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ON-LINE INFORMATION RETRIEVAL.

BRIEF GUIDE TO USER ORGANIZATIONS AND SYSTEMS.

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The following list is intended only as a brief guide to indicate the very widespread activity in this field. No attempt has been made to summarise projects or to give the results or conclusions reached although in some cases particularly pertinent facts such as data base size, cost details etc., have been included. (Space has been left between entries so that users may, if they wish, add supplementary notes.)

The list is not exhaustive, nor has it been possible in the short time available for the preparation of this Guide to ascertain the exact status (at December 1971) of all the many systems listed. Many are certainly not now operational but are included, however, since in some cases the experience or results obtained have been helpful in indicating potentially fruitful (or indeed potentially fruitless) lines of approach to on-line information retrieval.

In a number of cases organizations have developed several schemes. Where convenient, these have been numbered separately for ease of cross-reference.

Important Note

The information listed has been drawn from many sources. As stated above, it should not be assumed that the descriptions are up-to-date - progress in the development of individual on-line systems can often be rapid and many systems will doubtless be more advanced than indicated. This Guide will be revised and enlarged for issue in the form of a Directory by the end of 1972. This Directory will include details of bibliographic references and other literature/documentation known to be available.

Brief Guide to On-Line Information Retrieval User Organizations and Systems

N.B. This list is in alphabetical order by name of organization, institution or company. University projects are listed in the style of the following example: Illinois University, rather than University of Illinois (with one exception - the "University of Washington", Seattle is listed in that form to avoid confusion with "Washington University", St. Louis, Missouri).

1 American Institute of Physics, New York, N.Y., U.S.A.

An on-line system, AUDACIOUS, with 2,330 references was set up in 1968 for experimental on-line retrieval tests using UDC.

Current A.I.P. plans for use of the growing SPIN (Searchable Physics Information Notices) data base include the possibility of eventual terminal access to a searchable master file.

2 Aston University, Birmingham, U.K.

A research studentship award has been made by OSTI for the investigation of an on-line system for technical and management information in an industrial firm.

3 Atlas Laboratory, Chilton, Berks., U.K.

Searches of the tape-driven system running on the Atlas computer can be initiated from video or teletype terminals connected to the Sigma 2 which is used as a front end machine. Results of a search are stored in an on-line file and may be listed on a terminal or printed off-line. The data base consists of references to books and articles drawn from a number of journals relating to computers and their applications. All

the articles from 21 specific journals together with complete citations are entered into the system. The design is acknowledged to be based on and very similar to TIP at the Massachusetts Institute of Technology. (See also Cardiff University, Entry 11).

4 Auerbach Inc., Philadelphia, Pennsylvania, U.S.A.

DM-1 (Data Management System; sometimes called AIMS) is a commercially available, machine independent, conversational file management system which has been used on various bibliographic data bases. Users require computer programming orientation. DM-1 operates on a 360/50 or GE 635.

5 Bath University, U.K.

Experimental on-line searches of part of the University Library's book catalogue have been made. SPECOL (Special Customer Oriented Language; see Civil Service Department, Entry 13) has been used. A CRT terminal has been used in the interrogation of indexed sequential files held temporarily on-line on an ICL 4-50 computer. Search has so far been confined to personal author names or book number but there is interest in developing subject retrieval techniques.

6 Battelle Memorial Institute, Columbus, Ohio, U.S.A.

BASIS-70 (Battelle Automated Search Information System) permits users to search, using keywords and AND, OR, NOT techniques, a variety of data bases held on-line. Both bibliographic and data files are held in the following fields: plastics materials properties, defence metals, ecological material, marketing information, and task analysis. A

CDC 6400 is used, there being 6 teletype terminals and 1 CDC 214 video terminal.

7 Belfast, Queen's University, Northern Ireland

Project QUOBIRD (Queen's University On-line Bibliographic Information Retrieval and Dissemination system) has been developed over the last few years primarily as a small scale project to test methods that could be applicable to on-line retrieval from large data bases. Two data bases have so far been used - a small test base of computer science literature and more recently a larger data base of some 2,000 items drawn from the titles and abstracts contained on INSPEC tapes.

8 Book Centre Limited, London, U.K.

A keyword index file of British book titles has been developed. Titles may be retrieved via natural language words contained in the title and/or via author name(s). Six VDUs are linked to an IBM 360/50 with 2314 disc drives. The eventual aim is to hold a file, updated daily, for all books available in the U.K.

9 Bunker-Ramo Corporation, U.S.A.

The Direct Electronic Library (DEL) was developed by the Bunker-Ramo Corporation for on-line reference retrieval. Initially DEL was developed for implementation on a Univac 1050 with Fastrand II drum store. Some of the experience gained in developing DEL was later used in the implementation of the NASA RECON system (see Entry 58).

10 California University, Lawrence Radiation Laboratory, Berkeley, California, U.S.A.

The LRL library has a RECON terminal connected to the "Nuclear Science Abstracts" data base held at Oak Ridge and uses this for retrospective searches. LRL, currently using the IBM 1360 Chipstore for SDI

service from N.S.A. tapes, is believed to be interested in moving towards on-line searching of N.S.A. held in the Chipstore.

11 Cardiff University, U.K.

The computing services unit at Cardiff University with an ICL 4-70 operates a system similar to that described above for the Atlas Laboratory (Entry 3). Atlas tapes are used for the data base; further copies of these tapes are believed to be sent to the Universities of Bristol, Bath, London and Manchester.

12 Centre National de la Recherche Scientifique, Centre de Documentation, Paris, France.

The mechanization of "Bulletin Signalétique" by CNRS is proceeding. The main system is PASCAL (Programme Appliqué à la Sélection et à la Compilation Automatiques de la Littérature). CNRS intend during 1972 to investigate on-line retrieval using programs developed by DATAR (Délégation à l'Aménagement du Territoire).

13 Civil Service Department, U.K.

The SPECOL language (Special Customer Oriented Language) can be used in remote on-line interrogation of computer files. AND, OR and NOT logic is available making the language potentially of interest for information retrieval. It is used by Bath University (see Entry 5).

14 Communications Canada, Ottawa, Canada

An on-line, interactive co-ordinate index to information in the field of "communications" is being developed. The system design allows plain language questions in either English or French with normal Boolean search logic, output being either via teletype or CRT. The software package used (SPIRS - Special Purpose Information Retrieval System) was developed by Business Computer Systems Ltd. of Ottawa.

15 Computer Corporation of America, U.S.A.

The "103" system was used in a demonstration of the possibility of providing on-line (2260 CRT) access to the COSATI inventory of government-sponsored work in progress (1968) in the area of information sciences and technology.

16 Copper Data Centre of the Copper Development Association, Columbus, Ohio, U.S.A.

The Copper Data Center, established at the Battelle Memorial Institute, Columbus, Ohio, has recently applied on-line techniques to its co-ordinate index to copper data references (searchable off-line since 1965). The on-line printout refers the user to document accession numbers. The data base contains > 5,000 documents. A CDC 6400 computer with conventional teletypes is used.

17 Cornell University, Ithaca, N.Y., U.S.A.

The SMART development was originally aimed at experimental off-line document retrieval. However, design studies have been carried out for interactive on-line retrieval with initial tests aimed at a

few thousand documents using up to 5 access consoles. The mechanisms used are intended to be applicable without revision to collections of about 500,000 documents and up to 200 input-output consoles.

Work on a "document vector" approach to on-line information retrieval has been reported.

18 Culham Laboratory, Abingdon, Berks., U.K.

Culham Laboratory Library has been experimenting with on-line information retrieval since 1968 and various test data bases have been employed - computational physics, parliamentary literature, and plasma physics literature. During 1971, studies on the RIOT (Retrieval of Information by On-line Terminal) project used 2,000 report references and ran on the KDF9 computer. At the beginning of 1972 new programs were being developed and tested on the Culham ICL 4/70 computer prior to use with the full plasma physics data base of some 26,000 references.

19 Culham Laboratory, Abingdon, Berks., U.K.

The STATUS project investigated computer procedures for handling the full text of U.K. statute law dealing with atomic energy. The CONFAB program allowed on-line interrogation of full text from a computer terminal.

Cybernet Time Sharing Ltd., London, U.K.

SCISEARCH (in association with ISI, Entry 35).

20 Data Corporation, Dayton, Ohio, U.S.A.

The "DATA CENTRAL" (1050 console Dataphone) system was used in a demonstration of the possibility of providing on-line access to the COSATI inventory of government-sponsored work in progress (1968) in the area of information sciences and technology. Essentially the DATA CENTRAL system, which is commercially available, is a set of programs for full-text storage and retrieval. It has been used by the National Institute of Neurological Diseases and Stroke (see Entry 60), and by The Smithsonian Institution (see Entry 85). DATA CENTRAL operates on an IBM 360/40 or higher machine.

The Data Corporation is now part of The Mead Corporation (Entry 51).

21 Defense Documentation Center, Alexandria, Virginia, U.S.A.

DDC has a prototype on-line system which uses an inverted file and has a tutorial enquiry language. CRT terminals with page printer are used. It is hoped to extend the system to automate all operations of DDC, eliminating batch retrieval and manual searches.

22 European Communities, Centre for Information & Documentation, Luxembourg

The ENDS (European Nuclear Documentation System) data base covers nuclear literature published since 1947; the total size of the data base is about 1,100,000 items. These are normally searched in batch mode, but during 1971 an experimental on-line system has been developed in order to give faster turn round for queries and to give the searchers the ability to interact directly with the data base. By the summer of 1971 some 200,000 references were available on IBM 360 disc files.

23 European Space Research Organization, (ESRO), Neuilly-sur-Seine, France

The ESRO's version of NASA RECON was implemented in 1970 and has been under continuous development since then. The system was initially developed for the NASA file but has proved hospitable to a number of other data bases. Bibliographic data bases available on-line on an IBM 360/65 in Darmstadt included the NASA file, Metadex, Compendex, GRA and NSA.

24 Excerpta Medica Foundation, Amsterdam, Netherlands

A project, funded by the Netherlands Government, is underway to establish an on-line medical information system and to study its cost, efficiency, etc. Participants in the scheme are Excerpta Medica and Leiden University. It is believed that the system is not yet operational (December 1971) although the two computers available (NCR315 and IBM 360/50) both have on-line capabilities and mass storage devices (CRAM and Data Cell respectively).

25 Flintshire County Library, U.K.

A small on-line library test was carried out in 1969 using an IBM 360/30 (Treasurer's Department computer). This included a subject search capability.

26 Florida State University, Tallahassee, Florida, U.S.A.

An on-line search co-ordinate index is being developed for use in teaching and research. A test data base of 710 documents has been reported.

27 General Electric, Missile and Space Division, Daytona Beach, Florida, U.S.A.

An on-line system called RAPID SEARCH MACHINE was under development in 1968.

28 General Electric, Missile and Space Division, Valley Forge, Pennsylvania, U.S.A.

Details of 500,000 technical documents relevant to GE/MSD interests are held in a data bank. Three inverted search files are maintained, serial number/keywords, keyword/frequency and keyword/serial numbers. A thesaurus containing 12,000 words is used. Access is by means of teletypewriters.

George Washington University

See Smithsonian Institution.

29 Georgia University, Athens, Georgia, U.S.A.

As part of a programme for education in retrieval techniques, the University has representative subsets of 4 data bases available for interactive video search. These are (i) CA-Condensates; (ii) Biological Abstracts and BioResearch Index; (iii) MEDLARS; (iv) Chemical-Biological Activities. References are stored on a Data Cell. Free-text word searching, using Boolean logic if required, is possible.

30 House of Commons Library, London, U.K.

The POLLS (Parliamentary On-Line Library Study) experiment set up at the Culham Laboratory in 1970 used an adaptation of the early Culham RIOT facility to give some indication of the potential of on-line information systems in the U.K. parliamentary environment.

IBM

See International Business Machines.

31 Illinois University, Urbana, Illinois, U.S.A.

The REQUEST system was a prototype on-line document retrieval system operated by the Co-ordinated Science Laboratory on a Control Data 1604 computer.

The data base contained bibliographic details, citations, and sentences referring to citations. Source articles were selected from 3 journals.

32 Illinois University, Urbana, Illinois, U.S.A.

The PLATO system has been used to demonstrate a computer-based document retrieval system using visual display output.

33 Informatics, Inc., Bethesda, Maryland, U.S.A.

An on-line retrieval system is being designed for the Rome Air Development Center. The system will be based on automatic classification of documents (during batch runs) together with interactive retrieval, i.e. a concept vector approach.

34 INSPEC, Information Services in Physics, Electrotechnology, Computers and Control, London, U.K.

Inspec has made use of the Belfast University QUOBIRD system with a test file drawn from INSPEC tapes. Preliminary use has also been made of the Culham RIOT plasma physics on-line data base.

35 Institute for Scientific Information and Cybernet Time Sharing Ltd., U.S.A./U.K.

SCISEARCH is a commercially available service offered by Cybernet Time Sharing Ltd., in association with ISI's European Branch. The aim of SCISEARCH is to enable users to make on-line current awareness searches on the ISI interdisciplinary data base. Normally the most recent four weeks of ISI tapes are held on-line in a large scientific time sharing computer based in central London.

36 Institut Textile de France, Paris, France

The Institut Textile operates a mechanized input and retrieval system based on an IBM 360/40 and two IBM 2260 CRT display terminals. A thesaurus is used at both input and search stages. The system design allows browsing but in fact this facility appears to be little used.

37 International Business Machines, France

A system is being developed to provide on-line search of a book catalogue. Tables of contents of the books will also be held on-line.

38 International Business Machines, U.S.A.

INFORM-360 is used internally by IBM for full-text retrieval operations on their own internal documentation. It can be used with TEXTPAC for citation retrieval.

39 International Business Machines, Armonk, New York, U.S.A.

The feasibility of on-line normal text searching of professional journal article abstracts (using video or printing terminals) has been examined at Armonk, based on the Boolean capabilities available in the widely used batch text-searching IBM TEXTPAC system.

40 International Business Machines, Gaithersburg, Maryland, U.S.A.

BROWSER is an on-line interactive concept retrieval system allowing browsing via an IBM 2260 display terminal. The search file is created by scanning all terms included in the input (title and abstract) and from these forming an inverted file (in root form). Index terms are weighted so that terms occurring in many documents have a low value while little-used terms have a high value. BROWSER has been used in a number of tests, e.g. 1,600 input titles and abstracts of documents of interest to the U.S. Navy, 8,000 DDC abstracts, and several tests on patent abstracts (25,000 German language and 9,000

English language).

41 International Business Machines, Los Gatos, California, U.S.A.

At Los Gatos, IBM have produced a design for a total on-line computer library system ELMS (operating on an IBM 360/40 (or higher)), giving on-line search capabilities using an IBM 2260 display terminal or IBM 2741 teletypewriter. It is not clear from the published ELMS description whether any of the previous IBM experience gained in developing TEXTPAC or IRMS (Information Retrieval and Management System) was used in developing ELMS. At Los Gatos the library has 4 IBM 2260 display terminals and an IBM 2741, on-line to the Los Gatos IBM 360/65.

42 International Business Machines, San Jose, California, U.S.A.

The Negotiated Search Facility (NSF) in use at San Jose is a research tool for the study of indexing and on-line document reference retrieval strategies.

43 International Computers Ltd., U.K.

CODIL (Context Dependent Information Language) has been used on a System 4-50 on a trial basis. An extended test was not possible due to closure of ICL's Computing Research Division, but one of the files used during the trial period was a "library type" file of biographies drawn from Who's Who 1965.

44 International Labour Office, Geneva, Switzerland

The overall ILO Library mechanized system ISIS (Integrated Scientific Information System) contains, inter alia, specific on-line video retrieval capabilities with the aim of providing rapid search facilities using the ILO IBM 360/40. Well over 40,000 records are held on IBM 2314 disc packs.

45 Lehigh University, Bethlehem, Pennsylvania, U.S.A.

The GRINS system, believed to be one of Lehigh's first experimental teletype systems, operated on ~ 1,000 serially numbered documents with an inverted index term file.

46 Lehigh University, Bethlehem, Pennsylvania, U.S.A.

The LEADERMART system is being developed at the Mart Library to provide on-line information service to 8 interdisciplinary (scientific and engineering) centres, using several different data bases (e.g. input is drawn from Chemical Abstracts and Compendex tapes) held on a CDC 6400. Output is on CRT display and the user can obtain hard copy.

Leiden University, Netherlands

See Excerpta Medica Foundation.

47 Lewis-NASA, U.S.A.

The Line Information Storage and Retrieval (LISR) system, with a user-image similar to RECON, was designed to provide retrieval from abstracts of safety documents held in a Data Cell. The system was designed to provide natural language retrieval and, if desired, light pen selection of term from authority lists.

Leyden University, Netherlands

See Excerpta Medica Foundation.

Lister Hill National Center for Biomedical Communications, U.S.A.

See National Library of Medicine.

48 Lockheed Missiles and Space Company, Palo Alto, California, U.S.A.

Lockheed clearly foresaw at an early date the great potential advantages of CRT output for retrieval from their in-house report collection of 100,000 references.

The principal Lockheed development has been DIALOG which has been used in various RECON (Remote Console) projects in a number of different areas:

(a) a demonstration of DIALOG showed the possibility of providing on-line (2260 CRT) access to the COSATI inventory of government-sponsored work in progress (1968) in the area of information sciences and technology.

(b) NASA has at least 23 RECON terminals in various parts of the U.S.A. operating from an IBM 360/40 at College Park, Maryland.

(c) ESRO operates a version of NASA-RECON.

(d) the U.S. Atomic Energy Commission makes use of Lockheed techniques (see Oak Ridge National Laboratory, Entry 73).

(e) A simpler form of RECON for use in the educational field is under development and test use of 70,000 references using an IBM 360/40 has been made for the Office of Education (ERIC - Educational Research Information Centre).

System cost has been stated to be $25 to $30 per hour on-line, and that during this time the user can search out 10-15 problems.

49 Massachusetts Institute of Technology, Cambridge, Massachusetts, U.S.A.

INTREX (Information Transfer Experiment) is an experimental project set up in 1965. The main aim is a programme of research and experiment intended to provide a foundation for the design of future information systems. On-line retrieval is seen as being likely to be a necessary

component of these future systems. The project is well-funded (e.g. $1½ million for the two years 1968-1969) and much documentation is available. The INTREX project used the M.I.T.'s CTSS IBM 7094 with associated I/O equipment.

50 Massachusetts Institute of Technology, Cambridge, Massachusetts, U.S.A.

TIP (Technical Information Project) is an early and very well-known on-line information retrieval project. File structure: straightforward list. At one time it was stated that TIP was Project MAC's best customer. Only actual computer time was charged to users. Speed of search can be gauged from the fact that 10,000 articles could be searched in one minute using the computer facility available (which at that time comprised two IBM 7094 machines). The effectiveness of using an on-line citation index has been studied using the TIP data base.

51 Mead Corporation, U.S.A.

Mead's DATA CENTRAL system is based on the DATA CENTRAL system developed by the Data Corporation (now part of the Mead Corporation) (see Entry 20). In-house facilities include 15 colour CRTs (120 characters per second) linked to an IBM 360/50 holding all Ohio statute decisions (more than 600 million characters).

52 Michigan University, Ann Arbor, Michigan, U.S.A.

The Geologic Education Research Centre information system allows teletype access to indexed periodical references. The Centre uses Michigan's IBM 360/67. Programming languages are FORTRAN IV and PL-1.

53 Minnesota Manufacturing & Mining Company (3M), U.S.A.

The Microdisc System 1 is a fully automatic random access retrieval system designed to search a file of up to 414,000 microfilmed documents in 45 seconds or less. The system consists of three elements, a teletypewriter for input and output of information and control of the system, a magnetic disc memory unit for storage of basic indexing data, and the 3M Page Search microfilm retrieval reader/printer.

54 Minnesota University, Minneapolis, Minnesota, U.S.A.

Work has been carried out on the value of using CRTs in searching for MeSH (Medical Subject Headings) terms, and in user search strategies, in the Diabetes Literature Research Project.

55 Minnesota University, Minneapolis, Minnesota, U.S.A.

A system is being designed with the aim of providing State-wide on-line information retrieval and literature location services.

56 Missouri University, Columbia, Missouri, U.S.A.

A project is underway to provide on-line interrogation of a union-catalogue of the holdings of four campus libraries.

Mitre Corporation, McLean, Virginia, U.S.A.

AESOP project - see Stanford University, Entry 88

57 Mobil Research and Development Corporation, Dallas, Texas, U.S.A.

An in-house information system has been designed. It is intended to add on-line access using CRT terminals.

58 National Aeronautics and Space Agency, (NASA), U.S.A.

The NASA RECON (Remote Console) system was developed for NASA by the Lockheed Missiles and Space Company and made use of some earlier work by the Bunker-Ramo Corporation. NASA RECON is probably the largest current on-line information retrieval system, there being an extensive terminal network in the U.S.A. (see comments under Lockheed Missiles and Space Company (Entry 48), as well as a system based on NASA RECON operating in Europe.

59 National Diet, Library Automation Project, Tokyo, Japan

The second 5-year programme (1975-1979) includes the development of on-line retrieval systems to take advantage of the extensive mechanization programme now in hand under the first 5-year programme (1970-1974) aimed at the mechanization of the principal library

procedures in the Japanese parliamentary library.

60 National Institute of Neurological Diseases and Stroke, National Institutes of Health, Bethesda, Maryland, U.S.A.

In the EARS (Epilepsy Abstracts Retrieval System) over 8,000 abstracts are available for on-line, free-text searching. The DATA CENTRAL system (see item 20) is used.

61 National Library of Medicine, Bethesda, Maryland, U.S.A. (Lister Hill National Center for Biomedical Communications)

The AIM-TWX (Abridged Index Medicus) system can be used via TWX terminals (the equivalent of British Telex) as well as IBM 2741s etc. AIM-TWX runs on the System Development Corporation's IBM 360/67 in Santa Monica, California, using ELHILL programs (which are very similar to ORBIT II programs). It provides on-line searching of a data base containing some 170,000 bibliographic references taken from 122 journals starting with items appearing in Index Medicus in January 1966. Up to 18 terminals may be used at any one time. Test use has been reported.

Notes on the associated NLM service MEDLINE are given in Entry 62.

62 National Library of Medicine, Bethesda, Maryland, U.S.A. (Lister Hill National Center for Biomedical Communications)

MEDLINE (Medlars on-line) is a new NLM service started in October 1971. Some 400,000 references, selected from 1,106 journals, are stored in an IBM 370/155 in Bethesda. This system, which has been

designed to accommodate up to 45 simultaneous users, uses only half as much C.P.U. time as AIM-TWX to search a file twice as large. However, the overall time taken by the terminal operator is about the same (15 minutes) with both systems. A data communications network for MEDLINE, with concentrators in over twenty major U.S. cities, is due to come into operation in early 1972. This will greatly reduce connect charges to users.

Notes on the associated NLM service AIM-TWX are given in Entry 61.

63 National Science Library, Ottawa, Canada

The National Science Library is now using an on-line CRT retrieval system, using an IBM 360/50, to search a data base of over 46,000 references to literature on topics dealing with environmental quality and pollution.

64 National Technological Library, Lyngby, Denmark

Test use has been made of on-line searching of Chemical Abstracts Condensates held on IBM disc at the Danish Computer Centre (I/S Datacentralen). A standard information retrieval system TELETEXT is used for sequential text scanning.

65 Naval Postgraduate School, Monterey, California, U.S.A.

The Naval Postgraduate School has carried out work on an on-line system in which request terms are converted to numerical codes and matched with stored associated numerical codes for each subject

word; retrieved bibliographic data is printed out on a terminal.

66 Newcastle University, U.K.

Programs for searching MEDLARS tapes were written at Newcastle in 1965 and from that time run as off-line searches. More recently the University has been engaged in a project, using the University's IBM 360/67, to design a system giving the user the opportunity to construct his query formulation on-line to check its validity before going on to a full off-line search of the whole data base. In 1971 some 50,000 citations were held on a 30Mbyte disc together with the appropriate thesaurus and search programs.

67 New York Times, New York, N.Y., U.S.A.

The New York Times Information Bank is an on-line information retrieval system which provides subscribers with summaries of articles appearing in the NYT since 1968 together with selected items from some 60 other publications. Facsimiles of the original articles are available on microfiche. The system, scheduled to become operational in Autumn 1971, is run on an IBM 360/50 with disc and Data Cell storage.

A facility is available to allow in-house users to have the originals displayed on the CRT terminal. The fiche are stored in a Foto-Mem* RISAR unit interfaced with the computer. Conventional television images are transmitted to in-house terminals along co-axial cables. Off-site users must select the appropriate fiche manually and view on a conventional reader.

68 North Carolina Board of Science and Technology, Science & Technology Research Centre, Research Triangle Park, North Carolina, U.S.A.

The Science and Technology Research Centre has an interactive real-time search program running on an IBM 360/75. One application of this is to provide the North Carolina legislature with an on-line system providing information on "bill" status etc.

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*Foto-Mem was declared bankrupt in late 1971.

69 Northwestern University, Evanston, Illinois, U.S.A.

A computer data base containing references to literature on computer science is searched off-line. On-line searching is believed also to be possible.

70 Northwestern University, Evanston, Illinois, U.S.A.

RIMS (Remote Information Management System; incorporates work on INFOL) has been used on a variety of test data bases. The project has two main aims: (i) to develop a user-oriented general-purpose system; and (ii) to study the man-machine interaction environment. A CDC 6400 computer is used.

71 Northwestern University, Evanston, Illinois, U.S.A.

The Vogelbach Computing Centre's RIQS (Remote Information Query System) provides on-line teletype access to data bases held on a CDC 6400. The system has been used for bibliographic data bases, particularly in the medical, social sciences and astronomical research data areas.

72 Norwegian Industries Development Association, Oslo, Norway

An exploratory project to investigate the potential applications of on-line retrieval commenced in 1971.

73 Oak Ridge National Laboratory, Oak Ridge, Tennessee, U.S.A.

ORNL has operated remote access to 125,000 items from "Nuclear Science Abstracts" (from the 1968-70 issues of N.S.A.) using Lockheed's Palo Alto facilities (and basic RECON programs). The file at Palo Alto was successfully interrogated from Paris. The basic file was later transferred to ORNL and 6 terminals are now linked to the ORNL IBM 360/75.

74 Oxford University Press, Neasden, London, U.K.

O.U.P. use a dedicated ICL 1901A with 16K of core store and an 8 million character disc. Although primarily an "office" system serving a publishing house with over 21,000 active titles, the O.U.P. system has sufficient retrieval capability to merit inclusion in this list.

75 Pennsylvania University, Moore School of Electrical Engineering, Philadelphia, Pennsylvania, U.S.A.

The Moore School has for a number of years been interested in the possibility of natural language communication with a mechanized information retrieval system. They designed the "Easy English" command language. An early dialogue (which it was claimed was also available on a CRT facility) was published in 1966. Easy English was able to handle information retrieval requests submitted in an extremely limited form of English. Success with Easy English led to the development of Real English, a system allowing input of relatively free format English and expressly designed for use with a data base of bibliographic information (reference titles, keywords, author names, etc.). Project ROSE (Retrieval by On-line SEarch) was aimed at allowing the user an unrestricted search vocabulary.

76 Pennsylvania University, Moore School of Electrical Engineering, Philadelphia, Pennsylvania, U.S.A.

The Moore School is currently developing a large-scale interactive information storage and retrieval system called SOLER (System for On-Line Entry and Retrieval). Implementation is modular with nearly all subroutines written in COBOL. (Main exceptions are terminal and disc I/O routines which are written in RCA assembly code, making the whole system practically IBM 360 compatible.)

77 Philips Gloeilampenfabrieken N.V., Eindhoven, Netherlands

DIRECT (Document Information Retrieval and Evaluation for the Computer Terminal) is intended to give on-line access, initially to patent literature and later to other fields.

78 Pittsburgh University, Pennsylvania, U.S.A.

Citation retrieval (e.g. publications of faculty staff) is one of several files available. The system uses AND/OR/NOT techniques and was designed for an IBM 360/50 with 16K core. Searches of 1,100 documents, averaging 25 card images each, are made in 5.3 seconds.

79 Pittsburgh University, Pennsylvania, U.S.A.

Interactive retrieval experiments have been carried out on a social science literature reference base under Air Force Office of Scientific Research sponsorship. The CARESS compiler has the search logic implied by the user's free-form request built into the search program, rather than into an intermediate table.

80 Programmatics, U.S.A.

An on-line system called TORQUE was under development in 1968.

81 Redstone Arsenal, Huntsville, Alabama, U.S.A.

ALPHA (Automated Literature Processing, Handling and Analysis System) is to be developed to provide on-line search capabilities. Additionally, a RECON terminal is in use.

82 Royal Institute of Technology, Stockholm, Sweden

The Royal Institute of Technology Library has extensive experience in handling different data bases in tape form and is interested in the potential these data bases offer for on-line retrieval. The Library in conjunction with ESRO has carried out dial-up experiments to the ESRO RECON data base at Darmstadt.

83 Royal Radar Establishment, Malvern, U.K.

RRE has experimented with retrieval of catalogued facts about integrated circuits, using programs designed to analyse sentences or questions by referring to a prearranged vocabulary and set of grammar rules. CLIC (Command Language for Interrogating Computers) was written primarily for data retrieval but is included in this list since it has aspects germane to reference retrieval.

84 Sandia Corporation, Albuquerque, New Mexico, U.S.A.

SPIRAL (Sandia's Program for Information Retrieval and Listing) initially operated in batch mode (on an IBM 7090), but included plans for a later on-line version.

Science Information Exchange, Washington, D.C., U.S.A.

See Smithsonian Institution (Entry 85).

85 Smithsonian Institution, Washington, D.C., U.S.A.

The Data Corporation's DATA CENTRAL system (Entry 20) for the storage and retrieval of free text has been used by the Smithsonian Institution in a test by the Science Information Exchange. A file of 4,655 "project descriptions" was held on-line on the Data Corporation's computer at Arlington, Virginia and used remotely by S.I.E. and by the George Washington University. A cost per question of $97 has been quoted with an average per question time (i.e. "user time") of 36 minutes.

86 Stanford University, Stanford, Palo Alto, California, U.S.A.

SPIRES (Stanford Public Information Retrieval System) is a well developed on-line system allowing complex nesting where a query requires this. SPIRES operates on a 360/67 via normal IBM 2741 terminals. A number of data collections are available, e.g. Educational (ERIC), Geology, Nuclear ("Nuclear Science Abstracts"). One of the principal experimental user groups has been the SLAC (Stanford Linear Accelerator Centre) Library with an on-line file of over 14,000 high energy physics preprints. The SPIRES project is complementary to the library automation project BALLOTS (Bibliographic Automation of Libraries on Time-sharing).

87 Stanford University, Stanford, Palo Alto, California, U.S.A.

The DIRAC (DIRect ACcess) system has been applied to the "Preliminary Warsaw Catalogue of Supernovae". An on-line user can pose a question such as "locate a supernova for which the first article given as reference has "Mt. Wilson" as its source"; the end result of the search is display of the appropriate reference. DIRAC-I was implemented on Stanford's IBM 360/67, the data base being on IBM 2314 disc.

88 Stanford University, Stanford, Palo Alto, California, U.S.A.

A project in the Department of Industrial Engineering at Stanford is examining the advantages of displaying hierarchically structured index trees on a fairly large (14" × 14") CRT; the decision tree format permits the user merely to point with a light point at alternatives which seem to him to be appropriate. Two hierarchically structured subject indexes are being studied - a portion of an ACM Computer Index and a portion of MeSH (Medical Subject Headings). (In the use of "branching tree displays" this project carries forward some of the earlier interesting work carried out in the Mitre Corporation's AESOP project and System Development Corporation (Entry 96) work carried out at about the same time, i.e. 1965-66.)

89 State University of New York, Upstate Medical Centre, Syracuse, N.Y., U.S.A.

In the SUNY Biomedical Communication Network several participating libraries have IBM 2740 terminals connected to an IBM 360/40 at Syracuse. Headquarters of the network is at SUNY Upstate Medical Library at Syracuse. The on-line system SYMBIOSIS (SYstem for Medical and BIOlogical Sciences Information Searching) allowed normal Boolean-type access to 66,000 journal citations drawn from MEDLARS tapes and

30,000 book references in 1968. SUNY Biomed differs from AIM-TWX in that AIM-TWX not only has a different data base but it also offers additional search assistance (display, if required, of portions of the search tree).

90 Swedish Computerized Library Network, LIBRIS, Sweden

It is planned that LIBRIS will use the ISIS programs and the ILO's data base.

91 Syracuse University, Syracuse, N.Y., U.S.A.

The MOLDS (Management On-Line Data System) was originally developed in 1966 for management purposes but was adapted in 1968 to use the then MARC pilot project tape. The aim of the experiment was to determine how on-line interactive retrieval systems could be used to greatest advantage in the information gathering process. An IBM 360/50 was used, with IBM's Document Processing System (DPS).

92 Syracuse University, Syracuse, N.Y., U.S.A.

SUPARS II (Syracuse University Psychological Abstracts Retrieval Service) is aimed at the further development and evaluation of an on-line, free text reference retrieval system based on about 35,000 abstracts from "Psychological Abstracts" and using a modified version of IBM's Document Processing System (DPS).

93 Syracuse University, Syracuse, N.Y., U.S.A.

The aim of the LEEP (Library Education Experimental Project) project was to provide a laboratory where library school students could relate their problems in cataloguing and reference courses to the processing and retrieval procedures possible in mechanized library systems. Selected MARC I and II tapes were used. Computer facilities available were an IBM 360/50 with remote display consoles and teletypewriters.

94 System Development Corporation, Santa Monica, California, U.S.A.

COLEX-MICRO was an experimental teletype on-line system which operated on a data base of 2,000 documents. Descriptors plus qualifiers were used, organized into inverted files.

95 System Development Corporation, Santa Monica, California, U.S.A.

The LUCID QUUP system was used in a demonstration of the possibility of providing on-line teletype access to the COSATI inventory of government-sponsored work in progress (1968) in the area of information sciences and technology. (Another SDC system, TDMS, was considered but not in fact put forward by SDC for actual demonstration.)

96 System Development Corporation, Santa Monica, California, U.S.A.

The BOLD (Bibliographic On-Line Display) experimental CRT on-line system was one of the earliest projects to use on-line interactive CRT displays for document retrieval.

97 System Development Corporation, Santa Monica, California, U.S.A.

The ORBIT II (On-line Retrieval of Bibliographic Information Time-shared) system, which complements SDC's ALPS (Automated Library Processing Services), was developed after 7 years experience with ORBIT I. It is designed to operate on an IBM 360/40 or larger with 256K core minimum. ORBIT II is reported to be commercially available at $22,000. It is or has been used on a variety of data bases including MARC and ERIC. The SDC/ERIC search service is available to remote users at rates varying from $25 to $45 per hour. It is claimed that 6 to 15 searches can be carried out in one hour. However, there is a minimum use charge of $400 per month (≡ 60-150 searches per month).

98 System Development Corporation, Santa Monica, California, U.S.A.

The AIM-TWX system was developed by SDC in collaboration with the National Library of Medicine and runs on SDC's IBM 360/67 at Santa Monica. For further details see National Library of Medicine (Entry 61).

99 Texas Instruments Inc., Corporate Technical Information Centre, Dallas, Texas, U.S.A.

Automation of the Texas Instruments libraries is planned to include on-line retrieval of reports and patents. The cost of using external data bases is being investigated.

100 United Kingdom Chemical Information Service, (UKCIS), Nottingham, U.K.

UKCIS offers a retrospective chemical literature search service on a batch basis. In its plans for the future, UKCIS in its design of INFIRS (Inverted File Information Retrieval System) has applied the basic philosophy that INFIRS should have a capability for on-line real-time use (even if such use is not immediately implemented).

101 United Nations Educational, Scientific and Cultural Organization, (Unesco), Paris, France

A computer-based documentation system has been set up at Unesco in Paris. The system, which became operational in October 1971, uses an ICL 1902A and is expected to handle about 20,000-30,000 documents per year, initially on an off-line basis. However, since on-line retrieval is expected to be necessary at some point in the future the system has been designed so that it can be converted to on-line operation with a minimum of effort (the Master File together with all other working files are currently held on disc).

102 United States Patent Office, Washington, D.C., U.S.A.

POTOMAC is a project to investigate the ways in which the operations of the U.S. Patent Office, could be mechanized. The ultimate aim is to have 1.6 million patents in store in 6 years time allowing 1,200 patent examiners, and members of the public, on-line access to this data base from any one of over 120 terminals.

103 University of Washington, Seattle, Washington, U.S.A.

Washington University has a data bank covering international treaties and operates an on-line retrieval service from this file of references. The file contains details of over 10,000 treaties (~ 80% of all world treaties signed since 1945). The data bank is accessed via teletype terminals linked to a B5500 computer.

104 University of Washington, Seattle, Washington, U.S.A.

An interactive, library-type retrieval system has been developed based on the keyword-in-context concept. Especially suited to technical documents and non-book documents, the system has been primarily developed for an IBM 1130. The program suite comprises 19 FORTRAN programs.

105 Virginia University, Charlottesville, Virginia, U.S.A.

The Medical Library has reported on the test use made of the AIM-TWX system (for brief description of AIM-TWX see National Library of Medicine, Entry 61).

106 Vision Information Centre, Harvard Medical School, Boston, Massachusetts, U.S.A.

The Vision Information Centre (VIC) has developed a system providing on-line retrieval of biomedical literature on the eye. Over 10,000 articles are now in the data base, which is used via remote teletypewriter terminals by some 25 external research groups. A hierarchically structured thesaurus of ~ 7,000 terms is used;

this has been constructed partly from MeSH (Medical Subject Headings) and partly from experience gained in indexing the input to the VIC data base.

107 Warner Air Material Area, California, U.S.A.

The VEREAD (Value Engineering Retrieval of Esoteric Administrative Data) system was set up by a group of value engineers. The system is based on indexing of documents using a standard 'index page', the index being held in a time-shared computer. The index pages together with the full text of documents are held in microfilm cartridges. The result of a successful terminal (Model 35 Teletype) search is a statement of the microfilm location of a document matching the input enquiry, e.g.

CARTRIDGE = 1 FRAME = 133 PAGES = 13.

Washington University, Seattle, Washington, U.S.A.

See University of Washington.

ON-LINE INFORMATION RETRIEVAL
System and Other Particularly Significant
ACRONYMS etc.