUBLISHER  : New York: Bantam books
YEAR       : 1990
Collation  : 611 p.; 459 ref.
SERIES     : Bantam books
ISBN       : 0-553-18052-5
KEYWORDS   : Politics; Power; Future; Information; Information technology;
            : Mass media; Civilization
LOCAT./COPY : GRADUATE LIB c. 1
            : SISA c. 1
CALL NUMBER : 328.34 1990 Pow
ACC. NO.    : 12001
DOC. STATUS : Book
PgDn
```

[ESC] to quit [S]ave

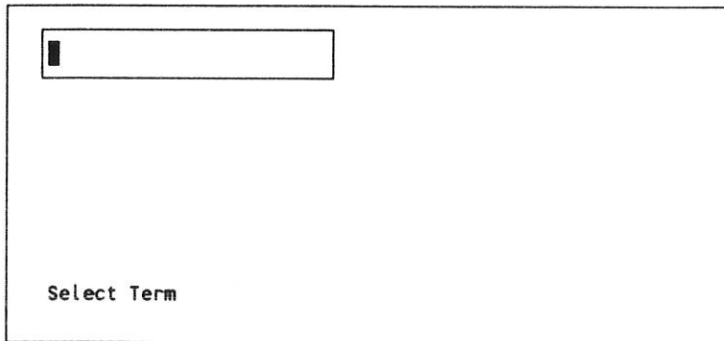
Fig. 18 Search result display for option 8

If a record is displayed, a choice among the options shown at the bottom right of the screen is possible. Pressing S will allow saving the record in a file whose name will be required to be typed in a box or in a pre-selected save file, as the case may be. Pressing <ESC> key will quit to main menu. Pressing <PgDn> key will enable display of successive records if any. At the end, the system will display "No more record exist" at the bottom of the screen. Pressing <ESC> key will return to main menu.

5.8.9 Search Using Thesaurus.

Search using a thesaurus can be performed by using option 9.

On selecting the option, the displayed screen will be:



Select Term

Fig. 19 Term select screen of thesaurus program

At the cursor position in the box, the term or the first few characters of the term representing a query is to be keyed in. A list of terms, from the alphabetical index of the thesaurus, beginning with the term/string keyed-in will be displayed. If there is no term in the thesaurus matching the term/string keyed-in, the display will be from the next closest string. Several options of THES program will be displayed at the bottom of the screen. Pressing the <ENTER> key as many times as required will position the cursor against the relevant term and pressing S key will select. The system will display the term selected along with its broader term

(BT), narrower term (NT) and related terms (RT), if any. Using the <ENTER> key as before the cursor may be positioned against any other relevant term. On pressing the S key, the system will display the new selected term and its associated BT, NT and RT. On the other hand, if the Q key is pressed, the term will be selected to formulate a search expression. In this way one can select as many search terms as necessary. Pressing the ? key will display the terms selected to form a search expression in a box at the lower half of the screen. Pressing X will exit the thesaurus; the selected terms will be combined with the OR operator and displayed at the top of the screen. One can edit to modify the term(s) and/or of the operators (see option 5). On pressing the <ENTER> key the search will be initiated, and thereafter, the process is similar to choosing option 5.

5.8.10 Review of Search Performance

Option Q is to display search history.

History of previous searches, if any will be displayed. Data on the number of hits, number of records saved, database searched, search expression, option used will be displayed along with user's ID number, address, etc. Pressing <ENTER> key will continue the display. Pressing <ESC> key returns to the main menu.

5.8.11 Help Facility

Detailed help on each of the main menu options of the interface and tutorial for the search language of Micro CDS/ISIS can be had using option H. (See Fig. 3)

A screen-full text will be displayed beginning with the first option. Using the <ENTER> key will enable moving forward. Pressing the <ESC> key will return to main menu.

5.8.12. Terminating the Session

<ESC> key or option ESC is to be used to terminate the session. The system will be back to the modified main menu of CDS/ISIS.

CHAPTER SIX

THE ONLINE CATALOGUE SEARCH FACILITY

6.1. GENERAL INTRODUCTION

Online access of catalogue database is becoming essential in libraries world-wide. In Africa, there is an increase in the use of microcomputers in libraries and information centres. A general use of microcomputers in libraries is to prepare the library's catalogue in computer readable form and to provide online access to it by end-users. Micro CDS/ISIS version 3.0, which has a network facility, can be conveniently used for such a purpose.

In searching a library catalogue, some approach points are more frequently used than others. For example: Name of personal author, corporate (author) name, conference name, title of document, class number and subject keywords. These frequently used access fields should be available for search in a computerized library catalogue as well.

As discussed earlier, the use of Micro CDS/ISIS is spreading in African libraries and documentation centres. Most libraries are likely to prepare their catalogue as databases using micro CDS/ISIS, and enabling end-users direct online access to the catalogue. This becomes quite

attractive both to the library as well as to the end-users now that version 3.0 of the software has multi-user capability in a LAN environment. However, as discussed in chapter 5 end-users will need guidance and online help in searching the catalogue. Therefore, an online interface facility, to enable end-users access the catalogue via the more frequently used approach points, has been attempted by developing a program written in CDS/ISIS Pascal.

In this interface, the catalogue database is selected automatically, obviating the need for users select the database. Major access fields, such as, author (personal and corporate), conference name, title, class number, subject keywords, have been incorporated. Help facility on how to formulate search expression, combining terms using boolean operators, for interpreting search results etc have also been incorporated. On screen brief guidance for formulating simple search expressions can be obtained by pressing a single key. Help messages to guide user to continue, quit, and the like activities have also been incorporated to facilitate end-user searching.

6.2. FEATURES OF MOPAC INTERFACE

One of the objectives of the study is to develop online access interface for search and retrieval from

catalogue databases. The MOPAC interface, written in CDS/ISIS Pascal language, is largely menu-driven, and designed to assist users in performing search and retrieval in library catalogue databases created with Micro CDS/ISIS. MOPAC is essentially intended for end-users who may not have had experience with search and retrieval operations of Micro CDS/ISIS (eg. students, researchers, teachers, etc.). The source code of the interface is given in Annex 2.

The major functions provided for by MOPAC allow users to search catalogue databases by:

- Name(s) of Personal Author(s)
- Name(s) of Corporate Body(ies)
- Name of Conference/meeting
- Title
- Class number
- Subject Keywords

USING MOPAC

As indicated regarding the program SISA in Chapter 8, MOPAC can be also incorporated and invoked from different points of CDS/ISIS system, but mainly as a menu exit. In any case, on invoking MOPAC, a main menu appears as shown in fig. 20.

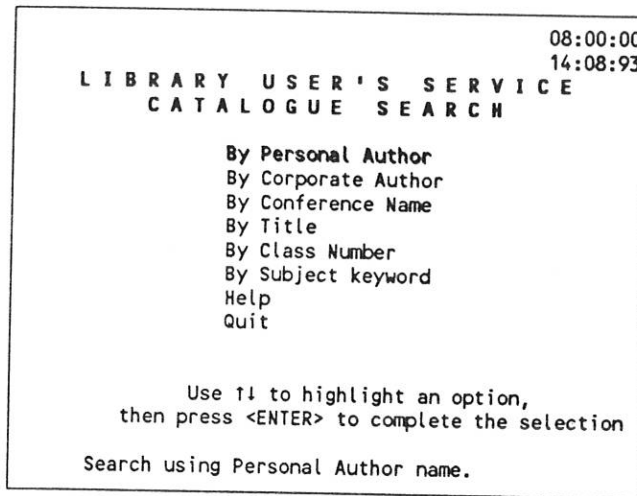


Fig 20. MOPAC Main Menu

As shown in fig. 20, the main menu contains 8 options, 6 of which are access points. At the top of the main menu screen is the heading of the main menu. The top right side of the screen displays a system date and time. The bottom part (last line) of the screen displays explanation for the highlighted option; for instance, the highlighted option is option 1 and the brief explanation of it appears at the bottom (last line) of the screen.

To select an option, as indicated at the bottom of the main menu screen, the cursor is moved to highlight the option using the appropriate arrow key (down or up arrows only), and then pressing the <ENTER> key to select.

OPTIONS 1 THROUGH 6

MOPAC provides a search capability to retrieve records by each of the options Personal Author name, Corporate Author Name, Conference Name, Title, Class Number, Subject Keyword as indicated in the main menu (Fig. 20). On selecting an option the following prompt will be displayed at the top left of the screen:

Enter Search Expression:

The search expression is to be typed in at the cursor and <ENTER> key pressed. <F1> key may be used to get a brief explanation of how to formulate search expressions (See Fig. 21).

Key in appropriate terms representing your information needs press
<↵> eg. Africa for retrieving information on Africa. Terms may be
combined as follows:
Information base or database
information and retrieval
Automation not library automation
Robert or John
Terms may be truncated by suffixing \$ to the root term eg. Network\$
which will search Network or Networking or Networks.
To execute earlier query: key in set number eg. #2

Press ESC to quit

For More help use option # in the main menu

Fig. 21 Brief help in search formulation screen.

Formulating Search Expression

The procedures are the same as described in chapter 5 section 5.8.5.

However, specific field(s) searching and free text searching are not supported by MOPAC.

After formulating the search expression, the user is required to press <ENTER> key, and then the system presents a report as explained in chapter 5 section 5.8.5.

If the number of hits is greater than 0 then, the record(s) will be displayed as shown below in the example. (see Fig. 22)

Search expression: Information Systems
Number of Documents Retrieved: 27

1 of 27

TITLE	: Application architecture - modern large-scale information processing
AUTHOR(S)	: Best, Laurence J
PUBLISHER	: New York: John Wiley
YEAR	: 1990
KEYWORDS	: Information systems; Information technology; Information processing
LOCAT./COPY	: SISA
CALL NUMBER	: 651.84 1990 App
ACC. NO.	: 12010
DOC. STATUS	: Book
LOAN STATUS	
BORROWED ON	: 93-03-25
DUE ON	: 93-04-24
BORROWER ID	: 7551
BORROWER	: Neelameghan; A

More - <CR>

Search expression: Information Systems
Number of Documents Retrieved: 27

1 of 27

STATUS	: Teacher/Professor
DEPARTMENT	: School of Information Studies for Africa
INSTITUTE	: Addis Ababa University
CONTACT TEL	: 110344
RESERVATIONS	
RESERVED BY	: Bhattacharya, G
CONTACT TEL	: 550970 (Res); 110433 (Office)

PgDn

[ESC] TO QUIT [S]AVE

Fig. 22 Search Result Display Screen.

In the above display the status of the document, that it is in circulation, and/or already on reserve by another user, is shown. In an online library catalogue such information is very helpful to the user. The record also shows the location of the document, which again is a desirable feature in an online catalogue.

After displaying a record the system offers two options, at the bottom right of the screen. Pressing the <ESC> key returns to the main menu; pressing S key will enable saving the displayed record in a file the name of which will have to be keyed in a box on the screen as shown below:

Save as:

<PgDn> and <PgUp> keys may be used to move back and forth through the retrieved records. If the displayed record is more than one screen page the <ENTER> key may be pressed to display the rest of the record.

OPTION : HELP

Option HELP may be used to get detailed help on each of the main menu options (See Fig. 20).

A screen-full text will be displayed beginning with the first option. The <ENTER> key can be used to go forward. Pressing the <ESC> key will return to the main menu.

OPTION 9: QUIT

The <ESC> key (or option QUIT) will terminate the session.

CHAPTER SEVEN
SERVICE UTILITIES

7.1. GENERAL INTRODUCTION

Usually when a database is searched, citations to documents are retrieved. The end-user may wish to obtain the original or copies of the documents cited. Libraries/information centres are expected to provide the materials either from their own collection or through interlibrary loan. In the latter case, especially if the cited item is an article in a periodical, the availability of the specific periodical issue in other libraries should be quickly checked in a union catalogue of serials and a request for interlibrary loan generated.

Current awareness bulletins and selective dissemination information (SDI) services are recognized as widely used and well appreciated services that a library/information centre can provide to its clients.

Also, when records are retrieved from databases and information products generated therefrom, it is often helpful to users if the entries are organized under subject headings, geographical/place names, etc.

With a view to facilitating the provision of these services, three programs have been incorporated with the interface. ILOAN and NEWSDI programs developed by L.J.

Haravu, ICRISAT, Hyderabad, India, and REPORT program provided by IDRC, Ottawa, Canada along with the MIBIS manual have been incorporated, to enable the library service staff provide these services.

The ILOAN program enables the entry of the bibliographical details of serials required on interlibrary loan or as photocopies from one or more libraries represented in the SRLS union catalogue of serials.

The NEWSDI program enables the generation of SDI outputs from any selected database(s) by matching user's interest profiles with the entries for documents entered in the database(s) during a given period.

The REPORT program generates various types of outputs, such as indexes, sorted outputs under various headings, using the ABNCD database, an integrated database containing bibliographic and other types of records in the field of socio-economic development.

7.2. FEATURES OF THE INTERFACES

The major functions provided by the interfaces are:

- Interlibrary loan request service
- Selective dissemination of information (SDI) service

- production of printed catalogues, indexes or the current awareness bulletin.

7.3. USING THE SERVICE UTILITIES

As indicated regarding the program SISA in chapter 8, the interfaces can also be incorporated and invoked from different points of the CDS/ISIS system, but mainly as a menu exit containing a sub-menu consisting of four options, one for each of the programs and an option to quit. The option for service utilities, option U as indicated in chapter 8, Fig. 25 (Modified CDS/ISIS main menu), is for use by the library/information centres (and may not be used by the end-users). Selecting the option (option U) enables the provision of selected services to users by executing a corresponding CDS/ISIS Pascal program. On selecting the Option U, the following menu will be displayed:

```
I - Interlibrary Loan Request
S - Selective Dissemination of Information (SDI)
R - Reports
Q - Exit to main menu
```

Fig. 23. Service utilities sub-menu

7.3.1. Interlibrary Loan Request

Selecting option I will execute program ILOAN on the database SRLS. When a user has selected relevant articles in periodicals through a search in a database(s), this program will help the library staff in identifying libraries/information centres that have the particular volume/issue of the periodical(s) in the SRLS (union catalogue of serials) database and automatically generates an interlibrary loan request. Details of the system are given in Annex 5.

7.3.2. Selective Dissemination of Information (SDI)

Selecting option S will execute program NEWSDI on a predefined/preselected database to generate SDI outputs matching users' interest profiles given in the related user profile file. The output provides for user feedback on each reference record to enable assessment of performance of the SDI services, and to modify user profiles as necessary. Details of the system are given in Annex 6.

7.3.3. Printed Outputs

Selecting option R will execute program REPORT on database ABNCD. A variety of outputs can be generated as indicated in the menu in fig. 24.

```
Request standard reports
X - Exit
or select the report to be printed:
M - Main bibliographic index      B - Current awareness bulletin
A - Author index                  U - Author catalogue
T - Title index                   I - Title catalogue
C - Corporate body index          R - Corporate author catalogue
S - Subject index                 E - Meeting catalogue
G - Geographic index              L - Order claim
O - Order
? -
```

Fig. 24. REPORT program main menu

The program is menu driven and selection of an option will automatically output the corresponding report. When requesting for a specific report, the user will be asked for the search criterion to be used.

7.3.4. Exit Option

Selecting Q will return to the modified main menu of CDS/ISIS.

CHAPTER EIGHT
MANUAL FOR SYSTEM MANAGER

The manual is intended for use by library/information/computer professionals serving as system/data managers. It is in three parts:

Part I: ADVANCED SEARCH FACILITY (SISA)

PART II: ONLINE CATALOGUE SEARCH FACILITY (MOPAC)

PART III: SERVICE UTILITIES

The manual can be used independently for learning/training about CDS/ISIS search language.

Part I describes the SISA interface written in CDS/ISIS Pascal language. SISA is a system interface search assistance program for use with Micro CDS/ISIS databases in information search and retrieval. The installation of the program and the facilities it provides are described with examples.

Part II describes the MOPAC interface written in CDS/ISIS Pascal language. MOPAC is also a system interface search assistance program for searching in online library catalogue databases developed with Micro CDS/ISIS. The installation of the program and the facilities it provides are discussed.

Part III describes three service utilities:

- 1) Interlibrary Loan Request generation
- 2) Selective Dissemination of Information (SDI) service,
- 3) Generation of Indexes, current awareness bulletin, etc.

8.1. PART I

ADVANCED SEARCH FACILITY

S I S A

A SYSTEM INTERFACE SEARCH ASSISTANCE PROGRAM

FOR INFORMATION SEARCH AND RETRIEVAL IN

MICRO CDS/ISIS DATABASES

This manual is intended for use by library/information/computer professionals serving as system/data managers. The installation of SISA program files and creation of certain other files, as well as the features of the interface facility are described. The files mentioned here are supplied on a floppy disk.

8.1.1. Introduction

The SISA interface, written in CDS/ISIS Pascal language, is largely menu-driven, and is designed to assist users in performing search and retrieval operations in CDS/ISIS databases. SISA is essentially intended for end-users who may not have had experience with the search and retrieval operations of Micro CDS/ISIS. However, it can also be used with advantage by library and information professionals operating on Micro CDS/ISIS databases. For instance, the H Help option

provides an overview of the search language capabilities of Micro CDS/ISIS.

The major functions provided for by SISA allow users to:

- select database(s) for searching
- formulate search expressions using CDS/ISIS search language
- retrieve records
- display records using different display formats
- save records retrieved selectively
- review search performance of each user.

The SISA interface is based on Micro CDS/ISIS version 3.0, released by Unesco in late 1992, and can be implemented on IBM PC or compatible microcomputers using MS-DOS 3.0 and above. Micro CDS/ISIS version 3.0 is a multi-user version and can be operated in a network configuration using Novel Netware, Banyan Vines, etc.

8.1.2. Installing SISA

Before using SISA, there are some files to be created on your system. This is a one time job and once installed for a particular computer configuration, no further changes may be necessary, except updating of DBFINF file as indicated below.

It is assumed that Micro CDS/ISIS version 3.0 has already been installed on your stand alone micro computer or the server in a network system and that databases have been created.

DBFINF file

File DBFINF is a text file containing brief information about each of the databases in the system available for searching. Example:

- LIBCAT - catalogue of books in the library
- ABNCD - an integrated database composed of bibliographical records, profiles of institutions, experts, research projects, and information systems in the field of socioeconomic development
- PLAN - records containing tabulated data relating to selected towns in Ethiopia

This file can be created using EDLIN or any word processing software. The file should be updated whenever a new database is added to the system. The file should be in the database sub-directory of CDS/ISIS. For example, if DBFINF has been created on a floppy disk in drive A, and CDS/ISIS has been installed on drive C in the directory ISIS, then type

A:\>Copy dbfinf C:\isis\data
and press <ENTER>

DBFILE file

File DBFILE which will contain a list of names of all the databases in the data sub-directory may be created automatically by the program. If you are using Micro CDS/ISIS version 2.3, then the following line should be included in AUTOEXEC.BAT file.

```
Dir c:\isis\data\*.mst > c:\isis\data\dbfile
```

GHELP

GHELP is a file containing the help text of the SISA program. The file is provided on a floppy disk. If the floppy disk is on drive A, and CDS/ISIS has been installed on drive C in directory ISIS, then type

```
copy a:\ghelp c:\isis
```

and press <ENTER> key.

UID database

The UID database is a Micro CDS/ISIS database for maintaining the search history of each query for each

user. It also serves as a user identification and 'password' entry device for each user. The fields in a UID record are:

- 1 User identification
- 2 Name
- 3 Designation
- 4 Division
- 5 Contact address
- 6 Search terms
- 7 Records saved retrieved
- 8 Relevant records
- 9 Database searched
- 10 Date of search
- 11 Option Used

The sample UID database provided on a floppy disk should be copied on to the data sub-directory of CDS/ISIS: For example, with the floppy in drive A, type

```
A:\>copy A:\uid.* X:\isis\data
```

and Press <ENTER> key. Again, type

```
A:\>copy A:\?uid.* X:\isis\data
```

and press <ENTER> key, 'X' denotes the drive on which CDS\ISIS is installed.

SISA.PAS and SISA.PCD

The SISA.PAS and SISA.PCD files contain the source and object code of the 'Advanced Search facility' option main programs. The files are provided on a floppy disk and should be copied on to the PROG sub-directory of CDS/ISIS. If the floppy disk is in drive A, type

```
A:\>copy sisa.* X:\isis\prog
```

and press <ENTER> key.

'X' denotes the drive on which CDS/ISIS is installed.
Note that SISA.PAS may not be necessary unless some modification in the program is to be done.

8.1.3. Using SISA

SISA can be incorporated and invoked from different points of the CDS/ISIS system, but mainly as a menu exit.

1. In a local area network, say using Novel Netware, the main menu of CDS/ISIS (EXISI.FMT) can be suitably modified, using option U (ISISUTL) System Utility Services, such that the main menu on the end-user terminal screen can be made to look like as follows:

SCHOOL OF INFORMATION STUDIES FOR AFRICA Welcome to Online Database Service	Name of Institution
A - Advanced Search Facility	Advanced Search Facility Option
O - Online Catalogue Search	Online Catalogue Search Facility Option
U - Service Utilities	Service Utilities option
X - Exit	
Enter selection [.]	

Figure 25. Modified CDS/ISIS main menu

The SISA program can be interfaced at option A, as a menu exit.

2. Alternatively, the SISA program can be interfaced at option S (Information Retrieval Services) of the normal main menu of Micro CDS/ISIS, as menu exit.

In either case, pressing the S key will exit to the SISA program.

3. Yet another alternative is to use option A (Advanced Programming Services) of the CDS/ISIS normal main menu, then press R (Run), key in SISA at the prompt 'Name of program? ' and press <ENTER>

4. It is also possible to invoke SISA from the drive/root directory in which CDS/ISIS is installed. In this case, if the system is in the server directory F, then type

```
F:\>SISA
```

and press <ENTER> key.

In each case the system will ask the user to type in an ID and to press <ENTER> key. If the ID is accepted, the SISA main menu will appear. SISA executes its functions through various options in the main menu. There are 12 options excluding the ESC. Quit, as shown in Fig. 26, the SISA main menu. Selection of each option presents the searcher a prompt to input values, select values or perform functions.

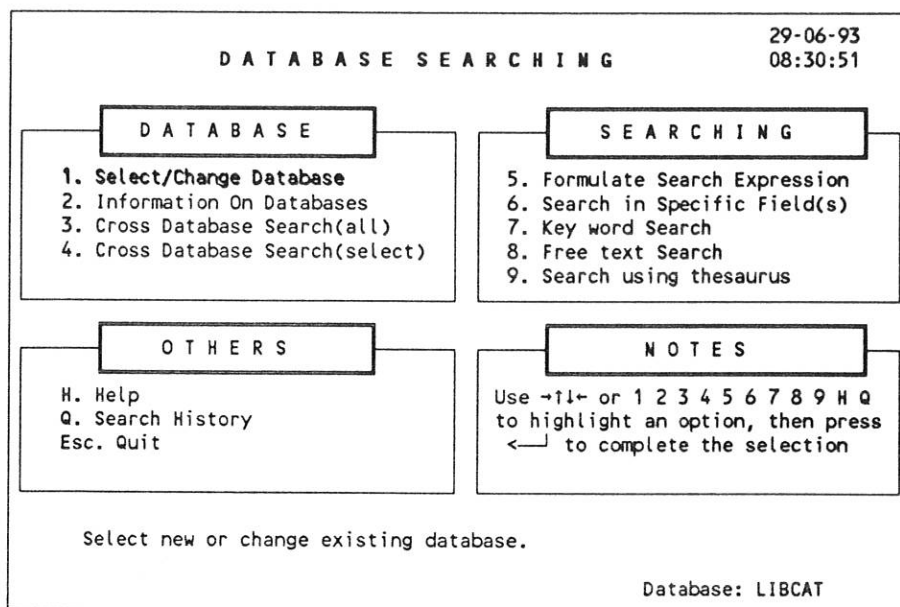


Fig. 26. SISA Main menu.

As shown in Fig. 26, the main menu is divided into four major sections DATABASE, SEARCHING, NOTES and OTHERS. At the top of the screen is the heading of the main menu. The right side of the heading displays a clock with system date and time. The bottom part of the screen contains a brief explanation for the highlighted option. For instance, the highlighted option as shown in Fig. 26 is 1, and the brief explanation of it appears at the bottom of the screen. If a database has already been selected, its name will be displayed at the right bottom of the main menu screen.

To select an option, move the cursor to highlight the option using appropriate arrow keys or pressing the option digit as mentioned in the NOTES, and then press the <ENTER> key.

OPTION 1: SELECT/ CHANGE DATABASE

Use option 1 to select a database or to change from a database in use to another.

Names of available databases as shown in Fig. 27 will be listed on the screen. Using appropriate arrow keys highlight the database one is interested in and press <ENTER> key to select.

DATABASE SEARCHING

29-06-93
08:30:51

DATABASES		SEARCHING																										
<table style="width: 100%; border-collapse: collapse;"> <tr><td>CDS</td><td>IIS</td></tr> <tr><td>OODB</td><td>PITU</td></tr> <tr><td>THESB</td><td>TMRI</td></tr> <tr><td>LIBCAT</td><td>MEDIS</td></tr> <tr><td>SERIAL</td><td>SYNDRO</td></tr> <tr><td>ABNCD</td><td>SRLS</td></tr> <tr><td>MIBIS</td><td>FORD</td></tr> <tr><td>IES</td><td>MAL</td></tr> <tr><td>PADDEV</td><td>PLAN</td></tr> <tr><td>PADEXP</td><td>CHEM</td></tr> <tr><td>RESPRO</td><td>TOXIS</td></tr> <tr><td>THES</td><td>PREMA</td></tr> <tr><td>LIBRI</td><td>PROMAR</td></tr> </table>	CDS	IIS	OODB	PITU	THESB	TMRI	LIBCAT	MEDIS	SERIAL	SYNDRO	ABNCD	SRLS	MIBIS	FORD	IES	MAL	PADDEV	PLAN	PADEXP	CHEM	RESPRO	TOXIS	THES	PREMA	LIBRI	PROMAR		<ol style="list-style-type: none"> 5. Formulate Search Expression 6. Search in Specific Field(s) 7. Key word Search 8. Free text Search 9. Searching using Thesaurus
CDS	IIS																											
OODB	PITU																											
THESB	TMRI																											
LIBCAT	MEDIS																											
SERIAL	SYNDRO																											
ABNCD	SRLS																											
MIBIS	FORD																											
IES	MAL																											
PADDEV	PLAN																											
PADEXP	CHEM																											
RESPRO	TOXIS																											
THES	PREMA																											
LIBRI	PROMAR																											
<p>Use →F1← to highlight an option, Press <ENTER> key to complete the selection</p>		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">NOTES</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;"> Use →F1← or 1 2 3 4 5 6 7 8 9 H Q to highlight an option, then press ← to complete the selection </td> </tr> </tbody> </table>	NOTES	Use →F1← or 1 2 3 4 5 6 7 8 9 H Q to highlight an option, then press ← to complete the selection																								
NOTES																												
Use →F1← or 1 2 3 4 5 6 7 8 9 H Q to highlight an option, then press ← to complete the selection																												
		Database: LIBCAT																										

Fig. 27. List of Available Database Names.

Information about the contents, coverage, etc of databases can be displayed by pressing <F1> key (see Fig. 28). This is equivalent to selecting option 2 (see below).

After selecting the database, the system will then return to the main menu to enable the selection of a search option. The selected database name will be displayed (see Fig. 25) at the right bottom corner of the main menu replacing the previously selected database name, if any. Use the <ESC> key to quit to the main menu without selecting a database or replacing a pre-selected database.

I N F O R M A T I O N O N D A T A B A S E S	
ABNCD	Integrated database of bibliographic records, profile of institutions, of experts, of information systems and activities mainly in the fields of socioeconomic development.
FORD	Factual information on forest divisions (Kerala, India)
IES	Description of IES museum objects
IIS	Bibliographical records on medical topics
LIBCAT	Library catalogue mainly on information systems, info technology, info economy, info politics and policies, etc.
MAL	Similar to ABNCD
MEDIS	Case records of hospital patients
MIBIS	Bibliographic records on African development (PADIS)
PITU	Case records of hospital patients with tumours
SRLS	Union catalogue of serials of international agri centres
SYNDRO	Medical syndromes
TMR1	Similar to PITU
URBPLN	Factual data relating to selected Ethiopian towns
Press <ESC> to quit	
Database: LIBCAT	

Fig. 28. Information on Databases (selected by pressing <F1> while using option 1).

OPTION 2. INFORMATION ON DATABASES

Use option 2 to get brief descriptions about the content, coverage, etc. of the databases. A screen-full of information will be displayed at a time (See Fig. 29). Use <PgDn> and <PgUp> keys to move from one page to another back and forth. Pressing <ESC> key will return to the main menu.

INFORMATION ON DATABASES

ABNCD	Integrated database of bibliographic records, profiles of institutions, of experts, of projects, of information systems and activities mainly in the fields of socioeconomic development in Africa
FORD	Factual information on forest divisions (Kerala, India)
IES	Descriptions of IES museum objects
IIS	Bibliographical records on medical topics
LIBCAT	Library catalogue mainly on information systems, info technology, info economy, info politics and policies, etc.
MAL	Similar to ABNCD
MEDIS	Case records of hospital patients
MIBIS	Bibliographic records on socioeconomic development
PADDEV	Bibliographic records on African development (PADIS)
PITU	Case records of hospital patients with tumours
SRLS	Union catalogue of serials of international agri centres
SYNDRO	Medical syndromes
TMR1	Similar to PITU
URBPLN	Factual data relating to selected Ethiopian towns

Press <ESC> to quit_____

Fig. 29. Information on Databases

OPTION 3: CROSS DATABASE SEARCH(ALL)

Use option 3 for searching all the databases in the system. This option helps in finding out how many records relevant to a specific query may be retrieved from each of the databases. To obtain such information, type in a keyword or combination of them in upper case or lower case representing, say a subject interest.

For example:

AGRICULTURE AND INFORMATION SYSTEMS AND AFRICA,
and press <ENTER> key. See Fig. 30.

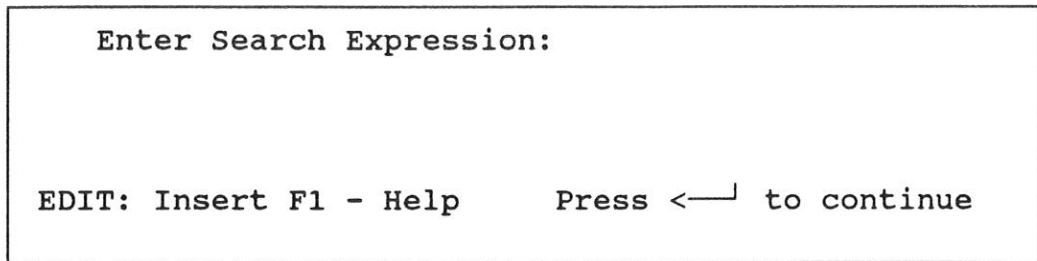


Fig. 30. Search Formulation

Brief help in formulating search expression can be obtained by pressing the <F1> key (see Fig. 31).

Enter Search Expression:

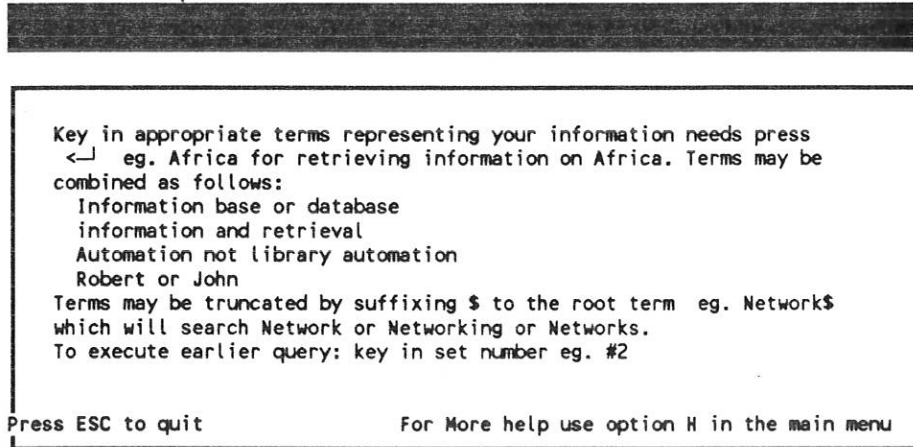


Fig. 31. Brief help in Search Formulation screen.

The system will search all the databases and display the number of hits, the search expression used, name of the corresponding database, the set number (see Fig. 32.) to enable the selection of one or more databases relevant to the search term(s):

SEARCH EXPRESSION(S) SUBMITTED			
<u>Set</u>	<u>Data base</u>	<u>Hits</u>	<u>Search Expression</u>
1	LIBCAT	45	INFORMATION
2	ABNCD	3	INFORMATION
3	CDS	30	INFORMATION
4	SERIAL	0	INFORMATION

[Set No.]select [M]ax [Q]uit █

Fig. 32. Cross Database Search result

Three options are shown at the bottom left of the screen: [Set No] [M]ax [Q]uit. To search in one of the databases listed, type in the set number and press <ENTER> key to initiate search. Selecting option M and pressing <ENTER> will initiate search in the database giving the highest number of hits for the query. Selecting option Q and pressing <ENTER> will return to the main menu.

In response to the search expression entered, the system will present a report. For example, for the search expression:

(CULTIVATION OR AGRONOMY) AND RICE

the report may be like as shown below, for a particular database:

```

Set          1: (CULTIVATION + AGRONOMY) * RICE

P=          3 CULTIVATION
P=          3 AGRONOMY
T=          5 -#2: CULTIVATION + AGRONOMY
P=          1 RICE
T=          1 -#3:  #2 * RICE
T=          1 -#1:  #3
----> █

```

Fig. 33. CDS/ISIS Report for a Search Expression

This indicates that the term CULTIVATION occurs three times (three postings) in the database, though all occurrences may be in the same record. The term AGRONOMY has also three occurrences. There are five occurrences of the sub-expression CULTIVATION + AGRONOMY (referred to as sub-expression #2), meaning that there are five records in which one or the other of the terms occur. There is one posting for the term RICE; one occurrence of the sub-expression #2 * RICE (that is, sub-expression #2 and RICE) (referred to as #3) and one for the whole query (referred to as #1), which is identical with the sub-expression #3.

Press the <ENTER> key to display the retrieved record(s). If the number of hits is greater than 0 the available display formats for the database will be displayed as shown in Fig. 34 below.

Database: LIBCAT
Search expression: Information

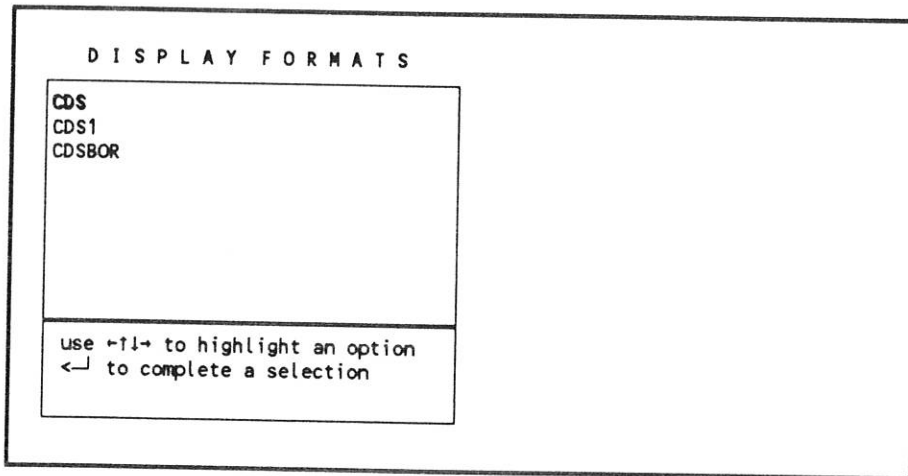


Fig. 34. List of Display Formats

Using the appropriate arrow keys highlight a display format and press <ENTER> key to select. Then, the records will be displayed (See Fig. 34). After displaying a record the system will request selection from one of the options shown at the bottom right of the screen. Press the <ESC> key to return to the main menu; or S key to save the displayed record in a file the name of which will be required to be keyed in a box on the screen. Use <PgDn> and <PgUp> keys to move back and forth through the retrieved records.

Database: LIBCAT Format: CDS
Search expression: Information

```
1 of 45
TITLE      : Powershift: Knowledge, wealth and violence at the edge of the
            : 21st century
AUTHOR(S)  : Toffler, Alvin
PUBLISHER  : New York: Bantam books
YEAR       : 1990
Collation  : 611 p.; 459 ref.
SERIES     : Bantam books
ISBN      : 0-553-18052-5
KEYWORDS   : Politics; Power; Future; Information; Information technology;
            : Mass media; Civilization
LOCAT./COPY : GRADUATE LIB c. 1
            : SISA C. 1
CALL NUMBER : 328.34 1990 Pow
ACC. NO.   : 12001
DOC. STATUS : Book
PgDn
```

[ESC] to quit [S]ave

Fig. 35. Search Result Display.

OPTION 4: CROSS DATABASE SEARCH(SELECT)

Use option 4 to search one or more specific databases preliminary to selecting database(s) for further search. A list of names of databases will be displayed as shown in Fig. 36 below.

DATABASES AVAILABLE

- CDS	- TMR1	- CHEM
- SERIAL	- MEDIS	- TOXIS
- ABNCD	- SYNDRO	- PREMA
- LIBCAT	- SRLS	- PROMAR
- MIBIS	- FORD	
- PADDEV	- MAL	
- PADEXP	- PLAN	
- RESPRO	- CHEM	

Use →← to highlight an option, press S to select,
then press ← to complete the selection(s)
F1 - database information

Fig. 36. Multiple Database Selection screen.

Using the appropriate arrow keys highlight the database to be searched and press the S key to select. Proceed in this manner to select other databases. After selecting the database(s), press the <ENTER> key to initiate the search process. Then follow the same procedure as for option 3. As for option 1, pressing <F1> key will display brief information on databases. (See Fig. 28)

OPTION 5 : FORMULATING SEARCH EXPRESSION

Use option 5 to formulate and submit search expression and to retrieve and display search results in one or more databases (see under options 3 and 4). On selecting option 5, the system will display the list of search expression, number of hits, etc. for previous searches (during the current session), if any. On

pressing the <ENTER> key, the system will display a blank screen with the prompt:

Enter search Expression:

at the top left of the screen.

The search term/expression is to be entered at the position of the cursor at the top left.

Micro CDS/ISIS provides for searching using the index of terms extracted by the system from the records of databases according to prescribed techniques, and also for free text searching, that is not using the index of terms. Formulation of search expressions according to search language of Micro CDS/ISIS is briefly discussed below:

SEARCH EXPRESSION

A search expression usually consists of a term or a combination of terms representing an information need, for example:

AGRICULTURE

AGRICULTURE AND AFRICA

URBAN AREAS AND AIR POLLUTION AND MOTOR TRAFFIC

ANDERSON K.S.

ANDERSON K.S. AND PHILLIPS J.

DATABASE OR DATA BASE

SOFTWARE NOT CDS/ISIS

BOOLEAN OPERATORS

In the above expressions 'AND', 'OR', 'NOT' are called operators (Boolean Operators) for combining the concepts represented by the terms.

The expression AGRICULTURE AND AFRICA means that only those records containing both these terms should be retrieved; so also is the case with the expression URBAN AREAS AND AIR POLLUTION AND MOTOR TRAFFIC.

The expression DATA BASE OR DATABASE means that any record containing either of the terms will satisfy the query.

The expression SOFTWARE NOT CDS/ISIS means that the record(s) retrieved should contain the term SOFTWARE but should not contain the term CDS/ISIS.

In general, the AND operator is used to increase the precision of a query (reduce the number of hits); the OR operator is used to broaden the search (increase the

number of hits); and the NOT operator to exclude term(s) which may also increase precision.

Note: One may use * instead of AND, + instead of OR and ^ instead of NOT in the search expression

MATCHING OF TERMS

In order to ensure that each term in the search expression matches exactly with term(s) in the index, the search term(s) should be entered precisely as in the index. That is, if the term in the index is DATABASES, the search term typed in as DATABASE, DATA BASE, DATA BASES will not match with the index term and no records may be retrieved. Similarly, ANDERSON K.S. and ANDERSON, K.S will not match; nor will COLOR and COLOUR.

Using the Boolean operator OR, alternative forms of a term may be taken care of; for example,

DATABASE OR DATABASES OR DATA BASE OR DATA BASES
COLOR OR COLOUR

Similarly, for synonyms and spelling variations

TRUCK OR LORRY OR TRUCKS OR LORRIES
FIBRE OR FIBER
LABOUR OR LABOR

For compounded terms

NETWORK OR NETWORKING

TERM TRUNCATION

Suffixing the truncation symbol \$ to the stem of a word can also help. For example:

BIOCHEM\$ will match with all terms having the stem 'BIOCHEM',

such as,

BIOCHEMICAL

BIOCHEMIST

BIOCHEMISTRY

etc.

PARENTHESES

In a search expression containing several combinations of terms, specificity can be achieved by the judicious use of parentheses. For example, if information is needed on " The relation between motor traffic or industrial fumes and air pollution in urban areas", the search expression

MOTOR TRAFFIC OR INDUSTRIAL FUMES AND URBAN AREAS AND AIR POLLUTION

may retrieve all records in which the term MOTOR TRAFFIC only or in combination with the terms mentioned in the search expression as well as with terms other than those

in the search expression, occur. This may result in the retrieval of records irrelevant to the query. A more precise expression of the query will be

(MOTOR TRAFFIC OR INDUSTRIAL FUMES) AND (URBAN AREAS AND AIR POLLUTION)

PROXIMITY OPERATORS

More restrictive types of the logical AND operators are (G) and (F).

Use (G) to retrieve from same field (all occurrence of the search terms in the same repeatable field treated as single entity); for example:

LIBRARY (G) AUTOMATION

will retrieve all records in which both terms LIBRARY and AUTOMATION occur, provided that they occur in the same field.

PERSONNEL (G) MANAGEMENT

will retrieve all records in which with both terms PERSONNEL and MANAGEMENT occur, provided that they occur in the same field.

Use (F) to retrieve all records with search terms in the same occurrence of any field or individual occurrence of a repeatable field. For example:

WATER (F) SOIL

will retrieve all records in which both the terms WATER and SOIL occur, in the same field or the same occurrence of a repeatable field.

. can be used in the same way as (F) , but with the additional restriction that the terms are not more than n words apart, where n is the number of dots minus one. For example:

INFORMATION . . MANAGEMENT

will retrieve records which contain

Information for management

Management information

Management of information,

but not

Information for middle management.

\$ can be used in the same way as (F), but with the additional restriction that the terms are exactly n words apart, where n is the number of dollars minus one. For example:

INFORMATION \$ \$ \$ MANAGEMENT

will retrieve records which contain:

INFORMATION FOR TOP MANAGEMENT

INFORMATION FOR MIDDLE MANAGEMENT, etc.

but not

INFORMATION MANAGEMENT

N.B. The operators (G), (F), \$ and ., must be preceded and followed by one space.

OPERAND QUALIFIERS

A qualifier can be used to specify a field or fields in which the search term(s) should occur. This is particularly useful for databases which may contain the same data in different fields. The form of the search expression is:

SEARCH TERM(t1,t2,t3,...), where t1, t2, t3, ... are field tags. For example,
INFORMATION SERVICES/(69) OR INFORMATION SYSTEMS/(24)
where 69 is the field tag for Descriptors and 24 the field tag for Title in the database LIBCAT. (see also option 6)

FREE TEXT SEARCH

A free text search can be done in this option (option 5). This is useful for searches in fields which may not have been indexed. The search expression is of the form:

? v24: 'plant' and val(v26) = 1965

which means with reference to a particular database (CDS in this case), the string 'PLANT' should be present in

term(s) in field 24 (i.e Title) and the numerical value of the field 26 (ie. Year of Publication) should be 1965; or

? #3 v300: 'neelameg' and v620: 'policy'

which means retrieve all records containing the string NEELAMEG in field 300 and POLICY in field 620 of the records retrieved previously in set number 3. #3 may be either an inverted file search expression, another free text search or a combination of both.

In response to the free text search expression the system will present a screen displaying information on the search process. For example, for the search expression for a particular database:

? v24: 'unesco' and val(v26) >= 1986 ,

the screen may look as follows:

MFN	Hits	%	Recs
50	5	10.0	150

Press any key to interrupt search

Fig. 37. CDS/ISIS Free Text Search Report

The value in MFN box shows the master file number (MFN) of the record being processed, the Hits box shows the current number of records retrieved, the % box shows the current hit rate, i.e, the percentage of records retrieved calculated with respect to the number of records processed, and the Recs box is the total number of records to be processed.

OTHER OPERATORS

Other relational operators used in a free text search expression are:

= equals
<> not equal to
< less than
> greater than
: contains

For each search expression CDS/ISIS assigns a unique set number. The records retrieved can be displayed. Or saved in a file for future use.

A search expression can be re-executed with or without modification on any of the databases by simply using the set number assigned by CDS/ISIS preceded by a number sign (#) (eg. #3). This facility allows one to develop the search step by step.

SYNTAX ERRORS

If a search term contains: * + () . \$ ^ or begins with a number sign (#), it must be enclosed in

double quotation marks ("), otherwise a syntax error will occur.

Example: Entering the search term INSTITUTION(S) will cause a syntax error. The correct form is "INSTITUTION(S)".

ANY TERM

ANY TERM is a collective name for a predefined set of access points in the ANY file for the database being searched. When an ANY term is used in a search expression, the system will OR together all the access points of the cluster of terms associated with that ANY term in the related ANY file.

Example: Assume that the ANY file for a database contains:

ANY EUROPE	EUROPE
ANY EUROPE	EEC
ANY EUROPE	EC
ANY EUROPE	EUROPEAN COMMISSION
ANY EUROPE	FRANCE
ANY EUROPE	GERMANY
ANY EUROPE	SPAIN
ANY EUROPE	ITALY
ANY EUROPE	PORTUGAL
ANY EUROPE	AUSTRIA
ANY EUROPE	SWITZERLAND
ANY EUROPE	DENMARK
ANY EUROPE	SCANDINAVIA
ANY EUROPE	NORWEGIAN
ANY EUROPE	SWEDEN
ANY EUROPE	ENGLAND
ANY EUROPE	SCOTLAND
ANY EUROPE	IRELAND
ANY EUROPE	WALES
ANY EUROPE	UK
ANY EUROPE	UNITED KINGDOM

Thus, the search expression ECONOMY AND ANY EUROPE will retrieve all records in which the terms ECONOMY and also any of the terms in the ANY file occur. This technique can increase the number of hits for a search expression.

OPTION 6: SEARCH IN SPECIFIC FIELD(S)

Use option 6 for searching in specific field(s). Field numbers (tags) and field names for the database will be listed on the screen (See Fig. 38).

DATABASE SEARCHING 29-06-93
08:30:51

Tag	Field Name
12	Conference main entry
24	Title
25	Edition
26	Imprint
30	Collation
44	Series
50	Notes
60	Class Number
69	Keywords
70	Personal Authors
71	Corporate Bodies
72	Meetings
74	Added Title
76	Other language titles
80	ISBN

Use →← to highlight an option,
Press S to select, then press ↵
to complete the selection(s)

S E A R C H I N G

5. Formulate Search Expression
6. Search in Specific Field(s)
 7. Key word Search
 8. Free text Search
 9. Searching using Thesaurus

N O T E

Use →← or 1 2 3 4 5 6 7 8 9 H Q
 to highlight an option, then press
 ↵ to complete the selection

Database: LIBCAT

Fig. 38. List of tags and tag names of a database.

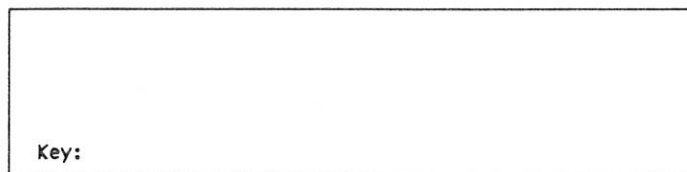
Using appropriate arrow keys highlight the field of interest and press S key to select. Proceed the same way to select more fields. A maximum of 10 tags can be selected. After selecting the tag(s), press <ENTER> key. The system will prompt to formulate the search expression. The procedure is the same as for option 5.

In this option free text search is not permitted. Specifying separate tags for different search terms in the same search expression is not permitted. Option 5 permits the performance of this kind of search specifying tags at the end of each term as qualifier (see option 5).

After formulating the search expression proceed in the same manner as for option 3.

OPTION 7: KEY WORD SEARCH

Use option 7 to search using the list or dictionary of index terms. On selecting the option the screen will look like as in Fig. 39.



Key:

Fig. 39. Key Word Search Prompt

Enter a key term or the first few characters of the term at the cursor position at the bottom left of the screen. A list of index terms beginning with the string keyed in will be displayed in alphabetical sequence in two columns (See Fig. 40). If there is no index term matching the string keyed in, the display will start from the next nearest term in the alphabetical sequence in two columns as shown below.

Dictionary ListData Base Name: LIBCAT	
- ABCARIAN, GILBERT	- ANTHONY, R.N
- ACCOUNTING	- ANTHROPOLOGY
- ACTION	- ANTILL, LYN
- ADAMS, WALTER	- APPLE
- ADAPTIVE	- APPLICATION
- ADDIS ABABA UNIVERSITY	- APPLICATIONS

Fig. 40. An example of the LIBCAT database dictionary.

Use the arrow keys to move the cursor to the desired terms(s) and press S to select. Use <PgDn> and <PgUp> keys to move from one page to the next on the screen. Finally press X to submit the search expression. The terms selected will be combined by the OR operator. The expression can be edited as desired. Press <ENTER> key to initiate the search. Follow the same procedure as for option 3. Press Q to quit to the main menu.

OPTION 8: FREE TEXT SEARCH

Use option 8 to search a string of character(s) in a database. If there is no pre-selected database, the system will automatically execute option 1. Then, if a database is selected, a list of tags and corresponding field name(s) will be displayed as for option 6. But, in this case the selection of only one field is permitted

(see Fig. 41). Using appropriate arrow keys highlight the relevant field and press <ENTER> key to select.

Tag	Field Name
12	Conference main entry
24	Title
25	Edition
26	Imprint
30	Collation
44	Series
50	Notes
60	Class Number
69	Keywords
70	Personal Authors
71	Corporate Bodies
72	Meetings
74	Added Title
76	Other language titles
80	ISBN

Use ←→ to highlight an option, then press ↵ to complete a selection

29-06-93
08:30:51

D A T A B A S E S E A R C H I N G

S E A R C H I N G

5. Formulate Search Expression
6. Search in Specific Field(s)
7. Key word Search
8. Free text Search
9. Searching using Thesaurus

N O T E

Use ←→ or 1 2 3 4 5 6 7 8 9 H Q to highlight an option, then press ↵ to complete the selection

Database: LIBCAT

Fig. 41. List of Tags and Field Names for Option 8.

When a field is selected, the system will prompt to type in the string to be searched,

Enter String to be searched: Information

and press <ENTER> to initiate the search. The record(s) in which the keyed-in string is present in the specified field will be displayed (see Fig. 42.).

```
TITLE      : Powershift: Knowledge, wealth and violence at the edge of the  
            21st century  
AUTHOR(S)  : Toffler, Alvin  
PUBLISHER  : New York: Bantam books  
YEAR       : 1990  
Collation  : 611 p.; 459 ref.  
SERIES     : Bantam books  
ISBN       : 0-553-18052-5  
KEYWORDS   : Politics; Power; Future; Information; Information technology;  
            Mass media; Civilization  
LOCAT./COPY : GRADUATE LIB c. 1  
            SISA C. 1  
CALL NUMBER : 328.34 1990 Pow  
ACC. NO.    : 12001  
DOC. STATUS : Book
```

PgDn

[ESC] to quit [S]ave

Fig. 42. Search result display of option 8

If a record is displayed, a choice among the options shown at the bottom right of the screen is possible. Press S to save the record in a file whose name will be required to be typed in a box or in a pre-selected save file, as the case may be. Press <ESC> key to quit to the main menu. Press <PgDn> to display successive records if any. At the end, the system will display "No more record Exists" at the bottom of the screen. Press <ESC> key to return to the main menu.

OPTION 9: SEARCH USING THESAURUS.

Use option 9 to search using a thesaurus.
On selecting the option, the displayed screen will be:

BIRD

Select Term

Fig. 43. Term Selection Screen For Thesaurus Searching.

Key in, at the cursor position in the box, the term or the first few characters of the term representing a query. A list of terms, from the alphabetical index of the thesaurus, beginning with the term/string keyed-in will be displayed (See Below).

- BIRDS
- BOB
- CAMEL
- CAT
- CATS
- EARTH
- EARTH SCIENCE
- EUROPE
- FISH
- FRANCE
- GERMANY, F.R.
- HORSES
- ITALY
- LION
- ~~MAMMALS~~
- PORTUGAL

< [Next] B[previous] P[age] S[elect]
 C[reate term] T[erm select] X[exit]

If there is no term in the thesaurus matching the term/string keyed-in, the display will be from the next

closest string. Several options of THES program will be displayed at the bottom of the screen. Press the <ENTER> key as many times as required to position the cursor against the relevant term and press S key to select. The system will display the term selected along with its broader term (BT), narrower term (NT) and related terms (RT), if any. (See below)

```
MAMMALS
```

- MAMMALS
- NT Camel
- NT Cats
- NT Horses
- NT Lion
- NT tiger

```
<- [Next] B[ack] F[first] P[age] S[elect] T[erm select] Q[query]  
?[display query] A[dd relation] D[delete] C[reate term] X[exit]
```

Use the <ENTER> key as before to position the cursor against any other relevant term. On pressing the S key, the system will display the new selected term and its associated BT, NT and RT. On the other hand, if the Q key is pressed, the term will be selected to formulate a search expression. In this way one can select as many search terms as necessary. Press the ? key for display of the terms selected to form a search expression in a box at the lower half of the screen. Press X key to exit the thesaurus; the selected terms will be combined with the OR operator and displayed at the top of the screen. One can edit to modify the term(s) and/or of the operators (see option 5). On pressing the <ENTER> key, the search will be initiated, thereafter, the process is similar to

choosing option 5.

OPTION Q: SEARCH HISTORY

Use option Q to display the search history.

User's previous search performances will be displayed. Number of hits, number of records saved, database searched, search expression, option used and user's personal information will be displayed. Press <ENTER> key to continue the display. <ESC> key returns to the main menu.

OPTION H. Help

Use option H to get detailed help on each of the main menu options as shown in Fig. 25 (see also Annex 3)

A screen-full text will be displayed beginning with the first option. Use the <ENTER> key to go forward. Pressing the <ESC> key will return to main menu.

OPTION Q: QUIT

Use <ESC> key (or option ESC) to terminate the session.

8.2. PART II

ONLINE CATALOGUE SEARCH FACILITY

8.2.1. Introduction

The MOPAC interface, written in CDS/ISIS Pascal language. is largely menu-driven, and designed to assist users in performing search and retrieval in library catalogue database developed with Micro CDS/ISIS. MOPAC is essentially intended for end-users who may not have had experience with search and retrieval operations of Micro CDS/ISIS (eg. students, teachers, researchers, etc.)

The major functions provided by MOPAC allow users to search database of library catalogue by:

- Name(s) of Personal Author(s)
- Name(s) of Corporate Body(ies)
- Name of Conferences/meetings
- Title
- Class Number
- Subject Keywords

8.2.2. INSTALLING MOPAC

Before using MOPAC, there are some files to be created in the computer system. This is a one time job

and once installed in a particular computer system, no further changes may be necessary.

DBTAG

DBTAG is a text file containing tags of each access point of the catalogue database.

The DBTAG that comes with the floppy disk contains the following lines:

70 Personal author
71 Corporate author
30 Meeting/conference name
24 Title
80 Class number
69 Subject Keyword

You may change/edit these lines using a text editor e.g. EDLIN, to match the fields (only the searchable fields) of the catalogue database of a particular library.

If the floppy disk is in drive A, and CDS/ISIS has been installed on drive C in the directory ISIS, then type

A:\copy dbtag c:\isis\data
and press <ENTER>

MOPAC.PAS and MOPAC.PCD

MOPAC.PAS and MOPAC.PCD are the source and the object files of the main Pascal program respectively. The files are provided on a floppy disk. If the floppy disk is in drive A, and CDS/ISIS has been installed on drive C in ISIS directory, then type

```
COPY a:\mopac.* c:\isis\prog
```

and press <ENTER> key.

READ.OPC

READ.OPC is a file containing the help text of the MOPAC program. The file is provided on a floppy disk along with other files. If the floppy disk is in drive A, and CDS/ISIS has been installed on drive C in directory ISIS, then type

```
copy a:\read.opc c:\isis
```

and press <ENTER> key.

8.2.3. Using MOPAC

As indicated in Part I regarding SISA program, MOPAC can be also incorporated and invoked from different points of the CDS/ISIS system, but mainly as a menu exit.

On selecting the menu exit option (Option 0) (See Fig. 25), the main menu of MOPAC appears as shown below.

```

                                                                    26-06-00
                                                                    08:00:00
LIBRARY USER'S SERVICE
CATALOGUE SEARCH

By Personal Author
By Corporate Author
By Conference Name
By Title
By Class Number
By Subject keyword
Help
Quit

Use ↑↓ to highlight an option,
then press <ENTER> to complete the selection

Search using Personal Author name.
```

Fig 44. MOPAC Main Menu

As shown in fig. 44, the main menu contains 8 options, 6 of which are access points. At the top of the main menu screen is the heading of the main menu. The top right side of the screen displays a system date and time. The bottom part (last line) of the screen displays explanation for the highlighted option; for instance, the highlighted option is option 1 and the brief explanation of it appears at the bottom (last line) of the screen.

To select an option, as indicated at the bottom of the main menu screen, move the cursor to highlight an option using the appropriate arrow key (down or up arrows only), and then press the <ENTER> key to select.

OPTION 1 THROUGH 6

MOPAC provides a search capability to retrieve records by each of the options Personal Author name, Corporate Author Name, etc. as indicated in the main menu (Fig. 44). On selecting an option the following prompt will be displayed at the top of left of the screen :

Enter Search Expression:

Type the search expression at the cursor and press <ENTER> key. <F1> key may be used to get a brief explanation of how to formulate search expressions (See Fig. 45).

Key in appropriate terms representing your information needs press
<␣> eg. Africa for retrieving information on Africa. Terms may be
combined as follows:
Information base or database
information and retrieval
Automation not library automation
Robert or John
Terms may be truncated by suffixing \$ to the root term eg. Network\$
which will search Network or Networking or Networks.
To execute earlier query: key in set number eg. #2

Press ESC to quit

For More help use option H in the main menu

Fig. 45. Brief help in search formulation screen.

Formulating Search Expression

The procedures are the same as described in Part I Advanced Search Facility, option 5.

However, Specific field(s) and free text searching are not supported by MOPAC.

After formulating the search expression, the user is requested to press <ENTER> key, then the system presents a report as indicated in part I, option 5.

If the number of hits is greater than 0 then, the record(s) will be displayed as shown in the example below. (Fig. 46)

Search expression: Information Systems
Number of Documents Retrieved: 27

1 of 27

TITLE	: Application architecture - modern large-scale information processing
AUTHOR(S)	: Best, Laurence J
PUBLISHER	: New York: John Wiley
YEAR	: 1990
KEYWORDS	: Information systems; Information technology; Information processing
LOCAT./COPY	: SISA
CALL NUMBER	: 651.84 1990 App
ACC. NO.	: 12010
DOC. STATUS	: Book
LOAN STATUS	
BORROWED ON	: 93-03-25
DUE ON	: 93-04-24
BORROWER ID	: 7551
BORROWER	: Neelameghan; A

More - <CR>

Search expression: Information Systems
Number of Documents Retrieved: 27

1 of 27

STATUS	: Teacher/Professor
DEPARTMENT	: School of Information Studies for Africa
INSTITUTE	: Addis Ababa University
CONTACT TEL	: 110344
RESERVATIONS	
RESERVED BY	: Bhattacharya, G
CONTACT TEL	: 550970 (Res); 110433 (Office)

PgDn

[ESC] TO QUIT [S]AVE

Fig. 46. Search Result Display Screen.

After displaying a record the system offers two options, at the bottom right of the screen. Press the <ESC> key to return to the main menu; or S key to save the displayed record in a file the name of which you will be asked to key-in in a box on the screen as shown below:

Save as:

Use <PgDn> and <PgUp> keys to move back and forth through the retrieved records. If a displayed record is more than one screen page, the user may press <ENTER> key to display the rest of the records.

OPTION: HELP

Use option HELP to get detailed help on each of the main menu options (See Fig. 44). (See also Annex 4)

A screen-full text will be displayed beginning from the first option. The <ENTER> key may be used to go forward. Pressing the <ESC> key will return to the main menu.

OPTION : QUIT

Use <ESC> key (or option QUIT) to terminate the session.

8.3. PART III

SERVICE UTILITIES

8.3.1. Introduction

The service utility interfaces (ILOAN, NEWSDI, REPORT), written in CDS/ISIS Pascal language, are designed to enable library/information service staff provide certain services frequently required by end-users. The interfaces are intended to be used by only service staff and available only to them.

The major functions provided by the interfaces enable the provision of:

- Interlibrary loan request
- Selective dissemination of information (SDI) service
- production of printed catalogues, indexes, and current awareness bulletins.

8.3.2. Installing the Interfaces

Before using the interfaces (ILOAN, NEWSDI, REPORT), there are some files to be created in the computer system. This is a one time job and once installed in a particular computer system, no further changes may be necessary.

LIBR.DAT file for SDI service

LIBR.DAT is a text file containing, in five lines, the name and address of the library/information centre providing the SDI service. It can be prepared using a text editor, such as, EDLIN, and copied on to the directory from which CDS/ISIS is invoked. Example:

```
ADDIS ABABA UNIVERSITY  
KENNEDY LIBRARY  
AAU  
P.O.BOX 1176  
ADDIS ABABA, ETHIOPIA
```

Users' Profiles for SDI service

This file is required for running the NEWSDI Pascal program. It is a text file that can be prepared using a text editor, such as, EDLIN, and copied on to the directory from which CDS/ISIS is invoked. The first line of the file should be a user identification code; line 2 the name of user; lines 3 to 5 the contact address of user; line 6 onwards, keywords or CDS/ISIS search expressions (see section 5.8) representing user's interest. After enumerating user's interests end the record with @@ symbols. Continue, without leaving any line space the profile of another user, and so on. A '-T' suffixed to the user identification number indicates that

the particular user will receive a feedback copy of each output reference distributed to the him/her. Example:

```
001-T
TEMTIM ASSEFA
STUDENT, SCHOOL OF INFORMATION STUDIES FOR AFRICA
SISA
P.O.BOX 1176, SISA, AAU
AU=BROWN$
(PLAN$ * ETHIOPIA)
(DATABASE$ * DESIGN)
@@
002
ABERA MELESSE
ANALYST PROGRAMMER, WATER AND SEWERAGE AUTHORITY
AAWSA,
P.O.BOX 1505
AU=CHORAFAS$
EXPERT SYSTEM$ * COMPUTE$
@@
```

INAME.DAT file for Interlibrary Loan Request

INAME.DAT is a text file containing in 5 lines the name and address of the library/information centre generating an interlibrary loan request form letter. The name and address will be printed at the top of the letter. The file can be prepared using a text editor, such as, EDLIN and copied on to the directory from which CDS/ISIS is invoked. Example:

```
ADDIS ABABA UNIVERSITY
KENNEDY LIBRARY
AAU
P.O.BOX 1176
ADDIS ABABA, ETHIOPIA
```

THE PROGRAM FILES

The program files are ILOAN, NEWSDI, REPORT; the source program and the object program have respectively extension PAS and PCD. The files are provided on a floppy disk. If the floppy disk is in drive A, and CDS/ISIS has been installed on drive C in ISIS directory, then type

```
COPY a:\ILOAN.* c:\isis\prog
```

and press <ENTER> key.

```
COPY a:\NEWSDI.* c:\isis\prog
```

and press <ENTER> key.

```
COPY a:\REPORT.* c:\isis\prog
```

and press <ENTER> key.

As mentioned earlier, the ILOAN program operates on the SRLS database, and the REPORT program on the ABNCD database. If these are to be used on other databases, appropriate modifications will have to be made in the respective program files and in the corresponding database files as well.

8.3.3. Using service utilities

As indicated in Part 1 regarding the program SISA, the interfaces can also be incorporated and invoked from

different points of CDS/ISIS system, but mainly as a menu exit (See Fig. 25).

The option for service utilities, option U (see Fig. 25), is for use by the library/information centres (and may not be used by the end-users). Selecting option U in the figure enables the provision of selected services to users by executing corresponding CDS/ISIS Pascal programs. On selecting the Option U, the service utilities menu (see below), listing the service utilities available will be displayed.

I - Interlibrary Loan Report
S - Selective Dissemination of Information (SDI)
R - Reports
Q - Exit to main menu

Fig. 47. Service utilities menu

Interlibrary Loan Report

On selecting option I, the CDS/ISIS Pascal program ILOAN will be executed using the SRLS database. For details, please refer to Annex 5.

After completing the operation, the system will return to the above menu.

Selective Dissemination of Information(SDI)

On selecting option C, the CDS/ISIS Pascal program NEWSDI will be executed. For details, please refer to Annex 6.

After completing operation, the system will return to the above menu.

Printed Outputs

On selecting option R, the CDS/ISIS Pascal program REPORT will be executed using the ABNCD database. The following menu will be displayed.

```
Request standard reports
X - Exit
or select the report to be printed:
M - Main bibliographic index   B - Current awareness bulletin
A - Author index               U - Author catalogue
T - Title index                I - Title catalogue
C - Corporate body index       R - Corporate author catalogue
S - Subject index              E - Meeting catalogue
G - Geographic index
O - Order                       L - Order claim
? -
```

Fig. 48. REPORT program main menu

Various types of indexes, current awareness bulletin etc can be produced by selecting the appropriate option.

After completing operation, the system will return to the menu. Pressing X will return to the main menu of SISA.

CHAPTER NINE
USER'S MANUAL

The manual describes the operation of the SISA and MOPAC interfaces and a tutorial for search language of Micro CDS/ISIS software. It is in two parts:

Part I: ADVANCED SEARCH FACILITY (SISA)

PART II: ONLINE CATALOGUE SEARCH FACILITY (MOPAC)

The manual can be used independently for learning about CDS/ISIS search language.

Part I describes the SISA interface written in CDS/ISIS Pascal language. SISA is a system interface search assistance program for use with Micro CDS/ISIS databases in information search and retrieval.

Part II describes the MOPAC interface written in CDS/ISIS Pascal language. MOPAC is also a system interface search assistance program for searching in online library catalogue databases developed with Micro CDS/ISIS.

9.1. PART I
ADVANCED SEARCH FACILITY

S I S A
A SYSTEM INTERFACE SEARCH ASSISTANCE PROGRAM
FOR INFORMATION SEARCH AND RETRIEVAL IN
MICRO CDS/ISIS DATABASES

This manual is intended for use by end-users to search and retrieve from Micro CDS/ISIS databases.

9.1.1. Introduction

The SISA interface is largely menu-driven and is designed to assist users in performing search and retrieval operations in CDS/ISIS databases. SISA is essentially intended for end-users who may not have had experience with the search and retrieval operations of Micro CDS/ISIS. However, it can also be used with advantage by library and information professionals operating on Micro CDS/ISIS databases.

The major functions provided for by SISA allow users to:

- select database(s) for searching
- formulate search expressions using CDS/ISIS search language

- retrieve records
- display records using different display formats
- save records retrieved selectively
- review search performance of each user.

9.1.2. Using SISA

SISA can be invoked from different points of the CDS/ISIS system, for your particular computer system consult the database manager.

In any case on invoking the system will ask you to type in an ID and press <ENTER> key. If the ID is accepted, the SISA main menu will appear. SISA executes its functions through various options in the main menu. There are 11 options excluding the ESC. Quit, as shown in Fig. 49, the SISA main menu. Selection of each option presents the searcher a prompt to input values, select values or perform functions.

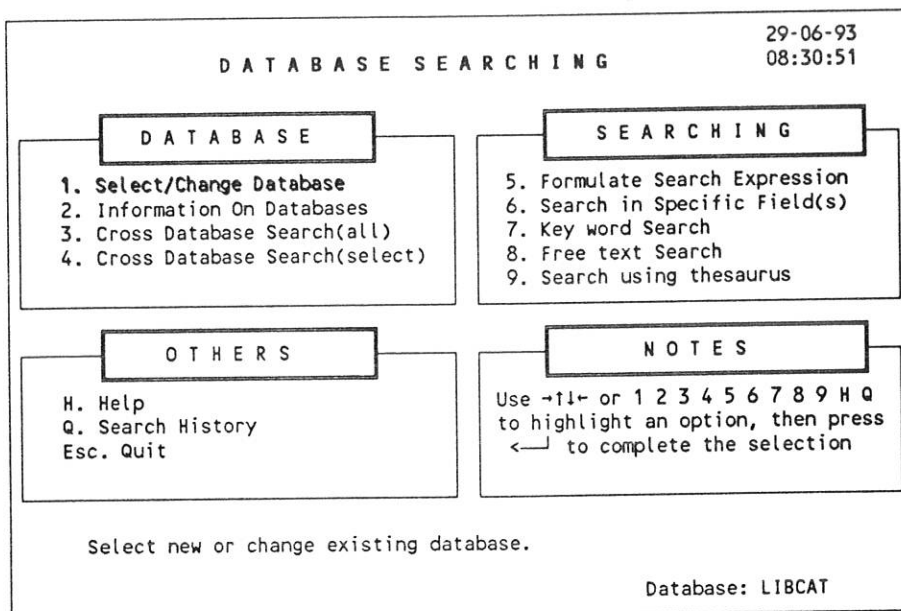


Fig. 49. SISA Main menu.

As shown in Fig. 49, the main menu is divided into four major sections DATABASE, SEARCHING, NOTES and OTHERS. At the top of the screen is the heading of the main menu. The right side of the heading displays a clock with system date and time. The bottom part of the screen contains a brief explanation for the highlighted option. For instance, the highlighted option as shown in Fig. 49 is 1, and the brief explanation of it appears at the bottom of the screen. If a database has already been selected, its name will be displayed at the right bottom of the main menu screen.

To select an option, move the cursor to highlight the option using appropriate arrow keys or pressing the option digit as mentioned in the NOTES, and then press the <ENTER> key.

OPTION 1: SELECT/ CHANGE DATABASE

Use option 1 to select a database or to change from a database in use to another.

Names of available databases as shown in Fig. 50 will be listed on the screen. Using appropriate arrow keys highlight the database one is interested in and press <ENTER> key to select.

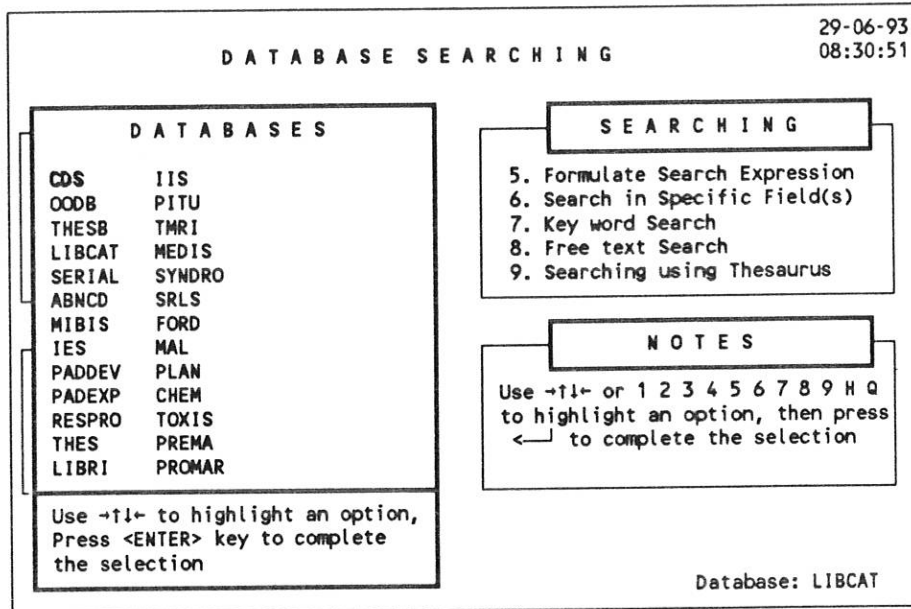


Fig. 50. List of Available Database Names.

Information about the contents, coverage, etc of databases can be displayed by pressing <F1> key (see Fig. 51). This is equivalent to selecting option 2 (see below).

After selecting the database, the system will then return to the main menu to enable the selection of a search option. The selected database name will be displayed (see Fig. 49) at the right bottom corner of the main menu replacing the previously selected database name, if any. Use the <ESC> key to quit to the main menu without selecting a database or replacing a pre-selected database.

I N F O R M A T I O N O N D A T A B A S E S	
ABNCD	Integrated database of bibliographic records, profile of institutions, of experts, of information systems and activities mainly in the fields of socioeconomic development.
FORD	Factual information on forest divisions (Kerala, India)
IES	Description of IES museum objects
IIS	Bibliographical records on medical topics
LIBCAT	Library catalogue mainly on information systems, info technology, info economy, info politics and policies, etc.
MAL	Similar to ABNCD
MEDIS	Case records of hospital patients
MIBIS	Bibliographic records on African development (PADIS)
PITU	Case records of hospital patients with tumours
SRLS	Union catalogue of serials of international agri centres
SYNDRO	Medical syndromes
TMR1	Similar to PITU
URBPLN	Factual data relating to selected Ethiopian towns

Press <ESC> to quit

Database: LIBCAT

Fig. 51. Information on Databases (selected by pressing <F1> while using option 1).

OPTION 2. INFORMATION ON DATABASES

Use option 2 to get brief descriptions about the content, coverage, etc. of the databases. A screen-full of information will be displayed at a time (See Fig. 52). Use <PgDn> and <PgUp> keys to move from one page to another back and forth. Pressing <ESC> key will return to the main menu.

I N F O R M A T I O N O N D A T A B A S E S

ABNCD	Integrated database of bibliographic records, profiles of institutions, of experts, of projects, of information systems and activities mainly in the fields of socioeconomic development in Africa
FORD	Factual information on forest divisions (Kerala, India)
IES	Descriptions of IES museum objects
IIS	Bibliographical records on medical topics
LIBCAT	Library catalogue mainly on information systems, info technology, info economy, info politics and policies, etc.
MAL	Similar to ABNCD
MEDIS	Case records of hospital patients
MIBIS	Bibliographic records on socioeconomic development
PADDEV	Bibliographic records on African development (PADIS)
PITU	Case records of hospital patients with tumours
SRLS	Union catalogue of serials of international agri centres
SYNDRO	Medical syndromes
TMR1	Similar to PITU
URBPLM	Factual data relating to selected Ethiopian towns

Press <ESC> to quit

Fig. 52. Information on Databases

OPTION 3: CROSS DATABASE SEARCH(ALL)

Use option 3 for searching all the databases in the system. This option helps in finding out how many records relevant to a specific query may be retrieved from each of the databases. To obtain such information, type in a keyword or combination of them in upper case or lower case representing, say a subject interest.

For example:

AGRICULTURE AND INFORMATION SYSTEMS AND AFRICA,
and press <ENTER> key. See Fig. 53.

SEARCH EXPRESSION(S) SUBMITTED			
<u>Set</u>	<u>Data base</u>	<u>Hits</u>	<u>Search Expression</u>
1	LIBCAT	45	INFORMATION
2	ABNCD	3	INFORMATION
3	CDS	30	INFORMATION
4	SERIAL	0	INFORMATION

[Set No.]select [M]ax [Q]uit █

Fig. 55. Cross Database Search result

Three options are shown at the bottom left of the screen: [Set No] [M]ax [Q]uit. To search in one of the databases listed, type in the set number and press <ENTER> key to initiate search. Selecting option M and pressing <ENTER> will initiate search in the database giving the highest number of hits for the query. Selecting option Q and pressing <ENTER> will return to the main menu.

In response to the search expression entered, the system will present a report. For example, for the search expression:

(CULTIVATION OR AGRONOMY) AND RICE

the report may be like as shown below, for a particular database:

```

Set          1: (CULTIVATION + AGRONOMY) * RICE
P=           3 CULTIVATION
P=           3 AGRONOMY
T=           5 -#2: CULTIVATION + AGRONOMY
P=           1 RICE
T=           1 -#3:  #2 * RICE
T=           1 -#1:  #3
----> █

```

Fig. 56. CDS/ISIS Report for a Search Expression

This indicates that the term CULTIVATION occurs three times (three postings) in the database, though all occurrences may be in the same record. The term AGRONOMY has also three occurrences. There are five occurrences of the sub-expression CULTIVATION + AGRONOMY (referred to as sub-expression #2), meaning that there are five records in which one or the other of the terms occur. There is one posting for the term RICE; one occurrence of the sub-expression #2 * RICE (that is, sub-expression #2 and RICE) (referred to as #3) and one for the whole query (referred to as #1), which is identical with the sub-expression #3.

Press the <ENTER> key to display the retrieved record(s). If the number of hits is greater than 0 the available display formats for the database will be displayed as shown in Fig. 57 below.

Database: LIBCAT
Search expression: Information

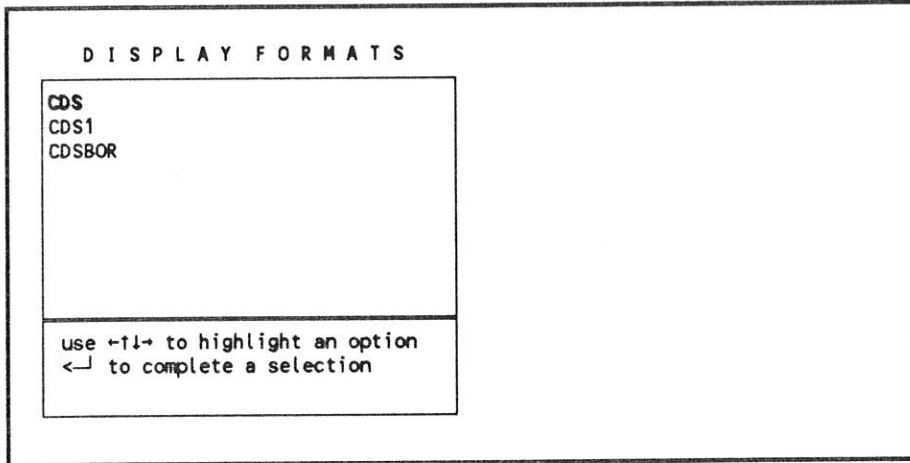


Fig. 57. List of Display Formats

Using the appropriate arrow keys highlight a display format and press <ENTER> key to select. Then, the records will be displayed (See Fig. 58). After displaying a record the system will request selection from one of the options shown at the bottom right of the screen. Press the <ESC> key to return to the main menu; or S key to save the displayed record in a file the name of which will be required to be keyed in a box on the screen. Use <PgDn> and <PgUp> keys to move back and forth through the retrieved records.

Database: LIBCAT Format: CDS
Search expression: Information

1 of 45

TITLE	: Powershift: Knowledge, wealth and violence at the edge of the 21st century
AUTHOR(S)	: Toffler, Alvin
PUBLISHER	: New York: Bantam books
YEAR	: 1990
Collation	: 611 p.; 459 ref.
SERIES	: Bantam books
ISBN	: 0-553-18052-5
KEYWORDS	: Politics; Power; Future; Information; Information technology; Mass media; Civilization
LOCAT./COPY	: GRADUATE LIB c. 1 SISA C. 1
CALL NUMBER	: 328.34 1990 Pow
ACC. NO.	: 12001
DOC. STATUS	: Book

PgDn

[ESC] to quit [S]ave

Fig. 58. Search Result Display.

OPTION 4: CROSS DATABASE SEARCH(SELECT)

Use option 4 to search one or more specific databases preliminary to selecting database(s) for further search. A list of names of databases will be displayed as shown in Fig. 59 below.

DATABASES AVAILABLE

- CDS	- THR1	- CHEM
- SERIAL	- MEDIS	- TOXIS
- ABNCD	- SYNDRO	- PREMA
- LIBCAT	- SRLS	- PROMAR
- MIBIS	- FORD	
- PADDEV	- MAL	
- PADEXP	- PLAN	
- RESPRO	- CHEM	

Use ←↑↓→ to highlight an option, press S to select,
then press ←↵ to complete the selection(s)

F1 - database information

Fig. 59. Multiple Database Selection screen.

Using the appropriate arrow keys highlight the database to be searched and press the S key to select. Proceed in this manner to select other databases. After selecting the database(s), press the <ENTER> key to initiate the search process. Then follow the same procedure as for option 3. As for option 1, pressing <F1> key will display brief information on databases. (See Fig. 51)

OPTION 5 : FORMULATING SEARCH EXPRESSION

Use option 5 to formulate and submit search expression and to retrieve and display search results in one or more databases (see under options 3 and 4). On selecting option 5, the system will display the list of search expression, number of hits, etc. for previous searches (during the current session), if any. On

pressing the <ENTER> key, the system will display a blank screen with the prompt:

Enter search Expression:

at the top left of the screen.

The search term/expression is to be entered at the position of the cursor at the top left.

Micro CDS/ISIS provides for searching using the index of terms extracted by the system from the records of databases according to prescribed techniques, and also for free text searching, that is not using the index of terms. Formulation of search expressions according to search language of Micro CDS/ISIS is briefly discussed below:

SEARCH EXPRESSION

A search expression usually consists of a term or a combination of terms representing an information need, for example:

AGRICULTURE

AGRICULTURE AND AFRICA

URBAN AREAS AND AIR POLLUTION AND MOTOR TRAFFIC

ANDERSON K.S.

ANDERSON K.S. AND PHILLIPS J.

DATABASE OR DATA BASE

SOFTWARE NOT CDS/ISIS

BOOLEAN OPERATORS

In the above expressions 'AND', 'OR', 'NOT' are called operators (Boolean Operators) for combining the concepts represented by the terms.

The expression AGRICULTURE AND AFRICA means that only those records containing both these terms should be retrieved; so also is the case with the expression URBAN AREAS AND AIR POLLUTION AND MOTOR TRAFFIC.

The expression DATA BASE OR DATABASE means that any record containing either of the terms will satisfy the query.

The expression SOFTWARE NOT CDS/ISIS means that the record(s) retrieved should contain the term SOFTWARE but should not contain the term CDS/ISIS.

In general, the AND operator is used to increase the precision of a query (reduce the number of hits); the OR operator is used to broaden the search (increase the

number of hits); and the NOT operator to exclude term(s) which may also increase precision.

Note: One may use * instead of AND, + instead of OR and ^ instead of NOT in the search expression

MATCHING OF TERMS

In order to ensure that each term in the search expression matches exactly with term(s) in the index, the search term(s) should be entered precisely as in the index. That is, if the term in the index is DATABASES, the search term typed in as DATABASE, DATA BASE, DATA BASES will not match with the index term and no records may be retrieved. Similarly, ANDERSON K.S. and ANDERSON, K.S will not match; nor will COLOR and COLOUR.

Using the Boolean operator OR, alternative forms of a term may be taken care of; for example,

DATABASE OR DATABASES OR DATA BASE OR DATA BASES
COLOR OR COLOUR

Similarly, for synonyms and spelling variations

TRUCK OR LORRY OR TRUCKS OR LORRIES
FIBRE OR FIBER
LABOUR OR LABOR

For compounded terms

NETWORK OR NETWORKING

TERM TRUNCATION

Suffixing the truncation symbol \$ to the stem of a word can also help. For example:

BIOCHEM\$ will match with all terms having the stem 'BIOCHEM',

such as,

BIOCHEMICAL

BIOCHEMIST

BIOCHEMISTRY

etc.

PARENTHESES

In a search expression containing several combinations of terms, specificity can be achieved by the judicious use of parentheses. For example, if information is needed on "The relation between motor traffic or industrial fumes and air pollution in urban areas", the search expression

MOTOR TRAFFIC OR INDUSTRIAL FUMES AND URBAN AREAS AND AIR POLLUTION

may retrieve all records in which the term MOTOR TRAFFIC

only or in combination with the terms mentioned in the search expression as well as with terms other than those in the search expression, occur. This may result in the retrieval of records irrelevant to the query. A more precise expression of the query will be
(MOTOR TRAFFIC OR INDUSTRIAL FUMES) AND (URBAN AREAS AND AIR POLLUTION)

PROXIMITY OPERATORS

More restrictive types of the logical AND operators are (G) and (F).

Use (G) to retrieve from same field (all occurrence of the search terms in the same repeatable field treated as single entity); for example:

LIBRARY (G) AUTOMATION

will retrieve all records in which both terms LIBRARY and AUTOMATION occur, provided that they occur in the same field.

PERSONNEL (G) MANAGEMENT

will retrieve all records in which with both terms PERSONNEL and MANAGEMENT occur, provided that they occur in the same field.

Use (F) to retrieve all records with search terms

in the same occurrence of any field or individual occurrence of a repeatable field. For example:

WATER (F) SOIL

will retrieve all records in which both the terms WATER and SOIL occur, in the same field or the same occurrence of a repeatable field.

. can be used in the same way as (F) , but with the additional restriction that the terms are not more than n words apart, where n is the number of dots minus one. For example:

INFORMATION . . MANAGEMENT

will retrieve records which contain

Information for management

Management information

Management of information,

but not

Information for middle management.

\$ can be used in the same way as (F), but with the additional restriction that the terms are exactly n words apart, where n is the number of dollars minus one. For example:

INFORMATION \$ \$ \$ MANAGEMENT

will retrieve records which contain:

INFORMATION FOR TOP MANAGEMENT

INFORMATION FOR MIDDLE MANAGEMENT, etc.

but not

INFORMATION MANAGEMENT

N.B. The operators (G),(F), \$ and ., must be preceded and followed by one space.

OPERAND QUALIFIERS

A qualifier can be used to specify a field or fields in which the search term(s) should occur. This is particularly useful for databases which may contain the same data in different fields. The form of the search expression is:

SEARCH TERM(t1,t2,t3,...), where t1, t2, t3, ... are field tags. For example,
INFORMATION SERVICES/(69) OR INFORMATION SYSTEMS/(24)
where 69 is the field tag for Descriptors and 24 the field tag for Title in the database LIBCAT. (see also option 6)

FREE TEXT SEARCH

A free text search can be done in this option (option 5). This is useful for searches in fields which may not have been indexed. The search expression is of the form:

? v24: 'plant' and val(v26) = 1965

which means with reference to a particular database (CDS in this case), the string 'PLANT' should be present in term(s) in field 24 (i.e Title) and the numerical value of the field 26 (ie. Year of Publication) should be 1965; or

```
? #3 v300: 'neelameg' and v620: 'policy'
```

which means retrieve all records containing the string NEELAMEG in field 300 and POLICY in field 620 of the records retrieved previously in set number 3. #3 may be either an inverted file search expression, another free text search or a combination of both.

In response to the free text search expression the system will present a screen displaying information on the search process. For example, for the search expression for a particular database:

```
? v24: 'unesco' and val(v26) >= 1986 ,
```

the screen may look as follows:

MFN	Hits	%	Recs
50	5	10.0	150

Press any key to interrupt search

Fig. 60. CDS/ISIS Free Text Search Report

The value in MFN box shows the master file number (MFN) of the record being processed, the Hits box shows the current number of records retrieved, the % box shows the current hit rate, i.e, the percentage of records retrieved calculated with respect to the number of

records processed, and the Recs box is the total number of records to be processed.

OTHER OPERATORS

Other relational operators you can use in a free text search expression are:

- = equals
- <> not equal to
- < less than
- > greater than
- : contains

For each search expression CDS/ISIS assigns a unique set number. The records retrieved can be displayed, or saved in a file for future use.

A search expression can be re-executed with or without modification on any of the databases by simply using the set number assigned by CDS/ISIS preceded by a number sign (#) (eg. #3). This facility allows one to develop the search step by step.

SYNTAX ERRORS

If a search term contains: * + () . \$ ^ or begins with a number sign (#), it must be enclosed in double quotation marks ("), otherwise a syntax error will occur.

Example: Entering the search term INSTITUTION(S) will cause a syntax error. The correct form is "INSTITUTION(S)".

ANY TERM

ANY TERM is a collective name for a predefined set of access points in the ANY file for the database being searched. When an ANY term is used in a search expression, the system will OR together all the access points of the cluster of terms associated with that ANY term in the related ANY file.

Example: Assume that the ANY file for a database contains:

ANY EUROPE	EUROPE
ANY EUROPE	EEC
ANY EUROPE	EC
ANY EUROPE	EUROPEAN COMMISSION
ANY EUROPE	FRANCE
ANY EUROPE	GERMANY
ANY EUROPE	SPAIN
ANY EUROPE	ITALY
ANY EUROPE	PORTUGAL
ANY EUROPE	AUSTRIA
ANY EUROPE	SWITZERLAND
ANY EUROPE	DENMARK
ANY EUROPE	SCANDINAVIA
ANY EUROPE	NORWEGIAN
ANY EUROPE	SWEDEN
ANY EUROPE	ENGLAND
ANY EUROPE	SCOTLAND
ANY EUROPE	IRELAND
ANY EUROPE	WALES
ANY EUROPE	UK
ANY EUROPE	UNITED KINGDOM

Thus, the search expression ECONOMY AND ANY EUROPE will retrieve all records in which the terms ECONOMY and also any of the terms in the ANY file occur. This technique can increase the number of hits for a search expression.

OPTION 6: SEARCH IN SPECIFIC FIELD(S)

Use option 6 for searching in specific field(s). Field numbers (tags) and field names for the database will be listed on the screen (See Fig. 61).

D A T A B A S E S E A R C H I N G		29-06-93 08:30:51
Tag	Field Name	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px; text-align: center;">S E A R C H I N G</div> 5. Formulate Search Expression 6. Search in Specific Field(s) 7. Key word Search 8. Free text Search 9. Searching using Thesaurus
12	Conference main entry	
24	Title	
25	Edition	
26	Imprint	
30	Collation	
44	Series	
50	Notes	
60	Class Number	
69	Keywords	
70	Personal Authors	
71	Corporate Bodies	
72	Meetings	
74	Added Title	
76	Other language titles	
80	ISBN	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px; text-align: center;">N O T E</div> Use ←→ or 1 2 3 4 5 6 7 8 9 H Q to highlight an option, then press ← to complete the selection
Use ←→ to highlight an option, Press S to select, then press ← to complete the selection(s)		
		Database: LIBCAT

Fig. 61. List of tags and tag names of a database.

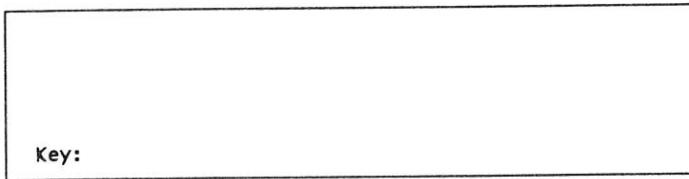
Using appropriate arrow keys highlight the field of interest and press S key to select. Proceed the same way to select more fields. A maximum of 10 tags can be selected. After selecting the tag(s), press <ENTER> key. The system will prompt to formulate the search expression. The procedure is the same as for option 5.

In this option, free text search is not permitted. Specifying separate tags for different search terms in the same search expression is not permitted. Option 5 permits the performance of this kind of search specifying tags at the end of each term as qualifier (see option 5).

After formulating the search expression proceed in the same manner as for option 3.

OPTION 7: KEY WORD SEARCH

Use option 7 to search using the list or dictionary of index terms. On selecting the option the screen will look like as in Fig. 62.



Key:

Fig. 62. Key Word Search Prompt

Enter a key term or the first few characters of the term at the cursor position at the bottom left of the screen. A list of index terms beginning with the string keyed in will be displayed in alphabetical sequence in two columns (See Fig. 63). If there is no index term matching the string keyed in, the display will start from the next nearest term in the alphabetical sequence in two columns as shown below.

Dictionary ListData Base Name: LIBCAT	
- ABCARIAN, GILBERT	- ANTHONY, R.N
- ACCOUNTING	- ANTHROPOLOGY
- ACTION	- ANTILL, LYN
- ADAMS, WALTER	- APPLE
- ADAPTIVE	- APPLICATION
- ADDIS ABABA UNIVERSITY	- APPLICATIONS

Fig. 63. An example of the LIBCAT database dictionary.

Use the arrow keys to move the cursor to the desired terms(s) and press S to select. Use <PgDn> and <PgUp> keys to move from one page to the next on the screen. Finally press X to submit the search expression. The terms selected will be combined by the OR operator. The expression can be edited as desired. Press <ENTER> key to initiate the search. Follow the same procedure as for option 3. Press Q to quit to the main menu.

OPTION 8: FREE TEXT SEARCH

Use option 8 to search a string of character(s) in a database. If there is no pre-selected database, the system will automatically execute option 1. Then, if a database is selected, a list of tags and corresponding field name(s) will be displayed as for option 6. But, in this case the selection of only one field is permitted (see Fig. 64). Using appropriate arrow keys highlight the relevant field and press <ENTER> key to select.

DATABASE SEARCHING		29-06-93 08:30:51
Tag	Field Name	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">SEARCHING</div> 5. Formulate Search Expression 6. Search in Specific Field(s) 7. Key word Search 8. Free text Search 9. Searching using Thesaurus
12	Conference main entry	
24	Title	
25	Edition	
26	Imprint	
30	Collation	
44	Series	
50	Notes	
60	Class Number	
69	Keywords	
70	Personal Authors	
71	Corporate Bodies	
72	Meetings	
74	Added Title	
76	Other language titles	
80	ISBN	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">NOTE</div> Use →← or 1 2 3 4 5 6 7 8 9 H Q to highlight an option, then press ← to complete the selection
Use →← to highlight an option, then press ← to complete a selection		
		Database: LIBCAT

Fig. 64. List of Tags and Field Names for Option 8.

When a field is selected, the system will prompt to type in the string to be searched,

Enter String to be searched: Information

and press <ENTER> to initiate the search. The record(s) in which the keyed-in string is present in the specified field will be displayed (see Fig. 65.).

Database: LIBCAT Format: CDS
String: Information

1

```
TITLE      : Powershift: Knowledge, wealth and violence at the edge of the
             21st century
AUTHOR(S)  : Toffler, Alvin
PUBLISHER  : New York: Bantam books
YEAR       : 1990
Collation  : 611 p.; 459 ref.
SERIES     : Bantam books
ISBN       : 0-553-18052-5
KEYWORDS   : Politics; Power; Future; Information; Information technology;
             Mass media; Civilization
LOCAT./COPY : GRADUATE LIB c. 1
             SISA C. 1
CALL NUMBER : 328.34 1990 Pow
ACC. NO.   : 12001
DOC. STATUS : Book
```

PgDn

[ESC] to quit [S]ave

Fig. 65. Search result display of option 8

If a record is displayed, a choice among the options shown at the bottom right of the screen is possible. Press S to save the record in a file whose name will be required to be typed in a box or in a pre-selected save file, as the case may be. Press <ESC> key to quit to the main menu. Press <PgDn> to display successive records if any. At the end, the system will display "No more record Exist" at the bottom of the screen. Press <ESC> key to return to the main menu.

OPTION 9: SEARCH USING THESAURUS.

Use option 9 to search using a thesaurus.
On selecting the option, the displayed screen will be:

BIRD

Select Term

Fig. 66. Term Selection Screen For Thesaurus Searching.

Key in, at the cursor position in the box, the term or the first few characters of the term representing a query. A list of terms, from the alphabetical index of the thesaurus, beginning with the term/string keyed-in will be displayed (See Below).

- BIRDS
- BOB
- CAMEL
- CAT
- CATS
- EARTH
- EARTH SCIENCE
- EUROPE
- FISH
- FRANCE
- GERMANY, F.R.
- HORSES
- ITALY
- LION
- **MAM**MALS
- PORTUGAL

<— [Next] B[previous] P[age] S[elect]
 C[reate term] T[erm select] X[exit]

If there is no term in the thesaurus matching the term/string keyed-in, the display will be from the next closest string. Several options of THES program will be

displayed at the bottom of the screen. Press the <ENTER> key as many times as required to position the cursor against the relevant term and press S key to select. The system will display the term selected along with its broader term (BT), narrower term (NT) and related terms (RT), if any. (See below)

MAMMALS

- MAMMALS
- NT Camel
- NT Cats
- NT Horses
- NT Lion
- NT tiger

<← [Next] B[ack] F[irst] P[age] S[elect] T[erm select] Q[query]
?[display query] A[dd relation] D[elete] C[reate term] X[exit]

Use the <ENTER> key as before to position the cursor against any other relevant term. On pressing the S key, the system will display the new selected term and its associated BT, NT and RT. On the other hand, if the Q key is pressed, the term will be selected to formulate a search expression. In this way one can select as many search terms as necessary. Press the ? key for display of the terms selected to form a search expression in a box at the lower half of the screen. Press X key to exit the thesaurus; the selected terms will be combined with the OR operator and displayed at the top of the screen. One can edit to modify the term(s) and/or of the operators (see option 5). On pressing the <ENTER> key, the search will be initiated, thereafter, the process is similar to choosing option 5.

OPTION Q: SEARCH HISTORY

Use option Q to display the search history.

Your previous search performances will be displayed. Number of hits, number of records saved, database searched, search expression, option used will be displayed along with your Name, ID number, and Contact address. Press <ENTER> key to continue the display. <ESC> key returns you to the main menu.

OPTION H. Help

Use option H to get detailed help on each of the main menu options as shown in Fig. 25 (see also Annex 3)

A screen-full text will be displayed beginning with the first option. Use the <ENTER> key to go forward. Pressing the <ESC> key will return to main menu.

OPTION Q: QUIT

Use <ESC> key (or option ESC) to terminate the session.

9.2. PART II

ONLINE CATALOGUE SEARCH FACILITY

9.2.1. Introduction

The MOPAC interface is largely menu-driven, and designed to assist users in performing search and retrieval in library catalogue database prepared with Micro CDS/ISIS. MOPAC is essentially intended for end-users who may not have had experience with search and retrieval operations of Micro CDS/ISIS (eg. students, teachers, researchers, librarians, etc.)

The major functions provided by MOPAC allow users to search database of library catalogue by:

- Name(s) of Personal Author(s)
- Name(s) of Corporate Body(ies)
- Name Conference/meeting
- Title
- Class Number
- Subject Keyword

9.2.2. Using MOPAC

As indicated in Part I, MOPAC can be also incorporated and invoked from different points of the

CDS/ISIS system, but mainly as a menu exit.

On invoking MOPAC, the main menu appears as shown below in Fig. 67.

```
26-06-00
08:00:00

LIBRARY USER'S SERVICE
CATALOGUE SEARCH

By Personal Author
By Corporate Author
By Conference Name
By Title
By Class Number
By Subject keyword
Help
Quit

Use ↑ to highlight an option,
then press <ENTER> to complete the selection

Search using Personal Author name.
```

Fig 67. MOPAC Main Menu

As shown in Fig. 67, the main menu contains 8 options, 6 of which are access points. At the top of the main menu screen is the heading of the main menu. The top right side of the screen displays a system date and time. The bottom part (last line) of the screen displays explanation for the highlighted option; for instance, the highlighted option is option 1 and the brief explanation of it appears at the bottom (last line) of the screen.

To select an option, as indicated at the bottom of the main menu screen, move the cursor to highlight the option using the appropriate arrow key (down or up arrows only), and then press the <ENTER> key to select.

OPTION 1 THROUGH 6

MOPAC provides a search capability to retrieve records by each of the options Personal Author name, Corporate Author Name, etc. as indicated in the main menu (Fig. 67). On selecting an option the following prompt will be displayed at the top of left of the screen :

Enter Search Expression:

Type the search expression at the cursor and press <ENTER> key. <F1> key may be used to get a brief explanation of how to formulate search expressions (See Fig. 68).

Key in appropriate terms representing your information needs press
<↵> eg. Africa for retrieving information on Africa. Terms may be
combined as follows:
Information base or database
information and retrieval
Automation not library automation
Robert or John
Terms may be truncated by suffixing \$ to the root term eg. Network\$
which will search Network or Networking or Networks.
To execute earlier query: key in set number eg. #2

Press ESC to quit

For More help use option H in the main menu

Fig. 68. Brief help in search formulation screen.

Formulating Search Expression

The procedures are the same as described in Part I Advanced Search Facility, option 5.

However, Specific field(s) and free text searching are not supported by MOPAC.

After formulating the search expression, you are requested to press <ENTER> key, then the system presents a report as indicated in part I, option 5.

If the number of hits is greater than 0 then, the record(s) will be displayed as shown in the example below. (Fig. 69)

Search expression: Information Systems
Number of Documents Retrieved: 27

1 of 27

TITLE	: Application architecture - modern large-scale information processing
AUTHOR(S)	: Best, Laurence J
PUBLISHER	: New York: John Wiley
YEAR	: 1990
KEYWORDS	: Information systems; Information technology; Information processing
LOCAT./COPY	: SISA
CALL NUMBER	: 651.84 1990 App
ACC. NO.	: 12010
DOC. STATUS	: Book
LOAN STATUS	
BORROWED ON	: 93-03-25
DUE ON	: 93-04-24
BORROWER ID	: 7551
BORROWER	: Neelameghan; A

More - <CR>

Search expression: Information Systems
Number of Documents Retrieved: 27

1 of 27

STATUS	: Teacher/Professor
DEPARTMENT	: School of Information Studies for Africa
INSTITUTE	: Addis Ababa University
CONTACT TEL	: 110344
RESERVATIONS	
RESERVED BY	: Bhattacharya, G
CONTACT TEL	: 550970 (Res); 110433 (Office)

PgDn

[ESC] TO QUIT [S]AVE

Fig. 69. Search Result Display Screen.

After displaying a record the system offers two options, at the bottom right of the screen. Press the <ESC> key to return to the main menu; or S key to save the displayed record in a file the name of which you will be asked to key-in in a box on the screen as shown below:

Save as:

Use <PgDn> and <PgUp> keys to move back and forth through the retrieved records. If a displayed record is more than one screen page, you may press <ENTER> key to display the rest of the records.

OPTION: HELP

Use option HELP to get detailed help on each of the main menu options (See Fig. 67). (See also Annex 4)

A screen-full text will be displayed beginning from the first option. The <ENTER> key may be used to go forward. Pressing the <ESC> key will return to the main menu.

OPTION : QUIT

Use <ESC> key (or option QUIT) to terminate the session.

CHAPTER TEN

SUMMARY AND RECOMMENDATIONS

10.1. SUMMARY

The main objective of this study was to enhance the user-friendliness of the search-interface of the Micro CDS/ISIS software. To this end, the study reviewed the historical background, development perspectives and capabilities of the Micro CDS/ISIS package. The software is used widely in many libraries and information centres in developing countries around the world, including several institutions in Africa.

Online Information storage and retrieval softwares and the attempts to develop end-user softwares have been briefly examined along with the development of interfaces for end-users and improving the capabilities of the Micro CDS/ISIS.

The search and retrieval option of Micro CDS/ISIS is not friendly to end-users who have not had experience in search and retrieval process with the software. The recently released version 3.0. of the software can be used in a network configuration. This will enable several end-users directly accessing CDS/ISIS databases from different user terminals. It also calls for enhancing

facilities for end-users to perform search and retrieval operation, with ease. For this purpose two CDS/ISIS Pascal programs called SISA and MOPAC have been developed.

The SISA program, provides for advanced search facility in Micro CDS/ISIS databases. The program consisting of various options each of which introduces a new facility or improvement over the standard CDS/ISIS options. The following major facilities have been either improved or introduced in the SISA interface.

1) Database(s) selection. This facility has been greatly enhanced, through databases listing, provision of information on databases as a means of selecting database(s) by end-users.

2) Formulating search expression. Online help facility on the search language of Micro CDS/ISIS software, guideline messages and help windows have been incorporated. In addition, a thesaurus facility to enable end-users to select appropriate terms that describe their information need have been incorporated. These facilities will make direct user search of database(s) more productive and comfortable.

3) Multiple Databases search. Facilities to search concurrently in multiple pre-selected databases or all the available databases have been incorporated.

4) Displaying retrieved records. The screen display of records has been modified, facilities to move backwards to re-display already displayed records incorporated and to save displayed records selectively have been incorporated.

5) Analysis of search performance. A mechanism to save each search performances in a database for later reference and analysis of search history has been provided.

These and other facilities incorporated in the interface has enhanced the user-friendliness of the search and retrieval operation of the Micro CDS/ISIS software package.

The MOPAC program provides access to Micro CDS/ISIS library catalogue databases. The program provides several access points, such as, by Name(s) of Personal author, Corporate author(s), Conferences, title words, descriptors and class number, in a user-friendly manner. As with the SISA program, help facility, guideline messages and help windows have been incorporated to facilitate formulating search expressions. The menu-driven facility is user-friendly enabling end-users directly access online library catalogue with little or no assistance from library intermediaries.

The programs have been tested by different groups in different places, such as, Institute of Information

Studies, Bangalore for trainees in CDS/ISIS, ILCA, and School of Information Studies for Africa (SISA), Addis Ababa, during the developmental stage.

Manuals for system manager and end-users have been prepared.

To facilitate provision of some frequently required services to users e.g. Interlibrary Loan request services, Selective Dissemination of Information services and generation of various types of reports, indexes, catalogues, current awareness bulletin, etc., three available CDS/ISIS Pascal programs have been incorporated for use by service staff.

The facilities incorporated in the interfaces overcome some of the limitations of the standard CDS/ISIS package's search and retrieval operations.

10.2. RECOMMENDATIONS

Preliminary testing of the new facilities in different institutions has been done and some suggestions from users have been incorporated. The programs need to be more widely used in practice to obtain feedback so as to modify them as necessary. Some of the institutions envisaged to test the interfaces are: ILCA-ICRAF course on information retrieval from Aug. 2 - 20, Asian & Pacific Development Centre Library, Kuala Lumpur,

Malaysia in November 1993, University of Colombo, Sri Lanka at a Course on CDS/ISIS in the end of July 1993, Documentation Research and Training Centre, and the Institute of Information Studies in Bangalore, India, Department of Library and Information Science in July 1993, and the University of Papua New Guinea in Nov. 1993. A person familiar with CDS/ISIS Pascal can incorporate such modifications or new features.

Some of the new features, such as, database listing, online help, and multiple database search facilities should preferably be incorporated in future standard versions of the software itself.

The study was aimed at improving only the search and retrieval phase of the software. Similar improvements on data entry, database creation, display formats, error messages can greatly enhance the use of this software in libraries and information centres. A facility for online reservation of books will be useful feature for incorporating in the MOPAC interface.

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ANNEX I
SISA SOURCE PROGRAM

```

program sisa(s1:string) [menu];
uses thes;
var
  posi,src,num,fnom,add4,REC,ADD1,ADD2,ADD3,SAVE,COUNT,i,j,
  n,kp,y,sz,row,s,rc,rmfn,fmt,ln,kk,u,kkey,maxp,fin,add5 :real;
  nom,vr,dr,tp,upline,line,DHITS,tsec,o,cn,ll,setmax,mmax:real;
  exit,xy,id,dat,dbname,key,x,lin,choice,qq ,till,strng1 :string;
  stored,strng2,nterm,term,namedb,tim,fnm,blop,setno,opp :string;
  ntag
    : array[1..10] of string;
  name
    : array[1..10] of string;

procedure fmtng;
var svar,svar1,svar2 :string;
  h :real;

begin
uc(nterm); term := Nterm;
repeat
  if (substr(term,1,1) = ' ') then
    term := substr(term,2, size(term));
until substr(term,1,1) <> ' ';
if (substr(term,1,1) <> '?' ) then
begin; term:=nterm;
repeat
  y := position(term, ' NOT ',1);
  if(y>0)then
    term := substr(term,1,y-1)' ' ^ ' '|substr(term,y+5,size(term));
until y = 0;
repeat
  y := position(term, ' AND ',1);
  if (y > 0) then
    term := substr(term,1,y-1)' ' * ' '|substr(term,y+5,size(term));
until y = 0;
repeat
  y := position(term, ' OR ',1);
  if (y > 0) then
    term := substr(term,1,y-1)' ' + ' '|substr(term,y+4,size(term));
until y = 0;
end;
end;
procedure tagformat;
var
  H,P,F,u :real;
  temp,ch :string;

begin
  F := 1; uc(term);
  repeat
    y := position(term, '^',F);
    if (y>0) then
      BEGIN
        temp := substr(term,1,y-1);
        temp := temp|'/'|ntag[1]; f := y+5;
        for h:=2 to 10 do
          begin
            if ntag[h]<>' ' then
              BEGIN TEMP := TEMP|'|ntag[h]; F := F+4; END;
          end;
        temp := temp|'|';
        term := temp|^'|substr(term,y+1,size(term));
        f := f+4;
      END;
    until y = 0;
    f := 1;
  repeat

```

```

y:=position(term, '* ',f);
if (y>0)then
begin
temp := substr(term,1,y-1);
temp := temp|'/'|ntag[1]; f:=y+5;
for h := 2 to 10 do
BEGIN
if ntag[h] <> '' then
begin temp := temp|','|ntag[h]; f := f+4; end;
END;
temp := temp|'|';
term := temp|' * '|substr(term,y+1,size(term));
f := f+4;
end;
until y = 0;
F := 1;
repeat
y := position(term, ' ',F);
if (y>0)then
begin
TEMP := substr(TERM,1,y-1); TEMP := TEMP|'/'|ntag[1];
F:=Y+5;
for h := 2 to 10 do
BEGIN
if ntag[h] <> '' then
begin temp := temp|','|ntag[h]; f := f+4; end;
END;
temp := temp|'|';
term := temp|' + '|substr(term,y+1,size(term));
f := f+4;
end;
until y = 0;
if (ntag[1] <> '') then
begin
term := term|'/'|ntag[1];
for h := 2 to 10 do
BEGIN
if ntag[h] <> '' then TERM := TERM|','|ntag[h];
END;
TERM:=TERM|'|';
end;
end;

procedure help1;
begin

clearbox(10,1,15,80,2); box(10,1,15,79,2); cursor(12,5);
write('Key in appropriate terms representing your ');
writeln('information needs press!');
cursor(13,5); write('^Q eg. Africa for retrieving!');
writeln(' information on Africa. Terms may!');
cursor(14,5); writeln('be combined as follows:');
cursor(15,10); writeln('INFORMATION BASE OR DATABASE!');
cursor(16,10); writeln('INFORMATION AND RETRIEVAL!');
cursor(17,10); writeln('AUTOMATION NOT LIBRARY AUTOMATION!');
cursor(18,10); writeln('ROBERT OR JOHN!');
cursor(19,5); write('Terms may be truncated by suffixing $!');
writeln(' to the root term eg. Network$!');
cursor(20,5);write('which will search NETWORK OR NETWORKING ');
writeln('or NETWORKS. ');
cursor(21,5);write('To execute earlier query: key in set!');
writeln('number eg. #2!');
cursor(23,1);write('Press ESC to quit ');
write(' For More help use option H in the main menu!');
repeat kp:=kbdkey(key);until kp = 1.00;
end;

procedure editing;
begin

```

```

clear;cursor(2,1);
writeln('Enter Search Expression: ');
cursor(24,15);write('F1 - Help      Press ^Q_ to complete!');
savescr(2);
repeat
  page(2);
  y:=edit(term,255,3,1,255,3,' ');
  if y = 1 then help1;
  if y = 4 then term := '';
until (y =0) or (y =4);
nterm:=term;
end;

procedure searching;
begin s:=search(term); dhits:=setpos(0,0); end;

procedure recallsr;
var p,maxhits           :real;
begin
  clear;clearmsg; maxhits := 0; row:=3;cursor(2,1);
  for p:=mxx to maxset do
    begin
      if p = mxx then
        begin
          writeln('SEARCH EXPRESSION(S) SUBMITTED');
          writeln('Set  Data base  Hits  Search Expression');
          writeln('____  _____  ____  _____');
          cursor(5,1);
        end;
        DHITS:=RECALL(P,namedb,NTERM);
        writeln(p:3,' ':3, namedb:6, ' ':6, dhits:4, ' ':3,
          substr(nterm,1,54));
        if dhits > maxhits then begin maxhits:=dhits;maxp:=p;end;
        if getcl > 20 then
          begin
            writeln(' -- More -- press any key ');
            repeat kp:=kbdkey(key); until (kp=1.00) or(kp=28.00);
            if kp=1.00 then begin p:=maxset;clear;end;
            clearbox(5,1,18,80,1); cursor(5,1);
          end;
        end;
    end;
end;

procedure defsr;
var
  H,P,F,u           :real;
  temp,ch           :string;
begin
  clear;
  if maxset > 0 then
    begin
      mxx:=1; recallsr; cursor(25,1);
      write('Press any key to proceed. ');kp:=kbdkey(key);
    end;
  IF CHOICE ='6' THEN
    BEGIN
      CURSOR(1, 60); WRITELN('Specific Field(s) Search');
      Chattr(4,1,60,25);
    END;
  term:=''; editing;
  if (y = 0) and (term <> '') then
    begin
      fmtng;
      if choice = '6' then tagformat;
      searching; DHITS:=SETPOS(0,0);
    END;
end;

procedure formulate;

```

```

var
  H,P,F,U                :real;
  temp,ch                :string;
begin
  clear;row:=3;dbname:=dbn;mmxx:=maxset + 1;
  term:=''; editing; nterm:=term;
  if (y = 0) and (term <> '') then
    begin
      fmtng;assign('inp',path('sys',5)|'dbfiles');
      while not(eof(inp)) do
        begin
          cursor(12,30);readln(inp,lin);
          if substr(lin,1,2) <> ' ' then open(substr(lin,1,6));
          autotype(' ');searching; xy:=inkey;
        end;
      if maxset > 1 then
        begin recallsr;
          repeat
            cursor(21,1);write('[set no.]select [M]ax [Q]uit: ');
            readln(setno);uc(setno);
            until (setno='M') or (setno='Q') or
              ((val(setno) >= mmxx) and (val(setno) <= maxset));
            if((setno <>'M')and(setno <>'Q')) then maxp:=val(setno);
            if setno <>'Q' then
              begin
                dhits:=recall(maxp,namedb,term);
                open(namedb); searching;
              end;
            end;
          end;
        end;
      end;
end;

procedure tagged;

var
  vl, ln, j, i, pg, lnok, dline, p      :real;
  still, nextpg                        :string;
  dtag                                  :array[1..10] of real;
begin
  for p:=1 to 10 do ntag[p]:='';
  clearbox(5,5,17,35,2);box(5,5,17,35,2);
  still:='X';vl:=5;ln:=6;pg:=0;i:=1;j:=1;line:=0;lnok:=0;
  assign('inp',path('sys',5)|dbn|'.fdt');
  while (still = 'X') do
    begin
      clearbox(5,5,17,35,2); box(5,5,17,35,2);
      cursor(5,6); write('Tag   Field Name');
      clearbox(21,5,5,35,2);box(21,5,5,35,2); CURSOR(22,6);
      WRITELN('Use<-^X^Y-> to highlight an option,');
      if choice = '8' then
        begin
          cursor(23,6);write('then press <- to complete a');
          cursor(24,6);write('selection!');
          end;
        if choice = '6' then
          begin
            cursor(23,6);WRITE('press S to select, then press <-');
            cursor(24,6);write('to complete the selection(s)');
            end;
          nextpg:='N';ln:=6;
          while not(eof(inp)) and (ln < 21) do
            begin
              readln(inp, lin);j:=j+1; lin:=substr(lin,51,3)|' '
                |substr(lin,1,27);
              if j > vl then
                begin cursor(ln,6); writeln(lin); ln:=ln+1;
                  line:=line+1;
                end;
            end;
          end;
end;

```

```

savescr(4);ln:=6;
repeat
page(4);chattr(3,ln,6,33); kp:=kbdkey(key);uc(key);
if (kp=80.00)and(ln<21)and(ln <(line+6-pg*15))then
ln:=ln+1;
if (kp=72.00) and (ln>6) then ln:=ln-1;
dline:=ln - 1 + pg*15;
if(choice='8')and(kp=28.0) then begin
dtag[1]:=dline;i:=2;end;
if(key='S')and(i<=11)and(choice='6') then
begin savescr(4); dtag[i]:=dline;i:=i+1;end;
if(kp=80.00) and (ln =21) and(not(eof(inp)))then
begin
nxtpg :='Y'; pg:=pg+1;
end;
if (kp = 1.00) or (kp = 28.00) then still :='Y';
if i = 11 then
begin cursor(25,1);
write('Tag array full press any key to proceed.');
```

```

kp:=kbdkey(key); kp:=28.00;
end;
until (kp=28.00)or(kp=1.00)or(nxtpg='Y');
```

```

end;
if (kp=28.00) then
begin
for p:=1 to i-1 do
begin
assign('inp', path('sys',5)|dbn|.fdt');lnok:=0;
repeat
readln(inp,ln);lnok:=lnok+1;
if lnok = dtag[p] then ntag[p]:=substr(ln,51,3);
until (eof(inp)) or (lnok =dtag[p]);
end;
end;
end;
end;
( ***** D I S P L A Y F O R M A T ***** )

PROCEDURE DSPFMT;
var
PK, cr, LN, LC, F, n, FIRST, no, z, x, cn, l, dline, line :real;
lid, LIM, LI, mi, sn, xtk, prln : STRING;
begin
FIRST:=1;MI:=' ';lin:= ' ';
if fileexist( path('dbn',10)|dbn|.fdt') = 0 then
begin
assign('inp',path('dbn',10)|dbn|.fdt');
if not (eof(inp)) then
begin
cursor(6,10);writeln('D I S P L A Y F O R M A T S');
cursor(8,10);LN:=8;LC:=10;dline:=0;line:=0;
box(7,8,15,40,1);
while (not(eof(inp))) and (substr(lin,1,2)<>'S:') do
begin
readln(inp,lin);
IF SUBSTR(LIN,1,2) = 'F:' THEN
BEGIN
F:=SIZE(LIN);X:=3;
WHILE X<=F DO
BEGIN
LIM:=SUBSTR(LIN,X,6);
CURSOR(LN,LC);WRITELN(LIM);
X:=X+6; LN:=LN+1; FIRST:=FIRST+1;
dline:=dline+1;
line:=line+1;
if LN =15 then
begin LN:=8;LC:=LC+9; end;
END;
END;
end;
end;
end;
end;
end;

```

```

attr('=',0,17,9,38);
cursor(18,9);
WRITELN('use <-^X^Y-> - to highlight an option!');
cursor(19,9); WRITELN('^Q_ to complete a selection!');
savescr(4);ln:=8;lc:=10;
repeat
  chattr(3,ln,lc,6);
  PK:=KBDKEY(KEY); page(4);
  IF (PK = 80.00) and (LN<line+7) and (lc=10) THEN
    ln:=ln+1;
  IF (PK = 80.00) and (LN<line+1) and (lc=19) THEN
    ln:=ln+1;
  IF (PK = 80.00) and (LN<line-7) and (lc=28) THEN
    ln:=ln+1;
  IF (PK = 72.00) and (LN>8) then ln:=ln-1;
  IF (PK = 77.00)and((LN<line+1) and (lc=10)or(LN<line-6)
    and (lc=19)) THEN lc:=lc+9;
  IF (PK = 75.00) and (Lc>10) and (lc=28) THEN lc:=lc-9;
  if lc = 10 then z :=ln-7;if lc = 19 then z :=ln;
  if lc = 28 then z :=ln+7;
until (pk=28.00) or (kk=1.00);
if pk = 28 then
  begin
    no:=1;F:=0;x:=0;
    assign('inp',path('dbn',10){dbn}!.fdt');
    repeat
      readln(inp,li);
      IF SUBSTR(LI,1,2) = 'F:' THEN
        BEGIN
          F:=SIZE(LI); X:=3;
          WHILE X<=F DO
            begin
              LId:=SUBSTR(LI,X,6); if no=z then sn:=lid;
              X:=X+6; no:=no+1;
            end;
          END;
          until substr(li,1,2)= 'S:';
          getfmt('@' {sn});
          MI:=FMTNAME;
        end;
      END;
    end;
  end;
end;

procedure srch;
var PK,cr,LN,LC,F,n,FIRST,no,z, x, cn, l : real;
    lid,LIM,LI,mi,sn, xtk,prln : STRING;
begin
  i:=1;cn:=5;
  l:=setpos(0,0);
  clear;clearmsg;
  cursor(1,1);write('Database: ', dbn);
  cursor(2,1);write('Search expression: ');
  write(substr(term,1,140));
  clearbox(4,1,20,80,2);box(4,1,20,80,2);
  attr('█', 1,24,1,80);attr('█', 1,25,1,80);
  savescr(2);
  dspfmt;page(2);cursor(1,20);write('Format: ',fmtname);savescr(2);
  fmt:=format(78);
  if fmt = 0 then
    begin
      repeat
        page(2);rmfn:=setpos(0,i);rc:=record(rmfn);
        fmt:=format(78);
        cursor(4,35);write(i:1, ' of ', l:1);
        ln:=nxtline(ln);
        while ln=0 do
          begin
            cursor(cn,2);writeln(ln);ln:=nxtline(ln);
          end;
        repeat

```

```

cn:=cn+1;
if (cn=23) and (ln=0) then
  begin
    cursor(23,30);write('- More - ^Q- ');
    repeat kp:=kbdkey(key); until kp = 28.00;
    page(2);cursor(4,35);write(i:1, ' of ',l:1);
    cn:=5;
  end;
end;
repeat
cursor(24,50);writeln('[ESC] TO QUIT [SAVE]');
cursor(4,75);if(i>1)then write('PgUp');
cursor(23,75);if(i<l)then write('PgDn');
kp:=kbdkey(key);uc(key);
if (kp=81.00) and (i<l) then
  begin i:=i+1;xtk:='C'; end;
if (kp=73.00)and (i>1) then
  begin i:=i-1;xtk:='C'; end;
if (kp=1.00)then xtk:='X';
if key='S' then
  begin
    savescr(3);
    IF FNM=' ' THEN
      BEGIN
        clearbox(10,10,3,25,2);BOX(10,10,3,25,2);
        CURSOR(11,11);write('Save as: ');READLN(FNM);
        IF FNM <> ' ' THEN ASSIGN('OUT',FNM);
      END;
    IF FILEXIST(FNM) = 0 THEN
      BEGIN
        rc:=record(rmf);fmt:=format(75);
        if (fmt = 0 ) then
          begin
            ln:= nxtline(ln);
            while ln=0 do
              begin writeln(out,LIN); ln:=nxtline(ln);
            end;
            page(3);xtk:=' ';
            cursor(22, 65); write('Saved ....');
            save:=save+1;
          END;
        END;
      end;
    CN:=5;
    until (xtk='C') or (xtk = 'X');
  until (xtk = 'X');
end;
if fmt <> 0 then
  begin
    write('Format error exists');
    writeln('the records retrieved will not be displayed');
    writeln('press any key to continue'); xy:=inkey;
    term:='';dhits:=0;
  end;
end;

{***** T E X T S E A R C H *****}
procedure textsr;
var i, j,y,nr,tot,tc,k,h,o,tag,fmt,cn          : real;
    fld,ttag                                  : string;
begin
  tagged;ttag:= ntag[1];
  if ttag <> ''then
    begin
      count:=0;
      clear;clearmsg;cursor(1,1);write('Database: ', dbn);
      cursor(2,1);write('Enter String to be searched: ');
      attr(' ',3,2,30,50); readln(term);uc(term);
      if term <> '' then

```

```

begin
clearbox(4,1,20,80,2); box(4,1,20,80,2);
attr('!',1,24,1,80); attr('!',1,25,1,80);
cursor(24,1);write('Press any key to interrupt');
savescr(3);
i:=0;y:=0;nr:=0;tot:=0;tc:=0;nterm:=term;
dspfmt; page(3); cursor(1,20);
writeln('Format:',fmtname); savescr(3);
page(3);
repeat
cn:=5;KP:=0.00;i:=i+1;rc:=record(i); tc:=tc+1;k:=0;
cursor(4,35);writeln(i:1);
kkey := keypress;
if kkey = 1 then
begin k:=0;kk:=kbdkey(key);kp:=1.00;rc:=1; end;
if rc= 0 then
begin
tag:=val(ttag);nr:=nr+1; n:=nocc(tag);
o:=0;kkey:=0;
while ((o<n) and (k=0)) do
begin
o:=o+1;j:=fieldn(tag,o);fld:=field(j);
uc(fld); k:=position(fld,term,1);
end;
if k > 0 then
begin
count:=count+1;clearbox(1,75,3,6,1);
box(1,75,3,6,1); cursor(2,77); writeln(count:2);
clearbox(4,1,20,80,2); box(4,1,20,80,2);
fmt:=format(78);
if fmt=0 then
begin
ln:=nxtline(FLD);
while ln= 0 do
begin
cursor(cn,2);writeln(FLD);
ln:=nxtline(FLD);
cn:=cn+1;
if (cn=23)and(ln=0)then
begin
cursor(23,30);write('- More - ^Q-');
repeat kp:=kbdkey(key);
until kp=28.00;
clearbox(4,1,20,80,2);
box(4,1,20,80,2);cn:=5;
end;
end;
end;
end;
end;
end;
IF (K <> 0) then
BEGIN
REPEAT
cursor(24,50);writeln('[ESC] TO QUIT [SAVE]');
CURSOR(23,75);WRITE('PGDN');
KP:=KBDKEY(KEY);UC(KEY);
if key='S' then
begin savescr(2);
IF FNM='' THEN
BEGIN
clearbox(10,10,3,25,2);
BOX(15,25,3,25,2); CURSOR(16,28);
write('Save as: ');READLN(FNM);
IF FNM <> '' THEN ASSIGN('OUT',FNM);
END;
IF FILEXIST(FNM) = 0 THEN
BEGIN
rc:=record(1); fmt:=format(75);
if (fmt = 0 ) then

```

```

begin
    ln:= nxtline(FLD);
    while ln=0 do
        begin writeln(out,FLD);
            ln:=nxtline(FLD);
        end;
    page(2);cursor(23, 65);
    write('Saved....');save:=save+1;
END;
END;
END;
UNTIL (KP = 81.00) or (kp=1.00);
END;
IF I = MAXMFN THEN
    BEGIN CURSOR(23,30);
    WRITE('NO MORE RECORD EXISTS');KP := KBDKEY(KEY);
    END;
until (i = maxmfn) OR (KP=1.00);
end;
end;
end;

procedure disp1;
var
    vr, scrent, recnt, frstln, keyval, recscr :real;
    till, extval, recval, strng :string;
begin
    scrent:=0; recnt:=0; frstln:=0; row:=3; recscr:=0;vr:=0;
    clearbox(2,9,23,71,1);box(2,9,23,71,1);
    cursor(1,25);
    write('I N F O R M A T I O N O N D A T A B A S E S');
    if (filexist(path('sys',5)}'dbfinf')=0) then
    begin
        assign('inp', path('sys',5)}'dbfinf');
        clearbox(2,9,23,71,1);box(2,9,23,71,1);
        cursor(24,10); write('Press <ESC> to quit');
        repeat
            while (not(eof(inp))) and (row < 22) do
            begin
                readln(inp,strng);
                cursor(row,10);writeln(substr(strng,1,70));
                row:=row+1; vr:=vr+1;
            end;
        repeat
            if not(eof(inp)) then begin cursor(24,73);
                writeln('<PgDn>');end;
            IF FRSTLN>0 THEN BEGIN cursor(2,73);write('<PgUp>'); END;
            cursor(24,79);keyval:=kbdkey(key);
            if (keyval = 81.00) and (not(eof(inp))) then row:=3;
            if (keyval=1.00) then extval:='X';
            if (keyval=73.00) then
                begin
                    frstln:=recnt-40;
                    assign('inp',path('sys',5)}'dbfinf');recnt:=0;
                    if(frstln < 0) then frstln:=0;
                    end;
                    row:=3;vr:=0;scrent:=0;
                until((keyval=81.00) or (keyval=73.00) or (keyval=1.00));
            until extval='X';
            assign('inp','');
        end;
    if (filexist(path('sys',5)}'dbfinf')<>0) then
        begin
            cursor(15,15);write('File dbfinf does not exist');

            cursor(16,15);write('Press any key to proceed. ');
            keyval:=kbdkey(key);
        end;
    end;
end;
end;

```

```

{***** D I S P L A Y D A T A B A S E S *****}
procedure SHOW;
var dline,lline,pg,p : real; nextpg : string;
begin
  dline:=0;lline:=0;pg:=0;vr:=0;line:=0;upline:=0;till:='x';ln:=8;
  cn:=6;
  assign('inp',path('sys',5)|'dbfiles');
  repeat
    dline:=0;lline:=0;vr:=0;line:=0;till:='x';ln:=8;
    cn:=6;
    clearbox(5,4,21,35,2);box(5,4,21,35,2);
    cursor(6,5);write('|||||| D A T A B A S E S ||||||');
    box(21,4,5,35,2);
    cursor(22,6);
    write('<-^X^Y-> to highlight an option,'); chattr(1,22,6,6);
    cursor(23,6);write('then press ^Q- to complete');
    chattr(1,23,17,3);
    nextpg:='N';cursor(24,14);write('ESC to quit ');
    chattr(3,24,14,3);
    while not(eof(inp)) and (line < 39) do
      begin
        readln(inp,ln);line:=line+1;lline:=lline+1;
        if ln > 20 then begin ln:=8;cn:=cn+10; end;
        CURSOR(ln,cn);writeln(substr(ln,1,6));ln:=ln+1;
      end;
    savescr(4);ln:=8;cn:=6;
    repeat
      page(4);chattr(1,ln,cn,6);
      repeat kk:=kbdkey(key);uc(key);until key <> '';
      if (kk=59.00) then disp1;
      if(cn = 26) and (ln=20) and (not(eof(inp))) and (kk=80.00)
        then begin pg:=pg+1; nextpg := 'Y'; end;
      if(kk=80.00) and (((ln<line+7)and(ln<20)and(cn=6)) or
        ((ln<line-6)and(ln<20)and(cn=16)) or
        ((ln<20)and(ln<line-19)and(cn=26))) then ln:=ln+1;
      if (kk=72.00) and (ln > 8) then ln:=ln-1;
      if (kk=77.00) and (((ln+5 < line) and(cn=6)) or
        ((ln+18 < line) and(cn=16))) then cn:=cn+10;
      if (kk=75.00) and (cn>6) then cn:=cn-10;
      if cn=6 then dline := ln-7;
      if cn = 16 then dline:=6+ln;
      if cn = 26 then dline:=19+ln;dline := pg*39+dline;
    until (kk=28.00) or (kk= 1.00) or(nextpg = 'Y');
    if (kk= 28.00) then
      begin
        assign('inp',path('sys',5)|'dbfiles');line:=0;
        repeat
          readln(inp,ln);line:=line+1;dbname:= substr(ln,1,6);
          if(line=dline)and(substr(ln,1,2)<>' ')then
            open(dbname);
          kk:=1.00;
          until (eof(inp)) or (dline = line);
        end;
      until kk = 1.00;
    end;
  procedure SHOW2;
  var dline,lline,pg,p,lnok : real; nextpg : string;
  begin
    dline:=0; lline:=0; pg:=0;i:=0; lnok:=0;vr:=0; line:=0;
    upline:=0; till:='x';mxx:=maxset + 1;
    clear;clearmsg;assign('inp',path('sys',5)|'dbfiles');
    cursor(2,22);write('D A T A B A S E S A V A I L A B L E');
    ATTR('=',1,4,1,80);ATTR('=',1,22,1,80);
    CURSOR(23,5);
    WRITEln('Use ^X^Y<- to highlight an option, Press S to
  select,');
    writeln(' then press ^Q- to complete the selection(s)');
    write(' F1 - database information');
  end;
end;

```

```

repeat
dline:=0; lline:=0; i:=0; lnok:=0;vr:=0; line:=0;
ln:=6;cn:=5; for p:=6 to 20 do attr(' ',1,p,1,80); nextpg:='N';
while not(eof(inp)) and (line < 105) do
begin
readln(inp,ln);line:=line+1;lline:=lline+1;
if ln > 20 then begin ln:=6;cn:=cn+10; end;
CURSOR(ln,cn);writeln('-', ' ',substr(ln,1,6));ln:=ln+1;
end;
savescr(4);ln:=6;cn:=5;
repeat
page(4);
if key='S' then
begin cursor(22,35);write('selected...',');end;
chattr(3,ln,cn,8);
repeat kk:=kbdkey(key);uc(key);until key <> '';
if((kk=80.00)and(ln< 20)) and
((ln<line+ 5)and(cn = 5)) or ((ln<line-10)and(cn = 15))
or
((ln<line-25)and(cn = 25)) or ((ln<line-40)and(cn = 35))
or
((ln<line-55)and(cn = 45)) or ((ln<line-70)and(cn = 55))
or
((ln<line-85)and(cn = 65))) then ln:=ln+1;
if (kk=72.00)and(ln>6) then ln := ln-1;
if(kk=77.00) and
((ln<line-9) and(cn =5) or (ln<line-24)and(cn =15) or
(ln<line-39)and(cn =25) or (ln<line-54)and(cn =35) or
(ln<line-69)and(cn =45) or (ln<line-84)and(cn =55))
then cn:=cn+10;
if (kk=59.00) then disp1;
if (kk=75.00) and (cn>5) then cn:=cn-10;
if cn = 5 then dline := ln - 5;
if cn = 15 then dline :=ln+10;
if cn = 25 then dline := ln+25;
if cn = 35 then dline :=ln+40;
if cn = 45 then dline := ln+55;
if cn = 55 then dline :=ln+70;
if cn = 65 then dline := ln+85;
dline:=pg*105 + dline;
if (cn = 65)and(ln=21) and (not(eof(inp))) and (kk=80.00)
then begin nextpg:='Y'; pg:=pg+1; end;
if key = 'S' then
begin
assign('inp', path('sys',5)|'dbfiles');lnok:=0;
savescr(4);
repeat
readln(inp,ln);lnok:=lnok+1;
if lnok = dline then
begin i:=i+1; name[i]:= substr(ln,1,6); end;
until (eof(inp)) or (dline = lnok);
end;
until (kk=28.00) or (kk= 1.00) or (nextpg = 'Y');
if (kk= 1.00) then setno:='Q';
if (kk= 28.00) and (i>0) then
begin
term:=''; editing;
if (y = 0) and (term <> '') then
begin
fmtng;
for p:=1 to i do
begin
open(name[p]);
autotype(' '); searching; xy:=inkey;
end;
if maxxset > 0 then
begin recallsr;
repeat
cursor(21,1);write('[Set no.]select [M]ax [Q]uit:');

```

```

        readln(setno);uc(setno);
        until (setno='M')or(setno='Q')or
        ((val(setno) >=mmxx)and(val(setno)<= maxset));
        if((setno <>'M')and(setno <>'Q')) then
        maxp:=val(setno);
        if setno <>'Q' then
        begin
            dhits:=recall(maxp,namedb,term);open(namedb);
            searching;
        end;
    end;
end;
until (kk = 1.00) or (kk= 28.00);    kk:=0.00;
end;

procedure gethelp;

begin
    kp:=0.00;
    y:=fileexist('ghelp');
    if y <> 0 then
    begin
        cursor(12,10); writeln('File Ghelp does not exist');
        write('          Press any key to proceed. ');kp:=kbdkey(key);
    end;
    if y = 0 then
    begin
        assign('inp','ghelp');
        repeat
            clear;clearmsg;row:=1;
            while not(eof(inp)) and (row < 25) do
            begin
                cursor(row,1);
                readln(inp, strng2);writeln(strng2);row:=row+1;
            end;
            repeat
                if eof(inp) then
                begin cursor(25,30);write('End of text');end;
                if not(eof(inp)) then
                begin cursor(25,1);write('Press ^Q_ for more');end;
                cursor(25,60);write('Esc to quit');
                kp:=kbdkey(key);
                until (kp=1.00)or(kp=28.00);
                until (kp=1.00) or (eof(inp));
                assign('inp','');
            end;
        end;
    end;

procedure store;
var
add,occ:real;db,con,cnt,sav,hits:string;
begin
    num:=num+1; con:=encreal(num,2,0);con:='#'|con; open('uid');
    hits:=encreal(dhits,2,0);sav:=encreal(save,2,0);
    cnt:=encreal(count,2,0); if posi > 0 then
    begin
        rec:=record(posi);
        if rec = 0 then
        begin
            fnom:=nfields+1;
            if dhits >= 0 then
            begin hits:=hits;add:=fldadd(4,fnom,hits);
            end
            else if count >=0 then
            begin
                cnt:=cnt; add:=fldadd(4,fnom,cnt);
            end;
            db:=dbname; db:=con|db;add1:=fldadd(6,fnom,db);

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```

sav:=sav;add2:=fldadd(5,fnom,sav);
term:=term;add3:=fldadd(3,fnom,term);
opp:=choice;add4:=fldadd(11,fnom,opp);
dat:=datestamp; dat:=substr(dat,1,8);
add5:=fldadd(10,fnom,dat);
end;
update; close;
end;
end;

procedure user;
var
nc,ky,fmt :real;  LINE :string;
BEGIN
CLEAR;OPEN('uid');
cursor(2,20);
write('USER/SYSTEM PERFORMANCE ON SEARCHING DATABASES');
rec:=record(posi);getfmt('uid');
if REC = 0 then
begin
NC:=5;box(4,1,20,80,2);fmt:=format(78);
if fmt=0 then
begin
ln:=nxtline(LINE);
while ln= 0 do
begin
cursor(NC,2);
writeln(LINE);ln:=nxtline(LINE);NC:=NC+1;
if nc>22 then
begin
cursor(23,70); write('More...');
kp:=kbdkey(key);
clearbox(5,2,18,76,0); nc:=5;
end;
END;
END;
END;
repeat cursor(25,1);write('Press <Esc> to Proceed. ');
kp:=kbdkey(key);
until kp = 1.00;
close;open(dbname);
END;
procedure date;
var add4:real;
begin
{open('uid');
rec:=record(posi); FNOM:=NFIELDS+1;dat:=datestamp;
dat:=substr(dat,1,8); add4:=fldadd(10,fnom,dat);
update; close;}
end;

procedure opn;
var ll, n,nm:real;
begin
n:=0;nm:=0;exit:='No!'; clear;clearmsg;cursor(2,1);
write('Type Your ID Number :');
attr(' ',5,2,22,10);cursor(2,22);
readln(id);open('uid');fin:=find(id);
while (fin <> 0) and (nm < 4) do
begin
cursor(4,1);writeln('* * Ineligible ID Number * * ');
cursor(2,1);write('Type Your ID Number :');
attr(' ',5,2,22,10);cursor(2,22);
readln(id); fin:=find(id);nm:=nm+1;
end;
if fin = 0 then
begin
x:=sysvars('?');
x:=sysvars('00000');

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```

clear; writeln('I am on the job ..... ');
write('please wait');chattr(4,2,1,11);
autotype(' ');y:=search(id);xy:=inkey;posi:=setpos(0,1);
end; qq:=sysvars(x);
if (nm > 3 )and(fin<0) then exit:='Yes!';
close;
end;

procedure briefhelp;
begin
cursor(23,5);
if cn = 5 then
begin
case ln of
8: writeln('Select new database or change to another. ');
9: writeln('Brief information on databases. ');
10: begin
write('Search all databases to select database(s) ');
writeln(' relevant to your interest. ');
end;
11: begin
write('Search one or more databases to select those ');
writeln('relevant to your interest. ');
end;
17: writeln('Detailed help on each option. ');
18: writeln('Displays search history of your queries. ');
19: writeln('Quit to DOS. ');
end;
end;
if cn = 45 then
begin
case ln of
8: writeln('For submitting search expression. ');
9: writeln('Search in one or more fields. ');
10: writeln('Search using index terms. ');
11: write('Search string of characters in a specific field. ');
12: writeln('Search using a thesaurus. ');
end;
end;
end;

procedure docommon;
begin
dbname:= dbn;
if term <> '' then
begin
if dhits > 0 then srch;
clear;cursor(23,1);write('* Please wait *');
chattr(4,23,1,15);
store;date; open(dbname); save:=0;
end;
dhits:=0;
end;

procedure dbupdate;
begin
CURSOR(25,1);WRITE(' Please wait ');chattr(4,25,8,5);
system('dir f:\isis3\data\*.mst > f:\isis3\data\dbfile');
assign('inp', path('sys',5)|'dbfile');assign('out',
path('sys',5)|'dbfiles');
line := 0;
while not eof(inp) do
begin
readln (inp, lin);line := line + 1;
if (line > 4 ) and (substr(lin,1,2) <> ' ') and
(substr(lin,11,7) <> 'File(s)') and
(substr(lin,2,3) <> 'MSG') and
(substr(lin,1,5) <> 'EMMSG') and
(substr(lin,1,6) <> 'UID ')

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```

        then writeln(out, substr(lin, 1,6));
    end;
    assign('inp', ''); assign('out', '');
end;

procedure screen1;
var ll: real;
begin
clear;clearmsg;for ll:=1 to 2 do attr(' ',2,ll,1,80);
for ll:=3 to 23 do attr(' ',1,ll,1,80);for ll:=24 to 25 do
attr(' ',2,ll,1,80);
cursor(4,15);
writeln(' ');
cursor(4,15);
writeln('
┌───┬───┬───┬───┐');
cursor(5,15);
writeln(' │   │   │   │   │');
cursor(6,15);
writeln(' │   │   │   │   │');
cursor(7,15);
writeln(' │   │   │   │   │');
cursor(8,15);
writeln(' │   │   │   │   │');
cursor(9,15);
writeln(' │   │   │   │   │');
cursor(10,15);
writeln(' ');
cursor(11,15);
writeln(' SYSTEM      INTERFACE      SEARCH      ASSISTANT ');
end;

procedure screen2;
begin
clearbox(14,21,8,41,1);
cursor(13,20);write(' ');
CHATTR(3,13,20,40);
cursor(14,20);write(' SYSTEM INTERFACE SEARCH ASSISTANT ');
CHATTR(3,14,20,40);
CURSOR(15,20);WRITE(' by ');
CHATTR(3,15,20,40);
CURSOR(16,20);WRITE(' Molla Hunegnaw ');
CHATTR(3,16,20,40);
CURSOR(17,20);WRITE('SCHOOL OF INFORMATION STUDIES FOR AFRICA');
CHATTR(3,17,20,40);
CURSOR(18,20);WRITE(' ADDIS ABABA, ETHIOPIA ');
CHATTR(3,18,20,40);
CURSOR(19,20);WRITE(' JUNE, 1993 ');
CHATTR(3,19,20,40);
CURSOR(20,20);WRITE(' ');
CHATTR(3,20,20,40);dbupdate;
tsec:= VAL(SUBSTR(DATESTAMP,17,2));
CURSOR(25,1);WRITE('Press any key to proceed. ');
REPEAT
TIM:=DATESTAMP;i:= tsec - VAL(SUBSTR(DATESTAMP,17,2));
kkey := keypress;
i:=i*i;
until (i > 100) or (kkey =1);
if kkey = 1 then kk:=kbdkey(key);
end;
procedure dispmenu;
var ll : real;
begin
clear; clearmsg;
for ll:=1 to 3 do attr(' ',3,ll,1,80); for ll:=4 to 21 do
attr(' ',3,ll,1,80); for ll:=22 to 25 do attr(' ',3,ll,1,80);
for ll:=1 to 25 do attr(' ',-1,ll,1,1);attr(' ',-1,1,1,80);
attr(' ',-1,25,1,80); for ll:=1 to 25 do attr(' ',-1,ll,80,1);
cursor(2,13);
write('■■■■■■■■ D A T A B A S E   S E A R C H I N G ■■■■■■■■');
CHATTR(1,2,23,34);clearbox(6,2,8,37,1);box(6,2,8,37,1);

```

```

box(5,10,3,20,2);cursor(6,11);writeln(' D A T A B A S E ');
CURSOR(8,5); WRITELN('1. Select/Change Database ');
CURSOR(9,5); WRITELN('2. Information on Databases ');
CURSOR(10,5); WRITELN('3. Cross Database Search(all) ');
CURSOR(11,5); WRITELN('4. Cross Database Search(select)');
clearbox(6,42,8,37,1);box(6,42,8,37,1);box(5,50,3,20,2); COUNT:=0;
SAVE:=0;
cursor(6,51);write(' S E A R C H I N G');
CURSOR(8,45); WRITELN('5. Formulate Search expression ');
CURSOR(9,45); WRITELN('6. Search in Specific Field(s) ');
cursor(10,45); writeln('7. Keyword Search ');
cursor(11,45); writeln('8. Free Text Search ');
cursor(12,45); writeln('9. Search using thesaurus ');
clearbox(15,2,7,37,1);box(15,2,7,37,1);box(14,10,3,20,2);
cursor(15,14); writeln('O T H E R S ');
cursor(17,5); writeln('H. Help ');
cursor(18,5); writeln('Q. Search History ');
cursor(19,5); writeln('ESC. Quit ');
cursor(1,70); write(substr(datestamp,4,2),'-',
substr(datestamp,1,2),'-',substr(datestamp,7,2));
clearbox(15,42,7,37,1);box(15,42,7,37,1);box(14,50,3,20,2);
cursor(15,52); write(' N O T E S ');chattr(4,15,55,10);
cursor(17,43); write('Use <-^X^Y-> or 1 2 3 4 5 6 7 8 9 H Q');
cursor(18,43); write('to highlight an option, then press ');
cursor(19,43); write(' ^Q to select ');
savescr(1);
end;
(* M A I N P R O G R A M *)
begin
posi:=0;rec:=0;num:=0;exit:='No';dbname:=dbn;
if exit='No' then
begin
opn;
if exit <> 'Yes' then
begin
screen1;screen2;
{***** i n i t i a l i z a t i o n *****}
I:=0;J:=0;N:=0;KP:=0;Y:=0;SZ:=0;
ROW:=0;S:=0;RC:=0;RMFN:=0;FMT:=0;LN:=0;
KK:=0;O:=0;VR:=0;DR:=0;TP:=0;UPLINE:=4;LINE:=0;DHITS:=0;
DBNAME:=DBN;KEY:='';X:='';LIN:='';CHOICE:='';QQ:='';TILL:='';
STRNG1:='';STRNG2:='';
NTERM:='';
TERM:='';NAMEDB:=DBN;FLUSH;
dispmenu;
repeat
ln:=8;kk:=0;cn:=5;
repeat
choice :='';page(1);briefhelp;
cursor(2,70);write(substr(datestamp,11,8));
if dbn <> '' then begin
cursor(25,60);write('Database: ', dbn);end;
dbname:=dbn;
chattr(3,ln,cn,32); kk:=kbdkey(key);uc(key);
if (kk=80.00) and (cn =5) and (ln < 19) then ln:=ln+1;
if (kk=80.00) and (cn =45) and (ln < 12) then ln:=ln+1;
if (kk=72.00) and (ln > 8) then ln:=ln-1;
if (kk=80.00) and (cn= 5) and (ln =12) then ln:=17;
if (kk=72.00) and (ln =16) then ln:=11;
if (kk=77.00) and (cn =5)and((ln=8) or(ln=9)or(ln=10)or(ln=11))
then cn:=45;
if (kk=75.00)and(cn = 45)and((ln=8) or(ln=9)or(ln=10)or(ln=11))
then cn:=5;
if (cn = 5)and(ln<17) then begin n:=ln-7;choice:=encint(n,1);end;
if (cn = 45) then begin n:=ln-3;choice:=encint(n,1);end;
if (ln = 17) then choice:= 'H';if (ln = 18) then choice:= 'Q';
if (ln = 19) and (kk=28.00) then kk:=1.00;if (kk = 1.00) then
choice:= '';
if position('123456789',key,1) <> 0 then

```

```

begin
  if val(key)<=4 then begin cn:=5;ln:=val(key)+7; end;
  if(val(key)<=9)and(val(key)>4)then begin
cn:=45;ln:=val(key)+3;end;
  end;
  if (key='H') then begin ln := 17 ; cn :=5;end;
  if (key='Q') then begin ln := 18 ; cn :=5;end;
  if (kk=1.00) then choice := '';
  UNTIL (KK=28.00)OR(KK=1.00);
  if((val(choice)>4)and(val(choice)<=9))and(dbn='') then
    begin show;kk:=0;end;
  if (choice='1')and(fileexist(path('sys',5)|'dbfile')=0) then
    begin show; kk:=0;end;
  if (choice='2')and(fileexist(path('sys',5)|'dbfinf')=0) then disp1;
  if choice='3' then
    begin formulate; if setno <> 'Q' then docommon; end;
  if choice='4' then
    begin show2; if setno <> 'Q' then docommon; end;
  if (choice='5') and (dbn <> '') then begin defsr;docommon; end;
  if (choice='6') AND (DBN<>'') then
    BEGIN tagged;IF NTAG[1]<>' THEN begin DEFSSR;docommon;end;END;
  if (choice='7') then
    begin clearmsg; TERM:=SHOWDICT;NTERM:=TERM; editing;
    if term <> '' then
      begin fmtng;
      searching;
      docommon;
      end;
    END;
  if(choice='8')and(dbn<>'')then begin textsr;dhits:=-1;docommon;end;
  if choice='9' then
    begin
    setmax:=maxset;
    autotype('k');key:=menu('exgen');xy:=inkey;(EXEC('thes'));
    if maxset > setmax then
      begin dhits:=recall(maxset,dbname,term);docommon;end;
    dispmenu;
    end;
  IF CHOICE = 'H' THEN BEGIN CLEAR; gethelp; END;
  if choice = 'Q' then user;
  UNTIL (kk=1.00) OR (exit<>'No');
  end;
  end;
  s1:=' ';
  end.

```

ANNEX II
MOPAC SOURCE PROGRAM

```

program mopac(s1:string) [menu];
var
  posi,src,num,fnom,add4,REC,ADD1,ADD2,ADD3,SAVE,COUNT,i,j,
  n,kp,y,sz,row,s,rc,rmfn,fmt,ln,kk,u,kkey,choice      :real;
  nom,vr,dr,tp,upline,line,DHITS,tsec,o,cn,ll          :real;
  exit,xy,id,dat,dbname,key,x,lin,qq,till,strng2       :string;
  stored,nterm,term,namedb,tim,fnm,ttag               :string;
  ntag                                                  :array[1..10] of string;

procedure formatting;
var svar,svar1,svar2      : string;
    h                      : real;
begin
uc(term);
repeat
  y:=position(term, ' NOT ',1);
  if(y>0)then
    term := substr(term,1,y-1) | ' ^ ' | substr(term,y+5,size(term));
until y = 0;
repeat
  y:=position(term, ' AND ',1);
  if (y > 0) then
    term := substr(term,1,y-1) | ' * ' | substr(term,y+5,size(term));
until y = 0;
repeat
  y:=position(term, ' OR ',1);
  if (y > 0) then
    term := substr(term,1,y-1) | ' + ' | substr(term,y+4,size(term));
until y=0;
end;

procedure tagformat;
var
  H,P,F,u          :real;
  temp,ch          :string;
begin
  F:= 1;
  repeat
    y:=position(term, '^',F);
    if (y>0) then
      begin
        TEMP:=substr(TERM,1,y-1);
        TEMP:=TEMP | '/' | ttag;F:=Y+4;
        TEMP:=TEMP | ')';
        TERM:=TEMP | ' ^ ' | substr(TERM,y+1,size(TERM));
        F:= F+5;
      end;
  UNTIL Y = 0;
  F:= 1;
  repeat
    y:=position(term, '*',F);
    if (y>0)then
      begin
        TEMP:=substr(TERM,1,y-1);
        TEMP:=TEMP | '/' | ttag;F:=Y+4;
        TEMP:=TEMP | ')';
        TERM:=TEMP | ' * ' | substr(TERM,y+1,size(TERM));
        F:=F+5;
      end;
  UNTIL Y = 0;
  F:=1;
  repeat
    y:=position(term, '+',F);
    if (y>0)then
      begin

```

```

        TEMP:=substr(TERM,1,y-1);
        TEMP:=TEMP|'|/(|'|ttag;F:=Y+4;
        TEMP:=TEMP|'|';
        TERM:=TEMP|'| +'|substr(TERM,y+1,size(TERM));
        F:=F+5;
    end;
UNTIL Y = 0;
TERM:=TERM|'|/(|'|ttag;
TERM:=TERM|'|';
END;

procedure dbtag;
var i      :real;
begin
assign('inp', path('sys',5)|'dbtag');
for i:= 1 to 8 do
    begin
        readln(inp,lin);
        ntag[i]:=substr(lin,1,3);
    end;
end;

procedure gethelp;
begin
    kp:=0.00;
    y:=fileexist('read.OPC');
    if y <> 0 then
        begin
            cursor(12,10); writeln('File read.OPC does not exist');
            write('          Press any key to proceed. ');kp:=kbdkey(key);
        end;
    if y = 0 then
        begin
            assign('inp','read.OPC');
            repeat
                clear;clearmsg;row:=1;
                while not(eof(inp)) and (row < 25) do
                    begin
                        cursor(row,1);
                        readln(inp,strng2);writeln(strng2);row:=row+1;
                    end;
                repeat
                    if eof(inp) then
                        begin cursor(25,30);write('End of text!');end;
                    if not(eof(inp)) then
                        begin cursor(25,1);write('Press ^Q_ for more!');end;
                    cursor(25,60);write('Esc to quit');
                    kp:=kbdkey(key);
                    until (kp=1.00)or(kp=28.00);
                    until (kp=1.00) or (eof(inp));
                    assign('inp','');
                end;
            end;
        end;

procedure briefhelp;
begin
cursor(24,5);
case ln of
    8: writeln('Search using Personal Author Name. ');
    9: writeln('Search using Corporate Author Name. ');
   10: writeln('Search using Conference Name(s). ');
   11: writeln('Search using Title Word(s). ');
   12: writeln('Search using Class Number. ');
   13: writeln('Search using Subject Word(s). ');
   14: writeln('Detailed help on each option. ');
   15: writeln('Quit to previous menu. ');
end;
end;

```

```

procedure ghelp;
var esckey      :real;
begin
clearbox(9,1,17,80,2); box(10,1,15,79,2);
cursor(13,5);
writeln('Key in appropriate terms representing your information
needs press!');
cursor(14,5);
writeln('<RETURN> eg. Africa for retrieving information on Africa.
Terms may');
cursor(15,5); writeln('be combined as follows:');
cursor(16,10); writeln('Information base or Database');
cursor(17,10); writeln('Information and retrieval');
cursor(18,10); writeln('Automation not Library automation');
cursor(19,10); writeln('Robert or John!');
cursor(20,5);
writeln('Terms may be truncated by suffixing $ to the root term
eg. Network$');
cursor(21,5);
writeln('which will search Network or Networking or networks. ');
cursor(22,5);
writeln('To execute earlier query: key in set number eg. #2');
cursor(23, 2);write('Press <ESC> to quit For More Help use');
writeln(' option ''Help'' in the main menu');
repeat
esckey:=kbdkey(key);
until esckey = 1.00;
end;

procedure searching;
begin
s:=search(term); dhits:=setpos(0,0);
end;

procedure dispresult;
var PK,cr,LN,LC,F,n,FIRST,no,z, x, cn, l      : real;
    lid,LIM,LI,mi,sn, xtk,prln              : STRING;
begin
i:=1;cn:=5;
l:=setpos(0,0);
clear;clearmsg;
cursor(1,24);write(' S E A R C H R E S U L T S ');
cursor(2,1);write('Search expression: ');
write(substr(nterm,1,60));
cursor(3,1);write('Number of Documents retrieved: ',l:1);
clearbox(4,1,20,80,2);box(4,1,20,80,2);
savescr(2);
repeat
page(2);
rmfn:=setpos(0,i);rc:=record(rmfn);
fmt:=format(78);
if (fmt=0) then
begin
cursor(4,35);write(i:1, ' of ', l:1);
ln:=nxtline(ln);
while ln=0 do
begin
cursor(cn,2);writeln(ln);ln:=nxtline(ln);
cn:=cn+1;
if (cn=23) and (ln=0) then
begin
cursor(23,30);write('- More - ^Q_');
repeat
kp:=kbdkey(key);
until kp = 28.00;
page(2);cursor(4,35);write(i:1, ' of ', l:1);
cn:=5;
end;
end;
end;

```

```

        end;
    end;
    repeat
        cursor(24,50);writeln('[ESC] TO QUIT [SAVE]');
        cursor(4,75);if(i>1)then write('PgUp');
        cursor(23,75);if(i<l)then write('PgDn');
        kp:=kbdkey(key);uc(key);
        if (kp=81.00) and (i<l) then
            begin i:=i+1;xtk:='C'; end;
        if (kp=73.00)and (i>1) then
            begin i:=i-1;xtk:='C'; end;
        if (kp=1.00)then xtk:='X';
        if key='S' then
            begin
                savescr(3);
                IF FNM=''THEN
                    BEGIN
                        clearbox(10,10,3,25,2);BOX(10,10,3,25,2);
                        CURSOR(11,11);write('Save as: ');READLN(FNM);
                        IF FNM <> '' THEN ASSIGN('OUT',FNM);
                    END;
                IF FILEXIST(FNM) = 0 THEN
                    BEGIN
                        rc:=record(rmf);
                        fmt:=format(75);
                        if (fmt = 0 ) then
                            begin
                                ln:= nxtline(ln);
                                while ln=0 do
                                    begin
                                        writeln(out,LIN);ln:=nxtline(ln);
                                    end;
                                page(3);xtk:='';
                                cursor(22, 65); write('Saved ....');
                                save:= save+1;
                            END;
                        END;
                    end;
                CN:=5;
                until (xtk='C') or (xtk='X');
                until (xtk='X');
            end;
end;

procedure postformat;
begin
    formatting; if fileexist(path('sys',5)|'dbtag') = 0 then tagformat;
    searching;
    if dhits> 0 then dispresult;
end;

procedure define;
begin
    clear;dhits := 0;
    term := '';
    writeln('Enter Search expression: ');
    cursor(24,15);write('F1 - Help      Press ^Q- to complete');
    savescr(2);
    repeat
        page(2);
        y:=edit(term,255,3,1,255,3,' ');
        if y = 1 then ghelp;
    until (y =0) or (y =4);
    IF Y=4 THEN TERM :='';nterm:=term;
    IF TERM <> '' THEN POSTFORMAT;
end;

```

```

(* M A I N P R O G R A M *)
begin
posi:=0;rec:=0;num:=0;
open('libcat');
  clear;clearmsg;
  cursor(8,25);write(' ');
  chattr(1,8,25,29);
  cursor(9,25);write(' Library Catalogue Searching');
  chattr(1,9,25,29);
  cursor(10,25);write(' by Molla Hunegnaw ');
  chattr(1,10,25,29);
  cursor(11,25);write(' SISA, ADDIS ABABA, ETHIOPIA');
  chattr(1,11,25,29);
  cursor(12,25);write(' June, 1993 ');
  chattr(1,12,25,29);
  cursor(13,25);write(' ');
  chattr(1,13,25,29);
  dbtag;
  tsec:=val(substr(datestamp,17,2));
  cursor(18,27);write('Press any key to continue');
  chattr(4,18,27,25);
  repeat
    tim:=datestamp;
    i:= tsec - val(substr(datestamp,17,2));
    kkey:=keypress;
  until (kkey = 1) or ( i > 10);
  if kkey = 1 then kk:=kbdkey(key);
  clear;clearmsg;
  for ll:=1 to 4 do attr('█',1,ll,1,80);
  for ll:=5 to 21 do attr('█',2,ll,1,80);
  for ll:=22 to 25 do attr('█',3,ll,1,80);
  cursor(2,20);write('L I B R A R Y U S E R ' S S E R V I C E');
  chattr(3,2,20,41);
  cursor(1,70);write(substr(datestamp,4,2),
'- ',substr(datestamp,1,2),'-',substr(datestamp,7,2));
  cursor(3,25);write('C A T A L O G U E S E A R C H');
  chattr(3,3,25,31);clearbox(8,25,9,25,1);
  cursor(8,25);write('BY Personal Author ');
  cursor(9,25);write('BY Corporate Author ');
  cursor(10,25);write('BY Conference Name ');
  cursor(11,25);write('BY Title ');
  cursor(12,25);write('By Class Number ');
  cursor(13,25);write('By Subject keyword ');
  cursor(14,25);write('Help ');
  cursor(15,25);write('Quit ');
  cursor(22,25);write('(Use ^X^Y to highlight an option,');
  chattr(1,22,30,2);
  cursor(23,19);write('then press <ENTER> to complete the');
  write(' selection)'); chattr(1,23,31,5);
  savescr(1);
  repeat
    ln:=8; kk:=0;cn:=25;
    repeat
      page(1);choice:=0; cursor(2,70);
      write(substr(datestamp,11,8)); briefhelp;
      chattr(3,ln,25,25);
      kk:=kbdkey(key);uc(key);
      if (kk=80.00) and (ln<15) then ln:=ln+1;
      if (kk=72.00) and (ln>8) then ln:=ln-1;
      choice := ln-7;
      if (kk=28.00)and(ln=15) then kk:=1.00;
      if kk= 1.00 then choice :=0;
    until (kk=28.00)or(kk=1.00);

    if (choice > 0) and (choice < 7) then
      begin
        ttag := ntag[choice];
        define;
      end;

```

```
    if choice = 7 then begin clear;gethelp;end;  
    until (kk=1.00);  
    clear;  
s1:=' '  
end.
```

ANNEX III
TEXT OF 'HELP' OPTION FOR SISA

Welcome to SISA - System Interface Search Assistance.
SISA is designed to assist you in performing search and retrieval operations and in better understanding of the search language capabilities of Micro CDS/ISIS. The use of each option in the main menu of SISA is explained below.

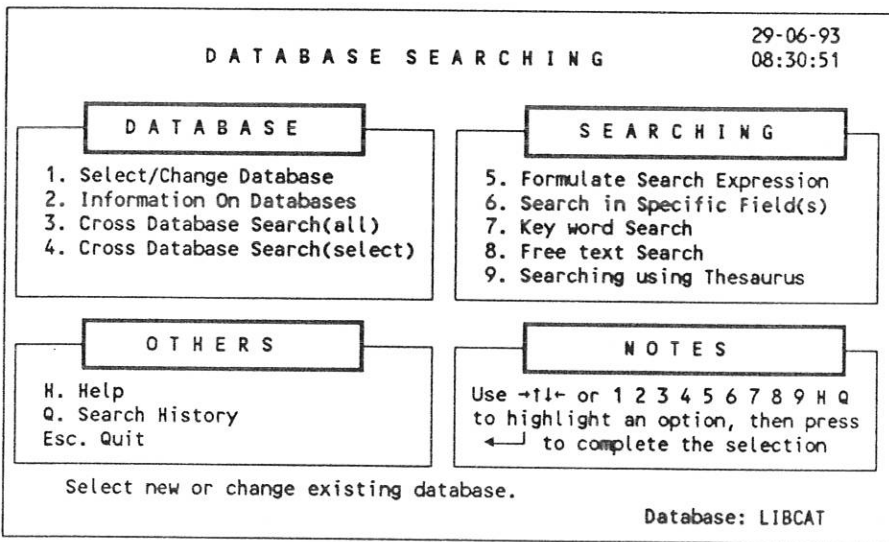


Fig 70. SISA main menu

As shown in the Fig. 70, the main menu is divided into four major sections DATABASE, SEARCHING, NOTES and OTHERS. At the top of the screen is the heading of the main menu. The right side of the heading displays a clock with system date and time. The bottom part of the screen contains a brief explanation for the highlighted option. For instance, the highlighted option is 1, and the brief explanation of it appears at the bottom of the screen. If a database has already been selected, its name will be displayed at the right bottom of the main menu screen.

To select an option, move the cursor to highlight the option using appropriate arrow keys or pressing the option digit as mentioned in the NOTES, and then press the <ENTER> key.

OPTION 1 : SELECT/CHANGE DATABASE

Use option 1 to select a database or to change from a database

ANNEX III
TEXT OF 'HELP' OPTION FOR SISA

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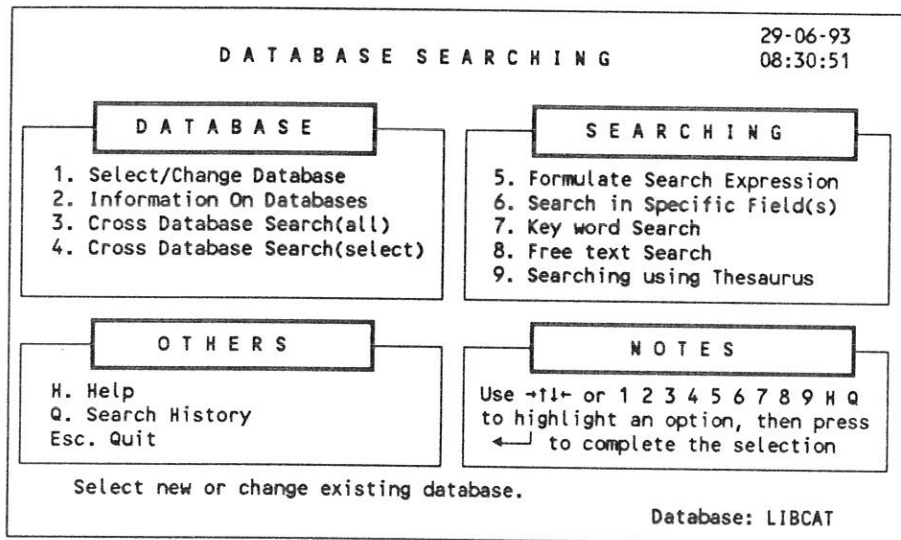


Fig 70. SISA main menu

As shown in the Fig. 70, the main menu is divided into four major sections DATABASE, SEARCHING, NOTES and OTHERS. At the top of the screen is the heading of the main menu. The right side of the heading displays a clock with system date and time. The bottom part of the screen contains a brief explanation for the highlighted option. For instance, the highlighted option is 1, and the brief explanation of it appears at the bottom of the screen. If a database has already been selected, its name will be displayed at the right bottom of the main menu screen.

To select an option, move the cursor to highlight the option using appropriate arrow keys or pressing the option digit as mentioned in the NOTES, and then press the <ENTER> key.

OPTION 1 : SELECT/CHANGE DATABASE

Use option 1 to select a database or to change from a database

in use to another.

Names of available databases will be listed on the screen. Using the appropriate arrow keys highlight the database you are interested in and press <ENTER> key to select. After selecting the database, the system will return to the main menu to enable you select a search option. The selected database name will be displayed at the right bottom corner of the main menu replacing the perviously selected database name, if any. Use <ESC> key to quit to the main menu without selecting a database or replacing a pre-selected database.

OPTION 2 : INFORMATION ON DATABASES

Use option 2 to get brief descriptions about the content , coverage, etc of the databases. A screen-full of information will be displayed at a time. Use <PgDn> and <PgUp> keys to move from one page to another back and forth. Pressing <ESC> key will return you to the main menu.

OPTION 3 : CROSS DATABASE SEARCH(ALL)

Use option 3 for searching all the databases in the system. This option can help you find out how many records relevant to your specific query may be retrieved from each of the databases. To obtain such information, type in a keyword or combination of them in upper case or lower case representing your interest. For example:

AGRICULTURE AND INFORMATION SYSTEMS AND AFRICA,
and press <ENTER> key. Brief help can be obtained by pressing the <F1> key. The system will search all the databases and display as shown below the number of hits, your search expression, name of the corresponding database, the set number to enable you select one or more databases relevant to your interests.

SEARCH EXPRESSION(S) SUBMITTED			
Set	Data base	Hits	Search Expression
1	LIBCAT	45	INFORMATION
2	ABNCD	3	INFORMATION
3	CDS	30	INFORMATION
4	SERIAL	0	INFORMATION

[Set No.]select [M]ax [Q]uit █

Fig. 71. Cross Database Search Result

Three options are shown at the bottom left of the screen: [Set on] [M]ax [Q]uit. If you wish to search in one of the databases listed, type in the set number and press <ENTER> key to initiate search. Selecting option M and pressing <ENTER> key will initiate search in the database giving the highest number of hits for your query. Selecting option Q and pressing <ENTER> key will return you to the main menu.

In response to your search expression entered the system will present a report which, for example, for the search expression: (CULTIVATION OR AGRONOMY) AND RICE, may be like as follows for a particular database:

Set	1: (CULTIVATION + AGRONOMY) * RICE
P=	3 CULTIVATION
P=	3 AGRONOMY
T=	5 -#2: CULTIVATION + AGRONOMY
P=	1 RICE
T=	1 -#3: #2 * RICE
T=	1 -#1: #3
----	█

Fig. 72. CDS/ISIS system report

This indicates that the term Cultivation occurs three times (three postings) in the database, though all occurrences may be in the same record. The term AGRONOMY has also three occurrences. There are five occurrences of the sub-expression CULTIVATION + AGRONOMY (referred to as sub-expression #2), meaning that there are five records in which one or the other of the terms occur. There is one posting for the term RICE; one occurrence of

the sub-expression #2 * RICE (that is, sub-expression #2 and RICE) (referred to as #3) and one for the whole query (referred to as #1), which is identical with the sub-expression #3.

Press the <ENTER> key to display the retrieved record(s). If the number of hits is greater than 0 the available display formats for the database will be displayed. Using the appropriate arrow keys highlight a display format and press <ENTER> key to select. Then, the records will be displayed. After displaying a record the system will request you to select a key. Press the <ESC> key to return to the main menu; or S key to save the displayed record in a file the name of which you will be asked to key-in in a box on the screen. You can use <PgDn> and <PgUp> keys to move back and forth through the retrieved records.

OPTION 4 : CROSS DATABASE SEARCH (SELECT)

Use option 4 to search one or more specific databases preliminary to selecting database(s) for further search.

A list of names of databases will be displayed as shown below.

DATABASES AVAILABLE

- CDS	- TMRI	- CHEM
- SERIA	- MEDIS	- TOXIS
- ABNCD	- SYNDRO	- PRENA
- LIBCAT	- SRLS	- PROMAR
- MIBIS	- FORD	
- PADDEV	- MAL	
- PADEXP	- PLAN	
- RESPRO	- CHEM	

Use →← to highlight an option, press S to select, then press ↵ to complete the selection(s)
F1 - database information

Fig. 73. List of databases in Cross Database (select) option

Using the appropriate arrow keys highlight the database to be searched and press the S key to select. Proceed in this manner to select other databases. After selecting the databases press the <ENTER> key to initiate the search process. Then follow the same procedure as for option 3. As for option 1, pressing <F1> key will display brief information about databases.

OPTION 5 : FORMULATING SEARCH EXPRESSION

Use option 5 to formulate and submit search expression and to retrieve and display search results in one or more databases (see under option 3 and 4). On selecting option 5, the system will display the list of search expression, number of hits, etc for

previous searches (during the current session), if any. On pressing the <ENTER> key, the system will display a blank screen with the prompt:

Enter Search Expression:

at the top left of the screen. The search term/expression is to be entered at the position of the cursor at the top left.

Micro CDS/ISIS provides for searching using the index of terms extracted by the system from the records of database according to prescribed techniques, and also for free text searching, that is not using the index of terms. Formulation of search expressions according to search language of Micro CDS/ISIS is briefly discussed below:

SEARCH EXPRESSION

A search expression usually consists of a term or a combination of terms representing an information need. For example:

AGRICULTURE
AGRICULTURE AND AFRICA
URBAN AREAS AND AIR POLLUTION AND MOTOR TRAFFIC
ANDERSON K.S.
ANDERSON K.S. AND PHILLIPS J.
DATABASE OR DATA BASE
SOFTWARE NOT CDS/ISIS

BOOLEAN OPERATORS

In the above expressions 'AND', 'OR', 'NOT' are called operators (Boolean Operators) for combining the concepts represented by the terms.

The expression AGRICULTURE AND AFRICA means that only those records containing both these terms should be retrieved; so also is the case with the expression URBAN AREAS AND AIR POLLUTION AND MOTOR TRAFFIC.

The expression DATA BASE OR DATABASE means that any record containing either of the terms will satisfy the query.

The expression SOFTWARE NOT CDS/ISIS means that the record(s) retrieved should contain the term SOFTWARE but should not contain the term CDS/ISIS.

In general, the AND operator is used to increase the precision of a query (reduce the number of hits); the OR operator is used to broaden the search (increase the number of hits); and the NOT operator to exclude term(s) which may also increase precision.

Note: you may use * instead of AND, + instead of OR and ^ instead of NOT in the search expression

MATCHING OF TERMS

In order to ensure that each term in the search expression matches exactly with term(s) in the index, the search term(s) should be entered precisely as in the index. That is, if the term in the index is DATABASES the search term typed in as DATABASE, DATA BASE, DATA BASES will not match with the index term and no records may be retrieved. Similarly, ANDERSON K.S. and ANDERSON, K.S will not match; nor will COLOR and COLOUR.

Using the Boolean operator OR, alternative forms of a term may be taken care of; for example,

DATABASE OR DATABASES OR DATA BASE OR DATA BASES
COLOR OR COLOUR

Similarly, for synonyms and spelling variations

TRUCK OR LORRY OR TRUCKS OR LORRIES
FIBRE OR FIBER
LABOUR OR LABOR

For compounded terms

NETWORK OR NETWORKING

TERM TRUNCATION

Suffixing the truncation symbol \$ to the stem of a word can also help. For example:

BIOCHEM\$ will match with all terms having the stem 'BIOCHEM', such as,

BIOCHEMICAL
BIOCHEMIST
BIOCHEMISTRY
etc.

PARENTHESES

In a search expression containing several combinations of terms, specificity can be achieved by the judicious use of parentheses. For example, if information is needed on "The relation between motor traffic or industrial fumes and air pollution in urban areas", the search expression MOTOR TRAFFIC OR INDUSTRIAL FUMES AND URBAN AREAS AND AIR POLLUTION may retrieve all records in which the term MOTOR TRAFFIC only or in combination with the terms mentioned in the search expression as well as with terms

other than those in the search expression occur. This may result in the retrieval of records irrelevant to the query. A more precise expression of the query will be (MOTOR TRAFFIC OR INDUSTRIAL FUMES) AND (URBAN AREAS AND AIR POLLUTION)

PROXIMITY OPERATORS

You may use more restrictive types of the logical AND operators are (G) and (F).

use (G) to retrieve from same field(all occurrence of the search terms in the same repeatable field treated as single entity); for example:

LIBRARY (G) AUTOMATION

will retrieve all records in which both terms LIBRARY and AUTOMATION occur, provided that they occur in the same field.

PERSONNEL (G) MANAGEMENT

will retrieve all records in which with both terms PERSONNEL and MANAGEMENT occur, provided that they occur in the same field.

Use (F) to retrieve all records with search terms in the same occurrence of any field or individual occurrence of a repeatable field.

WATER (F) SOIL

will retrieve all records in which both the term WATER and SOIL occur, in the same field or the same occurrence of a repeatable field.

. can be used in the same way as (F) , but with the additional restriction that the terms are not more than n words apart, where n is the number of dots minus one.

INFORMATION . . MANAGEMENT

will retrieve records which contain
Information for management
Management information
Management of information, but not
Information for middle management.

\$ can be used in the same way as (F) , but with the additional restriction that the terms are exactly n words apart, where n is the number of dollars minus one. For example:

INFORMATION \$ \$ \$ MANAGEMENT

will retrieve records which contain:

INFORMATION FOR TOP MANAGEMENT
INFORMATION FOR MIDDLE MANAGEMENT, etc.

but not

INFORMATION MANAGEMENT

N.B. The operators (G), (F), \$ and ., must be preceded and followed by one space.

OPERAND QUALIFIERS

You may use a qualifier to specify a field or fields in which you want the term(s) to occur. This is particularly useful for databases which may contain the same data in different fields. The form of the search expression is:

SEARCH TERM(t1,t2,t3,...), where t1, t2, t3, ... are field tags.

For example,

INFORMATION SERVICES/(69) OR INFORMATION SYSTEMS/(24)
where 69 is the field tag for Descriptors and 24 is the field tag for Title in the database LIBCAT.

FREE TEXT SEARCH

You can also use a free text search in this option (option 5). This is for searches in fields which may not have been indexed. The search expression is of the form:

? v24: 'plant' and val(v26) = 1965

which means with reference to a particular database (CDS in this case), the string 'PLANT' should be present in term(s) in field 24 (i.e title) and the numerical value of the field 26 (i.e., year of publication) should be 1965, or

? #3 v300: 'neelameg' and v620: 'policy'

which means retrieve all records containing, the string NEELAMEG in field 300 and POLICY in field 620 of the records retrieved previously in set number 3. #3 may be either an inverted file search expression, another free text search or a combination of both.

In response to your free text search expression the system will present you a screen containing information on the search process, for example, for the search expression for a particular database:

? v24: 'unesco' and val (v26) >= 1986 , may look as follows:

MFN 10	Hits 5	% 50.00	Recs 150
-----------	-----------	------------	-------------

Fig. 74. CDS/ISIS system search report in free test searching

Press any key to interrupt search

The value in MFN box shows the master file number (MFN) of the record being processed, the Hits box shows the current number of records retrieved, the % box shows the current hit rate, i.e, the percentage of records retrieved calculated with respect to the number of records processed and the Recs box is the total number of records to be processed.

Other relational operators you can use in a free text search expression are:

- = equals
- <> not equal to
- < less than
- > greater than
- : contains

For each search expression CDS/ISIS assigns a unique set number. A search expression can be re-executed with or without modification on any of the databases by simply using the set number assigned by CDS/ISIS preceded by a number sign (#) (eg. #3). This facility allows you to develop your search step by step.

SYNTAX ERRORS

If a search term contains: * + () . \$ ^ or begins with a number sign (#) you must enclose it in double quotation marks ("), otherwise a syntax error will occur.

Example: Entering the search term SPRING (SEASON) will produce a syntax error. The correct form is "SPRING (SEASON)".

ANY TERM

ANY TERM is a collective name for a predefined set of access points in the ANY file for the database being searched. When an ANY term is used in a search expression the system will OR together all the access points of the cluster of terms associated with that ANY term in the related ANY file.

Example: Assume that the ANY file for a database contains

ANY EUROPE	EUROPE
ANY EUROPE	EEC
ANY EUROPE	EC
ANY EUROPE	EUROPEAN COMMISSION
ANY EUROPE	FRANCE
ANY EUROPE	GERMANY
ANY EUROPE	SPAIN
ANY EUROPE	ITALY
ANY EUROPE	PORTUGAL
ANY EUROPE	AUSTRIA
ANY EUROPE	SWITZERLAND
ANY EUROPE	DENMARK
ANY EUROPE	SCANDINAVIA
ANY EUROPE	NORWAGIAN
ANY EUROPE	SWEDEN
ANY EUROPE	ENGLAND
ANY EUROPE	SCOTLAND
ANY EUROPE	IRELAND
ANY EUROPE	WALES
ANY EUROPE	UK
ANY EUROPE	UNITED KINGDOM

Thus, the search expression ECONOMY AND ANY EUROPE will retrieve all records in which the terms ECONOMY and also any of the terms in the ANY file occur.

This technique can increase the number of hits for a search expression.

OPTION 6: SEARCH IN SPECIFIC FIELD(S)

Use option 6 for searching in specific field(s). Field numbers (tags) and field names for the database will be listed on the screen. Using appropriate arrow keys highlight the field you are interested in and press S key to select. Proceed the same way to select more fields. A maximum of 10 tags can be selected. After selecting the tag(s), press <ENTER> key. The system will prompt you to formulate the search expression. The procedure is the same as for option 5.

In this option free text search is not permitted. Specifying separate tags for different search terms in the same search expression is not permitted. You can perform this kind of search in option 5 by specifying tags at the end of each term (see option 5) as qualifier.

After formulating the search expression proceed in the same manner as for option 3.

OPTION 7: KEYWORD SEARCH

Use option 7 to search using the list or dictionary of index

terms. On selecting the option the screen will look like:

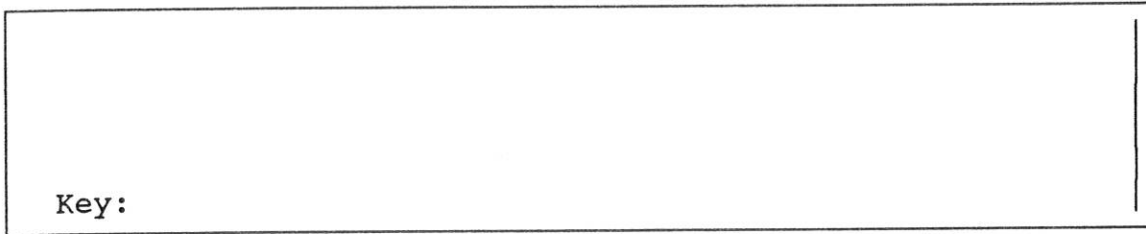


Fig. 75. Keyword Search Prompt

The system will ask you to enter a key term or the first few characters of the term at the bottom left of the screen. A list of index terms beginning with the string you keyed in will be displayed in alphabetical sequence in two columns. If there is no index term matching the string keyed in, the display will start from the next nearest term in the alphabetical sequence.

Use the arrow keys to move the cursor to the desired terms(s) and press S to select. Use <PgDn> and <PgUp> keys to move from one page to the next on the screen. Finally press X to submit your search expression. The terms selected will be combined by the OR operator. The expression can be edited as desired. Press <ENTER> key to initiate the search. Follow the same procedure as for option 3. You can press Q to quit to the main menu.

OPTION 8: FREE TEXT SEARCH

Use option 8 to search a string of character(s) in a database. If there is no pre-selected database, the system will automatically execute option 1. Then if you select a database lists of tags and corresponding field name(s) will be displayed as for option 6. But in this case you can select only one field. Using appropriate arrow keys highlight the field you are interested in and press <ENTER> key to select.

If you select a field, the system will ask you to type in the string you want to be searched and press <ENTER> to initiate the search. The record(s) in which the keyed-in string is present in the specified field will be displayed.

If a record is displayed, you have a choice among the options shown at the bottom right of the screen. Press S to save the record in a file whose name you will be required to type in a box or in a pre-selected save file, as the case may be. Press <ESC> key to quit to main menu. Press <PgDn> key to display successive records if any. At the end the system will display "No more records" at the bottom of the screen. Press <ESC> key to return to the main menu.

OPTION 9: SEARCH USING THESAURUS.

Use option 9 to search using a thesaurus. Several options of the THES program will be displayed. On

selecting the option the displayed screen will be:

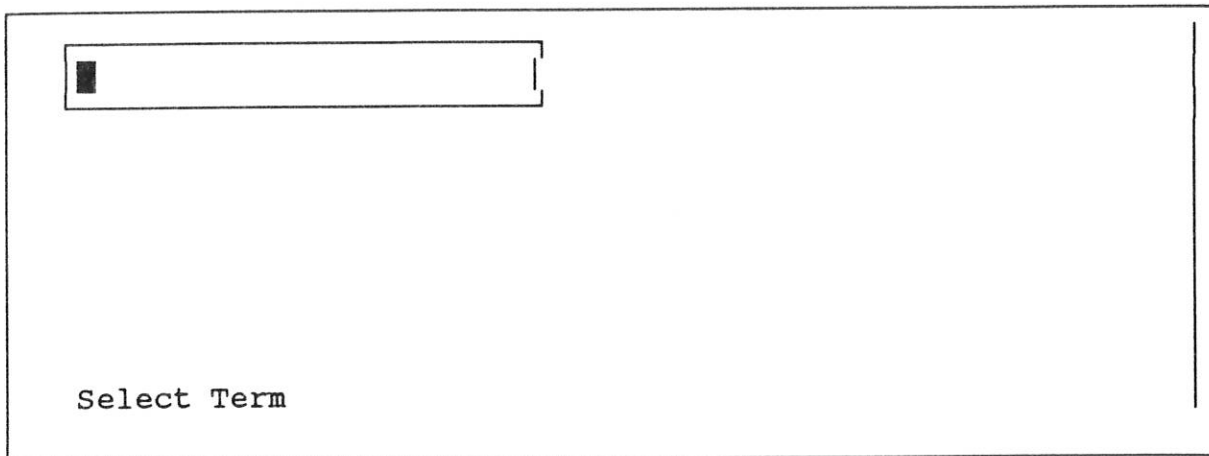


Fig. 76. Term Selection Screen of Thesaurus program

Key-in, at the cursor position in the box, the term or the first few characters of the term you wish to select. A list of terms, from the alphabetical index of the thesaurus, beginning with the term/string you have keyed-in will be displayed. If there is no term in the thesaurus matching the term/string you have keyed-in, the display will be from the next closest string. Several options of the THSE program will be displayed at the bottom of the screen. Press the <ENTER> key as many times as required to position the cursor against the term you are interested in and press S key to select. The system will display the term selected along with its broader term (BT), narrower term (NT) and related terms (RT), if any. Use the <ENTER> key as before to position the cursor against any of the term you are interested in. If you press S key, the system will display the new selected term and its associated BT, NT and RT. On the other hand, if you press the Q key, the term will be selected to formulate a search expression. In this way you can select as many search terms as necessary. Press the ? key for display of the terms you selected to form a search expression in a box at the lower half of the screen. Press X to exit the thesaurus; the selected terms will be combined with the OR operator and displayed at the top of the screen. You can edit to modify the term(s) and/or of the operators (see option 5). On pressing the <ENTER> key the search will be initiated, thereafter, the process is similar to choosing option 5.

OPTION H. Help

Use option H to get detailed help on the main menu options as shown in Fig. 70.

A screen-full text will be displayed beginning from the first option. You can use the <ENTER> key to go forward. Pressing the <ESC> key will return you to main menu.

OPTION Q: SEARCH HISTORY

Use option Q to display your search history/performance. Your previous search performances will be displayed. Number of hits, number of records saved, database searched, search expression, option used will be displayed along with your name, ID number address, etc will be displayed. Press <ENTER> key to continue the display if necessary. Pressing <ESC> key returns you to the main menu.

OPTION ESC: QUIT

Use <ESC> key (or option ESC) to terminate the session.

ANNEX 3

TEXT OF 'HELP' OPTION

Welcome to MOPAC - Online Public Access Catalogue facility. MOPAC is a menu-driven system designed to assist you in performing search and retrieval in the library catalogue database using several access points.

The use of each access point in the main menu of MOPAC is explained below.

```
08:00:00
14:06:93

LIBRARY USER'S SERVICE
CATALOGUE SEARCH

By Personal Author
By Corporate Author
By Conference Name
By Title
By Class Number
By Subject Keyword
Help
Quit

Use ↑↓ to highlight an option,
then press <ENTER> to complete the selection

Search using Personal Author name.
```

Fig 77. MOPAC Main Menu

As shown in the fig. 77, the main menu is contains 8 options, 6 of which are access points. At the top of the main menu screen is the heading of the main menu. The top right side of the screen displays a clock with system date and time. The bottom part of the screen displays explanation for the highlighted option; for instance, the highlighted option is 1, and the brief explanation of it appears at the bottom of the screen.

To select an option, as indicated at the bottom of the main menu screen, move the cursor to highlight an option using the appropriate arrow keys (down or up arrows only), and then press the <ENTER> key to select.

OPTION 1, 2, 3, 4, 5, and 6

MOPAC provides a search capability to retrieve records by each of the options Personal Author name, Corporate Author Name, etc as indicated in the main menu. (Fig. 77). On selecting an option you will be prompted to enter a search term or combination of terms

representing your information need, (see below) at the top left of the screen.

Enter Search Expression:

Type your search expression at the cursor and press <ENTER> key. You may use the <F1> key to get a brief explanation of how to formulate your search expression.

Key in appropriate terms representing your information needs press ^Q_ eg. Africa for retrieving information on Africa. Terms may be combined as follows:
Information base or database
information and retrieval
Automation not library automation
Robert or John
Terms may be truncated by suffixing \$ to the root term eg. Network\$ which will search Network or Networking or Networks.
To execute earlier query: key in set number eg. #2

Press ESC to quit

For More help use option H in the main menu

Fig. 78. Brief help in search formulation screen.

Micro CDS/ISIS provides for searching using the index of terms extracted by the system from the records of database according to prescribed techniques, and also for free text searching, that is not using the index of terms. However, MOPAC does not support free text searching using the master file. Formulation of search expressions according to search language of Micro CDS/ISIS is briefly discussed below:

SEARCH EXPRESSION

A search expression usually consists of a term or a combination of terms representing an information need. For example:

AGRICULTURE
AGRICULTURE AND AFRICA
URBAN AREAS AND AIR POLLUTION AND MOTOR TRAFFIC
ANDERSON K.S.
ANDERSON K.S. AND PHILLIPS J.
DATABASE OR DATA BASE
SOFTWARE NOT CDS/ISIS

BOOLEAN OPERATORS

In the above expressions 'AND', 'OR', 'NOT' are called operators (Boolean Operators) for combining the concepts represented by the terms.

The expression

AGRICULTURE AND AFRICA

means that only those records containing both these terms should be retrieved; so also is the case with the expression

URBAN AREAS AND AIR POLLUTION AND MOTOR TRAFFIC.

The expression DATA BASE OR DATABASE means that any record containing either of the terms will satisfy the query. The expression SOFTWARE NOT CDS/ISIS means that the record(s) retrieved should contain the term SOFTWARE but should not contain the term CDS/ISIS.

In general, the AND operator is used to increase the precision of a query (reduce the number of hits); the OR operator is used to broaden the search (increase the number of hits); and the NOT operator to exclude term(s) which may also increase precision.

Note: you may use * instead of AND, + instead of OR and ^ instead of NOT in the search expression

MATCHING OF TERMS

In order to ensure that each term in the search expression matches exactly with term(s) in the index, the search term(s) should be entered precisely as in the index. That is, if the term in the index is DATABASES the search term typed in as DATABASE, DATA BASE, DATA BASES will not match with the index term and no records may be retrieved. Similarly, ANDERSON K.S. and ANDERSON, K.S will not match; nor will COLOR and COLOUR.

Using the Boolean operator OR, alternative forms of a term may be taken care of; for example,

DATABASE OR DATABASES OR DATA BASE OR DATA BASES
COLOR OR COLOUR

Similarly, for synonyms and spelling variations

TRUCK OR LORRY OR TRUCKS OR LORRIES

FIBRE OR FIBER

LABOUR OR LABOR

For compounded terms

NETWORK OR NETWORKING

TERM TRUNCATION

Suffixing the truncation symbol \$ to the stem of a word can also help. For example:

BIOCHEM\$

will match with all terms having the stem 'BIOCHEM', such as,

BIOCHEMICAL
BIOCHEMIST
BIOCHEMISTRY
etc.

PARENTHESES

In a search expression containing several combinations of terms, specificity can be achieved by the judicious use of parentheses. For example, if information is needed on "The relation between motor traffic or industrial fumes and air pollution in urban areas", the search expression
MOTOR TRAFFIC OR INDUSTRIAL FUMES AND URBAN AREAS AND AIR POLLUTION
may retrieve all records in which the term MOTOR TRAFFIC only or in combination with the terms mentioned in the search expression as well as with terms other than those in the search expression occur. This may result in the retrieval of records irrelevant to the query. A more precise expression of the query will be

(MOTOR TRAFFIC OR INDUSTRIAL FUMES) AND (URBAN AREAS AND AIR POLLUTION)

SYNTAX ERRORS

If a search term contains: * + () . \$ ^ or begins with a number sign (#) you must enclose it in double quotation marks ("), otherwise a syntax error will occur.
Example: Entering the search terms

SPRING (SEASON)

SPRING (WATER SOURCE)

will produce syntax error. The correct form is

"SPRING (SEASON)"

"SPRING (WATER SOURCE)"

ANY TERM

ANY TERM is a collective name for a predefined set of access points in the ANY file for the database being searched. When an ANY term is used in a search expression the system will OR together all the access points of the cluster of terms associated with that ANY term in the related ANY file.

Example: Assume that the ANY file for a database contains:

```
ANY EUROPE    EUROPE
ANY EUROPE    EEC
ANY EUROPE    EC
ANY EUROPE    EUROPEAN COMMISSION
ANY EUROPE    FRANCE
ANY EUROPE    GERMANY
ANY EUROPE    SPAIN
ANY EUROPE    ITALY
ANY EUROPE    PORTUGAL
ANY EUROPE    AUSTRIA
ANY EUROPE    SWITZERLAND
ANY EUROPE    DENMARK
ANY EUROPE    SCANDINAVIA
ANY EUROPE    NORWEGIAN
ANY EUROPE    SWEDEN
ANY EUROPE    ENGLAND
ANY EUROPE    SCOTLAND
ANY EUROPE    IRELAND
ANY EUROPE    WALES
ANY EUROPE    UK
ANY EUROPE    UNITED KINGDOM
```

Thus, the search expression ECONOMY AND ANY EUROPE will retrieve all records in which the terms ECONOMY and any of the terms in the ANY file occur.

This technique can increase the number of hits for a search expression.

In response to your search expression the system will present a report which, for example, for the search expression: (NEELAMEGHAN\$ OR TAYE\$), may be like as follows for a particular database:

```
Set          1:  NEELAMEGHAN$/(70) + TAYE$/(70)

P=           5 NEELAMEGHAN, A
T=           5 -#2
P=           3 TAYE TADESSE
T=           3 -#3
T=           7 -#4:  #2 + #3
T=           7 -#1:  #4
----> █
```

Fig. 79. CDS/ISIS system search report

This indicates that the term NEELAMEGHAN, A occurs 5 times (five postings) in the database. The term TAYE TADESSE has also 3 occurrences. There are seven occurrences of the expression NEELAMEGHAN\$ + TAYE\$, meaning that there are seven records in which one or the other of the terms occur. There is one posting in which both terms appear.

Press the <ENTER> key to display the retrieved record(s). If the number of hits is greater than 0 then, the records will be displayed. After displaying a record the system will ask you to select a key. Press the <ESC> key to return to the main menu; or S key to save the displayed record in a file the name of which you will be asked to key-in in a box on the screen as shown below:

Save as:

You can use <PgDn> and <PgUp> keys to move back and forth through the retrieved records. On the other hand, if the displayed record is more than one screen page you may press <ENTER> key to display the rest.

OPTION : Help

Use option HELP to get detailed help on each of the main menu options (See Fig. 1) A screen-full text will be displayed beginning from the first option. You can use the <ENTER> key to go forward. Pressing the <ESC> key will return you to the main menu.

OPTION 9: QUIT

Use <ESC> key (or option QUIT) to terminate the session.

ANNEX V

ILOAN PROGRAM¹

The ILOAN program has the following capabilities:

- It enables the entry of the bibliographical details of the document(s) required on interlibrary loan or as photocopies from one or more libraries represented in the SRLS Union Catalogue database.

- Once the details of a needed item is entered, the program searches the database and outputs to a disk file that the user specifies, circular interlibrary loan/photocopy requests giving the details of the required document and listing all the libraries holding the serial volume/issue.

- Identifying the holding libraries, the program also scans the missing volumes and issues field (subfield ^e of the field 200.), and a library that has reported a missing volume or missing issue in a volume is not listed when the required document is from such a volume or issue of such a volume.

- the program is capable also of dealing with loan requests with partial or incomplete information about volumes or parts of serial titles. It is possible to make loan/photocopy requests giving one of the following sets of information about a serial title:

- volume, issue, year, and pages.
- volume, year, and pages.
- issue, year, and pages.
- volume, pages.
- year and pages.

However, the more specific the information on the volume, issue, and year of the serial in which the required document exists, the more accurate will be the performance of the program. For instance, only when the required volume and issue of a serial are provided, can the program avoid listing those libraries that have reported the particular volume and/or issue in that volume as missing from their holdings.

The program does not validate the correctness or match between the volume and year of the serial title being input. For instance, if a loan request specifies volume 36 of 1986 of a serial title, where in fact the year corresponding to vol 36 is 1987, the program

¹ The text is based on the Union Catalogue of Serials in International Agricultural Research Centres (IARCs) Database Manual by Haravu, L.J. and V. Venkatesan, 1990.

does not validate the wrongly matched volume and year.

Ensuring the accuracy of the data about the item required on loan is left to the library applying the software.

Applying the ILOAN program

The ILOAN program requires that the applying library should define a file called LIBR.DAT to hold the name and address of the library. This will appear on all loan/photocopy requests. The file LIBR.DAT is a text file and can be created using any Word Processing software package. However, if you wish to use Wordstar to create the LIBR.DAT file use it in the Nondocument mode. The file LIBR.DAT is to be created in the directory from which of ISIS is invoked.

The file LIBR.DAT has five lines of text. The first line holds the name of the organization, and lines 2 to 5 to hold the full address of the library. Each of the lines begins in the first column of the line. However, each line should not exceed 40 characters. The name of the organization may be abbreviated to 40 characters if required. An example of the file LIBR.DAT follows:

```
Addis Ababa University  
Kennedy Library  
P.O.Box 1176  
Addis Ababa  
Ethiopia
```

The program can be incorporated and invoked from different points of CDS/ISIS system. In any case, when invoked the following steps are required:

1. The program begins execution by asking you to name a file in which you will accumulate all loan/photocopy requests. Enter the name of a file of your choice and press the <ENTER> key.
2. Next, the program asks if you will use pre-printed Interlibrary loan/photocopy requests forms to print your output. Answer Y or N to this prompt.
3. A data-entry form now appears on the screen to enable the entry of the bibliographical details of the item required on loan or as a photocopy (See the Fig. 80 below)

This program generates Loan/Photocopy Request Forms

Enter details of articles required

```
1. Author(s)      :
2. Title of paper :
3. Journal title  :
4. ISSN           :
5. Volume         :   Issue:       Year:       Page(s):
-----
6. Library Users name:
7. Dept/program   :               8. Request No. :
```

Fig. 80. ILOAN program Data-entry Screen

The <ENTER> key pressed after entering the data for a given field moves the cursor to the beginning of the next field.

4. After entering the data for the author(s) and title of the document required (e.g. periodical article), the cursor moves to the ISSN field. If the ISSN of the required serial is available, this may now be input and the cursor then positions itself at the field for volume, skipping the Serial title field. If the ISSN is not input, the program then prompts you to enter up to two significant words of the Serial title. The words are to be separated from each other by a single space character. Following the name(s) of author(s), document title, ISSN or two significant serial title words, the volume, issue, year and pages are then to be entered.

5. Following the entry of all the details (or those available), the program then asks if the data entered requires to be modified. If you press y or Y, you are then asked to specify the line number that you wish to change. You are then prompted to reenter that line.

6. Once the data about the item required on loan/photocopy is entered and accepted by the program, it begins a search process to retrieve those serials records that match the input ISSN or those records that have two significant words that were input in the title field. The key titles of retrieved records are displayed one by one, and the user is prompted to type y or Y in response to the query if the title displayed is

in fact the one that is required serial title. When the required serial is found and the user confirms this by typing Y or y, the program then proceeds to generate the interlibrary loan or photocopy request form. the output is stored to the disk file specified in step 5, above.

7. Following this, the program now asks if more loan requests need to be attended to. If the answer is y or Y, the program then presents a blank data entry form once again so the new request can be input, and so on.

8. When no more loan requests are required to be attended to, type N or n at the prompt. This will take you where the program was invoked.

9 The output file specified in the beginning (step 1) can be printed using either of the DOS command Print Filename or Copy Filename to LPT1, where Filename is the name of the output file specified in the beginning (step 1).

ANNEX VI

NEWSDI PROGRAM¹

The features of the Program called NEWSDI which is used for the production of SDI outputs from Micro CDS/ISIS databases are explained below.

The file being supplied is named NEWSDI.PCD. This is the compiled program file and should be copied to the sub-directory where Programs under CDS/ISIS are stored. This is usually the subdirectory called PROG. Thus, for instance, if a library has installed the Micro CDS/ISIS in a directory called ISIS with subdirectories SYS, MENU, MSG, DATA and PROG, the NEWSDI.PCD program supplied is to be copied to the \isis\prog subdirectory. This is accomplished as follows:

Insert in drive A the diskette provided.

At the DOS C:\> prompt type cd isis. This will put you in the directory where Micro CDS/ISIS is installed. You may now see the DOS prompt shown as C:\ISIS>. Now type cd PROG. This will put you in the PROG subdirectory. You may now see the DOS Prompt as c:\ISIS\PROG>. At this prompt type COPY a:NEWSDI.PCD and press the <ENTER> key. This will copy the program into the PROG subdirectory of the ISIS directory.

All enquiries about this program may be sent to:

L.J.Haravu
Manager, Library & Documentation Services,
ICRISAT
Patancheru
Andhra Pradesh 502 324
India.

THE PROGRAM ASSUMES THE FOLLOWING:

1. The name, of the organization, name of the library and the organizations address that provides the SDI service in a text file called INAME.DAT. This file can be created using any standard text editor and has 5 lines, one for the name of the instn., followed by the name of the library, acronym of the institution and 2 lines for the address of the organization. If you use Wordstar to create this file, please use it in the Non document mode. The file INAME.DAT should be stored in root directory from which ISIS is invoked.

¹ The text is based on the Read me file provided with the NEWSDI program

An example of a file called INAME.DAT follows:

Addis Ababa University
Kennedy Library
AAU
P.O.BOX 1176
ADDIS ABABA, ETHIOPIA

The above names and address line will appear on each page of the SDI output to different profile holders.

Each line of the above file is to be entered from Column 1 onwards. The name of the organization will be truncated at column 54 since the SDI outputs run into two identical columns. The name of the Instn. may use abbreviations if it is necessary to limit the length to 54 characters.

2. An SDI Users Profile file having the following structure:

- The first line to contain a Profile ID. This is an alphanumeric field, and can contain any combination of numerals and letters to identify a given Users Profile. We suggest that you use simple serial numbers to identify profiles. A profile ID may be suffixed by the letter T to indicate Two-Column output to a given user. Two column output in which one of the columns is the feedback part of the output is useful to be provided to users until the profile is found to be fully satisfactory, i.e., until it meets the needs of a given user. Once the profile is found to be meeting needs, the Profile ID for the user may be changed to remove the suffix T. The SDI program then produces single column output to this user. (See also paragraph 4, below).
- Line 2 to contain the name of the profile holder.
- lines 3 to 5 to contain his mailing address. If the address requires only one or two lines, enter as many blank lines to fill up the required three lines for the mailing address.
- Line six and onwards to contain search terms which could be any valid search term and/or search expression or combination using set numbers, e.g. #1*#2, #1 * soil moisture, (#1 + #2) * (#3 + #4). Search terms could also be truncated, e.g. comput\$. If the inverted file of the database uses prefixes for fields (e.g. AU=Lancaster\$), remember to use the prefixes in building user profiles. If the database has one or more ANY files, these could also be included in the search expression or term. There is no limit to the number of search terms in a profile.

However, the program assumes that a profile will refer to a maximum of 99 sets using the '#set number' (e.g. #4 * #5), method of referring to previously created sets.

- The last line of each User Profile should contain @@.

The Users Profile file can be created using any standard text editor. Each line of the User Profile is to be entered from Column 1 and onwards. Do not give any line space between two profiles. As can be seen in the example below all profiles can reside in one file. If you wish to use Wordstar to create the Users Profile File, please use it in the Nondocument mode. The Users Profile File should be stored in the ISIS root directory from which ISIS is invoked.

Examples of user profiles are given below:

```
001-T
TEMTIM ASSEFA
STUDENT, SCHOOL OF INFORMATION STUDIES FOR AFRICA
SISA
P.O.BOX 1176, SISA, AAU
AU=BROWN$
(PLAN$ * ETHIOPIA)
(DATABASE$ * DESIGN)
@@
002
ABERA MELESSE
ANALYST PROGRAMMER, WATER AND SEWERAGE AUTHORITY
AAWSA,
P.O.BOX 1505
AU=CHORAFAS$
EXPERT SYSTEM$ * COMPUTE$
@@
```

In the above examples the first user (ID 001-T) will get two column output and the second user (ID 002) will get single column output.

3. The program provides the option to produce SDI outputs for items input into the database after a given date of data entry. This date will be used to create a subset and all SDI outputs will be for items within this subset. However, if the date option is not used, the whole database is used to produce the SDI outputs. If the date option is used the SDI program assumes that the database has a date of data entry field, and that this is indexed. The date of data entry to be given could be truncated (e.g. 9301\$ to take into account all input added after 9301, i.e. Jan 1993).

4. The output produced by the program is in one or two columns depending on the Profile ID. Two column output contains a user copy part and a feedback part. The latter is identical to the former, except that it also has two questions which the user is expected to answer as feedback. SDI outputs are all accumulated into an output disk file which can then be printed off line. The SDI output file specified at run time is created in the ISIS root directory.

5. SDI outputs will be produced using the CDS/ISIS display format that is specified at run time. If no CDS/ISIS format is specified the program will take the default format to produce the SDI outputs. However, users are advised not to specify a CDS/ISIS display format which itself uses a CDS/ISIS Pascal Format Exit.

6. The number of lines per printed page is also required to be specified at run time. The program automatically adjusts the number of lines printed per page which can vary also depending on whether the output is in two columns or one column.

7. SDI outputs contain a first title page that contains the name, address and Profile ID of user, followed by his/her Profile, and the number of hits output to him/her in that particular run.

RUNNING THE NEWSDI PROGRAM.

1. Invoke the ISIS program and come to the main menu.
2. Choose option U for Service Utilities option.
3. Then, choose S for Current Awareness (SDI) option.

Note: It is assumed that you already have a compiled version of the program Newsdi.

The program now asks for the following:

1. Name of the Users Profile file.
2. Name of the SDI output file, i.e. the name of the file in which SDI outputs to all users will be accumulated.
3. Name of the database to be used for the SDI outputs.
4. Name of the CDS/ISIS display format to be used in formatting the SDI outputs. If you do not specify any display format, the program takes the default format.
5. The profile ID from which the SDI run begin, and the Profile ID at which to end the run.
6. Next the program asks you if you wish to use the date search facility, i.e. whether you want your SDI output to be restricted to records entered into the database after a given date of entry. If you decide to use the date search facility, the program asks you to enter the date. However, to use the date search facility, the database

must have a field for date of entry and this field must be an indexed field.

7. Lastly, you will be asked for the number of lines per page of printed output.

Enter the information prompted for. At the end of the run the program returns to where the program is invoked. Type Q to return to the main menu of CDS/ISIS. You may then print the output file using the Print [Filename] command at the DOS prompt after exiting from CDS/ISIS. A 2-column output file will require 132 column stationery on your printer.)

must have a field for date of entry and this field must be an indexed field.

7. Lastly, you will be asked for the number of lines per page of printed output.

Enter the information prompted for. At the end of the run the program returns to where the program is invoked. Type Q to return to the main menu of CDS/ISIS. You may then print the output file using the Print [Filename] command at the DOS prompt after exiting from CDS/ISIS. A 2-column output file will require 132 column stationery on your printer. }